Eimac®

1964 QUICK REFERENCE CATALOG

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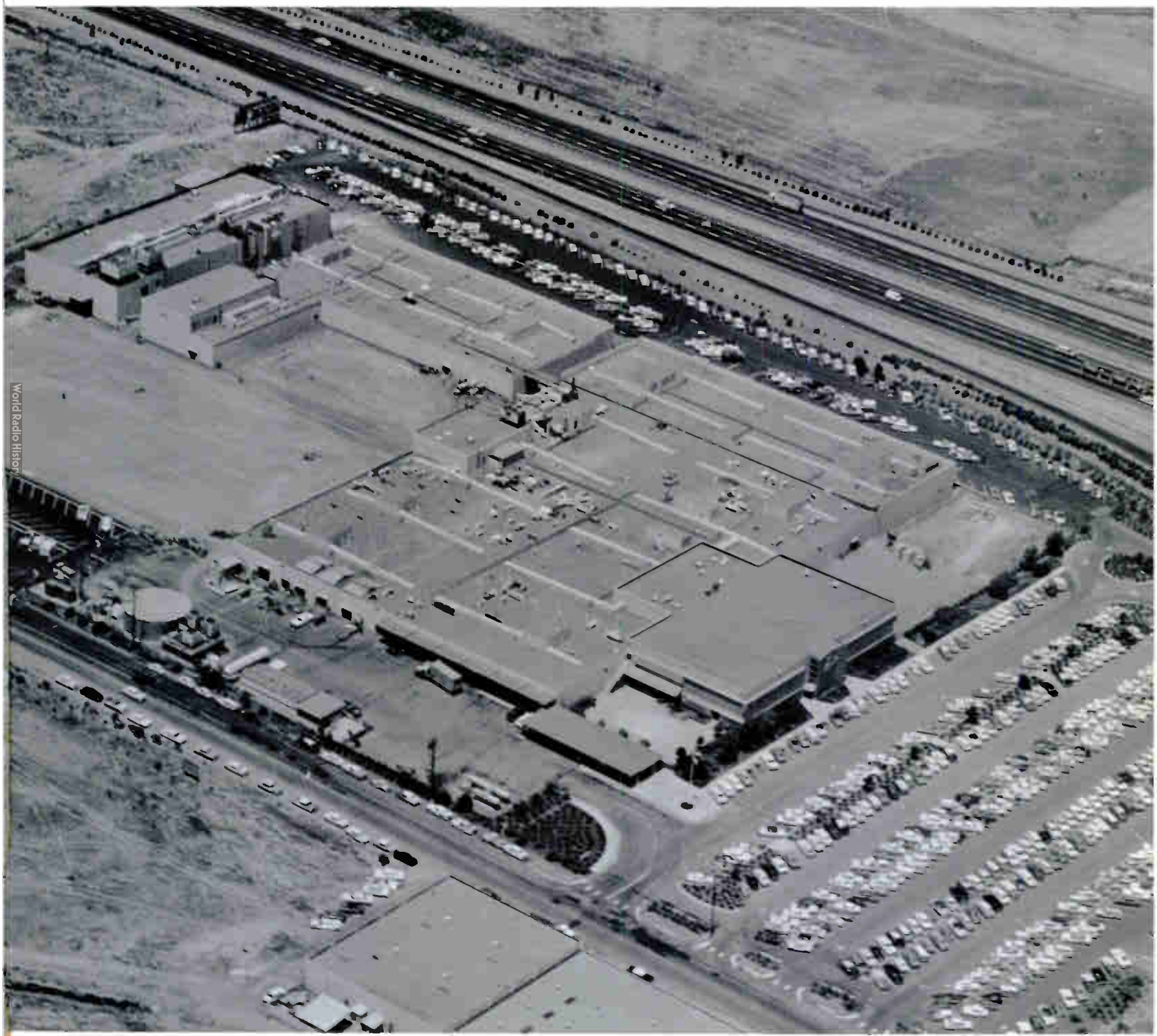

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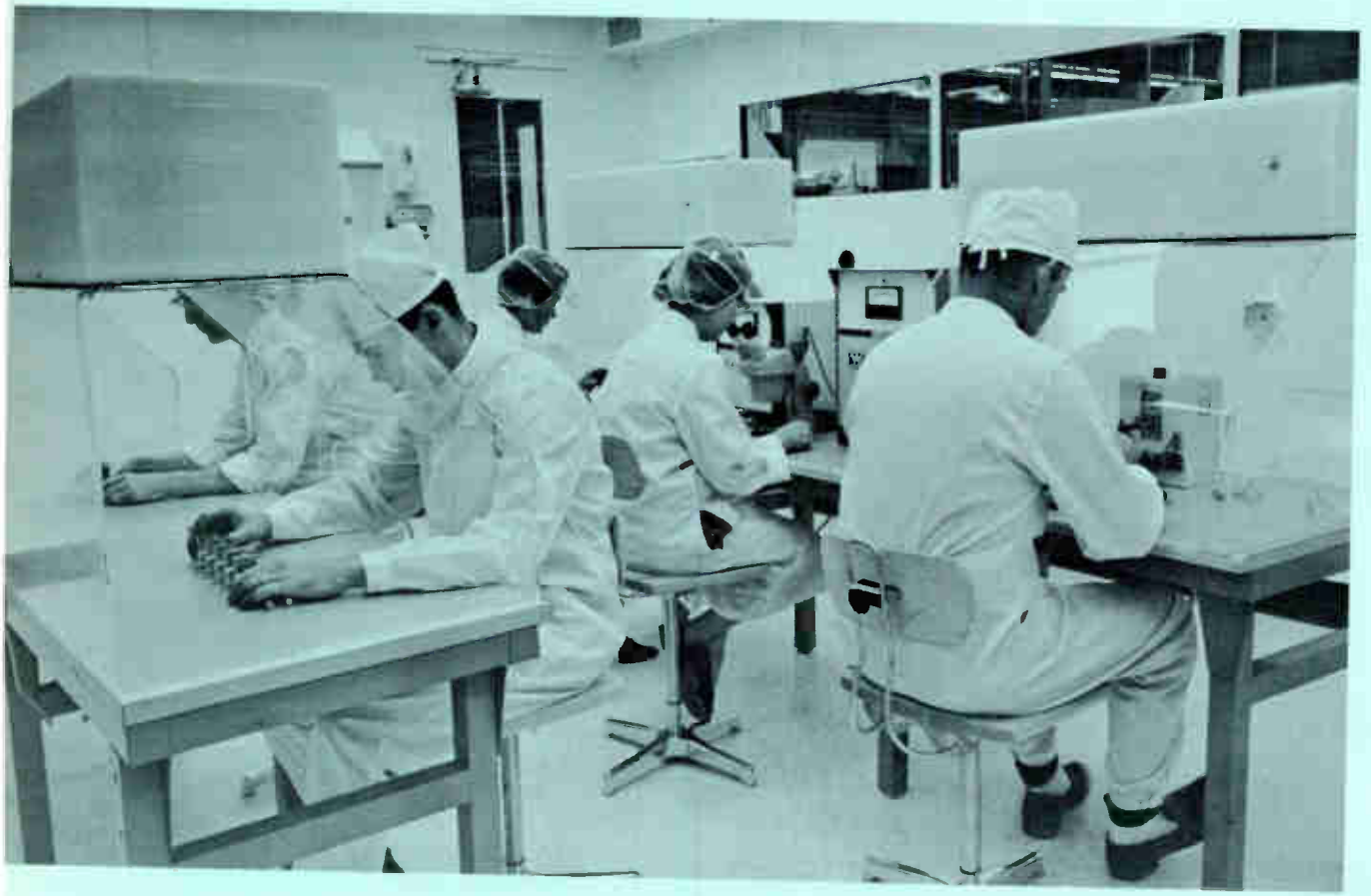


MICROWAVE TUBE DIVISION

The youngest, but fastest growing facility of Eitel-McCullough, Inc., is the Microwave Division which manufactures a variety of microwave tubes especially tailored for the services required. The large number of tubes vary from high production, low cost reflex tubes to the ultimate in sophisticated satellite tubes for space applications. In addition to microwave tubes, the Microwave Division has expanded its capabilities to include the development and delivery of completely packaged microwave tubes and their associated power supplies. The product line includes:

- Reflex tubes
- Two-cavity oscillators
- Traveling Wave Tubes—Pulse and CW
- Voltage Tunable Magnetrons
- Microwave Tube Packages
- Advanced microwave devices development

Advanced Eimac technology in material, processes and fabrication techniques contributes greatly to the stability, long life and efficiency which are typical of these products.

The Eitel-McCullough, Inc. engineering staff is capable of quick reaction because of its wide experience in a multitude of products and microwave devices.

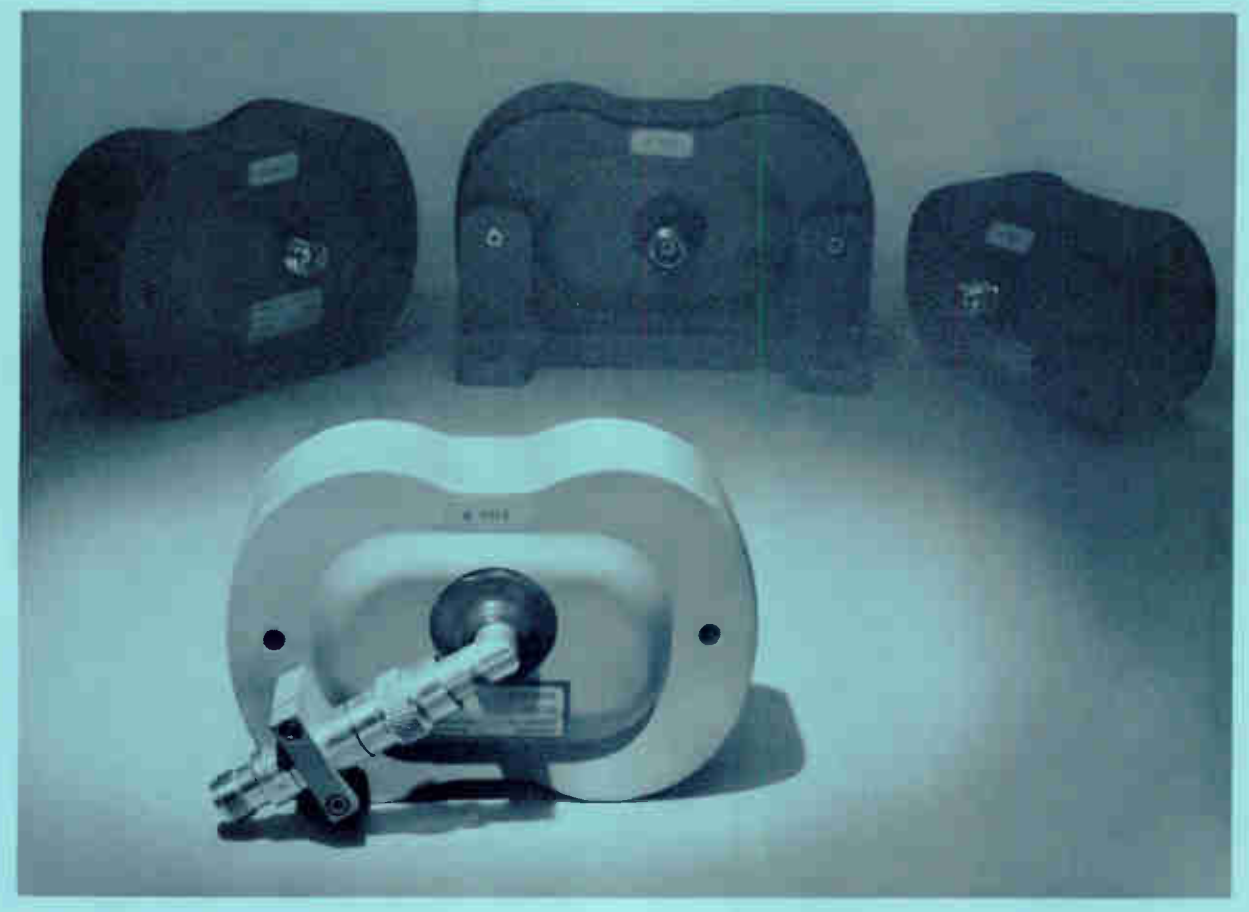
Improvement of over-all equipment performance and increased project speed are benefits which emerge logically from the use of Eimac component modules in equipment designs.

VTM

Eimac's Voltage Tunable Magnetrons offer power levels from a few watts to hundreds of watts over a broad, linear tuning range. The frequency agility, linear electronic tuning, simplicity in design, and high efficiency enable the System Design Engineer to achieve maximum design performance of system complexities. Much improved noise characteristics which have put Eimac's VTM's in a new generation of rf sources make them the choice for a whole new range of applications. When combined with the VTM's other desirable features, low noise characteristics make the VTM ideal for use as a local oscillator in sophisticated receivers.

Eimac's unique three-terminal design coupled with metal-ceramic construction, results in an extremely rugged assembly. The VTM operates with a minimum of performance degradation under severe environmental conditions. In addition, the design allows smoother power transition to the output coax which results in flatter output characteristics over the entire tuning range.

Reliability is assured because Eimac employs an indirectly heated nickel matrix cathode. This indirect heating method insures long life and minimum FM in severe environments. Also, the System Design Engineer is permitted the option of ac or dc filament power which is not possible with directly heated cathode.



VOLTAGE TUNABLE MAGNETRONS

LOW NOISE

Engineering advances of Eimac's VTM development program have established a new standard for low noise performance. Because there are numerous ways to define and measure AM noise, measurement techniques must be clearly defined if noise data are to be meaningful and comparable. For example, in a typica measurement technique, Eimac measures noise power in db below the carrier by using a 60 Mc if strip with a 2.5 Mc band pass, incorporating both side bands The Eimac EM1083 and EM-1088 exhibit relative noise power output consistently 90 db or better below the carrier. This and other proven techniques of noise measurement make Eimac the first choice source for low noise requirements.

TYPICAL OPERATION

Type	Frequency Range (Mc)	Minimum Power Output (mW)	Anode Voltage (Vdc)	Maximum Injection Anode Voltage (Vdc)	Maximum Injection Anode Current (mAdc)	Cathode Current (mAdc)	Tuning Rate (Mc/V)	Cooling
EM-1083	320–525	30	1230–2000	200	0.02	0.5–1.5	0.35	Conduction
EM-1088	520–925	30	970–2000	200	0.02	2–4	0.55	Conduction
*X1098	885–1460	30	1100–1900	200	0.02	3–5	1.2	Conduction
*X1151	520–770	50	1200–1700	125	0.02	0.5–1.5	0.55	Conduction

HIGH POWER

New manufacturing techniques have produced high power VTM's without sacrifice of minimum bandwidths of 30 per cent. The high efficiencies (35%) of Eimac VTM's permit missile and airborne system power supplies to be remarkably reduced in size and complexity.

Recent research and development at Eimac indicate that even higher power outputs than those shown below are possible. Current designs are immediately available in higher powers and efficiencies, with small sacrifice (10–12 percent) in bandwidth. These VTM's are ideally suited for solid state pump and frequency multiplier applications.

TYPICAL OPERATION

Type	Frequency Range (Mc)	Minimum Power Output (W)	Anode Voltage (Vdc)	Maximum Injection Anode Voltage (Vdc)	Maximum Injection Anode Current (mAdc)	Cathode Current (mAdc)	Tuning Rate (Mc/V)	Cooling
EM-1081	900–1200	10	970–1655	200	0.02	16–25	0.55	Forced Air
X1086	940–1060	15	1820–2060	500	0.02	24–26.5	0.5	Forced Air
X1087	515–605	10	1480–1790	500	0.02	13–17	0.35	Forced Air
*X1150	980–1000	40	2200–2240	100	0.02	45–50	0.55	Forced Air
*X1091	2200–2300	35	2200–2400	350	0.02	40–45	0.95	Forced Air

*INDICATES NEW PRODUCT

VOLTAGE TUNABLE MAGNETRONS

MEDIUM POWER

The broad spectrum of VTM's available from Eimac are ideally suited for broad band, low noise operation and for ease of frequency tuning. Excellent temperature stabilities offer attractive possibilities for local oscillator and noise signal sources. Special design features include low AM noise characteristics and the capability of operating into a 4:1 load with minimum performance degradation. When bandwidths of 3 to 1 or higher are required for ECM or microwave signal generators, production designs are now available or can be scaled rapidly from the current models.

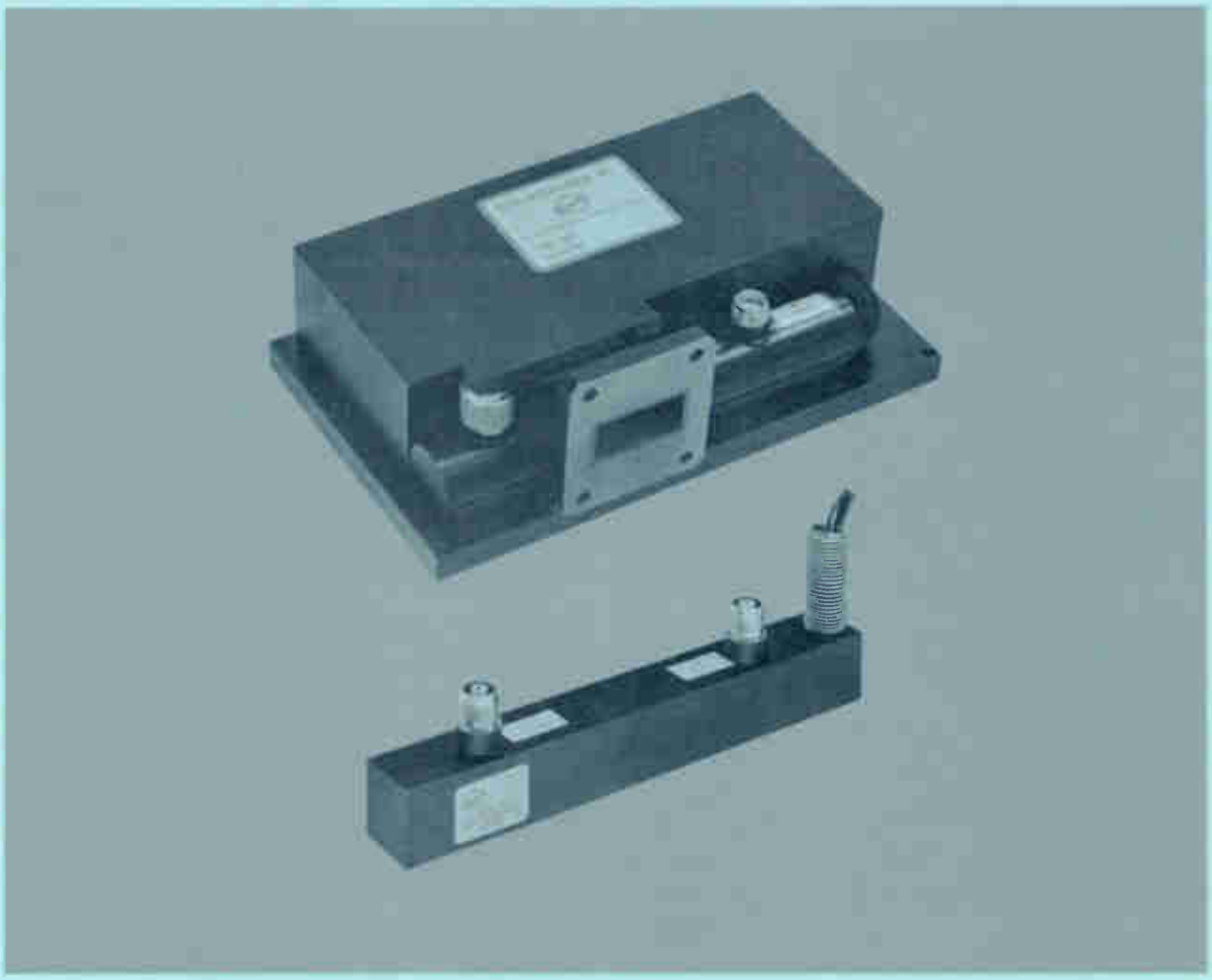
TYPICAL OPERATION

Type	Frequency Range (Mc)	Minimum Power Output (mW)	Anode Voltage (Vd)	Maximum Injection Anode Voltage (Vdc)	Maximum Injection Anode Current (mAdc)	Cathode Current (mAdc)	Tuning Rate (Mc/V)	Cooling
EM-747	400–1200	50	700–2000	150	0.1	2–10	0.65	Conduction
X1080	1200–2200	100	800–1400	350	0.1	4–12	1.7	Conduction
X1084	300–600	30	990–1900	150	0.05	0.5–1.5	0.4	Conduction
▲X1085	1200–1400	100	1820–2060	200	0.02	2–8	0.5	Forced Air
X1089	190–300	20	660–990	200	0.01	0.5–1.0	0.3	Conduction
*X1092	800–1400	500	1000–2200	200	0.01	3–18	0.65	Conduction
*X1093	2475–2725	1750	1120–1200	300	0.01	9–15	2.5	Conduction

▲ Small 1.5 pound magnet design X-1085 can also be offered at a power output of 1 watt with minor parameter changes. Forced-air cooling.

*INDICATES NEW PRODUCT

TRAVELING WAVE TUBES



Since Eimac developed its first Traveling Wave Tubes some years ago, this product line has met with universal acceptance. The EM-778, first model of the series, is now in large quantity production. From this basic design has evolved a diversified production line to meet a wide variety of applications.

The recent addition of many new types of TWT's has expanded Eimac's capability in this growing field. These types of tubes are of the latest ceramic and metal construction, designed to satisfy extreme missile and space environments. Heat sink cooling and ceramic stacked gun construction, derived from many years of experience, contribute to excellent performance and long life.

Variations of the tubes described can be supplied promptly and individual requirements are given careful engineering attention to assure maximum compatibility and integration in the system design. A staff of Applications Engineers is available to Eimac customers for solution of unique problems and testing of special designs.

TRAVELING WAVE TUBES

EM-778 SERIES

This family of tubes was developed as a by-product of the EM-778 series. These PPM focused tubes are of ruggedized ceramic and metal construction, and are designed to withstand missile environments without shock mounting. Either heat sink or convection cooling is optional. The advanced rf design eliminates the usual input and output transformer section which results in ample bandwidths with minimum power variation over the passband.

TYPICAL OPERATION

Type	Frequency (Gc)	Output Power Saturation (W)	Small Signal Gain (db)	Anode Voltage (Vdc)	Cathode Current (mA)	Focus Electrode Voltage (Vdc)
EM-778	5.0–11.0	1	60	2900	23	–30
*EM-778J	5.0–11.0	1	60	2900	26	–20
EM-779	5.0–11.0	1	30	2950	23	–30
*X1002	5.0–11.0	1	25	2900	26	–25
EM-1006	2.0–4.0	1	50	1250	35	–10
*X1007	2.0–4.0	2	60	1200	30	–15
X1008	2.5–3.8	1	55	1250	28	–10
EM-1010	4.0–8.0	1	60	2900	23	–30
EM-1011	4.0–8.0	1	30	2950	23	–30
EM-1015	4.0–8.0	3	60	2450	28	–40
*EM-1015S	C Band/X Band	2	45 db/40	2450	25	–30
EM-1016	4.0–8.0	3	30	2450	28	–40
EM-1025	4.0–12.0	1	40	2900	23	–30
EM-1030	7.0–11.0	5	60	3200	30	–30
EM-1031	7.0–11.0	5	30	3200	30	–30
EM-1045	8.0–12.0	1	60	2950	23	–30
EM-1046	8.0–12.0	1	30	2950	23	–30
EM-1050	8.0–12.0	3	60	3300	28	–40
EM-1051	8.0–12.0	3	30	3300	28	–40
EM-1060	2.5–11.0	0.5	30	2950	23	–30

*INDICATES NEW PRODUCT

TRAVELING WAVE TUBES

*MEDIUM POWER

Tubes of saturated output of 5 watts or more are ideally suited for radar augmentation, ECM and driver applications. Broad band, high-gain amplifiers with temperature compensated PPM focusing, are operable over −55 to +85°C. Ruggedized ceramic and metal construction with integral heat-sink mounting flange permits operation at high ambients at extreme altitudes and under severe shock and vibration conditions. Some of these tubes are available with depressed collectors for high efficiency operation.

TYPICAL OPERATION

Type	Frequency (Gc)	Output Power Saturation (W)	Small Signal Gain (db)	Anode Voltage (Vdc)	Cathode Current (mA)	Focus Electrode Voltage (Vdc)
*X1014	4.0–8.0	20	35	3000	85	−20
*X1020	5.8–6.3	20	30	2900	85	−20
*X1021	4.0–8.0	10	30	2900	80	−25
*X1022	5.0–11.0	2	60	1600	25	−30

*MINIATURE TWT

This new generation of TWT's complements the EM-778 production line. The chief distinction is the reduction in size and weight without sacrifice of pertinent specifications, already proven over many years in the 778 series.

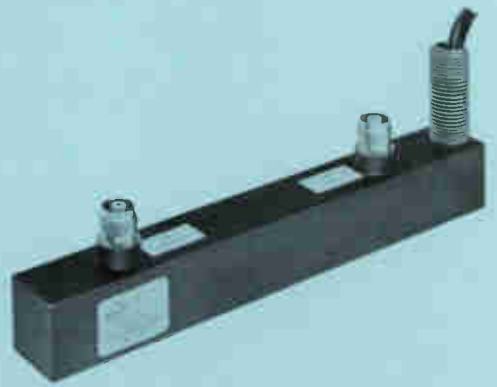
Miniature TWT's weigh 1½ pounds or less, measure ¾ inch diameter, are PPM focused and exhibit high gain over broad bands. Their successful operation under severe electrical and mechanical tests makes them ideal for airborne and space requirements. Nominal power outputs are 1 to 2 watts. With slight modifications in design, the power outputs can be increased to 5 to 10 watts.

*INDICATES NEW PRODUCT

TRAVELING WAVE TUBES

*PULSE

The Model X-1033 is gridded with 1 Kw (min) pulsed power output when operated at a duty cycle of 0.001 in the 4–8 Gc band. This lightweight, PPM focused TWT is heat sink cooled. It is designed for airborne environments with maximum reliability and shock resistance assured within a −40 to +85°C temperature range and is ideally suited for transponders, ECM, drones, range generators, missile beacons, frequency diversity systems, communications and test equipment.



*SATELLITE

A long life, highly reliable, TWT amplifier for satellite use. It operates in X-band at a saturated gain of 36 db. A mean time before failure of 50,000 hours is guaranteed.

*GENERAL PURPOSE TUBES

These are long life, reliable tubes of military type construction and offering the benefits of low initial and replacement cost. They are ideal for bench and test equipment applications. Minimum output of 1 watt at band edges, 30 db gain.

Special adaptations, such as isolated helix for rf modulation, or depressed collector for higher efficiencies, can be provided.

Heat sink or convection cooling are offered and mechanical arrangements can be modified to suit the system design. Sizes are compatible with standard rack or equipment cabinet dimensions.

Type	Frequency (Gc)	Minimum Output Power (W)	Gain (db)	Anode Voltage (Vdc)	Cathode Current (mA)	Focus Voltage (Vdc)
*X1026	2-4	1.0	30	1150	30	−30
*X1027	4-8	1.0	30	2800	25	−30
*X1028	8-12	1.0	30	2500	28	−40

*INDICATES NEW PRODUCT

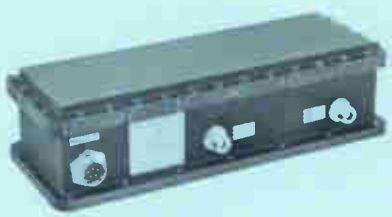
MICROWAVE TUBE PACKAGES

*SATELLITE COMMUNICATIONS PACKAGE

A long life, highly reliable, TWT packaged amplifier for satellite use. Operating from a 28-volt dc source, this package provides a minimum of 2.5 watts, at a saturated gain of 36 db, in X-band. A mean time before failure of 50,000 hours is guaranteed.

*TELEMETRY AMPLIFIER PACKAGE—PULSE

A small amplifier telemetry package (X-1133) covering the 4–8 Gc band with 1 Kw (min.) pulsed power output at 0.001 duty cycle is designed for airborne applications. Input power to the package is 28 Vdc at 3 amps. It uses the gridded X-1033 TWT output tube which operates from a solid state integral power supply. Specifications include an external signal trigger pulse of 10 volts, rf output widths of 100 microseconds length, pulse rise time of less than 300 nanoseconds, and pulse droop of less than 3 db over 100 usec width. There is a type N input rf connector and type SC ouptut connector, both with 50 ohms impedance. Conduction cooling is provided over the temperature range —45 to +85°C., to altitudes of 70,000 ft. Shock resistance to 50 g's (llms)—vibration resistance to 10 g's over 5–400 cps range in all three planes.



*TELEMETRY AMPLIFIER PACKAGE—CW

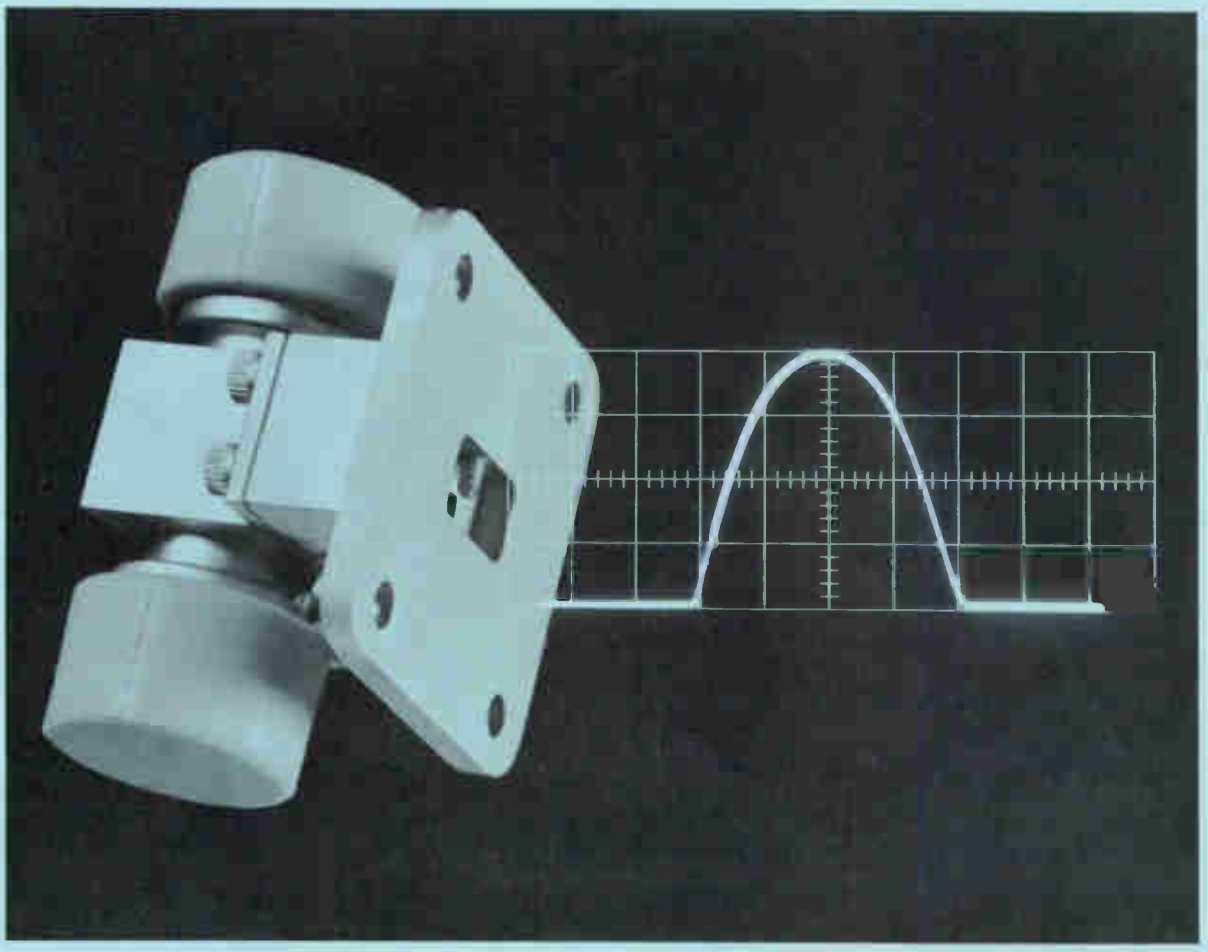
This package (X-1134) is designed for missile application. Salient features are: 30 db minimum saturation gain, 4 to 8 Gc operating frequency, 20 watt minimum output power, heat sink cooling, and —40 to +85°C operating temperature range. The self contained solid state power supply has an input voltage of 28 ± 4 Vdc with a power availability in excess of 150 watts. The complete package weighs 10 pounds maximum. It is designed to withstand environmental conditions of 20 g vibration at 20–500 cps and 100 g shock.

*TELEMETRY PACKAGE DRIVERS

The driver package (X-1135) for the TWT telemetry packages (X-1133 or X-1134) is composed of reflex klystron X-1095, Series A, B, C or D. These C-band reflex klystrons are matched with their own circulators and integral solid state power supplies. The combination is thermally compensated, assuring high stability. Heat sink cooling is provided. The minimum 400 mW power output provides ±50 Mc electronic tuning at 3 db points. Construction for severe airborne/space applications assures long life and reliability.

*INDICATES NEW PRODUCT

REFLEX KLYSTRONS & TWO-CAVITY OSCILLATORS



The largest number of microwave devices which Eimac has produced to date is in the reflex klystron line. Models vary from the low cost, high production types to sophisticated tubes for missile and space applications.

Latest design and manufacturing techniques are employed so that precision in meeting specifications and consequent reliability can be assured. Continuing value analysis guarantees Eimac's high quality at lowest cost to the customer.

If system requirements are not met in this large selection of reflex klystrons, Eimac engineers can readily adapt, modify or develop a device to specific needs.

REFLEX KLYSTRONS

1K20 SERIES

The 1K20 series of reflex klystrons are ceramic and metal, ruggedized tubes featuring external cavity tuning and low FM noise under vibrating conditions The brazed-joint construction, single screw tuning and low residual AM and FM noise make these tubes especially well suited for local oscillator and parametric amplifier applications as well as for operation in missile-type environments.

TYPICAL OPERATION

Type	Frequency Range (Gc)	Power Output (mW)	Minimum Electronic Tun. Range (Mc)	Average Reflector Voltage (Vdc)	Maximum Beam Voltage (Vdc)	Beam Current (mAdc)	Heater Voltage (V)	Heater Current (Amps)
1K20XN-A	8.5 to 11	100 to 200	20	—160	400	40	6.3	0.7 to 1.0
1K20XF-B	10.1 to 10.4	50	40	—110	350	40	6.3	0.7 to 1.0
1K20XD-A	10.0 to 10.7	40	25	—173	350	55	6.3	0.7 to 1.0
1K20SD-S	10.5 to 11.0	120	40	—170	400	40	6.3	0.7 to 1.0
X1075A	8.5 to 9.6	100	40	—150	400	40	6.3	0.7 to 1.0

1K75 SERIES

The 1K75 series of low noise, ceramic and metal, ruggedized reflex klystrons is especially designed for altimeter applications. The mounting bracket/heat sink flange, 1K75CL, provides efficient heat transfer when the cathode is grounded and the tube body is insulated from the chassis. The tube may be operated at any altitude.

