CENTRAL ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

NUCOR
RECTIFIER
TYPE
371B

RECTIFIER

DESCRIPTION

The Nucor tube type 371B was designed for operation in high voltage rectifier circuits where ambient temperatures and inverse voltage requirements preclude the use of mercury vapor or gas filled diodes. The tube is rugged physically and has adequate overload capacity for use in industrial circuits.

SPECIFICATIONS

ELECTRICAL

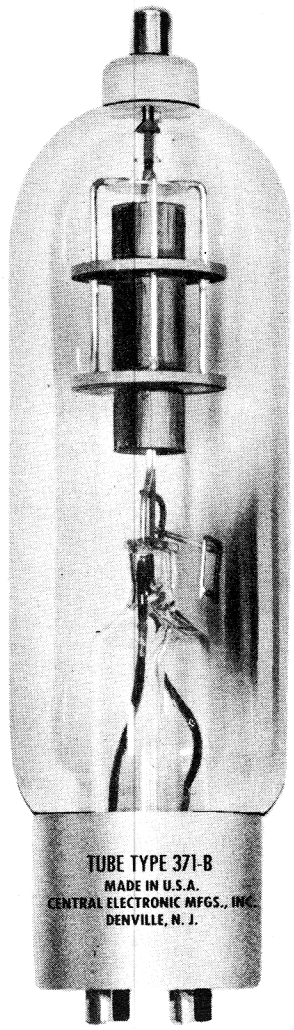
Filament	Thoriated tungsten
Filament voltage	5.0 volts ac
Filament current	10.3 amperes
Peak inverse voltage	25,000 volts max.
Peak anode current	1.5 amperes max.
Average anode current	0.300 ampere

PHYSICAL

Overall length	8.75 inches max.
Overall diameter	2.31 inches max.
Cap	Small metal (C1-1) with ceramic insulator
Base	A4-29 jumbo 4 pin bayonet
Weight	5¾ ounces
Type of cooling	Radiation (air)

OPERATING NOTES

Mount the Nucor tube type 371B vertically with adequate air space for ventilation. Anode temperature should not exceed 800°C. The base fits a standard "50 watt," 4 pin, bayonet socket. Connect the base shell and unused base pins to one filament terminal in the socket.

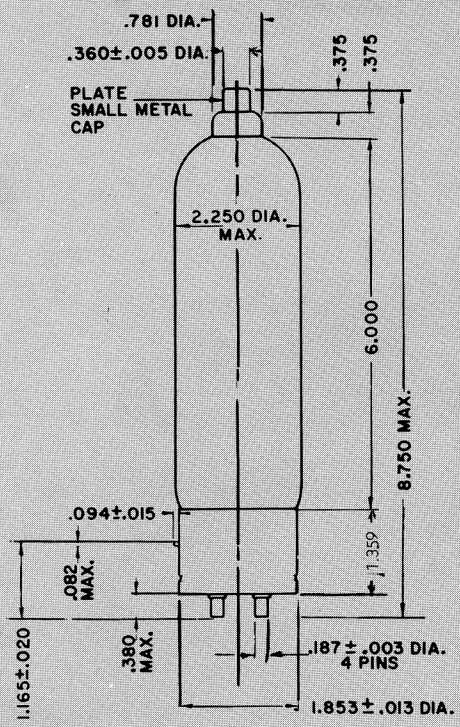


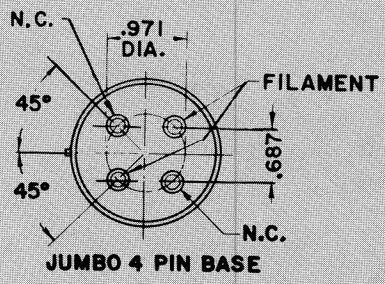
NUCOR
RECTIFIER
TYPE
371B

CENTRAL ELECTRONIC

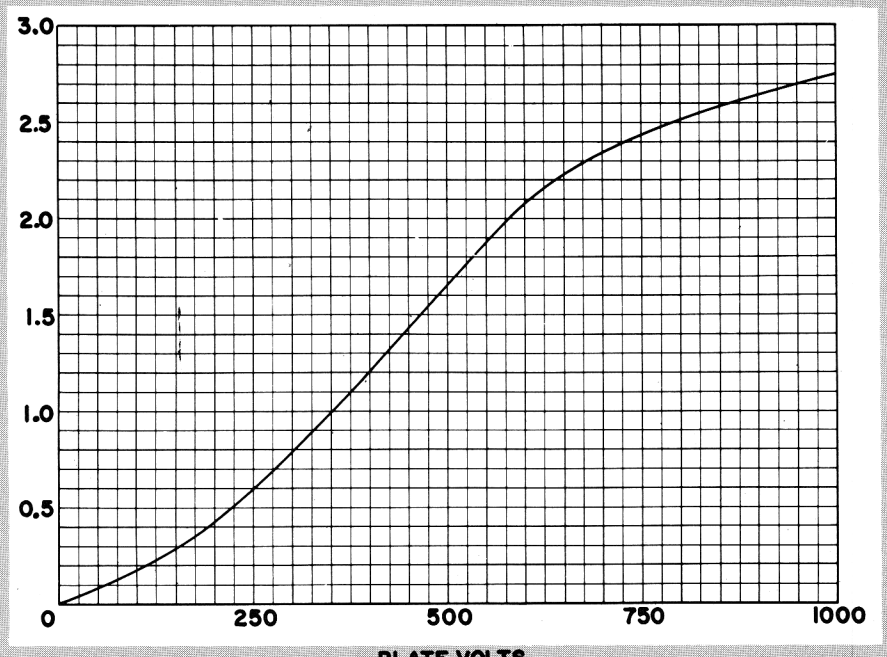
MANUFACTURERS

DENVILLE. NEW JERSEY





JUMBO 4 PIN BASE



AVERAGE PLATE CHARACTERISTIC

DIVISION OF NUCLEAR CORPORATION OF AMERICA

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Central ELECTRONIC
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DENVILLE, NEW JERSEY

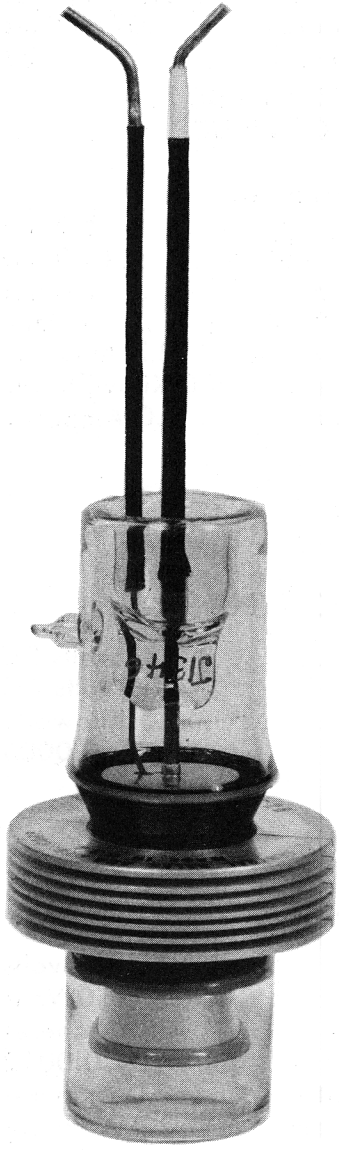
PULSE MODULATOR TRIODE TYPE 4C28

6.5 Kilowatts

PULSE MODULATOR TRIODE

DESCRIPTION

The 4C28 is a physically small transmitting triode for use in small loran and shoran; radar, and other types of pulse transmitters. This forced air cooled tube features an oxide coated, unipotential cathode, light weight at high power output and may be used either as a final or a driver for larger tubes.



SPECIFICATIONS
PHYSICAL

Overall Length	3⅞ inches
Overall Diameter	2 inches
Weight	6 ounces
Mounting Position	Vertical
Type of Cooling	Forced air
Required Air Flow on Anode	(NOTE 1)
Maximum Incoming Air Temperature	45°C
Maximum Glass Seal Temperature	180°C

NOTE 1 — For an anode dissipation of 150 watts, an air blast of at least 5 cfm should be directed upon the anode cooling fins and a blast of 1 cfm on the grid seal and lead.

PULSE MODULATOR TRIODE TYPE 4C28

6.5 Kilowatts

Central ELECTRONIC MANUFACTURERS

DENVILLE, NEW JERSEY

ELECTRICAL

Filament Oxide coated unipotential cathode
Filament Voltage . . . . . 6.0 Volts
Filament Current . . . . . 6.5 Amperes
Filament Starting Surge Current . . . . . 13.0 Amperes
Filament Cold Resistance . . . . . .071 Ohms
Amplification factor 22

E_c = −23 Volts DC
E_b = 500 Volts DC

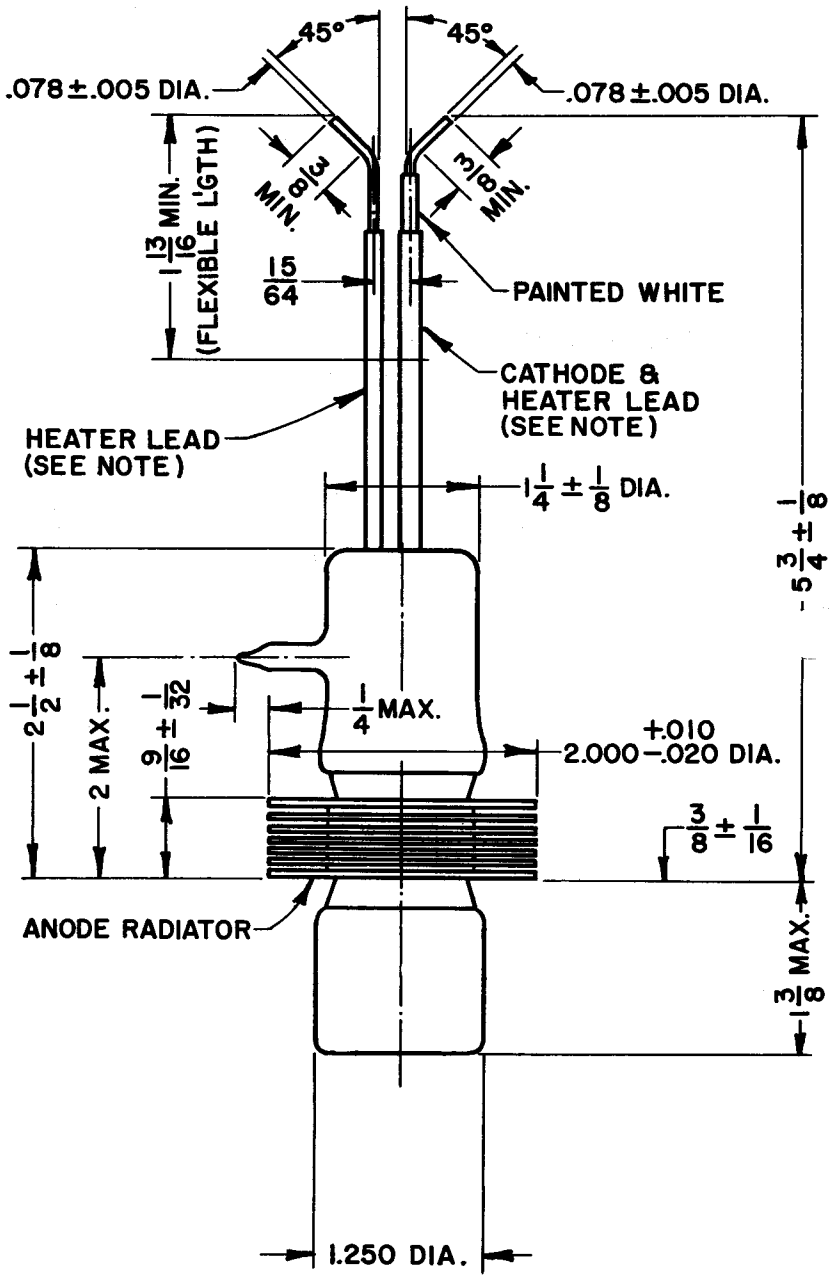
Interelectrode Capacitances
Grid to Anode . . . . . 6.9 uuf
Grid to Filament . . . . . 10.0 uuf
Anode to Filament . . . . . 2.0 uuf
Cathode Warm-up Time . . . . . 3 Min.
Peak Cathode Current . . . . 2.7 Amperes
Peak Inverse Voltage . . . . 8.0 Kilovolts DC
Peak Anode Current . . . . . 2.0 Amperes

TYPICAL OPERATION (PULSE)

DC Anode Voltage . . . . . 4.2 Kilovolts DC
DC Grid Voltage . . . . . −700 Volts DC
Peak Power Output . . . . . 6.5 Kilowatts
Duty 0.0005

MAXIMUM RATINGS

DC Anode Voltage . . . . . 7.5 Kilovolts
DC Grid Voltage . . . . . −750 Volts
DC Anode Current . . . . . 2.0 Amperes
Maximum Duty 0.0012
Peak Anode Current . . . . . 2.0 Amperes
Peak Cathode Current . . . . . 2.7 Amperes
Peak Anode Voltage . . . . . 8.0 Kilovolts
Peak Power Output . . . . . 6.5 Kilowatts



NOTE: LEAD INSULATED WITH BRAIDED FIBRE GLASS TUBING.

Central ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

HIGH VACUUM DIODE TYPE 561

HIGH VACUUM DIODE

DESCRIPTION

The Central 561 was designed for rectifier and clipper diode applications. It is a rugged, high vacuum diode with high emission capabilities, desirable where high inverse voltages and ambient temperatures preclude the use of gas filled or mercury vapor tubes.

SPECIFICATIONS

PHYSICAL

Length (max.)	9¾ inches
Diameter (max.)	3⅝ inches
Cap	.566 inches dia.
Base	A4-18 Super Jumbo 4 Pin Bayonet
Mounting Position	Vertical, Base Down
Weight	10 Ounces
Type of Cooling	Radiation

NOTE: Maximum anode temperature 800°C—Anode dissipation 450 watts.

ELECTRICAL

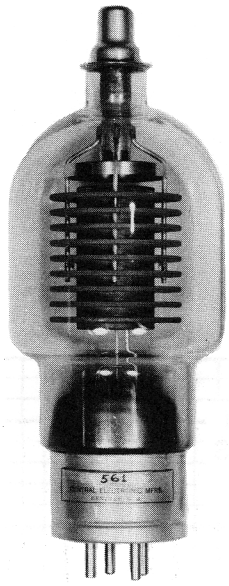
Filament	Bonded Thoria Tungsten
Filament Voltage	11.5 Volts
Filament Current	15.25 Amperes
Filament Starting Surge Current	98 Amperes
Filament Cold Resistance	.053 ohm

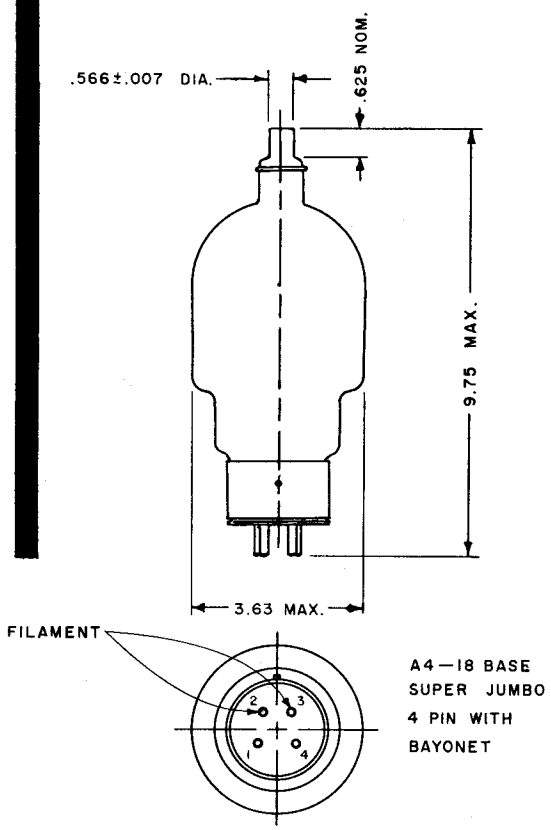
ELECTRICAL (RECTIFIER)

Filament Voltage	11.5 Volts
Filament Current	15.25 Amperes
Peak Inverse Voltage (max.)	33 Kilovolts
Average Anode Current	0.86 Amperes

ELECTRICAL (CLIPPER)

Filament Voltage	11.5 Volts
Filament Current	15.25 Amperes
Peak Inverse Voltage (max.)	33 Kilovolts
Peak Anode Current (max.)	50 Amperes
RMS Anode Current	1.25 Amperes

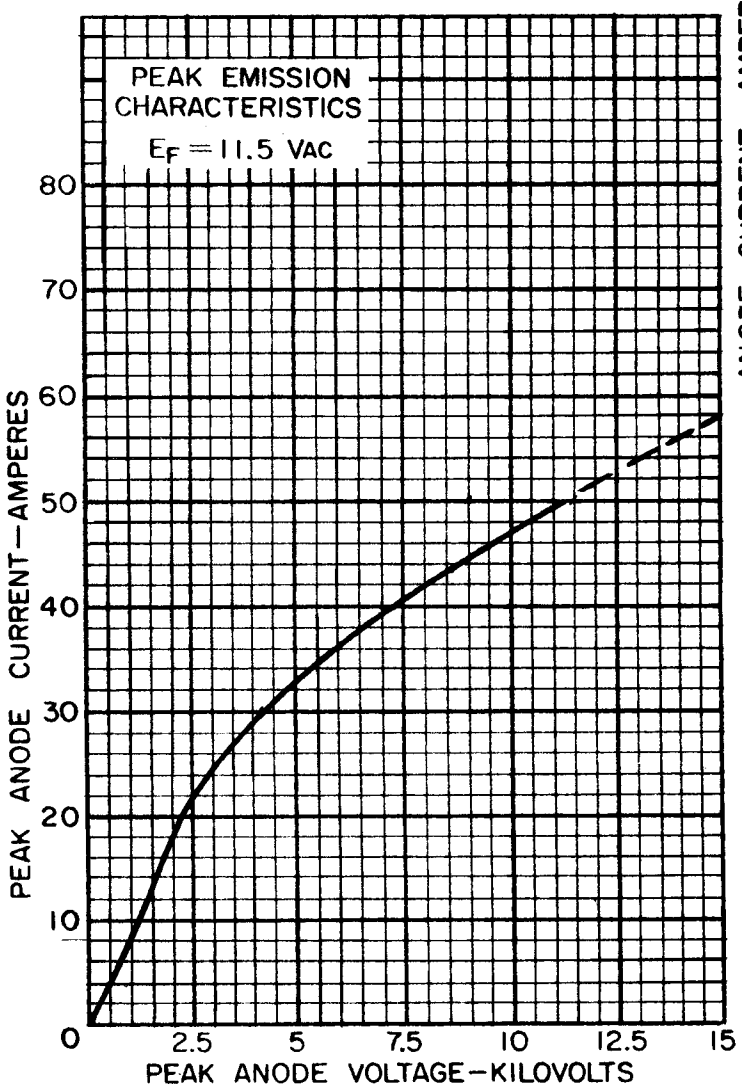


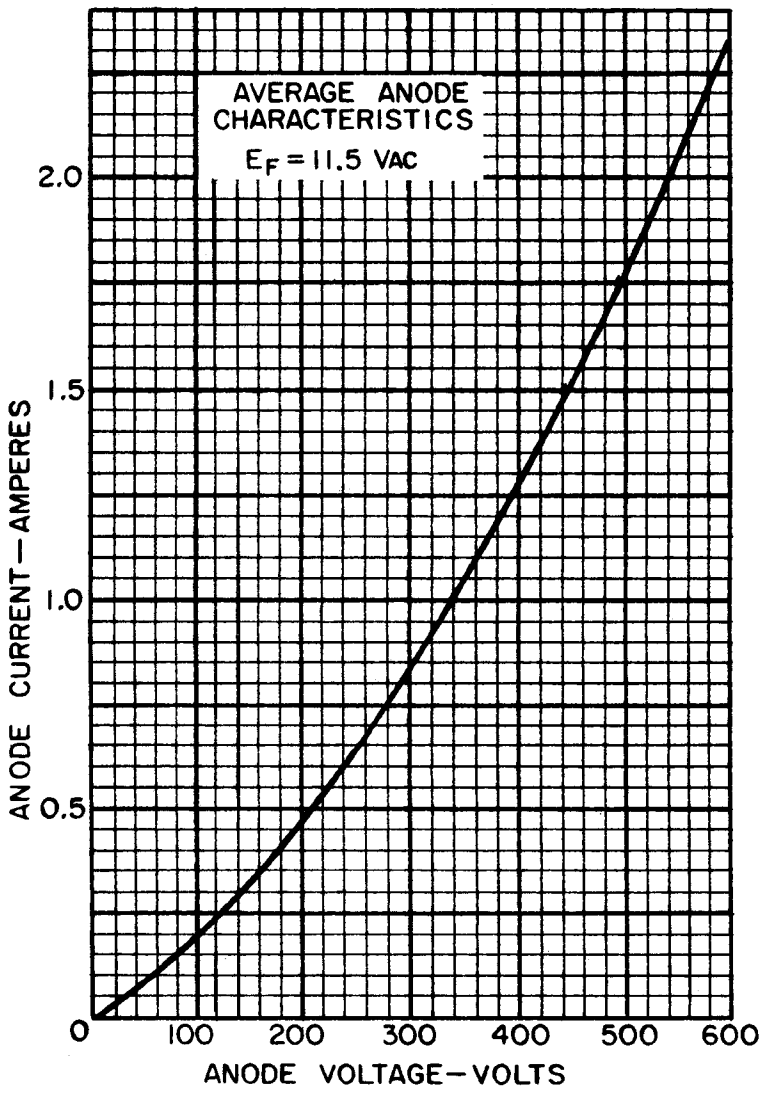


HIGH VACUUM DIODE TYPE 561

Central ELECTRONIC MANUFACTURERS

DENVILLE, NEW JERSEY





WARNING FOR POSSIBLE X-RAY GENERATION
See Safety Code for the Industrial Use of X-Rays published by the American Standards Association.

DIVISION OF NUCLEAR CORPORATION OF AMERICA

Printed U S A

CENTRAL ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

POWER TRIODE
TYPE
5680
PLATE DISSIPATION
—2.5KW

POWER TRIODE

DESCRIPTION

The Nucor tube type 5680 is a forced-air-cooled general purpose, three electrode tube, specifically designed for industrial and communication applications. The anode is capable of dissipating 2.5 kilowatts. It features a sturdily-supported, double-spiral thoriated tungsten filament. Rugged kovar grid and filament seals insure greater protection against mechanical stress and shock. The wide spacing between elements is an additional feature of this tube. Full input ratings apply to 30 mc. Reduced ratings as indicated, are applicable for useful power outputs extending to 50 mc.



SPECIFICATIONS

ELECTRICAL:

Filament Voltage	13.0 Volts
Filament Current	36 Amperes
Filament Starting Current	72 Amperes
Filament Cold Resistance	0.040 ohms
Amplification Factor	25
E_c = —200V, I_b =0.2A	
Interelectrode Capacitances	
Grid-Plate	12.0 $\mu\mu$f
Grid-Filament	15.0 $\mu\mu$f
Plate-Filament	1.8 $\mu\mu$f

PHYSICAL:

Mounting Position — Vertical, Anode Down
Type of Cooling — Forced Air Maximum Incoming Air Temperature ..... 45°C

Required Air Flow on Anode Plate Dissipation (Kilowatts)	2.5	2.0	1.5
Air Flow — Cubic Feet Per Min.	150	120	90
Pressure — Inches Water	2.5	1.6	0.9

Maximum Glass Temperature ..... 150°C
Net Weight, Approximate ..... 5¼ Pounds

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR -- CLASS B

MAXIMUM RATINGS, ABSOLUTE VALUES

DC Plate Voltage	6,000 Volts
Maximum Signal DC Plate Current*	2.0 Amperes
Maximum Signal Plate Input*	6.0 Kilowatts
Plate Dissipation*	2.5 Kilowatts

TYPICAL OPERATION

(Unless otherwise specified, values are for two tubes)

DC Plate Voltage	5,000 Volts
DC Grid Voltage	—150 Volts
Peak A-F Grid-to-Grid Voltage	1,260 Volts
Zero Signal DC Plate Current	0.4 Amperes
Maximum Signal DC Plate Current	2.25 Amperes
Effective Load Resistance, Plate to Plate	4,000 Ohms
Maximum Signal Driving Power, Approximate	175 Watts
Maximum Signal Power Output, Approximate	7.2 Kilowatts

*Averaged over any audio-frequency cycle of sine-wave form.

RADIO-FREQUENCY POWER AMPLIFIER -- CLASS B

(Carrier conditions per tube for use with a maximum modulation factor of 1.0)

MAXIMUM RATINGS, ABSOLUTE VALUES

DC Plate Voltage	6,000 Volts
DC Plate Current	1.5 Amperes
Plate Input	3.75 Kilowatts
Plate Dissipation	2.5 Kilowatts

TYPICAL OPERATION

DC Plate Voltage	6,000 Volts
DC Grid Voltage	—160 Volts
Peak R-F Grid Voltage	300 Volts
DC Plate Current	0.56 Amperes
DC Grid Current, Approximate	0.0 Amperes
Driving Power, Approximate**	47 Watts
Power Output, Approximate	1 Kilowatt

**At crest of audio-frequency cycle with modulation factor of 1.0.

PLATE-MODULATED RADIO-FREQUENCY POWER AMPLIFIER -- CLASS C TELEPHONY

(Carrier conditions per tube for use with a maximum modulation factor of 1.0)

MAXIMUM RATINGS, ABSOLUTE VALUES

DC Plate Voltage	5,000 Volts
DC Grid Voltage	—2,000 Volts
DC Plate Current	1.5 Amperes
DC Grid Current	0.2 Amperes
Plate Input	7.5 Kilowatts
Plate Dissipation	1.6 Kilowatts

TYPICAL OPERATION

DC Plate Voltage	5,000 Volts
DC Grid Voltage	—800 Volts
Peak R-F Grid Voltage	1,370 Volts
DC Plate Current	0.74 Amperes
DC Grid Current, Approximate	0.10 Amperes
Driving Power, Approximate	130 Watts
Power Output, Approximate	2.7 Kilowatts

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR CLASS C TELEGRAPHY

(Key-down conditions per tube without amplitude modulation) †

MAXIMUM RATINGS, ABSOLUTE VALUES

DC Plate Voltage	6,000 Volts
DC Grid Voltage	—2,000 Volts
DC Plate Current	2.0 Amperes
DC Grid Current	0.2 Amperes
Plate Input	12 Kilowatts
Plate Dissipation	2.5 Kilowatts

TYPICAL OPERATION

DC Plate Voltage	6,000 Volts
DC Grid Voltage	—800 Volts
Peak R-F Grid Voltage	1,510 Volts
DC Plate Current	1.4 Amperes
DC Grid Current, Approximate	0.16 Amperes
Driving Power, Approximate	225 Watts
Power Output, Approximate	6 Kilowatts

†Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR -- PULSED OPERATION

MAXIMUM RATINGS, ABSOLUTE VALUES

DC Plate Voltage	17,500 Volts
DC Grid Voltage	—5,000 Volts
Peak Cathode Current	35 Amperes
Plate Dissipation †	1.2 Kilowatts
Duty Cycle	.030

† Air Flow = 75 CFM

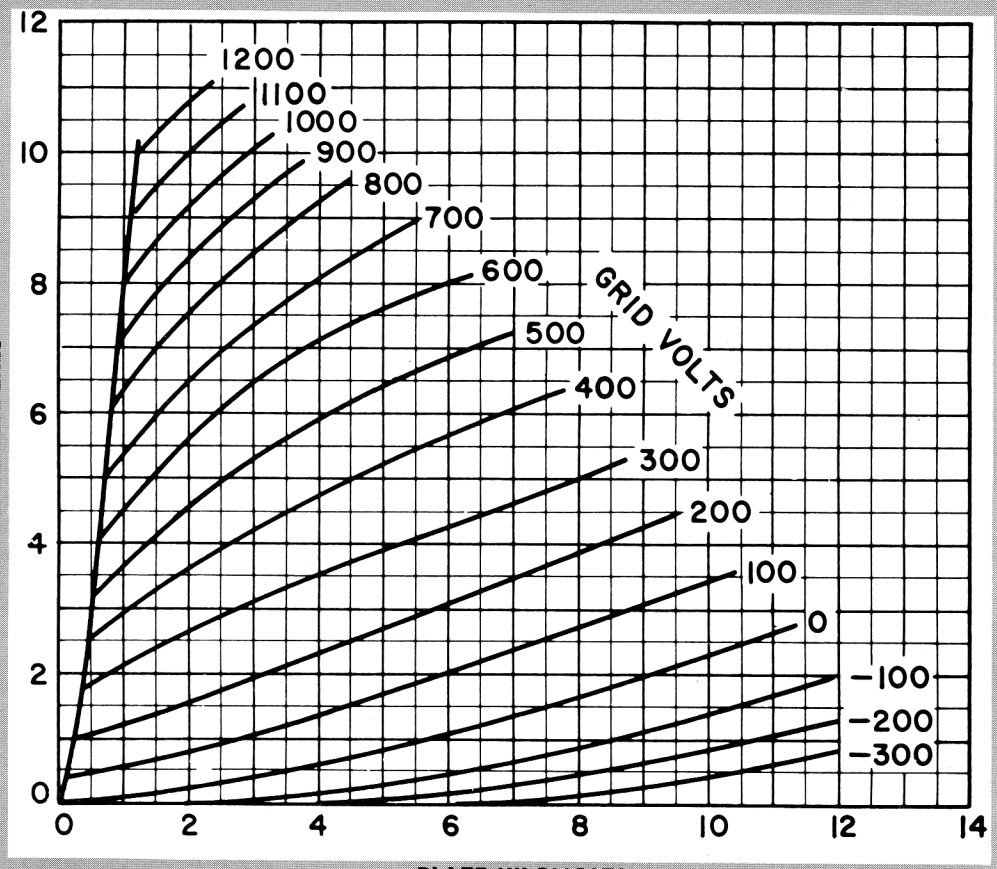
TYPICAL OPERATION

DC Plate Voltage	15,500 Volts
DC Grid Voltage (during pulse)	—750 Volts
DC Plate Current	0.20 Amperes
DC Grid Current	0.013 Amperes
Duty Cycle	.023
Peak Power Output	90 Kilowatts

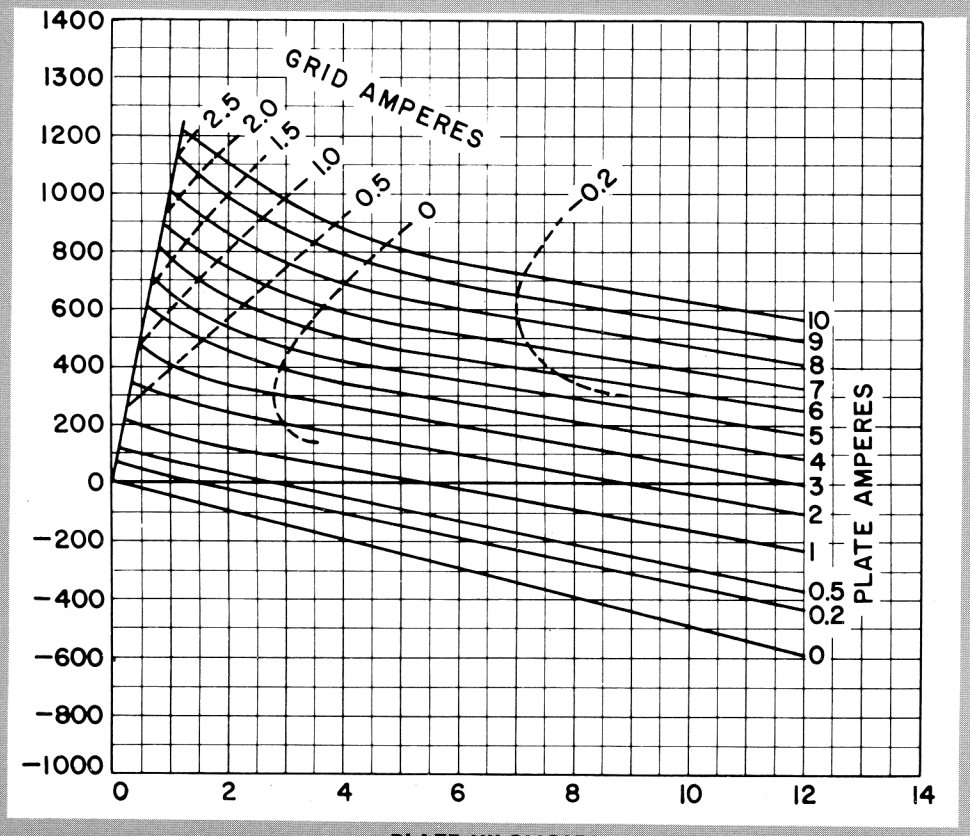
MAXIMUM RATINGS vs. OPERATING FREQUENCY

Frequency	30	50 Megacycles
Percentage of Maximum rated Plate Voltage and Plate Input		
Class C — Telegraphy	100	75 Per Cent

PLATE CHARACTERISTICS



CONSTANT CURRENT CHARACTERISTICS



POWER TRIODE

TYPE

5680

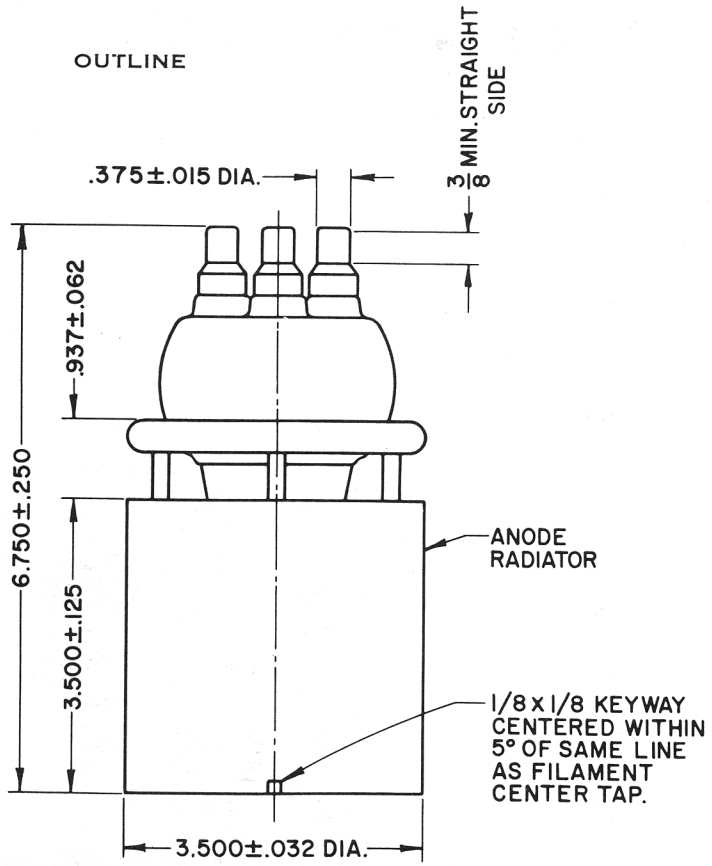
PLATE DISSIPATION —2.5KW

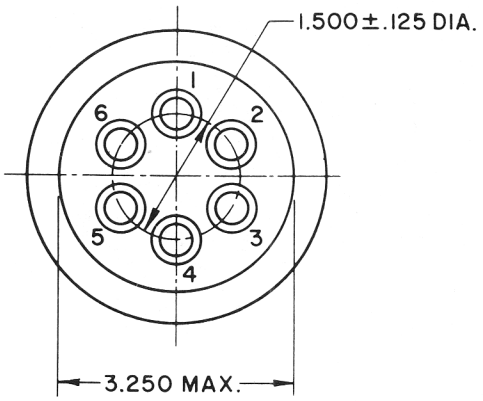
CENTRAL ELECTRONIC

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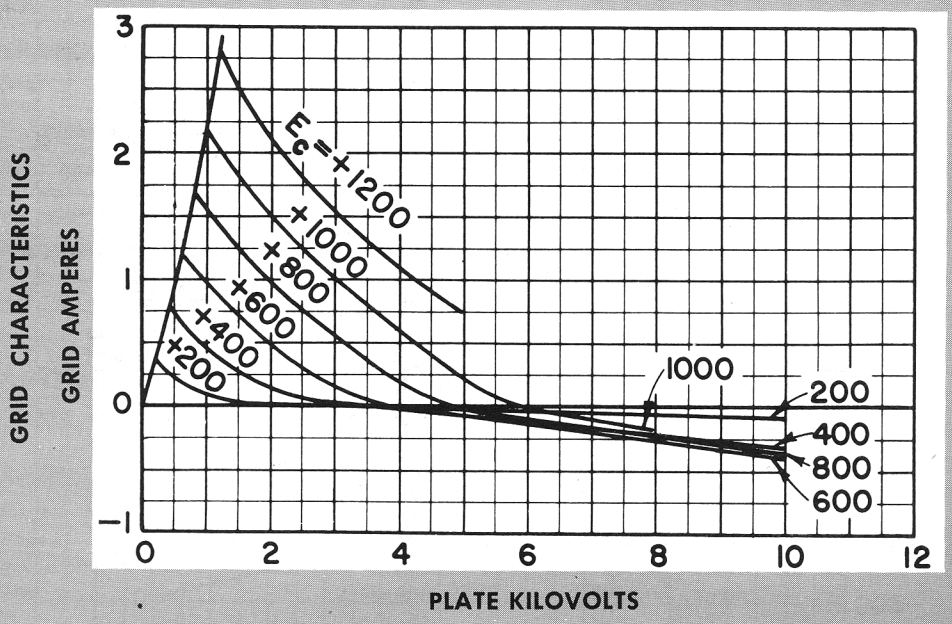
OUTLINE





TERMINAL COLOR CODE

1=GRID -- BLACK
2=FIL. -- YELLOW
3=GRID -- BLACK
4=F.C.T. -- RED
5=GRID -- BLACK
6=FIL. -- YELLOW



DIVISION OF NUCLEAR CORPORATION OF AMERICA

Printed in U. S. A.

Central ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

CENTRAL
POWER
TRIODE
TYPE
5736

PLATE DISSIPATION
–3KW

POWER TRIODE

DESCRIPTION

The 5736 is a three-electrode tube designed for use as a modulator, amplifier or oscillator in AM, FM and TV broadcasting service, high-frequency communications systems, and induction and dielectric heating equipments. Four grid terminals provide a low-inductance connection to the grid making the tube suited especially to cathode-drive operation. The cathode is a thoriated-tungsten filament connected for single-phase operation. The anode is forced-air cooled and can readily dissipate 2.5 kw with nominal air flow. Special features include: precise and stable alignment of electrodes to prevent grid-cathode shorts and to assure reliability and uniform operation, brazed radiator construction to eliminate hot-spotting and its detrimental effects. Maximum ratings of 5.0 kv dc plate voltage and 5.0 kw plate input apply at frequencies up to 60 mc; operation at 100 mc is permissible with plate voltage and input reduced to 80% of maximum ratings.



SPECIFICATIONS

ELECTRICAL

Filament Voltage	6.0 Volts
Filament Current	60 Amps
Filament Cold Resistance	0.016 Ohms
Amplification Factor	22
Interelectrode Capacitances:	
Grid-Plate	16 $\mu\mu$f
Grid-Filament	19 $\mu\mu$f
Plate-Filament	0.8 $\mu\mu$f

PHYSICAL

Mounting Position	Vertical, Anode Up or Down
Type of Cooling	Forced Air
Maximum Incoming Air Temperature	45°C
Required Air-Flow on Anode**	150 cfm
Static Pressure, Inches Water	2.8 Inches
Maximum Radiator Temperature	180°C
Required Air-Flow to Bulb and Seals	
Air-Flow through radiator normally is sufficient	
Maximum Bulb Temperature	160°C
Net Weight, approximate	3 lbs.

**Except television ratings which require 180 cfm of cooling air at 4 inches water static pressure.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

(CONTINUOUS COMMERCIAL SERVICE)

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR CLASS B

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C Plate Voltage	3000 volts
Maximum Signal D-C Plate Current*	1.4 amps
Maximum Signal Plate Input*	4200 watts
Plate Dissipation*	2500 watts

TYPICAL OPERATION

(Unless otherwise specified, values are for two tubes)

D-C Plate Voltage	3000 volts
D-C Grid Voltage	—160 volts
Peak A-F Grid-to-Grid Voltage	820 volts
Zero Signal D-C Plate Current	0.66 amp
Maximum Signal D-C Plate Current	2.80 amps
Effective Load Resistance, Plate-to-Plate	3060 ohms
Maximum Signal Driving Power, approx.	140 watts
Maximum Signal Power Output, approx.	4350 watts
Load Resistance (per tube)	765 ohms

RADIO-FREQUENCY AND POWER AMPLIFIER -- CLASS B

Carrier conditions per tube for use with a maximum modulation factor of 1.0

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C Plate Voltage	3500 volts
D-C Plate Current	1.75 amps
Plate Input	3500 watts
Plate Dissipation	2500 watts

TYPICAL OPERATION

D-C Plate Voltage	3000 volts
D-C Grid Voltage	—160 volts
Peak R-F Grid Voltage	280 volts
D-C Plate Current	1.1 amps
D-C Grid Current, approx.	0.050 amp
Driving Power, approx.††	15 watts
Power Output, approx.	800 watts

RADIO-FREQUENCY POWER AMPLIFIER -- CLASS B

Grounded-Grid, Wide-Band Television Service, Maximum Frequency — 88 Megacycles

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C Plate Voltage	3500 volts
D-C Plate Current	1.75 amps
Plate Input	4000 watts
Plate Dissipation##	2800 watts

TYPICAL OPERATION

D-C Plate Voltage	2600 volts
D-C Plate Current:	
Synchronizing Level	2.32 amps
Black Level	1.47 amps
D-C Grid Voltage	—160 volts
PEAK R-F GRID VOLTAGES:	
Synchronizing Level	535 volts
Black Level	400 volts
D-C GRID CURRENT:	
Synchronizing Level	0.430 amp
Black Level	0.136 amp
DRIVING POWER, APPROX.:	
Synchronizing Level	1160 watts
Black Level	535 watts
POWER OUTPUT, APPROX. #:	
Synchronizing Level	3680 watts
Black Level	1690 watts

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR CLASS C TELEGRAPHY

Key-down conditions per tube without amplitude modulation†

MAXIMUM RATINGS, ABSOLUTE VALUES

	60 mc	110 mc
D-C Plate Voltage	5000	3500 volts
D-C Grid Voltage	—1000	—700 volts
D-C Plate Current	1.4	1.4 amps
D-C Grid Current	0.5	0.5 amp
Plate Input	5000	3500 watts
Plate Dissipation	2500	2500 watts

TYPICAL OPERATION

	60 mc	110 mc	
D-C Plate Voltage	5000	3500	3500 volts
D-C Grid Voltage	—850	—600	—300 volts
Peak R-F Grid Voltage	1200	940	555 volts
D-C Plate Current	1.0	1.0	1.0 amps
D-C Grid Current	0.210	0.250	0.155 amp
Driving Power, approx.	250	235	85 watts
Power Output, approx.	4100	2800	2550 watts

PLATE-MODULATED RADIO-FREQUENCY POWER AMPLIFIER CLASS C TELEPHONY

Carrier conditions per tube for use with a maximum modulation factor of 1.0

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C Plate Voltage	3500 volts
D-C Grid Voltage	—1000 volts
D-C Plate Current	1.4 amps
D-C Grid Current	0.5 amp
Plate Input	4000 watts
Plate Dissipation	1650 watts

TYPICAL OPERATION

D-C Plate Voltage	3500 volts
D-C Grid Voltage	—600 volts
Peak R-F Grid Voltage	950 volts
D-C Plate Current	1.14 amps
D-C Grid Current, approx.	0.28 amp
Driving Power, approx.	270 watts
Power Ouptut, approx.	3200 watts

*Averaged over any audio-frequency cycle of sine-wave form.

††At crest of audio-frequency cycle with modulation factor of 1.0.

##Requires 180 cfm of cooling air at 4 inches static pressure.

#Includes power transferred from driver stage.

†Modulation essentially negative may be used if the positive peak of the carrier envelope does not exceed 115% of the carrier condition.

APPLICATION NOTES

Maximum ratings apply up to 60 megacycles. The tube may be operated at higher frequencies provided the maximum values of the plate voltage and power input are reduced according to the tabulation below. All other maximum ratings remain as shown above. Special attention should be given to adequate ventilation of the bulb at these frequencies. See special television service ratings.

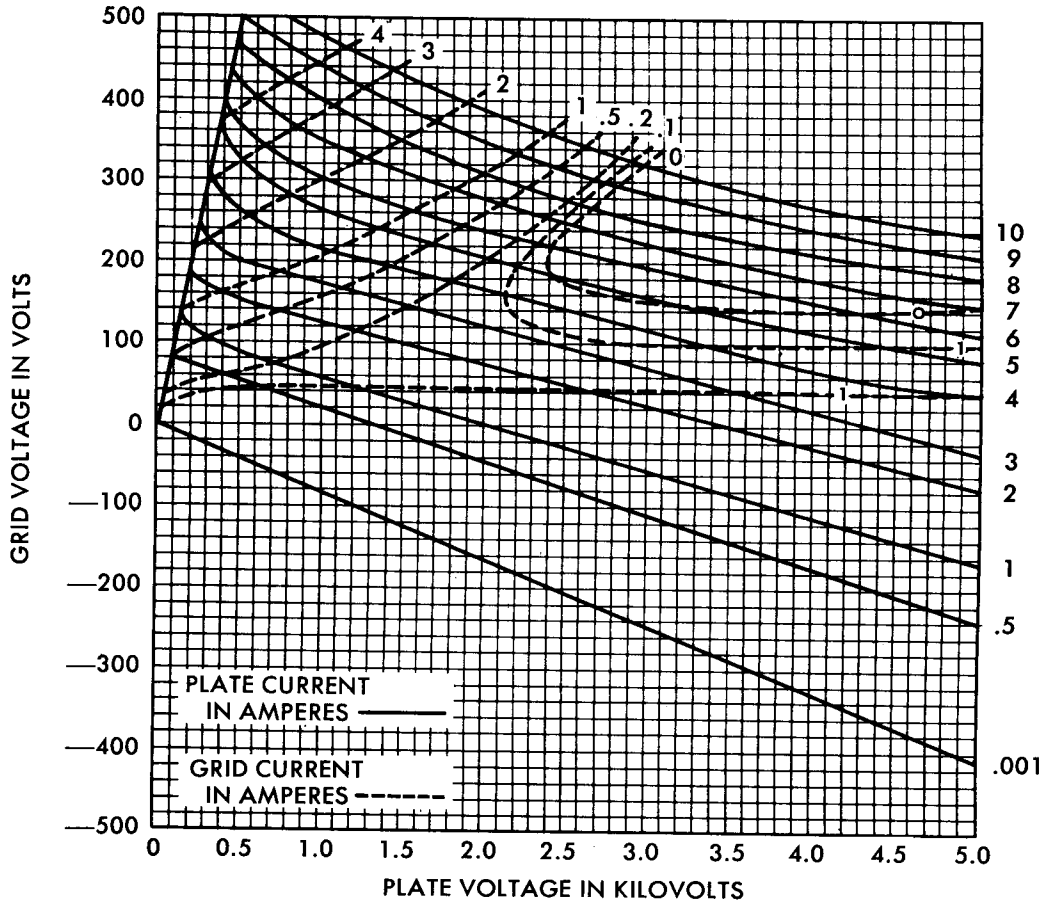
Percentage of Maximum Rated Plate Voltage and Plate Input:

Frequency	60	100	200 mc
Class B	100	85	60%
Class C Plate Modulated	100	80	50%
Class C Unmodulated	100	80	50%

CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

CHARACTERISTIC:	CONDITIONS	LIMITS	
		Min.	Max.
Grid Voltage	e_b = 1000 volts; i_b = 6 amps	——	360 Volts
Grid Current	e_b = 1000 volts; i_b = 6 amps	——	2.2 Amps.
Plate Voltage	E_c = −20 volts; I_b = 0.40 amp E_b	1150	1650 Volts
Plate Voltage	E_c = −30 volts; I_b = 0.40 amp E_b	1370	1870 Volts
Peak Cathode Current*		10	—— Amps.
Power Output	E_b = 5000 volts; I_b = 1.0 amp E_c = −850 volts; I_g = 0.3 amp f = 60 megacycles	3800	—— Watts

*Represents maximum usable cathode current for tube as plate current plus grid current for any condition of operation.