TYPICAL OPERATION

Type	Frequency Range (Mc)	Power Output (mW)	Minimum Electronic Tun. Range (Mc)	Reflector Voltage (Vdc)	Maximum Beam Voltage (Vdc)	Beam Current (mAdc)	Heater Voltage (V)	Heater Current (Amps)
X1079	4000 to 6000	225	30	—85	550	35	6.3	0.7 to 1.2
1K75CH	4300 ± 50	250 to 1000	50 30	—150 —350	550 to 750	35 to 60	6.3	0.9 to 1.5
1K75CK	4300 ± 50	250 to 1000	55 30	—150 —350	550 750	35 to 60	6.3	0.9 to 1.5
1K75CS	4300 ± 50	325	90	—85	700	55	6.3	0.9 to 1.5
*EM-1121	4300 ± 50	500	40	—180	700	55	6.3	0.9 to 1.5
*1K75CL-A	4300 to 4375	240	50	—90	550	35	6.3	0.9 to 1.5

*INDICATES NEW PRODUCT

REFLEX KLYSTRONS

MICROWAVE COMMUNICATIONS SERIES

The X-1115 series of ceramic and metal, conduction-cooled reflex klystrons is designed for local oscillator and transmitter service in microwave relay equipment. The X-1115 series features power and frequency stability in conjunction with mechanical tuning across the entire frequency band. Either heat sink or convection cooling versions can be supplied. These tubes feature low noise and gridless gun optics. They are conservatively warranted for 1000 hours of life.

TYPICAL OPERATION

Type	Frequency Range (Mc)	Power Output (mW)	Minimum Electronic Tun. Range (Mc)	Average Reflector Voltage (Vdc)	Maximum Beam Voltage (Vdc)	Beam Current (mAdc)	Heater Voltage (V)	Heater Current (Amps)
*X1118	10.7–11.2	1000	40	—200	750	85	6.3	0.9–1.3
*X1118A	10.7–11.2	100	40	—150	400	40	6.3	0.7–1.0
*X1118B	10.7–11.2	30	60	—100	300	25	6.3	0.7–1.0
*X1117	11.2–11.7	1000	40	—200	750	85	6.3	0.9–1.3
*X1117A	11.2–11.7	100	40	—150	400	40	6.3	0.7–1.0
*X1117B	11.2–11.7	30	60	—100	300	25	6.3	0.7–1.0
X1116	11.7–12.2	1000	40	—200	750	85	6.3	0.9–1.3
X1116A	11.7–12.2	100	40	—150	400	40	6.3	0.7–1.0
X1116B	11.7–12.2	30	60	—100	300	25	6.3	0.7–1.0
X1115	12.2–12.7	1000	40	—200	750	85	6.3	0.9–1.3
X1115A	12.2–12.7	100	40	—150	400	40	6.3	0.7–1.0
X1115B	12.2–12.7	30	60	—100	300	25	6.3	0.7–1.0

KU BAND SERIES

Ku band tubes cover the varied requirements of doppler navigators, radar altimeters, paramp pumps, terrain avoidance radars and many other systems applications. Broad band tuning or fixed trimmable are also available.

Of particular note are the new designs of high stability paramp pump tubes. These tubes are designed for long life, high efficiency and high power, at minimum cost.

TYPICAL OPERATION

Type	Frequency Range (Gc)	Power Output (mW)	Minimum Electronic Tun. Range (Mc)	Average Reflector Voltage (Vdc)	Maximum Beam Voltage (V)	Maximum Beam Current (mA)	Heater Voltage (V)	Maximum Heater Current (Amps)
X1120	12.5 to 14.5	250	35	—290	400	45	6.3	1.3
*X1120A	12.5 to 15.0	1200	60	—300	800	95	6.3	1.3
*X1149	12.5 to 18.0	1200	60	—300	800	95	6.3	1.3
*EM-1114	13.9	200	35	—300	400	45	6.3	1.3
*X1120B	13.325	200	150	—150	500	55	6.3	1.3
*X1130	15.0 to 18.0	200	35	—300	500	55	6.3	1.3
*X1119	15.0 to 18.0	1000	60	—300	800	95	6.3	1.3
*X1126	16 to 17	20	50	—100	300	25	6.3	1.3
*X1126B	16.5 to 17.2	20	50	—100	300	25	6.3	1.3
*X1123	13.395	20	30	—100	300	25	6.3	0.8

*INDICATES NEW PRODUCT

REFLEX KLYSTRONS

OTHER TYPES

Examples of other types of tubes are low noise, ceramic and metal reflex klystrons which can be used in transmitter microwave link communications or as local oscillators. A tuning cycle in excess of 100 cycles with a tuning rate of 100 Mc's per turn is provided by a bellows-coupled, dielectric tuner on the 1K125 types. The X1095 is factory preset to customer specifications within the stated frequency range. It offers broad electronic tuning with linearity better than 5%.

TYPICAL OPERATION

Type	Frequency Range (Mc)	Power Output (mW)	Minimum Electronic Tun. Range (Mc)	Reflector Voltage (Vdc)	Maximum Beam Voltage (Vdc)	Beam Current (mAdc)	Heater Voltage (V)	Heater Current (Amps)
1K125CA	3700 to 4400	1600	28	−275	1000	75	6.3	1.0 to 1.5
1K125CB	4400 to 5000	770 to 2500	28	−130 to −345	800 to 1000	55 to 75	6.3	1.0 to 1.5
1K015CA	5350 to 5950	35 to 130	30	−135 to −240	300 to 350	35 to 49	6.3	0.7 to 1.0
*X1095	5900 to 6300	400	100	−150 to −225	600	50	6.3	0.7 to 1.0

TWO-CAVITY KLYSTRON OSCILLATORS

Inherent amplitude stability and high power output make Eimac's new family of two-cavity oscillators ideal for parametric amplifier pumping applications. The high output levels automatically adapt this series to the pumping of multiple parametric amplifiers.

Of special note is the 13 Gc series designed for doppler radar. These tubes possess excellent temperature stabilities and low AM/FM noise characteristics and are ruggedly constructed for severe environmental operation.

TYPICAL OPERATION

Type	Frequency Range (Gc)	Minimum Power Output (W)	Beam Voltage (V)	Beam Current (mA)	Heater Voltage (V)	Heater Current (Amps)
*X1110	13.3	2	900	55	6.3	0.7 to 1.1
*X1111	13.3	2	2200	22	6.3	0.7 to 1.1
*X1113	35	2	2500	25	6.3	1.5

*INDICATES NEW PRODUCT

HIGH POWER MICROWAVE TUBE DIVISION

The High Power Microwave Tube Division of Eitel-McCullough, Inc. is responsible for developing and manufacturing velocity-modulated microwave tubes at average power levels above 100 watts. The principal products of the division are CW and pulse amplifier klystrons.

Eimac power amplifier klystrons are used in nearly all tropospheric scatter communication systems throughout the free world. They are also used in such applications as UHF television, missile and satellite tracking systems, space communications, radar detection systems for missiles and aircraft, particle accelerators, and radar astronomy.

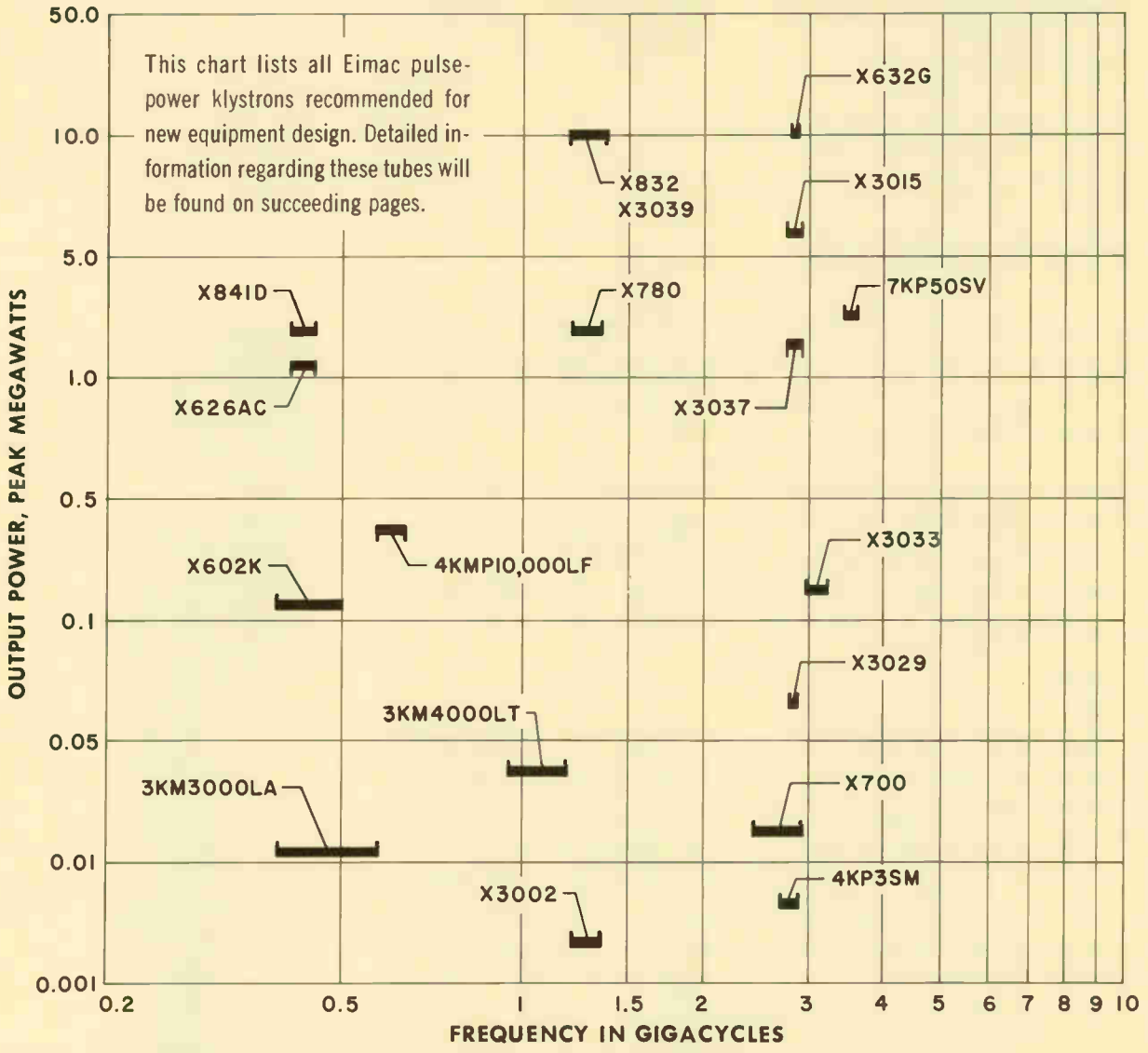
EIMAC
EIK

Development of a new concept, the EIMAC EIK, Extended Interaction Klystron, means greatly improved microwave power sources are available. High conversion efficiency, comparable to that of power grid tubes and crossed field devices, is now achieved with klystron gain, stability and long life. The principal characteristics of existing Eimac klystrons will be found in this catalog. Such information, however, should be regarded only as an indication of Eimac's capability. The high Power Microwave Division welcomes opportunities to build special amplifier klystrons at frequencies from 225 Mc to 10,000 Mc and at very high peak and average power levels.

The X832 pulse amplifier klystron, shown here, is an example of Eimac's leadership in the pulse field. Due to the use of a high perveance hollow beam this tube produces 12% bandwidth and a peak output power of 10 Mw with peak beam voltage of only 114 kilovolts.

Eimac's perfection of the high perveance, hollow beam electron gun makes possible greater bandwidths than those previously achieved and also permits high peak power levels at relatively low switching voltages.

PULSE POWER KLYSTRONS



POWER KLYSTRON CATALOG NUMBERING SYSTEM

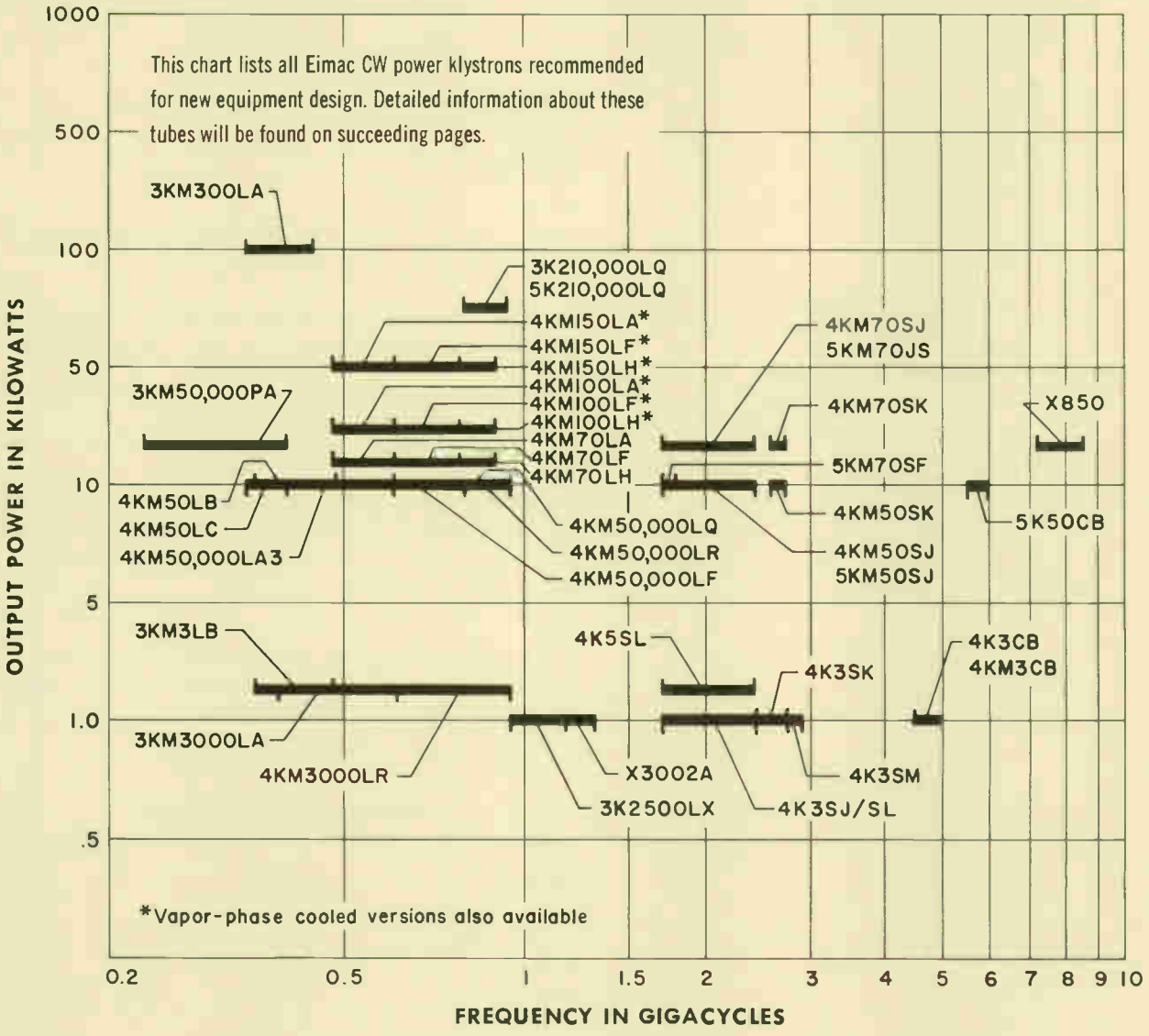
The catalog numbers for Eimac Power Klystrons have been designed to convey maximum information regarding the klystron. Here is an example:

4KMP10,000LF

- The first number indicates number of cavities (4). The first letter is always K, indicating klystron.
- The second letter, M, indicates that the tube has a modulating anode. If no modulating anode is used, the M is omitted.
- The third letter, P, indicates that this is a pulse klystron. In the case of CW klystrons the P is omitted.
- The second number, 10,000, indicates the maximum collector dissipation of the klystron. In catalog numbers assigned prior to May 1, 1961, this was expressed in watts, but in those assigned after this date it is expressed in kilowatts in the interest of brevity.
- The next to last letter, L, indicates the general frequency band in which the klystron operates.
- The last letter, F, indicates the frequency sub-band in which the klystron operates. Since no standard system of sub-band assignments exists, Eimac uses its own.

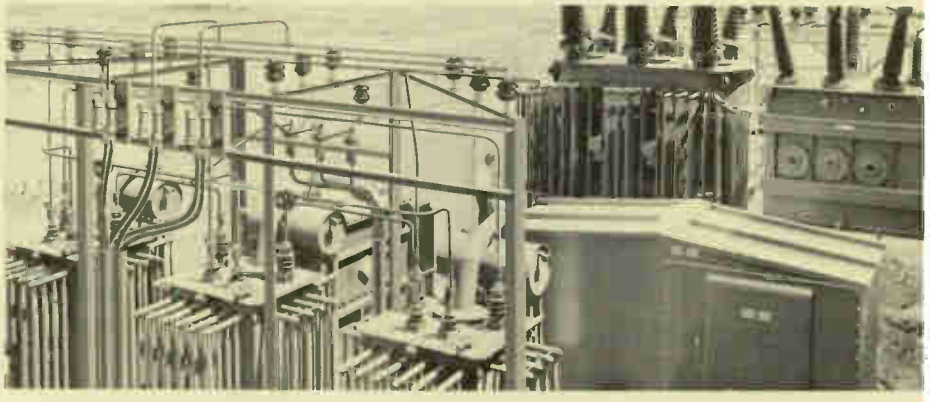
Eimac klystrons described by the letter X followed by three or four numerals are usually newly developed tubes which have not yet been assigned catalog numbers. In a few cases klystrons became so well known by their developmental designations that these are used permanently.

CW POWER KLYSTRONS

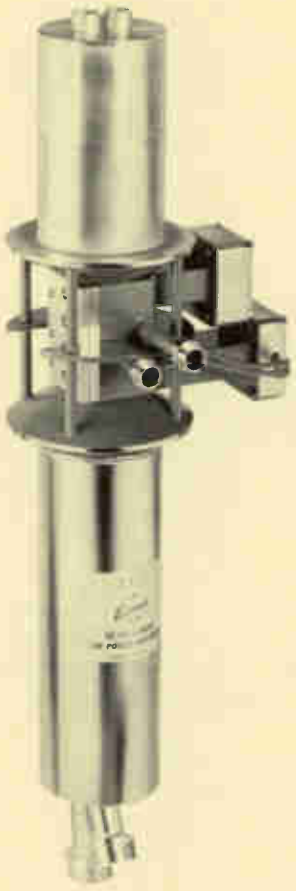


HIGH VOLTAGE POWER SUPPLY

Eimac's 3 Megawatt dc power supply. This extensive installation illustrates Eimac's unusual capability to develop tubes for current and future super-power applications.



X BAND CW



X850

7.125 - 8.5 Gc

20 kW

The X850 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 Gc band.

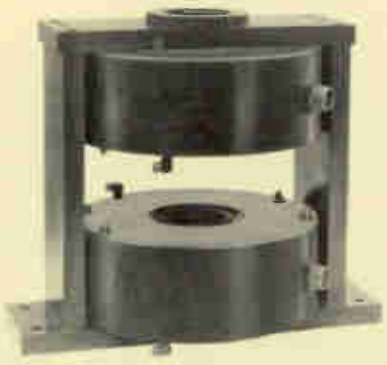
The X850 is intended especially for use in space age applications including missile and satellite tracking systems, radar astronomy, and earth-to-space vehicle communications.

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

Fixed input and output coupling is 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.

TYPICAL CHARACTERISTICS

Frequency	7.125 - 8.5 Gc
Output Power	20 kW
Gain	40 db
3 db Bandwidth	30 Mc
Beam Voltage	21 kVdc
Beam Current	3 Adc
Heater Voltage	15 Vac
Heater Current	5 Aac
Input Coupling, rf	WR-112 Waveguide
Output Coupling, rf	WR-112 Waveguide
Cooling	Water and Forced Air
Dimensions	6 in. x 7 in. x 25 in.
Weight	20 lbs.



ELECTROMAGNET AND KLYSTRON SUPPORT

Catalog Number	H-160
Length	17 in.
Width	18 in.
Depth	12 in.
Weight	200 lbs

C BAND CW

*5K50CB

4.4 - 5.0 Gc

10 kW

The Eimac 5K50CB is a liquid cooled power-amplifier klystron designed to operate at frequencies from 4.4–5.0 gigacycles with a rated output power of 10 kilowatts and a minimum gain of 47 decibels.

A large Eimac dispenser cathode is used in the 5K50CB. The large cathode results from exceptionally high electron gun convergence of 50:1. Light cathode loading assures long life. The electron gun has a confined flow configuration which minimizes focusing adjustments and produces a very stable beam.

Five integral cavities are used in the 5K50CB. Both input and output couplings are fixed. Unusual stability, for this power and frequency, is achieved through the use of improved body cooling.

TYPICAL OPERATION

Frequency	4.7 Gc
Output Power	10 kW
Driving Power	200 mW
Power Gain	47 db
DC Beam Voltage	15 kVdc
DC Beam Current	2.0 Adc
3 db Bandwidth	20 Mc

CHARACTERISTICS

Heater Voltage	10 Vac
Heater Current	3.0 Aac
Output Coupling, rf	RG49/U Waveguide
Input Coupling, rf	TNC
Dimensions	6 in. x 7 in. x 26½ in.

4K3CB-4KM3CB

4.4 - 5.0 Gc

1.0 kW

The Eimac 4K3CB and 4KM3CB are air-cooled, permanent magnet focused, power-amplifier klystrons. They are alike in all respects except that the 4KM3CB has the Eimac Modulating Anode.

These klystrons have been designed to be rugged and stable in operation, to make them especially suitable for use in transportable equipment. The use of permanent magnet focusing and fixed input and output coupling eliminates all adjustments except tuning of the four cavities. This simplicity adds to their desirability for use under difficult environmental conditions.

TYPICAL OPERATION

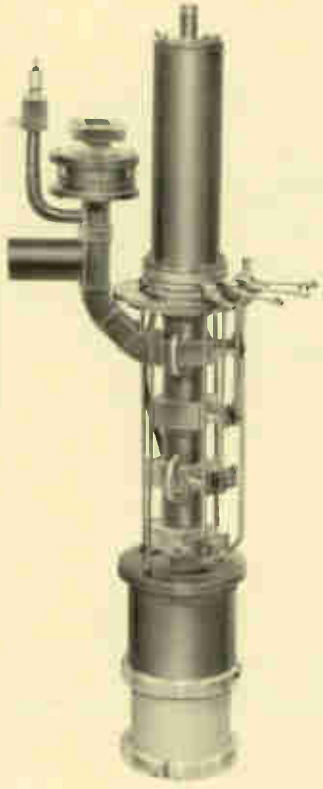
Frequency	4.4 Gc
Output Power	1.4 kW
Driving Power	40 mW
Gain	46 db
Beam Voltage	7.5 kVdc
Beam Current	0.47 Adc
Modulating Anode Voltage (4KM3CB only)	7.5 kVdc
Efficiency	40 %
3 db Bandwidth	7.5 Mc

CHARACTERISTICS

Heater Voltage	6.5 Vac
Heater Current	7.5 Aac
Length	15 in.
Width (At Waveguide)	13 in.
Depth (Across Magnet)	12 in.
Weight, Tube and Magnet	60 lbs.
Output Coupling, rf	UG149A/U Waveguide
Input Coupling, rf	UG149A/U Waveguide

*INDICATES NEW PRODUCT

S BAND PULSE



X632G

2.856 Gc

10 Mw Peak - 10 kW Average

The Eimac X632G is a pulse-amplifier klystron designed for linear accelerator service at a fixed frequency of 2856 megacycles.

Four integral cavities are used in the X632G. The output-coupling circuit is an inductive iris coupled into a waveguide through a ceramic disc window.

Use of a confined flow electron gun results in a very stable beam with non-critical focusing adjustments.

This klystron has a built-in ion pump and gauge which maintains low gas pressure and provides for continuous monitoring of this pressure.

TYPICAL CHARACTERISTICS

Frequency	2.856 Gc
Output Power, Peak	10 Mw
Output Power, Average	10 kW
Gain	40 db
Beam Voltage, Peak	187 kv
Beam Current, Peak	153 a
Pulse Width	1.4 us
Duty	0.001
Heater Voltage	28 Vac
Heater Current	11 Aac
Input Coupling, rf	UG-22B/U Coaxial
Output Coupling, rf	RF-48/U Waveguide
Cooling	Oil and Water
Dimensions	8 in. dia. x 48 in. long
Weight	100 lbs.

ELECTROMAGNET AND KLYSTRON SUPPORT

Catalog Number	H-149
Dimensions (Including Klystron):	
Length	54 in.
Diameter	18 in.
Weight	500 lbs.

4KP3SM

2.65 - 2.9 Gc

7.5 kw Peak

PERMANENT MAGNET FOCUSED PULSE AMPLIFIER KLYSTRON

TYPICAL CHARACTERISTICS

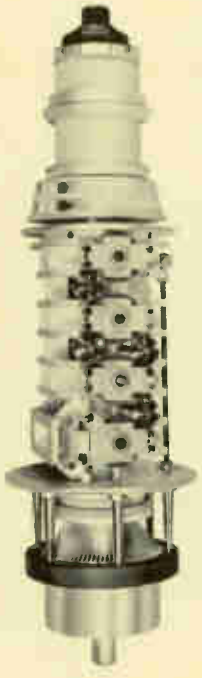
Frequency	2.65 - 2.9 Gc
Output Power, Peak	7.5 kw
Gain	50 db
Beam Voltage, Peak	14 kv
Beam Current, Peak	1.6 a
Heater Voltage	6 Vac
Heater Current	4.5 Aac
Input Coupling, rf	UG-21 D/U Connector
Output Coupling, rf	1⅝ in., 50 ohm
Dimensions	13 in. dia. x 19 in. long
Weight	85 lbs.

X700

2.4 - 2.9 Gc

20 kw Peak - 1 kW Average

PULSE AMPLIFIER KLYSTRON FOR USE IN MILITARY VEHICLES



TYPICAL CHARACTERISTICS

Frequency	2.4 - 2.9 Gc
Output Power, Peak	20 kw
Output Power, Average	1 kW
Gain	40 db
Beam Voltage	21 kVdc
Beam Current, Peak	2.77 a
Modulating Anode Voltage, Peak	10.5 kv
Duty	0.05
Pulse Width	50 us
Heater Voltage	7.5 Vac
Heater Current	5.5 Aac
Input Coupling, rf	50 ohm Type TNC
Output Coupling, rf	WR-284 Waveguide
Dimensions	7 in. dia. x 24 in. long
Weight	39 lbs.
Cooling	Forced Air

AMPLIFIER CIRCUIT ASSEMBLY

Dimensions (Including Klystron):	
Length	24 in.
Diameter	17 in.
Weight	160 lbs.

S BAND PULSE

7KP50SV

3.43 - 3.57 Gc Broad Band

3 Mw Peak - 11 kW Average

The 7KP50SV is a fixed tuned, broadband pulse klystron designed for modern frequency-agile radar applications.

Seven integral cavities are used in the 7KP50SV. rf input and output couplings are fixed.

The electron gun of the 7KP50SV has a convergent confined flow configuration which minimizes focusing adjustments and produces a stable beam.

TYPICAL CHARACTERISTICS

Center Frequency	3.5 Gc
1 db Bandwidth	140 Mc
Output Power, Peak	3 Mw
Output Power, Average	11 kW
Gain	40 db
Beam Voltage, Peak	115 kv
Beam Current, Peak	78 a
Pulse Width	12 us
Duty	0.0036
Heater Voltage	7 Vac
Heater Current	25 Aac
Input Coupling, rf	UG-22/U Connector
Output Coupling, rf	UG-53/U Waveguide Flange
Cooling	Oil and Water
Dimensions, Klystron and Electromagnet:	
Length	43 in.
Diameter	16 in.
Electromagnet Catalog Number	H-167

X3015

2.7 - 2.9 Gc Broad Band

6 Mw Peak - 10 kW Average

The Eimac X3015 is a fixed tuned, broadband pulse amplifier klystron designed for use in modern frequency-agile radar systems.

Seven integral cavities are used in the X3015. rf input and output couplings are fixed.

The electron gun of this tube has a convergent flow configuration which minimizes focusing adjustments and produces a stable beam.

TYPICAL CHARACTERISTICS

Center Frequency	2.8 Gc
1 db Bandwidth	200 Mc
Output Power, Peak	6 Mw
Output Power, Average	10 kW
Gain	40 db
Beam Voltage, Peak	140 kv
Beam Current, Peak	122 a
Pulse Width	6 us
Duty	0.0016
Heater Voltage	7 Vac
Heater Current	30 Aac
Input Coupling, rf	UG-22/U Connector
Output Coupling, rf	UG-53/U Waveguide Flange
Cooling	Oil and Water
Dimensions, Klystron and Electromagnet:	
Length	40 in.
Diameter	16½ in.
Electromagnet Catalog Number	H-164

X3029

2.856 Gc

75 kw Peak - 200 W Average

PPM FOCUSED PULSE AMPLIFIER KLYSTRON FOR RADAR OR LINEAR ACCELERATOR SERVICE

TYPICAL CHARACTERISTICS

Frequency	2.856 Gc
Output Power, Peak	75 kw
Output Power, Average	200 W
Power Gain	60 db
Beam Voltage, Peak	26 kv
Beam Current, Peak	9 a
Dimensions	6 in. dia. x 24 in. long
Cavities	Six Integral

X3033

2.95 - 3.25 Gc

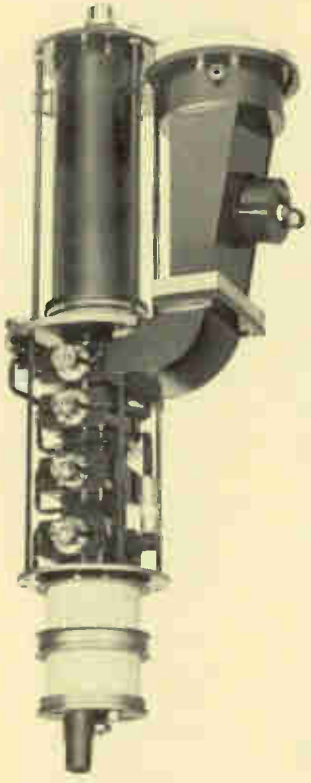
200 kw Peak - 48 kW Average

LONG PULSE, HIGH AVERAGE POWER, PULSE AMPLIFIER KLYSTRON FOR RADAR SERVICE.

TYPICAL CHARACTERISTICS

Frequency	2.95 - 3.25 Gc
Output Power, Peak	200 kw
Output Power, Average	48 kW
Power Gain	50 db
Beam Voltage	40 kVdc
Beam Current, Peak	16 a
Modulating Anode Voltage, Peak	40 kv
Pulse Width	2.4 ms
Dimensions	9½ in. dia. x 44 in. long
Cavities	Seven, Integral
Electromagnet Catalog Number	H-169

S BAND CW



4KM70SJ

1.7 - 2.4 Gc

20 kW

4KM50SJ

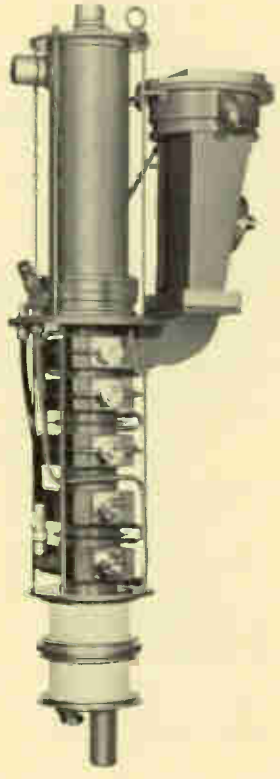
1.7 - 2.4 Gc

10 kW

The 4KM70SJ was the first product of Eimac's High Power Microwave Tube Laboratory, established in 1961. The design of this klystron is completely new, incorporating many recent advances in klystron technology. The 4KM50SJ uses the same design but its nominal output is 10 kW. Each klystron features a confined flow electron gun, non-critical focusing electromagnet, long-life EMA cathode, fixed input and output couplings, built-in titanium vacuum pump and the Eimac Modulating Anode.

TYPICAL CHARACTERISTICS

	4KM70SJ	4KM50SJ	
Frequency	1.7 - 2.4	1.7 - 2.4	Gc
Output Power	20	11	kW
Driving Power	1	1	W
Beam Voltage	21	18	kVdc
Beam Current	2.45	1.8	Adc
Modulating Anode Voltage	13	10.5	kVdc
Heater Voltage	7	7	Vac
Heater Current	12	12	Aac
Input Coupling, rf	Type N Coaxial		
Output Coupling, rf	UG435A/U Flange		
Cooling	Water and Forced Air		
Dimensions Including Electromagnet	18 in. dia. x 35 in. long		
Weight, Klystron Only	90	90	lbs.
3 db Bandwidth	12	12	Mc
Electromagnet Catalog Number	H-136	H-158	



5KM70SF

1.7 - 1.8 Gc

10 - 20 kW

5KM50SJ

1.7 - 2.4 Gc

10 kW

*5KM70SJ

1.7 - 2.4 Gc

20 kW

These power amplifier klystrons are designed for specific applications in space communications. The 5KM70SF provides the extreme bandwidth required for satellite communications systems; the 5KM50SJ and 5KM70SJ are most useful for satellite tracking systems.

Each klystron features a confined flow electron gun, non-critical focusing electromagnet, long life EMA cathode, fixed input and output rf couplings, built-in titanium vacuum pump and the Eimac Modulating Anode.

TYPICAL CHARACTERISTICS

	5KM70SF		5KM50SJ	5KM70SJ	
Output Power	10	20	10	20	kW
Driving Power	5	1	0.5	1.0	W
Beam Voltage	17	17.5	18	20	kVdc
Beam Current	3.25	3.75	1.75	2.85	Adc
Modulating Anode Voltage	17	17.5	10.3	14.1	kVdc
Bandwidth	14 (1 db)	10 (1 db)	10 (3 db)	10 (3db)	Mc
Heater Voltage	7.5	7.5	7.5	7.5	Vac
Heater Current	12	12	12	12	Aac
Input Coupling, rf	Type N Coaxial Fitting				
Output Coupling, rf	UG435A/U Flange				
Dimensions Including Electromagnet	19 in. dia. x 38 in. long				
Electromagnet Catalog Number	H-159	H-159	H-166	H-166	

*INDICATES NEW PRODUCT

S BAND CW

4KM70SK

2.55 - 2.7 Gc

20 kW

4KM50SK

2.55 - 2.7 Gc

10 kW

These Eimac klystrons differ only in output power. Their design is completely new, incorporating many recent advances in klystron technology. Each tube features a confined flow electron gun, non-critical focusing electromagnet, long-life EMA cathode, fixed input and output couplings, built-in titanium vacuum pump and the Eimac Modulating Anode.