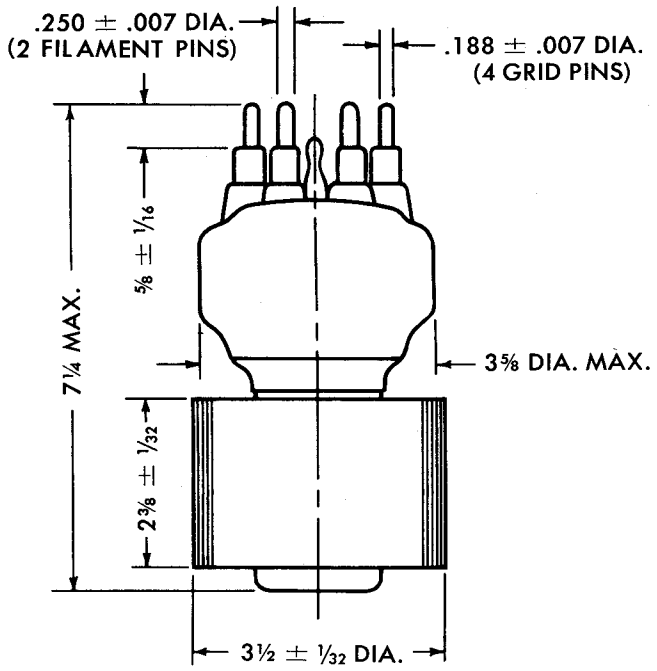
CONSTANT CURRENT CHARACTERISTICS

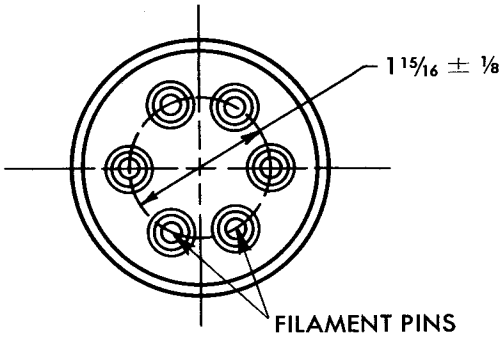
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POWER
TRIODE
TYPE

5736

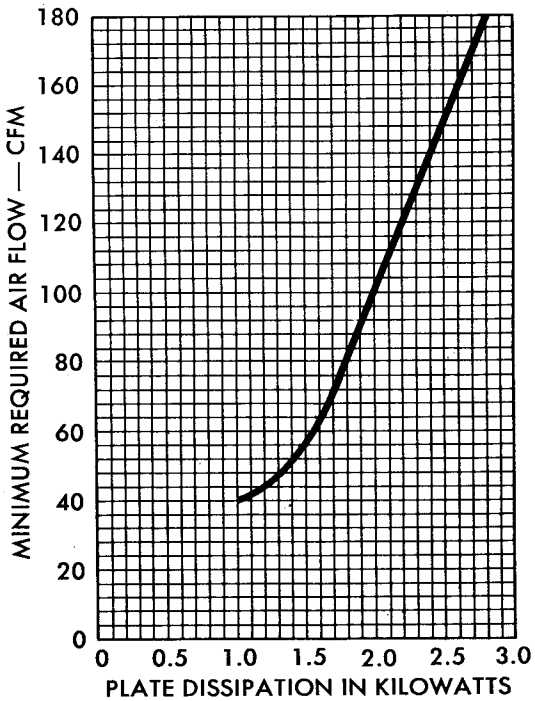
PLATE DISSIPATION
–3KW

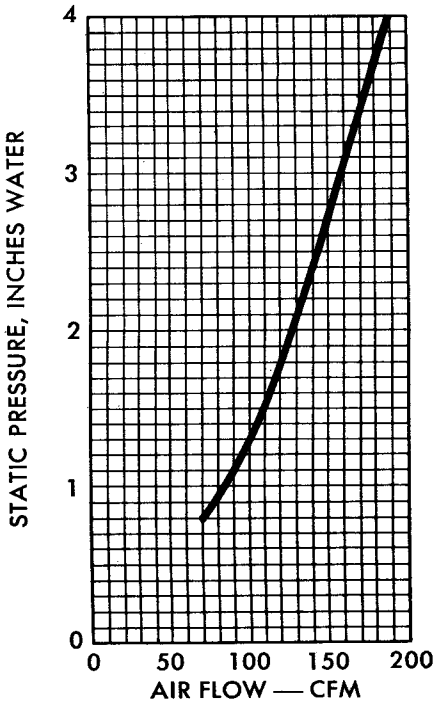
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MANUFACTURERS
DENVILLE NEW JERSEY





NOTE
6 PINS TO BE
CONCENTRIC





AIR COOLING CHARACTERISTICS

1M 8-60

CENTRAL ELECTRONIC
MANUFACTURERS, INCORPORATED
DENVILLE, NEW JERSEY

RECTIFIER AND CLIPPER DIODE

DESCRIPTION

The Central Tube type 576A is a rugged, compact, high vacuum rectifier. This tube is most suitable in applications where high inverse voltages and ambient temperatures preclude the use of mercury vapor and gas filled rectifiers or clipper diodes. The Central 576A is mechanically and electrically interchangeable with its earlier version (tube type 576) and offers greater ruggedness in the anode supporting structure.

SPECIFICATIONS

ELECTRICAL

Filament ..... Thoriated Tungsten

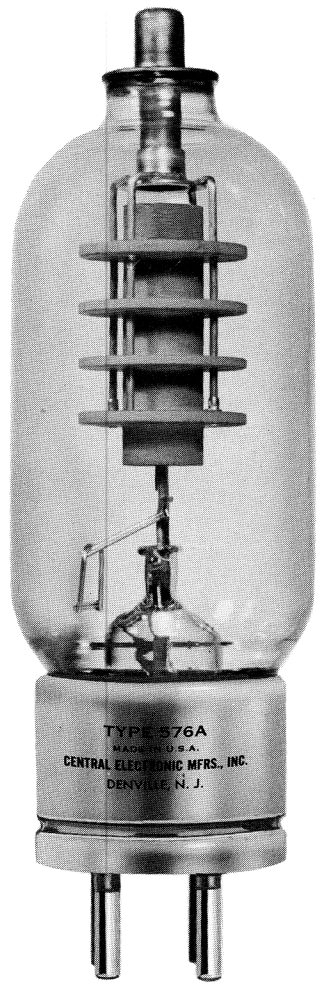
	Rectifier Service	Clipper Service
Filament voltage (volts a.c.)	5.0	5.4
Filament current (amps.)	14.0	15.0
Peak inverse voltage (volts max.)	25,000	25,000
Peak anode current (amps. max.)	2.5	12.0
Average anode current (amps.)	0.500	——
R.M.S. Anode current (amps.)	——	0.800

PHYSICAL

Overall length ..... 7.5 inches max.
Overall diameter ..... 2 5/16 inches max.
Bulb T-18
Cap ..... Integral KOVAR cap
Base ..... Industrial 412 with metal shell
Weight ..... 5.7 ounces
Type of cooling ..... Radiation (air)

OPERATING NOTES

Mount the Central tube type 576A tube vertically with adequate air space for ventilation. Anode temperature should not exceed 800°C. The base fits a standard 4 pin super jumbo wafer socket.

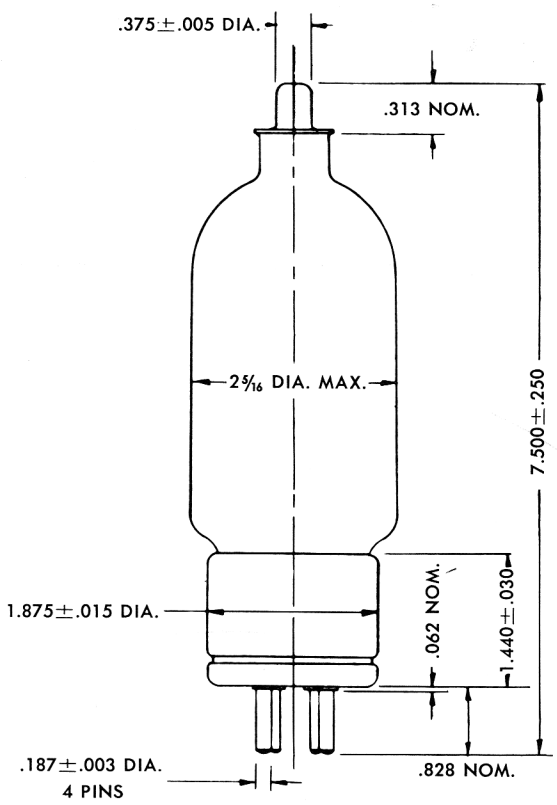


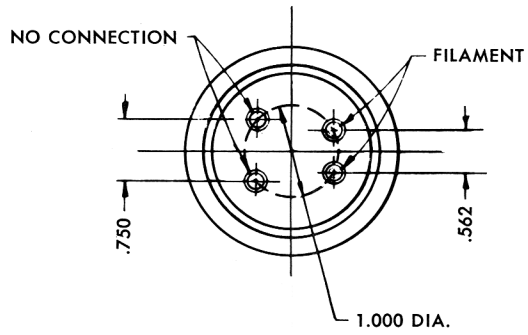
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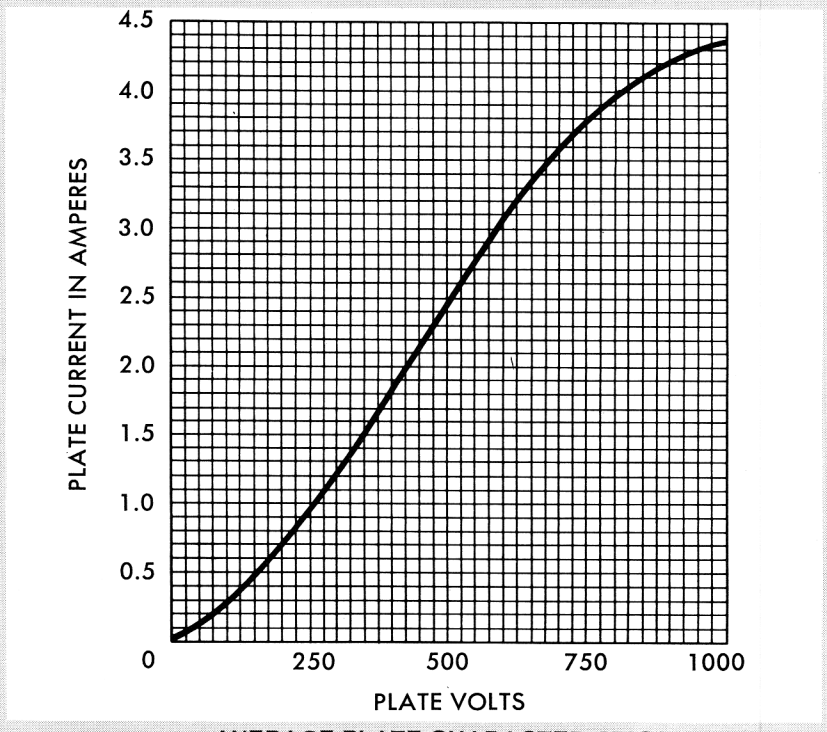
CENTRAL ELECTRONIC

MANUFACTURERS, INCORPORATED

DENVILLE, NEW JERSEY







AVERAGE PLATE CHARACTERISTICS

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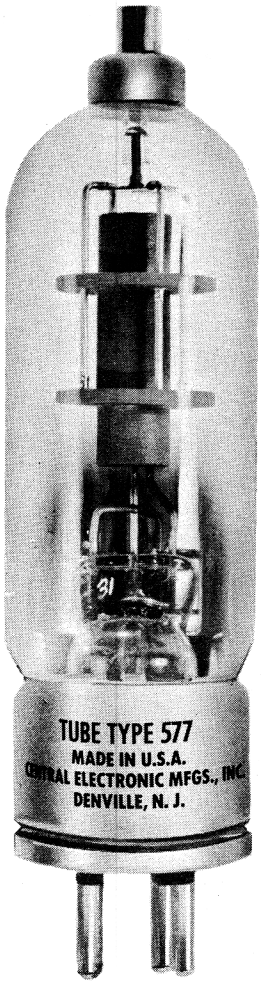
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MANUFACTURERS
DENVILLE, NEW JERSEY
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RECTIFIER

DESCRIPTION

The Nucor tube type 577 is a lightweight, rugged, compact, high vacuum rectifier. This tube is most suitable in applications where high inverse voltages and ambient temperatures preclude the use of mercury vapor and gas filled rectifier tubes. These characteristics make the Nucor tube type 577 partic -ularly useful in airborne equipment. This tube is a miniaturized version of the 371B and may be directly electrically substituted.



SPECIFICATIONS

ELECTRICAL

Filament	Thoriated tungsten
Filament voltage	5.0 volts ac
Filament current	10.3 amperes
Peak inverse voltage	25,000 volts max.
Peak anode current	1.5 amperes max.
Average anode current	0.300 ampere

PHYSICAL

Overall length	7.5 inches max.
Overall diameter	2.06 inches max.
Bulb	T-16
Cap	Small metal (C1-1) with ceramic insulator
Base	Industrial 412 with metal shell
Weight	5 ounces
Type of cooling	Radiation (air)

OPERATING NOTES

Mount the Nucor tube type 577 tube vertically with adequate air space for ventilation. Anode temperature should not exceed 800°C. The base fits a standard 4 pin super jumbo wafer socket.

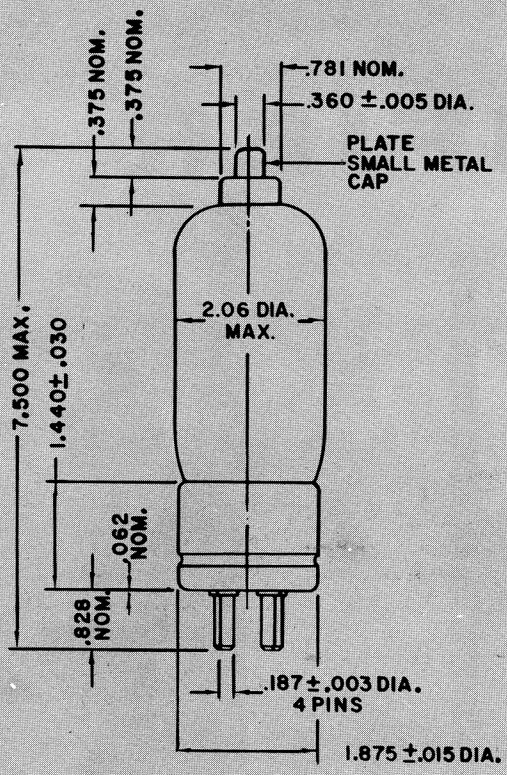
NUCOR
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TYPE
577

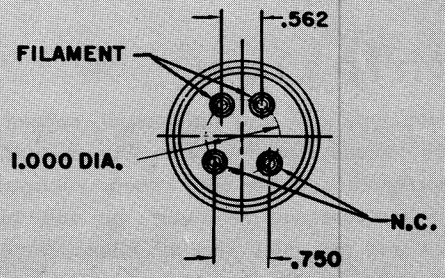
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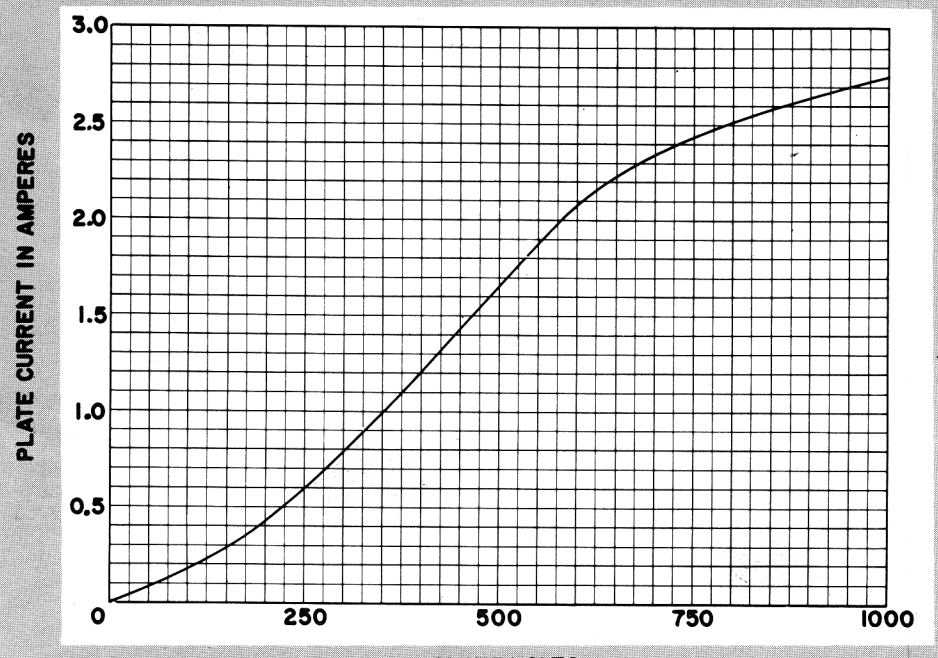
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AVERAGE PLATE CHARACTERISTIC

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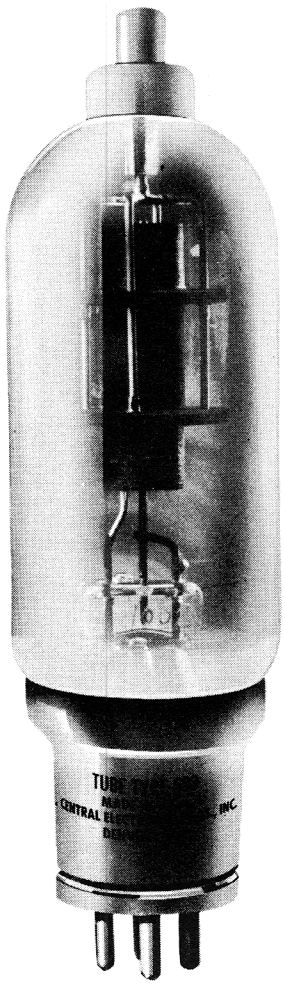
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NUCOR
RECTIFIER
TYPE
593

RECTIFIER

DESCRIPTION

The Nucor type 593 is a rugged, lightweight, miniaturized high vacuum rectifier. This tube can withstand inverse voltages and operate at ambient temperatures at which similar gas or mercury vapor tubes would not be suitable. The tube can be electrically substituted for the much larger 371B. The long base pins on the Nucor 593 insure adequate electrical contact.



SPECIFICATIONS

ELECTRICAL

Filament	Thoriated tungsten
Filament voltage	5.0 volts ac
Filament current	10.3 amperes
Peak inverse voltage	25,000 volts max.
Peak anode current	1.5 amperes max.
Average anode current	0.300 ampere

PHYSICAL

Overall length	7.5 inches max.
Overall diameter	2.06 inches max.
Bulb	T-16
Cap	Small metal (C1-1) with ceramic insulator
Base	Medium, skirted, 4 pin, bayonet base
Weight	4¾ ounces
Type of cooling	Radiation (air)

OPERATING NOTES

Mount the Nucor tube type 593 vertically with adequate air space for ventilation. Anode temperature should not exceed 800°C. The base fits a standard 4 pin medium socket.

NUCOR
RECTIFIER

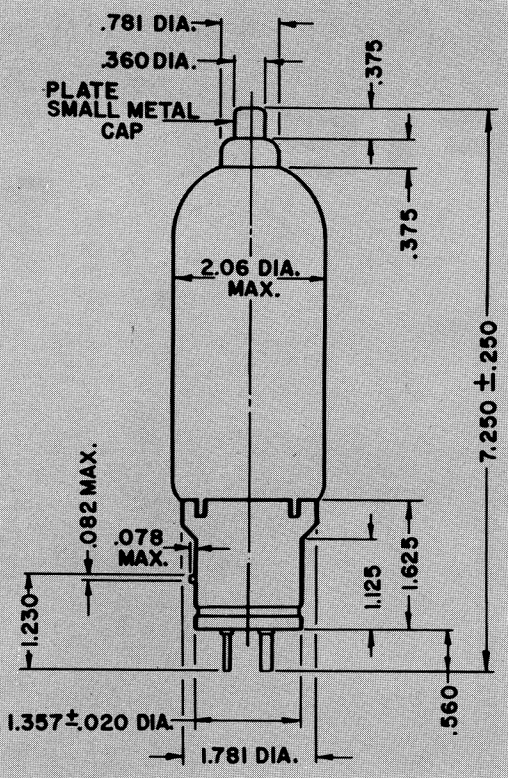
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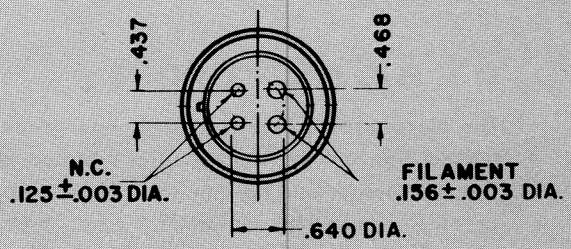
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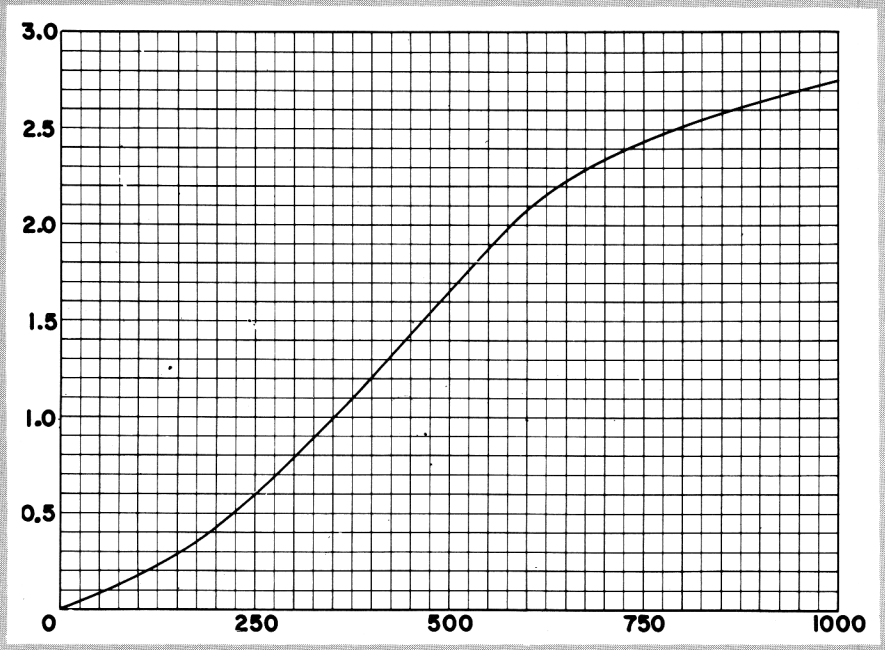
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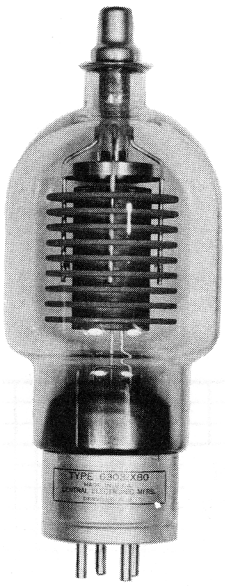
Central ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

HIGH VACUUM DIODE TYPE
6303/X-80

HIGH VACUUM DIODE

DESCRIPTION

The Central 6303/X-80 was designed for rectifier and clipper diode applications. It is a rugged, high vacuum diode with high emission capabilities, desirable where high inverse voltages and ambient temperatures preclude the use of gas filled or mercury vapor tubes.



SPECIFICATIONS:

PHYSICAL

Length (max.)	9¾ inches
Diameter (max.)	3⅝ inches
Cap	.566 inches dia.
Base	A4-18 Super Jumbo 4 Pin Bayonet
Mounting Position	Vertical, Base Down
Weight	10 Ounces
Type of Cooling	Radiation (1)

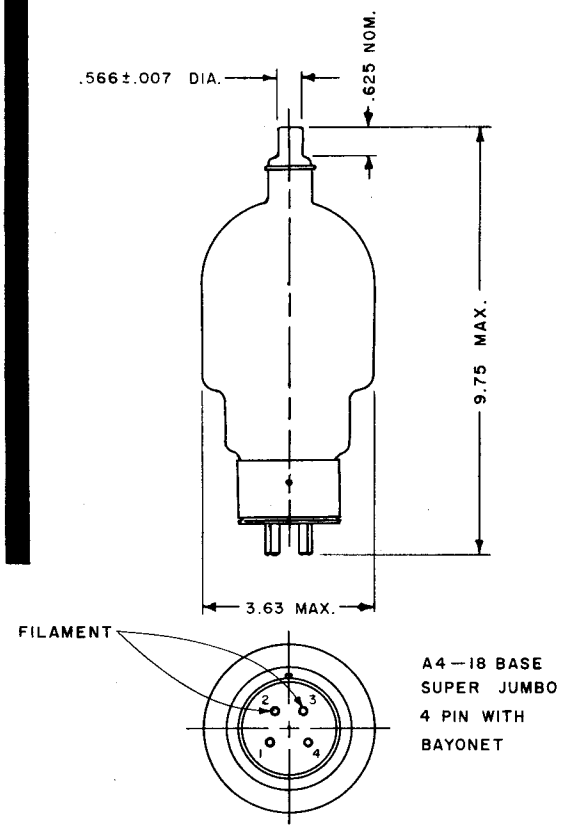
(1) Mount the tube so that forced air at the rate of 50 cfm is directed downward on the tube when operating at 60% of full rating. Maximum anode temperature 800°C. Anode dissipation 550 watts. Connect the base shell and unused pins externally to one filament terminal.

ELECTRICAL (RECTIFIER)

Filament	Bonded Thoria Tungsten
Filament Voltage	11.5 Volts
Filament Current	15.25 Amperes
Peak Inverse Voltage (max.)	40,000 Volts
Peak Anode Current (max.)	2.5 Amperes
Average Plate Current (max.)	0.700 Amperes

ELECTRICAL (CLIPPER)

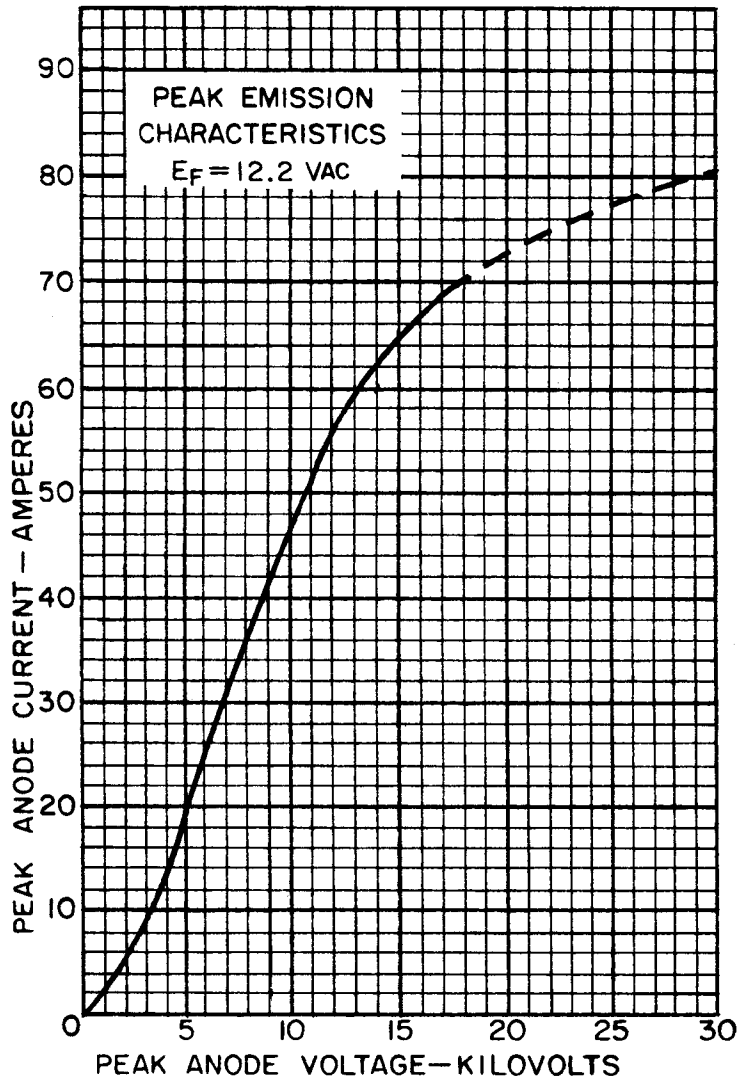
Filament	12.2 Volts
Filament Current	15.5 Amperes
Peak Inverse Voltage (max.)	33,000 Volts
Peak Anode Current (max.)	50 Amperes
RMS Anode Current	1.25 Amperes

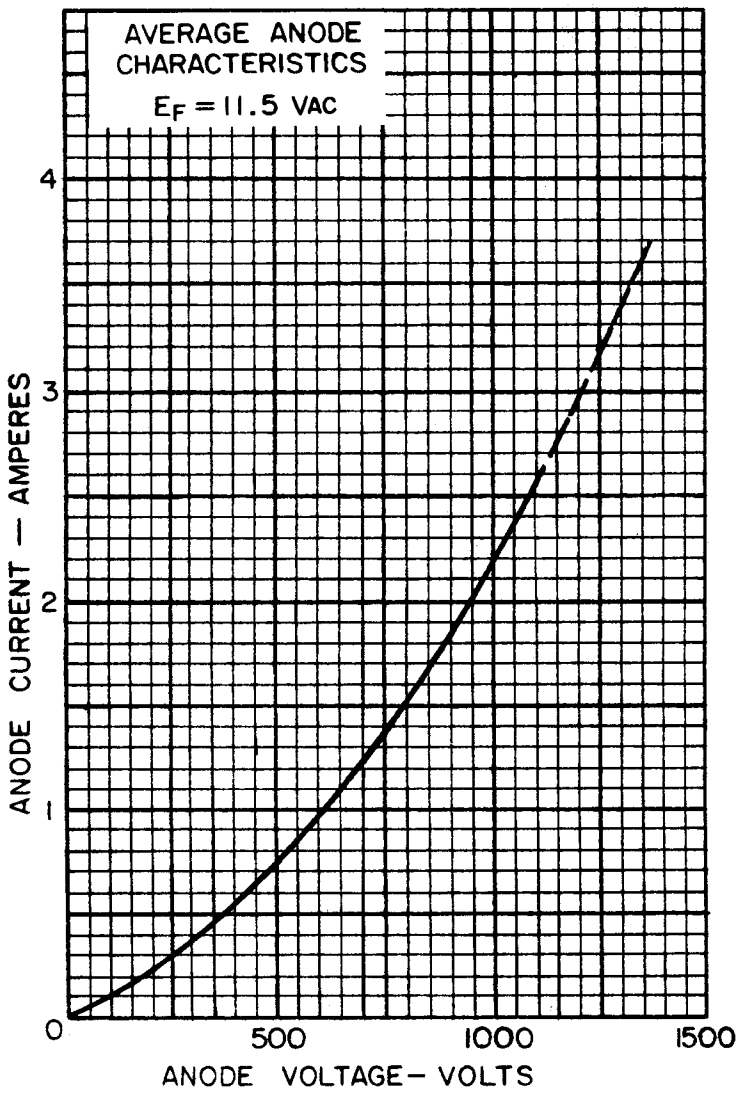


HIGH VACUUM DIODE TYPE 6303/X-80

Central ELECTRONIC MANUFACTURERS

DENVILLE, NEW JERSEY





WARNING FOR POSSIBLE X-RAY GENERATION
See Safety Code for the Industrial Use of X-Rays published by the American Standards Association.

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Central ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

GAS NOISE TUBE	C
6356	15.3 Db

References and notations contained herein are taken from Military Specifications for Electron tubes MIL-E-ID 31 March '58.

Description: Gaseous Discharge Diode, C Band (Note 11)

Ratings:

	I_f mA	I_b mAdc	TA °C	T Bulb °C
Absolute Maximum:	..	..	+85	+125
Minimum:	..	..	-55	..
Test Conditions:	0	250	..	..

Cathode: Filamentary Type.
Dimensions: Per Outline Drawing (Fig. 1)
Base: Per Outline Drawing (Fig. 1)
Mounting Position: Any

Ref. Para.	Test	Conditions	Min.	Max.
...	Qualification:	Required.		
4.5	Holding Period:	168 hours		
4.9.18.1.10	Carton Drop:	...		
4.9.20.3	*Vibration:	No Voltages, Note 9.		
4.10.5.1	Filament Voltage:	I_f = 170mAdc	E_f ---	10Vdc
4.13.2	Tube Voltage Drop:	Notes 1, 2	E_{td} 80	90Vdc
...	Excess Noise Ratio:	F = 5650 Mc. Notes 3, 4, 5, 10	N_r-1 15.05	15.45 Db
...	Match (1):	F = 5650 Mc. Notes 4, 6 I_b = 250 mAdc	VSWR	1.12:1
...	*Match (2):	F = 5650 Mc. I_b = 0 mAdc Notes 4, 6	VSWR	1.12:1
...	Intermittent Life Test	Notes 1, 3, 8, 9 (One min. on, Two min. off) Preheat time = 2 to 3 sec.	2500	...Cycles
4.11.4	Intermittent Life Test End Points Excess Noise Ratio: Note 11.		N_r-1 15.0	15.5 Db

Note 1. The tube shall be tested in the circuit of Fig. 3.
Note 2. In the test circuit of Fig. 3, with a filament current of 170 mAdc, the tube shall operate within three tries.
Note 3. The tube shall be tested in total darkness.
Note 4. The tube shall be tested in a tube mount as specified in Figure 2, or equivalent, terminated by a matched RG-49/U termination having a VSWR no greater than 1.01:1, such as Hewlett-Packard G-914A, or equivalent.
Excess Noise Ratio Measurement tests shall be made using the circuit of block diagram Fig. 2, or equivalent.
Note 5. The frequency specified is that of the Local Oscillator.
Note 6. The frequency specified is that of the Signal Generator.
Note 7. Excess noise ratio should be measured by comparison with an approved standard.
Note 8. The tube shall be tested at an ambient temperature of +85°C.
Note 9. Intermittent Life Test end points shall apply.
Note 10. The Excess Noise Ratio (N_r-1) is defined in Db as N_r-1 = 10 log $(\frac{T_e}{290}-1)$ where T_e is the effective electron temperature.
Note 11. The noise frequencies generated by this tube cover a broad band of frequencies. This bandwidth is limited only by the type of mount used. This tube is normally used with a mount in RG-49/U or RG-50/U wave guide, at a 10 degree angle in the E plane. Other wave guide sizes may be used with properly adapted mounts.

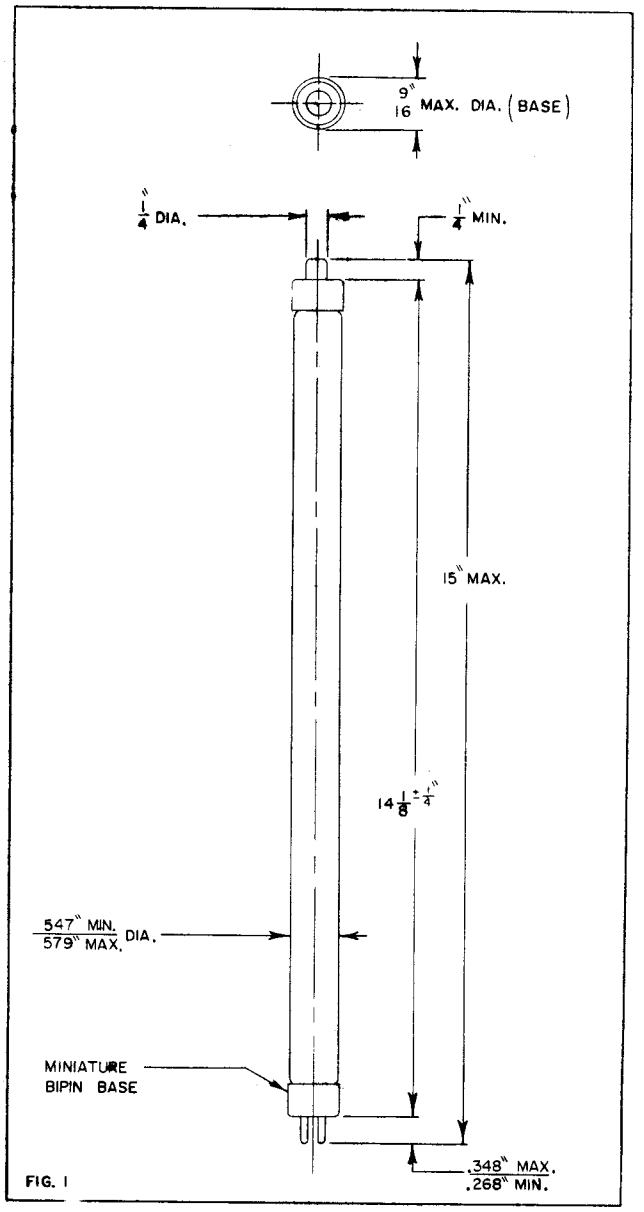


FIG. 1

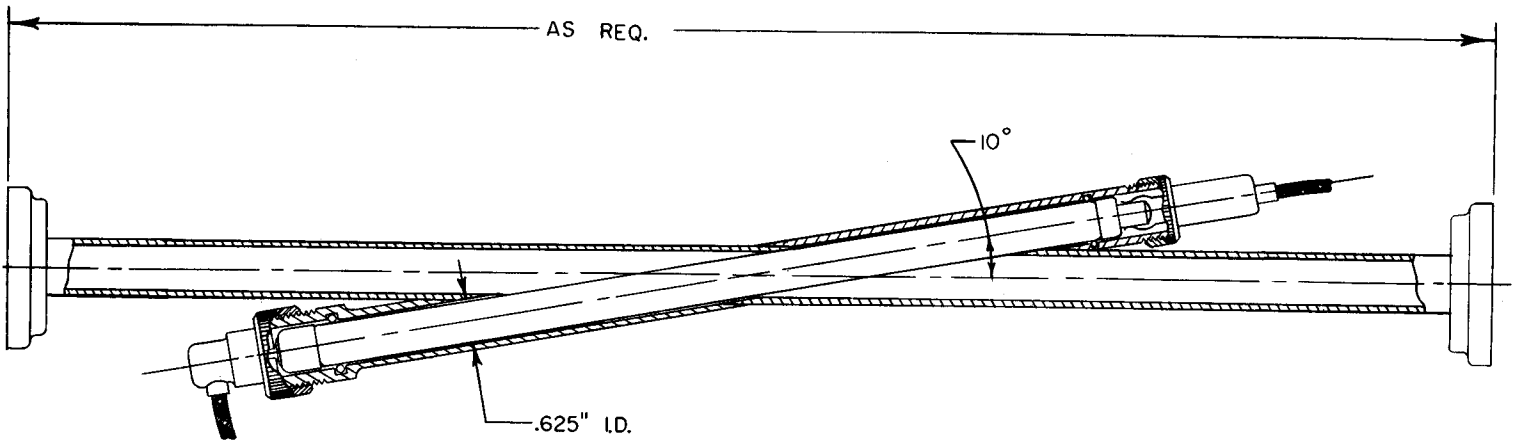
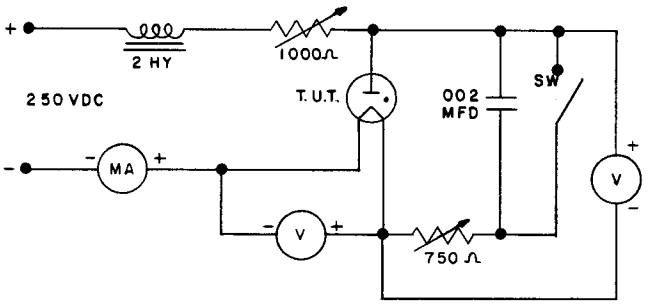
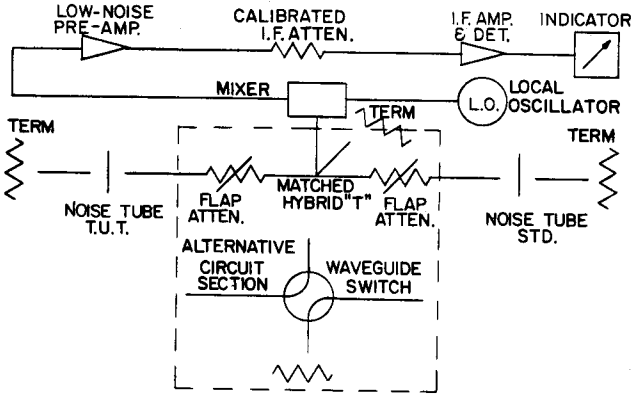


FIG. 2



D.C. TEST CIRCUIT

FIG. 3



TEST CIRCUIT FOR EXCESS NOISE MEASUREMENTS
FIG. 4

Central ELECTRONIC MANUFACTURERS

DENVILLE, NEW JERSEY

GAS NOISE TUBE	X
6357	15.3 Db

References and notation contained herein are taken from Military Specifications for Electron tubes MIL-E-1D 31 March '58.

Description: Gaseous Discharge Diode, X Band (Note 11)

References and notations contained herein are taken from Military Specifications for Electron tubes MIL-E-1D 31 March '58.

Description: Gaseous Discharge Diode, X Band (Note 11)

Ratings:

	If	Ib	TA	T Bulb
	mA	mAdc	°C	°C
Absolute:	..	..	+85	+125
Maximum:	..	..	−55	..
Test Conditions:	0	250	..	..

Cathode: Filamentary Type
Dimensions: Per Outline Drawing (Fig. 1)
Base: Per Outline Drawing (Fig. 1)
Mounting Position: Any

Ref. Para.	Test	Conditions	Min.	Max.
. . .	Qualification:	Required		
4.5	Holding Period:	168 hours		
4.9.18.1.10	Carton Drop:	. . .		
4.9.20.3	*Vibration:	No Voltages, Note 9.		
4.10.5.1	Filament Voltage:	If = 170mAdc	E_f . . .	10Vdc
4.13.2	Tube Voltage Drop:	Note 1,2	E_{td} 80	90Vdc
. . .	Excess Noise Ratio:	F = 9000 Mc. Notes 3,4,5,10.	N_r-1 15.05	15.45Db
. . .	Match (1)	F = 9000 Mc. Notes 4,6. I_b = 250 mAdc	VSWR	1.07:1
. . .	*Match (2):	F = 9000 Mc. I_b = 0 mAdc Notes 4,6.	VSWR	1.07:1
. . .	Intermittent Life Test	Notes 1,3,8,9. (One min. on, two min. off) Preheat time = 2 to 3 sec.	2500	Cycles
4.11.4	Intermittent Life Test End Points Excess Noise Ratio: Note 11.		N_r-1 15.0	15.5Db

Note 1. The tube shall be tested in the circuit of Fig. 3.
Note 2. In the test circuit of Fig. 3, with a filament current of 170 mAdc, the tube shall operate within three tries.
Note 3. The tube shall be tested in total darkness.
Note 4. The tube shall be tested in a tube mount as specified in Figure 2, or equivalent, terminated by a matched RG-52/U termination having a VSWR no greater than 1.01:1, such as Hewlett-Packard X-914A, or equivalent.
Excess Noise Ratio Measurement tests shall be made using the circuit of block diagram Fig. 4, or equivalent.
Note 5. The frequency specified is that of the Local Oscillator.
Note 6. The frequency specified is that of the Signal Generator.
Note 7. Excess noise ratio should be measured by comparison with an approved standard.
Note 8. The tube shall be tested at an ambient temperature of +85°C.
Note 9. Intermittent Life test end points shall apply.
Note 10. The Excess Noise Ratio (N_r-1) is defined in Db as N_r-1 = 10 log $\left(\frac{T_e}{290}-1\right)$ where T_e is the effective electron temperature.
Note 11. The noise frequencies generated by this tube cover a broad band of frequencies. This bandwidth is limited only by the type of mount used. This tube is normally used with a mount in RG-52/U wave guide, at a 10 degree angle in the E plane. Other wave guide sizes may be used with properly adapted mounts.

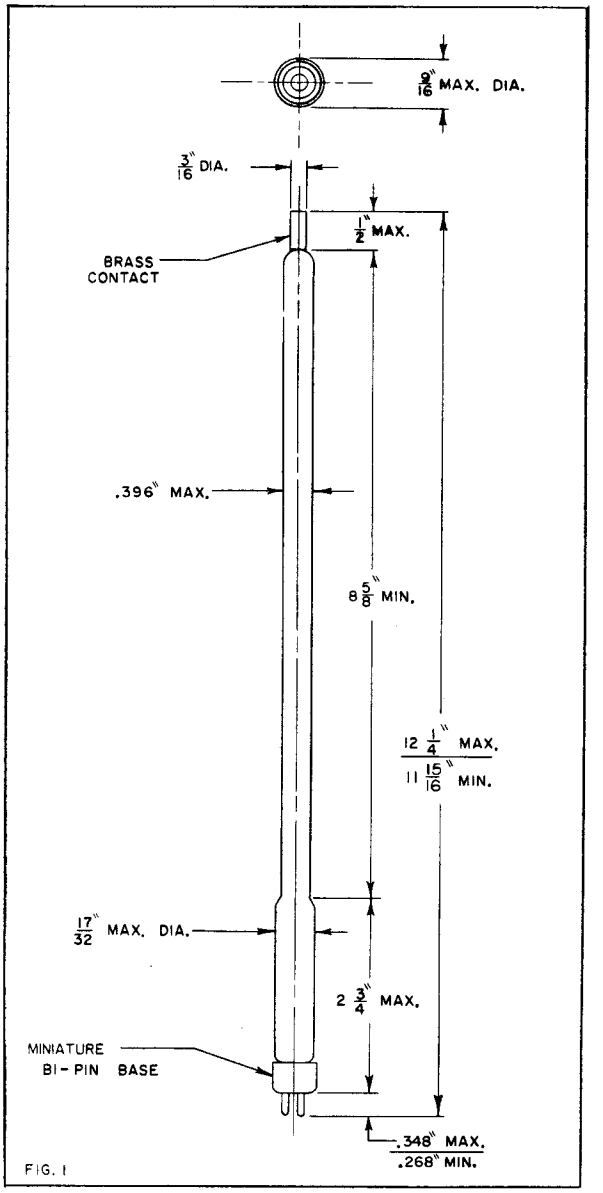


FIG. 1

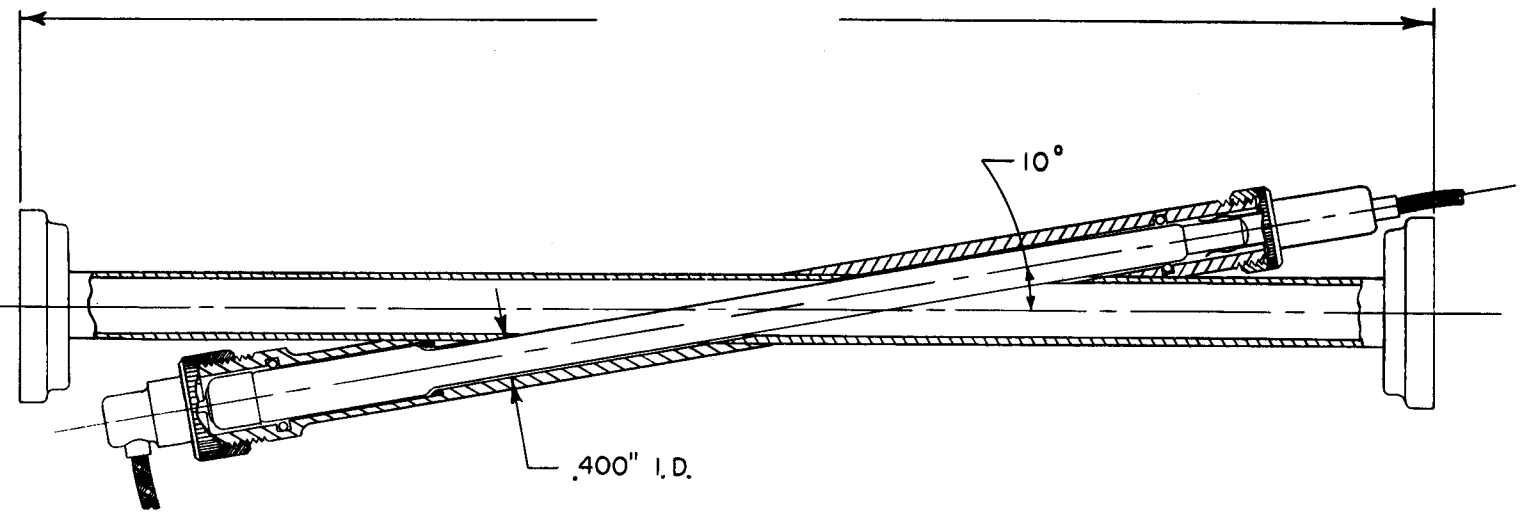
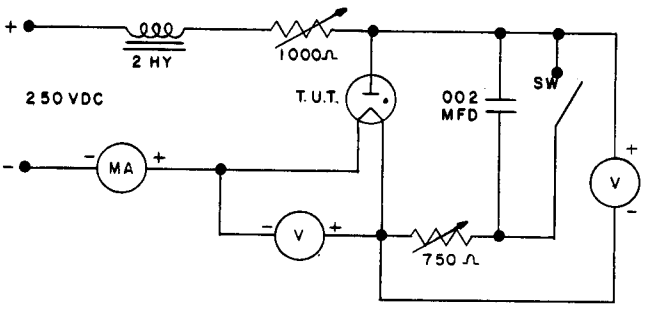
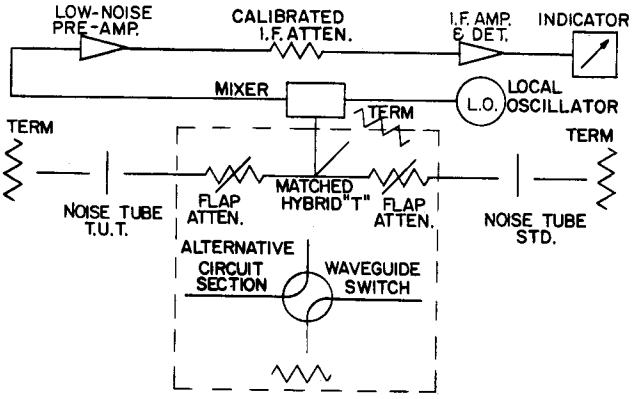


FIG. 2



D.C. TEST CIRCUIT

FIG. 3



TEST CIRCUIT FOR EXCESS NOISE MEASUREMENTS
FIG. 4

Central ELECTRONIC MANUFACTURERS
DENVILLE, NEW JERSEY

GAS NOISE TUBE	S
6358	15.3 Db

References and notations contained herein are taken from Military Specifications for Electron tubes MIL-E-1D 31 March '58.

Description: Gaseous Discharge Diode, S Band (Note 11)

Ratings:

	If	Ib	TA	T Bulb
	mA	mAdc	°C	°C
Absolute Maximum:	..	..	+85	+125
Minimum:	..	..	−55	..
Test Conditions:	0	250	..	..

Cathode: Filamentary Type.
Dimensions: Per Outline Drawing (Fig. 1)
Base: Per Outline Drawing (Fig. 1)
Mounting Position: Any

Ref. Para.	Test	Conditions	Min.	Max.
...	Qualification:	Required		
4.5	Holding Period:	168 hours		
4.9.18.1.10	Carton Drop:	...		
4.9.20.3	*Vibration:	No Voltages, Note 9.		
4.10.5.1	Filament Voltage:	I_f=300mAdc	E_f ...	10Vdc
1.13.2	Tube Voltage Drop:	Note 1,2,	E_{td} 80	90Vdc
...	Excess Noise Ratio:	F=3300 Mc. Notes 3,4,5,10.	N_r-1 15.05	15.45Db
...	*Match (1):	F=3270 Mc. Notes 4,6. I_b=250 mAdc	VSWR	1.15:1
...	*Match (2):	F=3270 Mc. I_b=0 mAdc Notes 4,6.	VSWR	1.15:1
...	Intermittent Life Test	Notes 1,3,8,9. (One min. on, two min. off) Preheat time=2 to 3 sec.	2500	Cycles
4.11.4	Intermittent Life Test End Points Excess Noise Ratio: Note 11.		N_r-1 15.0	15.5Db

Note 1. The tube shall be tested in the circuit of Fig. 3.
Note 2. In the test circuit of Fig. 3, with a filament current of 300 mAdc, the tube shall operate within three tries.
Note 3. The tube shall be tested in total darkness.
Note 4. The tube shall be tested in a tube mount as specified in Figure 2, or equivalent, terminated by a matched RG-49/U termination having a VSWR no greater than 1.01:1, such as Hewlett-Packard S-914A, or equivalent.
Excess Noise Ratio Measurement tests shall be made using the circuit of block diagram Fig. 4, or equivalent.
Note 5. The frequency specified is that of the Local Oscillator.
Note 6. The frequency specified is that of the Signal Generator.
Note 7. Excess noise ratio should be measured by comparison with an approved standard.
Note 8. The tube shall be tested at an ambient temperature of +85°C.
Note 9. Intermittent life test end points shall apply.
Note 10. The Excess Noise Ratio (N_r-1) is defined in Db as N_r-1 = 10 log $(\frac{T_e}{290}-1)$ where T_e is the effective electron temperature.
Note 11. The noise frequencies generated by this tube cover a broad band of frequencies. This bandwidth is limited only by the type of mount used. This tube is normally used with a mount in RG-48/U wave guide, at a 10 degree angle in the E plane. Other wave guide sizes may be used with properly adapted mounts.

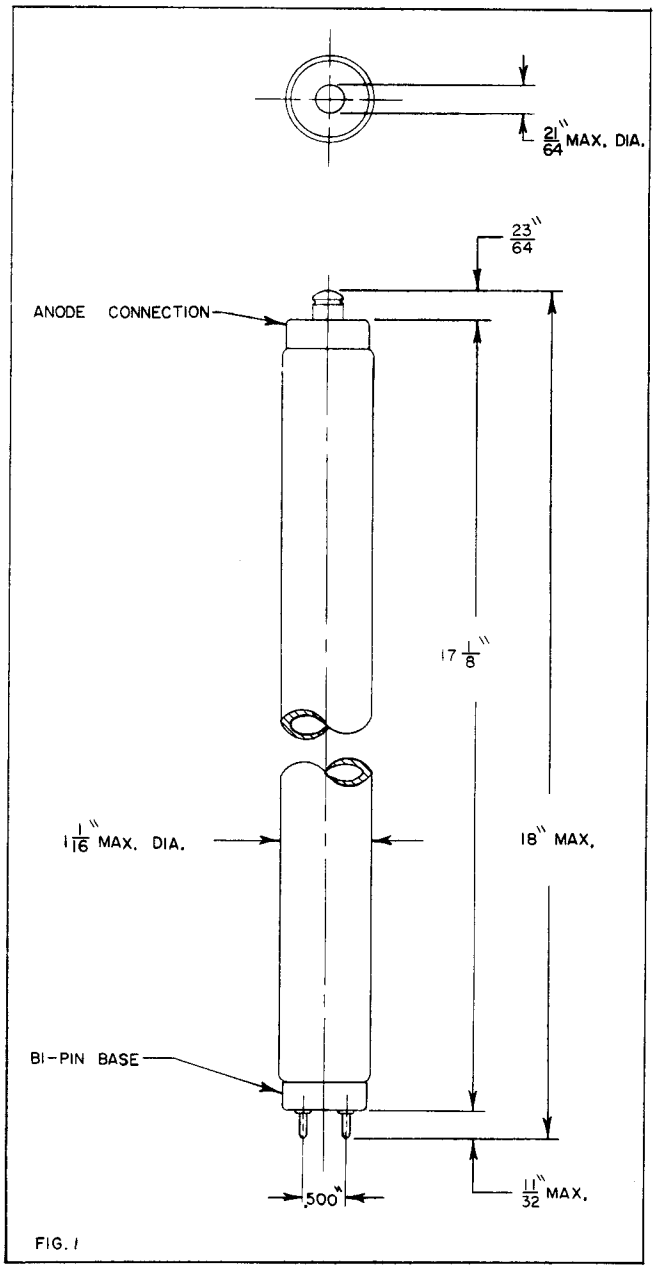


FIG. 1

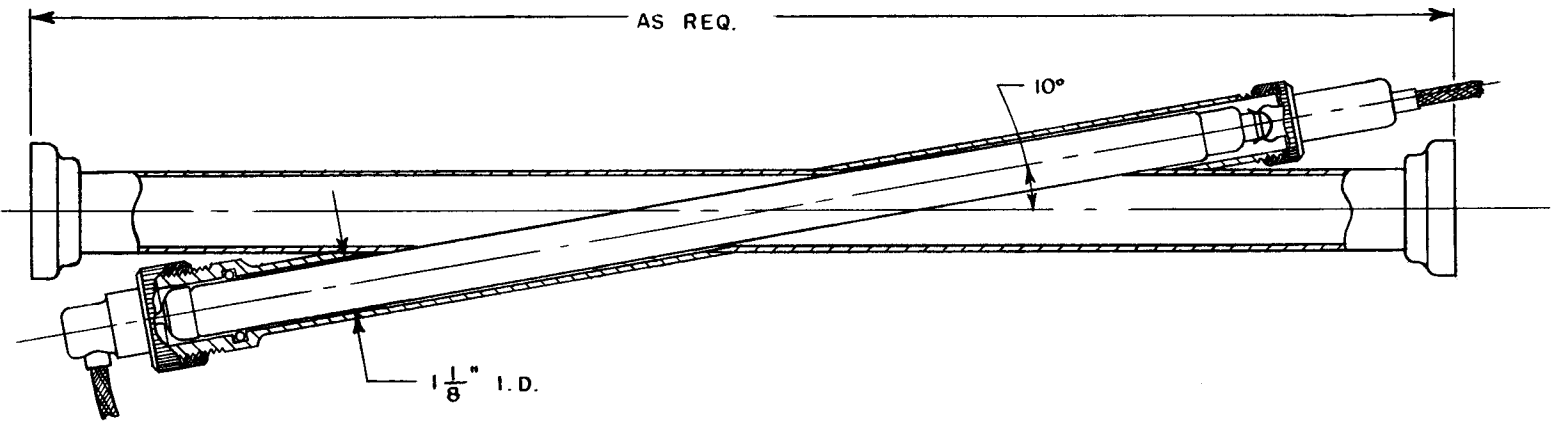
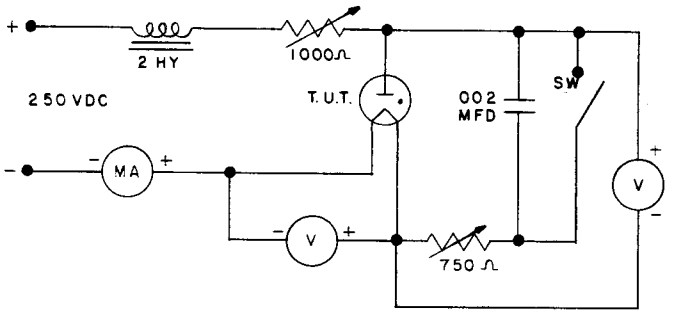
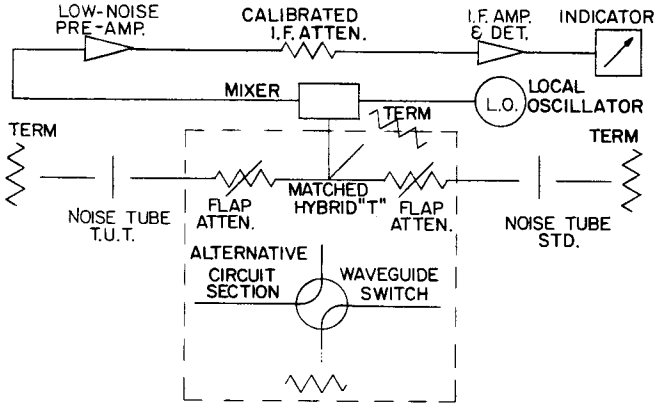


FIG. 2



D.C. TEST CIRCUIT

FIG. 3



TEST CIRCUIT FOR EXCESS NOISE MEASUREMENTS
FIG. 4

CENTRAL ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

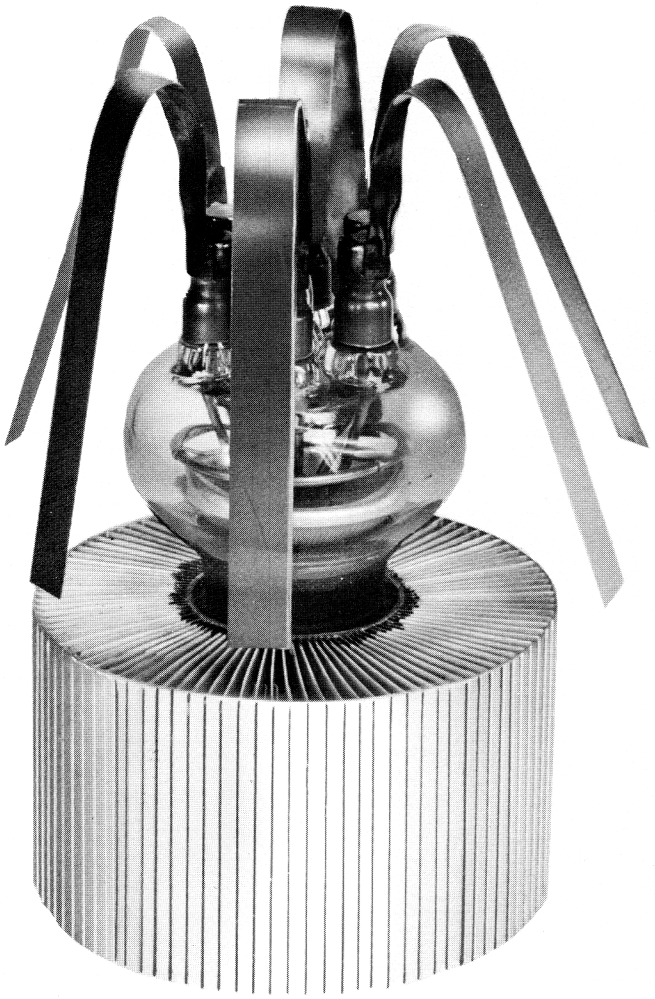
POWER TRIODE
TYPE
6366
PLATE DISSIPATION —3KW

POWER TRIODE

DESCRIPTION

The Nucor tube type 6366 is a forced-air-cooled, three electrode tube, specifically designed for use as an industrial oscillator. The anode is capable of dissipating 3 kilowatts. It features a sturdily-supported, double-spiral, thoriated tungsten filament. Rugged kovar grid and filament seals insure greater protection against mechanical stress and shock. The wide spacing between elements and the high efficiency, low pressure radiator are additional features of this tube. Flexible leads constructed of O.F.H.C. copper can be modified to individual customer requirements.

Full input ratings apply to 30 mc. Reduced ratings as indicated, are applicable for useful power outputs extending to 50 mc.



SPECIFICATIONS

ELECTRICAL:

Filament Voltage	11 Volts
Filament Current	29 Amperes
Amplification Factor	25
E_c = —200V, I_b = 0.2 A	
Interelectrode Capacitances	
Grid-Plate	13 $\mu\mu$f
Grid-Filament	14.5 $\mu\mu$
Plate-Filament	1.7 $\mu\mu$f

PHYSICAL:

Mounting Position — Vertical, Anode Down
Type of Cooling — Forced Air

Maximum Incoming Air Temperature	45°C

Required Air Flow on Anode

Plate Dissipation (Kilowatts)	3	2. 4	1.8
Air Flow—Cubic Feet per min	190	125	75
Pressure — Inches Water	1.21	0.58	0.26

Maximum Glass Temperature	150°C
Net Weight, Approximate	4¼ pounds

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR -- CLASS C TELEGRAPHY

(Key-down conditions per tube without amplitude modulation)†

MAXIMUM RATINGS, ABSOLUTE VALUES

DC Plate Voltage	5,500 Volts
DC Grid Voltage	—1,500 Volts
DC Plate Current	1.3 Amperes
DC Grid Current	0.15 Amperes
Plate Input	7 Kilowatts
Plate Dissipation	3 Kilowatts

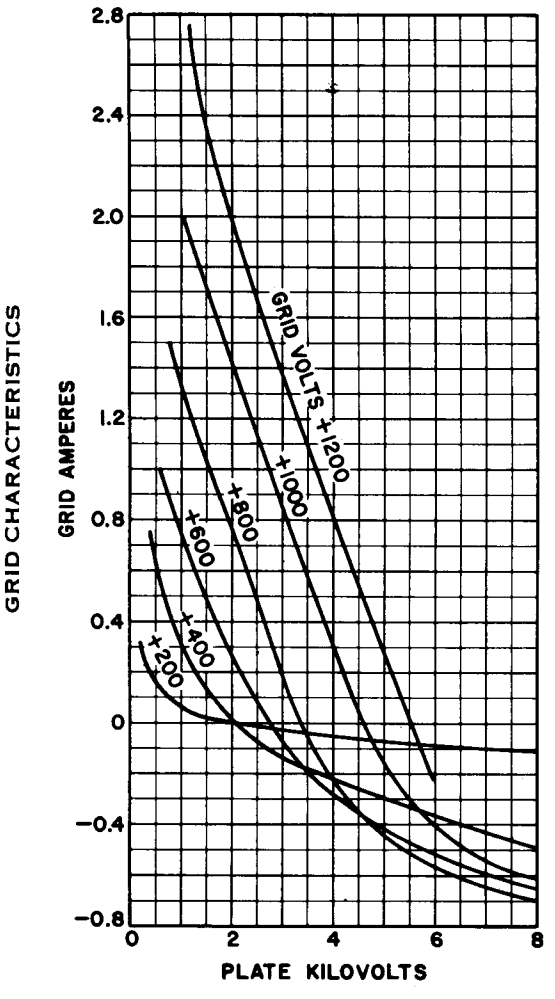
TYPICAL OPERATION

DC Plate Voltage	4,500	5,000 Volts
DC Grid Voltage	—500	—600 Volts
Peak R-F Grid Voltage	1,100	1,300 Volts
DC Plate Current	1.0	1.2 Amperes
DC Grid Current, Approximate	0.12	0.13 Amperes
Driving Power, Approximate	120	160 Watts
Power Output, Approximate	3.0	4 Kilowatts

† Modulation essentially negative may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

MAXIMUM RATINGS vs. OPERATING FREQUENCY

Frequency	30	50 Megacycles
Percentage of Maximum Rated Plate Voltage and Plate Input		
Class C — Telegraphy	100	75 Per Cent



CONSTANT CURRENT CHARACTERISTICS

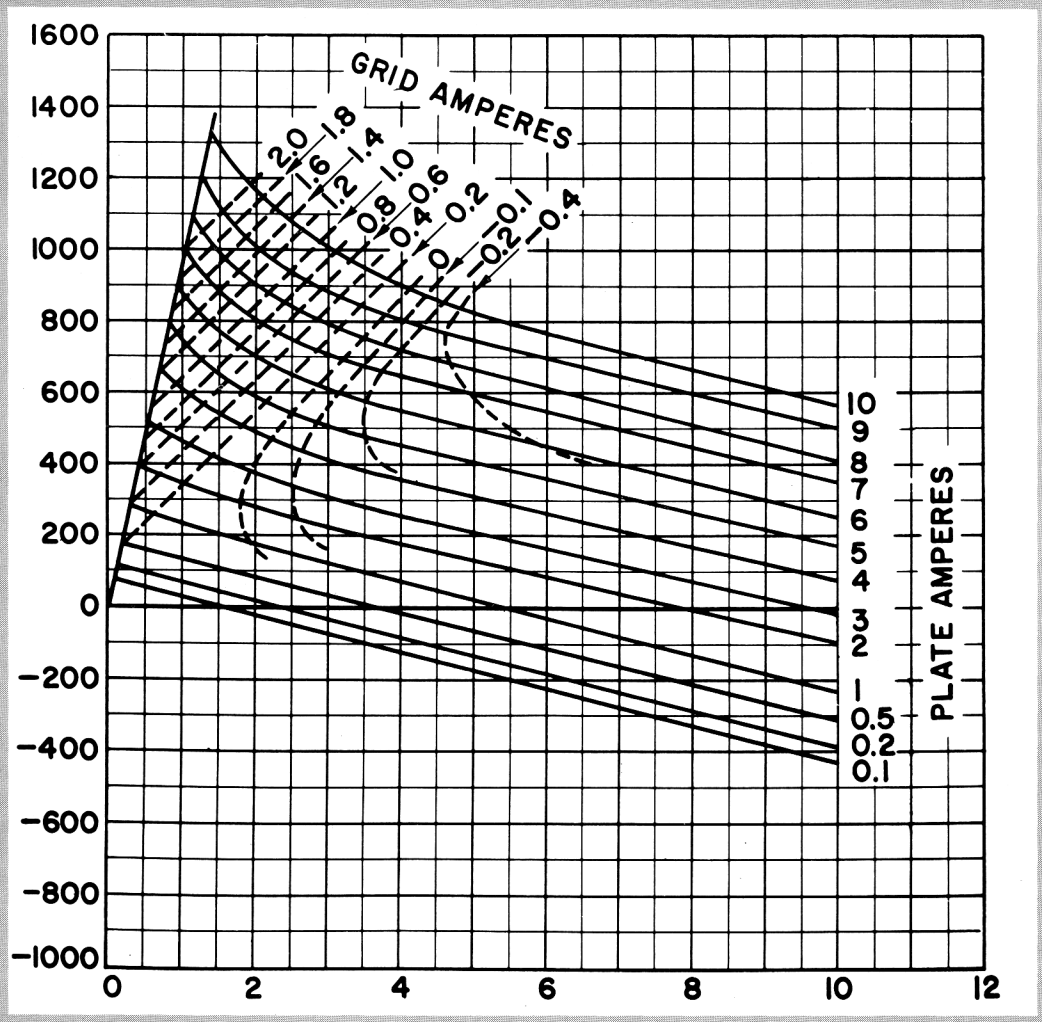
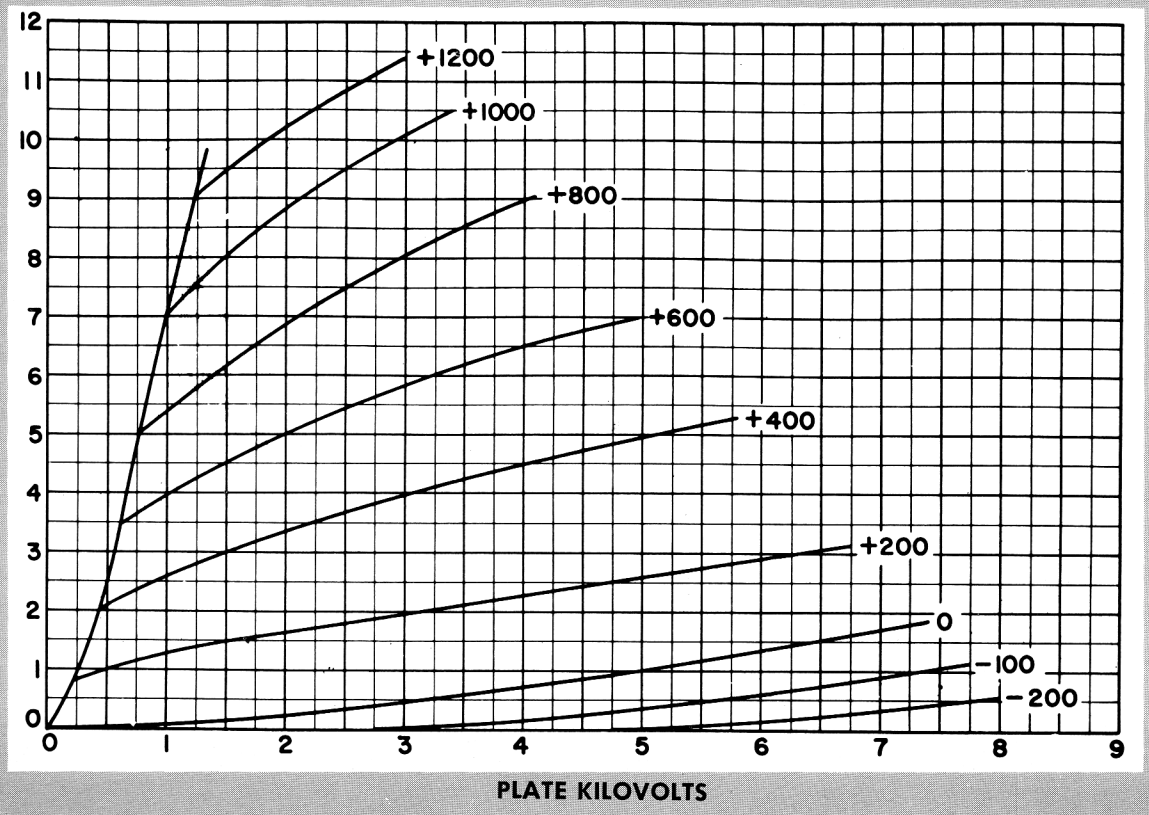


PLATE CHARACTERISTICS



POWER TRIODE

TYPE

6366

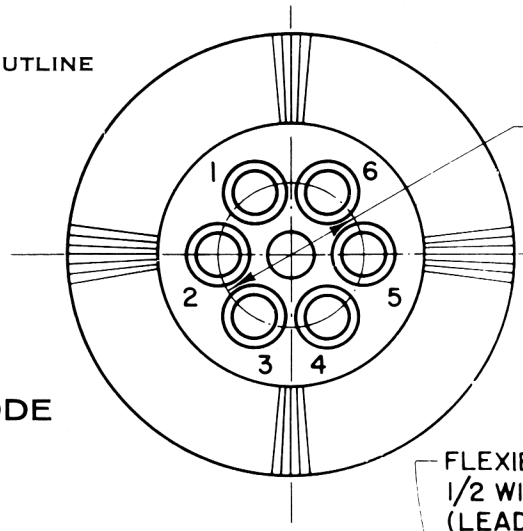
PLATE DISSIPATION —3KW

CENTRAL ELECTRONIC

MANUFACTURERS

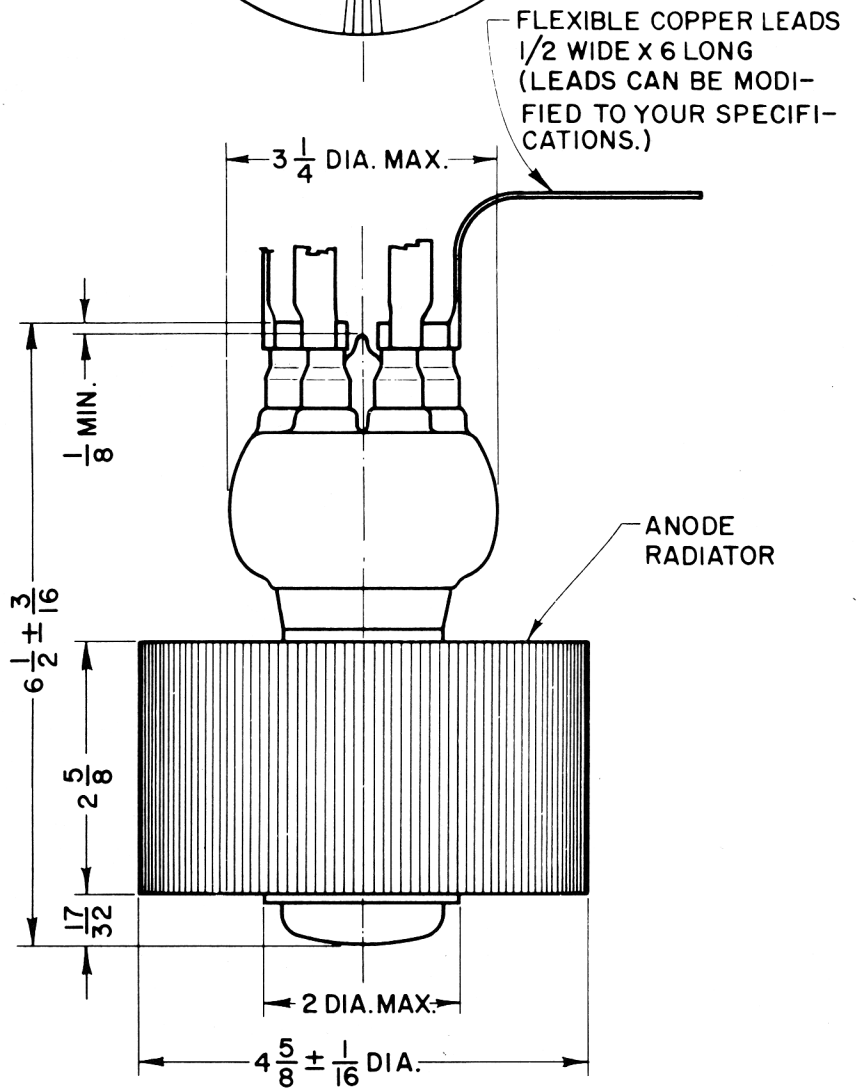
DENVILLE, NEW JERSEY

OUTLINE



TERMINAL COLOR CODE

1=GRID -- BLACK
2=FIL. -- YELLOW
3=GRID -- BLACK
4=F.C.T. -- RED
5=GRID -- BLACK
6=FIL. -- YELLOW



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CENTRAL ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

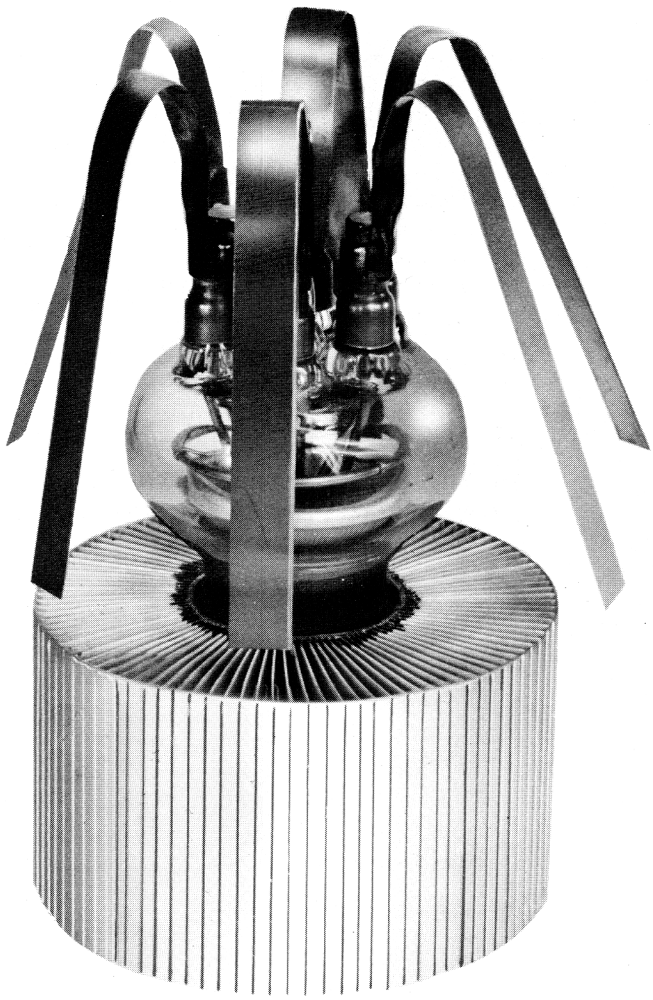
POWER TRIODE
TYPE
6367
PLATE DISSIPATION
—3KW

POWER TRIODE

DESCRIPTION

The Nucor tube type 6367 is a forced-air-cooled general purpose, three electrode tube, specifically designed for industrial and communication applications. The anode is capable of dissipating 3 kilowatts. It features a sturdily-supported, double-spiral thoriated tungsten filament. Rugged kovar grid and filament seals, insures greater protection against mechanical stress and shock. The wide spacing between elements and the high efficiency, low pressure radiator are additional features of this tube. Flexible leads constructed of O.F.H.C. copper can be modified to individual customer requirements.

Full input ratings apply to 30 mc. Reduced ratings, as indicated, are applicable for useful power outputs extending to 50 mc.



SPECIFICATIONS

ELECTRICAL:

Filament Voltage	13.0 Volts
Filament Current	36 Amperes
Amplification Factor, E_c = —200V, I_b = 0.2A	25
Interelectrode Capacitances	
Grid-Plate	14.7 $\mu\mu$f
Grid-Filament	14.5 $\mu\mu$f
Plate-Filament	1.7 $\mu\mu$f

PHYSICAL:

Mounting Position — Vertical

Type of Cooling — Forced-Air

Maximum Incoming Air Temperature ..... 45°C

Required Air Flow on Anode

Plate Dissipation (Kilowatts) ..	3	2.4	1.8
Air Flow — Cubic Feet Per Min.	190	125	75
Pressure — Inches Water	1.21	0.58	0.26

Maximum Glass Temperature .. 150°C

Net Weight Approximate ..... 4¼ Pounds

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR -- CLASS B

MAXIMUM RATINGS, ABSOLUTE VALUES

DC Plate Voltage	6,200 Volts
Maximum Signal DC Plate Current*	2.0 Amperes
Maximum Signal Plate Input*	6.0 Kilowatts
Plate Dissipation*	3 Kilowatts

TYPICAL OPERATION

(Unless otherwise specified, values are for two tubes)

DC Plate Voltage	5,000 Volts
DC Grid Voltage	—150 Volts
Peak A-F Grid-to-Grid Voltage	1,260 Volts
Zero Signal DC Plate Current	0.4 Ampere
Maximum Signal DC Plate Current	2.25 Amperes
Effective Load Resistance, Plate-to-Plate	4,000 Ohms
Maximum Signal Driving Power, Approximate	175 Watts
Maximum Signal Power Output, Approximate	7.2 Kilowatts

*Averaged over any audio-frequency cycle of sine-wave form.

PLATE MODULATED RADIO-FREQUENCY POWER AMPLIFIER -- CLASS C TELEPHONY

(Carrier conditions per tube for use with a maximum modulation factor of 1.0)

MAXIMUM RATINGS, ABSOLUTE VALUES

DC Plate Voltage	5,000 Volts
DC Grid Voltage	—1,500 Volts
DC Plate Current	1.5 Amperes
DC Grid Current	0.2 Ampere
Plate Input	7.5 Kilowatts
Plate Dissipation	2 Kilowatts

TYPICAL OPERATION

DC Plate Voltage	5,000 Volts
DC Grid Voltage	—800 Volts
Peak R-F Grid Voltage	1,370 Volts
DC Plate Current	0.74 Ampere
DC Grid Current, Approximate	0.10 Ampere
Driving Power, Approximate	130 Watts
Power Output, Approximate	2.7 Kilowatts

RADIO-FREQUENCY POWER AMPLIFIER -- CLASS B

(Carrier conditions per tube for use with a maximum modulation factor of 1.0)

MAXIMUM RATINGS, ABSOLUTE VALUES

DC Plate Voltage	6,200 Volts
DC Plate Current	1.5 Amperes
Plate Input	4.5 Kilowatts
Plate Dissipation	3 Kilowatts

TYPICAL OPERATION

DC Plate Voltage	6,000 Volts
DC Grid Voltage	—160 Volts
Peak R-F Grid Voltage	300 Volts
DC Plate Current	0.56 Ampere
DC Grid Current, Approximate	0.0 Amperes
Driving Power, Approximate**	47 Watts
Power Output, Approximate	1 Kilowatt

**At crest of audio-frequency cycle with modulation factor of 1.0.

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR -- CLASS C TELEGRAPHY

(Key-down conditions per tube without amplitude modulation) †

MAXIMUM RATINGS, ABSOLUTE VALUES

DC Plate Voltage	6,200 Volts
DC Grid Voltage	—1,500 Volts
DC Plate Current	2.0 Amperes
DC Grid Current	0.2 Ampere
Plate Input	12 Kilowatts
Plate Dissipation	3 Kilowatts

TYPICAL OPERATION

DC Plate Voltage	6,000 Volts
DC Grid Voltage	—800 Volts
Peak R-F Grid Voltage	1,510 Volts
DC Plate Current	1.4 Amperes
DC Grid Current, Approximate	0.16 Ampere
Driving Power, Approximate	225 Watts
Power Output, Approximate	6 Kilowatts

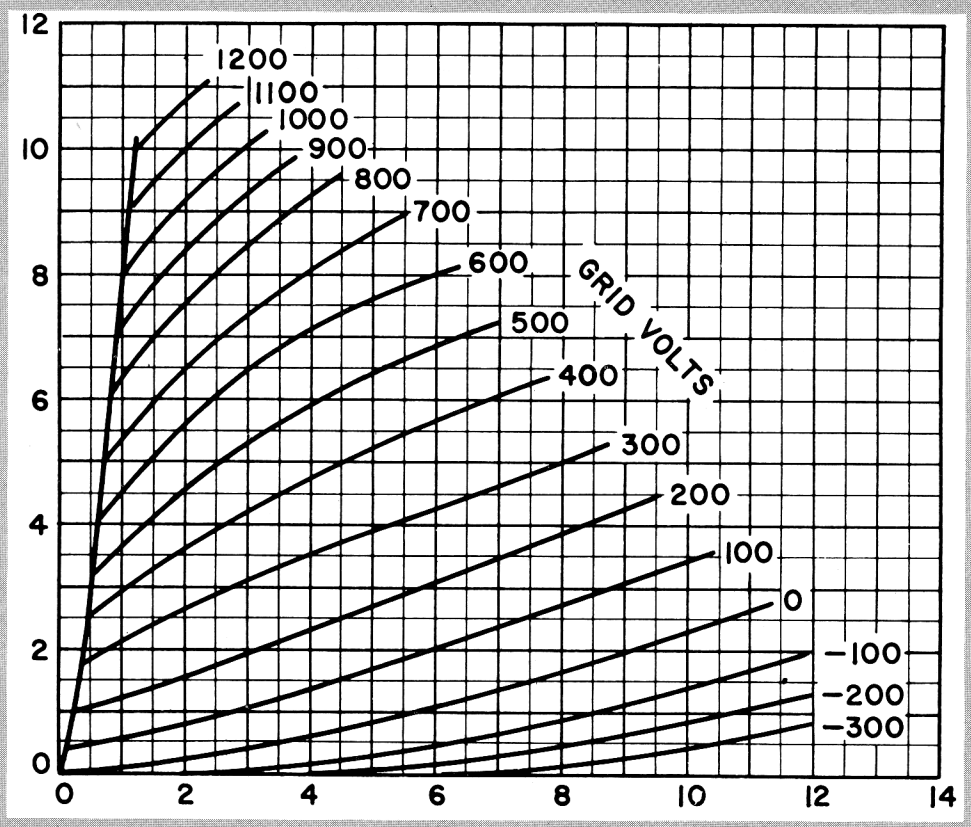
† Modulation, essentially negative, may be used if the positive peak of the envelope does not exceed 115 per cent of the carrier conditions.

MAXIMUM RATINGS vs. OPERATING FREQUENCY

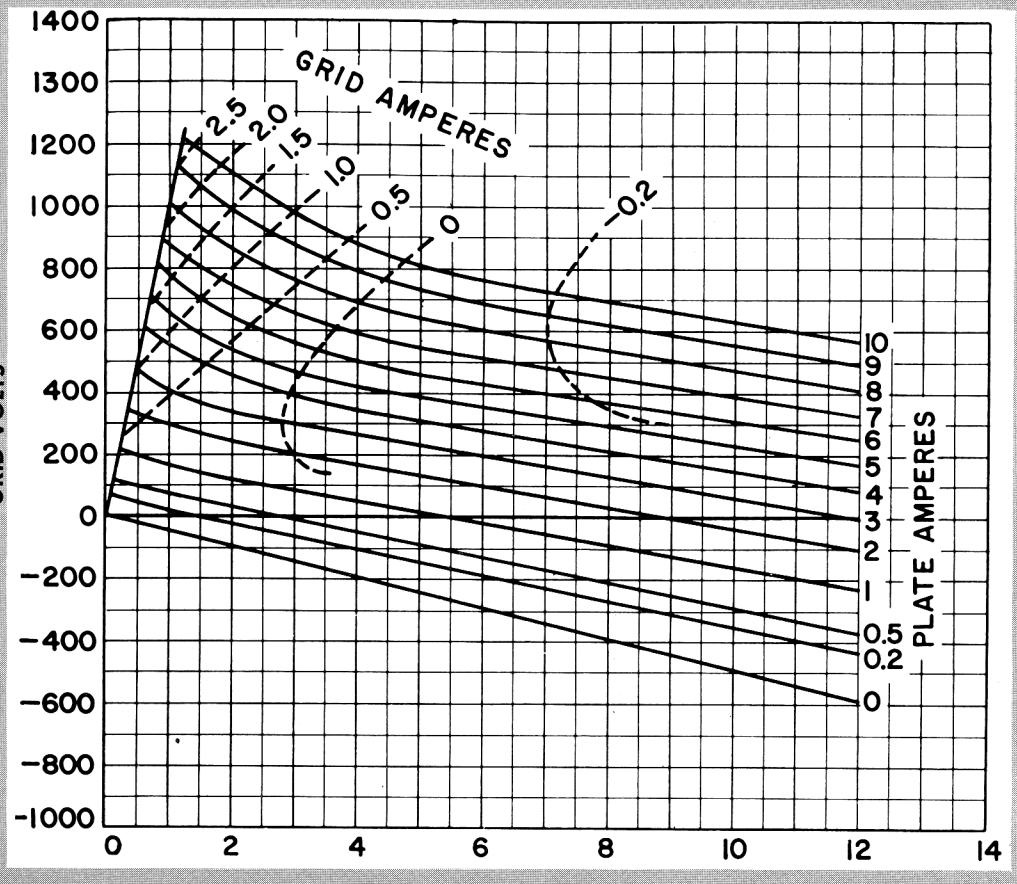
Frequency	30	50 Megacycles
Percentage of Maximum Rated Plate Voltage and Plate Input		
Class C — Telegraphy	100	75 Per Cent

(Unless otherwise specified, values are for two tubes)

PLATE CHARACTERISTICS



CONSTANT CURRENT CHARACTERISTICS



POWER TRIODE

TYPE

6367

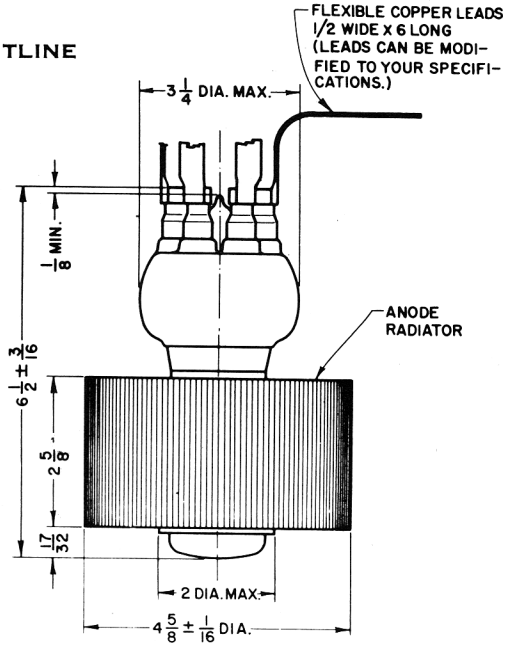
PLATE DISSIPATION —3KW

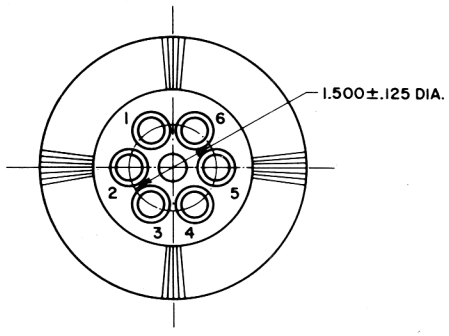
CENTRAL ELECTRONIC

MANUFACTURERS

DENVILLE, NEW JERSEY

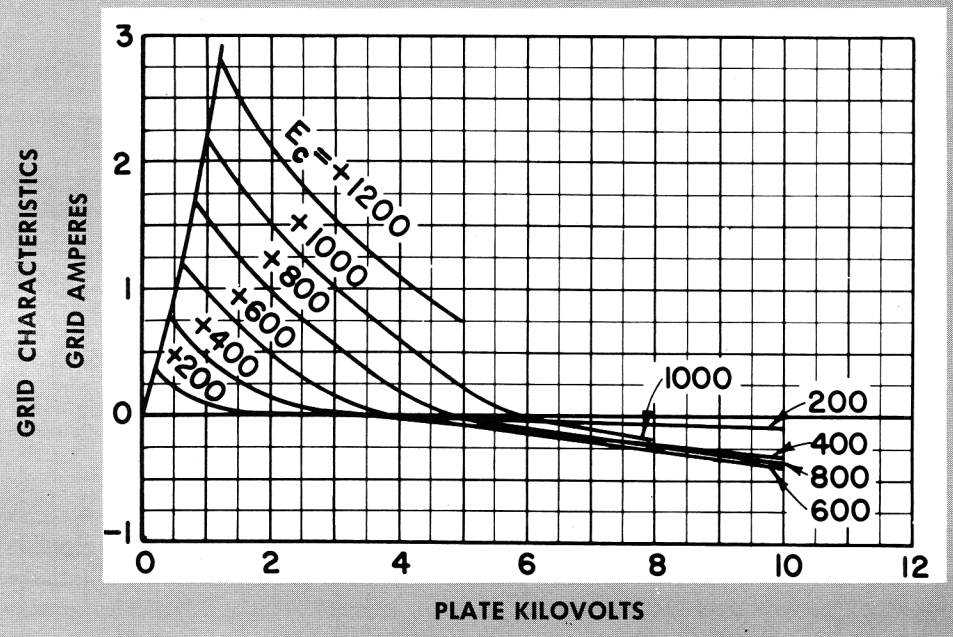
OUTLINE





TERMINAL COLOR CODE

1=GRID -- BLACK
2=FIL. -- YELLOW
3=GRID -- BLACK
4=F.C.T. -- RED
5=GRID -- BLACK
6=FIL. -- YELLOW



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Central ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

PULSE MODULATOR TRIODE TYPE 6544
Anode Dissipation 1 Kw

HIGH VOLTAGE PULSE MODULATOR TRIODE



DESCRIPTION

The CENTRAL tube type 6544 is a forced-air-cooled high vacuum tube, specifically designed for radar pulse modulation applications. The tube can capably provide 1 megawatt output pulses with 8 kilowatts peak driving power. The tube design features a beamed oxide coated cathode structure, a squirrel cage control grid, a shield grid internally connected to the cathode and a forced air cooled anode capable of dissipating 1 kilowatt continuously.