TYPICAL CHARACTERISTICS

	4KM70SK	4KM50SK	
Frequency	2.55 - 2.7	2.55 - 2.7	Gc
Output Power	20	11	kW
Driving Power	1	1	W
Beam Voltage	21	18	kVdc
Beam Current	2.45	1.8	Adc
Modulating Anode Voltage	13	10.5	kVdc
Heater Voltage	7	7	Vac
Heater Current	12	12	Aac
Input Coupling, rf	Type N Coaxial		
Output Coupling, rf	UG435A/U Flange		
Cooling	Water and Forced Air		
Dimensions Including Electromagnet	18 in. dia. x 35 in. long		
Weight, Klystron Only	90	90	lbs.
3 db Bandwidth	14	14	Mc
Electromagnet Catalog Number	H-162	H-161	

4K3SJ

1.7 - 2.4 Gc

1 kW

4K3SK

2.4 - 2.7 Gc

1 kW

4K3SM

2.65 - 2.86 Gc

1 kW

*4K3SL

1.7 - 2.4 Gc

1 kW

*4K5SL

1.7 - 2.4 Gc

2 kW

The Eimac 4K3SJ, 4K3SK and 4K3SM are air-cooled, permanent magnet focused, power amplifier klystrons designed especially for use in transportable equipment. These klystrons essentially differ only in frequency range. Their light weight and rugged construction recommend them for many applications formerly restricted to low power. The use of permanent magnet focusing and fixed input and output couplings eliminates all adjustments except tuning of the four cavities. The new 4K3SL and 4K5SL are broad band versions of the 4K3SJ at the one and two kilowatt levels respectively.

TYPICAL CHARACTERISTICS

	4K3SJ	4K3SK	4K3SM	4K3SL	4K5SL	
Frequency	1.7 - 2.4	2.4 - 2.7	2.65 - 2.86	1.7 - 2.4	1.7 - 2.4	Gc
Output Power	1	1	1	1	2	kW
Gain	45	47	45	37	37	db
3 db Bandwidth	4 - 6	7	7	13	13	Mc
Beam Voltage	6	7	6.5	6	8	kVdc
Beam Current	0.54	0.48	0.46	.57	.82	Adc
Heater Voltage	6	6	6	6	6	Vac
Heater Current	4.5	4.5	4.5	4.5	4.5	Aac
Input Coupling, rf	UG-21 D/U Connector					
Output Coupling, rf	1⅝ in., 50 ohm					
Cooling	Forced Air					
Dimensions	13 in. dia. x 18 in. long					
Weight	85	85	85	85	85	lbs.

*INDICATES NEW PRODUCT

L BAND PULSE

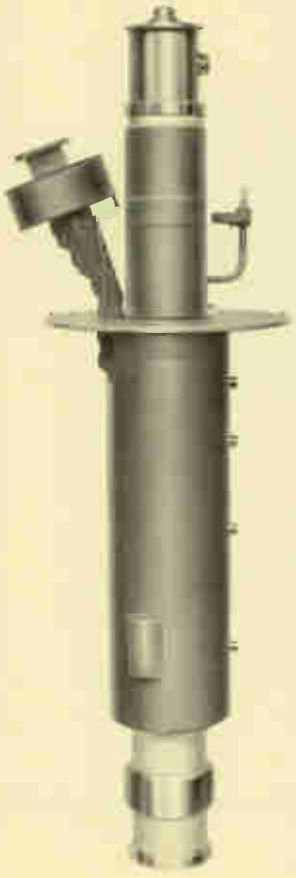
X832

1.2175 - 1.2825 Gc Broad Band
10 Mw Peak - 10 kW Average

The Eimac X832 is a very wide band pulse-amplifier klystron designed to operate at a fixed frequency of 1.3 Gc with 1 db bandwidth of 165 Mc. This extraordinary bandwidth results from the use of a microperveance 7 hollow beam.

TYPICAL CHARACTERISTICS

Center Frequency	1.3 Gc
1 db Bandwidth	165 Mc
Output Power, Peak	10 Mw
Output Power, Average	10 kW
Gain	35 db
Beam Voltage, Peak	114 kv
Beam Current, Peak	272 a
Heater Voltage	9 Vac
Heater Current	14 Aac
Input Coupling, rf	UG-22/U Connector
Output Coupling, rf	UG-417A Waveguide Flange
Cooling	Oil and Water
Dimensions, Klystron and Electromagnet:	
Length	55 in.
Diameter	30 in.
Electromagnet Catalog Number	H-168



X780

1.235 - 1.365 Gc
2.5 Mw Peak - 75 kW Average

The Eimac X780 is a four-cavity pulse-amplifier klystron designed for long range, high-average-power radar. Use of the Eimac Modulating Anode in this klystron enables it to be pulsed with minimum modulating power.

TYPICAL CHARACTERISTICS

Frequency	1.235 - 1.365 Gc
Output Power, Peak	2.5 Mw
Output Power, Average	75 kW
Gain	35 db
Beam Voltage	115 kVdc
Beam Current, Peak	58.6 a
Modulating Anode Voltage, Peak	78 kv
Pulse Width (Maximum)	2000 us
Heater Voltage	7 Vac
Heater Current	90 Aac
Input Coupling, rf	⅞ in., 50 ohm Coaxial
Output Coupling, rf	WR-650 Waveguide
Cooling	Oil and Water
Dimensions	15 in. dia. x 71 in. long
Weight	440 lbs.

ELECTROMAGNET AND KLYSTRON SUPPORT

Catalog Number	H-145
Dimensions (Including Klystron):	
Length	74 in.
Diameter	24 in.
Weight	1500 lbs.

*X3039

1.250 - 1.350 Gc Broad Band
10 Mw Peak - 75 kW Average

The X3039 is a 10 megawatt peak power, magnetron injection, modulating anode, broad band klystron. The very high perveance of the magnetron injection gun of this klystron results in very low switching voltage for convenient complex video modulation.

TYPICAL CHARACTERISTICS

Center Frequency	1.3 Gc
Bandwidth	100 Mc
Output Power, Peak	10 Mw
Output Power, Average	75 kW
Gain	33 db
Beam Voltage	180 kVdc
Beam Current, Peak	167 a
Modulating Anode Voltage, Peak	45 kv
Cavities	7

*INDICATES NEW PRODUCT

L BAND PULSE

X3002

1.235 - 1.365 Gc

4 kw Peak - 120 W Average

TYPICAL CHARACTERISTICS

Frequency	1.235 - 1.365 Gc
Output Power, Peak	4 kw
Output Power, Average	120 W
Gain	27 db
Beam Voltage	10.3 kVdc
Beam Current, Peak	0.75 a
Modulating Anode Voltage, Peak	3.9 kv
Heater Voltage	7 Vac
Heater Current	5.5 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	⅞ in., 50 ohm
Cooling	Forced Air
Dimensions	5 in. dia. x 27 in. long
Weight	23 lbs.
Cavities	Three External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-147
Dimensions (Including Klystron):	
Length	29 in.
Diameter	18 in.
Weight	155 lbs.

3KM4000LT

960 - 1215 Mc

40 kw Peak - 1 kW Average

TYPICAL CHARACTERISTICS

Frequency	960 - 1215 Mc
Output Power, Peak	40 kw
Output Power, Average	1 kW
Gain	33 db
Beam Voltage	28 kVdc
Beam Current, Peak	4.2 a
Modulating Anode Voltage, Peak	13 kv
Heater Voltage	7.5 Vac
Heater Current	5.5 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	1⅝ in., 50 ohm
Cooling	Forced Air
Dimensions	5 in. dia. x 30 in. long
Weight	21 lbs.
Cavities	Three External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-116
Dimensions (Including Klystron):	
Length	30 in.
Diameter	19 in.
Weight	240 lbs.

L BAND CW

3K2500LX

980 - 1200 Mc

1 kW

TYPICAL CHARACTERISTICS

Frequency	980 - 1200 Mc
Output Power	1 kW
Drive Power	2 W
Beam Voltage	7 kVdc
Beam Current	0.455 Adc
Heater Voltage	7.5 Vac
Heater Current	5.8 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	1⅝ in., 50 ohm
Cooling	Forced Air
Dimensions	5 in. dia. x 26 in. long
Weight	22 lbs.
Cavities	Three External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-114
Dimensions (Including Klystron):	
Length	27 in.
Diameter	22 in.
Weight	175 lbs.

X3002A

1.235 - 1.365 Gc

1 kW

TYPICAL CHARACTERISTICS

Frequency	1.235 - 1.365 Gc
Output Power	1 kW
Drive Power	5 W
Beam Voltage	7 kVdc
Beam Current	0.44 Adc
Modulating Anode Voltage	2.75 kVdc
Heater Voltage	7 Vac
Heater Current	5.5 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	⅞ in., 50 ohm
Cooling	Forced Air
Dimensions	5 in. dia. x 27 in. long
Weight	23 lbs.
Cavities	Three External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-147
Dimensions (Including Klystron):	
Length	29 in.
Diameter	18 in.
Weight	155 lbs.

UHF PULSE

X626AC

400 - 450 Mc

1.25 Mw Peak - 75 kW Average

TYPICAL CHARACTERISTICS

Frequency	400 - 450 Mc
Output Power, Peak	1.25 Mw
Output Power, Average	75 kW
Gain	30 db
Beam Voltage	100 kVdc
Beam Current, Peak	32.5 a
Modulating Anode Voltage, Peak	52 kv
Pulse Width	2000 us
Pulse Repetition Rate	30 pps
Duty	0.06
Heater Voltage	7.5 Vac
Heater Current	95 Aac
Input Coupling, rf	1⅝ in., 50 ohm
Output Coupling, rf	WR-2100 Waveguide
Cooling	Liquid and Forced Air
Dimensions	18 in. dia. x 118 in. long
Weight	590 lbs.
Cavities	Three External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-123B
Dimensions (Including Klystron):	
Length	120 in.
Width and Depth	38 in.
Weight	1780 lbs.

4KMP10,000LF

570 - 630 Mc

400 kw Peak - 4 kW Average

TYPICAL CHARACTERISTICS

Frequency	570 - 630 Mc
Output Power, Peak	466 kw
Output Power, Average	4.66 kW
Gain	57 db
Beam Voltage	65 kVdc
Beam Current, Peak	16.5 a
Modulating Anode Voltage, Peak	32 kv
Pulse Width	60 us
Duty	0.01
Heater Voltage	11 Vac
Heater Current	22 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	WR-1500 Waveguide
Cooling	Forced Air and Oil
Dimensions	7 in. dia. x 84 in. long
Weight	140 lbs.
Cavities	Four External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-127
Dimensions (Including Klystron):	
Length	85 in.
Width and Depth	24 in.

3KM3000LA

385 - 585 Mc

12 kw Peak - 720 W Average

TYPICAL CHARACTERISTICS

Frequency	385 - 585 Mc
Output Power, Peak	12 kw
Output Power, Average	720 W
Gain	30 db
Beam Voltage	15 kVdc
Beam Current, Peak	1.74 a
Modulating Anode Voltage, Peak	15 kv
Heater Voltage	5 Vac
Heater Current	31 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	1⅝ in., 50 ohm
Cooling	Forced Air
Dimensions	5 in. dia. x 44 in. long
Weight	46 lbs.
Cavities	Three External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-120
Dimensions (Including Klystron):	
Length	50 in.
Diameter	26 in.
Weight	538 lbs.

X602K

375 - 500 Mc

150 kw Peak - 75 kW Average

TYPICAL CHARACTERISTICS

Frequency	375 - 500 Mc
Output Power, Peak	155 kw
Output Power, Average	34 kW
Gain	47 db
Beam Voltage	45 kVdc
Beam Current, Peak	7.7 a
Modulating Anode Voltage, Peak	45 kv
Heater Voltage	11 Vac
Heater Current	47.5 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	6⅛ in., 50 ohm
Cooling	Liquid and Forced Air
Dimensions	9 in. dia. x 89 in. long
Weight	196 lbs.
Cavities	Four External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-142
Dimensions (Including Klystron):	
Length	103 in.
Diameter	38 in.
Weight	1792 lbs.

X841D

400 - 450 Mc Broad Band
2.5 Mw Peak - 150 kW Average

The Eimac X841D is a pulse amplifier klystron designed for frequency-agile, high-average-power radar. It is fixed tuned with a minimum 1 db bandwidth of 5%. This tube can be supplied pretuned to any frequency within its specified frequency range.

Six integral cavities are used in the X841D. rf input and output couplings are fixed and optimized at maximum output power.

This klystron employs the Eimac Modulating Anode which provides a convenient means for pulse modulating the output power without changing the beam voltage.

The X841D incorporates a built-in ion pump and gauge which maintains low gas pressure and provides means for continuously monitoring pressure.

TYPICAL CHARACTERISTICS

Frequency	400 - 450 Mc
Output Power, Peak	2.5 Mw
Output Power, Average	150 kW
Gain	33 db
Beam Voltage	115 kVdc
Beam Current, Peak	66.6 a
Modulating Anode Voltage, Peak	80 kv
1 db Bandwidth, Minimum	5 %
Pulse Width	2000 us
Duty	0.06
Heater Voltage	30 Vac
Heater Current	28 Aac
Input Coupling, rf	Type N Coaxial
Output Coupling, rf	6⅛ in., 50 ohm
Cooling	Liquid
Dimensions	20½ in. dia. x 130 in. long
Weight	1000 lbs.

ELECTROMAGNET AND KLYSTRON SUPPORT

Catalog Number	H-150
Dimensions (Including Klystron):	
Length	130 in.
Diameter	26 in.

UHF-CW

3K210,000LQ

755 - 985 Mc

75 kW

TYPICAL CHARACTERISTICS

Frequency	755 - 985 Mc
Output Power	75 kW
Drive Power	3750 W
Bandwidth	7 Mc
Beam Voltage	27 kVdc
Beam Current	6.7 Adc
Heater Voltage	26 Vac
Heater Current	10.5 Aac
Input Coupling, rf	3⅛ in., 50 ohm
Output Coupling, rf	WR-975 Waveguide
Cooling	Liquid and Forced Air
Dimensions	13 in. dia. x 61 in. long
Weight	370 lbs.
Cavities	Two External, One Integral

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-129
Dimensions (Including Klystron):	
Length	72 in.
Width	30 in.
Depth	42 in.
Weight	600 lbs.

*3KM300LA

345 - 455 Mc

100 kW

TYPICAL CHARACTERISTICS

Frequency	345 - 455 Mc
Output Power	100 kW
Drive Power	4 kW
Beam Voltage	30 kVdc
Beam Current	9 Adc
Heater Voltage	26 Vac
Heater Current	11.5 Aac
Input Coupling, rf	3⅛ in., 50 ohm
Output Coupling, rf	6⅛ in., 50 ohm
Cooling	Liquid and Forced Air
Dimensions:	22 in. dia. x 73 in. long
Weight:	560 lbs.
Cavities	Three Integral

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-172
Dimensions (including klystron):	
Length:	80 in.
Width:	28 in.
Depth:	28 in.
Weight:	642 lbs.

5K210,000LQ

755 - 985 Mc

75 kW

TYPICAL CHARACTERISTICS

Frequency	755 - 985 Mc
Output Power	75 kW
Drive Power	3 W
Bandwidth	10 Mc
Beam Voltage	25 kVdc
Beam Current	8 Adc
Heater Voltage	15 Vac
Heater Current	18 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	WR-975 Waveguide
Cooling	Liquid and Forced Air
Dimensions	44 in. dia. x 66 in. long
Weight	380 lbs.
Cavities	Four External, One Integral

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-132
Dimensions (Including Klystron):	
Length	75 in.
Width	32 in.
Depth	47 in.
Weight	1530 lbs.

3KM50,000PA

225 - 400 Mc

20 kW

TYPICAL CHARACTERISTICS

Frequency	225 - 400 Mc
Output Power	23.1 kW
Drive Power	5 W
Beam Voltage	23 kVdc
Beam Current	2.6 Adc
Heater Voltage	7.5 Vac
Heater Current	40 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	6⅛ in., 50 ohm
Cooling	Liquid and Forced Air
Dimensions	8 in. dia. x 81 in. long
Weight	163 lbs.
Cavities	Three External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-126
Dimensions (Including Klystron):	
Length	88 in.
Diameter	51 in.
Weight	1940 lbs.

*INDICATES NEW PRODUCT

UHF-CW

4KM50,000LR

755 - 985 Mc
10 kW

TYPICAL CHARACTERISTICS

Frequency	755 - 985 Mc
Output Power	10.8 kW
Drive Power	10 W
Bandwidth	7 Mc
Beam Voltage	17 kVdc
Beam Current	1.9 Adc
Heater Voltage	7.5 Vac
Heater Current	40 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	3⅛ in., 50 ohm
Cooling	Liquid and Forced Air
Dimensions	6 in. dia. x 46 in. long
Weight	55 lbs.
Cavities	Four External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-141
Dimensions (Including Klystron):	
Length	51 in.
Diameter	29 in.
Weight	349 lbs.

4KM50,000LQ

610 - 985 Mc
10 kW

TYPICAL CHARACTERISTICS

Frequency	610 - 985 Mc
Output Power	11.4 kW
Drive Power	10 W
Bandwidth	5 Mc
Beam Voltage	17 kVdc
Beam Current	1.8 Adc
Heater Voltage	7.5 Vac
Heater Current	40 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	3⅛ in., 50 ohm
Cooling	Liquid and Forced Air
Dimensions	6 in. dia. x 46 in. long
Weight	55 lbs.
Cavities	Four External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-122
Dimensions (Including Klystron):	
Length	51 in.
Diameter	29 in.
Weight	349 lbs.

4KM50,000LF

610 - 790 Mc
10 kW

TYPICAL CHARACTERISTICS

Frequency	610 - 790 Mc
Output Power	12.6 kW
Drive Power	10 W
Bandwidth	8 Mc
Beam Voltage	18 kVdc
Beam Current	2.03 Adc
Heater Voltage	7.5 Vac
Heater Current	40 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	3⅛ in., 50 ohm
Cooling	Liquid and Forced Air
Dimensions	7 in. dia. x 62 in. long
Weight	64 lbs.
Cavities	Four External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-139
Dimensions (Including Klystron):	
Length	68 in.
Diameter	26 in.
Weight	767 lbs.

4KM50,000LA3

400 - 610 Mc
10 kW

TYPICAL CHARACTERISTICS

Frequency	400 - 610 Mc
Output Power	12 kW
Drive Power	0.05 W
Beam Voltage	17 kVdc
Beam Current	1.8 Adc
Heater Voltage	7.5 Vac
Heater Current	40 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	3⅛ in., 50 ohm
Cooling	Liquid and Forced Air
Dimensions	5 in. dia. x 66 in. long
Weight	64 lbs.
Cavities	Four External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-143
Dimensions (Including Klystron):	
Length	68 in.
Diameter	26 in.
Weight	1084 lbs.

UHF - CW

4KM50LB 4KM50LC

350 - 475 Mc **345 - 455 Mc**

10 kW **10 kW**

TYPICAL CHARACTERISTICS

	4KM50LB	4KM50LC	
Frequency	350 - 475	345 - 455	Mc
Output Power	10	10	kW
Drive Power	6	6	W
Beam Voltage	17	17	kVdc
Beam Current	1.9	1.9	Adc
3 db Bandwidth	3	2	Mc
Heater Voltage	7.5	7.5	Vac
Heater Current	40	40	Aac
Input Coupling, rf	50 ohm, Type N		
Output Coupling, rf	3⅛ in., 50 ohm		
Cooling	Liquid and Forced Air		
Dimensions	5 in. dia. x 66 in. long		
Weight	64	64	lbs.
Cavities	Four External		

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-153
Dimensions (Including Klystron):	
Length	68 in.
Diameter	26 in.
Weight	1084 lbs.

4KM3000LR

610 - 985 Mc

2 kW

TYPICAL CHARACTERISTICS

	Broad Band	Narrow Band	
Output Power	1	2.1	kW
Drive Power	10	0.05	W
Beam Voltage	8.1	8.5	kVdc
Beam Current	0.48	0.55	Adc
3 db Bandwidth	7	0.5	Mc
Heater Voltage	5	5	Vac
Heater Current	31	31	Aac
Input Coupling, rf	50 ohm, Type N		
Output Coupling, rf	1⅝ in., 50 ohm		
Cooling	Forced Air		
Dimensions	5 in. dia. x 37 in. long		
Weight	38		lbs.
Cavities	Four External		

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-125
Dimensions (Including Klystron):	
Length	40 in.
Diameter	25 in.
Weight	225 lbs.

3KM3LB

350 - 475 Mc

2 kW

TYPICAL CHARACTERISTICS

Frequency	350 - 475 Mc
Output Power	2.3 kW
Drive Power	5 W
Beam Voltage	9 kVdc
Beam Current	0.59 Adc
Heater Voltage	5 Vac
Heater Current	31 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	1⅝ in., 50 ohm
Cooling	Forced Air
Dimensions	5 in. dia. x 44 in. long
Weight	46 lbs.
Cavities	Three External

AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-157
Dimensions (Including Klystron):	
Length	50 in.
Diameter	26 in.
Weight	570 lbs.

3KM3000LA

385 - 585 Mc

2 kW

TYPICAL CHARACTERISTICS

Frequency	385 - 585 Mc
Output Power	2.3 kW
Drive Power	2 W
Beam Voltage	9 kVdc
Beam Current	0.59 Adc
Heater Voltage	5 Vac
Heater Current	31 Aac
Input Coupling, rf	50 ohm, Type N
Output Coupling, rf	1⅝ in., 50 ohm
Cooling	Forced Air
Dimensions	5 in. dia. x 44 in. long
Weight	46 lbs.
Cavities	Three External

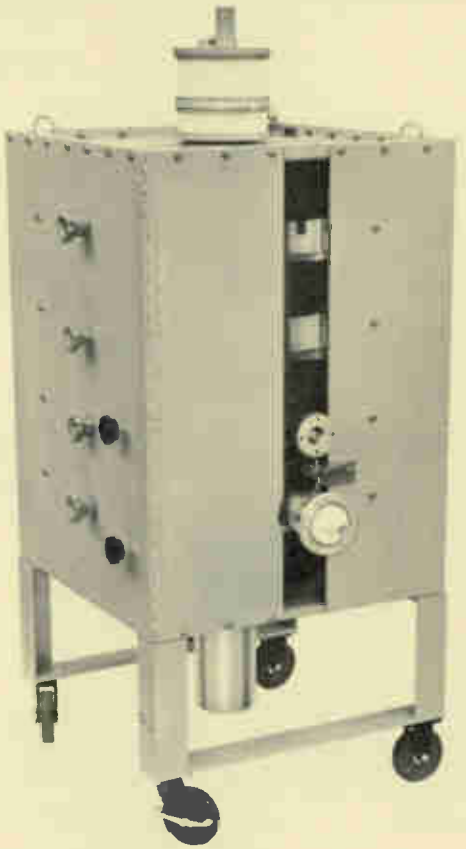
AMPLIFIER CIRCUIT ASSEMBLY

Catalog Number	H-120
Dimensions (Including Klystron):	
Length	50 in.
Diameter	26 in.
Weight	538 lbs.

UHF TV

4KM70LA 4KM100LA 4KM150LA
4KM70LF 4KM100LF 4KM150LF
*4KM70LH *4KM100LH *4KM150LH

These Eimac Power Klystrons cover the UHF television spectrum at power levels from 12.5 kilowatts to 50 kilowatts.



FEATURES

Random AM noise more than 60 db below black level

Confined flow electron gun for non-critical focusing

Large cathode with loading less than 150 mA per square centimeter for long life

Excellent linearity

Built-in titanium vacuum pump

Modulating anode for protection against internal arcs and for aural power control.

Four external cavities

Compact and attractive amplifier circuit assemblies

Ample bandwidth

High gain, requiring minimum number of preceding amplifiers

Cooling water need not be of high purity because it does not contact rf circuits

Suitable for replacement of older klystrons in existing transmitters

TYPICAL CHARACTERISTICS

	4KM70LA (470-610 Mc) 4KM70LF (590-720 Mc) 4KM70LH (720-890 Mc)	4KM100LA (470-610 Mc) 4KM100LF (590-720 Mc) 4KM100LH (720-890 Mc)	4KM150LA (470-610 Mc) 4KM150LF (590-720 Mc) 4KM150LH (720-890 Mc)	
Output Power	12.5	25	50	kw
Drive Power	10	20	20	W
Beam Voltage	13	16	20	kVdc
Beam Current	2.8	3.82	5.4	Adc
1 db Bandwidth	8	8	8	Mc
Heater Voltage	26	26	26	Vdc
Heater Current	11.5	11.5	11.5	Adc
Length	59	61	61	in.
Diameter	10	10	10	in.
Weight (Approx.)	110	119	119	lbs.
Input Coupling, rf	Type N Coaxial Connector for each Klystron			
Output Coupling, rf	3⅛ inch, 50 ohm Line for each Klystron			
Cooling	Water and Forced Air for each Klystron			

ASSOCIATED KLYSTRON AMPLIFIER CIRCUIT ASSEMBLIES

Klystron Type	4KM70 100 150LA	4KM70 100 150LF	4KM70 100 150LH	
Circuit Assembly Catalog Number	H-163	H-156	H-173	
Length (With Tube)	59-61	59-61	59-61	in.
Width and Depth	29	29	29	in.
Weight	1800	1800	1800	lbs.

*INDICATES NEW PRODUCT

UHF TV

*4KMV100LA *4KMV100LF *4KMV100LH
*4KMV150LA *4KMV150LF *4KMV150LH

VAPOR-PHASE COOLED KLYSTRON POWER AMPLIFIERS

The Eimac vapor-phase cooling technique has been applied to our UHF-TV klystrons. Eimac has developed a complete line of accessories to complement this new series. For information on how vapor-phase cooling can improve the performance of your equipment, write for a free copy of Application Bulletin No. 11, "The Care and Feeding of Vapor-Phase Cooling." This new cooling technique can substantially reduce equipment size, noise and cost. The technique has been applied to the following UHF-TV klystrons and can be applied to virtually all the high power klystrons listed in this catalog.

TYPICAL CHARACTERISTICS

	4KMV100LA	4KMV150LA	4KMV100LF	4KMV150LF	4KMV100LH	4KMV150LH	
Output Power	25	50	25	50	25	50	kW
Beam Voltage	16	20	16	20	16	20	kV
Beam Current	3.8	5.4	3.8	5.4	3.8	5.4	A
Eimac Vapor-Phase Cooling Circuit Assembly	H-183	H-183	H-184	H-184	H-185	H-185	

Electrical and mechanical characteristics of these tubes are similar to their water cooled equivalents listed on the previous page. The listed Eimac vapor-phase cooling circuit assemblies include all mounting hardware, magnetic circuitry, cavities, load-couplers and boilers. Control boxes, reservoirs, condensers and other VPC components are available. We will supply vapor-to-water or forced air cooled condensers on request. Engineering assistance in planning vapor cooled systems is available from the Eimac Application Engineering Department.

WATER LOADS

Eimac water loads provide convenient means for dissipating rf power at the frequencies covered by Eimac power klystrons. Power dissipated by these loads can be readily measured by calorimetric methods using auxiliary thermometers and flow measuring instruments.

These water loads are available in both coaxial and waveguide form. In all cases, the rf power is dissipated directly into the liquid. Mixtures of ethylene glycol and distilled water, often used in klystron cooling systems in frigid climates, are suitable for use in Eimac water loads.

Eimac water loads can be adapted for pressurizing on request. The peak power ratings listed below are with pressurization.

WL-150

Catalog Number	Type	Frequency Mc	Average Power kW	Peak Power Mw	Max. VSWR	Length Inches	Weight Lbs.
WL-120	3⅛ in. Coaxial	500-1200	50	3	1.15:1	38	13
WL-130	3⅛ in. Coaxial	320-1200	50	3	1.1:1	80	25
WL-140	3⅛ in. Coaxial	200-1200	50	3	1.18:1	152	38
WL-150	6⅛ in. Coaxial	250-750	300	5	1.1:1	87	78
WL-160	6⅛ in. Coaxial	200-750	300	5	1.07:1	153	112
WL-201 / WL-202	WR-430 Waveguide	1700-2400	24	-	1.1:1	38	16
WL-210	WR-975 Waveguide	750-1000	100	1.25	1.15:1	81	78
WL-220	WR-2100 Waveguide	390-460	150	1.25	1.13:1	154	347

ADDITIONAL HIGH POWER MICROWAVE PRODUCTS

High Power Klystrons which are not described in this catalog but which are currently available at Eimac for replacement purposes are as follows:

3K2500SG, 3K50,000LF, 4KM50,000LA, 4KM170,000LA, 3K50,000LA, 4KM3000LQ, 4K50,000LQ, 6K50,000LQ

*INDICATES NEW PRODUCT

POWER GRID TUBE DIVISION

Eitel-McCullough, Inc., manufactures a complete line of vacuum tubes and accessories including rectifiers, triodes, tetrodes, pentodes, pulse modulators, air-system sockets, heat dissipating connectors, contact-finger stock, vacuum switches, diffusion pumps and ionization gauges.

In addition to a standard line of glass-and-metal vacuum tubes, Eimac offers a selection of ceramic and metal triodes, tetrodes and pulse modulators. They have been specially designed to withstand severe environmental conditions.

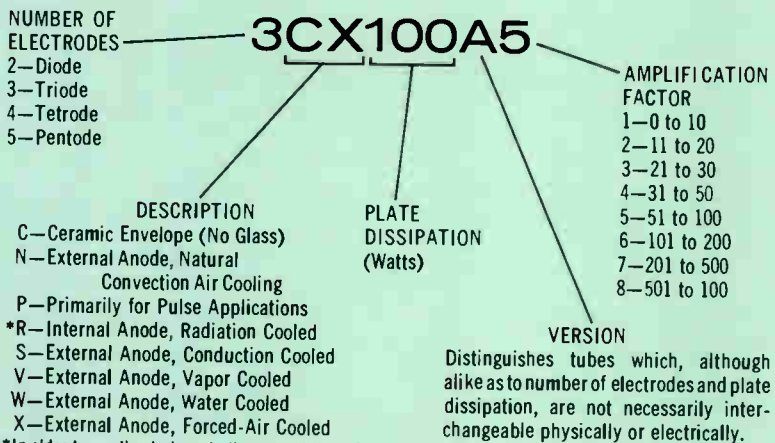
Eimac power tubes are divided into two general classifications: the internal-anode, radiation-cooled glass types and the external-anode tubes, cooled by forced-air, convection or other means. Eimac electron power tubes, including coaxial-based tubes for high-frequency operation, water-cooled and vapor-phase cooled tubes with power dissipation ratings up to 100 kilowatts, breechblock-based tubes for rugged environments, and lightweight tubes for airborne and pulse applications, are available.

A newly expanded research and development program produces experimental new tube types and modifies existing products to meet customer requirements. Application engineering services are willingly offered.

Since 1945 all new tube types developed by Eitel-McCullough, Inc. have been given a type number chosen according to a coded number system. This system is designed to convey descriptive information about the tube.

In general, the type numbers consist of: a numeral indicating the number of electrodes, one or more letters denoting special characteristics, a numeral representing the plate dissipation, and a final letter to distinguish the tube from others bearing similar preceding letters and numerals. Triode types carry an additional number to indicate their approximate amplification factor.

To illustrate the method of coding and the information the type number conveys, a 100-watt, ceramic, external-anode, forced-air cooled Eimac triode, type number 3CX100A5, is broken down as follows:



*In older types, the dash, as in the case of the 4-250A, carries the meaning of "R" given above.

NEW PRODUCTS

*7698

A new ceramic-metal pulse planar triode usable to 3000 Mc. As a grid pulsed amplifier at 1100 Mc or a plate pulsed amplifier at 3000 Mc, 2500 watts of power output is attainable. Cooling is by convection and conduction to a suitable heat sink. See page 40

*7211

A new planer triode featuring one third more cathode current than the 3CX100A5. The 7211 is of all ceramic-metal construction. The plate grid ceramic is longer than the 3CX100A5 making the tube more useful in pulse service or high altitude environments. Power output of 25 watts is available at 2500 Mc. See page 41

*X843D

A new planar triode with three times the capability of the standard in the field, the 3CX100A5. The tube is designed to produce over 100 watts in the 2100 Mc telemetry band with low driving power. Maximum frequency is 2500 Mc.

*5867A

A new medium-mu triode, the 5867A is capable of over one kilowatt input to 100 Mc. It is useful as a Class AB amplifier, Class C amplifier or industrial oscillator. The plate dissipation rating is 375 watts. See page 44

*3CX15,000A3

A new addition to Eimac's line of ceramic-metal triodes the 3CX15,000A is a medium-mu triode designed especially for rf heating service. Six amperes of dc plate current is available from a one kilowatt filament and the grid structure is rated at 500 watts. Adequate forced-air cooling permits 15 kilowatts of plate dissipation. The 3CX15,000A3 is also useful as a linear or plate-modulated rf amplifier. See page 48

*6697A

A new addition to Eimac's line, this popular triode finds wide use in industrial and broadcast equipment. The 6697A is all ceramic-metal construction for increased tube reliability. The anode is constructed of copper disk fins; forced-air cooling is required for rated plate dissipation of 35 kilowatts. See page 49

*6696A

A rugged, all ceramic-metal, water-cooled triode, the 6696A is rated at 120 kilowatts input and 60 kilowatts plate dissipation to 30 Mc. It is attractive for general broadcast or industrial service where a high-power, medium mu triode is required. Accessories such as water jackets and terminal connectors are available from Eimac. See page 51

*3CW25,000A3

An integral water jacket allows an anode dissipation rating of 25 kilowatts with this new medium-mu, ceramic-metal triode. A 500 watt grid structure makes this tube attractive for industrial heating service. The tube is rated at 60 kilowatts of input power to 100 Mc with operation at slightly reduced ratings to 140 Mc. See page 51

*7480

A new addition to Eimac's growing line of vapor-cooled power tubes, this triode is rated at 140 kilowatts input and 80 kilowatts of plate dissipation at frequencies to 30 Mc. Boilers and other accessories are available for the 7480 from Eimac. See page 51

*4CN15L

A coolerless version of Eimac's new quick heat tetrode, the 4CN15L is intended for convection or conduction cooling. A unique new cathode allows nearly instant warm-up; 70% of rated power output is available within 0.1 seconds using "hot-shot" techniques. A built-in control diode is used to sense rated emission, controlling the "hot-shot" voltage. See page 53

*4CS100L

Eimac's new quick-heat tetrode, featuring a 100 millisecond warm-up with "hot-shot" filament voltage or a one second warm-up at normal filament voltage. The 4CS100L is equipped with a beryllium oxide ceramic brazed to the anode. The excellent thermal conductivity of BeO combined with its electrical insulating properties permits flexibility in heat-sink cooling of this tube. See page 53

*4CX250L

A quick-heat tetrode with 250 watt forced-air cooled radiator, the 4CX250L is an excellent choice for mobile equipment. With "hot-shot" filament overvoltage, the tube is ready to use in 0.1 seconds. A built in control diode senses rated cathode emission and initiates switching to normal voltage. High transconductance permits full power output with low drive requirements. See page 55

*4CPX250K

This new tube is a pulse rated version of the coaxial 4CX250K. New cathode techniques permit pulse currents of over three amperes at pulse lengths up to 250 microseconds. Peak power output of 10 kW is available at 0.005 duty. See page 55

*Y-310

A water-cooled version of the 4CX15,000A with increased voltage holdoff capability. This tube is attractive for voltage regulator or switch tube applications or for general use where water-cooled tetrodes are desired.

*7843

Useable to 2000 Mc in CW service, this precisely-built, conduction-cooled tetrode finds wide use in commercial and military equipment. It is especially useful in mobile equipment and "pack-sets" because of its small size and light weight.

*INDICATES NEW PRODUCT

RECTIFIERS

INSTRUMENT DIODE

2-01C

A general-purpose UHF instrument diode capable of maintaining an accuracy of ±1 db to 700 megacycles. This diode is well suited to probe mounting and is useful as an indicator at frequencies as high as 3000 megacycles. The 2-01C is cooled by convection and radiation.

MAXIMUM RATINGS

PEAK INVERSE	1000 volts
D-C CURRENT	0.001 ampere
PLATE DISSIPATION	0.1 watt

CHARACTERISTICS

Cathode: Oxide-coated, unipotential

Heater:	
Voltage	5.0 volts
Current	0.31 to 0.39 ampere
Max. Seal Temp.	175 °C
Length	1.813 inches
Diameter	0.563 inches
Net Weight	0.2 ounce

INTERNAL ANODE

2-25A

This small instant-heating, high-voltage diode is useful in low-power rectifier or voltage-doubler service. No forced-air cooling is required in most applications.

MAXIMUM RATINGS

PEAK INVERSE	25,000 volts
D-C CURRENT	0.050 ampere
PEAK CURRENT	1.0 ampere
PLATE DISSIPATION	15 watts

CHARACTERISTICS

Filament: Thoriated tungsten

Voltage	6.3 volts
Current	2.75 to 3.15 amperes
Base	Small 4-pin
Socket	E. F. Johnson Co. No. 122-224 or National Co. No. XC-4 or CIR-4
Plate Connector	HR-1
Max. Seal Temp.	225 °C
Max. Envelope Temp.	225 °C
Length	4.38 inches
Diameter	1.44 inches
Net Weight	1.2 ounces

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amp)
1 - Phase Full Wave	17,700	8,000	0.1
1 - Phase Bridge	17,700	16,000	0.1
3 - Phase Full Wave	10,200 (per leg)	24,000	0.15

2-50A

A high-vacuum diode especially suitable for high-voltage applications where instant heating is desired. It is cooled by radiation and convection.

MAXIMUM RATINGS

PEAK INVERSE	30,000 volts
D-C CURRENT	0.075 ampere
PEAK CURRENT	1.0 ampere
PLATE DISSIPATION	30 watts

CHARACTERISTICS

Filament: Thoriated tungsten

Voltage	5.0 volts
Current	4 amperes
Base	Medium 4-pin bayonet
Socket	E. F. Johnson Co. No. 122-224 or National Co. No. XC-4 or CIR-4
Plate Connector	HR-3
Max. Seal Temp.	225 °C
Max. Envelope Temp.	225 °C
Length	5.50 inches
Diameter	1.82 inches
Net Weight	2.5 ounces

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amp)
1 - Phase Full Wave	21,200	9,500	0.150
1 - Phase Bridge	21,200	19,000	0.150
3 - Phase Full Wave	12,200 (per leg)	28,500	0.225

8020/100R

A compact high-vacuum rectifier frequently used in high-voltage and voltage-multiplier power supplies. The 8020 is instant heating and is cooled by radiation and convection.

MAXIMUM RATINGS

PEAK INVERSE	40,000 volts
D-C CURRENT	0.100 ampere
PEAK CURRENT	1.5 amperes
PLATE DISSIPATION	60 watts

CHARACTERISTICS

Filament: Thoriated tungsten

Voltage	5.0 volts
Current	5.5 to 6.5 amperes
Base	Medium 4-pin bayonet
Socket	E. F. Johnson Co. No. 122-224 or National Co. No. XC-4 or CIR-4
Plate Connector	HR-8
Max. Seal Temp.	225 °C
Max. Envelope Temp.	225 °C
Length	8.0 inches
Diameter	2.32 inches
Net Weight	4 ounces

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amp)
1 - Phase Full Wave	28,000	12,500	0.2
1 - Phase Bridge	28,000	25,000	0.2
3 - Phase Full Wave	16,300 (per leg)	38,000	0.3

2-150D

A unique high-voltage diode, actually two diodes in one envelope, suitable for use in many high-voltage rectifier and multiplier applications. The 2-150D is cooled by radiation and convection.

MAXIMUM RATINGS

PEAK INVERSE	30,000 volts
D-C CURRENT	0.250 ampere
PEAK CURRENT	3.0 amperes
PLATE DISSIPATION	90 watts

CHARACTERISTICS

Filament: Thoriated tungsten

Voltage	5.0 volts
Current	11.6 to 13.2 amperes
Base	50-watt jumbo 4-pin bayonet
Socket	E. F. Johnson Co. No. 123-211 or National Co. No. XM-50
Plate Connector	HR-6
Max. Seal Temp.	225 °C
Max. Envelope Temp.	225 °C
Length	8.88 inches
Diameter	2.50 inches
Net Weight	9 ounces

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amp)
1 - Phase Full Wave	21,200	9,500	0.50
1 - Phase Bridge	21,200	19,000	0.50
3 - Phase Full Wave	12,200 (per leg)	28,500	0.75

RECTIFIERS

INTERNAL ANODE

253

A high-vacuum radiation-cooled diode intended for use in high-voltage applications where conditions preclude the use of gas-filled rectifier tubes. In most cases, no forced air is required.

MAXIMUM RATINGS

PEAK INVERSE	15,000 volts
D-C CURRENT	0.35 ampere
PEAK CURRENT	2.5 amperes
PLATE DISSIPATION	100 watts

CHARACTERISTICS

Filament: Thoriated tungsten	
Voltage	5.0 volts
Current	10.0 amperes
Base	50-watt jumbo 4-pin bayonet
Socket	E. F. Johnson Co. No. 123-211 or National Co. No. XM-50
Plate Connector	Eimac HR-8
Max. Seal Temp.	225 °C
Max. Envelope Temp.	225 °C
Length	8.75 inches
Diameter	2.50 inches
Net Weight	7 ounces

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amp)
1 - Phase Full Wave	10,600	4,500	0.70
1 - Phase Bridge	10,600	9,000	0.70
3 - Phase Full Wave	6,150	13,500	1.0

2-240A

A high-vacuum, high-voltage rectifier frequently employed in three-phase klystron power supplies. It is cooled by radiation and convection in most equipments.

MAXIMUM RATINGS

PEAK INVERSE	25,000 volts
D-C CURRENT	0.5 ampere
PEAK CURRENT	4.0 amperes
PLATE DISSIPATION	150 watts

CHARACTERISTICS

Filament: Thoriated tungsten	
Voltage	7.5 volts
Current	11.0 to 12.5 amperes
Base	50-watt jumbo 4-pin bayonet
Socket	E. F. Johnson Co. No. 123-211 or National Co. No. XM-50
Plate Connector	HR-6
Max. Seal Temp.	225 °C
Max. Envelope Temp.	225 °C
Length	11.2 inches
Diameter	3.82 inches
Net Weight	10 ounces

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amps)
1 - Phase Full Wave	18,000	8,000	1.0
1 - Phase Bridge	18,000	16,000	1.0
3 - Phase Full Wave	10,200 (per leg)	24,000	1.5

250R

A high-vacuum radiation-cooled diode with instant-heating capability, the 250R is used in many high-voltage applications. No forced air is required in most cases.

MAXIMUM RATINGS

PEAK INVERSE	60,000 volts
D-C CURRENT	0.25 ampere
PEAK CURRENT	2.5 amperes
PLATE DISSIPATION	150 watts

CHARACTERISTICS

Filament: Thoriated tungsten	
Voltage	5.0 volts
Current	9.7 to 11.2 amperes
Base	50-watt jumbo 4-pin bayonet
Socket	E. F. Johnson Co. No. 123-211 or National Co. No. XM-50
Plate Connector	HR-6
Max. Seal Temp.	225 °C
Max. Envelope Temp.	225 °C
Length	10.13 inches
Diameter	3.82 inches
Net Weight	10 pounds

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amp)
1 - Phase Full Wave	42,000	19,000	0.50
1 - Phase Bridge	42,000	38,000	0.50
3 - Phase Full Wave	24,500 (per leg)	57,000	0.75

2-450A

A high-vacuum, high-voltage rectifier designed to replace parallel 2-240A's in three-phase power supplies. Additionally, it enjoys a higher plate dissipation capability and a higher peak-inverse voltage rating. It is cooled by radiation and convection.

MAXIMUM RATINGS

PEAK INVERSE	30,000 volts
D-C CURRENT	1.0 ampere
PEAK CURRENT	8.0 amperes
PLATE DISSIPATION	450 watts

CHARACTERISTICS

Filament: Thoriated tungsten	
Voltage	7.5 volts
Current	25.0 to 28.0 amperes
Base	4-pin metal shell
Socket	E. F. Johnson Co. No. 124-214
Plate Connector	HR-8
Max. Seal Temp.	225 °C
Max. Envelope Temp.	250 °C
Length	13.625 inches
Diameter	4.625 inches
Net Weight	2.4 pounds

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amps)
1 - Phase Full Wave	21,200	9,500	2.0
1 - Phase Bridge	21,200	19,000	2.0
3 - Phase Full Wave	12,200 (per leg)	28,500	3.0

RECTIFIERS

INTERNAL ANODE

2-2000A

A large high-vacuum rectifier with a high peak-inverse voltage rating and high plate-dissipation capability. The 2-2000A is cooled by radiation and convection; no forced-air cooling is required in most installations.

MAXIMUM RATINGS

PEAK INVERSE	75,000 volts
D-C CURRENT	0.750 ampere
PEAK CURRENT	12.0 amperes
PLATE DISSIPATION	1200 watts

CHARACTERISTICS

Filament: Thoriated tungsten	
Voltage	10.0 volts
Current	22.0 to 25.0 amperes
Base	Special 4-pin
Socket	E. F. Johnson Co. No. 124-214
Plate Connector	HR-8
Max. Seal Temp	225 °C
Max. Envelope Temp.	225 °C
Length	17.8 inches
Diameter	8.13 inches
Net Weight	3 pounds

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amps)
1 - Phase Full Wave	53,000	23,800	1.50
1 - Phase Bridge	53,000	47,600	1.50
3 - Phase Full Wave	30,600 (per leg)	71,500	2.25

EXTERNAL ANODE

2X3000F

A high-vacuum, forced-air cooled, external-anode diode intended for use in high-power rectifier units whenever high peak inverse voltages, extreme ambient temperatures, high operating frequency, or the production of high-frequency transients would prevent the use of mercury-vapor or gas-filled rectifier tubes.

MAXIMUM RATINGS

PEAK INVERSE	25,000 volts
D-C CURRENT	3.0 amperes
PEAK CURRENT	20.0 amperes
PLATE DISSIPATION	3000 watts

CHARACTERISTICS

Filament: Thoriated tungsten	
Voltage	7.5 volts
Current	49 to 54 amperes
Maximum Seal Temp.	175 °C
Maximum Anode-Core Temp.	175 °C
Length	8.375 inches
Diameter	4.125 inches
Net Weight	5.7 pounds

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amps)
1 - Phase Full Wave	17,700	8,000	6.0
1 - Phase Bridge	17,700	16,000	6.0
3 - Phase Full Wave	10,200 (per leg)	24,000	9.0

MERCURY VAPOR

RX21A

A half-wave, mercury-vapor rectifier incorporating features which enable it to withstand high peak inverse voltages and to supply high d-c current. A shielded ribbon filament provides a large emission reserve and assures long life.

MAXIMUM RATINGS

PEAK INVERSE	11,000 volts
D-C CURRENT	0.750 ampere
PEAK CURRENT	3.0 amperes
SUPPLY FREQUENCY	150 cps

CHARACTERISTICS

Filament: Coated	
Voltage	2.5 volts
Current	9.2 to 10.8 amperes
Base	Medium 5-pin
Max. Cond. Mercury Temp.	20-60 °C
Length	8.0 inches
Diameter	2.25 inches
Net Weight	5 ounces

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amps)
1 - Phase Full Wave	7,800	3,500	1.50
1 - Phase Bridge	7,800	7,000	1.50
3 - Phase Full Wave	4,500 (per leg)	10,500	2.25

MERCURY VAPOR ■ GRID CONTROLLED

KY21A

A grid-controlled mercury-vapor rectifier recommended for use in power supplies or control circuits where a variable voltage at high current is desired.

MAXIMUM RATINGS

PEAK INVERSE	11,000 volts
PEAK FORWARD	5,500 volts
D-C CURRENT	0.75 ampere
PEAK CURRENT	3.0 amperes
SUPPLY FREQUENCY	150 cps

CHARACTERISTICS

Filament: Coated	
Voltage	2.5 volts
Current	9.2 to 10.8 amperes
Base	Medium 5-pin
Max. Cond. Mercury Temp.	20-60 °C
Length	8.0 inches
Diameter	2.25 inches
Net Weight	5 ounces

MAXIMUM PERFORMANCE CAPABILITIES (Choke-Input Filter)

CIRCUIT	RMS INPUT VOLTAGE (volts)	D-C OUTPUT VOLTAGE (volts)	D-C OUTPUT CURRENT (amps)
1 - Phase Full Wave	7,800	3,500	1.50
1 - Phase Bridge	7,800	7,000	1.50
3 - Phase Full Wave	4,500 (per leg)	10,500	2.25

TRIODES

UHF

7815/3CPN10A5

This ceramic and metal, UHF, planar triode is designed primarily for use in low-duty pulse applications. It is capable of delivering 1600 watts pulse output power at 3000 megacycles at a duty of 0.0025.

The electrical characteristics of the 3CPN10A5 are similar to those of the 3CX100A5. The nominal plate dissipation rating of 10 watts may be exceeded if sufficient additional cooling is provided to maintain the anode and seal temperatures below the specified limits.

PLATE DISSIPATION 10 watts
FREQUENCY FOR MAXIMUM RATINGS 3000 megacycles
COOLING Conduction or Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.0 volts
Current 0.90 to 1.05 amperes
Capacitances:
Grid-Cathode 5.60 to 7.00 uufd
Grid-Plate 1.86 to 2.15 uufd
Plate-Cathode 0.035 uufd

Base Coaxial
Maximum Seal Temp. 250 °C
Maximum Anode Temp. 250 °C
Maximum Height 2.276 inches
Maximum Diameter 1.195 inches
Net Weight 1.6 ounces

Class of Operation	Type of Service	Maximum Pulse Ratings: Plate Voltage (volts)	Plate Current (amps.)	Plate Diss. (watts)	Grid. Diss. (watts)	Typical Pulse Operation: Plate Voltage (volts)	Plate Current (amps)	Duty	Output Power (watts)
C	Plate-Pulsed Power Oscillator—3000 megacycles	3,500	3.0	10	2	3,500	3.0	0.0025	1,600
C	Grid Pulsed Amplifier—1100 megacycles	2,000	3.0	10	2	1,700	1.9	0.01	1,500

*7698

A new ceramic-metal pulse planar triode usable to 3000 Mc. As a grid-pulsed amplifier at 1100 Mc or a plate pulsed amplifier at 3000 Mc, 2500 watts of power output is attainable. Cooling is by convection and conduction to a suitable heat sink.

PLATE DISSIPATION 10 watts
FREQUENCY FOR MAXIMUM RATINGS 3000 Mc
COOLING Conduction and Convection

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.3 volts
Current 1.3 amperes
Capacitances:
Grid-Cathode 5.60 to 7.00 uufd
Grid-Plate 1.86 to 2.15 uufd
Plate-Cathode 0.035 uufd

Base Coaxial
Maximum Seal Temp. 250°C
Maximum Anode Temp. 250°C
Maximum Height 2.276 inches
Maximum Diameter 1.195 inches
Net Weight 1.6 ounces

Class of Operation	Type of Service	Maximum Pulse Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Pulse Operation: Plate Voltage (volts)	Plate Current (amps)	Duty	Output Power (watts)
C	Plate-Pulsed Power Oscillator—3000 megacycles	3500	5.0	10	2	3500	4.8	0.0025	2500
C	Grid-Pulsed Amplifier—1100 megacycles	2000	5.0	10	2	2000	3.0	0.001	2500

7289/3CX100A5 and 8250/3CX100F5

The 3CX100A5 ceramic and metal planar UHF triode is intended to supersede all tubes in the 2C39A family. Narrow mechanical tolerances plus exacting electrical testing assure tube-to-tube uniformity. The Eimac 3X100A5 unilaterally replaces 2C39A's and other associated tube types in most equipments without requiring electrical or mechanical modification. A special version, the 3CX100F5 incorporates a 26.5 volt heater.

PLATE DISSIPATION 100 watts
FREQUENCY FOR MAXIMUM RATINGS 2500 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential

Heater:	3CX100F5	3CX100A5
Voltage	26.5	6.0 volts
Current	0.2 to 0.24	0.90 to 1.05 amperes

Capacitances:
Grid-Cathode 5.6 to 7.0 uufd
Grid-Plate 1.95 to 2.15 uufd
Plate-Cathode 0.035 uufd

Base Coaxial
Maximum Seal Temp. 300 °C
Maximum Anode-Core Temp. 300 °C
Maximum Height 2.701 inches
Maximum Diameter 1.264 inches
Net Weight 2.5 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Cathode Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Radio-Frequency Power Amplifier and Oscillator — 500 megacycles	1000	0.125	100	2	800	0.080	6	27
C	Radio-Frequency Power Amplifier or Oscillator — 2500 megacycles	1000	0.125	100	2	900	0.090	—	15
C	Plate-Modulated Radio-Frequency Power Amplifier or Oscillator — 500 megacycles	600	0.100	70	2	600	0.065	5	16

7815R/3CPX100A5

A ceramic-metal UHF planar triode intended for pulse and high altitude applications. It is similar to the popular 3CX100A5 but features a longer grid-anode ceramic insulator with a higher voltage breakdown rating.
The pulse ratings are applicable to 70,000 feet altitude making the 3CPX100A5 especially suitable for airborne applications.

PLATE DISSIPATION 100 watts
FREQUENCY FOR MAXIMUM RATINGS 2500 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.0 volts
Current 0.90 to 1.05 amperes
Capacitances:
Grid-Cathode 5.6 to 7.0 uufd
Grid-Plate 1.86 to 2.15 uufd
Plate-Cathode 0.035 uufd

Base Coaxial
Maximum Seal Temp. 250 °C
Maximum Anode-Core Temp. 250 °C
Maximum Height 2.701 inches
Maximum Diameter 1.264 inches
Net Weight 2.5 ounces

Class of Operation	Type of Service	Maximum Pulse Ratings: Plate Voltage (volts)	Plate Current (amps.)	Plate Diss. (watts)	Grid. Diss. (watts)	Typical Pulse Operation: Plate Voltage (volts)	Plate Current (amps)	Duty	Output Power (watts)
C	Plate-Pulsed Power Oscillator—3000 megacycles	3,500	3.0	100	2	3,500	3.0	0.0025	1,600
C	Grid Pulsed Amplifier—1100 megacycles	2,000	3.0	100	2	1,700	1.9	0.01	1,500

*INDICATES NEW PRODUCT

TRIODES

UHF

*7211

A new planar triode featuring one third more cathode current than the 3CX100A5. The 7211 is of all ceramic-metal construction. The plate-grid ceramic is longer than the 3CX100A5 making the tube more useful in pulse service or high altitude environments. Power output of 25 watts is available at 2500 Mc.

PLATE DISSIPATION 100 watts
FREQUENCY FOR MAXIMUM RATINGS 2500 Mc
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.3 volts
Current 1.3 amperes
Capacitances:
Grid-Cathode 8.0 uufd
Grid-Plate 2.25 uufd
Plate-Cathode 0.06 uufd

Base Coaxial
Maximum Seal Temp. 250°C
Maximum Anode-Core Temp. 250°C
Maximum Height 2.75 inches
Maximum Diameter 1.27 inches
Net Weight 2.5 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Radio-Frequency Power Amplifier 500 Mc	1000	0.19	100	2	900	0.14	9	65
C	Radio-Frequency Power Amplifier 2500 Mc	1000	0.19	100	2	900	0.14	—	25

INTERNAL ANODE

25T

The 25T is a radiation-cooled triode suitable for use at maximum ratings through 60 megacycles. A plate-dissipation power of 25 watts is allowable in most installations without the necessity for forced-air cooling.

PLATE DISSIPATION 25 watts
FREQUENCY FOR MAXIMUM RATINGS 60 megacycles
COOLING Convection and Radiation

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 6.3 volts
Current 2.80 to 3.15 amperes
Capacitances:
Grid-Filament 1.95 to 2.75 uufd
Grid-Plate 1.3 to 1.7 uufd
Plate-Filament 0.1 to 0.3 uufd

Base Small 4-pin
Socket Johnson 122-224, National XC-4 or CIR-4
Maximum Seal Temp. 200 °C
Maximum Envelope Temp. 225 °C
Maximum Height 4.38 inches
Maximum Diameter 1.44 inches
Net Weight 1.5 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	2000	0.075	25	7	1250	0.130*	3.4*	112*
C	Radio-Frequency Power Amplifier and Oscillator	2000	0.075	25	7	2000	0.063	4.0	100
C	Plate-Modulated Radio-Frequency Power Amplifier	1600	0.060	17	7	1600	0.053	3.1	68

*Two tubes.

3C24

A general-purpose radiation-cooled triode, the 3C24 has a 25-watt plate-dissipation rating and is capable of operation at maximum ratings to 60 megacycles. No forced air is required in most applications.

PLATE DISSIPATION 25 watts
FREQUENCY FOR MAXIMUM RATINGS 60 megacycles
COOLING Convection and Radiation

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 6.3 volts
Current 2.8 to 3.15 amperes
Capacitances:
Grid-Filament 1.4 to 2.2 uufd
Grid-Plate 1.4 to 1.8 uufd
Plate-Filament 0.1 to 0.3 uufd

Base UX small 4-pin
Socket Johnson 122-224, National XC4 or CIR-4
Maximum Seal Temp. 200 °C
Maximum Envelope Temp. 225 °C
Maximum Height 4.375 inches
Maximum Diameter 1.438 inches
Net Weight 1.5 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	2000	0.075	25	7	1250	0.130*	3.4*	112*
C	Radio-Frequency Power Amplifier and Oscillator	2000	0.075	25	7	2000	0.063	4.0	100
C	Plate-Modulated Radio-Frequency Power Amplifier	1600	0.060	17	7	1600	0.053	3.1	68

*Two tubes.

35T

The 35T is a radiation-cooled triode with a 50-watt plate-dissipation capability. It is suitable for both audio-frequency and radio-frequency service; maximum ratings apply to 100 megacycles.

PLATE DISSIPATION 50 watts
FREQUENCY FOR MAXIMUM RATINGS 100 megacycles
COOLING Convection & Radiation

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 5.0 volts
Current 3.6 to 4.2 amperes
Capacitances:
Grid-Filament 3.0 to 5.0 uufd
Grid-Plate 1.4 to 2.2 uufd
Plate-Filament 0.08 to 0.23 uufd

Base Medium 4-pin bayonet
Socket Johnson 122-224, National XC-4 or CIR-4
Maximum Seal Temp. 200 °C
Maximum Envelope Temp. 225 °C
Maximum Height 5.500 inches
Maximum Diameter 1.813 inches
Net Weight 2.5 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	2000	0.150	50	15	2000	0.167*	4*	235*
C	Radio-Frequency Power Amplifier and Oscillator	2000	0.150	50	15	2000	0.125	6.8	200
C	Plate-Modulated Radio-Frequency Power Amplifier	1600	0.120	33	15	1500	0.090	11	105

*Two tubes.

*INDICATES NEW PRODUCT

TRIODES

INTERNAL ANODE

75TH

A general-purpose high-mu (20) triode with a plate-dissipation rating of 75 watts and with maximum ratings applicable to 40 megacycles. The 75TH may be used without forced-air cooling under most conditions.

PLATE DISSIPATION 75 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Convection & Radiation

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 5.0 volts
Current 5.8 to 6.6 amperes
Capacitances:
Grid-Filament 2.0 to 3.4 uufd
Grid-Plate 1.7 to 2.9 uufd
Plate-Filament 0.15 to 0.35 uufd

Base Medium 4-pin bayonet
Socket Johnson 122-224, National XC-4 or CIR-4
Maximum Seal Temp. 200 °C
Maximum Envelope Temp. 225 °C
Maximum Height 7.250 inches
Maximum Diameter 2.810 inches
Net Weight 3 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier and Modulator	3000	0.225	75	16	2000	0.225*	3*	300*
C	Radio-Frequency Power Amplifier and Oscillator	3000	0.225	75	16	2000	0.150	10	225
C	Plate-Modulated Radio-Frequency Power Amplifier	2400	0.180	50	16	2000	0.110	6	170

*Two tubes.

100TH

This radiation-cooled general-purpose high-mu (38) triode is useable at maximum ratings through 40 megacycles. Forced-air cooling is not required in most applications.

PLATE DISSIPATION 100 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Convection and Radiation

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 5.0 volts
Current 5.8 to 6.6 amperes
Capacitances:
Grid-Filament 2.5 to 3.4 uufd
Grid-Plate 1.7 to 2.3 uufd
Plate-Filament 0.45 uufd

Base Medium 4-pin bayonet
Socket Johnson 122-224, National XC-4 or CIR-4
Maximum Seal Temp. 200 °C
Maximum Envelope Temp. 225 °C
Maximum Height 7.750 inches
Maximum Diameter 3.187 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	3000	0.225	100	20	2500	0.250*	7.5*	425*
C	Radio-Frequency Power Amplifier and Oscillator	3000	0.225	100	20	3000	0.165	18	400
C	Plate-Modulated Radio-Frequency Power Amplifier	2500	0.180	65	20	2500	0.140	17	285

*Two tubes.

100TL

This radiation-cooled general-purpose low-mu (14) triode is useable at maximum ratings through 40 megacycles. Forced-air cooling is not required in most applications.

PLATE DISSIPATION 100 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Convection and Radiation

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 5.0 volts
Current 5.8 to 6.6 amperes
Capacitances:
Grid-Filament 2.3 uufd
Grid-Plate 2.0 uufd
Plate-Filament 0.4 uufd

Base Medium 4-pin bayonet
Socket Johnson 122-224, National XC-4 or CIR-4
Maximum Seal Temp. 200 °C
Maximum Envelope Temp. 225 °C
Maximum Height 7.750 inches
Maximum Diameter 3.187 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	3000	0.225	100	15	2500	0.250*	10*	425*
C	Radio-Frequency Power Amplifier and Oscillator	3000	0.225	100	15	3000	0.165	20	400
C	Plate-Modulated Radio-Frequency Power Amplifier	2500	0.180	65	15	2500	0.140	23	285

*Two tubes.

592/3-200A3

This triode features short low-inductance grid leads and a center-tapped thoriated-tungsten filament. Maximum ratings apply at frequencies up to 150 megacycles; cooling is by radiation and forced air.

PLATE DISSIPATION 200 watts
FREQUENCY FOR MAXIMUM RATINGS 150 megacycles
COOLING Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 10.0 volts
Current 4.7 to 5.3 amperes
Capacitances:
Grid-Filament 3.6 uufd
Grid-Plate 3.3 uufd
Plate-Filament 0.29 uufd

Maximum Seal Temp. 175 °C
Maximum Envelope Temp. 225 °C
Maximum Height 6.0 inches
Maximum Diameter 2.875 inches
Net Weight 6 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier and Modulator	3500	0.250	200	25	3000	0.400*	20*	820*
C	Radio-Frequency Power Amplifier and Oscillator	3500	0.250	200	25	3500	0.228	15	600
C	Plate-Modulated Radio-Frequency Power Amplifier	2600	0.200	130	25	2500	0.200	19	375

*Two tubes.

TRIODES

INTERNAL ANODE

250TH

A high-power high-mu (37) triode for general usage. The 250TH may be employed at maximum ratings through 40 megacycles; forced-air cooling is not required in most applications.

PLATE DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Convection and Radiation

CHARACTERISTICS

Filament: Thoriated tungsten		Base	Special 4-pin
Voltage	5.0 volts	Socket	Johnson 123-211, National XM-50
Current	9.7 to 11.2 amperes	Maximum Seal Temp.	200 °C
Capacitances:		Maximum Envelope Temp.	225 °C
Grid-Filament	3.7 to 5.1 uufd	Maximum Height	10.125 inches
Grid-Plate	2.2 to 3.0 uufd	Maximum Diameter	3.813 inches
Plate-Filament	0.6 uufd	Net Weight	10 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	4000	0.350	250	40	3000	0.560*	42*	1180*
C	Radio-Frequency Power Amplifier and Oscillator	4000	0.350	250	40	4000	0.313	39	1000
C	Plate-Modulated Radio-Frequency Power Amplifier	3200	0.280	165	40	3000	0.200	14	435

*Two tubes.

250TL

A high-power low-mu (14) triode for general usage. The 250TL may be employed at maximum ratings through 40 megacycles; forced-air cooling is not required in most applications.

PLATE DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Convection and Radiation

CHARACTERISTICS

Filament: Thoriated tungsten		Base	Special 4-pin
Voltage	5.0 volts	Socket	Johnson 123-211, National XM-50
Current	9.7 to 11.2 amperes	Maximum Seal Temp.	200 °C
Capacitances:		Maximum Envelope Temp.	225 °C
Grid-Filament	3.2 to 4.3 uufd	Maximum Height	10.125 inches
Grid-Plate	2.5 to 3.5 uufd	Maximum Diameter	3.813 inches
Plate-Filament	0.4 to 0.7 uufd	Net Weight	10 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	4000	0.350	250	35	3000	0.500*	16*	1000*
C	Radio-Frequency Power Amplifier and Oscillator	4000	0.350	250	35	4000	0.310	33	1000
C	Plate-Modulated Radio-Frequency Power Amplifier	3200	0.280	165	35	3000	0.200	11	435

*Two tubes.

304TH

A unique high-mu (20) triode, actually four paralleled triodes in one envelope, often employed in pulse service where high peak currents are demanded. The 304TH is also an excellent choice for amplifier or oscillator applications up to 40 megacycles when high output power is required and where radiation cooling is desired.

PLATE DISSIPATION 300 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Convection and Radiation

CHARACTERISTICS

Filament: Thoriatedt ungsten		Base	Special 4-pin
Voltage	5.0 volts	Socket	Johnson 124-213
Current	24.0 to 28.0 amperes	Maximum Seal Temp.	200 °C
Capacitances:		Maximum Envelope Temp.	225 °C
Grid-Filament	12 to 16 uufd	Maximum Height	7.625 inches
Grid-Plate	8 to 11 uufd	Maximum Diameter	3.563 inches
Plate-Filament	1.0 uufd	Net Weight	9 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	3000	0.900	300	60	3000	0.665*	14*	1400*
C	Radio-Frequency Power Amplifier and Oscillator	3000	0.900	300	60	3000	0.500	53	1200
C	Plate-Modulated Radio-Frequency Power Amplifier	2500	0.750	200	60	2500	0.400	29	800

*Two tubes.

304TL

A unique low-mu (12) triode, actually four paralleled triodes in one envelope, often employed in pulse service where high peak currents are demanded. The 304TL is also an excellent choice for amplifier or oscillator applications up to 40 megacycles when high output power is required and where radiation cooling is desired.

PLATE DISSIPATION 300 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Convection and Radiation

CHARACTERISTICS

Filament: Thoriated tungsten		Base	Special 4-pin
Voltage	5.0 volts	Socket	Johnson 124-213
Current	24.0 to 28.0 amperes	Maximum Seal Temp.	200 °C
Capacitances:		Maximum Envelope Temp.	225 °C
Grid-Filament	10.0 to 14.3 uufd	Maximum Height	7.625 inches
Grid-Plate	7.1 to 10.2 uufd	Maximum Diameter	3.563 inches
Plate-Filament	0.9 uufd	Net Weight	9 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	3000	0.900	300	—	3000	0.444*	0	730*
AB_2	Audio-Frequency Power Amplifier and Modulator	3000	0.900	300	50	3000	0.800*	55*	1800*
C	Radio-Frequency Power Amplifier and Oscillator	3000	0.900	300	50	3000	0.500	40	1200
C	Plate-Modulated Radio-Frequency Power Amplifier	2500	0.700	200	50	2500	0.450	40	925

*Two tubes.

TRIODES

INTERNAL ANODE

*5867A

A new medium-mu triode, the 5867A is capable of over one kilowatt input to 100 Mc. It is useful as a Class AB amplifier, Class C amplifier or industrial oscillator. The plate dissipation rating is 375 watts.

PLATE DISSIPATION 375 watts
GRID DISSIPATION 20 watts
COOLING Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 5.0 volts
Current 14.1 amperes
Capacitances (Grounded Filament):
Grid-Filament 6.3 uufd
Grid-Plate 5.0 uufd
Plate-Filament 0.16 uufd

Base 5 Pin
Socket Eimac SK-410
Maximum Seal Temp. 180°C
Maximum Anode-Core Temp. 220°C
Maximum Height 5.65 inches
Maximum Diameter 3.38 inches
Net Weight 7 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps.)	Plate Diss. (watts)	Grid. Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Radio-Frequency Industrial Oscillator	3000	0.35	375	20	3000	0.35	30	830
AB_2	Audio-Frequency Linear Power Amplifier	3000	0.40	375	20	3000	0.59*	35*	1280*
C	Radio-Frequency Power Amplifier, Grounded-Grid	3000	0.35	375	20	3000	0.35	160	900
C	Plate-Modulated RF Power Amplifier	2500	0.30	250	20	2500	0.25	28	480

*Two tubes.

8163/3-400Z

The Eimac 3-400Z is a new zero-bias triode intended for linear amplifier applications. This tube may be used as a Class B R-F amplifier in either the grid-driven or cathode-driven connection, or two 3-400Z's may be used in push-pull as a grid-driven Class B audio amplifier or modulator. At a plate voltage of 3000 volts 1KW PEP input can be run with a single 3-400Z, providing a power gain of over 20 in the cathode-driven connection.

MAXIMUM PLATE DISSIPATION 400 Watts
FREQUENCY FOR MAXIMUM RATINGS 110 Megacycles
COOLING Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 5.0 volts
Current 13.5 to 14.7 amperes
Capacitances (Grounded Filament):
Grid-Filament 6.0 to 9.0 uufd
Grid-Plate 4.0 to 5.3 uufd
Plate-Filament 0.11 uufd

Base 5-pin, Special
Socket Eimac SK-410
Maximum Base Temp. 200 °C
Maximum Plate Seal Temp. 225 °C
Maximum Height 5.25 inches
Maximum Diameter 3.57 inches
Net Weight 7 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier and Modulator	3000	0.400	400	20	3000	0.666*	26	1310*
B	Radio-Frequency Linear Power Amplifier SSB Grounded-Grid	3000	0.400	400	20	3000	0.333	32	655
C	Radio-Frequency Power Amplifier and Oscillator	4000	0.350	400	20	3000	0.333	25	730
C	Plate-Modulated R-F Power Amplifier	3000	0.275	270	20	3000	0.245	18	550

*Two tubes.