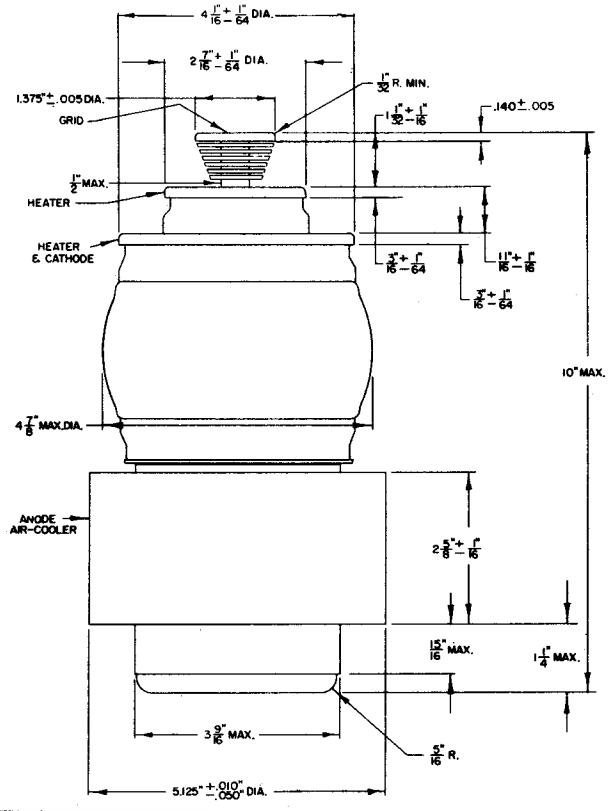
SPECIFICATIONS

MECHANICAL

Mounting Position (support tube by anode radiator only)	Any
Type of Cooling	Forced-air (1)
Air flow on anode (at 75°C and 14.7 psi ambient atmospheric pressure)	150 cfm (2)
Static pressure, inches of water	0.8
Air flow on grid radiator, minimum	5 cfm
Maximum incoming air temperature	75°C
Maximum Glass Temperature	175°C (1)
Net Weight, approximate	12 pounds

ELECTRICAL

Heater Voltage	6.0 ± 5% volts
Heater Current	60 amperes
Heater Starting Current, maximum	300 amperes
Cathode Warm-Up Time (3)	10 minutes
Amplification Factor	90
Interelectrode Capacitances:	
Grid-Anode, maximum	4 uuf
Grid-Cathode	250 uuf
Anode-Cathode	40 uuf



PULSE MODULATOR TRIODE TYPE 6544

Anode Dissipation 1 Kw

Central ELECTRONIC MANUFACTURERS

DENVILLE, NEW JERSEY

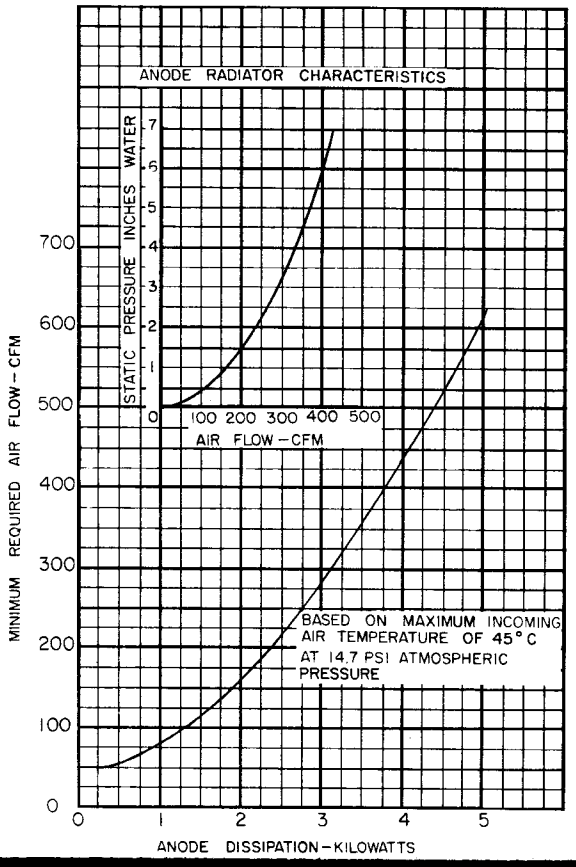
MAXIMUM RATINGS

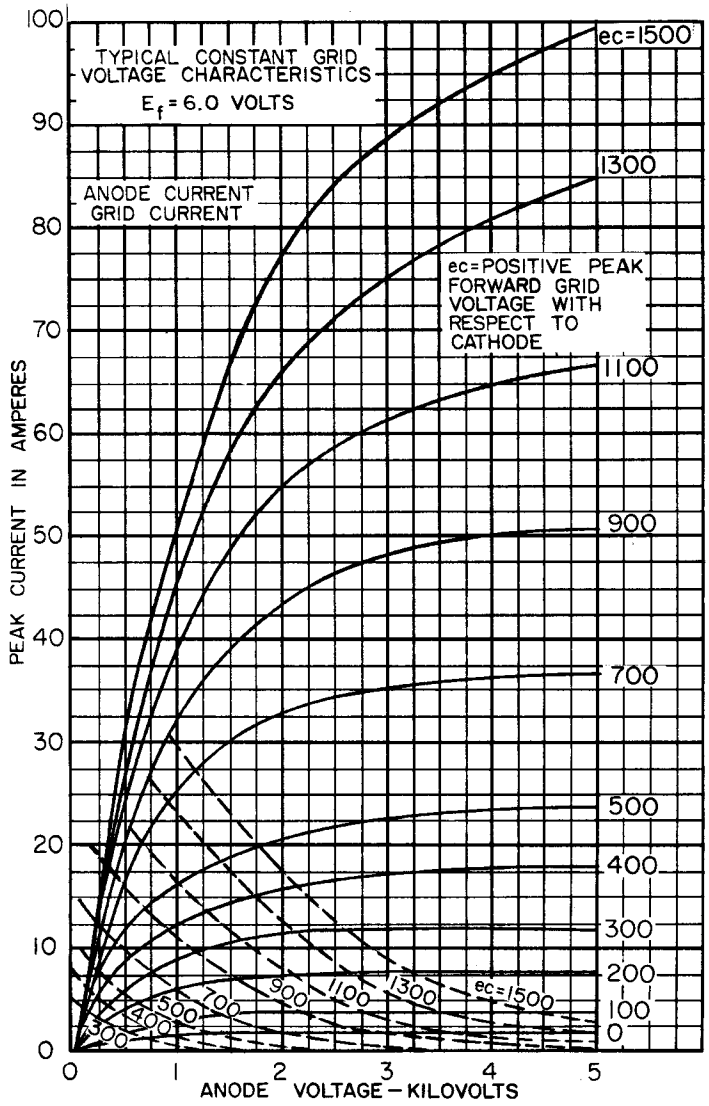
Maximum Ratings, Absolute Values

Pulse Width (4 & 5)	6 microseconds
Duty Factor	.03
Peak Anode Voltage	25 kilovolts
DC Anode Voltage	20 kilovolts
DC Grid Voltage	—600 volts
Peak Positive Grid Voltage	1500 volts
Peak Cathode Current	70 amperes
DC Anode Current	250 milliamperes
Grid Dissipation	75 watts
Anode Dissipation (150 cfm @ 0.8" water)	1000 watts

Typical Operation: Pulse Modulator or Amplifier
Class C (5)

DC Anode Voltage	18 kilovolts
DC Grid Voltage	—500 volts
Pulse Positive Grid Voltage	1200 volts
Pulse Anode Current	65 amperes
Pulse Grid Current	5 amperes
Load Resistance	225 ohms
Duty Factor	.0015
Pulse Power Input	12 kilowatts
Pulse Power Output	1000 kilowatts





(1) Sufficient air cooling must be provided to keep glass seal temperatures at less than 175°C under all conditions of operation.

(2) For air-flow requirements at other temperatures and pressures, consult the Central Engineering Department.

(3) For accelerated cathode warm-up, the heater may be energized at 7 volts for 5 minutes and then reduced to 6 volts for high-voltage operation. If a heater stand-by voltage of 5 volts is used, the minimum cathode warm-up time is 1 minute at 6 volts.

(4) Under certain conditions of operation, longer pulses may be possible.

(5) For information concerning specific tube problems or applications not covered, consult the Central Engineering Department.

Central ELECTRONIC
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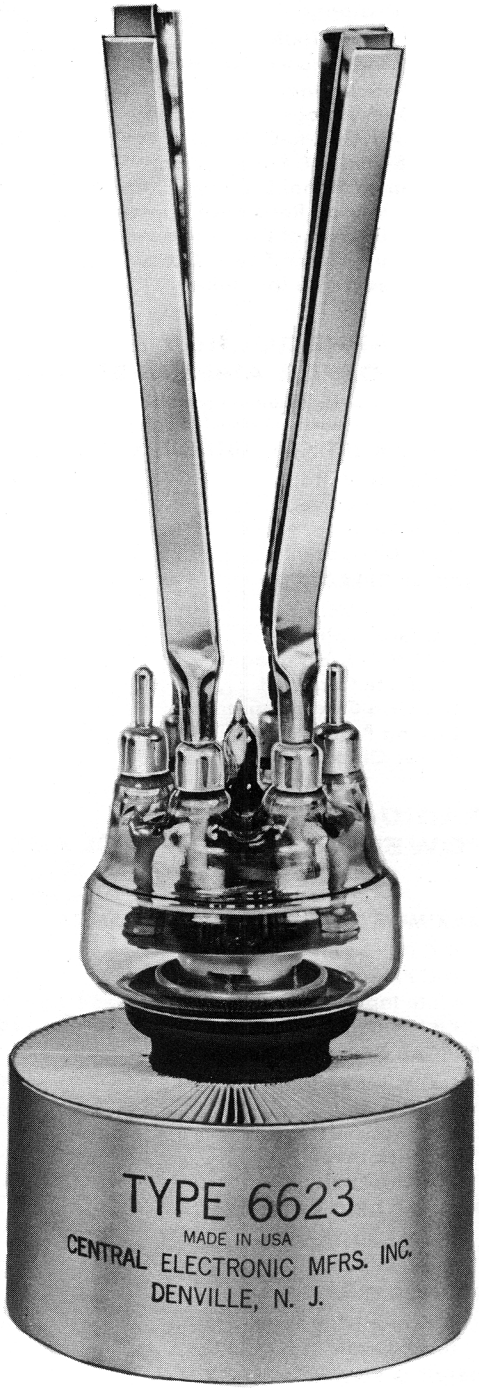
POWER TRIODE

TYPE
6623
PLATE DISSIPATION
—3KW

POWER TRIODE

DESCRIPTION

The **6623** is a three-electrode tube designed for use as a modulator, amplifier or oscillator in AM, FM and TV broadcasting service, high-frequency communications systems, and induction and dielectric heating equipments. Two grid terminals provide a low-inductance connection to the grid making the tube suited especially to cathode-drive operation. The emitter is a thoriated-tungsten filament connected for single-phase operation. The anode is forced-air cooled and can readily dissipate 2.5 kw with nominal air flow. Special features include: precise and stable alignment of electrodes to prevent grid-cathode shorts and to assure reliability and uniform operation, brazed radiator construction to eliminate hot-spotting and its detrimental effects. Maximum ratings of 5.0 kv dc plate voltage and 5.0 kw plate input apply at frequencies up to 60 mc; operation at 100 mc is permissible with plate voltage and input reduced to 80% of maximum ratings.



SPECIFICATIONS

ELECTRICAL

Filament	Thoriated tungsten
Filament Voltage	6.0 Volts
Filament Current	60 Amps
Filament Cold Resistance	0.016 Ohms
Amplification Factor	22
Interelectrode Capacitances:	
Grid-Plate	16 $\mu\mu$f
Grid-Filament	19 $\mu\mu$f
Plate-Filament	1.0 $\mu\mu$f
Mounting Socket	CAS-A or CAS-B series

PHYSICAL

Mounting Position	Vertical, Anode Up or Down
Type of Cooling	Forced Air
Maximum Incoming Air Temperature	45°C
Required Air-Flow on Anode	150 cfm
Static Pressure, Inches Water	0.9 Inches
Maximum Radiator Temperature	180°C
Required Air-Flow to Bulb and Seals	
Air-Flow through radiator normally is sufficient	
Maximum Bulb Temperature	160°C
Net Weight, approximate	4 lbs.

Note: Cooling of header and envelope may be provided by deflecting anode cooling air or by a separate blower delivering 10 cfm air.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

(CONTINUOUS COMMERCIAL SERVICE)

AUDIO-FREQUENCY POWER AMPLIFIER AND MODULATOR CLASS B

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C Plate Voltage	3000 volts
Maximum Signal D-C Plate Current*	1.75 amps
Maximum Signal Plate Input*	4200 watts
Plate Dissipation*	2500 watts

TYPICAL OPERATION

(Unless otherwise specified, values are for two tubes)

D-C Plate Voltage	3000 volts
D-C Grid Voltage	—160 volts
Peak A-F Grid-to-Grid Voltage	820 volts
Zero Signal D-C Plate Current	0.66 amp
Maximum Signal D-C Plate Current	2.80 amps
Effective Load Resistance, Plate-to-Plate	3060 ohms
Maximum Signal Driving Power, approx.	140 watts
Maximum Signal Power Output, approx.	4350 watts
Load Resistance (per tube)	765 ohms

RADIO-FREQUENCY AND POWER AMPLIFIER -- CLASS B

Carrier conditions per tube for use with a maximum modulation factor of 1.0

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C Plate Voltage	3500 volts
D-C Plate Current	1.75 amps
Plate Input	3500 watts
Plate Dissipation	2500 watts

TYPICAL OPERATION

D-C Plate Voltage	3000 volts
D-C Grid Voltage	—160 volts
Peak R-F Grid Voltage	280 volts
D-C Plate Current	1.1 amps
D-C Grid Current, approx.	0.050 amp
Driving Power, approx.††	15 watts
Power Output, approx.	800 watts

RADIO-FREQUENCY POWER AMPLIFIER -- CLASS B

Grounded-Grid, Wide-Band Television Service, Maximum Frequency — 88 Megacycles

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C Plate Voltage	3500 volts
D-C Plate Current	1.75 amps
Plate Input	4000 watts
Plate Dissipation##	2800 watts

TYPICAL OPERATION

D-C Plate Voltage	2600 volts
D-C Plate Current:	
Synchronizing Level	2.32 amps
Black Level	1.47 amps
D-C Grid Voltage	—160 volts
PEAK R-F GRID VOLTAGES:	
Synchronizing Level	535 volts
Black Level	400 volts
D-C GRID CURRENT:	
Synchronizing Level	0.430 amp
Black Level	0.136 amp
DRIVING POWER, APPROX.:	
Synchronizing Level	1160 watts
Black Level	535 watts
POWER OUTPUT, APPROX. #:	
Synchronizing Level	3680 watts
Black Level	1690 watts

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR CLASS C TELEGRAPHY

Key-down conditions per tube without amplitude modulation†

MAXIMUM RATINGS, ABSOLUTE VALUES

	60 mc	110 mc
D-C Plate Voltage	5000	3500 volts
D-C Grid Voltage	—1000	—700 volts
D-C Plate Current	1.4	1.4 amps
D-C Grid Current	0.5	0.5 amp
Plate Input	5000	3500 watts
Plate Dissipation	2500	2500 watts

TYPICAL OPERATION

	60 mc	110 mc	
D-C Plate Voltage	5000	3500	3500 volts
D-C Grid Voltage	—850	—600	—300 volts
Peak R-F Grid Voltage	1200	940	555 volts
D-C Plate Current	1.0	1.0	1.0 amps
D-C Grid Current	0.210	0.250	0.155 amp
Driving Power, approx.	250	235	85 watts
Power Output, approx.	4100	2800	2550 watts

PLATE-MODULATED RADIO-FREQUENCY POWER AMPLIFIER CLASS C TELEPHONY

Carrier conditions per tube for use with a maximum modulation factor of 1.0

MAXIMUM RATINGS, ABSOLUTE VALUES

D-C Plate Voltage	3500 volts
D-C Grid Voltage	—1000 volts
D-C Plate Current	1.4 amps
D-C Grid Current	0.5 amp
Plate Input	4000 watts
Plate Dissipation	1650 watts

TYPICAL OPERATION

D-C Plate Voltage	3500 volts
D-C Grid Voltage	—600 volts
Peak R-F Grid Voltage	950 volts
D-C Plate Current	1.14 amps
D-C Grid Current, approx.	0.28 amp
Driving Power, approx.	270 watts
Power Ouptut, approx.	3200 watts

*Averaged over any audio-frequency cycle of sine-wave form.

††At crest of audio-frequency cycle with modulation factor of 1.0.

##Requires 180 cfm of cooling air at 4 inches static pressure.

#Includes power transferred from driver stage.

†Modulation essentially negative may be used if the positive peak of the carrier envelope does not exceed 115% of the carrier condition.

APPLICATION NOTES

Maximum ratings apply up to 60 megacycles. The tube may be operated at higher frequencies provided the maximum values of the plate voltage and power input are reduced according to the tabulation below. All other maximum ratings remain as shown above. Special attention should be given to adequate ventilation of the bulb at these frequencies. See special television service ratings.

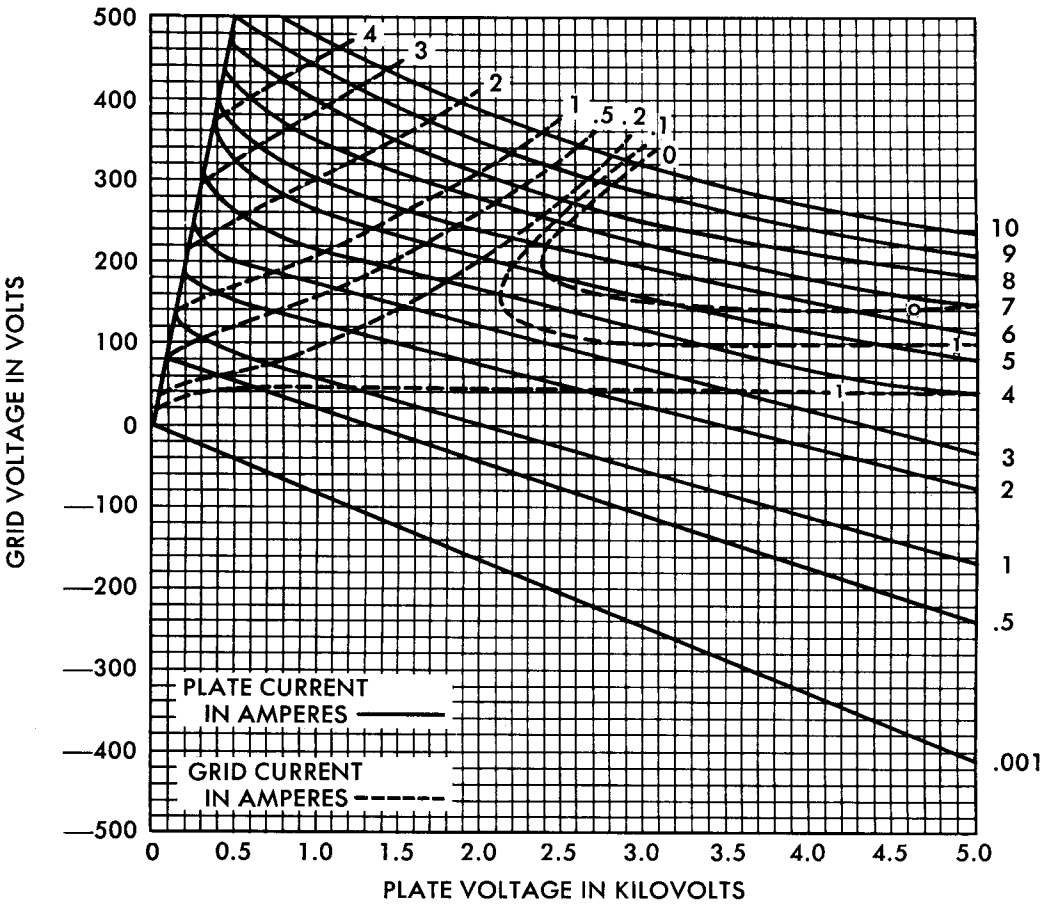
Percentage of Maximum Rated Plate Voltage and Plate Input:

Frequency	60	100	200 mc
Class B	100	85	60%
Class C Plate Modulated	100	80	50%
Class C Unmodulated	100	80	50%

CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

CHARACTERISTIC:	CONDITIONS	LIMITS	
		Min.	Max.
Grid Voltage	e_b = 1000 volts; i_b = 6 amps	——	360 Volts
Grid Current	e_b = 1000 volts; i_b = 6 amps	——	2.2 Amps
Plate Voltage	E_c = −20 volts; I_b = 0.40 amp E_b	1150	1650 Volts
Plate Voltage	E_c = −30 volts; I_b = 0.40 amp E_b	1370	1870 Volts
Peak Cathode Current*		10	—— Amps
Power Output	E_b = 5000 volts; I_b = 1.0 amp E_c = −850 volts; I_g = 0.3 amp f = 60 megacycles	3800	—— Watts

*Represents maximum usable cathode current for tube as plate current plus grid current for any condition of operation.



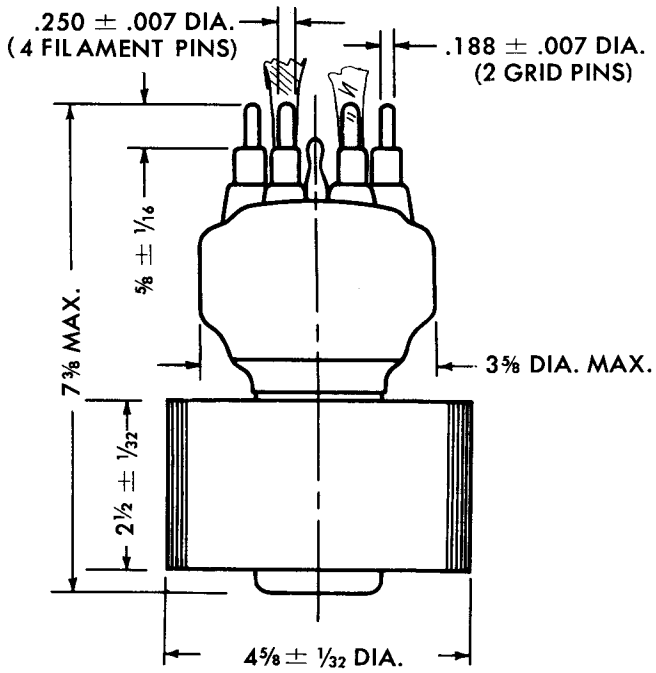
CONSTANT CURRENT CHARACTERISTICS

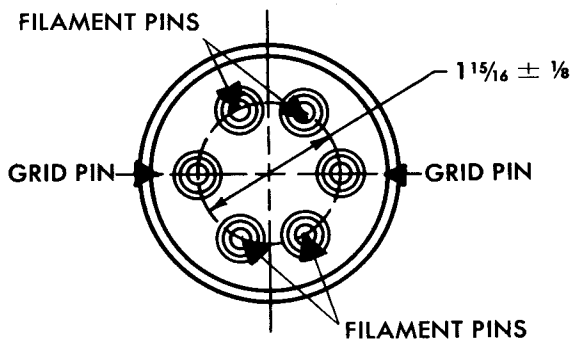
POWER TRIODE

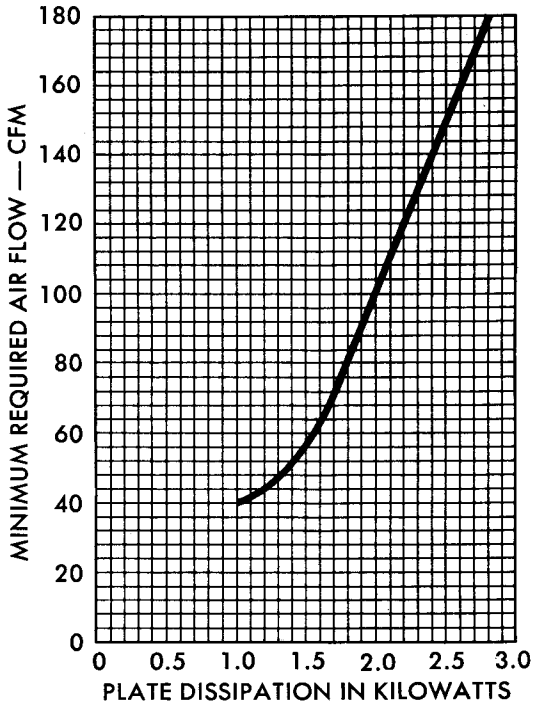
TYPE
6623
PLATE DISSIPATION
—3KW

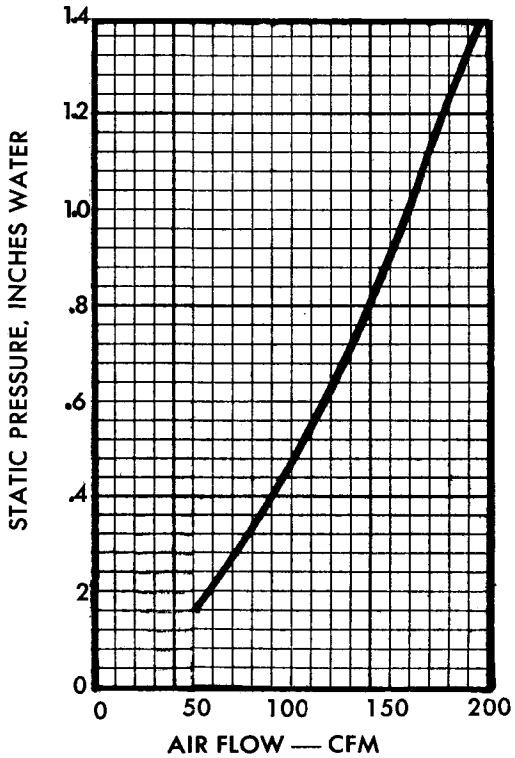
Central ELECTRONIC MANUFACTURERS

DENVILLE, NEW JERSEY









AIR COOLING CHARACTERISTICS

DIVISION OF NUCLEAR CORPORATION OF AMERICA

Printed in U. S. A.

CENTRAL ELECTRONIC MANUFACTURERS
2 RICHWOOD PLACE
DENVILLE, NEW JERSEY

TECHNICAL SPECIFICATIONS FOR 7030

The Central 7030 is a forced-air cooled hard tube diode specifically designed for rectifier, charging and shunt diode service up to 30KV peak inverse voltage. The tube design features a special thoriated tungsten filament capable of high peak currents and long life. The external anode allows for high anode dissipation ratings and efficient air cooling. The 7030 can dissipate 2.5KW continuously at an air flow of 150 cfm.

SPECIFICATIONS:

PHYSICAL

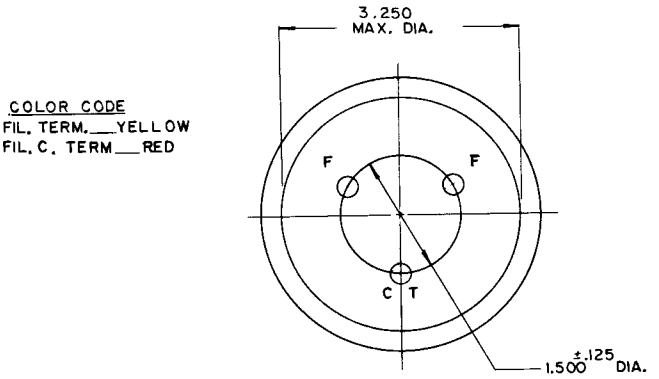
Net Weight, Approximate	6 1/4 pounds
Max. Input Air Temp.	45°C
Max. Glass Seal Temp.	180°C
Mounting Position	Vertical
Type of Cooling	Forced Air

Air Flow Requirements

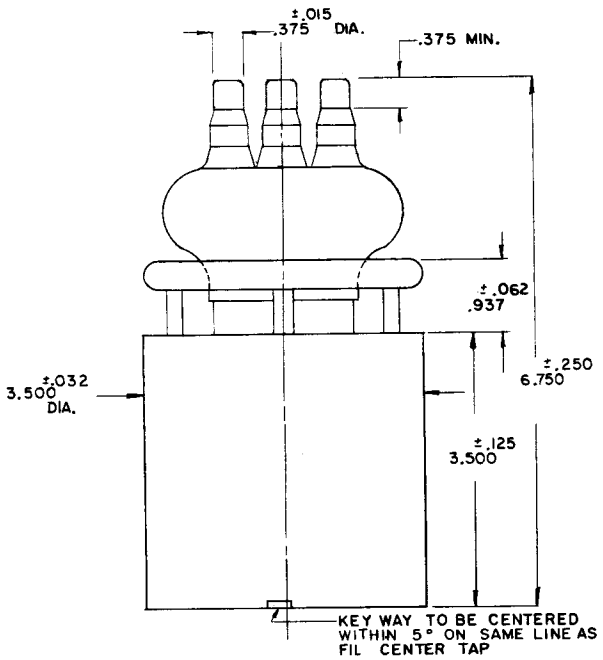
cfm	Dissipation	Press. Drop (in. of water)
150	2.5	2.5
120	2.0	1.6
90	1.5	.9
65	1.0	.65
50	0.5	.5

Interelectrode Capacitance 12 μμf

TYPE 7030
HIGH VACUUM POWER DIODE



TUBULATION TIP-OFF TO BE 1/8 MIN. BELOW TERMINALS

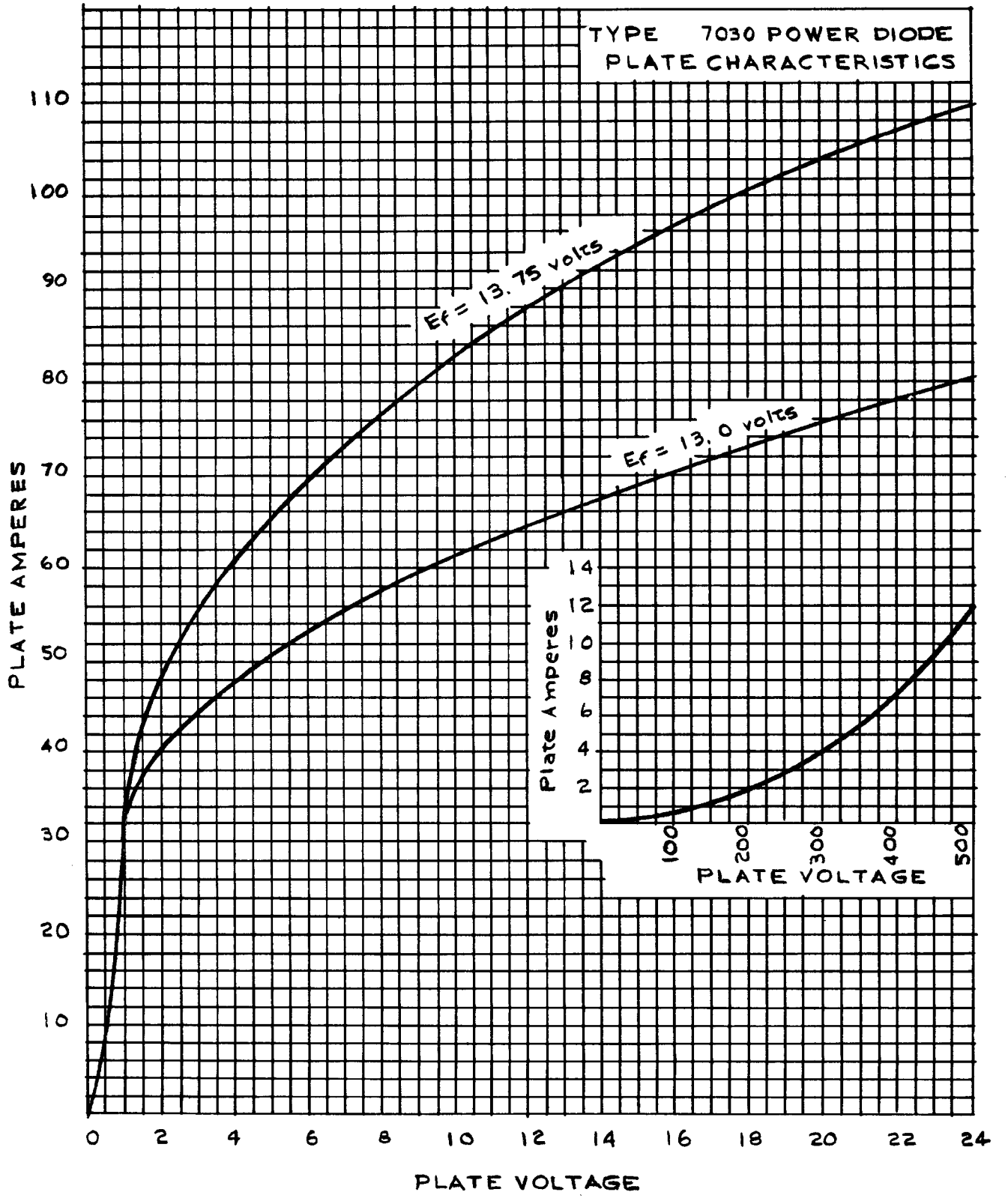


ELECTRICAL (RECTIFIER):

Filament	Thoriated Tungsten
Filament Voltage	13 Volts
Filament Current	36 Amperes
Filament Starting Current	Full filament voltage may be applied to the cold filament.
Peak Inverse Voltage	25KV
Peak Plate Current	20 Amps.
Average Plate Current	6 Amps.

ELECTRICAL (CLIPPER AND SHUNT):

Filament Voltage	13.75 volts.	
Filament Current	38 Amps.	
Peak Inverse Voltage	30KV	30KV
Peak Plate Current	50 Amps.	75 Amps.
Average Plate Current	.7 Amps.	2 Amps.


TYPE 7030 POWER DIODE
PLATE CHARACTERISTICS
Ef = 13.75 volts
Ef = 13.0 volts
PLATE AMPERES
PLATE VOLTAGE
Plate Amperes
PLATE VOLTAGE
0
2
4
6
8
10
12
14
16
18
20
22
24
10
20
30
40
50
60
70
80
90
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10
12
14
100
200
300
400
500

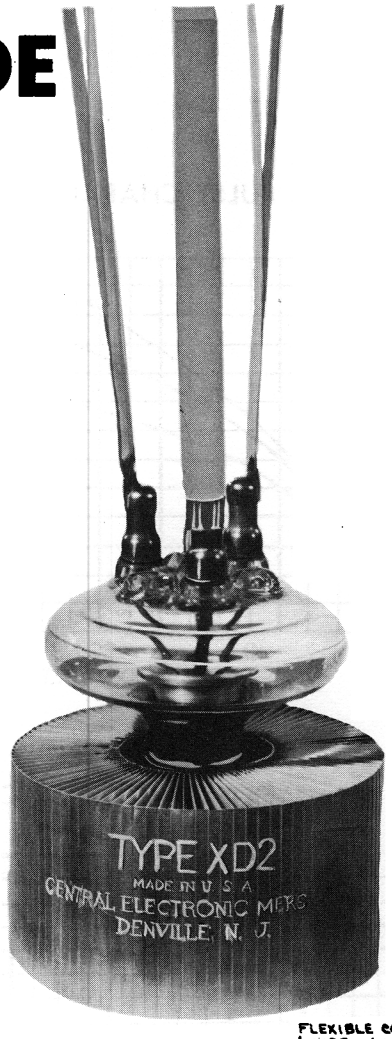
Central ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

HIGH VOLTAGE
HIGH CURRENT
DIODE
TYPE
7131/XD-2
Anode Dissipation
3 Kw

HIGH VOLTAGE HIGH VACUUM DIODE

DESCRIPTION

The Central 7131/XD-2 is a forced-air cooled hard tube diode specifically designed for rectifier, charging and shunt diode service up to 40Kv peak inverse voltage. The tube design features a special thoria-tungsten rilament capable of high peak currents and long life. The external anode allows for high anode dissipation ratings and efficient air cooling when used with the recommended Central air socket. This air socket permits maximum air flow at the anode. The 7131/XD-2 can dissipate 3Kw continuously at an air flow of 190 cfm.



SPECIFICATIONS

PHYSICAL

Overall Length . . . . . 6½ inches
Overall Diameter . . . . . 4⅝ inches
Weight . . . . . 5¼ pounds (approx.)
Mounting Position . . . . . Vertical
Mounting Socket . . . . . CAS-A or CAS-B Series
Type of Cooling . . . . . Forced air

Air Flow

Velocity cfm	Anode Dissipation Rating	Pressure Drop (in. of water)
50	1.0Kw	0.20
75	1.8Kw	0.26
125	2.4Kw	0.58
190	3.0Kw	1.21

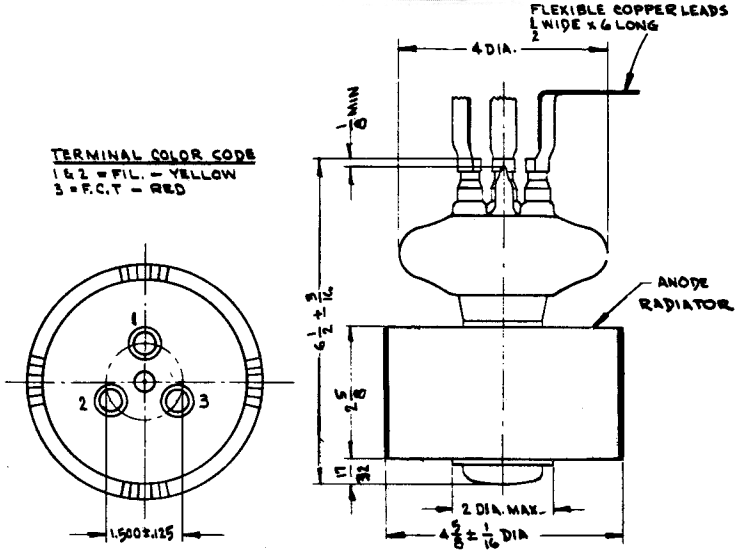
Max. Incoming Air Temperature . . . . . 45°C
Max. Glass Seal Temperature . . . . . 180°C

ELECTRICAL (RECTIFIER)

Filament . . . . . Special Thoriated Tungsten
Filament Voltage . . . . . 13 Volts A.C.
Filament Current . . . . . 36 Amperes
Starting Filament Surge Current . 80 Amperes (max.)
Peak Inverse Voltage . . . . . 40,000 Volts (max.)
Anode Current . . . . . 3 Amperes
Peak Anode Current . . . . . 15 Amperes

ELECTRICAL (CLIPPER, SHUNT or CHARGING DIODE)

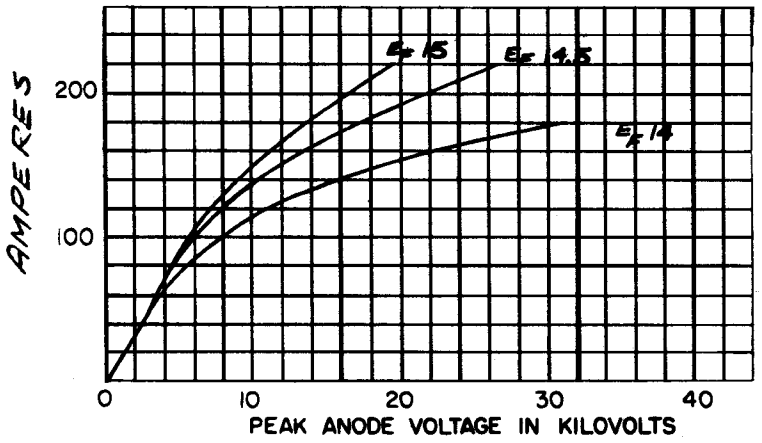
Filament Voltage . . . . . 14.5 Volts A.C. (clipper)
13 Volts A.C. (charging)
Filament Current . . . . . 40 Amperes (clipper)
36 Amperes (charging)
Starting Filament Surge Current 80 Amperes (max.)
Peak Inverse Voltage . . . . . 40,000 Volts (max.)
Anode Current (RMS) . . . . . 6 Amperes
Peak Anode Current . . . . . 150 Amperes (clipper)



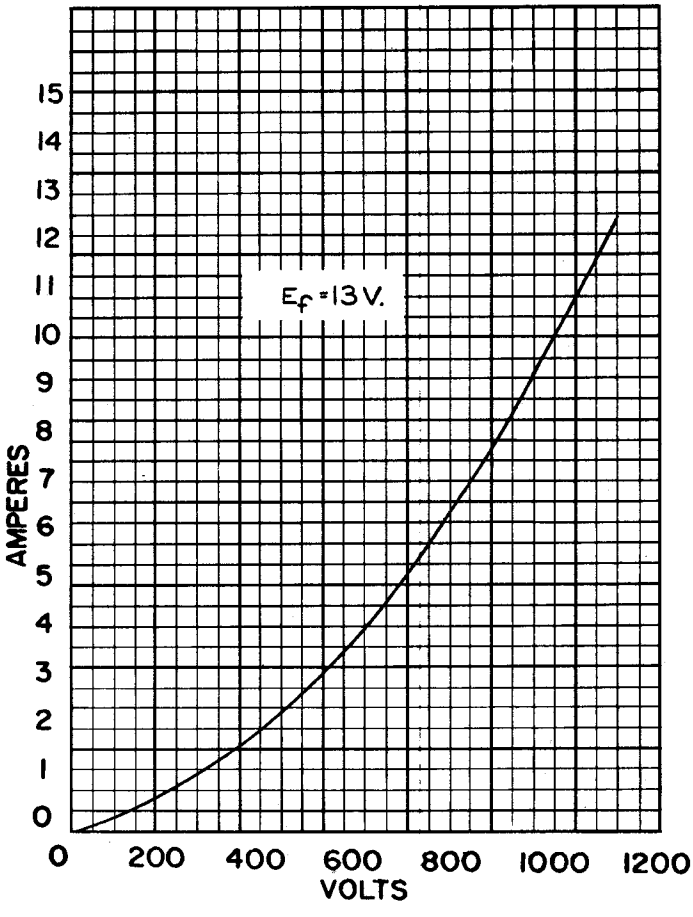
HIGH VOLTAGE
HIGH CURRENT
DIODE
TYPE
7131/XD-2
Anode Dissipation
3 Kw

Central ELECTRONIC
MANUFACTURERS
DENVILLE NEW JERSEY

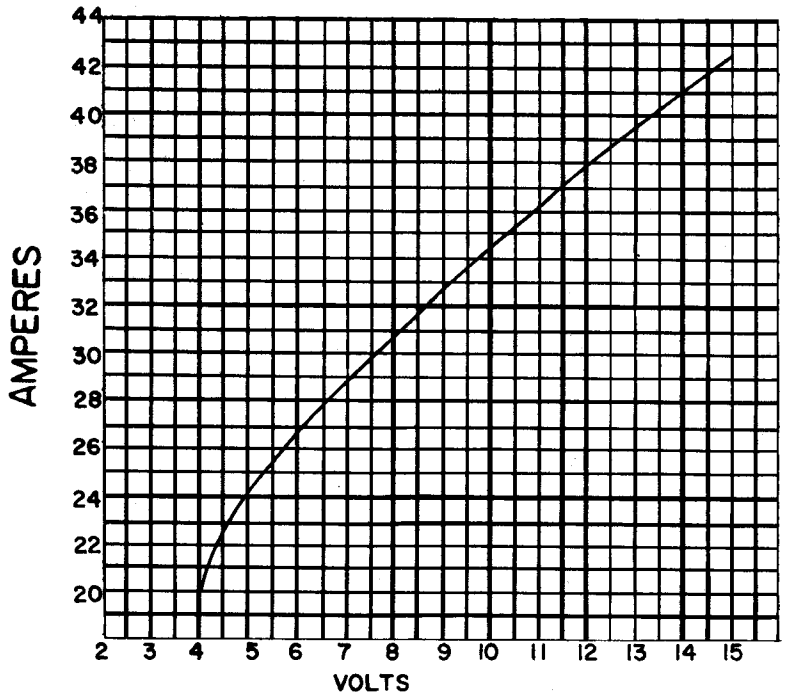
PULSE CHARACTERISTICS



AVERAGE ANODE CHARACTERISTICS



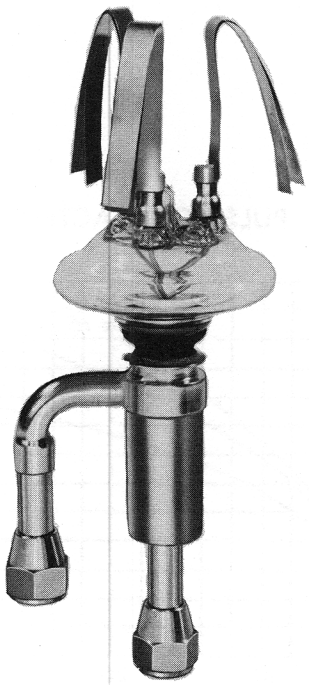
FILAMENT CHARACTERISTICS



Central ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

HIGH VOLTAGE
HIGH CURRENT
DIODE
TYPE
7132/XD-2
Anode Dissipation
5 Kw

HIGH VOLTAGE
HIGH VACUUM DIODE



DESCRIPTION

The Central 7132/XD-2 is a water cooled hard tube diode specifically designed for rectifier, charging and shunt diode service up to 40Kv peak inverse voltage. The tube design features a special thoria-tungsten filament capable of high peak currents and long life. The external anode allows for high anode dissipation ratings and efficient water cooling through its specially designed integral jacket. The 7132/XD-2 can dissipate 5Kw continuously at a water flow of 3 gpm.