450TH

The 450TH is a high-power general-purpose triode with a 450-watt plate-dissipation rating and is cooled by radiation and convection. It has an amplification factor of 38; it is useable at maximum ratings through 40 megacycles.

PLATE DISSIPATION 450 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Radiation and Convection

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 11.0 to 12.5 amperes
Capacitances:
Grid-Filament 7.3 to 8.9 uufd
Grid-Plate 4.0 to 5.4 uufd
Plate-Filament 0.4 to 0.9 uufd

Base Special 4-pin
Socket Johnson 123-211 or National XM-50
Maximum Seal Temp. 200 °C
Maximum Envelope Temp. 225 °C
Maximum Height 12.625 inches
Maximum Diameter 5.125 inches
Net Weight 1.3 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	6000	0.600	450	80	5000	0.620*	20*	2200*
C	Radio-Frequency Power Amplifier and Oscillator	6000	0.600	450	80	5000	0.450	46	1800
C	Plate-Modulated Radio-Frequency Power Amplifier	4500	0.500	300	80	4500	0.345	29	1250

*Two tubes.

450TL

The 450TL is a high-power general-purpose triode with a 450-watt plate-dissipation rating and is cooled by radiation and convection. It has an amplification factor of 18; it is useable at maximum ratings through 40 megacycles.

PLATE DISSIPATION 450 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Radiation and Convection

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 11.0 to 12.5 amperes
Capacitances:
Grid-Filament 5.6 to 7.6 uufd
Grid-Plate 4.2 to 5.7 uufd
Plate-Filament 0.5 to 0.8 uufd

Base Special 4-pin
Socket Johnson 123-211 or National XM-50
Maximum Seal Temp. 200 °C
Maximum Envelope Temp. 225 °C
Maximum Height 12.625 inches
Maximum Diameter 5.125 inches
Net Weight 1.3 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	6000	0.600	450	65	5000	0.620*	28*	2200*
C	Radio-Frequency Power Amplifier and Oscillator	6000	0.600	450	65	5000	0.450	42	1800
C	Plate-Modulated Radio-Frequency Power Amplifier	4500	0.500	300	65	4500	0.345	36	1250

*Two tubes.

TRIODES

INTERNAL ANODE

750TL

The 750TL is a high-power triode capable of delivering three kilowatts output power at frequencies through 40 megacycles. It is cooled by radiation and convection in the usual installation.

PLATE DISSIPATION 750 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Radiation and Convection

CHARACTERISTICS

Filament: Thoriated tungsten		Base	Special 4-pin
Voltage	7.5 volts	Socket	Johnson 124-214
Current	20.0 to 22.7 amperes	Maximum Seal Temp.	200 C
Capacitances:		Maximum Envelope Temp.	225 °C
Grid-Filament	7.0 to 10.0 uufd	Maximum Height	17.0 inches
Grid-Plate	5.0 to 7.0 uufd	Maximum Diameter	7 125 inches
Plate-Filament	0.9 to 1.5 uufd	Net Weight	2.9 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	10,000	1.0	750	100	6000	0.834*	46*	3500*
C	Radio-Frequency Power Amplifier and Oscillator	10,000	1.0	750	100	6000	0.625	125	3000
C	Plate-Modulated Radio-Frequency Power Amplifier	8000	0.8	500	100	6000	0.415	75	2000

*Two tubes.

8164/3-1000Z

The Eimac 3-1000Z is a new zero-bias triode intended for linear amplifier applications. This tube may be used as a class-B R-F amplifier in either the grid-driven or cathode-driven connection, or two 3-1000Z's may be used in push-pull as a grid-driven class-B audio amplifier or modulator. At a plate voltage of 3000 volts, 2KW PEP input can be run with a single 3-1000Z, providing a power gain of over 20 in the cathode-driven connection.

MAXIMUM PLATE DISSIPATION 1000 watts
FREQUENCY FOR MAXIMUM RATINGS 110 megacycles
COOLING Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten		Base	5-pin, Special
Voltage	7.5 volts	Socket	Eimac SK-510
Current	21.3 amperes	Maximum Base Temp.	200 °C
Capacitances (Grounded Filament):		Maximum Plate Seal Temp.	225 °C
Grid-Filament	17.0 uufd	Maximum Height	7.88 inches
Grid-Plate	6.9 uufd	Maximum Diameter	5.25 inches
Plate-Filament	0.12 uufd	Net Weight	1.2 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier and Modulator	3000	0.800	1000	50	3000	1.340*	42	2570*
B	Radio-Frequency Linear Power Amplifier—SSB Grounded-Grid	3000	0.800	1000	50	3000	0.670	65	1360
C	Radio-Frequency Power Amplifier and Oscillator	6000	0.700	1000	50	6000	0.700	57	3300
C	Plate-Modulated R-F Power Amplifier	4500	0.550	670	50	4500	0.500	35	1765

*Two tubes.

1000T

This high-power high-mu (35) triode enjoys a maximum plate-dissipation rating of 1000 watts; this and other maximum ratings apply through 50 megacycles. It is cooled by radiation and forced air.

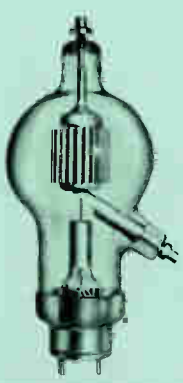
PLATE DISSIPATION 1000 watts
FREQUENCY FOR MAXIMUM RATINGS 50 megacycles
COOLING Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten		Base	50-watt jumbo 4-pin with air-conduction pipe
Voltage	7.5 volts	Socket	Johnson 123-211
Current	14.5 to 16.5 amperes	Maximum Seal Temp.	200 °C
Capacitances:		Maximum Envelope Temp.	225 °C
Grid-Filament	9.3 uufd	Maximum Height	12.625 inches
Grid-Plate	5.1 uufd	Maximum Diameter	5.125 inches
Plate-Filament	0.5 uufd	Net Weight	1.25 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	7500	0.750	1000	80	6000	1.05*	60*	4600*
C	Radio-Frequency Power Amplifier and Oscillator	7500	0.750	1000	80	6000	0.667	60	3000
C	Plate-Modulated Radio-Frequency Power Amplifier	6000	0.600	665	80	6000	0.600	75	2935

*Two tubes.



1500T

This 1500-watt medium-mu (24) triode is intended for use in general-purpose high-power applications at frequencies up to 40 megacycles. It is cooled by radiation and forced air.

PLATE DISSIPATION 1500 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten		Base	Special 4-pin
Voltage	7.5 volts	Socket	Johnson 124-214
Current	22.0 to 25.0 amperes	Maximum Seal Temp.	200 °C
Capacitances:		Maximum Envelope Temp.	225 °C
Grid-Filament	7.5 to 12.5 uufd	Maximum Height	17.0 inches
Grid-Plate	5.5 to 9.0 uufd	Maximum Diameter	7.125 inches
Plate-Filament	1.1 to 2.0 uufd	Net Weight	3.0 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier and Modulator	8000	1.25	1500	125	6000	1.650*	115*	7000*
C	Radio-Frequency Power Amplifier and Oscillator	8000	1.25	1500	125	7000	0.860	85	4500
C	Plate-Modulated Radio-Frequency Power Amplifier	6500	1.00	1000	125	6000	0.665	70	3000

*Two tubes.

TRIODES

INTERNAL ANODE

2000T

The largest internal-anode triode in the comprehensive Eimac line. The 2000T has a medium-mu (23) and is intended for high-power general-purpose service at frequencies through 40 megacycles. It is cooled by radiation and forced air.

PLATE DISSIPATION 2000 watts
FREQUENCY FOR MAXIMUM RATINGS 40 megacycles
COOLING Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten		Base	Special 4-pin
Voltage	10.0 volts	Socket	Johnson 124-214
Current	22.0 to 25.0 amperes	Maximum Seal Temp.	200 °C
Capacitances:		Maximum Envelope Temp.	225 °C
Grid-Filament	12.7 uufd	Maximum Height	17.750 inches
Grid-Plate	8.5 uufd	Maximum Diameter	8.125 inches
Plate-Filament	1.7 uufd	Net Weight	3.5 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	8000	1.75	2000	150	7000	1.80*	175*	8600*
C	Radio-Frequency Power Amplifier and Oscillator	8000	1.75	2000	150	7000	1.15	115	6000
C	Plate-Modulated Radio-Frequency Power Amplifier	6000	1.40	1350	150	6000	1.13	225	5400

*Two tubes.

EXTERNAL ANODE ■ FORCED-AIR COOLED

8283 / 3CX1000A7

A new addition to the Eimac line of zero-bias triodes, the 3CX1000A7 features ceramic-metal construction and a mesh thoriated-tungsten filament. Positive socketing is provided by three breechblock terminal surfaces. This tube is intended for class-B linear amplifier service in either the grid-driven or cathode-driven connection. It is equally attractive for use at audio frequencies or at radio frequencies through the TV broadcast bands. It is recommended for use in new equipment.

PLATE DISSIPATION 1000 watts
FREQUENCY FOR MAXIMUM RATINGS 220 megacycles
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated Tungsten Mesh		Base	Special, breechblock
Voltage	5.0 volts	Socket	Eimac SK-860 or SK-870
Current	34 amperes	Maximum Seal Temp.	250 °C
Capacitances (In Shielded Fixture):		Maximum Anode Core Temp.	250 °C
Grid-Filament	35 uufd	Maximum Height	4.68 inches
Grid-Plate	14 uufd	Maximum Diameter	3.36 inches
Plate-Filament	0.08 uufd	Net Weight	2.0 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Radio-Frequency Linear Power Amplifier, Grounded-Grid—SSB	2500	1.0	1000	45	2500	0.800	65	1250

8161 / 3X2500A3

This popular high-power triode is widely employed in AM, FM, and TV service. Its coaxial filament and grid terminals insure low-inductance connection to these electrodes and allow operation at maximum ratings through 75 megacycles. The use of an external forced-air-cooled anode results in a compact structure with high power-handling capability.

PLATE DISSIPATION 2500 watts
FREQUENCY FOR MAXIMUM RATINGS 75 megacycles
COOLING Forced Air

NOTE: This tube is also available in an all ceramic-metal version known as 3CX2500A3.

CHARACTERISTICS

Filament: Thoriated tungsten		Base	Coaxial
Voltage	7.5 volts	Maximum Seal Temp.	175 °C
Current	49 to 54 amperes	Maximum Anode-Core Temp.	175 °C
Capacitances:		Maximum Height	8.594 inches
Grid-Filament	29.2 to 40.2 uufd	Maximum Diameter	4.156 inches
Grid-Plate	16.8 to 23.2 uufd	Net Weight	6.25 pounds
Plate-Filament	0.6 to 1.2 uufd		

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier and Modulator	6000	2.5	2500	150	6000	3.0*	113*	13,000*
C	Radio-Frequency Power Amplifier, and Oscillator	6000	2.5	2500	150	6000	2.08	136	10,000
C	Radio-Frequency Power Amplifier Grounded-Grid 85 to 110 mc.	4000	2.0	2500	150	4000	1.85	1900	7500
C	Plate-Modulated Radio-Frequency Power Amplifier	5000	2.0	1670	150	5000	1.25	115	5300

*Two tubes.

8251 / 3X2500F3

This compact, high-power triode has electrical characteristics identical to those of the 3X2500A3. Coaxial basing is not used, however, and special socketing is not required; conventional grid and filament leads are attached. This tube is frequently employed in industrial-heating or other radio-frequency equipments operating below 30 megacycles.

PLATE DISSIPATION 2500 watts
FREQUENCY FOR MAXIMUM RATINGS 30 megacycles
COOLING Forced Air

NOTE: This tube is also available in an all ceramic-metal version known as 3CX2500F3.

CHARACTERISTICS

Filament: Thoriated tungsten		Maximum Seal Temp.	175 °C
Voltage	7.5 volts	Maximum Anode-Core Temp.	175 °C
Current	49 to 54 amperes	Maximum Height	18.0 inches
Capacitances:		Maximum Diameter	3.625 inches
Grid-Filament	29.2 to 40.2 uufd	Net Weight	7.5 pounds
Grid-Plate	16.8 to 23.2 uufd		
Plate-Filament	0.6 to 1.2 uufd		

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier and Modulator	6000	2.5	2500	150	6000	3.0*	113*	13,000*
C	Radio-Frequency Power Amplifier and Oscillator	6000	2.5	2500	150	6000	2.08	136	10,000
C	Plate-Modulated Radio-Frequency Power Amplifier	5000	2.0	1670	150	5000	1.25	115	5300

*Two tubes.

TRIODES

EXTERNAL ANODE ■ FORCED-AIR COOLED

8238 / 3X3000A1

This high-power compact triode was specifically designed to be used in class-AB_1 audio-amplifier service. Two tubes will typically deliver 10,000 watts output in such service. The 3X3000A1 uses coaxial electrode terminals and may be installed or removed with a minimum of delay.

PLATE DISSIPATION 3000 watts
GRID DISSIPATION 50 watts
COOLING Forced Air

NOTE: This tube is also available in an all ceramic-metal version known as 3CX3000A1.

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 49 to 54 amperes
Capacitances:
Grid-Filament 29 uufd
Grid-Plate 17 uufd
Plate-Filament 2.5 uufd

Base Coaxial
Maximum Seal Temp. 175 °C
Maximum Anode-Core Temp. 175 °C
Maximum Height 8.594 inches
Maximum Diameter 4.156 inches
Net Weight 6.25 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	6000	2.5	3000	—	6000	2.65*	0	10,000*

*Two tubes.

8239 / 3X3000F1

This low-mu high-power triode is electrically identical to the 3X3000A1. Physically, however, coaxial terminals have been replaced by heavy leads and a special socket is not needed. Typically, 10,000 watts audio may be obtained from two tubes in a class-AB_1 amplifier.

PLATE DISSIPATION 3000 watts
GRID DISSIPATION 50 watts
COOLING Forced Air

NOTE: This tube is also available in an all ceramic-metal version known as 3CX3000F1.

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 49 to 54 amperes
Capacitances:
Grid-Filament 29 uufd
Grid-Plate 17 uufd
Plate-Filament 2.5 uufd

Maximum Seal Temp. 175 °C
Maximum Anode-Core Temp. 175 °C
Maximum Diameter 4.156 inches
Net Weight 7.5 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	6000	2.5	3000	—	6000	2.65*	0	10,000*

*Two tubes.

3X3000A7

The Eimac 3X3000A7 is a new zero-bias triode intended for class-B linear amplifier applications. Operation with zero grid bias offers circuit simplicity by eliminating the bias supply. In addition, grounded-grid operation is attractive since a power gain of over twenty times can be obtained with the 3X3000A7 in the cathode-driven connection. Because of its very high mu (200), this tube is also attractive for certain pulse modulator and voltage regulator applications.

PLATE DISSIPATION 3000 watts
FREQUENCY FOR MAXIMUM RATINGS 75 megacycles
COOLING Forced Air

NOTE: This tube is also available in an all ceramic-metal version known as 3CX3000A7.

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 51 amperes
Capacitances:
Grid-Filament 38 uufd
Grid-Plate 24 uufd
Plate-Filament 0.6 uufd

Maximum Seal Temp. 175 °C
Maximum Anode Core Temp. 175 °C
Maximum Height 8.594 inches
Maximum Diameter 4.156 inches
Net Weight 7.5 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier or Modulator	5000	2.5	3000	225	4000	4.0*	120	11,000*
B	Radio-Frequency Linear Power Amplifier, Grounded-Grid—SSB	5000	2.5	3000	225	5000	1.56	215	5500
B	Radio-Frequency Linear Power Amplifier, Carrier Conditions	5000	2.5	3000	225	4000	0.815	15	1100

*Two tubes.

8162 / 3X3000F7

This tube is identical to the 3X3000A7 except for the addition of heavy grid and filament leads to simplify socketing problems. A pair of these tubes as audio amplifiers will deliver over 10 kilowatts output power.

PLATE DISSIPATION 3000 watts
FREQUENCY FOR MAXIMUM RATINGS 30 megacycles
COOLING Forced Air

NOTE: This tube is also available in an all ceramic-metal version known as 3CX3000F7.

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 51 amperes
Capacitances:
Grid-Filament 38 uufd
Grid-Plate 24 uufd
Plate-Filament 0.6 uufd

Maximum Seal Temp. 175 °C
Maximum Anode Core Temp. 175 °C
Maximum Height 8.594 inches
Maximum Diameter 4.156 inches
Net Weight 7.5 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier or Modulator	5000	2.5	3000	225	4000	4.0*	120	11,000*
B	Radio-Frequency Linear Power Amplifier, Grounded-Grid—SSB	5000	2.5	3000	225	5000	1.56	215	5500
B	Radio-Frequency Linear Power Amplifier, Carrier Conditions	5000	2.5	3000	225	4000	0.815	15	1100

*Two tubes.

TRIODES

EXTERNAL ANODE ■ FORCED-AIR COOLED

8158/3CX10,000A1

The Eimac 3CX10,000A1 is a new ceramic-metal low-mu power triode intended for use as a linear amplifier in audio or RF applications requiring high output power with zero driving power. It features a large thoriated-tungsten filament with ample reserve emission and an integral anode cooler with the inherent ability to withstand large overloads. This tube is particularly well suited for use in audio modulators and vibration testing equipment amplifiers supplying up to 25 KW of output power (two tubes, push-pull).

PLATE DISSIPATION 12,000 watts
GRID DISSIPATION 100 watts
FREQUENCY FOR MAXIMUM RATINGS 140 megacycles
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 94.0 to 104.0 amperes
Capacitances (Grounded Filament):
Grid-Filament 45.0 to 57.0 uufd
Grid-Plate 25.0 to 32.0 uufd
Plate-Filament 3.4 to 4.2 uufd

Base Coaxial
Socket Eimac SK-1300
Maximum Seal Temp. 250 °C
Maximum Anode-Core Temp. 250 °C
Maximum Height 8.50 inches
Maximum Diameter 7.00 inches
Net Weight 12 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier or Modulator	7000	5.0	12,000	100	7000	7.40*	0	29,100*
C	Radio-Frequency Industrial Oscillator	5000	4.0	10,000	100	5000	2.75	—	11,000
A	Voltage Regulator Service	7000	**	12,000	100	0-5000	**	0	—

*Two tubes. **Up to 5 amperes depending on voltage drop across tube.

8159/3CX10,000A3

Here is a new ceramic-metal medium-mu triode designed for industrial-heating oscillator service. It features a large thoriated-tungsten filament with ample reserve emission and an integral anode cooler with the inherent ability to withstand large overloads. It is intended for use through 140 megacycles, also as a grounded-grid FM amplifier developing 20 kilowatts useful output power.

PLATE DISSIPATION 12,000 watts
GRID DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS 140 megacycles
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 94 to 104 amperes
Capacitances (Grounded Filament):
Grid-Filament 48.0 to 58.0 uufd
Grid-Plate 30.0 to 38.0 uufd
Plate-Filament 1.20 to 1.50 uufd

Base Coaxial
Socket Eimac SK-1300
Maximum Seal Temp. 250 °C
Maximum Anode-Core Temp. 250 °C
Maximum Height 8.50 inches
Maximum Diameter 7.00 inches
Net Weight 12 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Radio-Frequency Industrial Oscillator	7000	4.0	10,000	250	7000	4.0	—	22,400
AB_2	Radio-Frequency Linear Power Amplifier—SSB, Grounded-Grid	7000	5.0	12,000	250	7000	4.0	2050	20,000
C	Radio-Frequency Power Amplifier, Grounded-Grid	7000	4.0	10,000	250	7000	4.0	4100	24,500
C	Plate-Modulated R-F Power Amplifier	5500	3.0	6500	250	5000	3.0	515	12,400

8160/3CX10,000A7

The new Eimac 3CX10,000A7 is a ceramic-metal zero-bias triode intended for use in grounded-grid linear amplifiers delivering 20 kilowatts of useful output power. Because of its low intermodulation distortion characteristics the 3CX10,000A7 is particularly well suited for single-sideband amplifiers. Two tubes operating in a push-pull audio amplifier under class-B zero-bias conditions will deliver up to 45 kilowatts of useful output power.

MAXIMUM PLATE DISSIPATION 12,000 watts
GRID DISSIPATION 500 watts
FREQUENCY FOR MAXIMUM RATINGS 140 megacycles
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 94.0 to 104.0 amperes
Capacitances (Grounded Filament):
Grid-Filament 63 uufd
Grid-Plate 41 uufd
Plate-Filament 0.05 uufd

Base Coaxial
Socket Eimac SK-1300
Maximum Seal Temp. 250 °C
Maximum Anode Core Temp. 250 °C
Maximum Height 8.5 inches
Maximum Diameter 7.0 inches
Net Weight 12 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier or Modulator	7000	5.0	12,000	500	7000	10.0*	560*	47,700*
B	Radio-Frequency Linear Power Amplifier, Grounded-Grid—SSB	7000	5.0	12,000	500	7000	5.0	1540	24,200
C	Radio-Frequency Power Amplifier or Oscillator	7000	4.0	10,000	500	7000	4.0	430	21,300
C	Plate-Modulated R-F Power Amplifier	5500	3.0	6500	500	5000	3.0	380	11,900

*Two tubes

*3CX15,000A3

A new addition to Eimac's line of ceramic-metal triodes, the 3CX15,000A3 is a medium-mu triode designed especially for rf heating service. Six amperes of dc plate current is available from a one kilowatt filament and the grid structure is rated at 500 watts. Adequate forced-air cooling permits 15 kilowatts of plate dissipation. The 3CX15,000A3 is also useful as a linear or plate-modulated rf amplifier.

PLATE DISSIPATION 15,000 watts
GRID DISSIPATION 500 watts
FREQUENCY FOR MAXIMUM RATINGS 100 Mc
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 6.3 volts
Current 152 to 168 amperes
Capacitances (Grounded Filament):
Grid-Filament 40.0 to 58.0 uufd
Grid-Plate 30.0 to 38.0 uufd
Plate-Filament 1.2 to 1.5 uufd

Base Coaxial
Socket Eimac SK-1300
Maximum Seal Temp. 250°C
Maximum Anode-Core Temp. 250°C
Maximum Height 8.5 inches
Maximum Diameter 7.0 inches
Net Weight 12 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps.)	Plate Diss. (watts)	Grid. Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Radio-Frequency Oscillator or Amplifier	10,000	6.0	15,000	500	10,000	4.3	75	33,000
AB_2	Radio-Frequency Linear Power Amplifier	10,000	6.0	15,000	500	10,000	4.8	2050	33,000
C	Plate-Modulated RF Power Amplifier	7000	5.0	10,000	500	7000	5.0	750	27,500

*INDICATES NEW PRODUCT

TRIODES

EXTERNAL ANODE ■ FORCED-AIR COOLED

*6697A

A new addition to Eimac's line, this popular triode finds wide use in industrial and broadcast equipment. The 6697A is all ceramic-metal construction for increased tube reliability. The anode is constructed of copper disk fins; forced-air cooling is required for rated plate dissipation of 35 kilowatts.

PLATE DISSIPATION 35,000 watts
GRID DISSIPATION 750 watts
FREQUENCY FOR MAXIMUM RATINGS 30 Mc
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 13 volts
Current 205 amperes
Capacitances (Grounded Filament):
Grid-Filament 76 uufd
Grid-Plate 55 uufd
Plate-Filament 2.7 uufd

Terminals Coaxial
Maximum Seal Temp. 250°C
Maximum Anode-Core Temp. 250°C
Maximum Height 19.75 inches
Maximum Diameter 5.3 inches
Net Weight 45 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio Frequency Power Amplifier or Modulator	16,000	11.0	35,000	750	10,000	17.4	550*	110,000*
C	Radio-Frequency Power Amplifier or Oscillator	16,000	11.0	35,000	750	10,000	10.0	1400	70,000
C	Plate-Modulated RF Power Amplifier	10,000	8.5	23,000	750	10,000	8.2	2080	60,000

*Two tubes.

EXTERNAL ANODE ■ WATER COOLED

8240/3W5000A1

The 3W5000A1 is a water-cooled version of the 3X3000A1 and is useful in audio service when reserve anode dissipation is needed or when water is easily employed as a coolant. It has coaxial terminals which allow rapid tube installation or removal if quick-disconnect water fittings are also employed.

PLATE DISSIPATION 5000 watts
GRID DISSIPATION 50 watts
COOLING Water and Forced Air

NOTE: This tube is also available in an all ceramic-metal version known as 3CW5000A1.

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 49 to 54 amperes
Capacitances:
Grid-Filament 29 uufd
Grid-Plate 17 uufd
Plate-Filament 2.5 uufd

Base Coaxial
Maximum Seal Temp. 175 °C
Maximum Height 12.562 inches
Maximum Diameter 3.625 inches
Net Weight 3.5 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	6000	2.5	5000	—	6000	2.65*	0	10,000*

*Two tubes.

8241/3W5000F1

The 3W5000F1 is a water-cooled version of the 3X3000F1. Conventional grid and filament leads allow installation without special socketing. It is designed for use in audio-amplifier applications where plate dissipation may be as high as 5000 watts or for similar service when water cooling is preferred.

PLATE DISSIPATION 5000 watts
GRIO DISSIPATION 50 watts
COOLING Water and Forced Air

NOTE: This tube is also available in an all ceramic-metal version known as 3CW5000F1.

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 49 to 54 amperes
Capacitances:
Grid-Filament 29 uufd
Grid-Plate 17 uufd
Plate-Filament 2.5 uufd

Maximum Seal Temp. 175 °C
Maximum Diameter 3.625 inches
Net Weight 4.8 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	6000	2.5	5000	—	6000	2.65*	0	10,000*

*Two tubes.

8242/3W5000A3

This water-cooled version of the 3X2500A3 is for use in equipments where water is the preferred cooling medium or where additional plate-dissipation capability is required. It, too, is coaxial based and may be employed at maximum ratings through 75 megacycles.

PLATE DISSIPATION 5000 watts
FREQUENCY FOR MAXIMUM RATINGS 75 megacycles
COOLING Water and Forced Air

NOTE: This tube is also available in an all ceramic-metal version known as 3CW5000A3.

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 49 to 54 amperes
Capacitances:
Grid-Filament 36 uufd
Grid-Plate 20 uufd
Plate-Filament 1.2 uufd

Base Coaxial
Maximum Seal Temp. 175 °C
Maximum Height 12.562 inches
Maximum Diameter 3.625 inches
Net Weight 3.5 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	6000	2.5	5000	150	5000	2.26*	59*	8000*
B	Audio-Frequency Power Amplifier and Modulator	6000	2.5	5000	150	6000	3.0*	113*	13,000*
C	Radio-Frequency Power Amplifier and Oscillator	6000	2.5	5000	150	6000	2.08	136	10,000
C	Plate-Modulated Radio-Frequency Power Amplifier	5000	2.0	3350	150	5000	1.45	76	5580

*Two tubes.

*INDICATES NEW PRODUCT

TRIODES

EXTERNAL ANODE ■ WATER COOLED

8243/3W5000F3

The 3W5000F3 is electrically identical to the 3X2500F3 except for plate-dissipation rating. Its water-cooled anode with 5000-watt capability makes it an ideal choice for equipments where high power must be dissipated or where it is more convenient to cool with water than forced air. Conventional grid and filament leads allow installation without special socketing.

PLATE DISSIPATION 5000 watts
FREQUENCY FOR MAXIMUM RATINGS 30 megacycles
COOLING Water and Forced Air

NOTE: This tube is also available in an all ceramic-metal version known as 3CW5000F3.

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 49 to 54 amperes
Capacitances:
Grid-Filament 36 uufd
Grid-Plate 21 uufd
Plate-Filament 1.2 uufd

Maximum Seal Temp. 175 °C
Maximum Height 22.0 inches
Maximum Diameter 3.625 inches
Net Weight 4.8 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_2	Audio-Frequency Power Amplifier and Modulator	6000	2.5	5000	150	5000	2.26*	59*	8000*
B	Audio-Frequency Power Amplifier and Modulator	6000	2.5	5000	150	6000	3.0*	113*	13,000*
C	Radio-Frequency Power Amplifier and Oscillator	6000	2.5	5000	150	6000	2.08	136	10,000
C	Plate-Modulated Radio-Frequency Power Amplifier	5000	2.0	3350	150	5000	1.45	76	5580

*Two tubes.

3CW20,000A1

The Eimac 3CW20,000A1 is a ceramic-metal low-mu power triode intended for use as a linear amplifier in audio or rf applications requiring high output power with zero driving power. It features a large thoriated-tungsten filament with ample reserve emission and an integral anode cooler with the inherent ability to withstand large overloads. This tube is particularly well suited for use in audio modulators and vibration testing equipment amplifiers supplying up to 25 kw of output power (two tubes, push-pull).

PLATE DISSIPATION 20,000 watts
GRID DISSIPATION 100 watts
FREQUENCY FOR MAXIMUM RATINGS 140 megacycles
COOLING Water and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 94.0 to 104.0 amperes
Capacitances (Grounded Filament):
Grid-Filament 45.0 to 57.0 uufd
Grid-Plate 25.0 to 32.0 uufd
Plate-Filament 3.4 to 4.2 uufd

Base Coaxial
Socket Eimac SK-1300
Maximum Seal Temp. 250 °C
Maximum Anode-Core Temp. 250 °C
Maximum Height 8.50 inches
Maximum Diameter 7.00 inches
Net Weight 12 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier or Modulator	7000	5.0	20,000	100	7000	7.40*	0	29,100*
C	Radio-Frequency Industrial Oscillator	5000	4.0	20,000	100	5000	2.75	—	11,000
A	Voltage Regulator Service	10,000	**	12,000	100	0-5000	**	0	—

*Two tubes. **Up to 5 amperes depending on voltage drop across tube.

3CW20,000A3

Here is a ceramic-metal medium-mu triode designed for industrial-heating oscillator service. It features a large thoriated-tungsten filament with ample reserve emission and an integral anode cooler with the inherent ability to withstand large overloads. It is intended for use through 140 megacycles, also as a grounded-grid FM amplifier developing 20 kilowatts useful output power.

PLATE DISSIPATION 20,000 watts
GRID DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS 140 megacycles
CODLING Water and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 94 to 104 amperes
Capacitances (Grounded Filament):
Grid-Filament 48.0 to 58.0 uufd
Grid-Plate 30.0 to 38.0 uufd
Plate-Filament 1.20 to 1.50 uufd

Base Coaxial
Socket Eimac SK-1300
Maximum Seal Temp. 250 °C
Maximum Anode-Core Temp. 250 °C
Maximum Height 8.50 inches
Maximum Diameter 7.00 inches
Net Weight 12 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Radio-Frequency Industrial Oscillator	7000	4.0	20,000	250	7000	4.0	—	22,400
AB_2	Radio-Frequency Linear Power Amplifier—SSB, Grounded-Grid	7000	5.0	20,000	250	7000	4.0	2050	20,000
C	Radio-Frequency Power Amplifier, Grounded-Grid	7000	4.0	20,000	250	7000	4.0	4100	24,500
C	Plate-Modulated RF Power Amplifier	5500	3.0	13,500	250	5000	3.0	515	12,400

3CW20,000A7

The Eimac 3CW20,000A7 is a ceramic-metal zero-bias triode intended for use in grounded-grid linear amplifiers delivering 20 kilowatts of useful output power. Because of its low intermodulation distortion characteristics the 3CW20,000A7 is particularly well suited for single-sideband amplifiers. Two tubes operating in a push-pull audio amplifier under class-B zero-bias conditions will deliver up to 45 kilowatts of useful output power.

MAXIMUM PLATE DISSIPATION 20,000 watts
GRID DISSIPATION 500 watts
FREQUENCY FOR MAXIMUM RATINGS 140 megacycles
COOLING Water and Forced Air

*Two tubes.

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 94.0 to 104.0 amperes
Capacitances (Grounded Filament):
Grid-Filament 63 uufd
Grid-Plate 41 uufd
Plate-Filament 0.05 uufd

Base Coaxial
Socket Eimac SK-1300
Maximum Seal Temp. 250 °C
Maximum Anode Core Temp. 250 °C
Maximum Height 8.5 inches
Maximum Diameter 7.0 inches
Net Weight 12 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier or Modulator	7000	5.0	20,000	500	7000	10.0*	560*	47,700*
B	Radio-Frequency Linear Power Amplifier, Grounded-Grid—SSB	7000	5.0	20,000	500	7000	5.0	1540	24,200
B	Radio-Frequency Linear Power Amplifier, Carrier Conditions, Grounded-Grid	7000	5.0	20,000	500	7000	2.4	330	5650
C	Radio-Frequency Power Amplifier or Oscillator	7000	4.0	20,000	500	7000	4.0	430	21,300
C	Plate-Modulated RF Power Amplifier	5500	3.0	13,500	500	5000	3.0	380	11,900

TRIODES

EXTERNAL ANODE ■ WATER COOLED

*3CW25,000A3

An integral water jacket allows an anode dissipation rating of 25 kilowatts with this new medium-mu, ceramic-metal triode. A 500 watt grid structure makes this tube attractive for industrial heating service. The tube is rated at 60 kilowatts of input power to 100 Mc with operation at slightly reduced ratings to 140 Mc.

PLATE DISSIPATION 25,000 watts
GRID DISSIPATION 500 watts
FREQUENCY FOR MAXIMUM RATINGS 100 Mc
COOLING Water and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 6.3 volts
Current 152 to 168 amperes
Capacitances (Grounded Filament):
Grid-Filament 48.0 to 58.0 uufd
Grid-Plate 30.0 to 38.0 uufd
Plate-Filament 1.2 to 1.5 uufd

Base Coaxial
Socket Eimac SK-1300
Maximum Seal Temp. 250°C
Maximum Anode-Core Temp. 250°C
Maximum Height 11.4 inches
Maximum Diameter 4.7 inches
Net Weight 12 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps.)	Plate Diss. (watts)	Grid. Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Radio-Frequency Oscillator or Amplifier	10,000	6.0	25,000	500	10,000	6.0	365	42,000
AB_2	Radio-Frequency Linear Power Amplifier	10,000	6.0	25,000	500	10,000	6.0	250	41,000
C	Plate-Modulated RF Power Amplifier	7000	6.0	16,500	500	7000	5.0	750	27,500

*6696A

A rugged, all ceramic-metal, water-cooled triode, the 6696A is rated at 120 kilowatts input and 60 kilowatts plate dissipation to 30 Mc. It is attractive for general broadcast or industrial service where a high-power, medium mu triode is required. Accessories such as water jackets and terminal connectors are available from Eimac.

PLATE DISSIPATION 60,000 watts
GRID DISSIPATION 750 watts
FREQUENCY FOR MAXIMUM RATINGS 30 Mc
COOLING Water and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 13 volts
Current 205 amperes
Capacitances (Grounded Filament):
Grid-Filament 76 uufd
Grid-Plate 55 uufd
Plate-Filament 2.7 uufd

Terminals Coaxial
Maximum Seal Temp. 250°C
Maximum Anode-Core Temp. 250°C
Maximum Height 19.75 inches
Maximum Diameter 4.8 inches
Net Weight 20 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps.)	Plate Diss. (watts)	Grid. Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier or Modulator	16,000	11.0	60,000	750	12,000	20.0*	600*	150,000*
C	Radio-Frequency Power Amplifier or Oscillator	16,000	11.0	60,000	750	15,000	7.0	600	80,000
C	Plate-Modulated RF Power Amplifier	10,000	8.5	40,000	750	10,000	8.2	2080	60,000

*Two tubes.

EXTERNAL ANODE ■ VAPOR COOLED

3CV30,000A3

A vapor-cooled triode with a heavy, one kilowatt filament and 30 kW anode dissipation capability. It is highly recommended for heavy duty applications such as industrial, rf heating service. A complete line of accessories is available including boiler, condenser, etc. for simplified systems installation.

PLATE DISSIPATION 30,000 watts
FREQUENCY FOR MAXIMUM RATING 100 megacycles
COOLING Vapor and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 6.3 volts
Current 158 amperes
Capacitances (Grounded Filament):
Grid-Filament 48.0 to 58.0 uufd
Grid-Plate 30.0 to 38.0 uufd
Plate-Filament 1.2 to 1.5 uufd

Base Coaxial
Socket Eimac SK-1310
Maximum Seal Temp. 250 °C
Maximum Anode-Core Temp. 250 °C
Maximum Height 8.75 inches
Maximum Diameter 7.75 inches
Net Weight 22 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Current (amps)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Output Power (watts)
C	Radio-Frequency Industrial Oscillator	10,000	6.0	30,000	1.0	10,000	6.0	18,000	42,000

*7480

A new addition to Eimac's growing line of vapor-cooled power tubes, this triode is rated at 140 kilowatts input and 80 kilowatts of plate dissipation at frequencies to 30 Mc. Boilers and other accessories are available for the 7480 from Eimac.

PLATE DISSIPATION 80,000 watts
GRID DISSIPATION 750 watts
FREQUENCY FOR MAXIMUM RATINGS 30 Mc
COOLING Vapor and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 13.0 volts
Current 205 amperes
Capacitances (Grounded Filament):
Grid-Filament 76 uufd
Grid-Plate 55 uufd
Plate-Filament 2.7 uufd

Terminals Coaxial
Maximum Seal Temp. 250°C
Maximum Anode-Core Temp. 250°C
Maximum Height 20.2 inches
Maximum Diameter 7.1 inches
Net Weight 50 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B	Audio-Frequency Power Amplifier or Modulator	16,000	11.0	60,000	750	12,000	20.0*	600*	150,000*
C	Radio-Frequency Power Amplifier or Oscillator	16,000	11.0	60,000	750	15,000	7.0	600	80,000
C	Plate-Modulated RF Power Amplifier	10,000	8.5	40,000	750	10,000	8.2	2080	60,000

*Two tubes

*INDICATES NEW PRODUCT

TETRODES

INTERNAL ANODE

8165/4-65A

A general-purpose radial-beam power tetrode, the 4-65A is cooled by radiation and convection and may be used without forced air in most installations. Maximum ratings extend to 150 megacycles.

PLATE DISSIPATION 65 watts
FREQUENCY FOR MAXIMUM RATINGS 150 megacycles
COOLING Convection and Radiation

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 6.0 volts
Current 3.2 to 3.8 amperes
Capacitances (Grounded Filament):
Input 6.0 to 8.3 uufd
Output 1.9 to 2.6 uufd
Feed-Through 0.12 uufd

Base 5-pin
Socket National HX29 or Johnson 122-101
Max. Seal Temp. 200 °C.
Max. Envelope Temp. 225 °C.
Max. Height 4.38 inches
Max. Diameter 2.38 inches
Net Weight 3 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	3000	0.150	65	10	—	1750	500	0.170*	0	175*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	3000	0.150	65	10	—	3000	360	0.065	0	130
AB_2	Audio-Frequency Power Amplifier and Modulator	3000	0.150	65	10	5	1800	250	0.220*	1.3*	270*
C	Radio-Frequency Power Amplifier and Oscillator	3000	0.150	65	10	5	3000	250	0.115	1.7	280
C	Plate-Modulated R-F Power Amplifier	2500	0.120	45	10	5	2500	250	0.110	2.6	230

*Two Tubes.

4D21/4-125A

This 125-watt general-purpose power tetrode is usable at maximum ratings to 120 megacycles. Its low interelectrode capacitances make it ideal for r-f amplifier service but it is equally useful in audio applications.

PLATE DISSIPATION 125 watts
FREQUENCY FOR MAXIMUM RATINGS 120 megacycles
COOLING Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 5.0 volts
Current 6.0 to 7.0 amperes
Capacitances (Grounded Filament):
Input 9.2 to 12.4 uufd
Output 2.5 to 3.5 uufd
Feed-Through 0.07 uufd

Base 5-pin metal shell
Socket National HX100 or Johnson 122-275
Max. Base-Seal Temp. 170 °C.
Max. Envelope Temp. 225 °C.
Max. Height 5.69 inches
Max. Diameter 2.81 inches
Net Weight 6.5 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	3000	0.225	125	20	—	2500	600	0.232*	0	330*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	3000	0.225	125	20	—	3000	510	0.105	0	200
AB_2	Audio-Frequency Power Amplifier and Modulator	3000	0.225	125	20	5	2500	350	0.260*	1*	400*
C	Radio-Frequency Power Amplifier and Oscillator	3000	0.225	125	20	5	3000	350	0.167	2.5	375
C	Plate-Modulated R-F Power Amplifier	2500	0.200	85	20	5	2500	350	0.152	3.3	300

*Two Tubes.

5D22/4-250A

The Eimac 4-250A enjoys a 250-watt plate dissipation rating and is usable at maximum ratings through the FM broadcast band. Its low interelectrode capacitances make it an ideal choice for high-frequency applications but it is often used in audio-amplifier work as well.

PLATE DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS 110 megacycles
COOLING Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 5.0 volts
Current 13.5 to 14.7 amperes
Capacitances (Grounded Filament):
Input 10.7 to 14.5 uufd
Output 3.7 to 5.1 uufd
Feed-Through 0.14 uufd

Base 5-pin metal shell
Socket Eimac SK-400
Max. Seal Temp. 200 °C.
Max. Envelope Temp. 225 °C.
Max. Height 6.38 inches
Max. Diameter 3.56 inches
Net Weight 8 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	4000	0.350	250	35	—	3000	600	0.417*	0	750*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	4000	0.350	250	35	—	4000	510	0.165	0	450
AB_2	Audio-Frequency Power Amplifier and Modulator	4000	0.350	250	35	10	3000	300	0.473*	1.9*	1040*
C	Radio-Frequency Power Amplifier and Oscillator	4000	0.350	250	35	10	4000	500	0.312	2.46	1000
C	Plate-Modulated R-F Power Amplifier	3200	0.275	165	35	10	3000	400	0.225	3.2	510

*Two Tubes.

8348/4-400A

A 400-watt general-purpose radial-beam tetrode, the 4-400A is ideal for any r-f application below 110 megacycles. Its ratings allow an input power of up to 1400 watts in such service or in others where lower radio frequencies or audio frequencies are to be amplified.

PLATE DISSIPATION 400 watts
FREQUENCY FOR MAXIMUM RATINGS 110 megacycles
COOLING Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 5.0 volts
Current 13.5 to 14.7 amperes
Capacitances (Grounded Filament):
Input 10.7 to 14.5 uufd
Output 4.2 to 6.6 uufd
Feed-Through 0.17 uufd

Base 5-pin metal shell
Socket Eimac SK-400
Max. Seal Temp. 200 °C.
Max. Envelope Temp. 225 °C.
Max. Height 6.38 inches
Max. Diameter 3.56 inches
Net Weight 9 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	4000	0.350	400	35	—	4000	750	0.585*	0	1540*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	4000	0.350	400	35	—	4000	705	0.250	0	650
AB_2	Audio-Frequency Power Amplifier and Modulator	4000	0.350	400	35	10	4000	500	0.638*	3.5*	1750*
C	Radio-Frequency Power Amplifier and Oscillator	4000	0.350	400	35	10	4000	500	0.350	5.8	1100
C	Plate-Modulated R-F Power Amplifier	3200	0.275	270	35	10	3000	500	0.275	3.5	630

*Two Tubes.

8166/4-1000A

This high-power general-purpose tetrode is capable of dissipating 1000 watts from its radiation-cooled anode. Maximum ratings apply through the FM broadcast band but its low drive-power requirements make it an ideal choice for audio and low-frequency applications as well.

PLATE DISSIPATION 1000 watts
FREQUENCY FOR MAXIMUM RATINGS 110 megacycles
COOLING Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 20.0 to 22.7 amperes
Capacitances (Grounded Filament):
Input 23.8 to 32.4 uufd
Output 6.8 to 9.4 uufd
Feed-Through 0.35 uufd

Base 5-pin metal shell
Socket Eimac SK-500
Max. Base-Seal Temp. 150 °C.
Max. Envelope Temp. 225 °C.
Max. Height 9.63 inches
Max. Diameter 5.25 inches
Net Weight 1.5 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	6000	0.700	1000	75	—	6000	1000	0.950*	0	3840*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	6000	0.700	1000	75	—	6000	1000	0.475	0	1920
AB_2	Audio-Frequency Power Amplifier and Modulator	6000	0.700	1000	75	25	6000	500	0.950*	4.7*	3900*
C	Radio-Frequency Power Amplifier and Oscillator	6000	0.700	1000	75	25	6000	500	0.700	15	3400
C	Plate-Modulated R-F Power Amplifier	5000	0.600	670	75	25	5500**	500	0.600	9	2630

**Below 30 mc. *Two Tubes.

TETRODES

EXTERNAL ANODE ■ CONDUCTION COOLED

4CN15A

A special version of the popular 4CX300A intended for use in low-duty pulse applications or where size and weight are important. The 4CN15A carries a nominal plate-dissipation rating of 15 watts but this may be extended by employing liquid immersion or another suitable heat sink. Its rugged design makes it ideal for applications where shock and or vibration are encountered.

PLATE DISSIPATION 15 watts
FREQUENCY FOR MAXIMUM RATINGS 500 megacycles
COOLING Convection or Conduction

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.0 volts
Current 2.6 to 3.1 amperes
Capacitances (Grounded Cathode):
Input 25 to 33 uufd
Output 3.5 to 4.5 uufd
Feed-Through 0.06 uufd

Base Special, breechblock
Socket Eimac SK-700 series
Maximum Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 2.5 inches
Max. Diameter 0.894 inches
Net Weight 2.5 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation
C	Radio-Frequency Power Amplifier or Oscillator	2000	0.250	15*	12	2	Values dependent upon allowable plate dissipation
C	Plate-Modulated Radio Frequency Amplifier	1500	0.200	9.5*	12	2	
AB_1	Radio-Frequency Linear Power Amplifier—SSB	** 2500	0.250	15*	12	2	(determined by heat sink).

**Below 250 Mc. *May be increased by conduction cooling.

*4CN15L

A coolerless version of Eimac's new quick heat tetrode, the 4CN15L is intended for convection or conduction cooling. A unique new cathode allows nearly instant warm-up; 70% of rated power output is available within 0.1 seconds using "hot-shot" techniques. A built-in control diode is used to sense rated emission, controlling the "hot-shot" voltage.

PLATE DISSIPATION (IN AIR) 15 watts
COOLING Convection or Conduction

CHARACTERISTICS

Cathode: Oxide-coated
Heater:
Voltage 2.1 volts
Current 7.5 amperes
Capacitances (Grounded Cathode):
Input 28.0 uufd
Output 6.0 uufd
Feed-Through 0.07 uufd

Base 9 Pin
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 2.464 inches
Max. Diameter 1.65 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation
AB_1	Radio-Frequency Linear Power Amplifier — SSB	2,000	0.200	15*	8	0.5	(Determined by heat sink)
C	Radio-Frequency Power Amplifier or Oscillator	2,000	0.200	15*	8	0.5	Values dependent upon allowable plate dissipation
C	Plate-Modulated Radio Frequency Amplifier	1,500	0.160	10*	8	0.5	

*May be increased by conduction cooling.

*4CS100L

Eimac's new quick-heat tetrode, featuring a 100 millisecond warm-up with "hot-shot" filament voltage or a one second warm-up at normal filament voltage. The 4CS100L is equipped with a beryllium oxide ceramic brazed to the anode. The excellent thermal conductivity of BeO combined with its electrical insulating properties permits flexibility in heat-sink cooling of this tube.

PLATE DISSIPATION 100 watts
COOLING Conduction

CHARACTERISTICS

Cathode: Oxide-coated
Heater:
Voltage 2.1 volts
Current 7.5 amperes
Capacitances (Grounded Cathode):
Input 28.0 uufd
Output 6.0 uufd
Feed-Through 0.07 uufd

Base 9 Pin
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 2.464 inches
Max. Diameter 1.640 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	2,000	0.200	100	8	—	2,000	400	0.300*	0	400*
AB_1	Radio-Frequency Linear Power Amplifier — SSB	2,000	0.200	100	8	—	2,000	400	0.150	0	200

*Two tubes.

EXTERNAL ANODE ■ FORCED-AIR COOLED

4CX125C and 4CX125F

The 4CX125C is a horizontally-finned version of the 4CX300A and is intended for use where transverse air cooling is desired. It is also useful where anode power is dissipated by liquid immersion. Its electrical characteristics are identical to those of the 4CX300A with the exception of plate dissipation which is established at 125 watts with air cooling. It is ideally suited for applications where shock and/or vibration are experienced. The 4CX125F is an identical tube with a 26.5 volt heater.

PLATE DISSIPATION 125 watts
FREQUENCY FOR MAXIMUM RATINGS 500 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater: **4CX125C** **4CX125F**
Voltage 6.0 26.5 volts
Current 2.6 to 3.1 .59 to .70 amps
Capacitances (Grounded Cathode):
Input 25 to 33 uufd
Output 3.5 to 4.5 uufd
Feed-Through 0.06 uufd

Base Special, breechblock
Socket Eimac SK-700 series
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 2.50 inches
Max. Diameter 1.25 inches
Net Weight 3.5 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
C	Radio-Frequency Power Amplifier and Oscillator	2000	0.250	125	12	2	2000	250	0.250	2.9	390
C	Plate-Modulated RF Power Amplifier	1500	0.200	80	12	2	1500	250	0.200	1.7	235

*INDICATES NEW PRODUCT

TETRODES

EXTERNAL ANODE ■ FORCED-AIR COOLED

7034/4X150A and 7035/4X150D

The veteran of external-anode tetrodes, and an Eimac original, continues to enjoy its deserved popularity. Recent tube improvements have made possible increases in maximum plate-voltage and plate-dissipation ratings. In Class-AB or Class-C service an input power of 500 watts is now allowed at frequencies up to 150 megacycles. The 4X150D is a 26.5 volt heater version of the 4X150A.

PLATE DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS 150 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater: **4X150A** **4X150D**
Voltage 6.0 26.5 volts
Current 2.3 to 2.9 0.50 to 0.62 amps
Capacitances (Grounded Cathode):
Input 14.5 to 17.0 uufd
Output 4.0 to 4.8 uufd
Feed-Through 0.05 uufd

Base 9-pin, special
Socket Eimac SK-600 series
Max. Base-Seal Temp. 175 °C
Max. Anode-Core Temp. 250 °C
Max. Height 2.404 inches
Max. Diameter 1.640 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	2000	0.250	250	12	—	2000	350	0.500*	0	600*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	2000	0.250	250	12	—	2000	350	0.250	0	300
C	Radio-Frequency Power Amplifier and Oscillator	2000	0.250	250	12	2	2000	250	0.250	2.9	390
C	Plate-Modulated RF Power Amplifier	1600	0.200	165	12	2	1500	250	0.200	1.7	235

*Two tubes.

8172/4X150G

One of the forerunners in external-anode coaxial-based tetrodes, the 4X150G continues to deliver long life and high reliability in VHF and UHF applications. It is intended for use in CW service at frequencies up to 1200 megacycles and is useful in pulse service at frequencies up to 1500 megacycles.

PLATE DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS
500 megacycles CW
1500 megacycles Pulsed
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 2.5 volts
Current 6.2 to 7.3 amperes
Capacitances (Grounded Cathode):
Input 25.0 to 29.0 uufd
Output 4.0 to 4.9 uufd
Feed-Through 0.05 uufd

Base Coaxial
Max. Seal & Anode-Core Temp. 175 °C
Max. Height 2.750 inches
Max. Diameter 1.635 inches
Net Weight 6 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
B_{TV}	Radio-Frequency Linear Amplifier — TV Visual Service	1250	0.250	250	12	2	1250	300	0.305*	9	250*
C	Plate-Pulsed RF Power Amplifier and Oscilator	7000 pulse	**	250	12	2	7000 pulse	1000	6.0	1200 Mc. Osc.	17,000

*Peak synchronizing level.
**Maximum pulse cathode current, 7 amperes; maximum pulse duration, 5 microseconds.

8296/4X150R and 8297/4X150S

This new addition to the Eimac tetrode line is a ruggedized version of the famous 4X150A. It incorporates construction features found in the 4CX300A and 4CX250R resulting in a tube capable of operating at full voltages in environments where moderate shock and vibration are present. The 4X150R will replace the 4X150A in nearly all applications since it is electrically identical except for a small (1.75 uufd) increase in input-capacitance limits, in feed-through capacitance (0.01 uufd) and in heater current (0.1 ampere). The 4X150S is identical but incorporates a 26.5 volt heater for mobile or airborne applications.

PLATE DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS 150 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater: **4X150R** **4X150S**
Voltage 6.0 26.5 volts
Current 2.4 to 3.0 0.56 to 0.68 amps
Capacitances (Grounded Cathode):
Input 16.25 to 18.75 uufd
Output 4.0 to 4.8 uufd
Feed-Through 0.06 uufd

Base 9-pin, special
Socket Eimac SK-600 series
Max. Base Seal Temp. 175 °C
Max. Anode Core Temp. 250 °C
Max. Height 2.404 inches
Max. Diameter 1.640 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	2000	0.250	250	12	—	2000	350	0.500*	0	600*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	2000	0.250	250	12	—	2000	350	0.250	0	300
C	Radio-Frequency Power Amplifier and Oscillator	2000	0.250	250	12	2	2000	250	0.250	2.9	390
C	Plate-Modulated RF Power Amplifier	1600	0.200	165	12	2	1500	250	0.200	1.7	235

*Two tubes.

7203/4CX250B and 7204/4CX250F

A 250-watt general purpose external-anode tetrode featuring ceramic-metal construction. This compact power tube can be used at maximum ratings at frequencies up to 500 megacycles. It is recommended for use in equipments of new design. The 4CX250F is identical in all respects except for a heater rated at 26.5 volts.

PLATE DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS 500 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater: **4CX250B** **4CX250F**
Voltage 6.0 26.5 volts
Current 2.3 to 2.9 0.5 to 0.62 amps
Capacitances (Grounded Cathode):
Input 14.2 to 17.2 uufd
Output 4.0 to 5.0 uufd
Feed-Through 0.06 uufd

Base 9-pin, special
Socket Eimac SK-600 series
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 2.464 inches
Max. Diameter 1.640 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	2000	0.250	250	12	—	2000	350	0.500*	0	600*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	2000	0.250	250	12	—	2000	350	0.250	0	300
C	Radio-Frequency Power Amplifier and Oscillator	2000	0.250	250	12	2	2000	250	0.250	2.9	390
C	Plate-Modulated RF Power Amplifier	1500	0.200	165	12	2	1500	250	0.200	1.7	235

*Two tubes.

TETRODES

EXTERNAL ANODE ■ FORCED-AIR COOLED

7580W / 4CX250R

A recent addition to the Eimac line of ceramic-metal tetrodes, the 4CX250R is a ruggedized version of the 7580. It is intended for use in environments where shock and vibration levels preclude the use of such a tube as the 4CX250B and where the use of a higher-perveance tetrode is indicated. The 4CX250R is designed to operate with maximum rated plate and screen voltages applied in equipment where shock and/or vibration is experienced.

PLATE DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS 500 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.0 volts
Current 2.3 to 2.9 amperes
Capacitances (Grounded Cathode):
Input 16.0 to 18.5 uufd
Output 4.2 to 5.2 uufd
Feed-Through 0.06 uufd
Base 9-pin, special
Socket Eimac SK-600 series
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 2.464 inches
Max. Diameter 1.640 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	2000	0.250	250	12	—	2000	350	0.500*	0	625*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	2000	0.250	250	12	—	2000	400	0.245	0	495
C	Radio-Frequency Power Amplifier and Oscillator	2000	0.250	250	12	2	2000	250	0.250	2.9	390
C	Plate-Modulated R-F Power Amplifier	1500	0.200	165	12	2	1500	250	0.200	1.7	235

*Two tubes.

8245 / 4CX250K and 8246 / 4CX250M

These coaxial base tetrodes are particularly useful as a CW rf amplifier between 500 and 1200 megacycles, in pulse applications, the useful frequency is above 1500 megacycles. The 4CX250K employs a 6.0 volt heater while the 4CX250M uses a 26.5 volt heater.

PLATE DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS 500 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater: **4CX250K** **4CX250M**
Voltage 6.0 26.5 volts
Current 2.3 to 3.0 0.53 to 0.68 amps
Capacitances (Grounded Cathode):
Input 25.0 to 29.0 uufd
Output 4.0 to 4.9 uufd
Feed-Through 0.05 uufd
Base Special, coaxial
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 2.813 inches
Max. Diameter 1.640 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Radio-Frequency Linear Power Amplifier—SSB	2000	0.250	250	12	—	2000	350	0.250	0	300
C	Radio-Frequency Power Amplifier and Oscillator	2000	0.250	250	12	2	2000	250	0.250	2.9	390
C	Plate-Modulated RF Power Amplifier	1500	0.200	165	12	2	1500	250	0.200	1.7	235

*4CX250L

A quick-heat tetrode with 250 watt forced-air cooled radiator, the 4CX250L is an excellent choice for mobile equipment. With "hot-shot" filament overvoltage, the tube is ready to use in 0.1 seconds. A built in control diode senses rated cathode emission and initiates switching to normal voltage. High transconductance permits full power output with low drive requirements.

PLATE DISSIPATION 250 watts
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated
Heater:
Voltage 2.1 volts
Current 7.5 amperes
Capacitances (Grounded Cathode):
Input 28.0 uufd
Output 6.0 uufd
Feed-Through 0.07 uufd
Base 9-Pin, special
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 2.464 inches
Max. Diameter 1.640 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	2,000	0.200	250	8	—	2,000	400	0.360*	0	430
AB_1	Radio-Frequency Linear Power Amplifier—SSB	2,000	0.200	250	8	—	2,000	400	0.180	0	215

*Two tubes.

*4CPX250K

This new tube is a pulse rated version of the coaxial 4CX250K. New cathode techniques permit pulse currents of over three amperes at pulse lengths up to 250 microseconds. Peak power output of 10 kW is available at 0.005 duty.

PLATE DISSIPATION 250 watts
FREQUENCY FOR MAXIMUM RATINGS 500 Mc
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.0 volts
Current 2.3 to 3.0 amperes
Capacitances (Grounded Grid):
Input 14.5 to 19.0 uufd
Output 3.9 to 4.1 uufd
Feed-Through 0.01 uufd
Base Special, coaxial
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 2.813 inches
Max. Diameter 1.640 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Duty	Output Power (watts)
C	Grid-Pulsed Amplifier (450 Mc)—250 usec pulses	5,500	0.250	250	12	2	5,500	1,000	0.250	0.005	10,000

*INDICATES NEW PRODUCT

TETRODES

EXTERNAL ANODE ■ FORCED-AIR COOLED

8167 / 4CX300A

This rugged ceramic-metal tetrode with unique breechblock basing has electrical characteristics similar to other tubes in the 4X150 and 4X250 families but is especially suited for service in severe environments. Its unusual internal construction assures reliable operation at acceleration levels up to 20 g's. Suitable for service from dc to 500 megacycles, the 4CX300A is first choice for use in new equipments where shock and/or vibration are expected.

PLATE DISSIPATION 300 watts
FREQUENCY FOR MAXIMUM RATINGS 500 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.0 volts
Current 2.6 to 3.1 amperes
Capacitances (Grounded Cathode):
Input 25 to 33 uufd
Output 3.5 to 4.5 uufd
Feed-Through 0.06 uufd

Base Special, breechblock
Socket Eimac SK-700 series
Max. Seal Temp. 225 °C
Max. Anode Core Temp. 250 °C
Max. Height 2.5 inches
Max. Diameter 1.65 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	2500	0.250	300	12	—	2500	350	0.500*	0	800*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	2500	0.250	300	12	—	2500**	350	0.250	0	400
C	Radio-Frequency Power Amplifier and Oscillator	2500	0.250	300	12	2	2500**	250	0.250	2.8	500
C	Plate-Modulated R-F Power Amplifier	1500	0.200	200	12	2	1500	250	0.200	1.7	235

*Two tubes. **Below 250 mc. only.

4CX300Y

This special version of the 4CX300A has a higher plate current rating which allows 60 per cent more input power. Physically identical to the 4CX300A, the Eimac 4CX300Y is attractive for general use wherever a compact high-power tetrode is indicated.

PLATE DISSIPATION 400 watts
FREQUENCY FOR MAXIMUM RATINGS 110 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.0 volts
Current 3.00 to 3.85 amperes
Capacitances (Grounded Cathode):
Input 30.0 to 38.0 uufd
Output 3.9 to 5.0 uufd
Feed-Through 0.07 uufd

Base Special, breechblock
Socket Eimac SK-700 series
Max. Seal Temp. 250 °C
Max. Anode Core Temp. 250 °C
Max. Height 2.5 inches
Max. Diameter 1.65 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	2,000	0.4	400	8	—	2,000	400	0.75*	0	850*
AB_1	Radio-Frequency Linear Power Amplifier — SSB	2,000	0.4	400	8	—	2,000	400	0.375	0	450
C	Radio-Frequency Power Amplifier and Oscillator	2,000	0.4	400	8	1	2,000	250	0.4	3.8	600
C	Plate-Modulated R-F Power Amplifier	1,500	0.3	250	8	1	1,500	250	0.3	1.7	300

*Two tubes.

8321 / 4CX350A and 8322 / 4CX350F

These tubes are externally identical to the 4CX250B but contain more rugged internal construction. These compact radial beam tetrodes have plate dissipation ratings of 350 watts.
These tubes are intended primarily for Class-AB_1 linear service having high transconductance and allowing full output with extremely low drive requirements. The 4CX350A and 4CX350F differ only in heater voltages.

PLATE DISSIPATION 350 watts
FREQUENCY FOR MAXIMUM RATINGS 500 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater: **4CX350A** **4CX350F**
Voltage 6.0 26.5 volts
Current 2.9 to 3.6 0.66 to 0.81 amps
Capacitances (Grounded Cathode):
Input 22.2 to 26.2 uufd
Output 5.0 to 6.0 uufd
Feed-Through 0.05 uufd

Base Special, breechblock
Socket Eimac SK-600 Series
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 2.46 inches
Max. Diameter 1.64 inches
Net Weight 4 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	2000	0.4	350	8	—	2000	400	0.54*	0	600*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	2000	0.4	350	8	—	2000	400	0.27	0	300

*Two tubes.

4X500A

This medium-power external-anode tetrode finds wide acceptance in FM broadcast service. The instant-heating filament of thoriated tungsten and the overall compactness are but two of the 4X500A's bonus features. Maximum ratings apply to 120 megacycles.

PLATE DISSIPATION 500 watts
FREQUENCY FOR MAXIMUM RATINGS
120 megacycles — class-C CW
220 megacycles — class-B TV
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 5.0 volts
Current 12.2 to 13.7 amperes
Capacitances (Grounded Cathode):
Input 10.6 to 14.4 uufd
Output 4.9 to 6.9 uufd
Feed-Through 0.1 uufd

Base 4-pin special
Socket Eimac SK-900
Max. Anode-Core Temp. 150 °C
Max. Seal Temp. 150 °C
Max. Height 4.750 inches
Max. Diameter 2.625 inches
Net Weight 1.17 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
B_{TV}	Radio-Frequency Linear Amplifier — TV Visual Service	3000	0.350	500	30	10	2400	500	0.400*	25*	600*
C	Radio-Frequency Power Amplifier and Oscillator	4000	0.350	500	30	10	4000	500	0.315	5	835

*Peak synchronizing level.

TETRODES

EXTERNAL ANODE ■ FORCED-AIR COOLED

*4CX600A

The Eimac 4CX600A is a new ceramic-metal tetrode with low lead inductances and low interelectrode capacities and is designed especially for distributed amplifier and UHF service.
A built-in screen bypass capacitor simplifies equipment design. Maximum input of 1500 watts can be realized well into the UHF region.

PLATE DISSIPATION 600 watts
MAXIMUM FREQUENCY 1300 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.0 volts
Current 4.8 amps
Capitances (Grounded-Cathode):
Input 40 uuf
Output 5 uuf
Feed-Through 0.1 uuf
Screen-Cathode 110 uuf

Base 5 pin, special
Max. Seal Temp. 250°C
Max. Anode-Core Temp. 250°C
Max. Height 2.2 inches
Max. Diameter 2.1 inches

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Drive Power (watts)	Output Power (watts)
C	RF Power Amplifier or Oscillator	3,000	0.5	600	15	3	3,000	0.4	400	10	800

8168 / 4CX1000A

This high-power ceramic-metal tetrode is an excellent choice for applications where class-AB_1 operation is desired. It is capable of delivering more than 1500 watts plate output power per tube in audio or r-f service without requiring grid driving power. It is recommended for use in new equipments.

PLATE DISSIPATION 1000 watts
FREQUENCY FOR MAXIMUM RATINGS 110 megacycles
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.0 volts
Current 8.1 to 9.9 amperes
Capacitances (Grounded Cathode):
Input 77 to 90 uufd
Output 11 to 13 uufd
Feed-Through 0.02 uufd

Base Special, breechblock
Socket Eimac SK-800 series
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 4.8 inches
Max. Diameter 3.37 inches
Net Weight 27 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	3000	1.0	1000	12	—	3000	325	1.75*	0	3260*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	3000	1.0	1000	12	—	3000	325	.875	0	1630

*Two tubes.

8352 / 4CX1000K

This high-power ceramic-metal tetrode is electrically identical to the 4CX1000A, but gives improved performance at UHF due to its solid-ring screen terminal. This terminal surface improves isolation between input and output circuits to a marked degree and insures stable UHF operation as a class-AB_1 amplifier.

PLATE DISSIPATION 1000 watts
COOLING Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Voltage 6.0 volts
Current 10.5 amperes
Capacitances (Grounded Cathode):
Input 84 uufd
Output 12 uufd
Feed-Through 0.02 uufd

Base Special, ring and breechblock
Socket Special
Max. Seal Temp. 250 °C
Max. Anode Core Temp. 250 °C
Max. Height 4.75 inches
Max. Diameter 3.36 inches
Net Weight 28 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Radio-Frequency Linear Power Amplifier—SSB	3000	1.0	1000	12	—	2700	250	0.680	0	1100

8169 / 4CX3000A

The 4CX3000A is a new ceramic-metal tetrode designed especially for class-AB_1 linear amplifier service. In such service, the intermodulation distortion products produced by the 4CX3000A are of very low level, typically 32 to 44 db below PEP level, depending on operating conditions. The ample grid and screen dissipation ratings also make the 4CX3000A attractive for use as a class-C amplifier. The 4CX3000A is first choice for modern, new equipment design.

PLATE DISSIPATION 3000 watts
FREQUENCY FOR MAXIMUM RATINGS 110 megacycles
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 10.0 volts
Current 45 amperes
Capacitances (Grounded Filament):
Input 140 uufd
Output 20 uufd
Feed-Through 0.9 uufd

Base Special, ring and breechblock
Socket Eimac SK-1400
Max. Seal Temp. 250 °C
Max. Anode Core Temp. 250 °C
Max. Height 7.90 inches
Max. Diameter 4.63 inches
Net Weight 5.5 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	6000	2.0	3000	175	50	5000	850	3.3*	0	11,200*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	6000	2.0	3000	175	50	5000	850	1.65	0	5600
C	Radio-Frequency Power Amplifier and Oscillator	7000	2.0	3000	175	50	7000	500	1.9	47	11,000
C	Plate-Modulated R-F Power Amplifier	5000	1.4	2000	175	50	5000	400	1.35	42	5500

*Two tubes.

*INDICATES NEW PRODUCT

TETRODES

EXTERNAL ANODE ■ FORCED-AIR COOLED

8170/4CX5000A

This high-power ceramic and metal tetrode features high class-AB_1 output power at audio and radio frequencies. It is also an excellent choice for AM or FM commercial service where high-efficiency class-C operation is desired. Its modern and straight-forward design makes it preferred for use in new equipments.

PLATE DISSIPATION 5000 watts
FREQUENCY FOR MAXIMUM RATINGS 30 megacycles
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 73 to 78 amperes
Capacitances (Grounded Filament):
Input 108 to 122 uufd
Output 18.0 to 23.0 uufd
Feed-Through 1.0 uufd

Base Special, concentric
Socket Eimac SK-300A
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 9.125 inches
Max. Diameter 4.938 inches
Net Weight 9.5 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	7500	4.0	6000	250	—	7000	1250	3.65*	0	17,500*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	7500	4.0	6000	250	—	7500	1250	1.9	0	10,000
C	Radio-Frequency Power Amplifier and Oscillator	7500	3.0	5000	250	75	7500	500	2.8	150	16,000
C	Plate-Modulated R-F Power Amplifier	5000	2.5	3500	250	75	5000	500	1.4	25	5800

*Two tubes.

8170W/4CX5000R

A ruggedized version of the 4CX5000A power tetrode, the 4CX5000R incorporates a sturdy mesh cathode construction. Electrically identical to the "A" version, it is an excellent choice for high power applications in severe environments.

PLATE DISSIPATION 5000 watts
FREQUENCY FOR MAXIMUM RATINGS 30 megacycles
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 73 to 78 amperes
Capacitances (Grounded Filament):
Input 108 to 122 uufd
Output 18.0 to 23.0 uufd
Feed-Through 1.0 uufd

Base Special, concentric
Socket Eimac SK-300A
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 9.125 inches
Max. Diameter 4.938 inches
Net Weight 9.5 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	7500	4.0	6000	250	—	7000	1250	3.65*	0	17,500*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	7500	4.0	6000	250	—	7500	1250	1.9	0	10,000
C	Radio-Frequency Power Amplifier and Oscillator	7500	3.0	5000	250	75	7500	500	2.8	150	16,000
C	Plate-Modulated RF Power Amplifier	5000	2.5	3500	250	75	5000	500	1.4	25	5800

*Two tubes.

8171/4CX10,000D

This recent addition to the Eimac line is electrically identical to the 4CX5000A except for its plate dissipation rating and is intended for use where the extra plate dissipation is a necessity. It may be used at maximum ratings through 30 megacycles and at slightly reduced ratings through the FM broadcast band.