SPECIFICATIONS

PHYSICAL

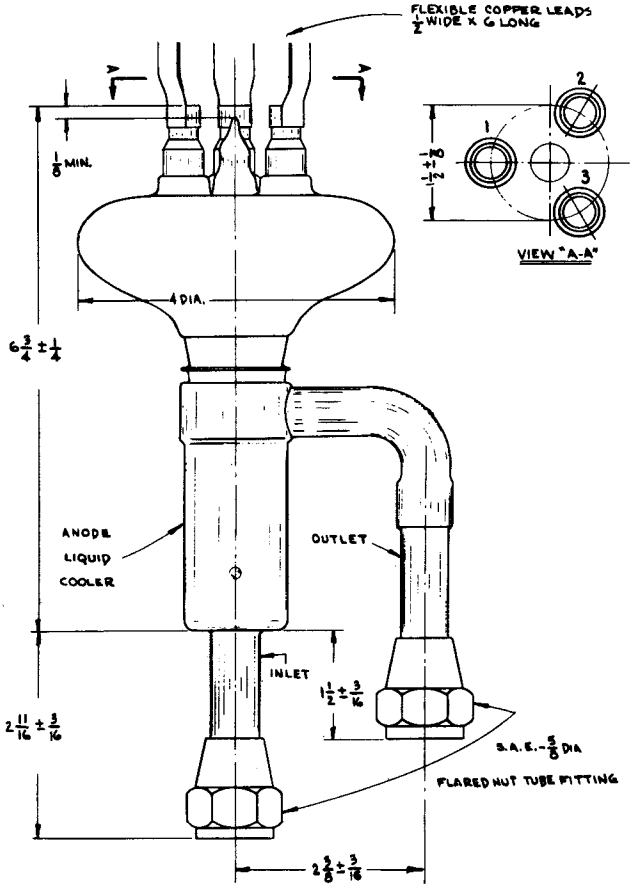
Overall Length	9 7/16 inches
Overall Diameter	4 inches
Weight	1½ pounds (approx.)
Mounting Position	Vertical
Type of Cooling	Water
Water Flow	3 gpm (minimum)
Max. Outlet Temperature	70°C
Max. Glass Seal Temperature	180°C

ELECTRICAL (RECTIFIER)

Filament	Special Thoriated Tungsten
Filament Voltage	13 Volts A.C.
Filament Current	36 Amperes
Starting Filament Surge Current	80 Amperes (max.)
Peak Inverse Voltage	40,000 Volts (max.)
Anode Current	3 Amperes
Peak Anode Current	15 Amperes

ELECTRICAL (CLIPPER, SHUNT or CHARGING DIODE)

Filament Voltage	14.5 Volts A.C. (clipper) 13 Volts A.C. (charging)
Filament Current	40 Amperes (clipper) 36 Amperes (charging)
Starting Filament Surge Current	80 Amperes (max.)
Peak Inverse Voltage	40,000 Volts (max.)
Anode Current (RMS)	6 Amperes
Peak Anode Current	150 Amperes (clipper)



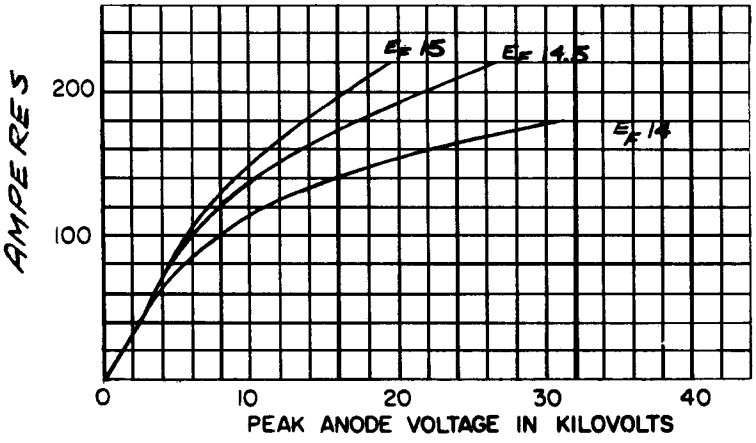
Printed U. S. A.

HIGH VOLTAGE
HIGH CURRENT
DIODE
TYPE
7132/XD-2
Anode Dissipation
5 Kw

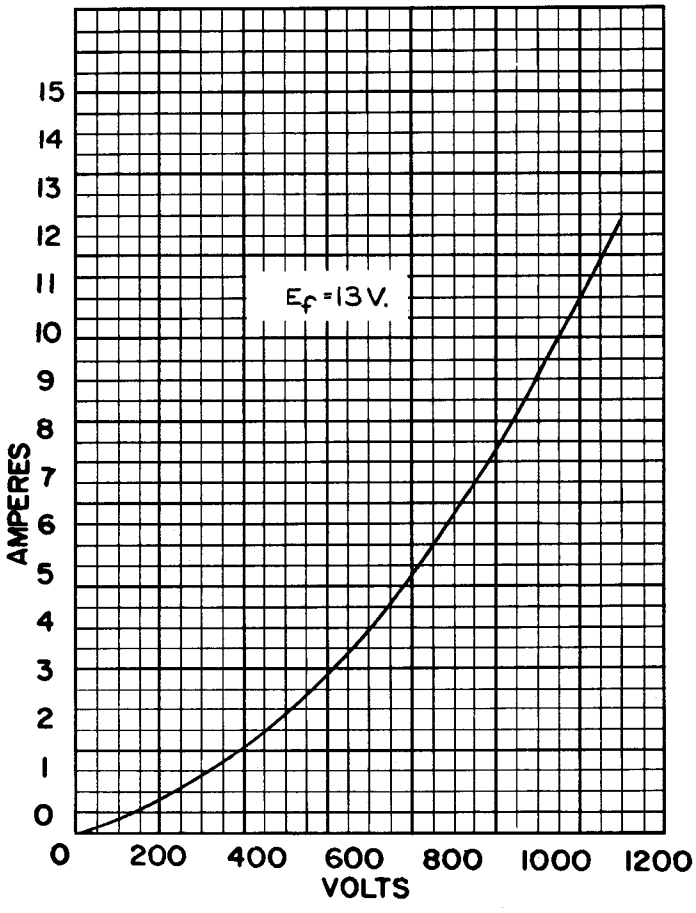
Central ELECTRONIC
MANUFACTURERS

DENVILLE, NEW JERSEY

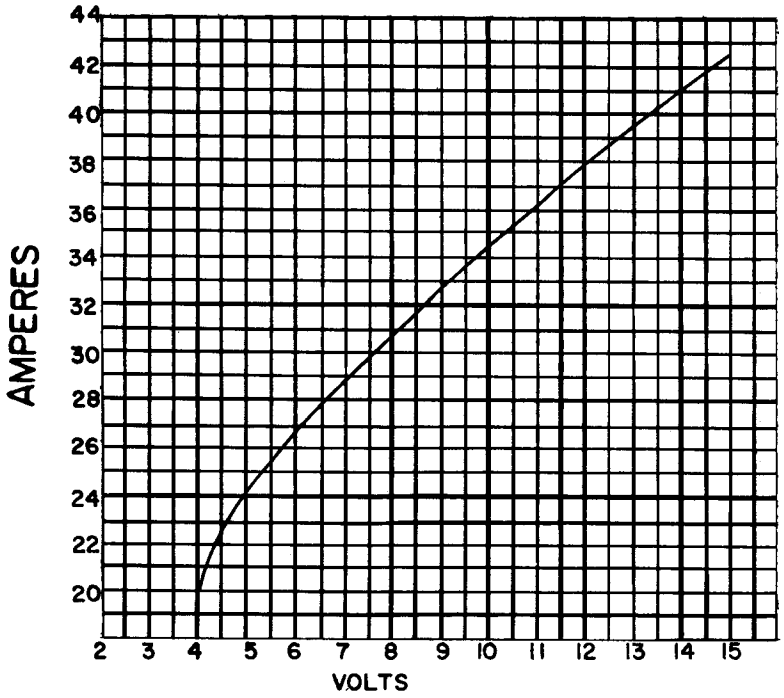
PULSE CHARACTERISTICS



AVERAGE ANODE CHARACTERISTICS



FILAMENT CHARACTERISTICS



DIVISION OF NUCLEAR CORPORATION OF AMERICA

Printed U S A

Central ELECTRONIC MANUFACTURERS

DENVILLE, NEW JERSEY

PULSE TUBE

7545/XD-45

3.4 MEGAWATTS

Description

The Central tube type 7545/XD-45 is a forced-air-cooled triode specifically designed for use in pulsed service as an amplifier and modulator switch tube.

Filament-thoriated tungsten

E_f	10V
I_f	120A
Mu	30

Maximum Ratings:

Plate Voltage –	25000 volts dc for pulse application
Plate Voltage –	8000 volts dc for cw application
Cathode Current –	200 peak amperes
Plate Current –	6 amperes dc
Plate Dissipation	6 Kw forced air cooled
Power Input –	48 Kw for class C Telegraphy

Typical Operation

Pulsed RF power amplifier .03 duty class B

Plate Voltage	15000 volts dc
Grid Voltage	–600 volts dc
Peak RF Grid Voltage	2560 volts
D.C. Plate Current	0.573 amperes
Driving Power	461 watts
Pulse Power Output	390 Kw
Air Flow for 6 Kw	200 cfm @ 1" water back pressure

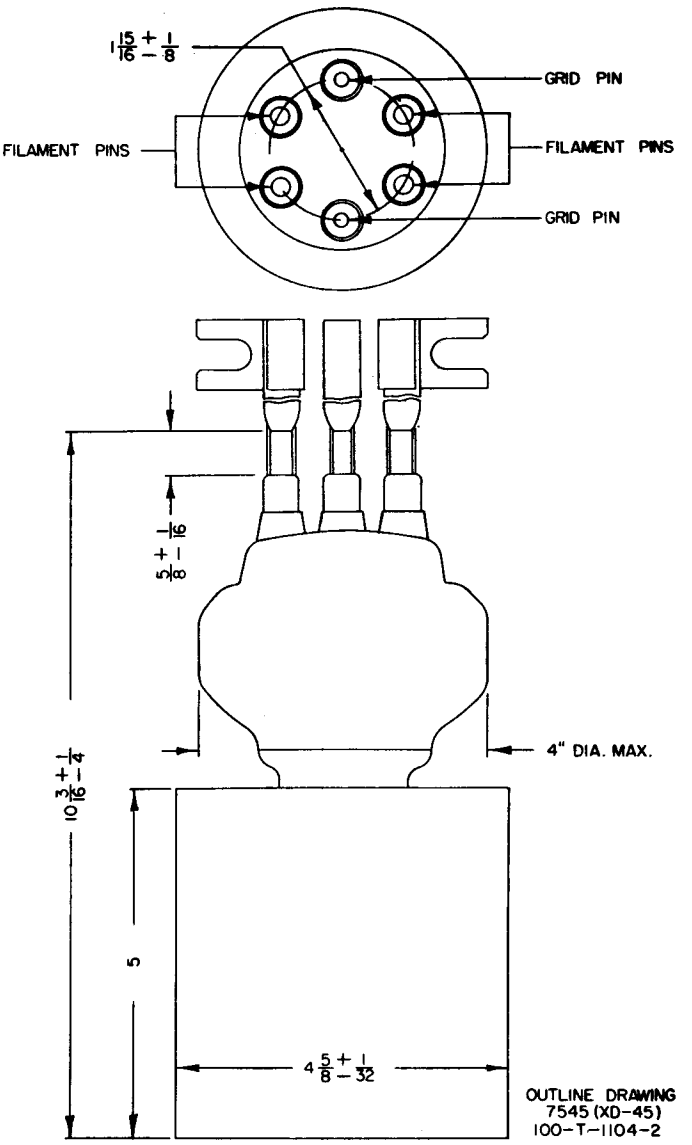
PULSED SWITCH TUBE 0.002 DUTY

E_f 10 Vdc	
Plate Voltage	25000 volts dc
Peak Plate Current	130 amperes
Peak Grid Current	70 amperes
Average Plate Dissipation	6 Kw forced air cooled
Pulse Width	25 μ seconds
Peak Power Switched	2.6 Mw

E_f 10.8 Vdc	
Plate Voltage	25000 volts dc
Peak Plate Current	180 amperes
Peak Grid Current	100 amperes
Average Plate Dissipation	6 Kw forced air cooled
Pulse Width	25 μ seconds
Peak Power Switched	

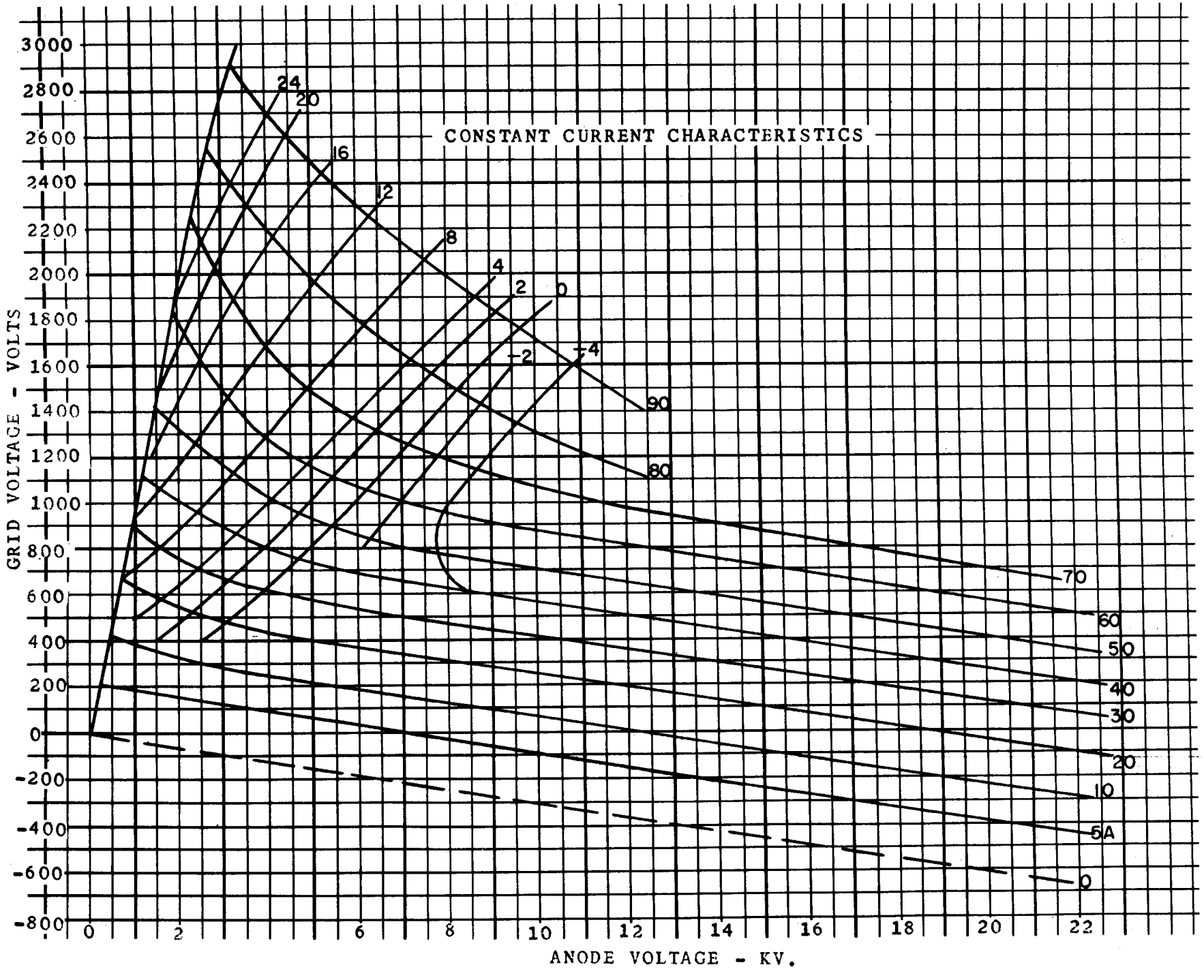
PULSED SWITCH TUBE 0.06 DUTY

E_f 10.8 Vdc	
Plate Voltage	25000 Vdc
Peak Plate Current	120 amperes
Peak Grid Current	65 amperes
Average Plate Dissipation	6 Kw forced air cooled
Pulse Width	3000 μ seconds



PROVISIONAL DATA
Issued 5/60
Check factory before finalizing designs.

(Over)


CONSTANT CURRENT CHARACTERISTICS
GRID VOLTAGE - VOLTS
ANODE VOLTAGE - KV.
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-200
-400
-600
-800
0
2
6
8
10
12
14
16
18
20
22
24
20
16
12
8
4
2
0
-2
-4
90
80
70
60
50
40
30
20
10
5A
0

CENTRAL ELECTRONIC
MANUFACTURERS
DENVILLE NEW JERSEY

POWER TRIODE
TYPE
7C23
PLATE DISSIPATION
— 1.2KW

POWER TRIODE

DESCRIPTION

The Nucor tube type 7C23 is a forced-air-cooled, three electrode tube, specifically designed for use in high voltage pulse operation. The anode is capable of dissipating 1.2 kilowatts. It features a sturdily-supported, double-spiral thoriated tungsten filament. Rugged kovar grid and filament seals insure greater protection against mechanical stress and shock. The wide spacing between elements is an additional feature of this tube. Maximum ratings apply up to 5 megacycles.



SPECIFICATIONS

ELECTRICAL:

Filament Voltage	11.0 Volts
Filament Current	29.0 Amperes
Filament Starting Current	58 Amperes
Amplification Factor, at $E_c = -50V$; $I_b = 0.2$ Amp.	25
Interelectrode Capacitances	
Grid-Plate	12.0 $\mu\mu$f
Grid-Filament	12.5 $\mu\mu$f
Plate-Filament	1.7 $\mu\mu$f

PHYSICAL:

Mounting Position — Vertical, Anode Down
Type of Cooling — Forced-Air

Maximum Incoming Air Temperature	45°C
Required Air Flow on Anode	
Cubic Feet Per Minute	75
Maximum Glass Temperature	150°C
Net Weight, Approximate	5¼ Pounds

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR -- PULSED OPERATION

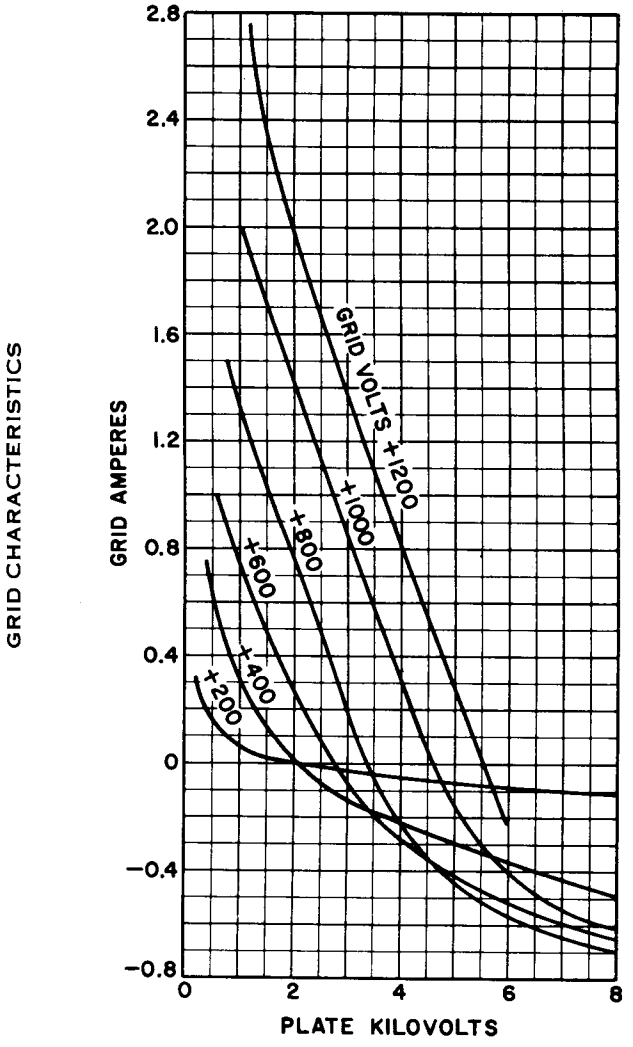
MAXIMUM RATINGS, ABSOLUTE VALUES

DC Plate Voltage	17,500 Volts
DC Grid Voltage	—2,000 Volts
DC Plate Current	0.100 Ampere
DC Grid Current	0.010 Ampere
Plate Dissipation	1200 Watts
Maximum Pulse Width	90 μ Seconds
Maximum Duty	0.005

TYPICAL OPERATION

(Unless otherwise specified, values are for two tubes)

DC Plate Voltage	15,000 Volts
DC Plate Current	0.16 Ampere
DC Grid Current	1.25 Ma
Average Power Output	120 Watts
Peak Power Output	120 Kilowatts



CONSTANT CURRENT CHARACTERISTICS

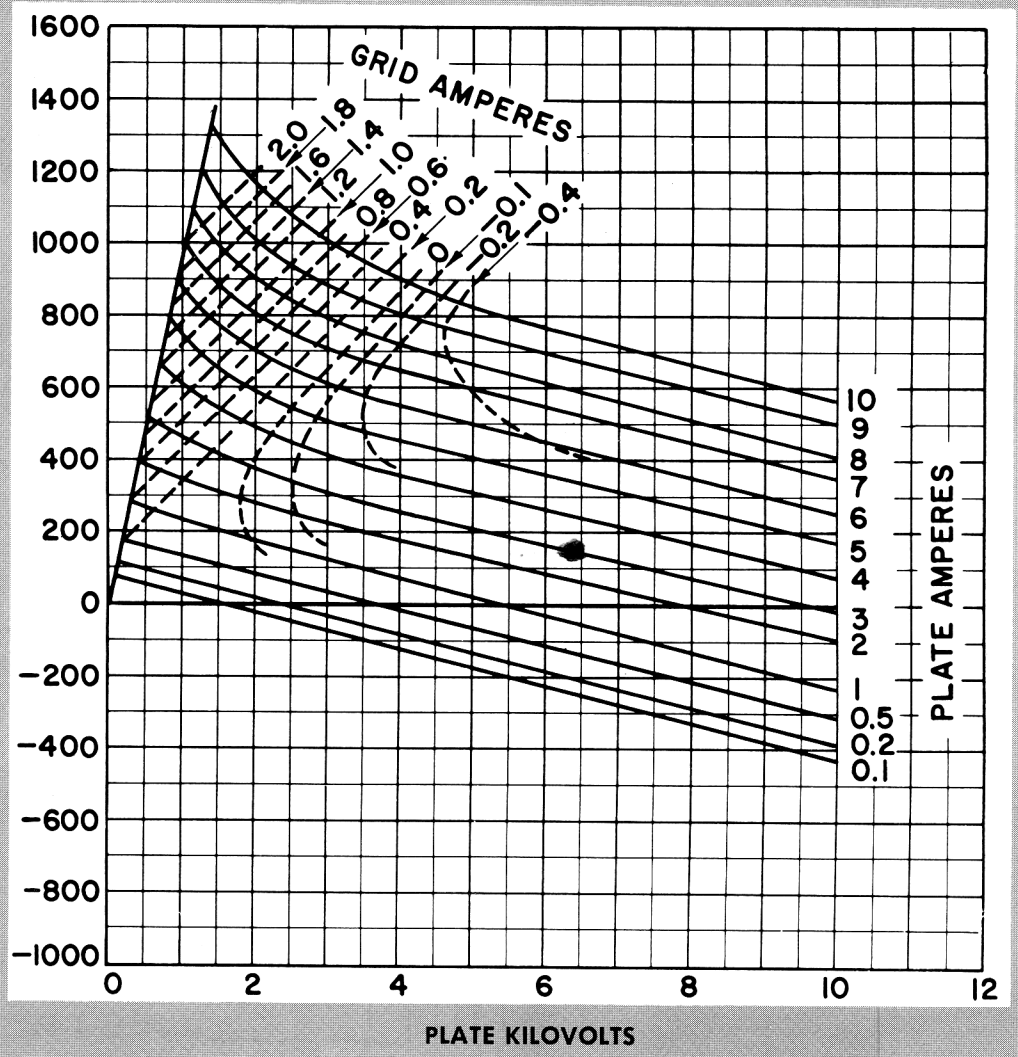
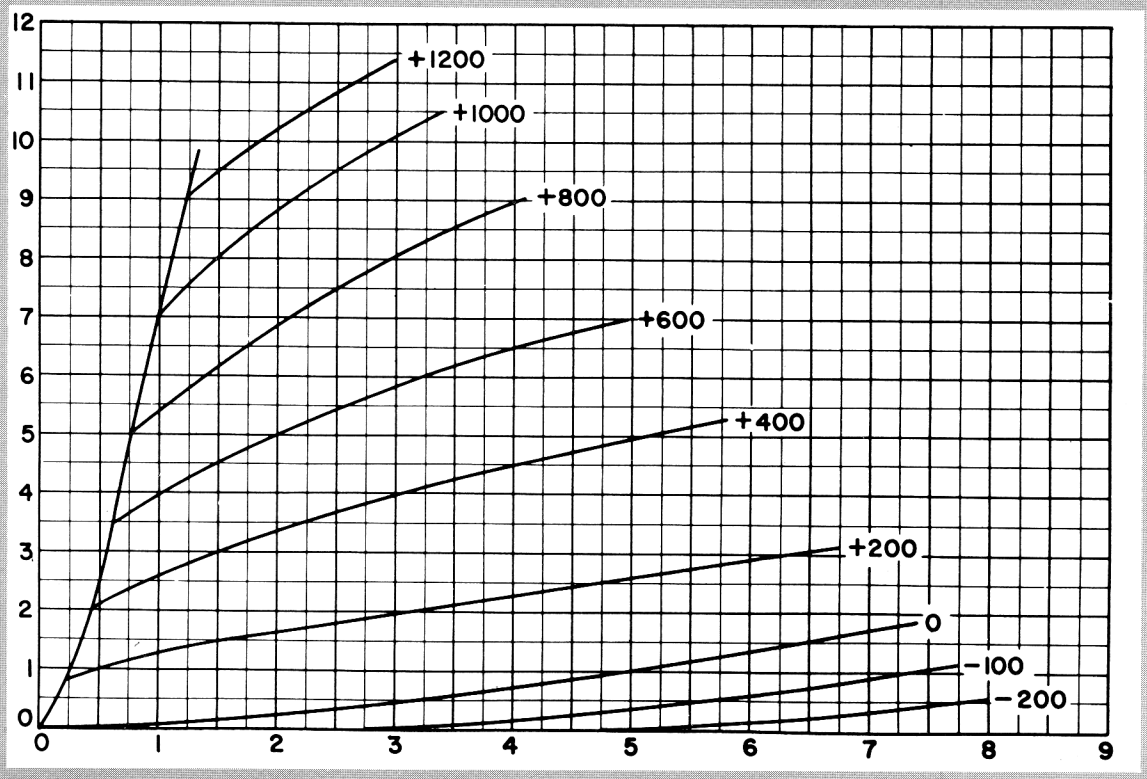


PLATE CHARACTERISTICS



POWER TRIODE

TYPE **7C23**

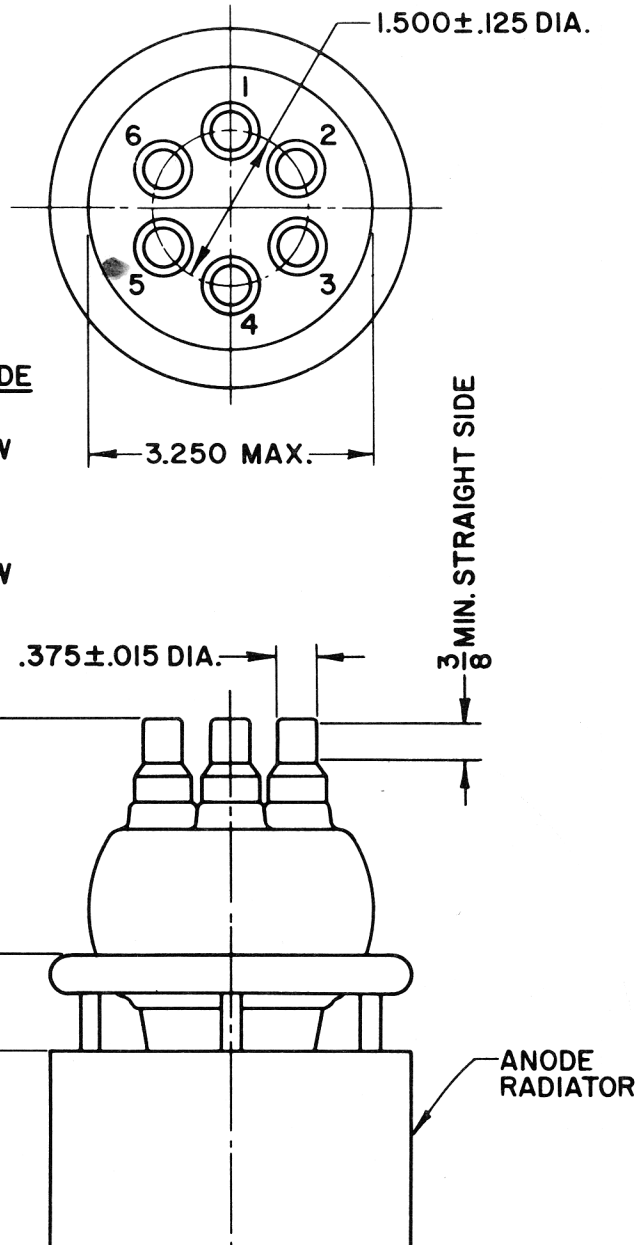
PLATE DISSIPATION — 1.2KW

CENTRAL ELECTRONIC

MANUFACTURERS

DENVILLE, NEW JERSEY

OUTLINE



TERMINAL COLOR CODE

1 = GRID — BLACK
2 = FIL. — YELLOW
3 = GRID — BLACK
4 = F.C.T. — RED
5 = GRID — BLACK
6 = FIL. — YELLOW

DIVISION OF NUCLEAR CORPORATION OF AMERICA

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CENTRAL ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

POWER TRIODE TYPE
7C25
PLATE DISSIPATION —2.5KW

POWER TRIODE

DESCRIPTION

The Nucor tube type 7C25 is a forced-air-cooled general purpose, three electrode tube, specifically designed for industrial and communication applications. The anode is capable of dissipating 2.5 kilowatts. It features a sturdily-supported, double-spiral thoriated tungsten filament. Rugged kovar grid and filament seals insure greater protection against mechanical stress and shock. The wide spacing between elements is an additional feature of this tube. Flexible leads constructed of O.F.H.C. copper can be modified to individual customer requirements.

Full input ratings apply to 30 mc. Reduced ratings, as indicated, are applicable for useful power outputs extending to 50 mc.



SPECIFICATIONS

ELECTRICAL:

Filament Voltage	11 Volts
Filament Current	28 Amperes
Filament Starting Current	56 Amperes
Filament Cold Resistance	0.047 Ohms
Peak Cathode Current	10 Amperes
Amplification Factor	25
	E_b = 3,000 Volts, 1_b = 0.200 Amps.
Interelectrode Capacitances	
Grid-Plate	13.2 $\mu\mu$f
Grid-Filament	14.5 $\mu\mu$f
Plate-Filament	1.7 $\mu\mu$f

PHYSICAL:

Mounting Position —
Vertical, Anode Down

Type of Cooling — Forced Air

Maximum Incoming Air Temperature .... 45°C

Required Air Flow on Anode

Plate Dissipation (Kilowatts)	2.5	2.0	1.5
Air Flow—Cubic Feet per min.	150	120	90
Pressure — Inches Water	2.5	1.6	0.9

Maximum Glass Temperature ..... 150°C

Net Weight, Approximate ..... 5 pounds

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

FOR MAXIMUM FREQUENCY OF 50 MEGACYCLES

RADIO-FREQUENCY POWER AMPLIFIER AND OSCILLATOR -- CLASS C TELEGRAPHY

MAXIMUM RATINGS

DC Plate Voltage	5,000 Volts
DC Grid Voltage	—1,500 Volts
DC Plate Current	1.3 Amperes
DC Grid Current	0.150 Amperes
Plate Input	6.5 Kilowatts
Plate Dissipation	2.5 Kilowatts

TYPICAL OPERATION

DC Plate Voltage	4,000	4,500	5,000 Volts
DC Grid Voltage	—400	—500	—600 Volts
Peak R-F Grid Voltage	1,000	1,150	1,300 Volts
DC Plate Current	1.0	1.2	1.2 Amperes
DC Grid Current	0.08	0.1	0.13 Amperes
Driving Power, Approx.	80	110	160 Watts
Power Output	2.5	3.1	4.0 Kilowatts

PLATE-MODULATED RADIO-FREQUENCY POWER AMPLIFIER -- CLASS C TELEPHONY

(Carrier conditions per tube use with a maximum modulator factor of 1.0)

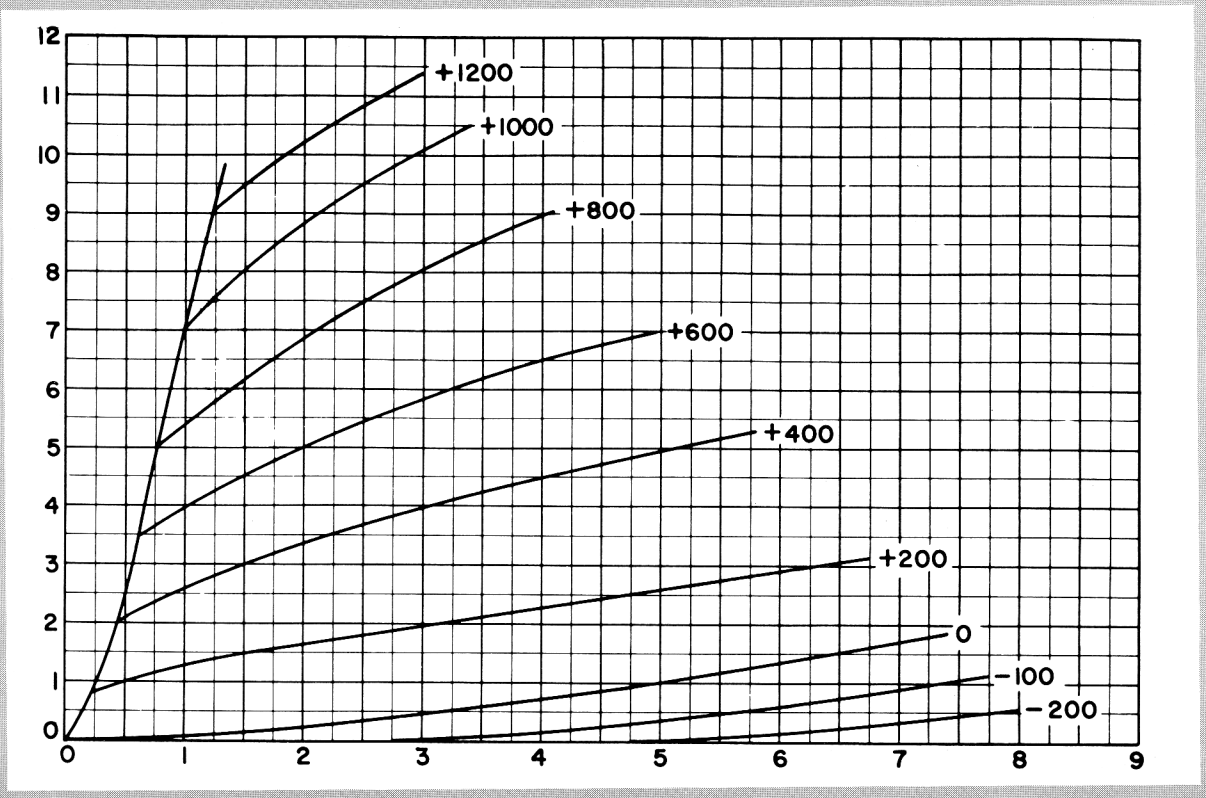
MAXIMUM RATINGS

DC Plate Voltage	4,000 Volts
DC Grid Voltage	—1,500 Volts
DC Plate Current	1.0 Amperes
DC Grid Current	0.15 Amperes
Plate Input	4.0 Kilowatts
Plate Dissipation	1.6 Kilowatts

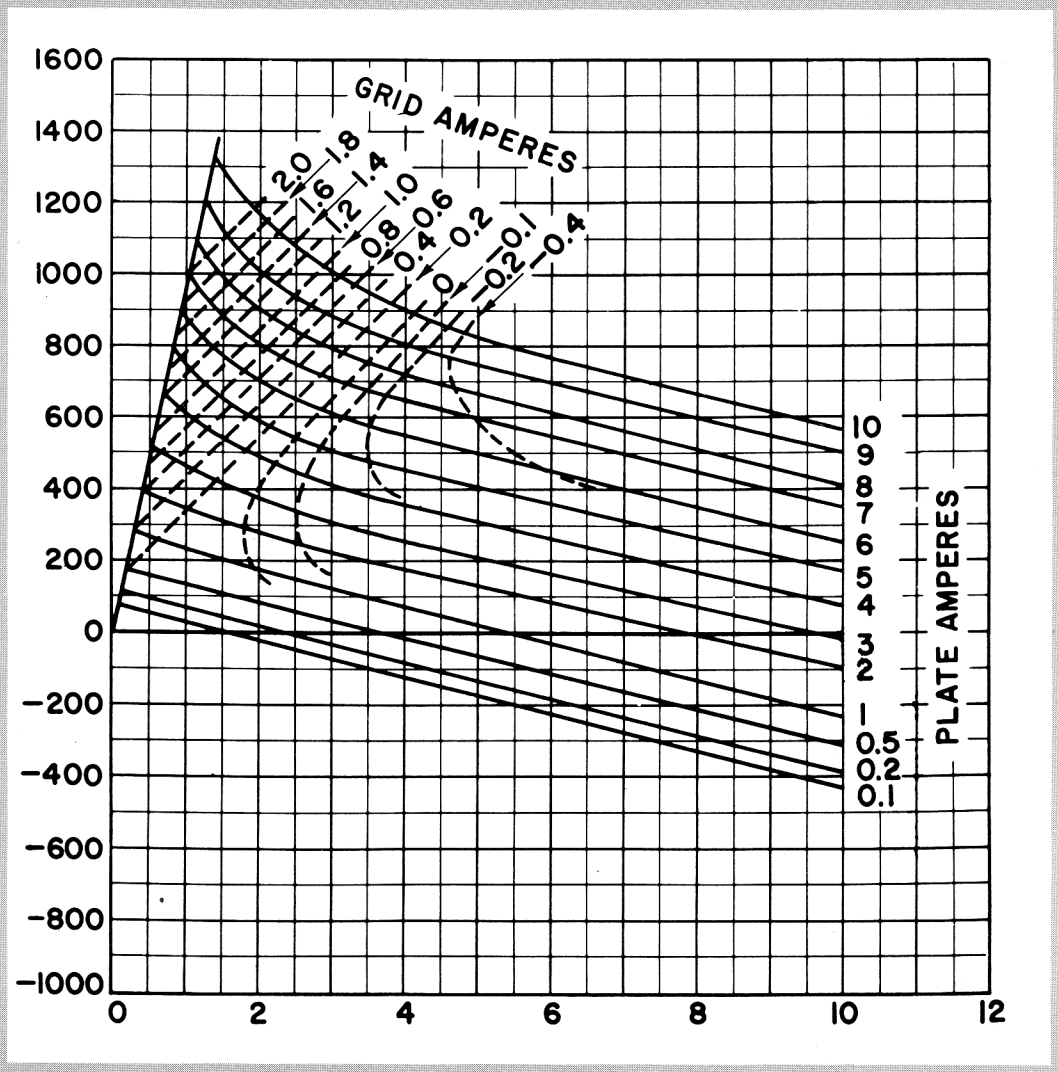
TYPICAL OPERATION

DC Plate Voltage	3,500 Volts
DC Grid Voltage	—500 Volts
Peak R-F Grid Voltage	1,000 Volts
DC Plate Current	0.825 Amperes
DC Grid Current	0.110 Amperes
Driving Power, Approx.	100 Watts
Power Output	2 Kilowatts

PLATE CHARACTERISTICS



CONSTANT CURRENT CHARACTERISTICS



POWER TRIODE

TYPE

7C25

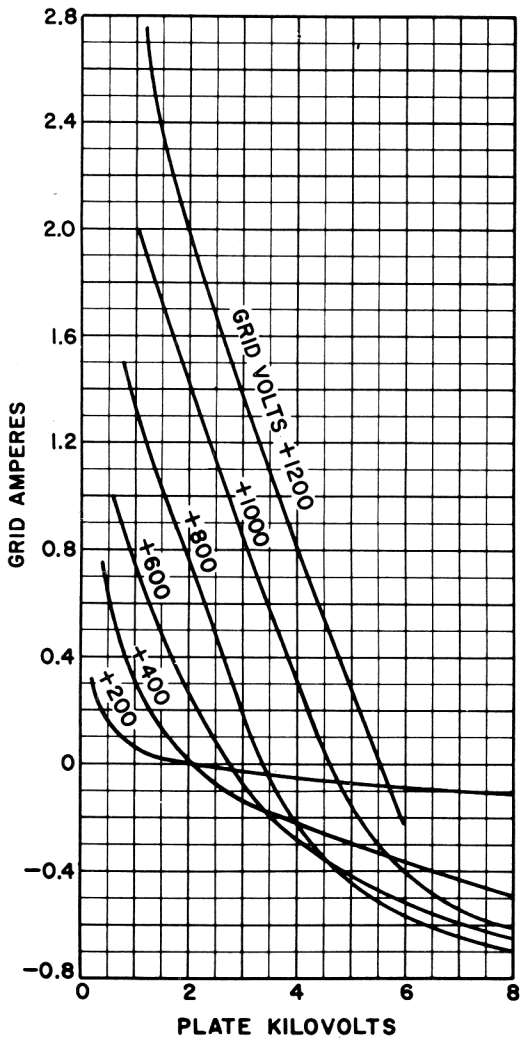
PLATE DISSIPATION —2.5KW

CENTRAL ELECTRONIC

MANUFACTURERS

DENVILLE, NEW JERSEY

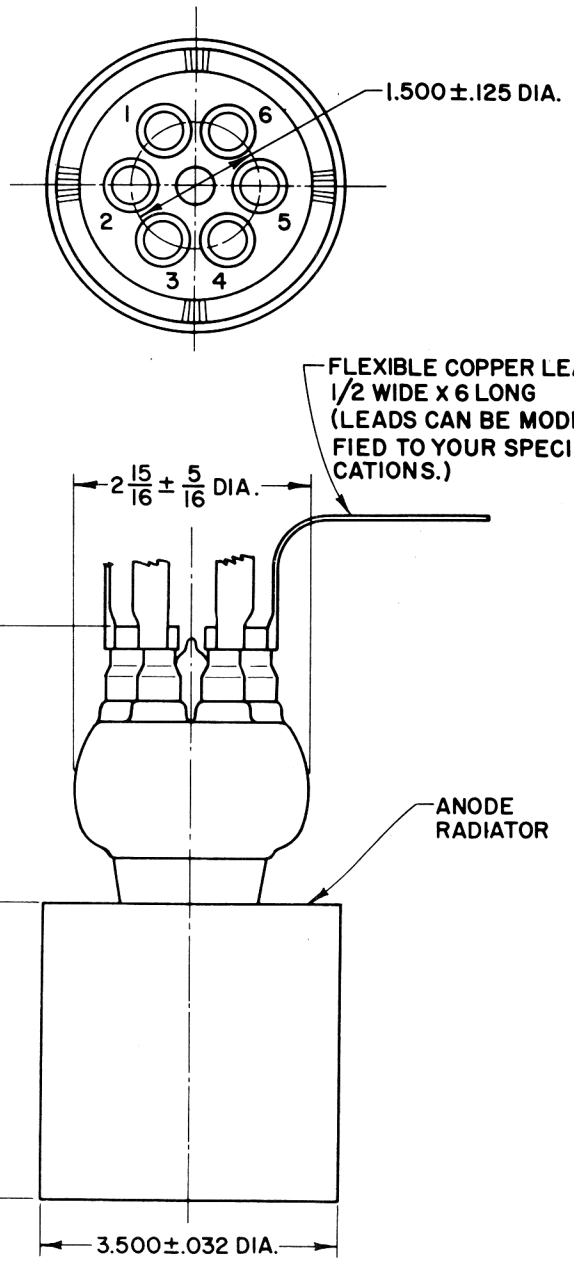
GRID CHARACTERISTICS



TERMINAL COLOR CODE

1=GRID -- BLACK
2=FIL. -- YELLOW
3=GRID -- BLACK
4=F.C.T. -- RED
5=GRID -- BLACK
6=FIL. -- YELLOW

OUTLINE



DIVISION OF NUCLEAR CORPORATION OF AMERICA

Printed in U. S. A.

NUCLEAR CORPORATION OF AMERICA
central electronic mfr's division
DENVILLE, NEW JERSEY

IONIZATION GAUGE TUBE TYPE CEM-75

IONIZATION GAUGE TUBE

DESCRIPTION

The CEM-75 is a burn out proof version of the Bayard-Alpert design. It is capable of vacuum measurement in the range of 10^{-4} to 10^{-10} millimeters of mercury. The burn out proof filament, incorporated in the CEM-75, makes it desirable for use in systems that are repeatedly opened to air.

SPECIFICATIONS

PHYSICAL:

LENGTH (Max.)	6¾
BULB DIAMETER (Max.)	2⅜
TUBULATION O.D.	¾
FILAMENT	thorium oxide coated iridium ribbon

ELECTRICAL:

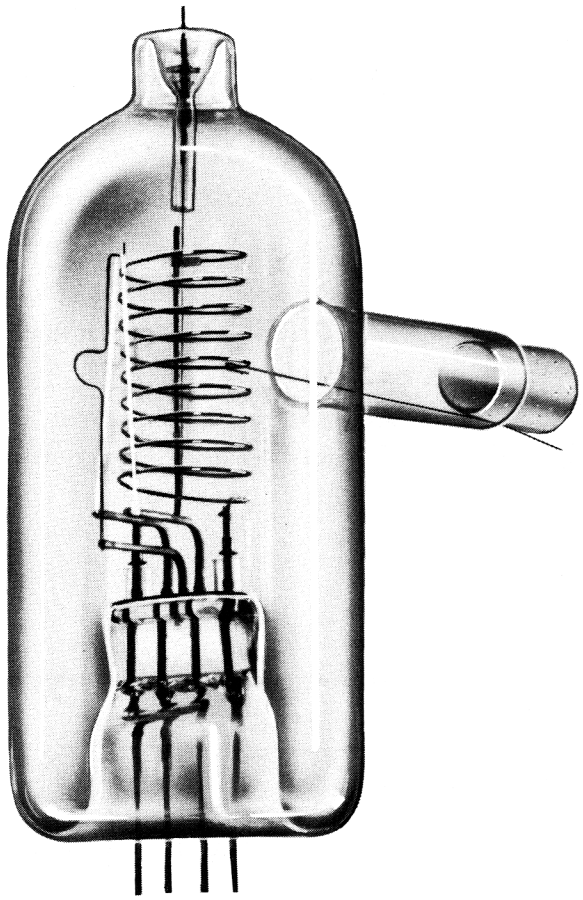
FILAMENT VOLTAGE	3-5 VOLTS AC
FILAMENT CURRENT	4-6 AMPS AC
GRID VOLTAGE	+150 VOLTS
COLLECTOR VOLTAGE	—30 VOLTS
GRID DEGASSING:	
VOLTAGE	7.5-8 VOLTS AC
CURRENT	10-11 AMPS AC

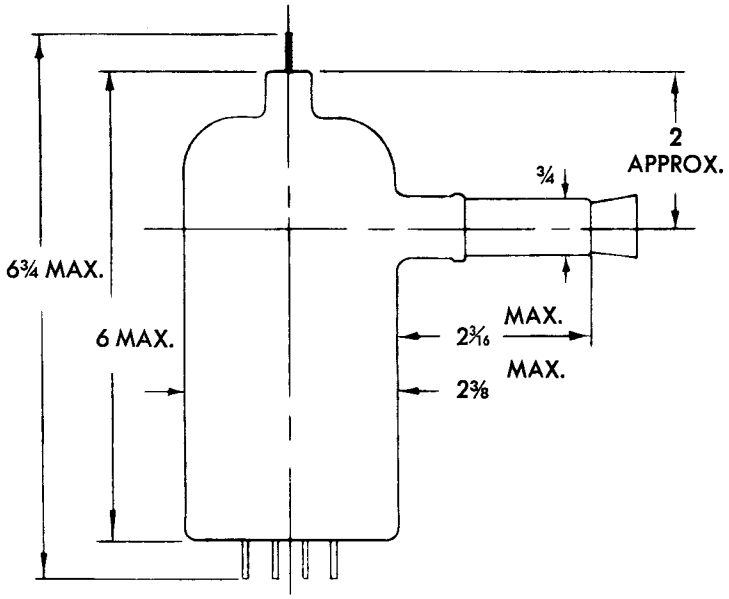
SENSITIVITY (NITROGEN)

100 microamps per micron @ 10ma grid current or 10 microamps per micron per ma grid current

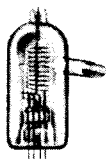
SPECIAL GAUGES

Our engineering staff is available to design and custom-produce specialized ionization gauges to meet your particular operating requirements.