PLATE DISSIPATION 12,000 watts
FREQUENCY FOR MAXIMUM RATINGS 30 megacycles
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 73 to 78 amperes
Capacitances (Grounded Filament):
Input 115 uufd
Output 21 uufd
Feed-through 1.0 uufd

Base Special, concentric
Socket Eimac SK-300A
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 9.13 inches
Max. Diameter 7.05 inches
Net Weight 12.2 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	7500	4.00	12,000	250	—	7500	1500	7.18*	0	34,300*
AB_1	Radio-Frequency Linear Power Amplifier	7500	4.00	12,000	250	—	7500	1500	3.59	0	17,150
C	Plate-Modulated r-f Power Amplifier	500	2.5	6650	250	75	5000	500	2.4	120	8500
C	Radio-Frequency Power Amplifier and Oscillator	7500	3.0	10,000	250	75	7500	500	2.8	150	16,000

*Two tubes.

8281/4CX15,000A

A versatile addition to the Eimac line of ceramic-metal power tetrodes, the 4CX15,000A is similar to the 4CX10,000D but features higher plate voltage and current and greater plate dissipation. These increased capabilities allow it to operate at full ratings through the FM broadcast band. The 4CX15,000A is recommended for use in new equipment design.

PLATE DISSIPATION 15,000 watts
FREQUENCY FOR MAXIMUM RATINGS 110 megacycles
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 6.3 volts
Current 152 to 168 amperes
Capacitances (Grounded Filament):
Input 158 to 172 uufd
Output 22.0 to 27.0 uufd
Feed-Through 2.0 uufd

Base Special, concentric
Socket Eimac SK-300A
Max. Seal Temp. 250 °C
Max. Anode Core Temp. 250 °C
Max. Height 9.44 inches
Max. Diameter 7.58 inches
Net Weight 12.8 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Radio-Frequency Power Amplifier and Oscillator	10,000	5.0	15,000	450	200	10,000	750	4.55	220	36,500
C	Plate-Modulated rf Power Amplifier	8,000	4.0	10,000	450	200	8,000	750	3.65	150	23,500
AB_1	Audio-Frequency Power Amplifier or Modulator	10,000	6.0	15,000	450	200	10,000	1500	8.5*	0	57,000*

*Two tubes.

8349/4CX35,000C

Eimac's largest, forced-air cooled power tetrode has a plate dissipation rating of 35 kilowatts and is usable to 20,000 plate volts in Class-C and Class-AB amplifier service.
A single 4CX35,000C will deliver over 100 kilowatts of CW power as a Class-C power amplifier or oscillator.

PLATE DISSIPATION 35,000 watts
FREQUENCY FOR MAXIMUM RATINGS 30 megacycles
COOLING Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 10.0 volts
Current 300 amperes
Capacitances (Grounded Filament):
Input 465 uufd
Output 55 uufd
Feed-Through 2.45 uufd

Base Special, concentric rings
Socket Eimac SK-1500
Max. Seal Temp. 250 °C
Max. Anode Core Temp. 250 °C
Max. Height 15.0 inches
Max. Diameter 9.75 inches
Net Weight 50 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	20,000	15.0	35,000	1750	500	20,000	1500	14.4*	0	210,000*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	20,000	15.0	35,000	1750	500	20,000	1500	7.2	0	105,000
C	Radio-Frequency Power Amplifier and Oscillator	20,000	15.0	35,000	1750	500	20,000	500	6.35	230	110,000
C	Plate-Modulated rf Power Amplifier	15,000	15.0	23,000	1750	500	15,000	500	6.45	250	82,50

*Two tubes.

TETRODES

EXTERNAL ANODE ■ WATER COOLED

8249/4W300B

A general-purpose radial-beam tetrode with electrical characteristics similar to those of the Eimac 4X250B, this water-cooled version is intended for use where reserve anode dissipation is desired or where the use of water is a convenience. Maximum ratings apply to frequencies as high as 500 megacycles.

PLATE DISSIPATION 300 watts
FREQUENCY FOR MAXIMUM RATINGS 500 megacycles
COOLING Water and Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.0 volts
Current 2.3 to 2.9 amperes
Capacitances (Grounded Cathode):
Input 14.2 to 17.2 uufd
Output 4.0 to 5.0 uufd
Feed-Through 0.06 uufd

Base 9-pin, special
Socket Eimac SK-600 series
Max. Seal Temp. 175 °C
Max. Height 3.407 inches
Max. Diameter 2.126 inches
Net Weight 6 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	2000	0.250	250	12	—	2000	350	0.500*	0	600*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	2000	0.250	250	12	—	2000	350	0.250	0	300
C	Radio-Frequency Power Amplifier and Oscillator	2000	0.250	250	12	2	2000	250	0.250	2.9	390
C	Plate-Modulated R-F Power Amplifier	1500	0.200	165	12	2	1500	250	0.200	1.7	235

*Two tubes.

8244/4CW2000A

This recent addition to the Eimac line is electrically identical to the popular 4CX1000A except for its plate-dissipation rating which is 2000 watts. It is intended for use where water cooling is preferred or where higher anode-dissipation capability is required.

PLATE DISSIPATION 2000 watts
FREQUENCY FOR MAXIMUM RATINGS 110 megacycles
COOLING Water and Forced Air

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 6.0 volts
Current 9.5 to 11.5 amperes
Capacitances (Grounded Cathode):
Input 77 to 90 uufd
Output 11 to 13 uufd
Feed-Through 0.02 uufd

Base Special, breechblock
Socket Eimac SK-800 series
Max. Seal Temp. 250 °C
Max. Height 5.875 inches
Max. Diameter 2.625 inches
Net Weight 1.75 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	3000	1.0	2000	12	—	3000	325	1.8*	0	3360*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	3000	1.0	2000	12	—	3000	325	0.9	0	1680

*Two tubes.

4CW10,000A

Electrically identical to the 4CX5000A except for its plate dissipation rating, the 4CW10,000A is intended for use where water cooling is preferred or where the extra plate dissipation is a necessity. It may be used at maximum ratings through 30 megacycles and at slightly reduced ratings through the FM broadcast band.

PLATE DISSIPATION 12,000 watts
FREQUENCY FOR MAXIMUM RATINGS 30 megacycles
COOLING Water and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 73 to 78 amperes
Capacitances (Grounded Filament):
Input 106 uufd
Output 18 uufd
Feed-Through 0.75 uufd

Base Special, concentric
Socket Eimac SK-300A
Max. Seal Temp. 250 °C
Max. Height 11.407 inches
Max. Diameter 4.656 inches
Net Weight 7.5 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	7500	4.00	12,000	250	—	7500	1500	7.18*	0	34,300*
AB_1	Radio-Frequency Linear Power Amplifier	7500	4.00	12,000	250	—	7500	1500	3.59	0	17,150
C	Plate-Modulated r-f Power Amplifier	500	2.5	6650	250	75	5000	500	2.4	120	8500
C	Radio-Frequency Power Amplifier and Oscillator	7500	3.0	10,000	250	75	7500	500	2.8	150	16,000

*Two tubes.

8350/4CW50,000C

The water-cooled version of the 4CX35,000C, this high power tetrode is capable of over 150 kilowatts output in Class-C service.
Full plate dissipation of 50 kilowatts is realized with lower than usual water flow due to superior anode-water jacket design.

PLATE DISSIPATION 50,000 watts
FREQUENCY FOR MAXIMUM RATINGS 30 megacycles
COOLING Water and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 10.0 volts
Current 300 amperes
Capacitances (Grounded Filament):
Input 465 uufd
Output 55 uufd
Feed-Through 2.45 uufd

Base Special, concentric rings
Socket Eimac SK-1500
Max. Seal Temp. 250 °C
Max. Anode Core Temp. 250 °C
Max. Height 16.5 inches
Max. Diameter 8.02 inches
Net Weight 48 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	20,000	15.0	50,000	1750	500	20,000	1500	17.3*	0	250,000*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	20,000	15.0	50,000	1750	500	20,000	1500	8.65	0	125,000
C	Radio-Frequency Power Amplifier and Oscillator	20,000	15.0	50,000	1750	500	20,000	750	9.7	705	165,000
C	Plate-Modulated rf Power Amplifier	15,000	15.0	33,000	1750	500	15,000	750	8.95	570	110,000

*Two tubes.

TETRODES

EXTERNAL ANODE ■ VAPOR COOLED

4CV8000A

This vapor-cooled version of Eimac's 4CX3000A offers a conservative plate dissipation rating of 8000 watts. It is recommended for Class-AB audio and radio-frequency applications as well as Class-C rf amplifier service.
A pair of these tubes will deliver over 14 kilowatts of audio frequency output with low distortion in Class-AB_1 service.

PLATE DISSIPATION 8000 watts
FREQUENCY FOR MAXIMUM RATINGS 160 megacycles
COOLING Vapor and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 10.0 volts
Current 43.5 to 48.5 amperes
Capacitances (Grounded Filament):
Input 120 to 140 uufd
Output 10.5 to 14.5 uufd
Feed-Through 1.4 uufd

Base Special, ring and breechblock
Socket Eimac SK-1490
Max. Seal Temp. 250 °C
Max. Anode Core Temp. 250 °C
Max. Height 7.983 inches
Max. Diameter 7.016 inches
Net Weight 7.0 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	6000	2.0	8000	175	50	6000	850	4.0*	0	14,500*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	6000	2.0	8000	175	50	6000	850	2.0	0	7,250
C	Radio-Frequency Power Amplifier and Oscillator	7000	2.0	8000	175	50	7000	500	1.9	47	11,000
C	Plate-Modulated rf Power Amplifier	5000	1.4	5500	175	50	5000	400	1.35	42	5,500

*Two tubes.

4CV20,000A

A vapor-cooled version of the popular 4CX5000A, the 4CV20,000A has a plate dissipation rating of 20 kilowatts. Two of these tubes in a push-pull, Class-AB_1 amplifier will produce 35 kilowatts output.
A full complement of vapor cooling accessories is available for this and all other Eimac vapor-cooled tube types.

PLATE DISSIPATION 20,000 watts
FREQUENCY FOR MAXIMUM RATINGS 30 megacycles
COOLING Vapor and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 7.5 volts
Current 73 to 78 amperes
Capacitances (Grounded Filament):
Input 108 to 122 uufd
Output 18.0 to 23.0 uufd
Feed-Through 1.0 uufd

Base Special, concentric
Socket Eimac SK-310
Max. Seal Temp. 250 °C
Max. Anode-Core Temp. 250 °C
Max. Height 9.125 inches
Max. Diameter 7.75 inches
Net Weight 21 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	7500	4.0	20,000	250	—	7500	1500	8.0*	0	35,000*
AB_1	Radio-Frequency Linear Power Amplifier—SSB	7500	4.0	20,000	250	—	7500	1500	4.0	0	17,500
C	Radio-Frequency Power Amplifier and Oscillator	7500	3.0	20,000	250	75	7500	500	3.0	155	17,000
C	Plate-Modulated rf Power Amplifier	5000	2.5	13,500	250	75	5000	500	2.2	77	7,750

*Two tubes.

4CV35,000A

Recommended for use as a modulator, oscillator or amplifier, the 4CV35,000A is usable to 110 megacycles. With a plate voltage of 10 kV in Class-C service, the tube is capable of over 35 kilowatts output power. The plate dissipation of 35 kilowatts allows use of the 4CV35,000A in low efficiency Class-AB_1 circuits.

PLATE DISSIPATION 15,000 watts
FREQUENCY FOR MAXIMUM RATINGS 110 megacycles
COOLING Vapor and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 6.3 volts
Current 152 to 168 amperes
Capacitances (Grounded Filament):
Input 158 to 172 uufd
Output 22.0 to 27.0 uufd
Feed-Through 2.0 uufd

Base Special, concentric
Socket Eimac SK-310
Max. Seal Temp. 250 °C
Max. Anode Core Temp. 250 °C
Max. Height 9.125 inches
Max. Diameter 7.88 inches
Net Weight 24 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
C	Radio-Frequency Power Amplifier and Oscillator	10,000	5.0	35,000	450	200	10,000	750	4.8	225	38,000
C	Plate-Modulated rf Power Amplifier	7500	4.0	23,000	450	200	7500	750	3.65	150	23,500
AB_1	Audio-Frequency Power Amplifier or Modulator	10,000	6.0	35,000	450	200	10,000	1500	5.35	0	33,000

8351 / 4CV100,000C

The largest of Eimac's power grid tubes, the 4CV100,000C is finding wide acceptance in application where a very high power rugged tetrode is desired. Vapor cooling allows a conservative plate dissipation rating of 100 kilowatts.

PLATE DISSIPATION 100,000 watts
FREQUENCY FOR MAXIMUM RATINGS 30 megacycles
COOLING Vapor and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 10.0 volts
Current 300 amperes
Capacitances (Grounded Filament):
Input 430 uufd
Output 45 uufd
Feed-Through 2.3 uufd

Base Special concentric rings
Socket Eimac SK-1510
Max. Seal Temp. 250 °C
Max. Anode Core Temp. 250 °C
Max. Height 17.0 inches
Max. Diameter 10.0 inches
Net Weight 95 pounds

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amps)	Plate Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amps)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Frequency Power Amplifier and Modulator	20,000	15.0	100,000	1750	500	20,000	1500	20.0	0	280,000
AB_1	Radio-Frequency Linear Power Amplifier—SSB	20,000	15.0	100,000	1750	500	20,000	1500	10.0	0	140,000
C	Radio-Frequency Power Amplifier and Oscillator	20,000	15.0	100,000	1750	500	20,000	1500	14.0	200	225,000
C	Plate-Modulated rf Power Amplifier	17,500	15.0	66,500	1750	500	17,500	750	11.3	940	155,000

PENTODE AND PULSE MODULATORS

PENTODE ■ INTERNAL ANODE

4E27A/5-125B

A general-purpose compact pentode cooled by radiation and convection and with maximum ratings applicable to 75 megacycles. No forced-air cooling is required in most installations.

PLATE DISSIPATION 125 watts
FREQUENCY FOR MAXIMUM RATINGS 75 megacycles
COOLING Radiation and Convection

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 5.0 volts
Current 7.0 to 8.0 amperes
Capacitances (Grounded Filament):
Input 8.7 to 12.3 uufd
Output 3.5 to 5.9 uufd
Feed-Through 0.1 uufd
Base 7-pin, metal shell
Socket Johnson 122-237
Max. Seal Temp. 225 °C
Max. Height 6.188 inches
Max. Diameter 2.750 inches
Net Weight 6 ounces

Class of Operation	Type of Service	Maximum Ratings: Plate Voltage (volts)	Plate Current (amp)	Plate Diss. (watts)	Supp. Diss. (watts)	Screen Diss. (watts)	Grid Diss. (watts)	Typical Operation: Plate Voltage (volts)	Screen Voltage (volts)	Plate Current (amp)	Drive Power (watts)	Output Power (watts)
AB_1	Audio-Freq. Power Amp. and Modulator	4000	0.200	125	20	20	—	2500	500	0.220*	0	300*
AB_2	Audio-Freq. Power Amp. and Modulator	4000	0.200	125	20	20	5	2500	500	0.250*	0.2*	400*
C	Radio-Freq. Power Amp. and Oscillator—Zero Suppressor Volts	4000	0.200	125	20	20	5	3000	500	0.167	1.9	375
C	Plate-Mod. Radio-Freq. Amp.—Zero Suppressor Volts	2500	0.160	85	20	20	5	2500	500	0.152	2	295
C	Suppressor-Mod. Radio-Freq. Amp.	4000	0.200	125	20	20	5	3000	400	0.060	1.2	75

*Two tubes.

PULSE MODULATORS

6C21

A high-vacuum triode designed for pulse-modulator service and incorporating a pyrovac plate and a non-emitting grid. It is recommended for use where long-pulse requirements rule out the use of tubes employing oxide-coated cathodes.

MAXIMUM PLATE VOLTAGE
30 kilovolts

MAXIMUM PULSE PLATE CURRENT
15 amperes

COOLING
Radiation & Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 8.2 volts
Current 15.9 to 17.7 amperes
Capacitances:
Grid-Plate 3.0 to 5.6 uufd
Grid-Filament 7.0 to 12.0 uufd
Plate-Filament 2.0 uufd
Base 50-watt jumbo 4-pin
Socket E. F. Johnson Co. No. 123-211 or National Co. XM-50
Maximum Seal Temp. 225 °C
Maximum Length 12.625 inches
Maximum Diameter 5.125 inches
Net Weight 1.3 pounds

MAXIMUM RATINGS

DC PLATE VOLTAGE	30 kilovolts
PEAK PLATE CURRENT	15 amperes
PLATE DISSIPATION	300 watts
GRID DISSIPATION	50 watts

TYPICAL OPERATION

DC Plate Voltage	28 kilovolts
Pulse Plate Voltage	25 kilovolts
Pulse Plate Current	15 amperes
Peak Drive Power	7.5 kilowatts
Peak Output Power	375 kilowatts
Duty	0.2 percent

8252/ 4PR60B

The Eimac 4PR60B is a high-vacuum, radial-beam tetrode intended for pulse modulator service in circuits employing resistive loads. The 4PR60B supersedes the 4PR60A and unilaterally replaces the 715C and 5D21. It is recommended for use in equipment of new design.

MAXIMUM PLATE VOLTAGE
20 kilovolts

MAXIMUM PULSE PLATE CURRENT
18 amperes

COOLING
Radiation & Convection

CHARACTERISTICS

Cathode: Oxide-coated, unipotential
Heater:
Voltage 26.0 volts
Current 1.95 to 2.35 amperes
Capacitances (Grounded Cathode):
Input 35.0 to 50.0 uufd
Output 6.0 to 11.0 uufd
Feed-through 2.0 uufd
Socket E. F. Johnson Co. No. 122-234
Maximum Seal Temp. 200 °C
Maximum Envelope Temp. 200 °C
Maximum Length 6.0 inches
Maximum Diameter 3.063 inches
Net Weight 12 ounces

MAXIMUM RATINGS

DC PLATE VOLTAGE	20 kilovolts
DC SCREEN VOLTAGE	1.5 kilovolts
PEAK PLATE CURRENT	18 amperes
PLATE DISSIPATION	60 watts
SCREEN DISSIPATION	8 watts
GRID DISSIPATION	1 watt

TYPICAL OPERATION

DC Plate Voltage	20 kilovolts
DC Screen Voltage	1.25 kilovolts
Pulse Plate Voltage	18.75 kilovolts
Pulse Plate Current	18 amperes
Pulse Drive Power	552 watts
Pulse Output Power	337 kilowatts
Duty	0.1 percent
Pulse Duration	2 microseconds

8187/ 4PR65A

A compact, high-vacuum, radial-beam tetrode incorporating a pyrovac plate and non-emitting grids, intended for pulse-modulator service. A new pulse modulator in the Eimac line, it is recommended for use in new equipments whenever long pulse durations, high duty factors, or high voltages preclude the use of tubes employing oxide-coated cathodes.

MAXIMUM PLATE VOLTAGE
15 kilovolts

MAXIMUM PULSE PLATE CURRENT
1 ampere

COOLING
Radiation and Convection

CHARACTERISTICS

Filament: Thoriated tungsten
Voltage 6.0 volts
Current 3.2 to 3.8 amperes
Capacitances (Grounded Cathode):
Input 6.0 to 8.3 uuf
Output 1.9 to 2.6 uuf
Feed-through 0.12 uuf
Base 5-pin metal shell
Socket National HX-29 or Johnson 122-101
Maximum Base-Seal Temp. 200 °C
Max. Plate-Seal Temp. 225 °C
Maximum Length 4.38 inches
Maximum Diameter 2.38 inches
Net Weight 3 ounces

MAXIMUM RATINGS

DC PLATE VOLTAGE	15 kilovolts
DC SCREEN VOLTAGE	2 kilovolts
PEAK PLATE CURRENT	1 ampere
PLATE DISSIPATION	65 watts
SCREEN DISSIPATION	10 watts
GRID DISSIPATION	5 watts

TYPICAL OPERATION

DC Plate Voltage	15 kilovolts
DC Screen Voltage	1 kilovolt
Pulse Plate Voltage	14 kilovolts
Pulse Plate Current	1 ampere
Peak Drive Power	11 watts
Peak Output Power	14 kilowatts
Duty	5 percent

PULSE MODULATORS

8247/ 4PR125A

A compact, high-vacuum, radial-beam tetrode incorporating a pyrovac plate and non-emitting grids, intended for pulse-modulator service. A new pulse modulator in the Eimac line, it is recommended for use in new equipments whenever long pulse durations, high duty factors, or high voltages preclude the use of tubes employing oxide-coated cathodes.

MAXIMUM PLATE VOLTAGE
18 kilovolts

MAXIMUM PULSE PLATE CURRENT
1.8 amperes

COOLING
Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten	
Voltage	5.0 volts
Current	6.0 to 7.0 amperes
Capacitances (Grounded Cathode):	
Input	9.2 to 12.4 uuf
Output	2.5 to 3.5 uuf
Feed-through	0.07 uuf
Base	5-pin metal shell
Socket	National HX-100 or Johnson 122-275
Maximum Base-Seal Temp.	200 °C
Maximum Plate-Seal Temp.	170 °C
Maximum Length	5.69 inches
Maximum Diameter	2.81 inches
Net Weight	6.5 ounces

MAXIMUM RATINGS

DC PLATE VOLTAGE	18 kilovolts
DC SCREEN VOLTAGE	2 kilovolts
PEAK PLATE CURRENT	1.8 amperes
PLATE DISSIPATION	125 watts
SCREEN DISSIPATION	20 watts
GRID DISSIPATION	5 watts

TYPICAL OPERATION

DC Plate Voltage	18 kilovolts
DC Screen Voltage	1 kilovolt
Pulse Plate Voltage	17 kilovolts
Pulse Plate Current	1.8 amperes
Peak Drive Power	30 watts
Peak Output Power	30.6 kilowatts
Duty	4.0 percent

8248/ 4PR250C

A 50-kilovolt tetrode for use in pulse-modulator and switch-tube applications. The 4PR250C has a 250-watt plate dissipation rating and is capable of supplying pulses of four amperes and nearly 50 kilovolts to a resistive load. It is recommended for use in new equipments.

MAXIMUM PLATE VOLTAGE
50 kilovolts

MAXIMUM PULSE PLATE CURRENT
4 amperes

COOLING
Radiation and Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten	
Voltage	5.0 volts
Current	13.5 to 14.7 amperes
Capacitances:	
Input	11 to 15 uufd
Output	2.7 to 3.7 uufd
Feed-Through	0.15 uufd
Socket	Eimac SK-400
Max. Plate-Seal Temp.	200 °C
Max. Envelope Temp.	200 °C
Max. Length	7.5 inches
Max. Diameter	3.5 inches
Net Weight	12.5 ounces

MAXIMUM RATINGS

DC PLATE VOLTAGE	50 kilovolts
DC SCREEN VOLTAGE	2 kilovolts
PEAK PLATE CURRENT	4 amperes
PLATE DISSIPATION	250 watts
SCREEN DISSIPATION	25 watts
GRID DISSIPATION	5 watts

TYPICAL OPERATION

DC Plate Voltage	49.7 kilovolts
DC Screen Voltage	1 kilovolt
Pulse Plate Voltage	48 kilovolts
Pulse Plate Current	4 amperes
Peak Drive Power	415 watts
Peak Output Power	192 kilowatts
Duty	1.7 percent

8188/ 4PR400A

A compact, high-vacuum, radial-beam tetrode incorporating a pyrovac plate and non-emitting grids, intended for pulse-modulator service. A new pulse modulator in the Eimac line, it is recommended for use in new equipments whenever long pulse lengths, high duty factors, or high voltages preclude the use of tubes employing oxide-coated cathodes.

MAXIMUM PLATE VOLTAGE
20 kilovolts

MAXIMUM PULSE PLATE CURRENT
4 amperes

COOLING
Radiation & Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten	
Voltage	5.0 volts
Current	13.5 to 14.7 amperes
Capacitances (Grounded Cathode):	
Input	10.7 to 14.5 uufd
Output	4.2 to 5.6 uufd
Feed-through	0.17 uufd
Base	5-pin metal shell
Socket	Eimac SK-400
Max. Base-Seal Temp.	200 °C
Max. Plate-Seal Temp.	225 °C
Maximum Length	8.0 inches
Maximum Diameter	5.5 inches
Net Weight	9 ounces

MAXIMUM RATINGS

DC PLATE VOLTAGE	20 kilovolts
DC SCREEN VOLTAGE	2.5 kilovolts
PEAK PLATE CURRENT	4 amperes
PLATE DISSIPATION	400 watts
SCREEN DISSIPATION	35 watts
GRID DISSIPATION	10 watts

TYPICAL OPERATION

DC Plate Voltage	20 kilovolts
DC Screen Voltage	1.5 kilovolts
Pulse Plate Voltage	19 kilovolts
Pulse Plate Current	4 amperes
Peak Drive Power	40 watts
Peak Output Power	76 kilowatts
Duty	1.5 percent

8189/ 4PR1000A

A compact, high-vacuum, radial-beam tetrode incorporating a pyrovac plate and non-emitting grids, intended for pulse-modulator service. New to the Eimac line, this heavy-duty pulse modulator is recommended for use in new equipments where high voltage, high current, or high duty preclude the use of tubes employing oxide-coated cathodes.

MAXIMUM PLATE VOLTAGE
30 kilovolts

MAXIMUM PULSE PLATE CURRENT
8 amperes

COOLING
Radiation & Forced Air

CHARACTERISTICS

Filament: Thoriated tungsten	
Voltage	7.5 volts
Current	20.0 to 22.7 amperes
Capacitances (Grounded Cathode):	
Input	23.8 to 32.4 uufd
Output	6.8 to 9.4 uufd
Feed-through	0.35 uufd
Base	5-pin metal shell
Socket	Eimac SK-500
Max. Base-Seal Temp.	150 °C
Max. Plate-Seal Temp.	200 °C
Maximum Length	9.63 inches
Maximum Diameter	5.25 inches
Net Weight	1.5 pounds

MAXIMUM RATINGS

DC PLATE VOLTAGE	30 kilovolts
DC SCREEN VOLTAGE	2.5 kilovolts
PEAK PLATE CURRENT	8 amperes
PLATE DISSIPATION	1000 watts
SCREEN DISSIPATION	75 watts
GRID DISSIPATION	25 watts

TYPICAL OPERATION

DC Plate Voltage	30 kilovolts
DC Screen Voltage	1.5 kilovolts
Pulse Plate Voltage	29.4 kilovolts
Pulse Plate Current	8 amperes
Peak Drive Power	900 watts
Peak Output Power	235 kilowatts
Duty	1.0 percent

ACCESSORY PRODUCTS DIVISION

This division is responsible for design and manufacture of accessories used with Eimac tubes. These include sockets, cavities, vapor-phase cooling system components and miscellaneous items. Ceramic-metal assemblies for special applications are also offered by the Accessory Products Division. Engineering and production capability has been expanded during the past year to provide a high level of capability in this field.

Complete cavity amplifier and oscillator modules are offered by Eimac. New modules include broad tuning range units and amplifiers for the new S band telemetry service.

EM-4512 Oscillator

EM-4523 Amplifier

Best performance of Eimac tubes is assured by use of sockets and other accessories designed for the specific tube required. A thorough knowledge of tube characteristics is reflected in these accessories.

SK—300A Socket

BR—200 Boiler

SK—600 Socket

CB—202 Control Box

The EM4527 is first of a series of high efficiency transmitters for use in the new S band and L band telemetry systems. Superior stability and reliability are additional advantages of this complete rf system.

EM 4527

Airborne Telemetry Transmitter

The techniques used in design and manufacture of Eimac ceramic-metal vacuum tubes are now offered for application to special assemblies. Optical and rf windows, coaxial and power connectors, headers and many other products are now in production.

Feed-Through

Header

Optical Window

SOCKETS & ACCESSORIES

ORDNANCE & TELEMETRY PRODUCTS

CERAMIC-METAL PRODUCTS

CAVITY AMPLIFIERS & OSCILLATORS

VAPOR-PHASE COOLING

SOCKETS AND ACCESSORIES

These sockets and accessories are specifically designed for use with Eimac tubes. Choice of the proper socket insures longer tube life and better performance. All sockets incorporate low loss insulating materials. All metal parts are plated for corrosion protection. Tube contact surfaces are nonferrous spring alloy, silver plated for good rf conductivity and heat treated for positive contact and long life. Open construction permits adequate air flow for tube cooling.

SK-300A
SK-310

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR		GROUNDED CONTACTS	CHIMNEY
		CAPACITANCE (uufd)	VOLTAGE RATING (volts dc)		
SK-300A	4CX5000A 4CX5000R	None	.....	None	SK-306
	4CX10,000D				SK-1306
	4CX15,000A				SK-316
	4CW10,000A				None
SK-310	4CV20,000A 4CV35,000A				

SK-306
SK-1306
SK-316

SK-400

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR		GROUNDED CONTACTS	CHIMNEY
		CAPACITANCE (uufd)	VOLTAGE RATING (volts dc)		
SK-400	4-125A 4-250A 4-400A 4PR125A 4PR250C 4PR400A	None	.....	None	SK-406

SK-406

SK-410

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR		GROUNDED CONTACTS	CHIMNEY
		CAPACITANCE (uufd)	VOLTAGE RATING (volts dc)		
SK-410	3-400Z	None	.....	None	SK-416
	4-125A 4-250A 4-400A 4PR125A 4PR400A				SK-406
	4PR250C				None

SK-416
SK-406

SK-500

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR		GROUNDED CONTACTS	CHIMNEY
		CAPACITANCE (uufd)	VOLTAGE RATING (volts dc)		
SK-500	4-1000A 4PR1000A	None	.....	None	SK-506

SK-506

SK-510

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR		GROUNDED CONTACTS	CHIMNEY
		CAPACITANCE (uufd)	VOLTAGE RATING (volts dc)		
SK-510	3-1000Z	None	.....	None	SK-516
	4-1000A 4PR1000A				SK-506

SK-516
SK-506

SK-600
SK-600A
SK-610
*SK-611
*SK-612

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR		GROUNDED CONTACTS	CHIMNEY
		CAPACITANCE (uufd)	VOLTAGE RATING (volts dc)		
SK-600 SK-600A SK-611	4X150A 4X150D 4X250B 4CX250B 4CX250F 4CX250R 4W300B 4CX350A 4CX350F 7580	2700	400	None	SK-606
SK-610				Cathode	
SK-612*				1 Heater Cathode	

*The SK-612 differs from the SK-600 by addition of a base pin contact spring and retainer.

SK-606

*INDICATES NEW PRODUCT

SOCKETS AND ACCESSORIES

***SK-604A**
***SK-604B**

This tube puller is designed for use in removing coaxial-base and 9-pin-base tubes from their sockets without damage. The 4X150 series and 4CX250 series tubes may be removed with this puller. SK-604A has a bonderize finish, SK-604B is nickel-plated.

These special pliers are designed for use in removing breechblock base tubes from their sockets without damage. The 4CX300 series and 4CX1000 series tubes may be removed with these pliers.

***SK-605**

SK-620
SK-620A
SK-630
SK-630A

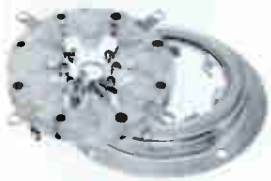
AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR CAPACITANCE (uufd)	SCREEN BYPASS CAPACITOR VOLTAGE RATING (volts dc)	GROUNDED CONTACTS	CHIMNEY
SK-620 SK-620A	4X150A 4X150D 4X150R 4X150S 4X250B 4CX250B 4CX250F 4CX250R 4W300B 7580	1100	1000	None	SK-626 SK-636B
SK-630 SK-630A				Cathode	None

SK-626
SK-636B

SK-640

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR CAPACITANCE (uufd)	SCREEN BYPASS CAPACITOR VOLTAGE RATING (volts dc)	GROUNDED CONTACTS	CHIMNEY
SK-640	4X150A 4X150D 4X250B 4CX250B 4CX250F 4CX250R 4CX350A 4CX350F 4W300B 7580	None	.....	None	SK-606 None

SK-606



SK-650
SK-655

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR CAPACITANCE (uufd)	SCREEN BYPASS CAPACITOR VOLTAGE RATING (volts dc)	GROUNDED CONTACTS	CHIMNEY
SK-650 SOCKET	4X150A 4X150D 4X250B 4X250F 4CX250B 4CX250F 4CX250R 4CX350A 4CX350F 4W300B 7580	None	.....	Cathode	None
SK-655 CAPACITOR		1100	1000		SK-626 None

SK-626

SK-700
SK-710
SK-711A
***SK-712A**

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR CAPACITANCE (uufd)	SCREEN BYPASS CAPACITOR VOLTAGE RATING (volts dc)	GROUNDED CONTACTS	CHIMNEY
SK-700	4CN15A 4CX125C 4CX125F 4CX300A	1100	400	1 Heater	SK-606
SK-710				1 Heater Cathode	
SK-711A*					
SK-712A*				1 Heater	

*The SK-711A and SK-712A differ from the SK-710 and SK-700 only in the altitude rating. The capacitor decks of the SK-711A and SK-712A have been especially flanged and the exposed section of the dielectric is sealed to permit a screen voltage of 350 Vdc at 60,000 feet.

SK-606

SK-740

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR CAPACITANCE (uufd)	SCREEN BYPASS CAPACITOR VOLTAGE RATING (volts dc)	GROUNDED CONTACTS	CHIMNEY
SK-740	4CN15A 4CX125C 4CX125F 4CX300A 4CX300Y	None	.....	None	

SK-760
***SK-761**
SK-770

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR CAPACITANCE (uufd)	SCREEN BYPASS CAPACITOR VOLTAGE RATING (volts dc)	GROUNDED CONTACTS	CHIMNEY
SK-760 SK-761*	4CX300A 4CX300Y	None	.....	None	Integral Chimney
SK-770				Screen	

*The SK-761 is the same as the SK-760, except input capacitance has been reduced by reducing the number of contact fingers.

*INDICATES NEW PRODUCT

SOCKETS AND ACCESSORIES

SK-800B
SK-810B
***SK-820**
***SK-830**
SK-860
SK-870
SK-890B

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR		GROUNDED CONTACTS	CHIMNEY
		CAPACITANCE (uufd)	VOLTAGE RATING (volts dc)		
SK-800B	4CX1000A 4CW2000A†	1500	400	None	SK-806
SK-810B SK-890B*		None	...		Integral
		1500	400	Cathode 1 Heater	SK-806
SK-820	4CX1000K	None	...	Screen	SK-806
SK-830		1500	400	Cathode	
SK-860	3CX1000A7	None	...	None	SK-816
SK-870				Grid	

*Screen bypass capacitor isolated from screen contacts. †No chimney necessary.