IONIZATION GAUGE TUBE



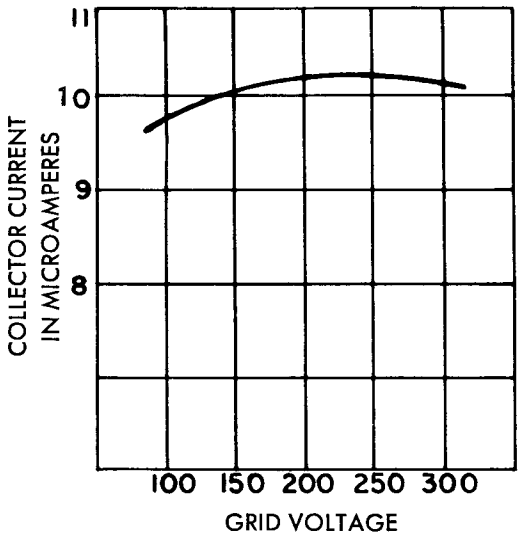
TYPE
CEM-75

NUCLEAR CORPORATION OF AMERICA
central electronic mfr's division
DENVILLE, NEW JERSEY

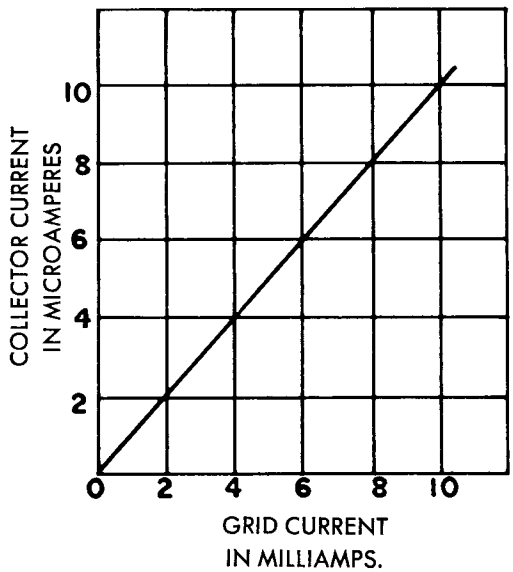
CEM-75
The ~~CSM-75~~ is available with three different types of tubulation that are designated by the letter following the gauge type.

CEM-75N (NONEX GLASS)
CEM-75P (PYREX GLASS)
CEM-75K (KOVAR TUBING)

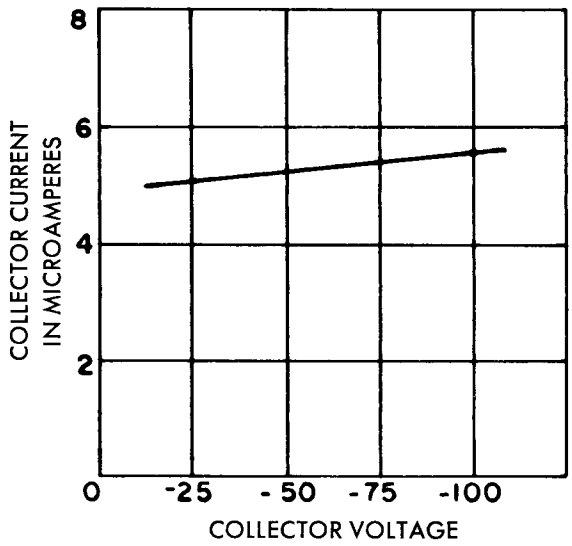
The standard tubulation size is ¾ inches in diameter but price and delivery on special sizes will be quoted on request.



PRESSURE = 1×10^{-4} mm Hg
COLLECTOR VOLTAGE = —30 V.
GRID CURRENT = 10 ma



PRESSURE = 1×10^{-4} mm Hg
COLLECTOR VOLTAGE = —30 V.
GRID VOLTAGE = +150 V.



PRESSURE = 5×10^{-5} mm Hg
GRID VOLTAGE = 150 V.
GRID CURRENT = 10 ma

Printed in U. S. A.

Central ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

GAS NOISE TUBE	S
CNT-S18D-1	18 Db

References and notations contained herein are taken from Military Specifications for Electron tubes MIL-E-1D 31 March '58.

Description: Gaseous Discharge Diode, S Band (Note 11)

Ratings:

	If	Ib	TA	T Bulb
Absolute Maximum:	mA	mAdc	°C	°C
	. .	. .	+85	+125
Minimum:	. .	. .	−55	. .
Test Conditions:	0	250	. .	. .

Cathode: Filamentary Type.
Dimensions: Per Outline Drawing (Fig. 1)
Base: Per Outline Drawing (Fig. 1)
Mounting Position: Any

Ref. Para.	Test	Conditions	Min.	Max.
. . .	Qualification:	Required.		
4.5	Holding Period:	168 hours		
4.9.18.1.10	Carton Drop:	. . .		
4.9.20.3	*Vibration:	No Voltages, Note 9.		
4.10.5.1	Filament Voltage:	I_f = 300mAdc	E_f . . .	10Vdc
4.13.2	Tube Voltage Drop:	Note 1,2	E_{td} 160	170Vdc
. . .	Excess Noise Ratio:	F = 3300 Mc. Notes 3,4,5,10.	N_r-1 17.5	18.5Db
. . .	Match (1):	F = 3270 Mc. Notes 4,6. I_b = 250 mAdc	VSWR	1.15:1
. . .	*Match (2):	F = 3270 Mc. I_b = 0 mAdc Notes 4,6.	VSWR	1.15:1
. . .	Intermittent Life Test	Notes 1,3,8,9. (One min. on, two min. off) Preheat time = 2 to 3 sec.	2500	Cycles
4.11.4	Intermittent Life Test End Points Excess Noise Ratio: Note 11.		N_r-1 17.5	18.5Db

Note 1. The tube shall be tested in the circuit of Fig. 3.
Note 2. In the test circuit of Fig. 3, with a filament current of 300 mAdc, the tube shall operate within three tries.
Note 3. The tube shall be tested in total darkness.
Note 4. The tube shall be tested in a tube mount as specified in Figure 2, or equivalent, terminated by a matched RG-48/U termination having a VSWR no greater than 1.01:1
Excessive Noise Ratio Measurement tests shall be made using the circuit of block diagram Fig. 4, or equivalent.
Note 5. The frequency specified is that of the Local Oscillator.
Note 6. The frequency specified is that of the Signal Generator.
Note 7. Excess noise ratio should be measured by comparison with an approved standard.
Note 8. The tube shall be tested at an ambient temperature of +85°C.
Note 9. Intermittent Life Test end points shall apply.
Note 10. The Excess Noise Ratio (N_r-1) is defined in Db as N_r-1 = 10 log $(\frac{T_e}{290}-1)$ where T_e is the effective electron temperature.
Note 11. The noise frequencies generated by this tube cover a broad band of frequencies. This bandwidth is limited only by the type of mount used. This tube is normally used with a mount in RG-48/U wave guide, at a 10 degree angle in the E plane. Other wave guide sizes may be used with properly adaptedy mounts.

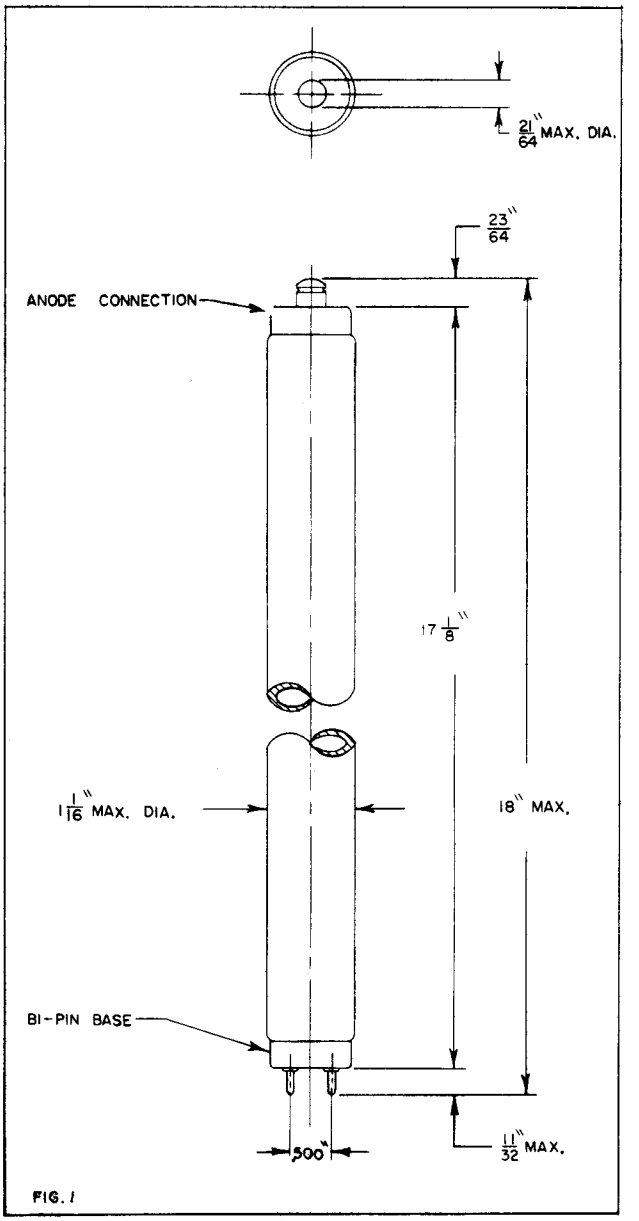


FIG. 1

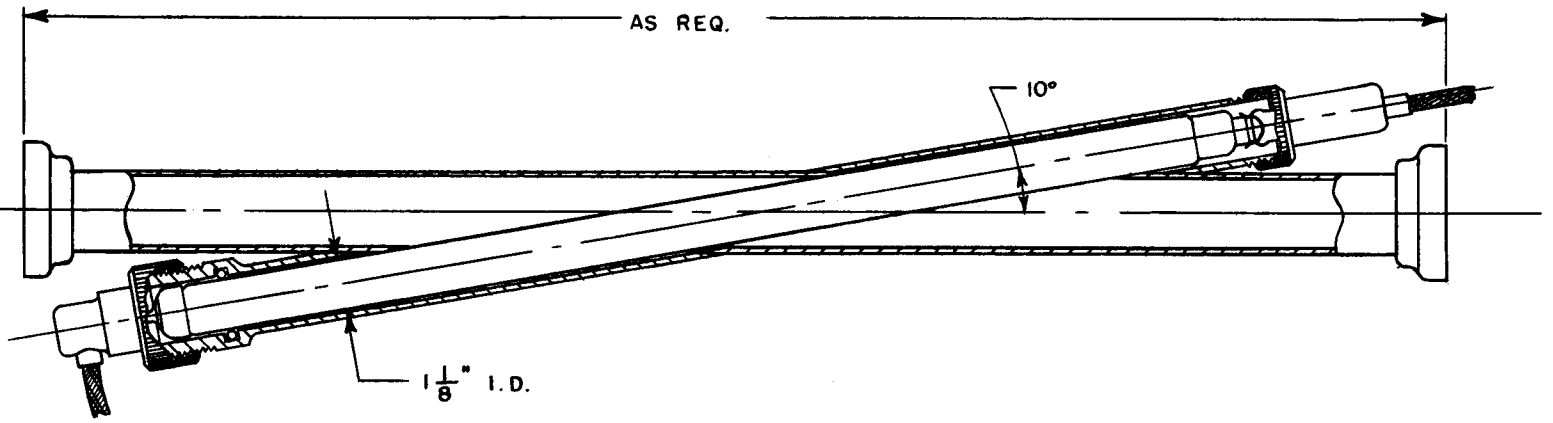
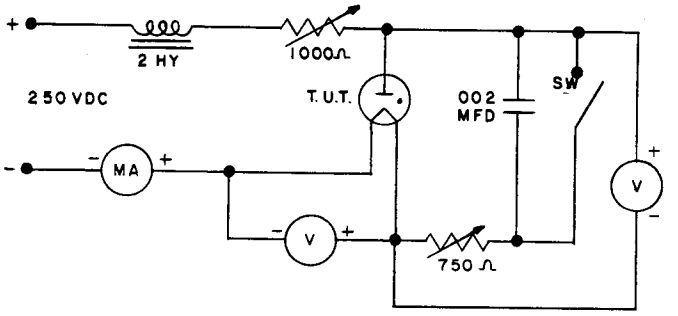
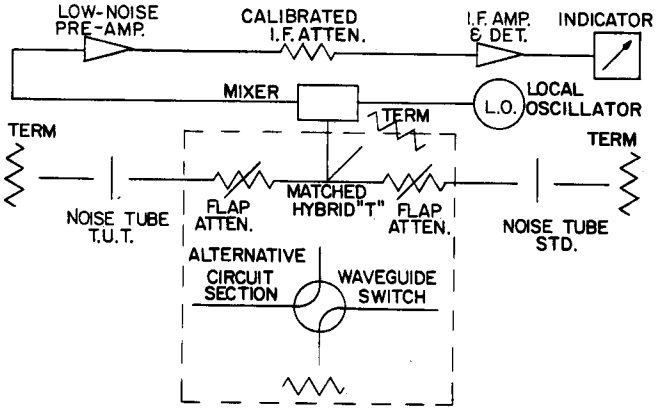


FIG. 2



D. C. TEST CIRCUIT

FIG. 3

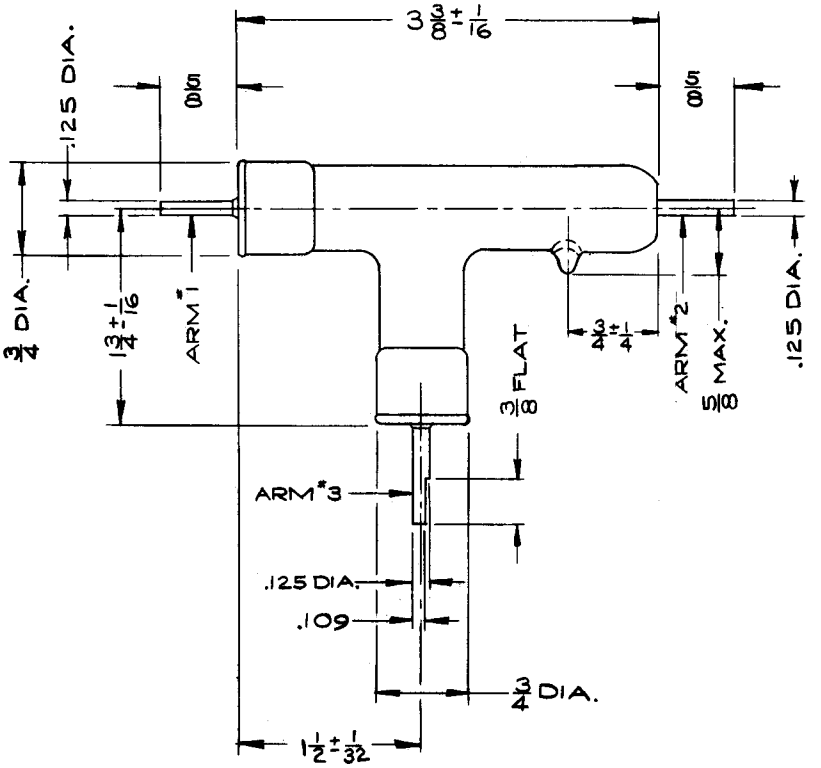


TEST CIRCUIT FOR EXCESS NOISE MEASUREMENTS
FIG. 4

Central ELECTRONIC
MANUFACTURERS
DENVILLE NEW JERSEY

VACUUM SWITCH
CVS-1

VACUUM SWITCH



Maximum Voltage	5000 Volts
Maximum Current at 10 Mcs.	3 Amperes
Ambient Temperature	125° C Max.
Metal Finish	Cadmium Plated

DC resistance between arms 1 and 2 with a closed force of 3 inch ounces or more does not exceed .02 ohms

DC resistance between arms 1 and 3 with a closed force of 3 inch ounces or more does not exceed .02 ohms

Torque needed to open arms 1 and 2 by moving arm 1: 4 inch ounces ± 1 inch ounce

Torque needed to open arms 1 and 2 by moving arm 3: does not exceed 8 inch ounces

This switch will withstand 15G when properly mounted

Issued 8/60

IONIZATION GAUGE TUBE VGIA

Central

ELECTRONIC MFRS. DENVILLE, N. J.
DIVISION OF NUCLEAR CORP. OF AMERICA

IONIZATION GAUGE TUBE VGIA

DESCRIPTION

Ionization gauge tube VG1A is a triode that utilizes positive ion current for sensing purposes. It is connected into a vacuum system and is capable of measuring pressures between the regions of 10^{-3} mm Hg. and 10^{-9} mm Hg. A spiral grid structure accessible at both ends for out-gassing with current of 7 amperes facilitates the removal of gases from the elements of the gauge tube. The collector is a platinum deposit on the inside of the glass bulb that only requires heating with a torch for out-gassing.

SPECIFICATIONS

Any type of tubulation is available upon request. Stock tubulations are:

VGIA/1 — 24/40 inner joint
VGIA/2 — 3/4" O. D. open tubulation
VGIA/3 — 1/2" O. D. open tubulation
VGIA/4 — 3/8" O. D. open tubulation

Sensitivity under normal conditions - approximately 100 microamperes per micron of gas pressure.

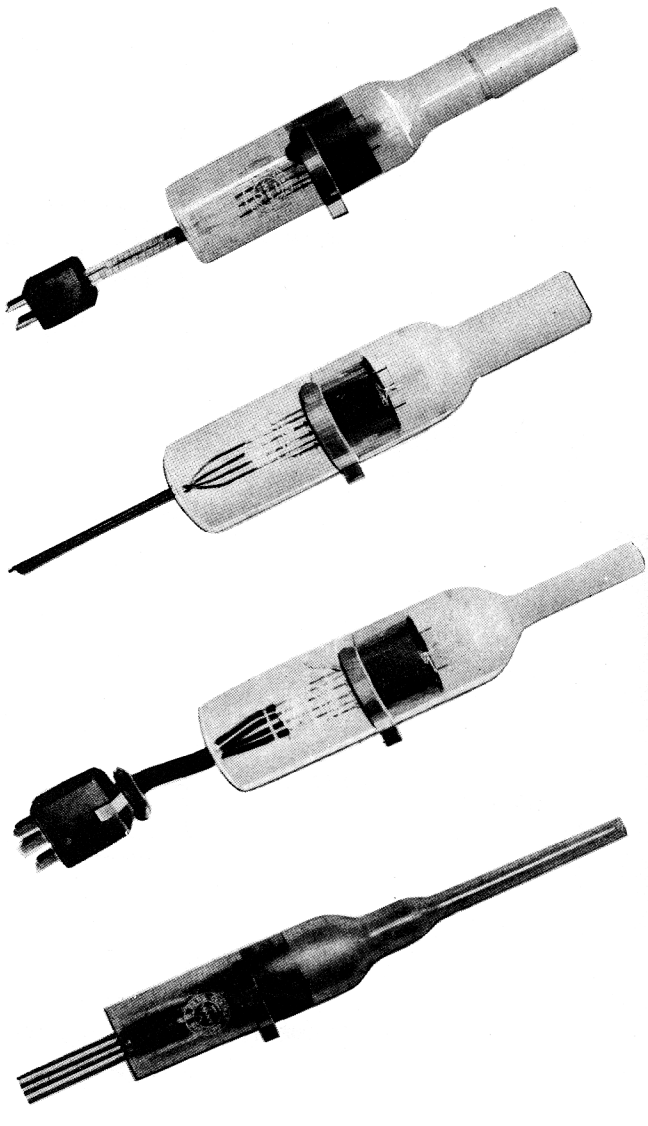
TYPICAL CHARACTERISTICS

$E_p = 25V$ $E_g = 120V$ $I_g = 5.0$ ma
$E_f = 3.0 — 7.5V$ $I_f = 3.5 — 5a$

Construction, standard pyrex glass.

SPECIAL GAUGES

Our engineering staff is available to design and custom - produce specialized ionization gauges to meet your particular operating requirements. Jones plugs (4 or 6 prong) are available to your specifications.

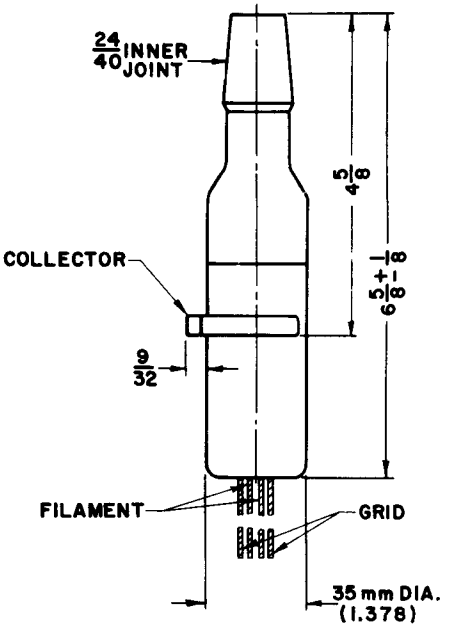


IONIZATION GAUGE TUBE VGIA

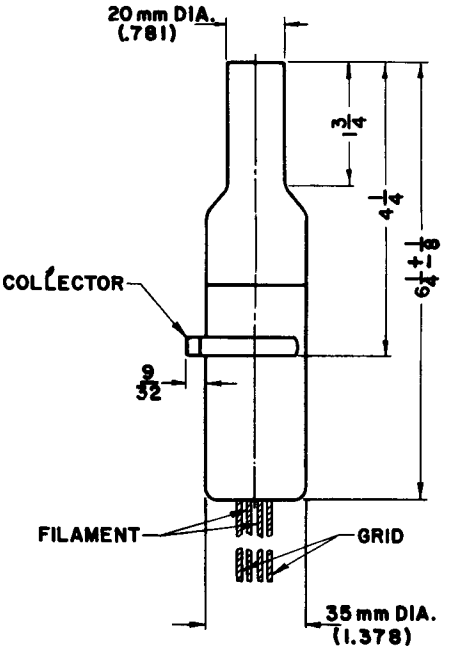
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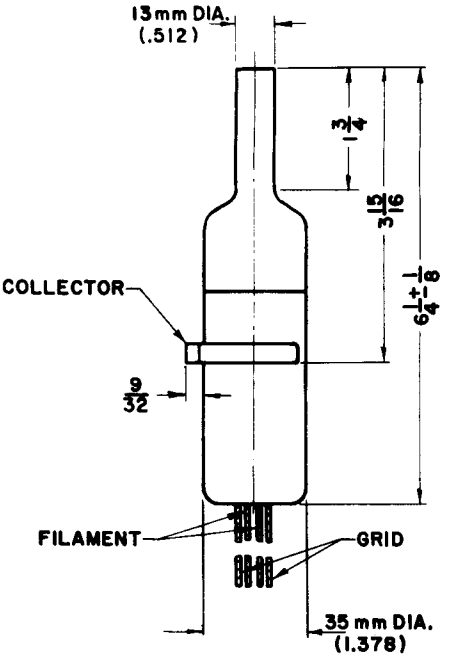
VGIA/1



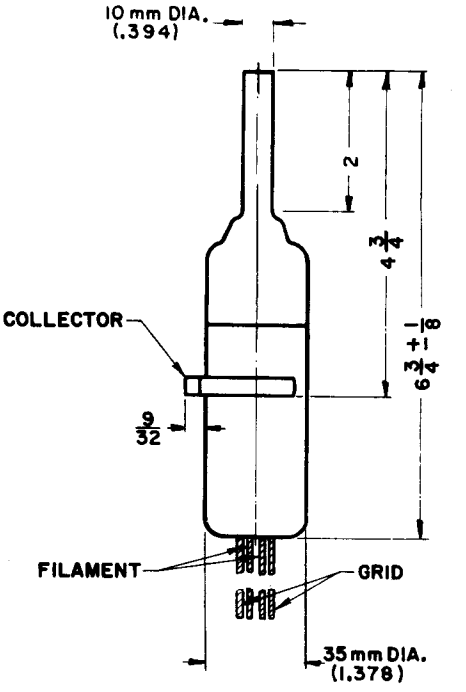
VGIA/2



VGIA/3



VGIA/4

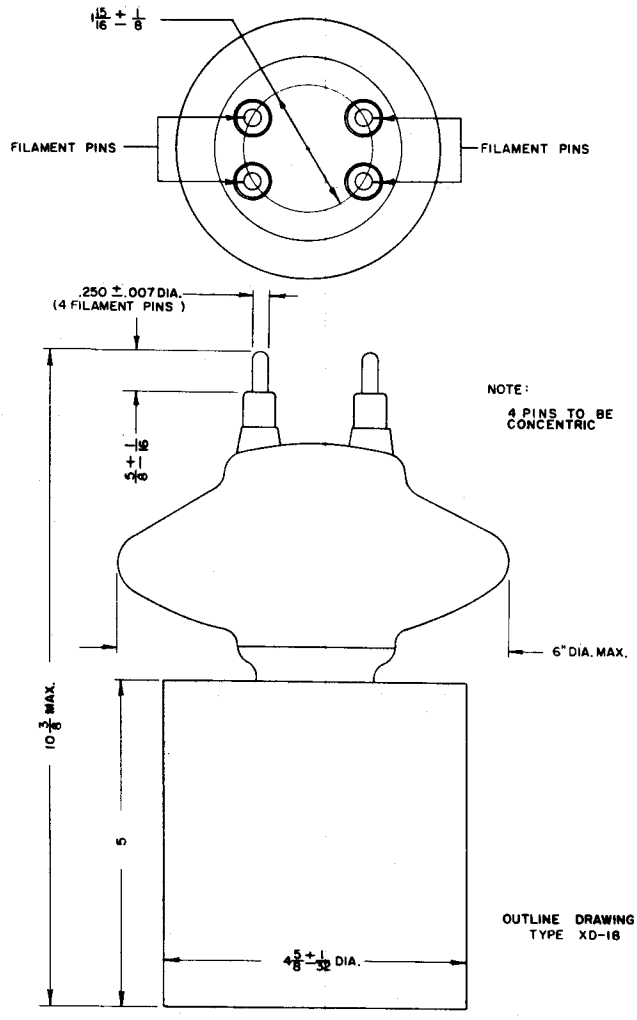


central ELECTRONIC
MANUFACTURERS
DENVILLE NEW JERSEY

HIGH VACUUM DIODE TYPE XD-18

NOTE
This tube now designated XD-18R

HIGH VOLTAGE HIGH VACUUM DIODE



DESCRIPTION

The Central Electronic Manufacturers tube type XD-18 is a forced-air-cooled high vacuum type diode for use in power supplies and modulators. Rugged kovar grid and filament seals insure greater protection against mechanical stress and shock.

SPECIFICATIONS

PHYSICAL

Overall length	$10\frac{3}{8}$" max.
Overall diameter	$4\frac{5}{8}$" max.
Type of cooling	Forced air
Mounting position	Vertical
Mounting sockets	Central CAS-1, 4, 6
Air flow	300 cfm @ 2.5" back pressure for 13Kw dissipation

HIGH VACUUM DIODE TYPE XD-18

central ELECTRONIC

MANUFACTURERS

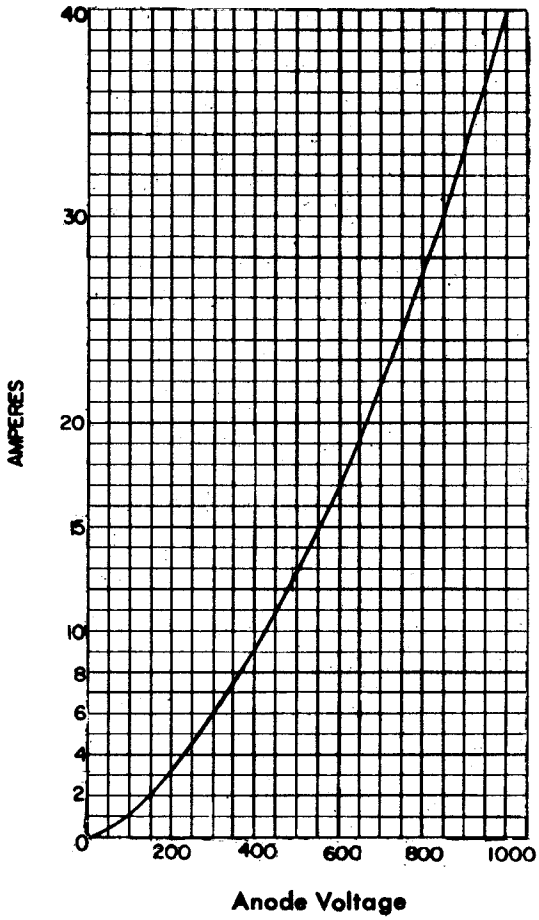
DENVILLE NEW JERSEY

ELECTRICAL (RECTIFIER)

Filament . . . . . Thoriated Tungsten
Filament Voltage . . . . . 10 Volts A.C.
Filament Current . . . . . 120 Amperes
Max. Starting Filament Surge Current . . . . . 250 Amperes
Peak Inverse Voltage . . . 40,000 Volts max.
Average Anode Current . . . . . 15 Amperes
Peak Anode Current . . . . . 50 Amperes

ELECTRICAL (CLIPPER, SHUNT or CHARGING DIODE)

Filament Voltage . . . . . 11 Volts A.C.
Filament Current . . . . . 125 Amperes
RMS Anode Current . . . . . 15 Amperes
Peak Anode Current . . . . . 300 Amperes



Central ELECTRONIC MANUFACTURERS

DENVILLE, NEW JERSEY

HIGH VACUUM DIODE

XD – 27

DESCRIPTION

The Central XD–27 is a high vacuum high current diode of the low impedance type. This thoriated tungsten filament tube was designed for rectifier or clipper service, and is available in both water and air cooled versions.

SPECIFICATIONS:

PHYSICAL	Water	Air
Length	9 7/16	6½ inches
Diameter	4	4 5/8 inches
Weight	1 1/2	5½ Pounds (approx.)
Mounting Position	Vertical	Vertical
Mounting Socket (air version)		CAS-A or CAS-B series
Type of Cooling		

Air		Water		
Velocity (cfm)	Anode Dissipation (Kw)	Pressure (in. of water)	Flow (gpm)	Anode Dis. (Kw)
50	1.0	0.20	3	5
75	1.8	0.26		
125	2.4	0.58		
190	3.0	1.21		

Max. Incoming Air Temperature	45°C (air version)
Max. Glass Seal Temperature	180° C (air version)
Max. Outlet Temperature	70° C (water version)

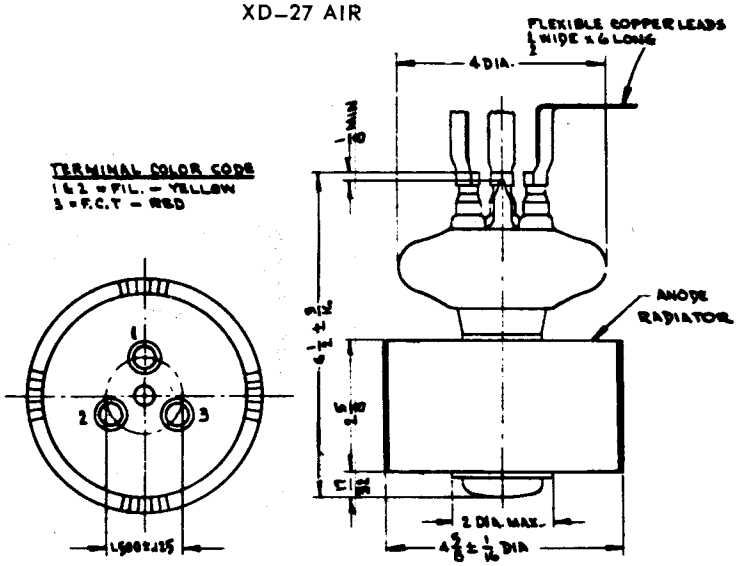
ELECTRICAL (RECTIFIER)

Filament	Thoriated Tungsten
Filament Voltage	13.0 Volt
Filament Current	36.0 Ampere
Peak Inverse Voltage (max.)	30 Kilovolts
Average Anode Current	3 Amperes
Peak Anode Current (max.)	15 Amperes

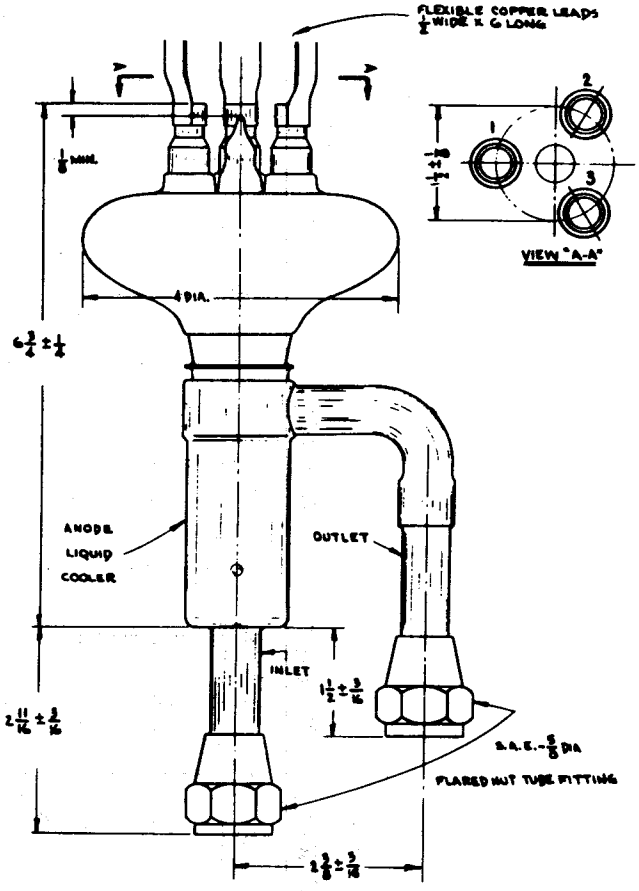
ELECTRICAL (CLIPPER)

Filament Voltage	14.5 Volts
Filament Current	40.0 Amperes
Peak Inverse Voltage (max.)	30 Kilovolts
Peak Anode Current (max.)	150 Amperes
CMS Anode Current	6 Amperes

XD–27 AIR



XD–27 WATER



X-RAY INFORMATION

WARNING FOR POSSIBLE X-RAY GENERATION

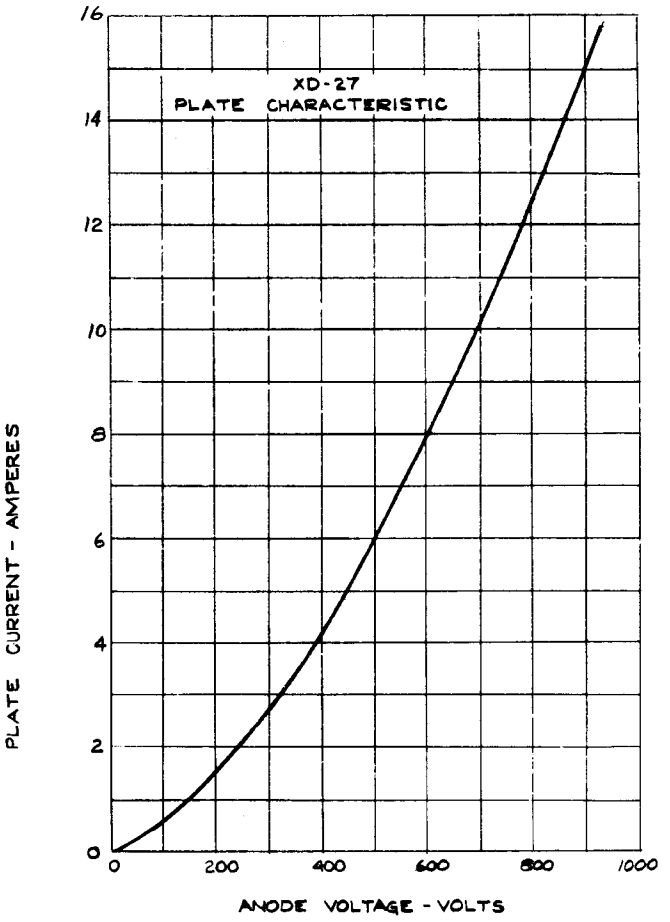
See Safety Code for the Industrial Use of X-Rays published by the American Standards Association.

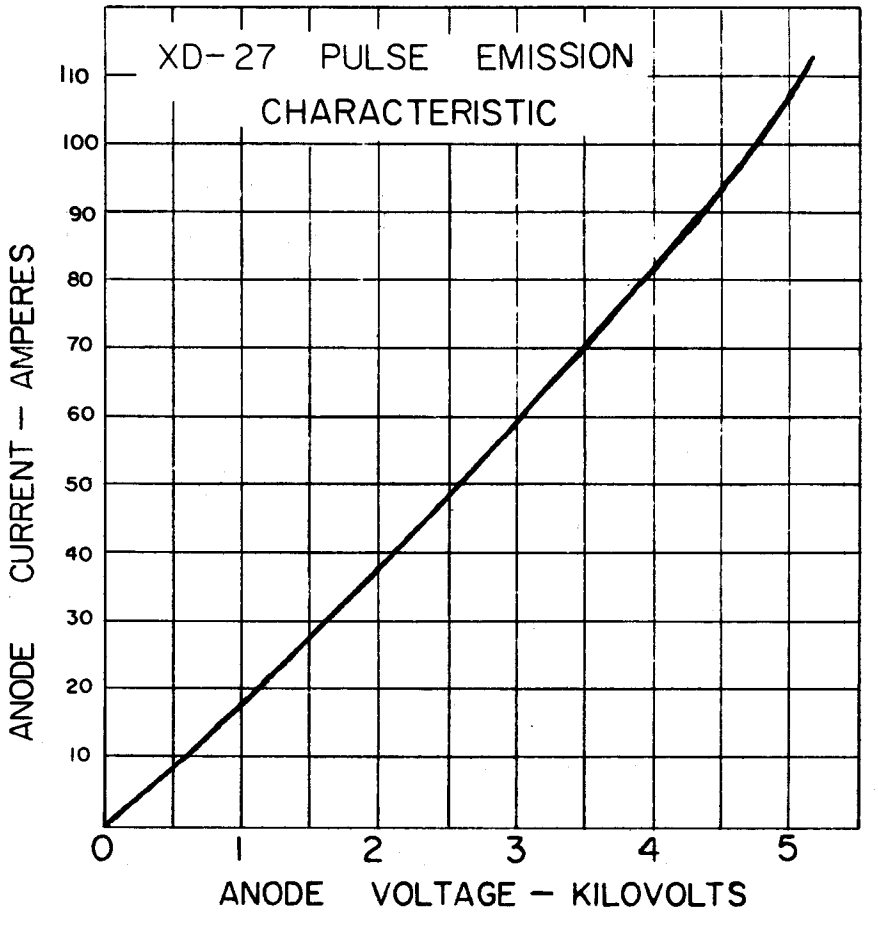
Over

PROVISIONAL DATA

Issued 8-60

Check factory before finalizing designs.


XD-27
PLATE CHARACTERISTIC
PLATE CURRENT - AMPERES
ANODE VOLTAGE - VOLTS
0
2
4
6
8
10
12
14
16
0
200
400
600
800
1000


XD-27 PULSE EMISSION
CHARACTERISTIC
ANODE CURRENT — AMPERES
ANODE VOLTAGE — KILOVOLTS
10
20
30
40
50
60
70
80
90
100
110
0
1
2
3
4
5

Central ELECTRONIC MANUFACTURERS

DENVILLE, NEW JERSEY

HIGH VACUUM DIODE

XD – 31

DESCRIPTION

The Central tube type XD–31 is a forced air cooled high voltage, high current diode featuring a unipotential oxide coated cathode and an external anode. The XD–31 is designed for rectifier or clipper service.

SPECIFICATIONS:

PHYSICAL

Length	3½ inches
Diameter	2 inches
Weight	6 ounces
Mounting Position	Any
Type of Cooling	Forced Air
Required Air Flow on Anode	

Velocity (cfm)	Anode Dissipation (Kw)	Pressure (in. of water)
50	.15	1.0

Maximum Incoming Air Temperature	45°C
Maximum Glass Seal Temperature	180°C

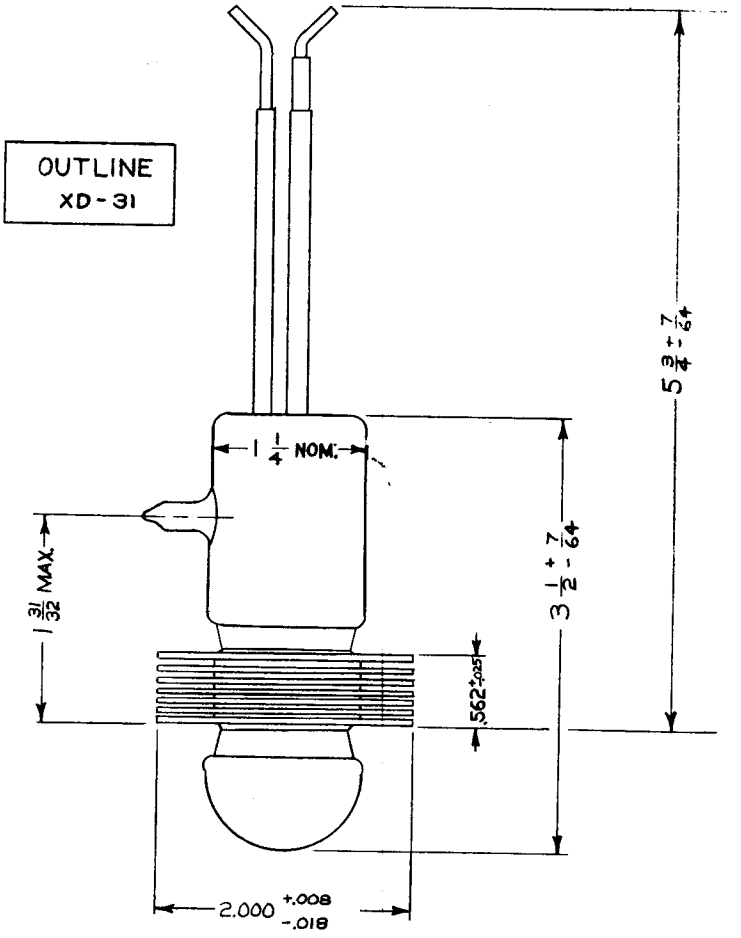
ELECTRICAL (RECTIFIER)

Filament	Oxide coated unipotential cathode
Heater Voltage	6 Volts
Heater Current	6.5 Amperes
Peak Inverse Voltage	17 Kilovolts
Peak Anode Current	2.7 Amperes
Average Anode Current	0.7 Amperes
Anode Dissipation	150 Watts

ELECTRICAL (CLIPPER)

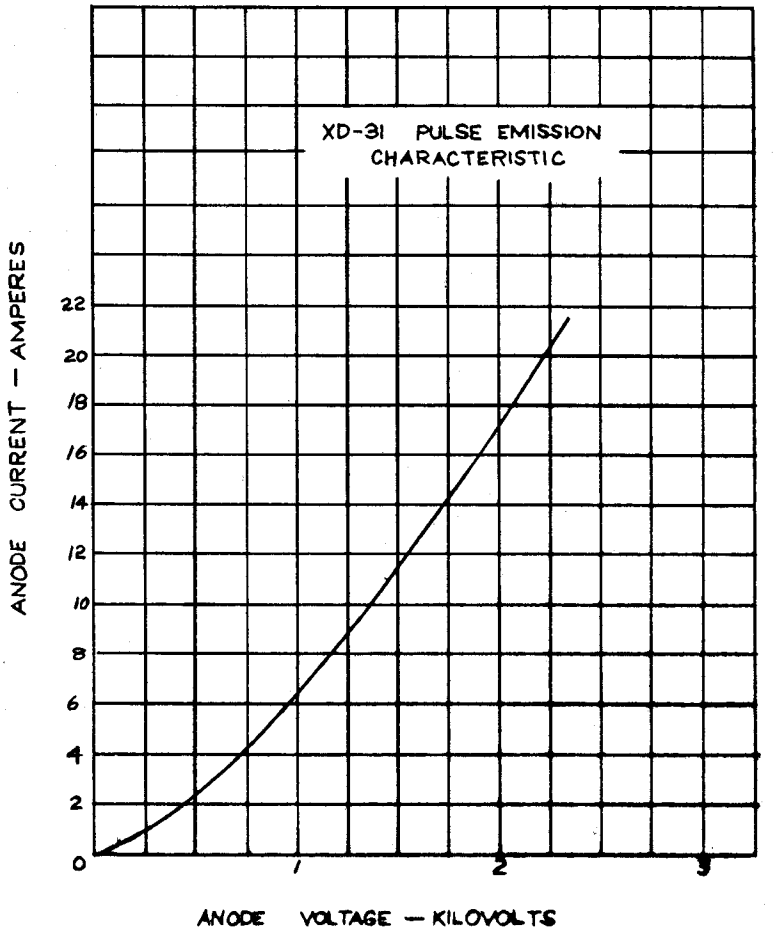
Heater Voltage	6 Volts
Heater Current	6.5 Amperes
Peak Inverse Voltage	15 Kilovolts
Peak Anode Current	20 Amperes
RMS Anode Current	1.5 Amperes
Pulse Width (max.)	1 u second
Duty Cycle (max.)	0.0012
Anode Dissipation	150 Watts

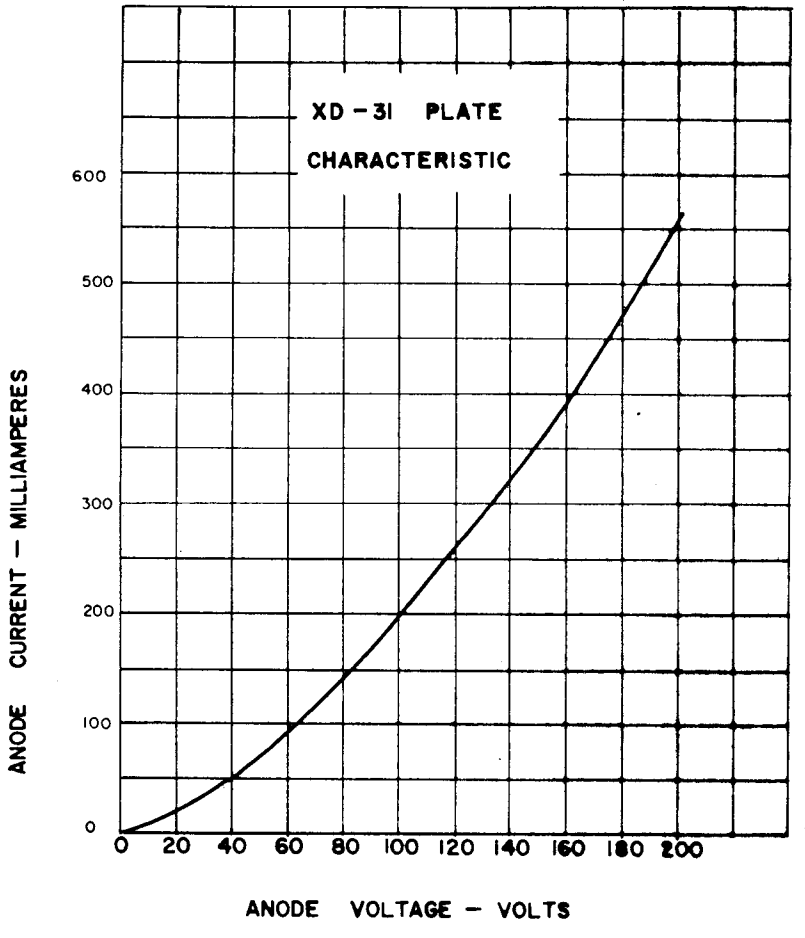
OUTLINE XD-31



PROVISIONAL DATA
Issued 8-60
Check factory before finalizing designs.