SK-806
SK-816

SK-900

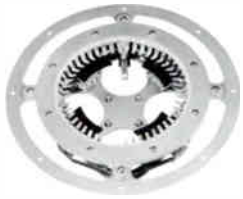
AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR		GROUNDED CONTACTS	CHIMNEY
		CAPACITANCE (uufd)	VOLTAGE RATING (volts dc)		
SK-900	4X500A	650	700	None	SK-906

SK-906

SK-1300
SK-1310

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR		GROUNDED CONTACTS	CHIMNEY
		CAPACITANCE (uufd)	VOLTAGE RATING (volts dc)		
SK-1300	3CX10,000A1 3CX10,000A3 3CX10,000A7	None	.....	None	SK-1306
	3CW20,000A1 3CW20,000A3 3CW20,000A7				None
SK-1310	3CV30,000A3				

SK-1306



SK-1400A
SK-1470A
SK-1490

AIR-SYSTEM SOCKET	TUBE	SCREEN BYPASS CAPACITOR		GROUNDED CONTACTS	CHIMNEY
		CAPACITANCE (uufd)	VOLTAGE RATING (volts dc)		
SK-1400A	4CX3000A	1800	1000	None	SK-1406
SK-1470A		None	.....	Screen	
SK-1490	4CV8000A			None	None

SK-1406

SK-1500
SK-1510

SOCKET	TUBE	SCREEN BYPASS CAPACITOR		GROUNDED CONTACTS	CHIMNEY	TUBE POSITIONER
		CAPACITANCE (uufd)	VOLTAGE RATING (volts dc)			
SK-1500	4CX35,000C 4CW50,000C	None	.....	None	None	SK-1511
SK-1510	4CV100,000C					

SK-1510 is similar to SK-1500, and incorporates the SK-1511 tube positioner.

For operation in corrosive environments, such as oil, any of these sockets can be supplied gold-plated with a rhodium flash. For example, Y231 is an SK-740 socket, modified by this special plating.

CUSTOM SOCKET DESIGN:

For special applications which require features different from these standard sockets, custom designed sockets are offered. These may be modifications of the standard sockets or completely new designs, manufactured to customer drawings or Eimac design. Common modifications include: contact spacing, mounting features, encapsulation of components, grounded contacts, by-pass capacitors, insulating materials, contact materials, and plating.

*INDICATES NEW PRODUCT

ORDNANCE PRODUCTS

Squib

Detonator

As a result of applying to new problems the advanced materials and processing techniques used in making vacuum tubes, new products of outstanding quality have been developed. The Detonator and Squib were developed for a major missile system in cooperation with the missile manufacturer. Literally thousands of these advanced units have been delivered for test and successful missile firing. Eimac offers complete cooperation with aerospace and ordnance firms in supplying partial or completed assemblies of single or multipin construction.

FEATURING

- All ceramic and metal brazed construction.
- Single pin design for improved reliability and elimination of rf hazard.
- Close-toleranced surface gaps providing uniform firing characteristics and safety from accidentally applied voltages (including rf).
- Exploding Bridge Wire (EBW) operation for rapid and consistent firing time. (Simple design modification for 1 ampere, 1 watt application.)

AIRBORNE TELEMETRY TRANSMITTERS

This S band transmitter provides 2 watts rf output with high overall efficiency. This efficiency permits a package of minimum size and weight. The transmitter is designed to withstand the severe shock and vibration of missile launch. The rf power stage is a rugged ceramic-metal planar triode and cavity.

This transmitter combines the advantages of vacuum tube technology and solid state circuitry. The total package includes the rf section, the servo system and the power supply. The rf is generated and modulated at the output frequency. Stability is achieved by a servo system which compares the output signal with a crystal reference and applies correction to the rf oscillator through a varactor diode. This design produces a highly efficient, very stable transmitter.

Model X4527 can handle FM/FM, PDM/FM, PAM/FM and PCM/FM signals. The power oscillator is cooled by conduction to the mounting plate. Operating life of the transmitter is at least 500 hours, with 95% probability.

This is the first of a series of airborne telemetry transmitters available from Eimac for operation at various power levels in the 2200–2300 Mc and 1435–1535 Mc bands. Your inquiries are invited.

X4527 CHARACTERISTICS

ELECTRICAL	
Frequency, Tunable	2.2–2.3 Gc
Power output, CW	2 watts
Overall package efficiency	13%
Frequency accuracy	± 0.001%
Frequency stability	± 0.001%
Carrier deviation	± 3 kc to ± 1.5 Mc, 5 volts input
Modulation bandwidth, ± 0.5 db	100 cps–500 kc
Modulation bandwidth,* ± 1 db	5 cps–600 kc
Modulation linearity (from ± 10 kc to ± 300 kc),	± 0.5%
Incidental FM	± 5 kc
Amplitude modulation, maximum	5%
Modulation input impedance, minimum 5 cps to 600 kc	10,000 ohms**
Input power source	28 ± 4 Vdc
Input power source, current	550 mA
Interference and susceptibility	Per MIL-I-26600
MECHANICAL	
Temperature	−40°C to + 85°C
Altitude	Any altitude (pressurized package)
Vibration	15 g per MIL-STD-810
Shock	100 g for 11 milliseconds
Volume, maximum	50 cubic inches
Weight, maximum	3.5 pounds
Connectors, rf	OSM/BRM

*Direct-coupled modulation also available.

**Other impedance available on request.

CERAMIC-METAL SEALS

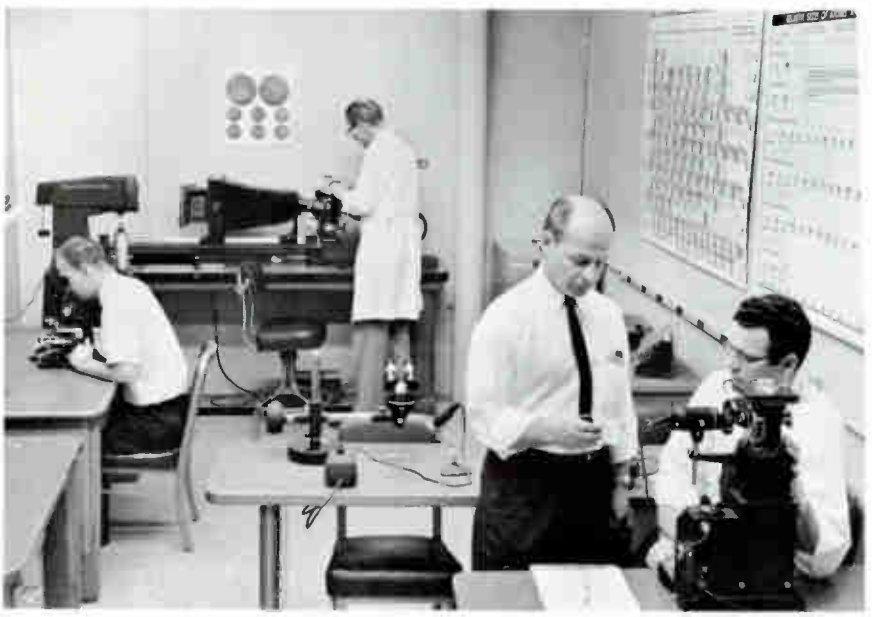
Design and fabrication of Ceramic-Metal assemblies started at Eimac in 1952, leading to production of a full line of ceramic-metal high power vacuum tubes. This production facility is now also used for fabrication of a variety of standard and custom designed ceramic-metal assemblies for special applications. The production rate is now 100,000 finished assemblies a month, with full in-house capability from machining of parts through metallizing, plating, brazing and final inspection. Product designs are completed by the division engineering department, and products are also manufactured to customer's designs.

Ceramic-Metal assemblies should be considered whenever any of the following conditions are significant:

Temperature extremes
Radiation effects
High shock and vibration
Vacuum seal required
Close dimensional control
Corrosive conditions

The most commonly used ceramic is 95% alumina (aluminum oxide). For applications requiring maximum heat conductance by the electrical insulator, beryllia (beryllium oxide) is recommended. For optical or rf windows, sapphire or quartz may be used. All of these ceramics, after metallizing and plating can be brazed to almost any metal, including iron, stainless steel, copper, nickel, Monel and Kovar. The brazed joint is vacuum-tight and stronger than the ceramic part.

The ceramic-metal department is staffed by over 65 employees, including an engineering group of 11. This is in addition to the machining and plating capability available from other departments.



The best choice of materials and of manufacturing procedures is insured by the Processes and Materials Laboratory. This laboratory, staffed by over 25 employees and fully equipped, makes possible a continuing advance in the state-of-the-art of ceramic-metal assemblies.

CERAMIC-METAL SEALS

Where temperature extremes, radiation, corrosive atmospheres and high stress are problems, metal-ceramic products are frequently the best solution. Eimac offers metal-ceramic assemblies that have the vacuum-tight seals and close dimensional control typical of vacuum tube fabrication. Our applications engineers will work with you in designing metal-ceramic assemblies to meet your requirement.

CONNECTORS AND HEADERS

Coaxial rf connectors, power cable connectors and header assemblies are available to current designs or custom designed for your system. These have significant advantages for use in space craft, missiles, nuclear power systems, and any other equipment where temperature extremes and radiation are problems or where a vacuum-tight seal is required.

A typical connector provides two power connector pins, with a nickel-plated steel outer shell and low-loss alumina insulation. This connector will withstand temperature of over 1500°F, high shock and vibration, and is vacuum tight.

A typical header assembly has eight nickel pins and a copper center conductor in an alumina insulator, with a copper flange and Kovar sealing ring.

WINDOWS—RF AND OPTICAL

For operation under severe temperature extremes, high rf power, or where a vacuum seal is essential, these windows are recommended. Ceramic discs of sapphire, quartz, alumina or beryllia can be brazed to flanges of copper, stainless steel, Kovar or Monel. Various diameters are available.

CUSTOM ASSEMBLIES

For any application requiring an electrical insulator combined with metal parts, a ceramic-metal assembly should be considered. Heat sinks, vacuum-tight packages, circuit components, standoff insulators, switches, radomes, slip-rings, commutators, and transducer components are some of the items that can be improved by metal-ceramic components. Typical Custom Assemblies manufactured by Eimac are:

- Laser windows
- Standoff insulators
- Transistor bases
- Alternator air-gap diaphragms

Contact our applications engineering department for custom design of a ceramic-metal assembly to meet your requirements.

COMPLETE CAVITY AMPLIFIERS AND OSCILLATORS

EM-4515

OSCILLATOR
1700-1800 Mc

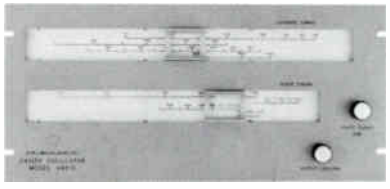
CHARACTERISTICS

ELECTRICAL:	EM4515
Tuning Range	± 40 Mc, 1650–1800 Mc
Power Output	2.5* watts
Stability	.075%, −50°F to +150°F
Modulation	CW
Tube Type	Y319
Anode Voltage	250 V
Anode Current	75 mA
Grid Voltage	Self Bias
Filament Voltage	6.0 V
Filament Current	1.0 A
MECHANICAL:	
Mounting	2.75' dia. flange
Dimensions (inches)	1.5 x 1.5 x 3.75
Output Connector	TNC Female
Cooling required	Conduction

*Up to 20 watts with higher anode voltage and current; special cooling required.

*EM4512 *EM4546

OSCILLATORS AND AMPLIFIERS
170-2000 Mc



CHARACTERISTICS

ELECTRICAL:	EM4512	EM4546
Tuning Range	170–2000 Mc	170–2000 Mc
Power Output	25–2 watts	40–10 watts
Drive power required	—	2 watts
Stability	±0.05%	—
Tube Type	Y319	Y319
Anode Voltage	1 kv	—
Anode Current	100 mA	—
Grid Voltage	Bias through variable 50–1000 ohm cathode resistor	
Filament Voltage	6.0 V	6.0 V
Filament Current	1 A	1 A
MECHANICAL:		
Mounting	To 19 inch rack	
Height	8¾ inches	8¾ inches
Depth	6 inches	6 inches
Connectors	Type TNC Female	Type TNC Female
Cooling required	Conduction to heat sink (included)	

*EM4523 *EM4524

AMPLIFIERS 2200-2300 Mc

CHARACTERISTICS

ELECTRICAL:	EM4523	EM4524
Tuning Range	2200–2300 Mc	2200–2300 Mc
Power Output	20 watts	80 watts
Drive power required	2 watts	8 watts
Bandwidth, 3 db points	10 Mc	15 Mc
Frequency Stability	20 PPM/°C	20 PPM/°C
Modulation	CW/FM	CW/FM
Load VSWR maximum	1.5:1, any constant phase	
Tube Type	A 126066	X843
Anode Voltage	750 V	1 kV
Anode Current	100 mA	250 mA
Filament Voltage	6.0 V	6.0 V
Filament Current	1.0 A	2.1 A
MECHANICAL:		
Mounting	To base plate having temperature −40°C to +100°C	
Dimensions (inches)	1.25 x 1.25 x 3.9	2 x 2 x 5.1
Weight	0.75 pound	2.3 pounds
Connectors	Type BRM	Type BRM
Vibration	per MIL-STD-810, method 514, Class 1–4	
Shock	per MIL-STD-810, method 516, procedure 1	

CUSTOM CAVITY DESIGN

Eimac's Accessory Products Division specializes in designing cavity amplifiers and oscillators to fit specific customer requirements. Modifications to an existing design, or the development of a whole new cavity design, can be accomplished in a minimum of time.

Inquire about a cavity to fit your particular application—from a few watts to kilowatts. It will help if you include the following information:

ELECTRICAL
Input Frequency
Output Frequency
Input Power
Output Power
Tuning Range
Bandwidth
Frequency Stability
Harmonic Output
Modulation
Maximum Input VSWR
Maximum Load VSWR
Pulse Width
Duty Cycle
FM Noise
AM Noise

MECHANICAL
Size and Weight

POWER SUPPLY LIMITS
Input Voltage and Current

ENVIRONMENT
Temperature Range
Vibration and shock
Pressurization Required

Immediate quantity desired
Required delivery

Ultimate quantity desired
Required delivery

*INDICATES NEW PRODUCT

COMPLETE CAVITY AMPLIFIERS AND OSCILLATORS

EM-4500 EM-4501A

AMPLIFIERS 145-150 Mc

EM4500

EM4501

CHARACTERISTICS

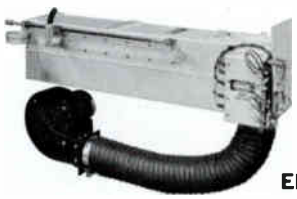
ELECTRICAL:	EM4500	EM4501A
Tuning Range	145–150 Mc	145–150 Mc
Power Output	300 watts CW*	3 kW CW
Drive power required	3 watts*	175 watts
Bandwidth	20 kc minimum at 3 db	
Modulation	0–100% amplitude modulation 0–10,000 cps	
Tube Type	4CX1000K	4CX3000A
Anode Voltage	3000 V	4500 V
Anode Current	0.6 A	1.1 A
Screen Voltage	325 V	300 V
Screen Current	−100 to +125 mA	125 mA
Grid Voltage	−10 to −100 V	−150 V
Grid Current	−0.25 to +0.75 mA	55 mA
Filament Voltage	6.0 V	9.0 V
Filament Current	20 A	45 A

MECHANICAL:		
Mounting	to 19 inch rack panel	
Height	16 inches	18 inches
Width	14 inches	15¾ inches
Depth	12 inches	14⅞ inches
Input Connector	Type N Female	
Output Connector	Type LC Female	
Cooling required	50 CFM at 0.5"	170 CFM at 1.6"

*Up to 1 Kw output can be achieved, using 15 W drive.

EM-4505 EM-4506 EM-4507 EM-4516**

AMPLIFIERS 122-150 Mc



EM4505

EM4506

EM4507

CHARACTERISTICS

ELECTRICAL:	EM4505	EM4506	EM4507
Tuning Range	122–150 Mc	122–150 Mc	122–150 Mc
Power Output	30 Watts CW*	1 kW CW	12 kW CW
Drive power required	1 watt	30 watts	800 watts
Bandwidth	2 Mc at 1.5 db	2 Mc at 1.5 db	2 Mc at 1.5 db
Modulation	FM	FM	FM-CW
Tube Type	4CX250R	4CX1000K	3CX10, 000A7
Anode Voltage	400–800 V	3000 V	6000 V
Anode Current	150–250 mA	1.0 A	3.5 A
Screen Voltage	80–175 V	250–350 V	—
Screen Current	−25 to +25 mA	−100 to +125 mA	—
Grid Voltage	−35 to −60 V	−90 to −120 V	—
Grid Current	−25 to +25 mA	−50 to +0.75 mA	—
Filament Voltage	6.0 V	6.0 V	7.5 V
Filament Current	2.6 A	12 A	102 A

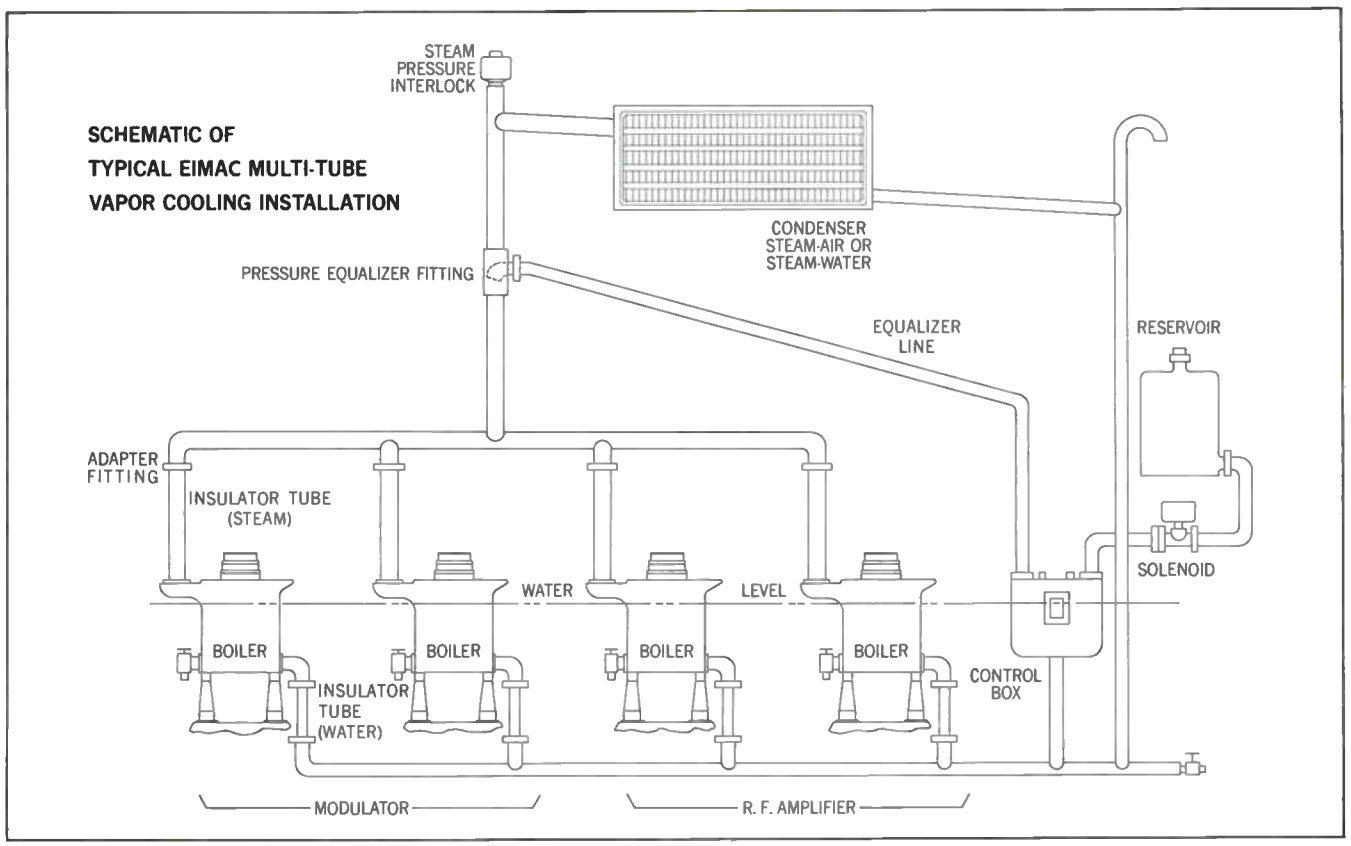
MECHANICAL:			
Mounting	to 19 inch rack panel		Special Cabinet
Height	13 inches	24 inches	72 inches
Width	8½ inches	15 inches	28 inches
Depth	26 inches	12½ inches	28 inches
Input connector	Type N Female		Type LC Female
Output connector	Type N Female	Type LC Female	1⅝" EIA Coax
Cooling required	Blowers Included		Anode: 365 CFM at 3.5" filament: 40 CFM at 2.0"

*Up to 200 watts with higher anode voltage.

**EM-4516 is a complete amplifier chain package, including two stages of EM-4505 and one stage of EM-4506.

VAPOR-PHASE COOLING ACCESSORIES

In order to take the guess work out of using vapor cooling, Eimac has developed a complete line of accessories to complement its new series of vapor-cooled tubes. All the components labeled in the system below are available from Eimac.



For more information on how this cooling technique can improve the performance of your equipment, write for a free copy of Application Bulletin Number 11, "The Care and Feeding of Vapor-Phase Cooling." Also available from Eimac is application engineering assistance in planning vapor-cooled systems. Eimac representatives can put you in touch with the same people who produced the first completely integrated vapor-phase cooling packages.

4CV100,000C
(Page 60)

4CV35,000C
(Page 60)

3CV30,000A3
(Page 51)

4CV20,000A
(Page 60)

4CV8000A
(Page 60)

See page 34 for vapor-phase cooled klystrons

VAPOR-PHASE COOLING ACCESSORIES

BOILER

Boiler design must be compatible with tube design to realize the full potential of a vapor-cooled tube. The Eimac boilers are complete with inlet and outlet connections, anti-corrosion target and mounting provisions. They are used with Eimac 8- to 100-kilowatt vapor-cooled tubes.

BOILER	TUBE TYPE
BR-101	4CV8000A
BR-200	4CV20, 000A 3CV30, 000A3 4CV35, 000A
BR-300	4CV100, 000C
BR-400	7480

BOILER

This special boiler for the 4CV100,000C uses a "steam-out-the-bottom" arrangement. It is designed for applications where it is desirable to keep all plumbing below the tube. This system requires a small pump to keep a constant water level.

BOILER	TUBE TYPE
BR-310	4CV100,000C

DOUBLE BOILER

A special double boiler, the BR-500, is available for use with two parallel 4CV100,000C tetrodes. The boiler is rated at 200 kilowatts dissipation.

BOILER	TUBE TYPE
BR-500	2-4CV100,000C

CONTROL BOX

The Eimac CB-102 and CB-202 Control Boxes serve as level monitoring devices and as reservoirs. They contain an overflow siphon and two water-level switches for activating an alarm system and for equipment shut-down in case of low water level.

CONTROL BOX	TUBE TYPE
CB-102	4CV8000A
CB-202	4CV20,000A 3CV30,000A3 4CV35,000A 4CV100,000C

CONDENSERS

Reliable steam-to-air and steam-to-water condensers are available in several sizes from Eimac. Air cooled types are available with fans and motors.

INSULATOR TUBE

Heavy Pyrex glass tubing, matching the inlet and outlet connectors on the Eimac boilers, is also available. It serves as water or steam plumbing as well as electrical insulation. Standard length is 24 inches. Special lengths can be made to order.

BOILER	STEAM LINE	WATER LINE
BR-101	1¾ in.	½ in.
BR-200	2½ in.	½ In.
BR-300	3½ in.	¾ in.

ADAPTER FITTING

An adapter to make the transition from the Pyrex steam tube to copper pipe.

ADAPTER FITTING	SIZE
AF-100	1¼" Pyrex to 2" Cu
AF-200	2½" Pyrex to 2½" Cu
AF-300	3½" Pyrex to 3½" Cu
AF-102	12 mm Pyrex to ½" MPT
AF-202	18 mm Pyrex to ¾" MPT
AF-302	28 mm Pyrex to 1" MPT

STEAM PRESSURE INTERLOCK

Used to sense steam pressure and to remove power from the tube in the event of excessive pressure. The unit is set for 0.5 pounds per square inch above atmospheric pressure.

EQUALIZER FITTING (not shown)

A special Tee fitting for connecting the equalizer line to the steam line.

EQUALIZER FITTING	SIZE
AD-100	2" C x 2" C x ½" C
AD-200	2½" C x 2½" C x ½" C
AD-300	3½" C x 3½" C x ½" C

OPTIONAL ACCESSORIES

SOLENOID WATER VALVE

SIZE
½" FPS
½" Cu

Large silicon-bronze solder fittings are now available from Eimac. These are used in vapor systems to eliminate the contamination which occurs with brass fittings. Tees, elbows, crosses, unions, reducers, flanges and caps can be supplied in sizes up to 6" I.D.

RESERVOIR

RESERVOIR	CAPACITY
RE-100	0.5 liter
RE-200	1.0 liter
RE-300	4 liter

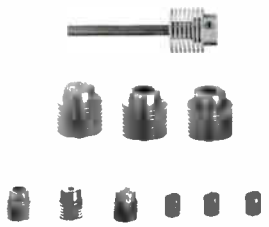
OTHER PRODUCTS

100 IG IONIZATION GAUGE

Essentially a triode vacuum tube for measuring pressures from 10^{-3} to less than 10^{-8} mm of mercury, constructed of "hard" glass for sealing directly to nonex glass vacuum systems.

HEAT DISSIPATING CONNECTORS

Eimac HR Heat-Dissipating Connectors are used to make electrical connections to the plate and grid terminals of Eimac Tubes, and at the same time, provide efficient heat transfer from the tube element and glass seal to the air. These connectors are machined from solid dural rod and are supplied with the necessary set screws.

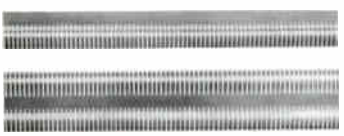


TYPE*	Length	Dia.	Hole Dia.
HR-1	11/16″	1/2″	.052″
HR-2	11/16″	1/2″	.062″
HR-3	11/16″	1/2″	.072″
HR-4	7/8″	3/4″	.102″
HR-5	7/8″	3/4″	.127″
HR-6	7/8″	3/4″	.367″
HR-7	1-11/32″	1-3/8″	.127″
HR-8	1-11/32″	1-3/8″	.575″
HR-9	4-11/32″	1-3/8″	.569″
HR-10	1-11/32″	1-3/8″	.510″

RECOMMENDED CONNECTORS FOR USE WITH EACH EIMAC TUBE TYPE

TUBE	Plate Connector	Grid Connector	TUBE	Plate Connector	Grid Connector
2-25A	HR-1	....	25T	HR-1	....
2-50A	HR-3	....	35T	HR-3	....
2-150D	HR-6	....	35TG	HR-3	HR-3
2-240A	HR-6	....	75TH-TL	HR-3	HR-2
2-450A	HR-8	....	100TH-TL	HR-6	HR-2
2-2000A	HR-8	....	VT127A	HR-3	HR-3
3-1000Z	HR-8	....	250TH-TL	HR-6	HR-3
3C24	HR-1	HR-1	250R	HR-6	....
4-65A	HR-6	....	304TH-TL	HR-7	HR-6
4D21/4-125A	HR-6	....	450TH-TL	HR-8	HR-8
5D22/4-250A	HR-6	....	592/3-200A3	HR-10	HR-5
4-400A	HR-6	....	750TL	HR-8	HR-8
4-1000A	HR-8	....	866A	HR-8	....
4E27A/5-125B	HR-5	....	872A	HR-8	....
4PR60A	HR-8	....	1000T	HR-9	HR-9
6C21	HR-8	HR-8	1500T	HR-8	HR-8
KY21A	HR-3	....	2000T	HR-8	HR-8
RX21A	HR-3	....	8020(100R)	HR-8	....

*For marking per MIL-STD-130B add prefix letter "M" to the part number for connectors HR-4 through HR-10. Note HR-1 through HR-3 are too small to permit marking.



PREFORMED CONTACT FINGER STOCK

Eimac Preformed Finger Stock is a prepared strip of spring material slotted and formed into a series of fingers designed to make a sliding contact. It is especially suitable for making connections to tubes with coaxial terminals or to moving parts, such as long-line and cavity circuits or screen-room doors. Eimac finger stock is available in 9 different shapes and sizes, three of which incorporate "spooned" contact fingers. All sizes come in standard 36 inch lengths. Standard stock is heat treated and silver plated. Also available without heat treating or plating.

Type	Finger Radius (inches)	Finger Width (inches)	Slot Width (inches)	Slot Depth (inches)	Comments
CF-100	1/16	1/8	0.040	9/32	spooned
CF-200	1/16	1/8	0.040	9/32	double-edged
CF-300	13/64	1/8	0.040	19/32	finger tip has reverse radius
CF-400	13/64	1/8	0.040	35/64	double-edged
CF-500	15/32	1/8	0.040	7/8	finger tip has reverse radius
CF-600	15/32	1/8	0.040	29/32	double-edged with reverse tip radii
CF-700	1/16	1/8	0.040	9/32	spooned
CF-800	1/16	1/8	0.040	15/32	spooned and bent
CF-900	0.030	1/16	0.020	15/64	smallest fingers

VACUUM SWITCHES

VS-2, VS-4, VS-5, VS-6

Eimac offers four vacuum switches intended primarily for rf service. All have similar characteristics and similar ratings, though each differs from the others in some respect. They are rated at 20 kilovolts peak rf in the "open" position. In the "closed" position, they can carry 7.5 amperes rf current at frequencies to 15 megacycles, and 5 amperes from 15 to 30 megacycles. They are designed to be activated by a separate 12- or 24-volt coil, also available from Eitel-McCullough, Inc. The Power Grid Tube Marketing Department at the San Carlos offices should be contacted if additional data or specific recommendations are desired.

Y-3 Grid Wire

Eimac nonemitting Y-3 Grid Wire is made by a special patented process designed to improve those properties which control the primary and secondary electron emission of the wire surface. Y-3 wire is intended solely for use in thoriated tungsten filament tubes.

The wire has a molybdenum core and no special treatment is required before the fabrication into grids for electron tubes. It is available in the following finished diameter sizes:

0.0053″	0.0083″	0.0111″	0.0183″
0.0063″	0.0093″	0.0120″	0.0203″
0.0070″	0.0103″	0.0153″	0.0253″
0.0073″			

Eimac Y-3 coated grid wires can also be obtained on special orders in wire sizes ranging from 0.0023″ to 0.0253″.

Eimac will be glad to furnish additional information on the products listed below. Simply note your product interest by number on a reply card and mail. Prompt response is assured.

MICROWAVE PRODUCTS

1. Voltage Tunable Magnetrons
2. Traveling Wave Tubes
3. Reflex Klystrons

HIGH POWER MICROWAVE PRODUCTS

4. External Cavity Power Klystrons
5. UHF TV Klystrons
6. Vapor Phase Cooled UHF TV Klystrons
7. Water Loads

POWER GRID PRODUCTS

8. Rectifiers (specify)
9. Triodes (specify)
10. Tetrodes (specify)
11. Pentode
12. Pulse Tubes (specify)
13. Vapor Phase Cooling

ACCESSORY PRODUCTS

14. Cavity Amplifiers & Oscillators
15. Ceramic-Metal Products
16. Airborne Telemetry Transmitters
17. Ordnance Products
18. Sockets & Accessories (specify)
19. Ionization Gauge
20. Finger Stock
21. Vacuum Switches
22. Grid Wire
23. Optical Windows

Date_____

Please send me further information on the following numbered Eimac products:

_____

My application is_____

Special requirements_____

Name_____

Title or Position_____

Company_____

Address_____

_____

Eimac®

EITEL-McCULLOUGH, INC. 301 INDUSTRIAL WAY • SAN CARLOS, CALIFORNIA

Date_____

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My application is_____

Special requirements_____

Name_____

Title or Position_____

Company_____

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Special requirements_____

Name_____

Title or Position_____

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PERMIT No. 103
San Carlos, Calif.

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SAN CARLOS, CALIFORNIA

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BUSINESS REPLY MAIL
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Inglewood, California
673-2710

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301 Industrial Way
San Carlos, California
591-1451

EITEL-McCULLOUGH, INC.
Ben Roberts
1129 Bellwood Ave.
Bellwood, Illinois
(Bellwood) 547-7411
(Chicago) 261-8437

EITEL-McCULLOUGH, INC.
Bill Rate
383 Washington Ave.
Belleville, New Jersey
(New Jersey) 751-2300
(New York City) 944-5346

EITEL-McCULLOUGH, INC.
Harry Breese
678 West Onondaga Street
Syracuse 4, New York
475-5911

EITEL-McCULLOUGH, INC.
Bob Mason
9 Tanner Street
Haddonfield, New Jersey
428-0640

EITEL-McCULLOUGH, INC.
Gene Uecker
Suite 200
First Bank and Trust Bldg.
Richardson, Texas
235-2379

See the Yellow Pages of your Telephone Directory for the Eimac Office or Representative in your area.

WORLD-WIDE REPRESENTATION

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15 rue du Jeu-de-l' Arc
Geneva, Switzerland
Phone: 35.89.30
Cable: EIMACTUBES, GENEVA

ARGENTINA
SADELCO
Casilla Correo N. °2693
BUENOS AIRES, Argentina
Cable: SADELCO, BUENOS AIRES

AUSTRALIA
SAMPLE ELECTRONICS (VIC.)
PTY. LTD.
9-11 Cremorne Street
RICHMOND, E.1., Victoria, Australia
Cable: SAMPLE MELBOURNE

SAMPLE ELECTRONICS (NSW)
PTY. LTD.
48 Chippen Street
SYDNEY, N.S.W. Australia

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INELCO S. A.
20-24 rue de l'Hopital
BRUSSELS, Belgium
Phone: 11.22.20
Cable: IENLCOBEL

BRAZIL
WHINNER, S. A.
Industria E. Comercio
Rua Afonso Celso, 982
SAO PAULO, Brazil
Cable: WHINNER, SAO PAULO

WHINNER, S. A.
INDUSTRIA E COMERCIO
Av. Alte. Barroso, 90 — Sala 810
RIO DE JANEIRO, Brazil
Cable: SHIPREPAIR, RIO DE JANEIRO

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R.D.B. SHEPPARD AGENCIES LTD.
901 Rob Roy Avenue
OTTAWA 14, Ontario, Canada
Tel: 828-5677

CENTRAL AMERICA
CARAZO & CO. LTD.
P.O. Box 300, San Jose, Costa Rica
Cable: LEACARAZO, SAN JOSE

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LUIS M. DESMARAS
Casilla 761
SANTIAGO, Chile

COLOMBIA
L. ENRIQUE CORREA
Apartado Aereo 4085
BOGOTA, Colombia
Cable: LUENCOR, BOGOTA

DENMARK
DITZ SCHWEITZER A/S
Bredgade, 37
COPENHAGEN, Denmark
Phone: Minerva 57
Cable: SCHWEITZER

ENGLAND
WALMORE ELECTRONICS
11-15 Betterton Street
Drury Lane
LONDON, W.C. 2, England
Phone: Temple Bar 0201-5
Cable: VALVEXPORT

FINLAND
INTO O/Y
11, Meritullinkatu
HELSINKI, Finland
Phone: 35125
Cable: INTO

FRANCE & LUXEMBOURG
RADIO EQUIPEMENTS S. A.
65 rue de Richelieu
PARIS 2e, France
Phone: Richelieu 49.88
Cable: SASSOPHER

GREECE
K. KARAYANNIS
Klaftmonos Square
ATHENS, Greece
Phone: 230-301—/5
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