Over


XD-31 PULSE EMISSION CHARACTERISTIC
ANODE CURRENT — AMPERES
0
2
4
6
8
10
12
14
16
18
20
22
1
2
3
ANODE VOLTAGE — KILOVOLTS


XD-31 PLATE CHARACTERISTIC
ANODE CURRENT — MILLIAMPERES
0
100
200
300
400
500
600
0
20
40
60
80
100
120
140
160
180
200
ANODE VOLTAGE — VOLTS

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PULSE TUBE
XD-32
44 MEGAWATTS

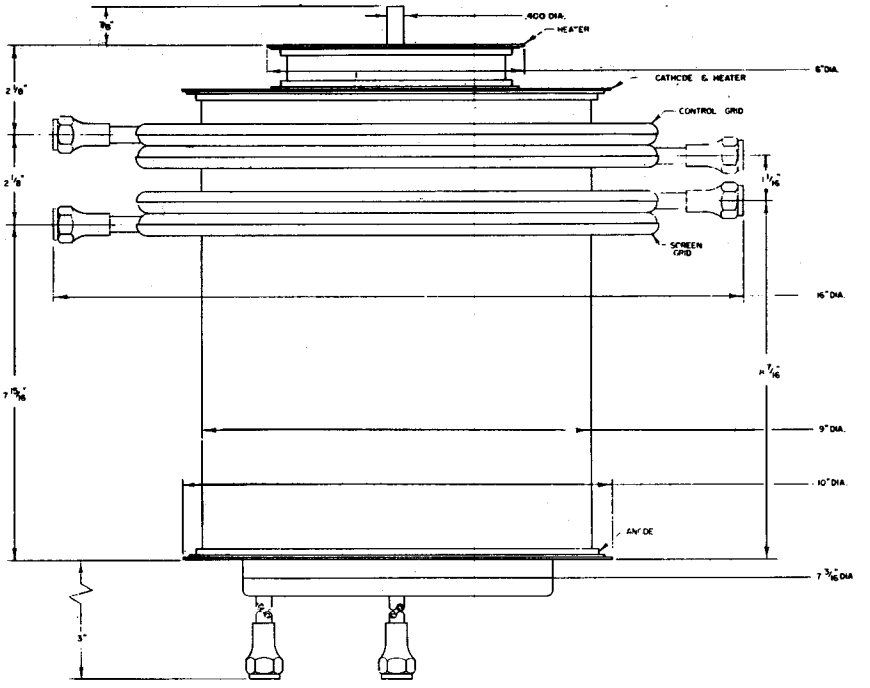
DESCRIPTION

The Central tube type XD-32 is a completely water-cooled tetrode, having a unipotential matrix cathode, specifically designed for pulse service as a hard tube modulator or switch tube.

SPECIFICATIONS

ELECTRICAL:

Heater Voltage	6.0 volts
Heater Current	233 amperes
Amplification (Triode) Factor	4



PHYSICAL:

Mounting Position – Vertical, Anode Down

Cooling – Anode	6 GPM
Screen Grid	6 GPM
Control Grid	6 GPM
Pressure	30 psi

Dimensions – As shown on outline

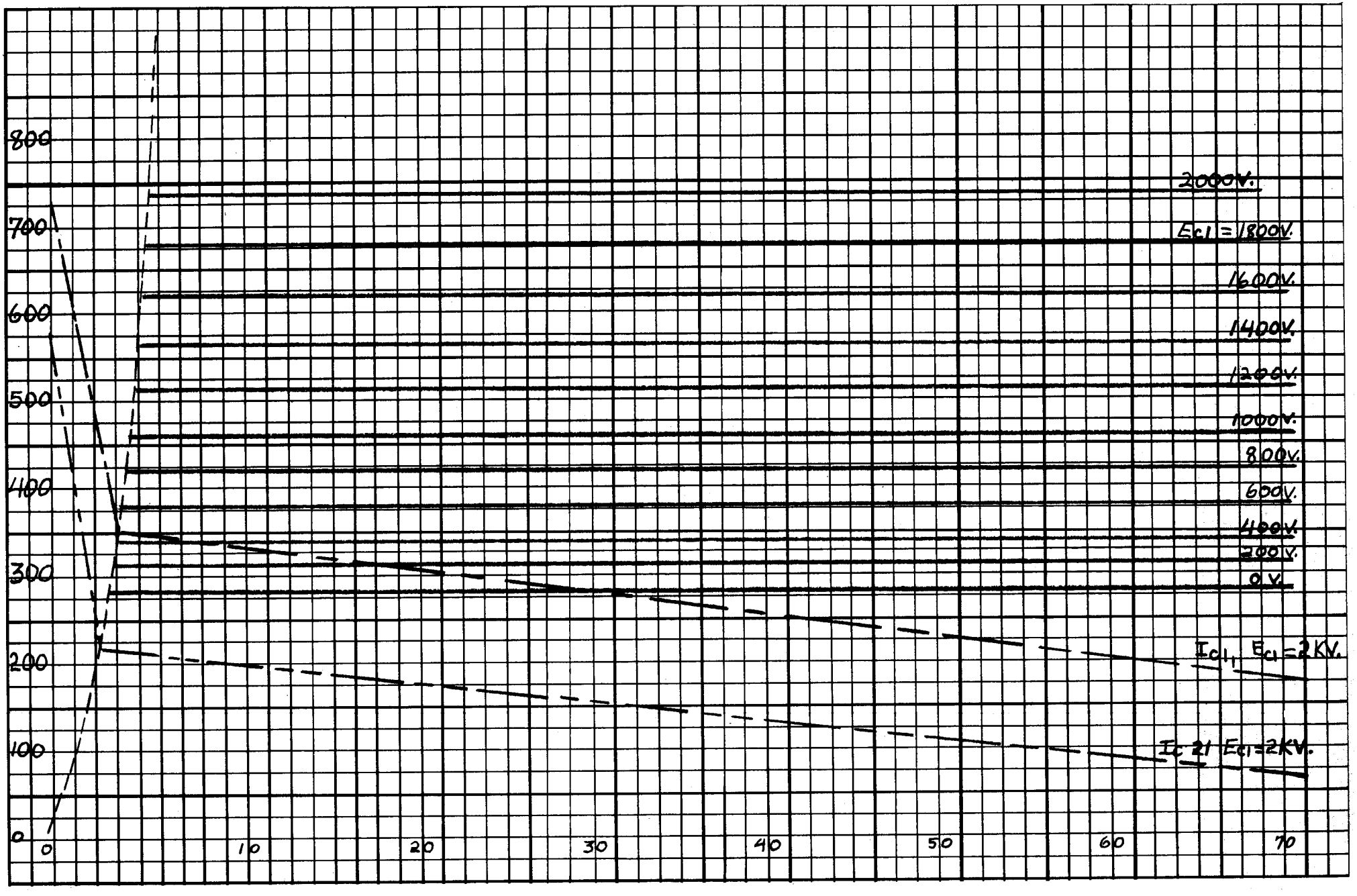
TYPICAL OPERATION AS HARD TUBE MODULATOR

.01 Duty, Class B.

Anode Voltage	65 Kv
Screen Voltage	6 Kv
Control Grid	–1.5 Kv
Peak Anode Current	750 amperes
Peak Screen Current	218 amperes
Anode Dissipation, Average	44 Kw
Screen Dissipation, Average	13 Kw
Grid Driving Power, Average	7 Kw
Grid Driving Power, Peak	708 Kw
Peak Grid Voltage	2 Kv
Power Output, Peak	44 Mw
Pulse Width (max.)	25 μ seconds

PROVISIONAL DATA
Issued 5/60
Check factory before finalizing designs.

(Over)


800
700
600
500
400
300
200
100
0
0
10
20
30
40
50
60
70
2000V.
Ec1 = 1800V.
1600V.
1400V.
1200V.
1000V.
800V.
600V.
400V.
200V.
0 V.
Ic11, Ec1 = 2KV.
Ic 21 Ec1 = 2KV.

Central ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

GAS NOISE TUBE	X
XD-44A/CNT-X15D-4	15.3 Db

References and notations contained herein are taken from Military Specifications for Electron tubes MIL-E-1D 31 March '58.

Description: Gaseous Discharge Diode, X Band (Note 11)

Ratings:

	If	Ib	TA	T Bulb
	mA	mAdc	°C	°C
Absolute Maximum:	. .	. .	+85	+125
Minimum:	. .	. .	−55	. .
Test Conditions:	0	200	. .	. .

Cathode: Filamentary Type.
Dimensions: Per Outline Drawing (Fig. 1)
Base: Per Outline Drawing (Fig. 1)
Mounting Position: Any

Ref. Para.	Test	Conditions	Min.	Max.
. . .	Qualification:	Required.		
4.5	Holding Period:	168 hours		
4.9.18.1.10	Carton Drop:	. . .		
4.9.20.3	*Vibration:	No Voltages, Note 9.		
4.10.5.1	Filament Voltage:	I_f=170mAdc	E_f . . .	10Vdc
4.13.2	Tube Voltage Drop:	Note 1,2	E_{td} 65	75Vdc
. . .	Excess Noise Ratio:	F=8500 Mc. Notes 3,4,5,10.	N_r-1 15.05	15.45Db
. . .	Match (1):	F=8500 Mc. Notes 4,6. I_b=200 mAdc	VSWR	1.07:1
. . .	*Match (2):	F=8500 Mc. I_b=0 mAdc Notes 4,6.	VSWR	1.07:1
. . .	Intermittent Life Test	Notes 1,3,8,9. (One min. on, two min. off) Preheat time=2 to 3 sec.	2500	Cycles
4.11.4	Intermittent Life Test End Points Excess Noise Ratio: Note 11.		N_r-1 15.0	15.5Db

Note 1. The tube shall be tested in the circuit of Fig. 3.
Note 2. In the test circuit of Fig. 3, with a filament current of 170 mAdc, the tube shall operate within three tries.
Note 3. The tube shall be tested in total darkness.
Note 4. The tube shall be tested in a tube mount as specified in Figure 2, or equivalent, terminated by a matched RG-51/U termination having a VSWR no greater than 1.01:1.
Excessive Noise Ratio Measurement tests shall be made using the circuit of block diagram Fig. 4, or equivalent.
Note 5. The frequency specified is that of the Local Oscillator.
Note 6. The frequency specified is that of the Signal Generator.
Note 7. Excess noise ratio should be measured by comparison with an approved standard.
Note 8. The tube shall be tested at an ambient temperature of +85°C.
Note 9. Intermittent Life Test end points shall apply.
Note 10. The Excess Noise Ratio (N_r-1) is defined in Db as N_r-1 = 10 $\log\left(\frac{T_e}{290}-1\right)$ where T_e is the effective electron temperature.
Note 11. The noise frequencies generated by this tube cover a broad band of frequencies. This bandwidth is limited only by the type of mount used. This tube is normally used with a mount in RG-51/U wave guide, at a 10 degree angle in the E plane. Other wave guide sizes may be used with properly adapted mounts.

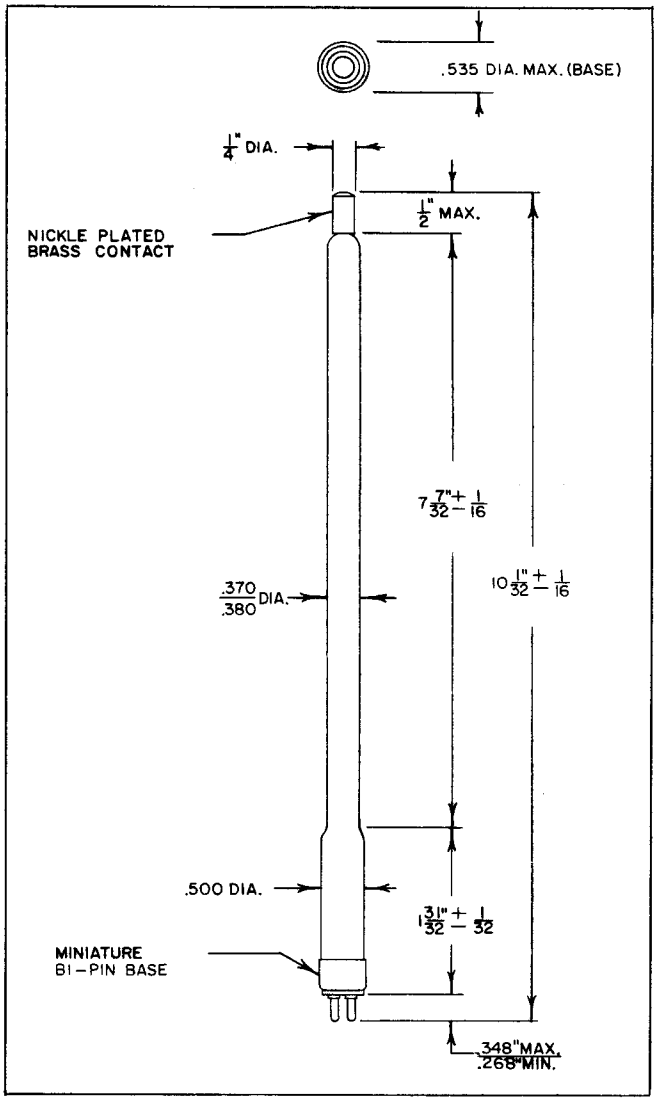


FIG. 1

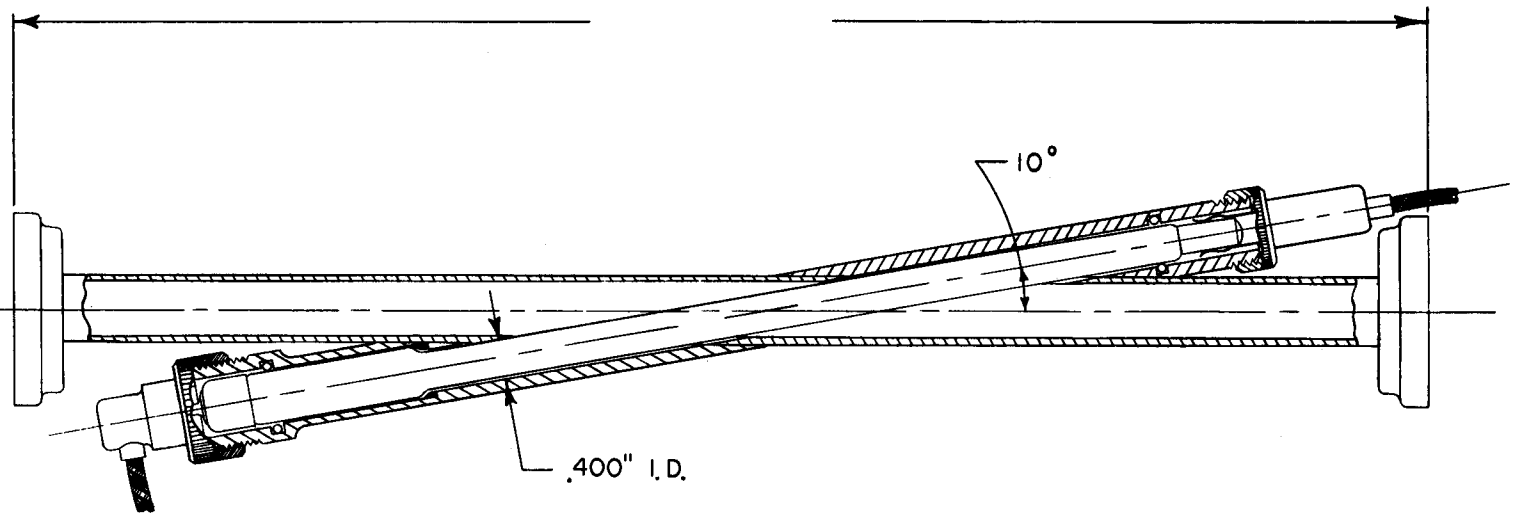
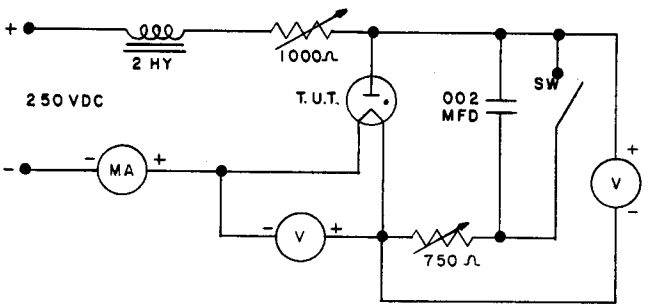
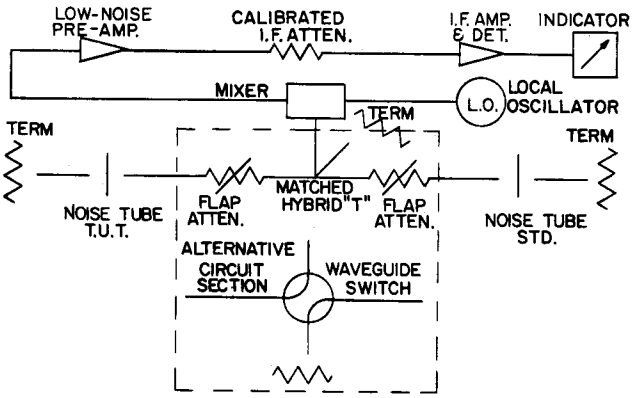


FIG. 2



D.C. TEST CIRCUIT

FIG. 3



TEST CIRCUIT FOR EXCESS NOISE MEASUREMENTS
FIG. 4

NUCLEAR CORPORATION OF AMERICA
CENTRAL ELECTRONIC MANUFACTURERS DIVISION
Denville, New Jersey

High Vacuum Diode
Type XD-49R & XD-49W

DESCRIPTION

The XD-49 is available as a forced air cooled XD-49R or water cooled diode (XD-49W) for use in rectifier and clipper services and features a special thoriated tungsten filament.

SPECIFICATIONS

PHYSICAL	XD-49W	XD-49R
Length	9 7/8 max.	7 3/8 max.
Diameter	4	4 21/32 max.
Weight	1 3/4 approx.	5 1/2 pounds approx.
Mounting Position	Vertical	Vertical
Mounting Socket	--	CAS-A or CAS-B Series
Type of Cooling	Water	Forced Air

Required Air Flow on Anode (Air Cooled Tube)

Anode Dissipation (kw)	Air Flow (cfm)	Pressure (in. of water)
1.0	50	0.20
1.8	75	0.26
2.4	125	0.58
3.0	190	1.21

Maximum Incoming Air Temperature	45°C
Maximum Glass Seal Temperature	180°C
Required Water Flow (Water Cooled Tube)	3 gpm for 5 kw dissipation
Required Water Flow (Water Cooled Tube)	70°C

ELECTRICAL

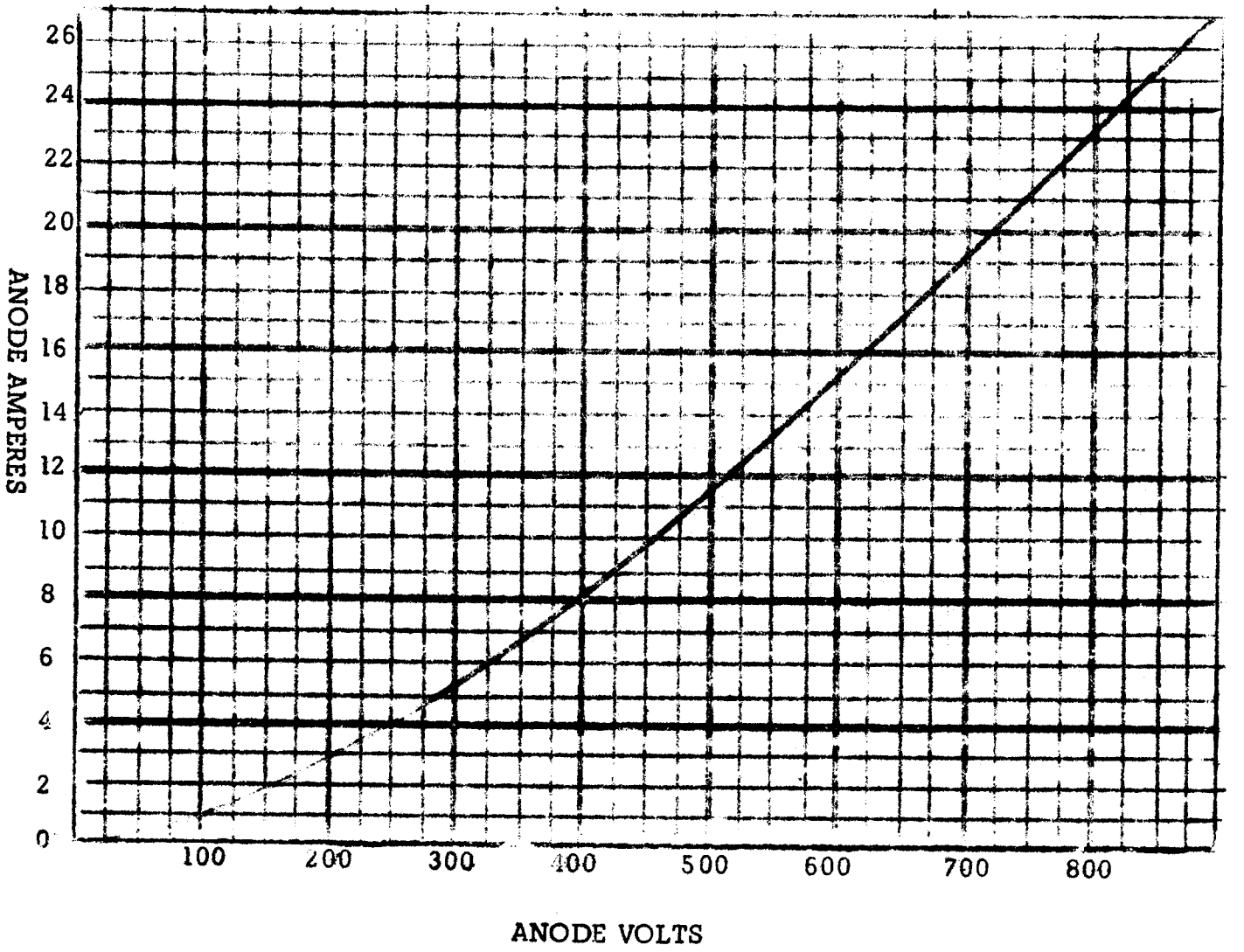
Filament	Thoriated Tungsten
Filament Voltage	15 Volts
Filament Current	36 Amperes
Filament Starting Surge Current	80 Amperes
Filament Cold Resistance	.042 Ohms

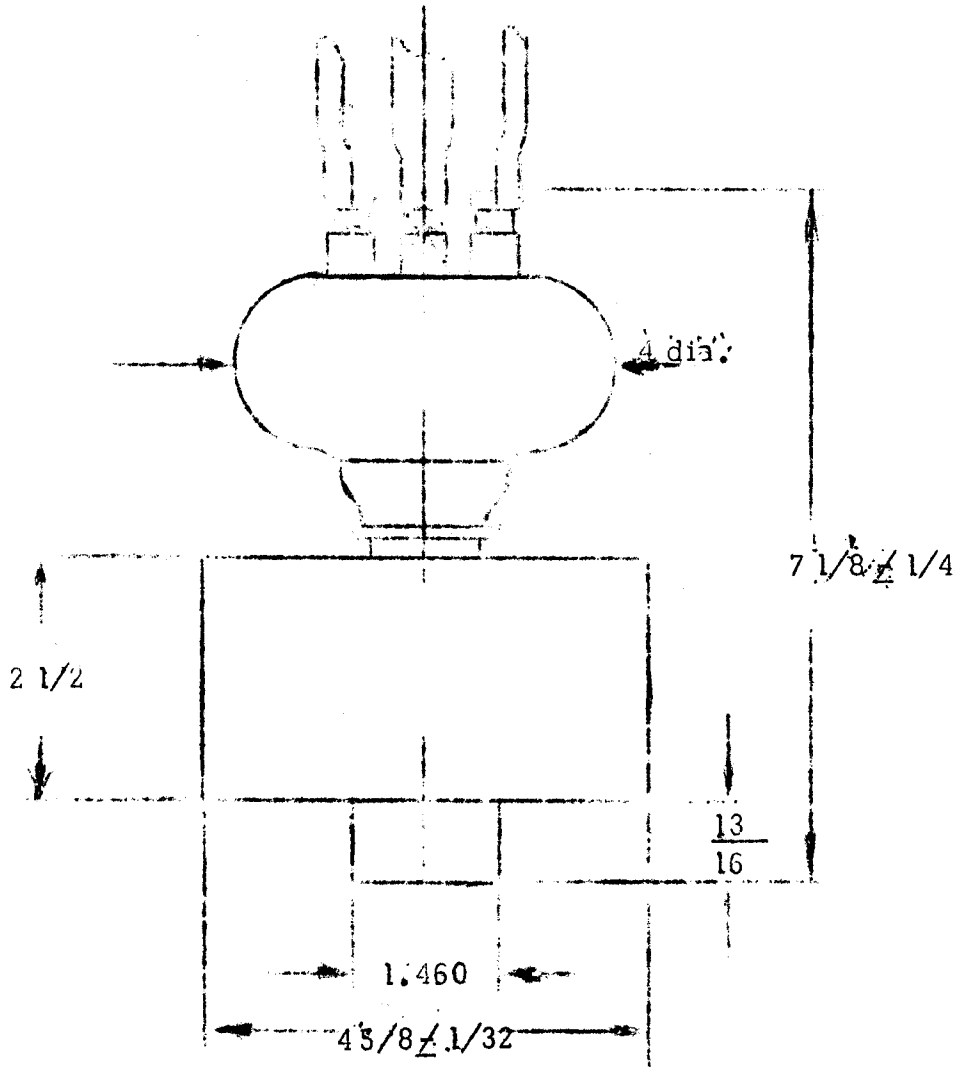
ELECTRICAL (RECTIFIER)	XD-49W	XD-49R
Filament Voltage	15 volts	15 volts
Filament Current	36 amperes	36 amperes
Peak Inverse Voltage (max.)	25 kilovolts	25 kilovolts
Average Anode Current	7 amperes	3 amperes

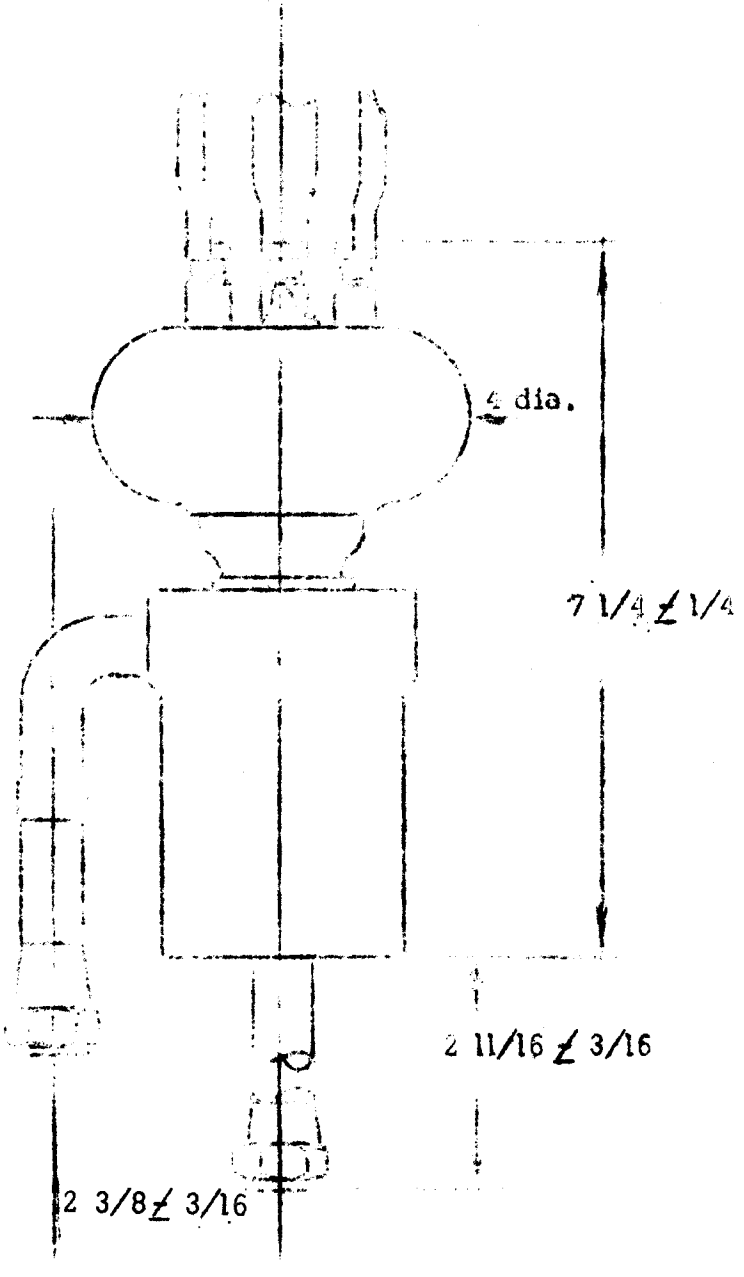
ELECTRICAL (RECTIFIER)	XD-49W	XD-49R
Peak Anode Current (max.)	25 amperes	10 amperes
Maximum Dissipation	5 kilowatts	3 kilowatts

ELECTRICAL (CLIPPER)		
Filament Voltage	16.2 volts	16.2 volts
Filament Current	39 amperes	39 amperes
Peak Inverse Voltage (max.)	25 kilovolts	25 kilovolts
Peak Anode Current (max.)	160 amperes	160 amperes
RMS Anode Current	8 amperes	4 amperes

See Safety Code for Industrial Use of X-Rays published by A.S.A.

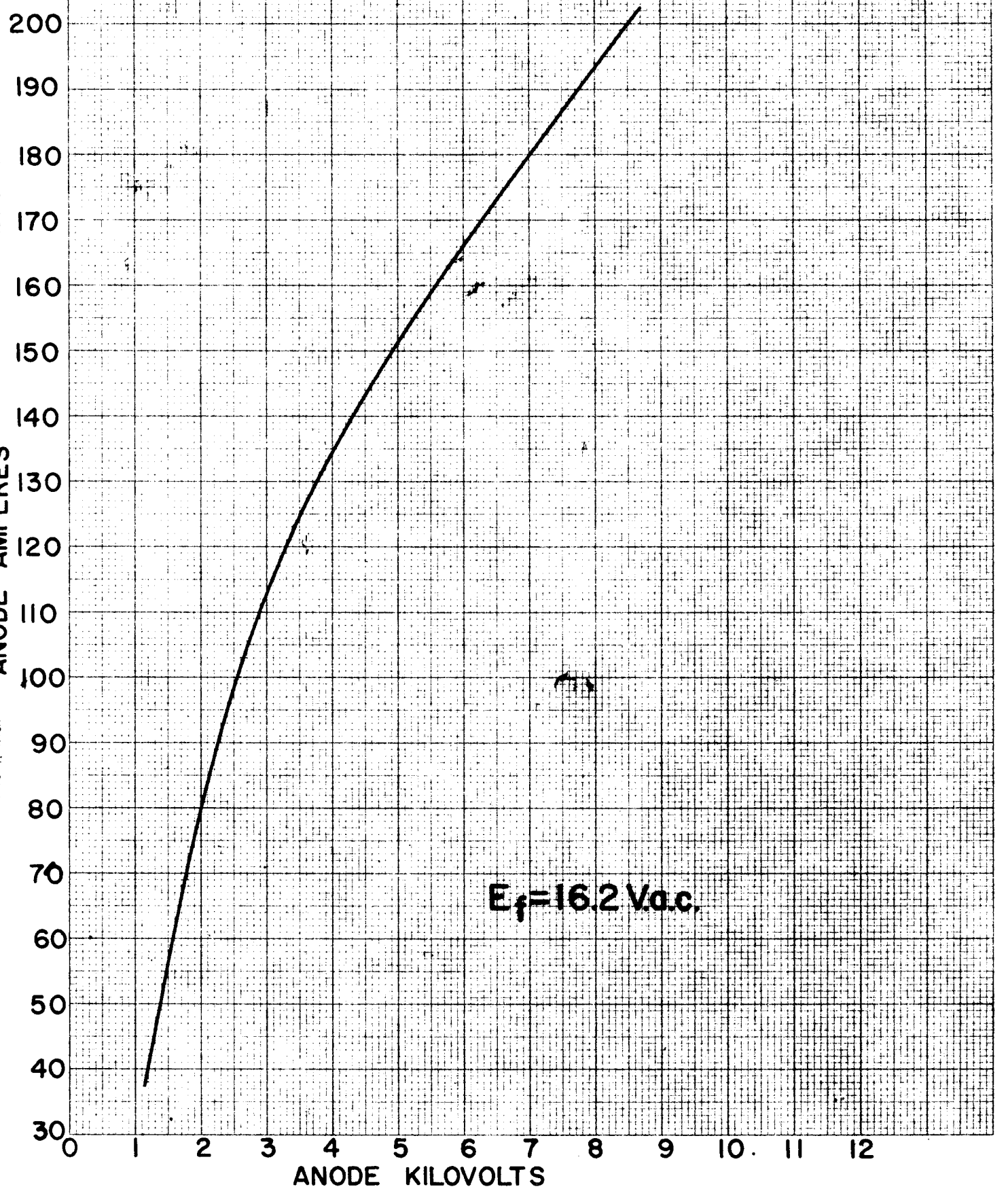



4 dia.
7 1/8 ± 1/4
2 1/2
13/16
1.460
4 5/8 ± 1/32


4 dia.
7 1/4 ± 1/4
2 11/16 ± 3/16
2 3/8 ± 3/16

TUBE TYPE XD-49

PULSE CHARACTERISTIC PLATE CURVE



CHARLES BRUNING COMPANY, Inc.
MADE IN U.S.A.
BRUNING 700 20
10 X 10 TO ½ INCH

CENTRAL ELECTRONIC MANUFACTURERS
2 RICHWOOD PLACE
DENVILLE, NEW JERSEY

TECHNICAL SPECIFICATIONS FOR XD-5

The Central tube type XD-5 is a forced air cooled triode specifically designed for use in high voltage pulse operation.

SPECIFICATIONS:

PHYSICAL

Length	$6\frac{1}{2}$ inches
Diameter	4 5/8 inches
Weight	4 1/4 pounds
Mounting Position	Vertical
Mounting Socket-CASA or CASB ser.	
Type of Cooling	Forced air
Required Air Flow on Anode	
190 cfm @ 1.21 psi for 3 Kw.	
Max. Inc. Air Temp.	45°C
Max. Glass Seal Temp.	180°C

ELECTRICAL

Filament	Thoriated Tungsten
Filament V.	14.0 Volts
Filament Current	38.0 Amps.
Filament Starting Cur.	80.0 Amps.
Amplification Factor	25
E_c = -200 V. E_b = 0.2 Amps.	
Interelectrode Capacitances	
Grid to Filament	15.0 uuf
Anode to Filament	1.8 uuf
Grid to Anode.	12.0 uuf

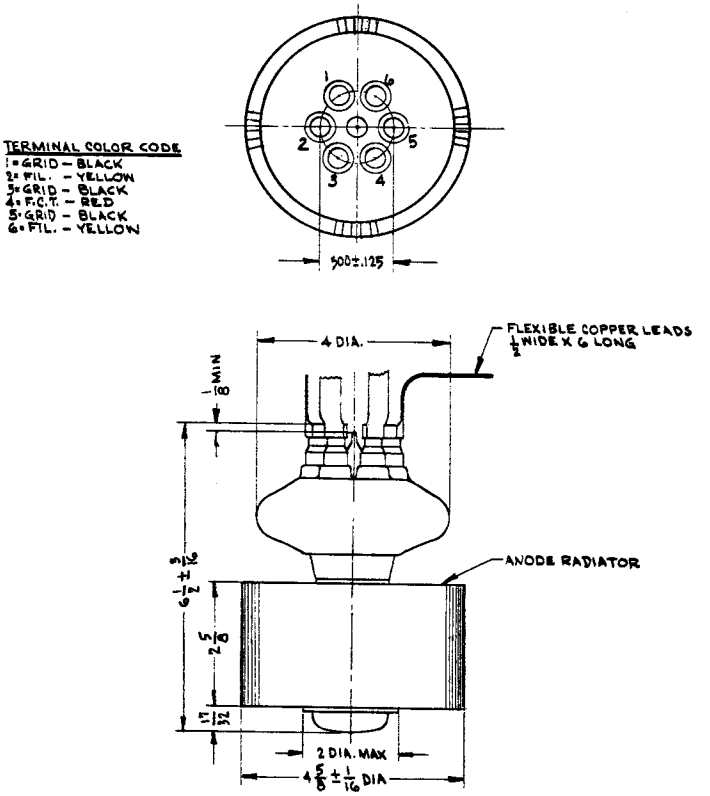
TYPICAL OPERATION (PULSE)

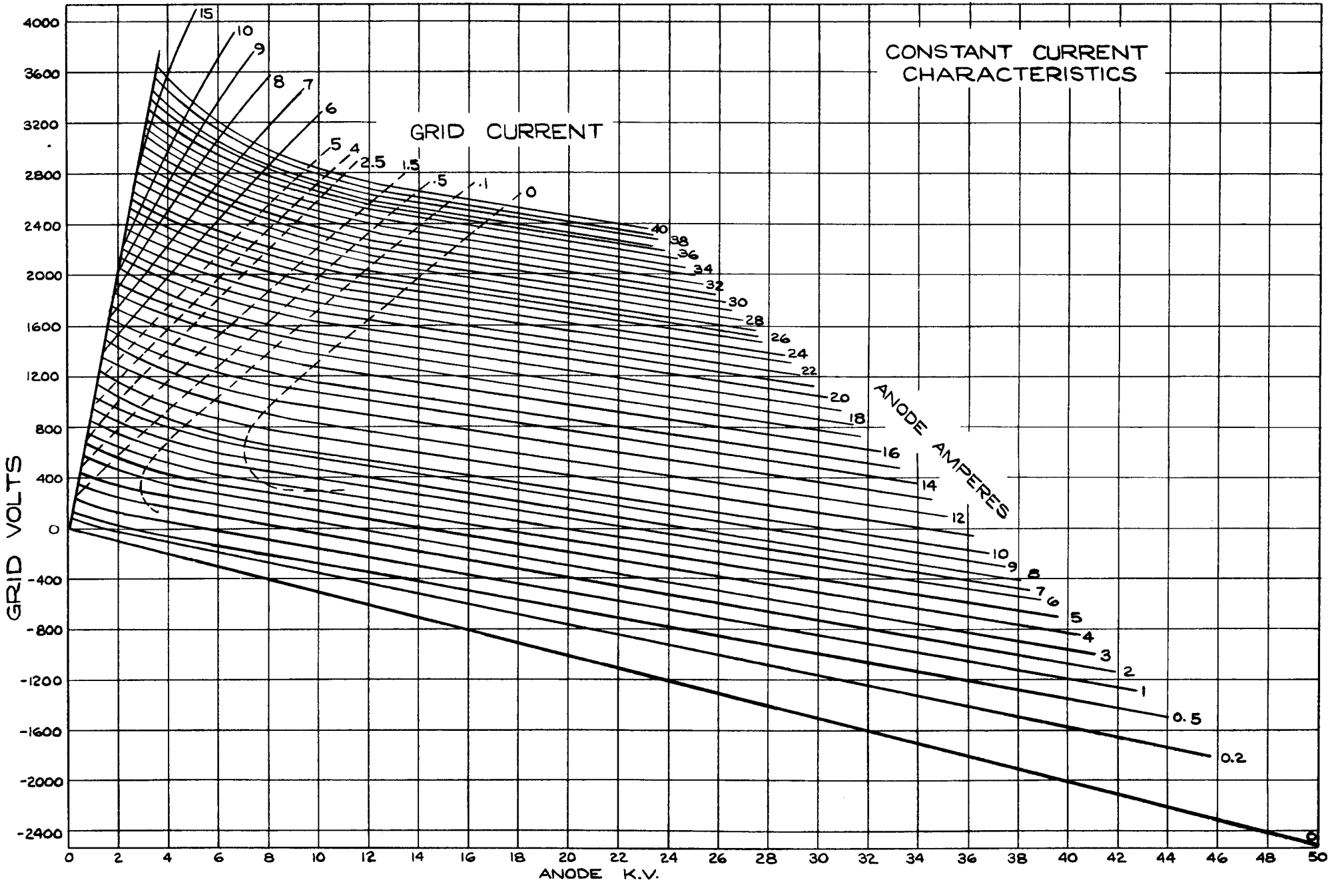
Peak Anode Voltage	30 Kilovolts
Grid Voltage -	1500 Volts DC
Peak Anode Current	25 Amps.
DC Anode Current	0.025 Amps.
DC Grid Current	0.003 Amps.
Average Power Output	750 Watts
Duty	.001

MAXIMUM RATINGS

DC Anode Voltage	35Kv.
DC Grid Voltage -	5000 V.
DC Anode Current	0-130 Amps.
DC Grid Current	0.150 Amps.
Pulse Width	90 u sec.
Peak Anode Current	30 Amps.
Peak Cathode Current	45 Amps.
Max. Duty	.30
Peak Anode Voltage	40 Kilovolts
Peak Power Output	750 Kilovolts

TUBE TYPE XD-5




CONSTANT CURRENT CHARACTERISTICS
GRID CURRENT
ANODE AMPERES
GRID VOLTS
ANODE K.V.
4000
3600
3200
2800
2400
2000
1600
1200
800
400
0
-400
-800
-1200
-1600
-2000
-2400
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50
15
10
9
8
7
6
5
4
2.5
1.5
.5
.1
0
40
38
36
34
32
30
28
26
24
22
20
18
16
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2
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0.5
0.2
0

Central ELECTRONIC MANUFACTURERS

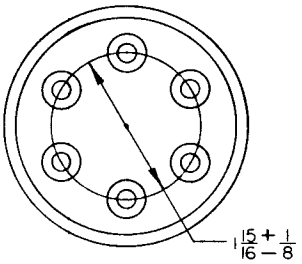
DENVILLE, NEW JERSEY

HIGH VACUUM DIODE

XD – 53

DESCRIPTION

The Central XD–53 is a water cooled high voltage high current diode for use in rectifiers and modulators. The tube features a woven thoriated tungsten filament for greatest protection against shock and vibration.



SPECIFICATIONS:

PHYSICAL

Length	9 7/8 inches
Diameter	4 13/16 inches
Weight	10 pounds
Mounting Position	Vertical
Type of Cooling	Water
Required Water Flow on Anode	

Velocity (gpm)	Anode Dissipation (Kw)	Pressure (psi)
15	30	30

Maximum Outgoing Water Temperature	70°C
Maximum Glass Seal Temperature	180°C

ELECTRICAL

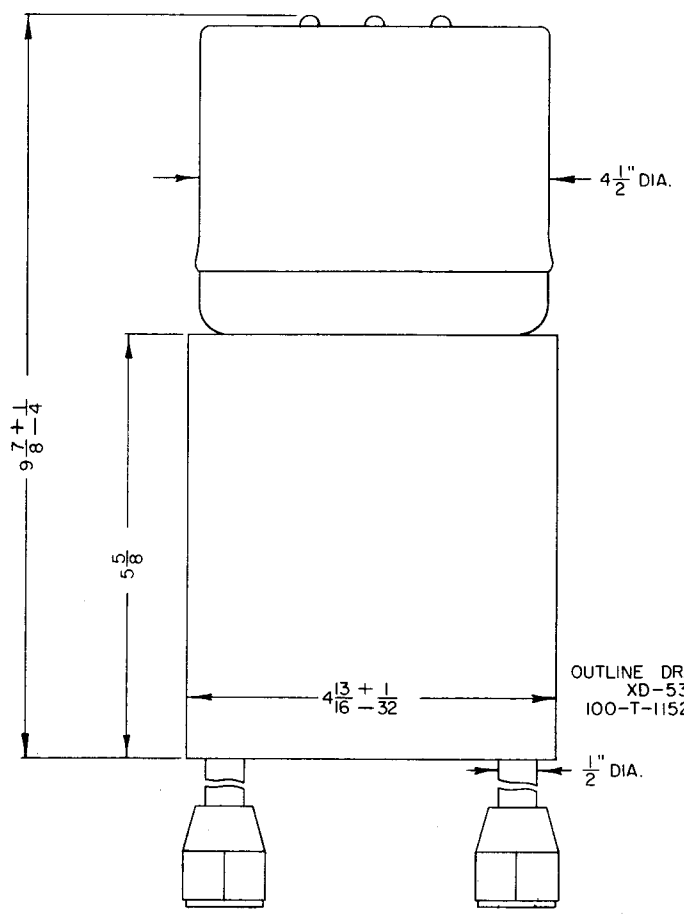
Filament	Thoriated Tungsten
Filament Voltage	10 Volts
Filament Current	120 Amperes
Filament Starting Surge Current	240 Amperes
Filament Cold Resistance	.008 Ohm
Interelectrode Capacitance Anode to Filament	35 uuf
Cathode Warm–up Time	30 Seconds
Average Cathode Current	20 Amperes
Peak Inverse Voltage	40 Kilovolts
Average Anode Current	20 Amperes
Peak Anode Current	60 Amperes

ELECTRICAL (RECTIFIER)

Filament Voltage	10.0 Volts
Filament Current	120 Amperes
Peak Inverse Voltage (max.)	40 Kilovolts
Average Anode Current (max.)	60 Amperes
RMS Anode Current	42.5 Amperes

ELECTRICAL (CLIPPER)

Filament Voltage	10.8 Volts
Filament Current	130 Amperes
Peak Inverse Voltage (max.)	40 Kilovolts
Peak Anode Current (max.)	250 Amperes



X-RAY INFORMATION

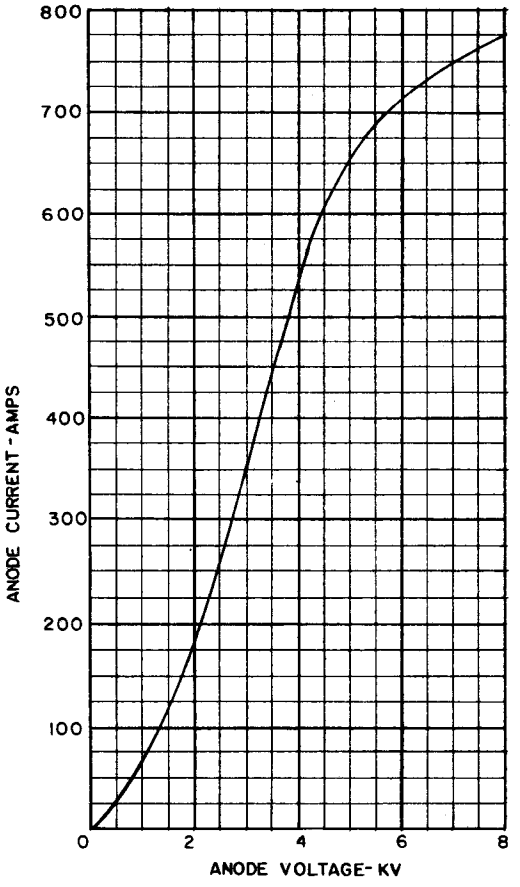
WARNING FOR POSSIBLE X-RAY GENERATION

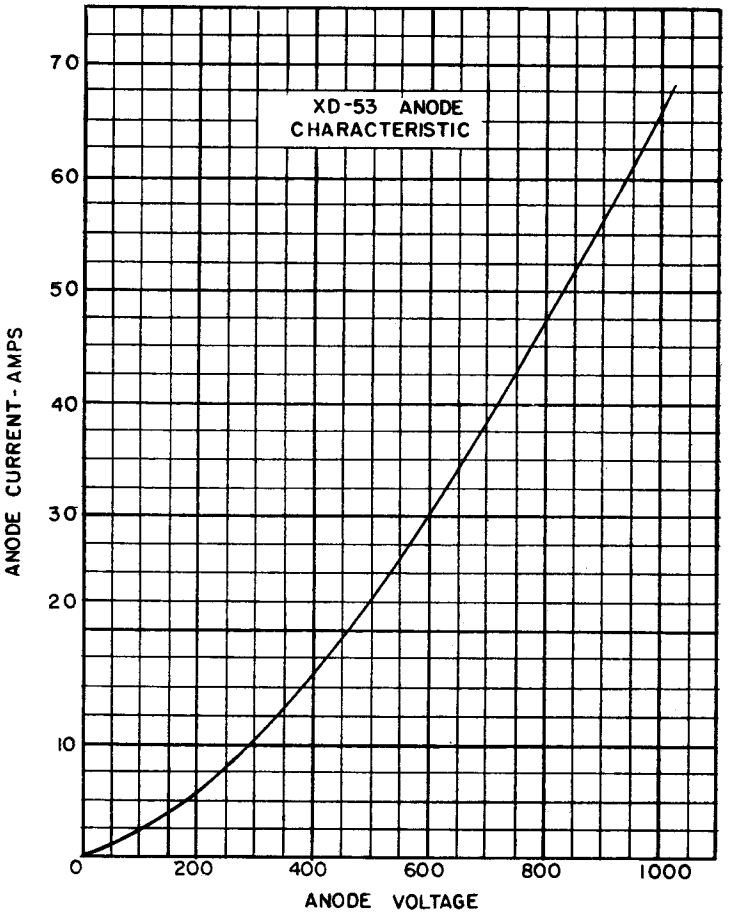
See Safety Code for the Industrial Use of X-Rays published by the American Standards Association.

Over

PROVISIONAL DATA
Issued 8-60
Check factory before finalizing designs.

XD-53 PULSE
EMISSION CHARACTERISTIC





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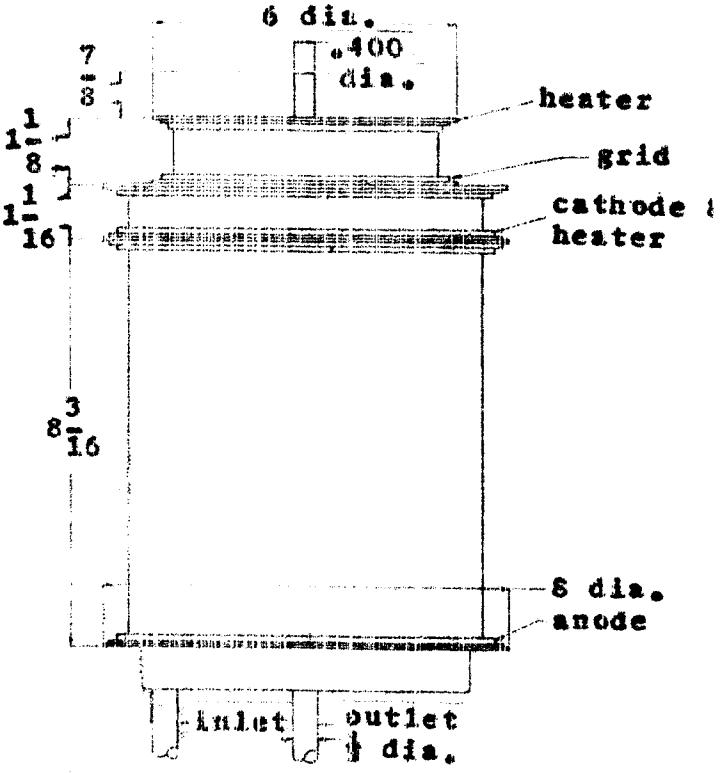
PRE-PROVISIONAL TECHNICAL SPECIFICATIONS FOR XD-55

The Central XD-55 is a completely oil immersed tetrode with forced oil circulation, having a thoriated tungsten filament specifically designed for pulse service as a hard tube modulator or switch tube.

Heater Voltage	10.0 V.
Heater Current	350 Amps
Amplification Factor	50
E_{bb} = 180 Kv. E_{cc} = -3.6 Kv.	
Interelectrode Capacitance	
anode to cathode	25 uuf
anode to grid	2 uuf
cathode to grid	300 uuf
Mounting Position - Vertical	
Maximum Altitude	10,000 ft.

MAXIMUM RATINGS

Anode Voltage	180 Kv.
Estimated Tube Drop	30 Kv.
Peak Anode Current	130 A.
Average Anode Current	400 mA.
Anode Dissipation	25 Kw.
Maximum Duty	.003
Peak Cathode Current	175A.
Maximum Pulse Width	12 u sec.

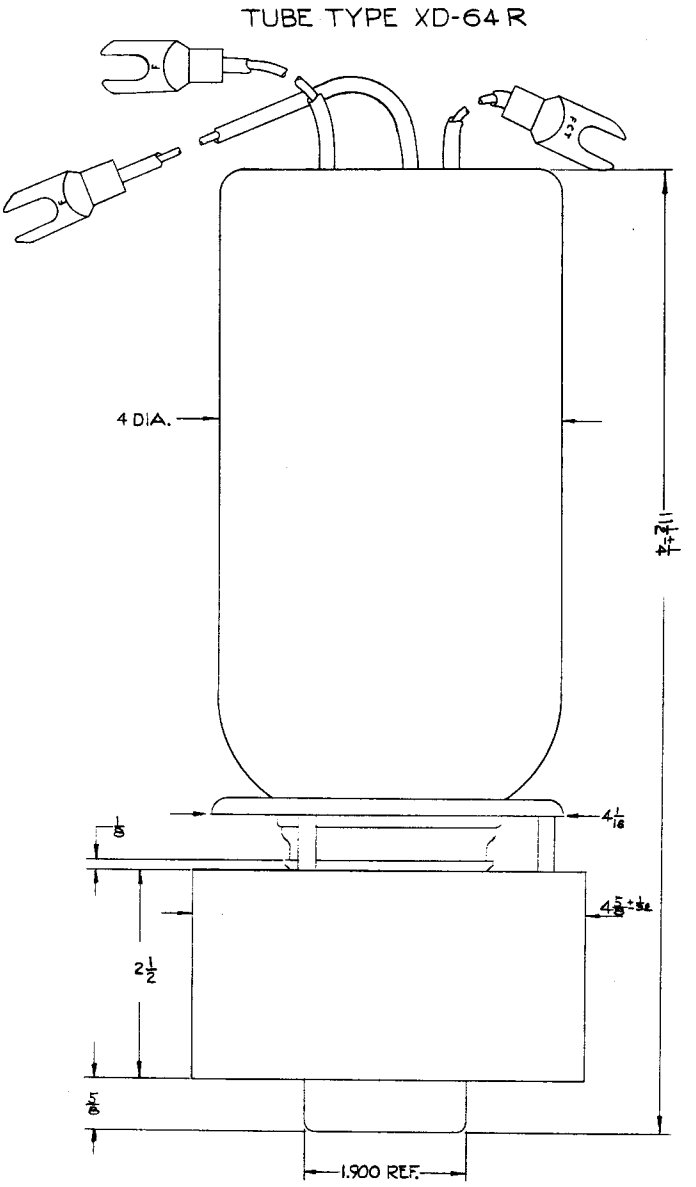


CENTRAL ELECTRONIC MANUFACTURERS
2 RICHWOOD PLACE
DENVILLE, NEW JERSEY

TECHNICAL SPECIFICATIONS FOR TYPE XD-64R HIGH VOLTAGE, HIGH VACUUM DIODE

The Nucor XD-64R is a forced-air cooled high vacuum tube diode specifically designed for rectifier, charging and shunt diode service up to 80KV peak inverse voltage. The tube design features a special thoriated tungsten filament capable of high peak currents and long life. The external anode allows for high anode dissipation ratings and efficient air cooling when used with the recommended Nucor air socket. This air socket permits maximum air flow at the anode. The XD-64R can dissipate 3KW continuously at an air flow of 190 cfm.

SPECIFICATIONS:



PHYSICAL

Overall Length (max)	11 3/4 in.
Overall Diameter (max)	4 21/32 in.
Weight (approx)	8 1/2 lbs.
Mounting Position	Vertical
Mounting Socket	
Type of Cooling	Forced Air

Air Flow

Velocity (cfm)	Anode Dissipation	Pressure Drop (in. of water)
50	1.0 KW	0.20
75	1.8 KW	0.26
125	2.4 KW	0.58
190	3.0 KW	1.21

Maximum Incoming Air Temp. 45°C
Maximum Glass Seal Temp. 180°C

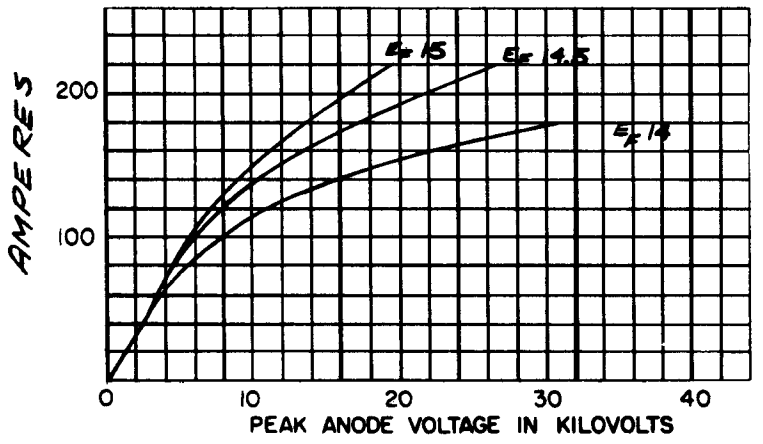
ELECTRICAL (Rectifier):

Filament Voltage	13 volts AC
Filament Current	36 amperes
Filament Surge Current (max)	80 amperes
Peak Inverse Voltage (max)	80 kilovolts
Anode Current	3 amperes
Peak Anode Current	15 amperes

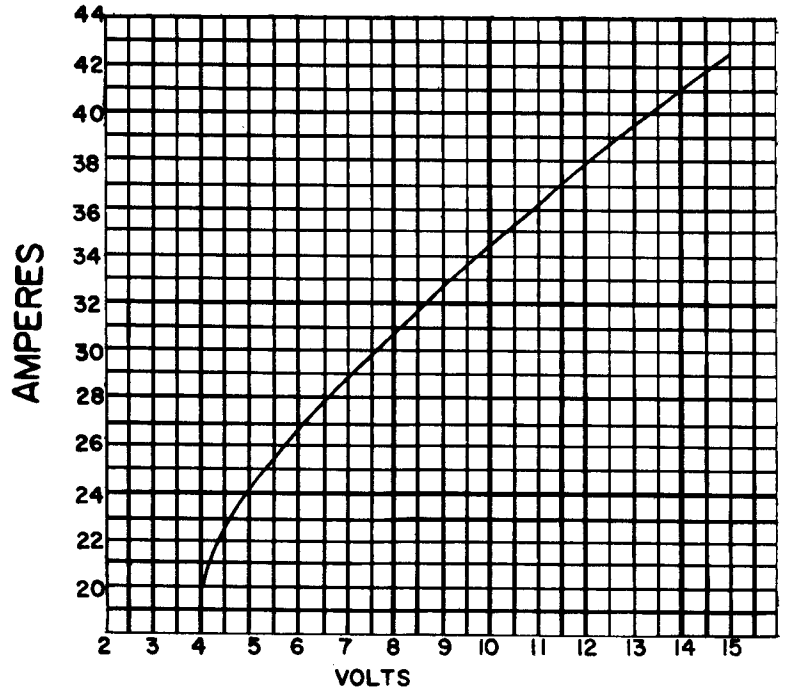
CLIPPER, SHUNT OR CHARGING DIODE

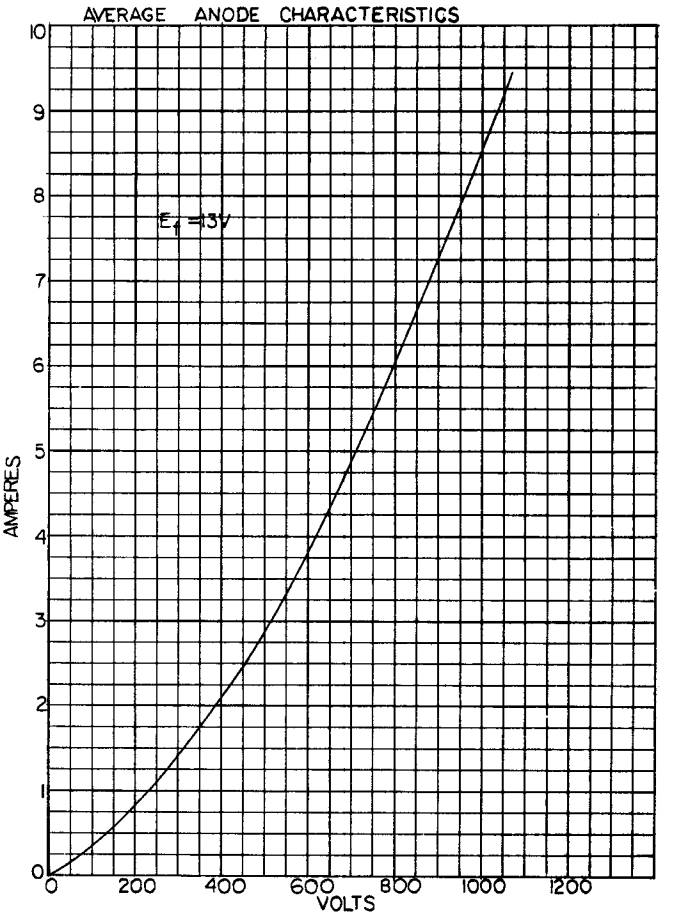
Filament Voltage (clipper)	14.5 volts AC
Filament Voltage (charging)	13 volts AC
Filament Current (clipper)	40 amperes
Filament Current (charging)	30 amperes
Filament Surge Current (max)	80 amperes
Peak Inverse Voltage (max)	80 kilovolts
Anode Current (RMS)	6 amperes
Peak Anode Current (clipper)	150 amperes

PULSE CHARACTERISTICS



FILAMENT CHARACTERISTICS





CENTRAL ELECTRONIC MANUFACTURERS
2 RICHWOOD PLACE
DENVILLE, NEW JERSEY

TECHNICAL SPECIFICATIONS FOR TYPE XD-64W HIGH VOLTAGE VACUUM DIODE

The Nucor XD-64W is a water cooled high vacuum diode specifically designed for rectifier, charging and shunt diode service up to 80KV peak inverse voltage. The tube design features a special thoriated-tungsten filament capable of high peak currents and long life. The external anode allows for high anode dissipation ratings and efficient water cooling through its specially designed integral jacket. The XD-64W can dissipate 5 KW continuously at a water flow of 3 gpm.

SPECIFICATIONS:

PHYSICAL

Overall Length (max.)	12 in.
Overall Diameter (max.)	4 21/32 in.
Weight (approx.)	4 lbs.
Mounting Position	Vertical
Type of Cooling	Water
Water Flow (min.)	3 gpm
Maximum Outlet Temp.	70°C
Maximum Glass Seal Temp.	180°C

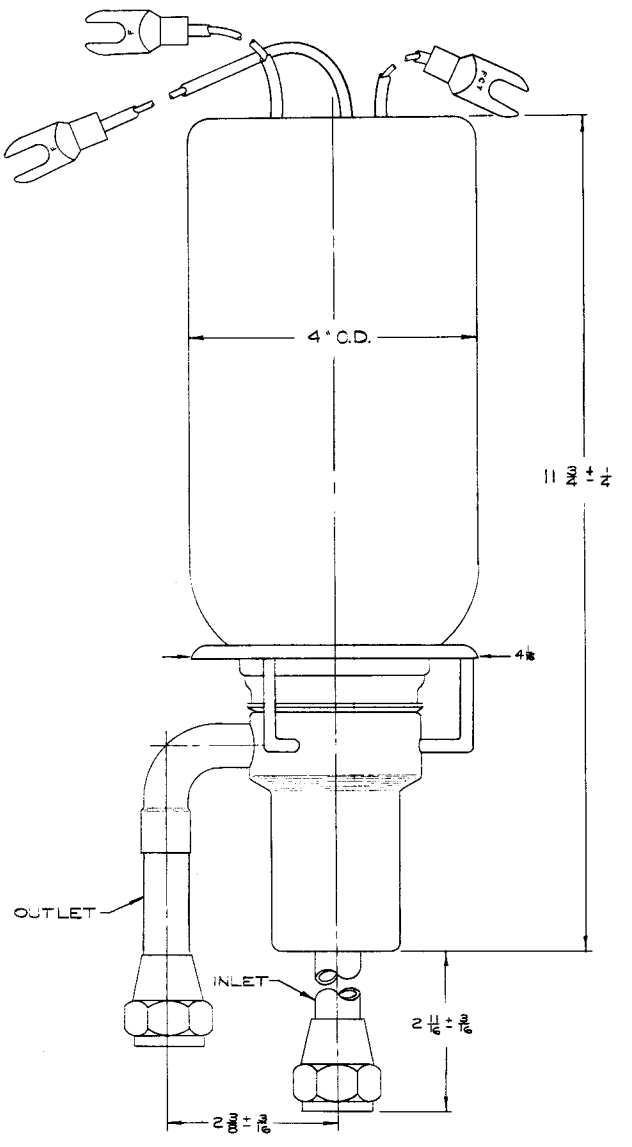
ELECTRICAL (Rectifier):

Filament Voltage	13 Volts AC
Filament Current	36 Amperes
Filament Surge Current (max)	80 Amperes
Peak Inverse Voltage (max)	80 Kilovolts
Anode Current	3 Amperes
Peak Anode Current	15 Amperes

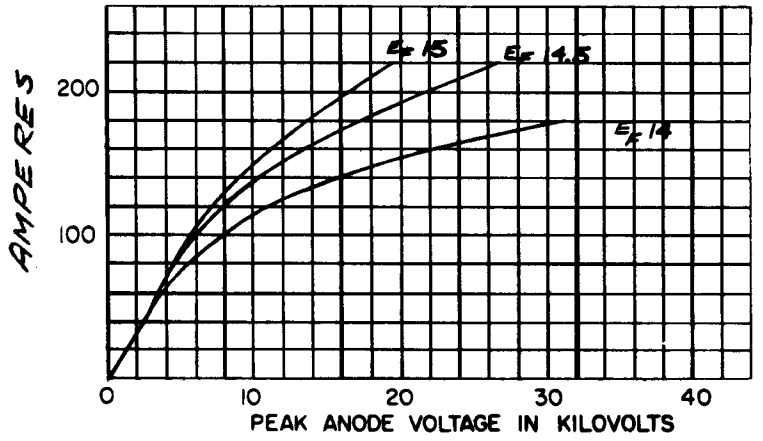
CLIPPER, SHUNT OR CHARGING

Filament Voltage (clipper)	14.5 Volts AC
Filament Voltage (charging)	13 Volts AC
Filament Current (clipper)	40 Amperes
Filament Current (charging	30 Amperes
Filament Surge Current (max)	80 Amperes
Peak Inverse Voltage (max)	80 Kilovolts
Anode Current (RMS)	6 Amperes
Peak Anode Current (clipper	150 Amperes

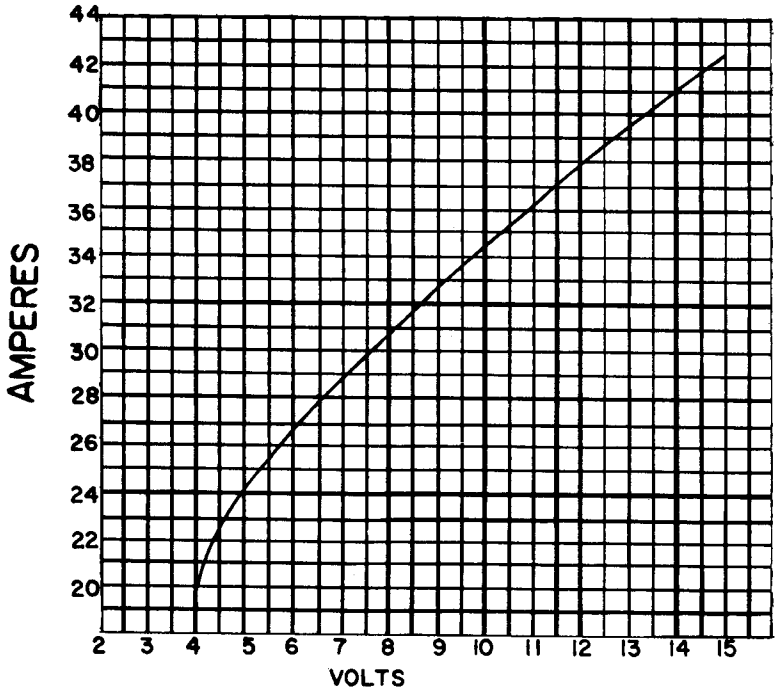
TUBE TYPE XD-64W

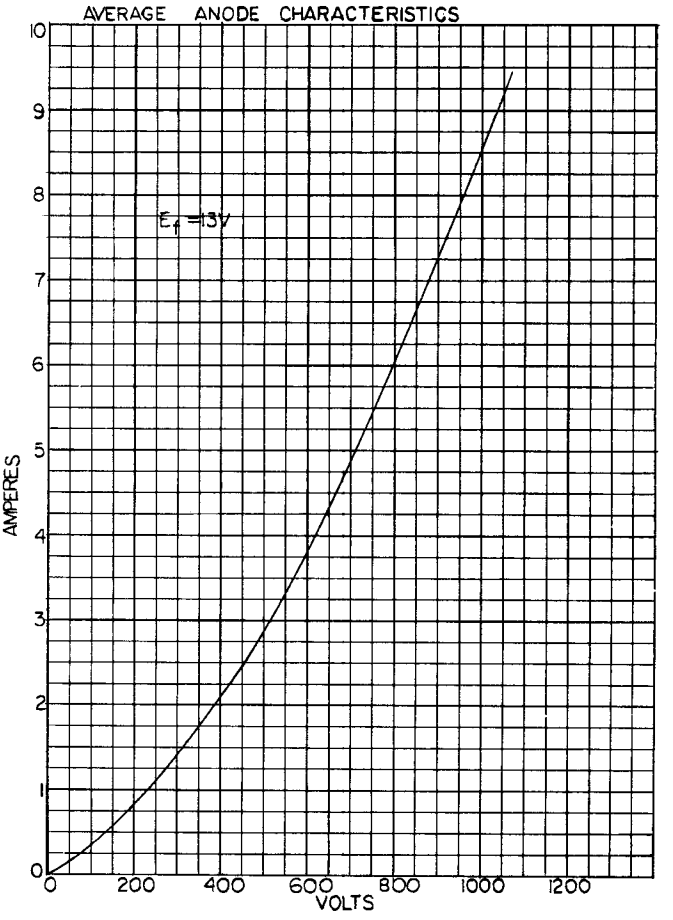


PULSE CHARACTERISTICS



FILAMENT CHARACTERISTICS





NUCLEAR CORPORATION OF AMERICA
CENTRAL ELECTRONIC MANUFACTURERS DIVISION
Denville, New Jersey

High Vacuum Diode
Type XD-66R & XD-66W

DESCRIPTION

The XD-66 is available as a forced air cooled (XD-66R) or water cooled diode (XD-66W) for use in rectifier and clipper services and features a special thoriated tungsten filament.

SPECIFICATIONS

PHYSICAL	XD-66W	XD-66R
Length	13 1/8 max.	12 5/8 max.
Diameter	5 1/8 max.	4 21/32 max.
Weight	6 pounds	7 pounds
Mounting Position	Vertical	Vertical
Mounting Socket	--	CAS-A or CAS-B Series
Type of Cooling	Water	Forced Air

Required Air Flow on Anode (Air Cooled Tube)

Anode Dissipation (kw)	Air Flow (cfm)	Pressure (in. of Water)
2.4	75	.35
2.8	125	.78
3.5	190	1.6

Maximum Incoming Air Temperature	45°C
Maximum Glass Seal Temperature	180°C
Required Water Flow (Water Cooled Tube)	6 gpm for 12 Kw dissipation

ELECTRICAL

Filament	Thoriated Tungsten
Filament Voltage	15 Volts
Filament Current	36 Amperes
Filament Starting Surge Current	80 Amperes
Filament Cold Resistance	.042 Ohms

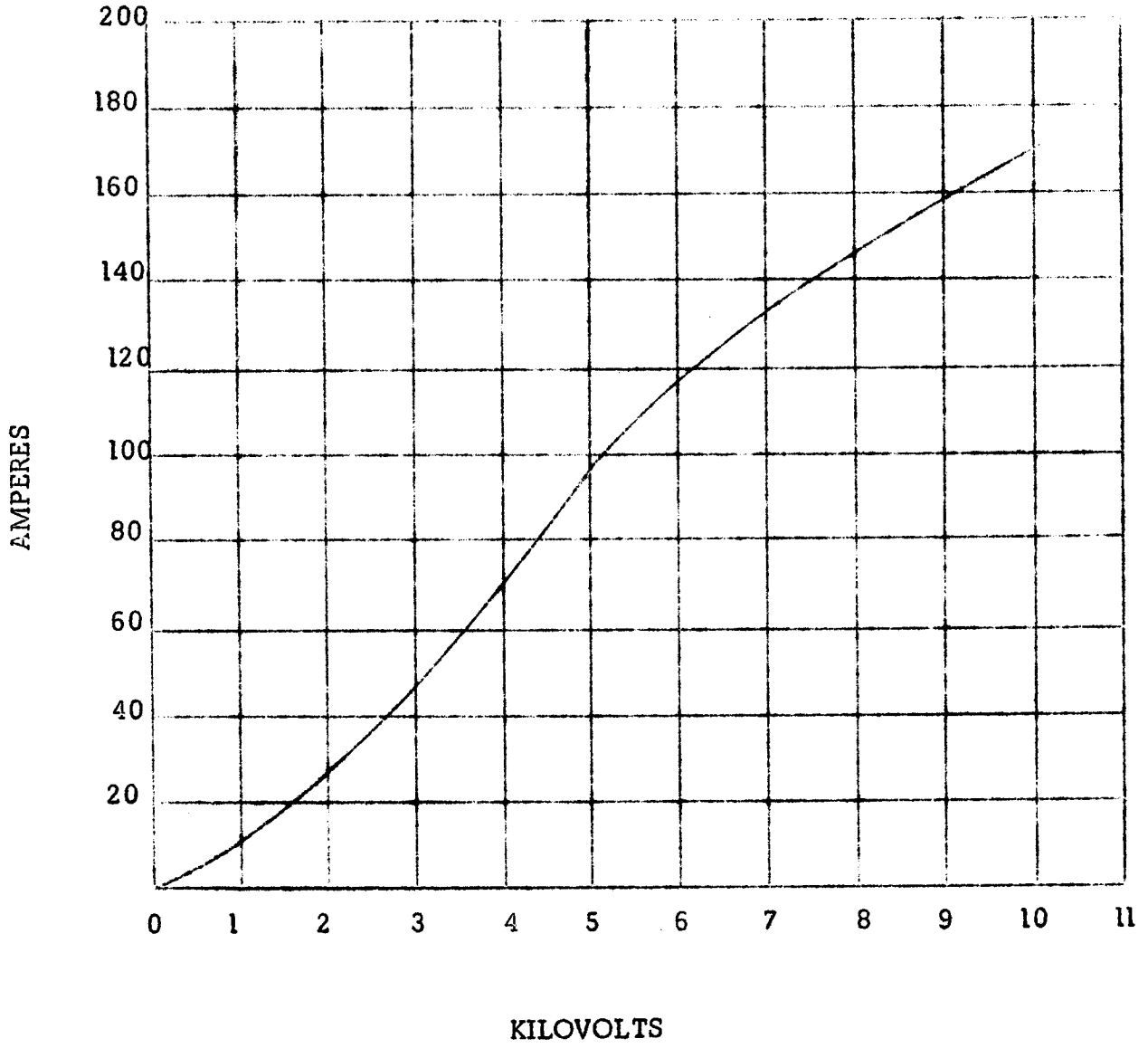
ELECTRICAL (RECTIFIER)	XD-66W	XD-66R
Filament Voltage	15 Volts	15 Volts
Filament Current	36 Amperes	36 Amperes
Peak Inverse Voltage (max.)	80 Kilovolts	80 Kilovolts
Average Anode Current	7 Amperes	3 Amperes

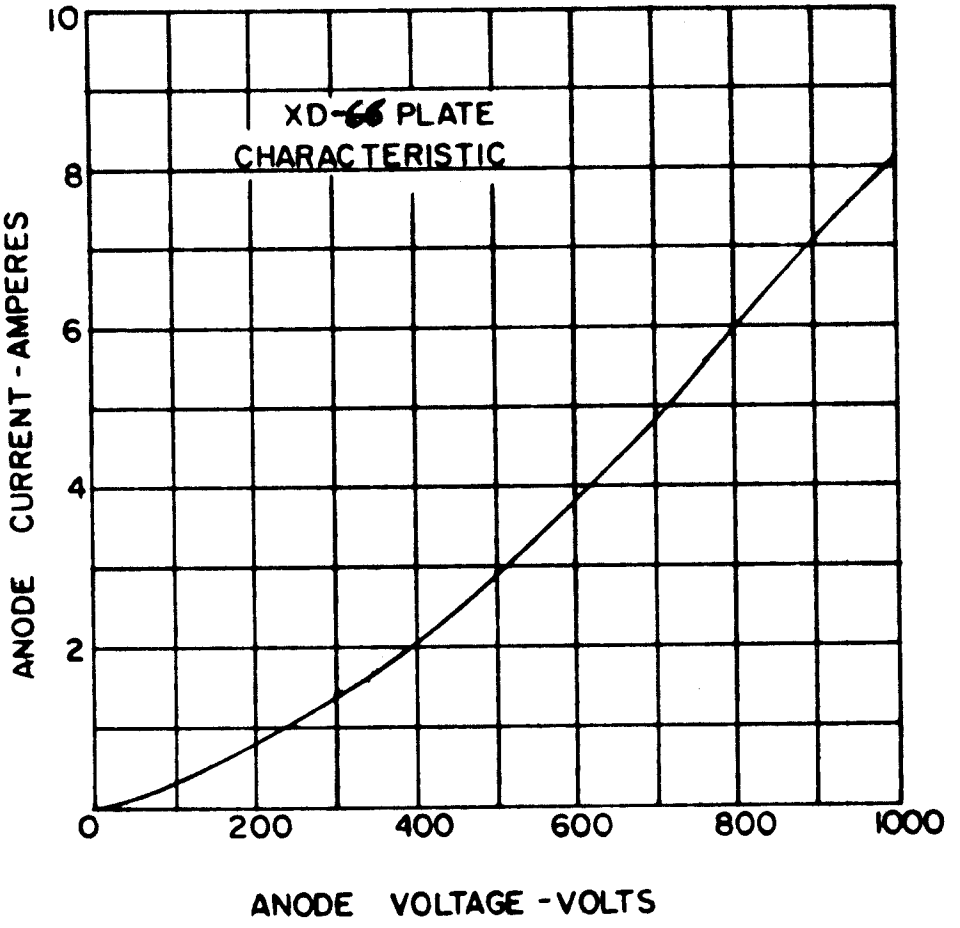
ELECTRICAL (RECTIFIER)	WATER COOLED	AIR COOLED
Peak Anode Current (max.)	25 Amperes	10 Amperes
Maximum Dissipation	12 Kilowatts	3 1/2 Kilowatts

ELECTRICAL (CLIPPER)		
Filament Voltage	16.2 Volts	16.2 Volts
Filament Current	39 Amperes	39 Amperes
Peak Inverse Voltage (max.)	80 Kilovolts	80 Kilovolts
Peak Anode Current (max.)	160 Amperes	160 Amperes
RMS Anode Current	8 Amperes	4 Amperes

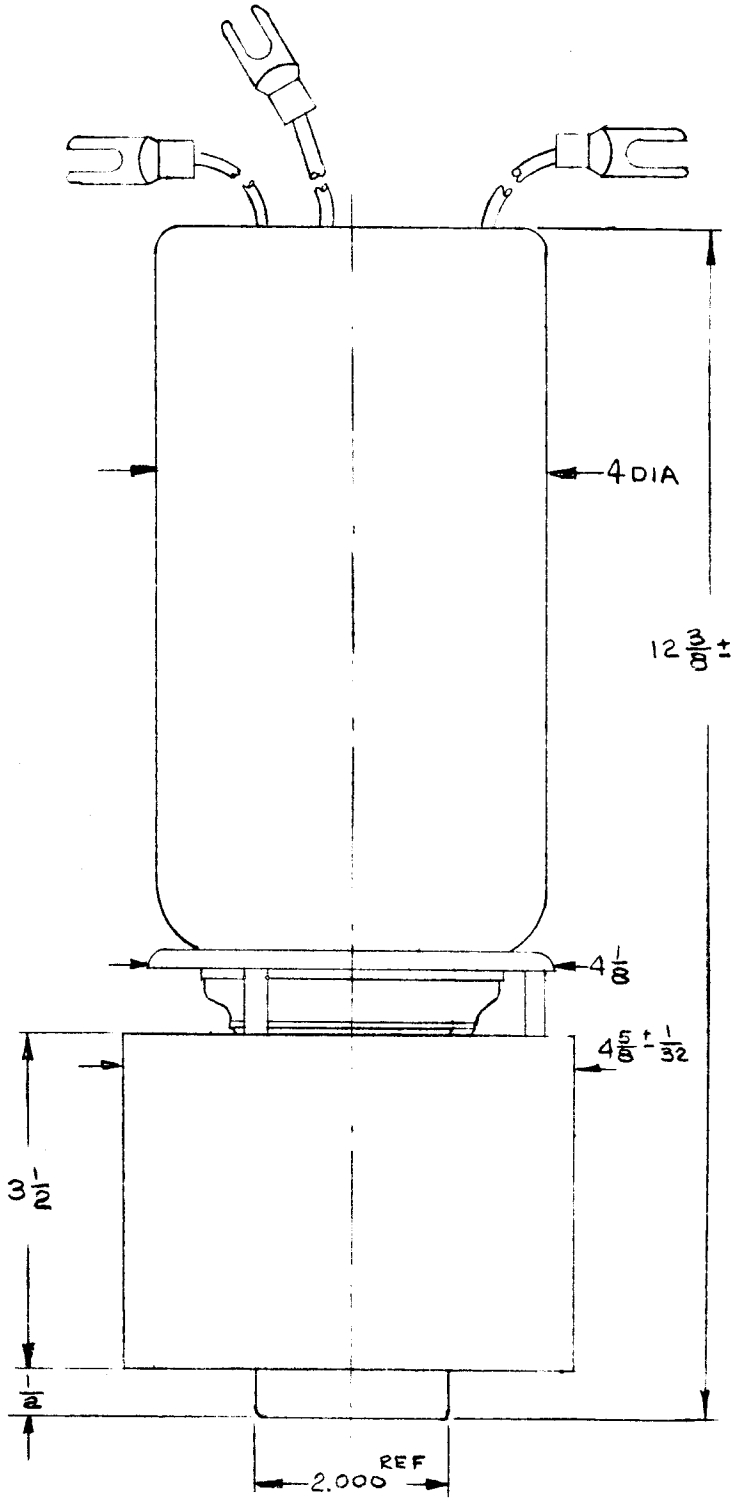
See Safety Code for Industrial Use of X-Rays published by A.S.A.

ANODE CURVE
PULSE CHARACTERISTICS

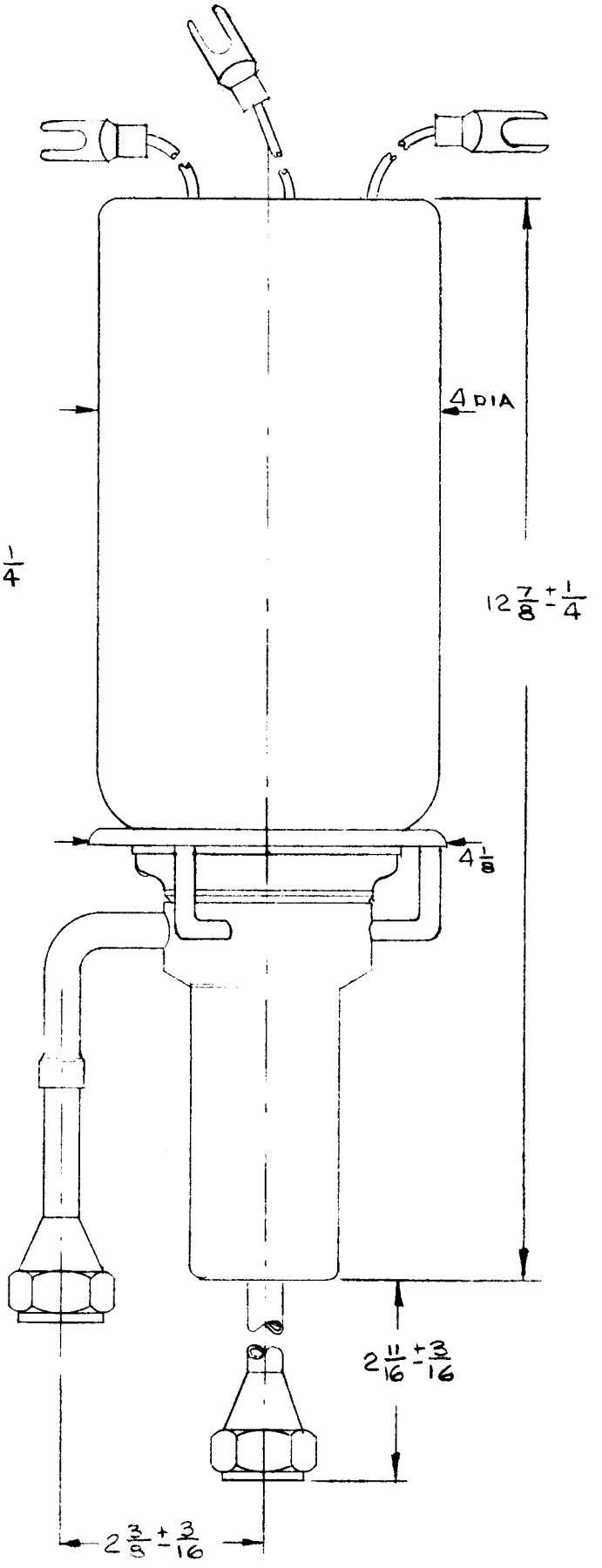



XD-66 PLATE
CHARACTERISTIC
ANODE CURRENT - AMPERES
10
8
6
4
2
0
200
400
600
800
1000
ANODE VOLTAGE - VOLTS

XD-66R


4 DIA
12 3/8 ± 1/4
4 1/8
4 5/8 + 1/32
3 1/2
1/2
2.000 REF

XD-66W


4 DIA
12 7/8 ± 1/4
4 1/8
2 11/16 ± 3/16
2 3/8 ± 3/16

Central ELECTRONIC
MANUFACTURERS
DENVILLE, NEW JERSEY

GAS NOISE TUBE	X
XD-9A/CNT-X15D-1	15.3 Db

References and notations contained herein are taken from Military Specifications for Electron tubes MIL-E-1D 31 March '58.

Description: Gaseous Discharge Diode, X Band (Note 11)

Ratings:

	If	Ib	TA	T Bulb
	mA	mAdc	°C	°C
Absolute Maximum:	. .	. .	+85	+125
Minimum:	. .	. .	−55	. .
Test Conditions:	0	250	. .	. .

Cathode: Filamentary Type.
Dimensions: Per Outline Drawing (Fig. 1)
Base: Per Outline Drawing (Fig. 1)
Mounting Position: Any

Ref. Para.	Test	Conditions	Min.	Max.
. . .	Qualification:	Required.		
4.5	Holding Period:	168 hours		
4.9.18.1.10	Carton Drop:	. . .		
4.9.20.3	*Vibration:	No Voltages, Note 9.		
4.10.5.1	Filament Voltage:	I_f = 170mAdc	E_f . . .	10Vdc
4.13.2	Tube Voltage Drop:	Note 1,2	E_{td} 55	65Vdc
. . .	Excess Noise Ratio:	F = 9000 Mc. Notes 3,4,5,10.	N_r-1 15.05	15.45Db
. . .	*Match (1):	F = 9000 Mc. Notes 4,6. I_b = 200 mAdc	VSWR	1.07:1
. . .	*Match (2):	F = 9000 Mc. I_b = 0 mAdc Notes 4,6.	VSWR	1.07:1
. . .	Intermittent Life Test	Notes 1,3,8,9. (One min. on, two min. off) Preheat time = 2 to 3 sec.	2500	Cycles
4.11.4	Intermittent Life Test End Points Excess Noise Ratio: Note 11.		N_r-1 15.0	15.5Db

Note 1. The tube shall be tested in the circuit of Fig. 3.
Note 2. In the test circuit of Fig. 3, with a filament current of 170 mAdc, the tube shall operate within three tries.
Note 3. The tube shall be tested in total darkness.
Note 4. The tube shall be tested in a tube mount as specified in Figure 2, or equivalent, terminated by a matched RG-52/U termination having a VSWR no greater than 1.01:1.
Excessive Noise Ratio Measurement tests shall be made using the circuit of block diagram Fig. 4, or equivalent.
Note 5. The frequency specified is that of the Local Oscillator.
Note 6. The frequency specified is that of the Signal Generator.
Note 7. Excess noise ratio should be measured by comparison with an approved standard.
Note 8. The tube shall be tested at an ambient temperature of +85°C.
Note 9. Intermittent Life Test end points shall apply.
Note 10. The Excess Noise Ratio N_r-1 is defined in Db as N_r-1 = 10 $\log(\frac{T_e}{290}-1)$ where T_e is the effective electron temperature.
Note 11. The noise frequencies generated by this tube cover a broad band of frequencies. This bandwidth is limited only by the type of mount used. This tube is normally used with a mount in RG-52/U wave guide, at a 10 degree angle in the E plane. Other wave guide sizes may be used with properly adapted mounts.
Note 12. This tube has heretofore designated as the XD-9A.

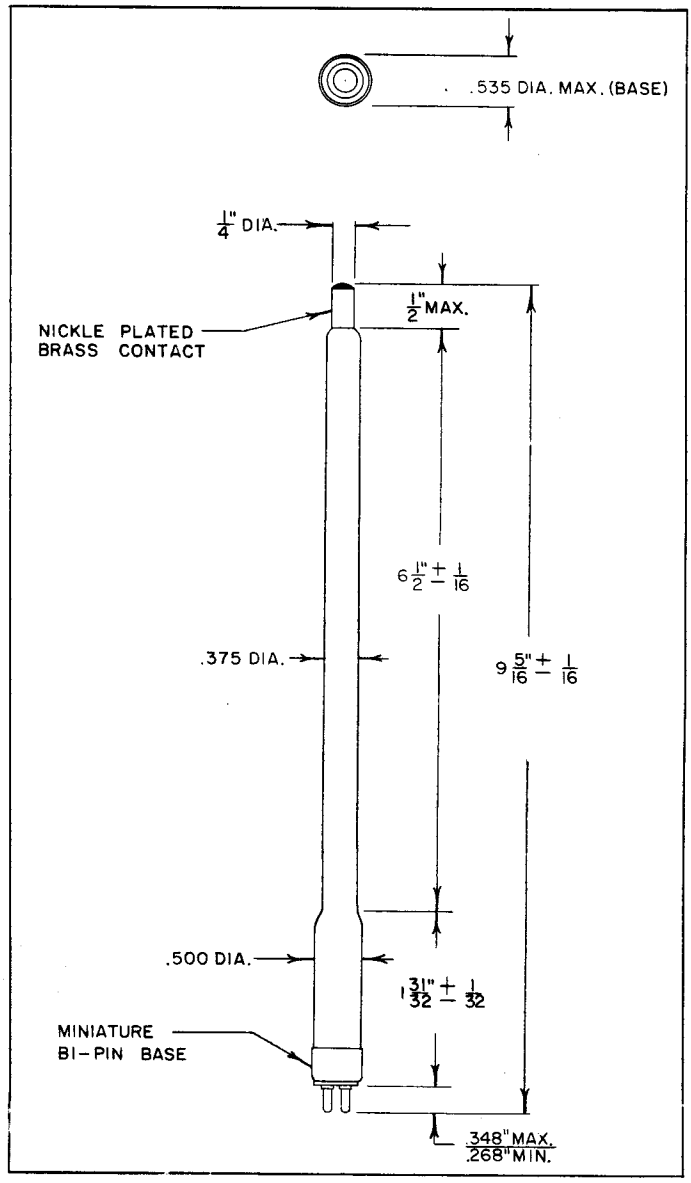


FIG. 1

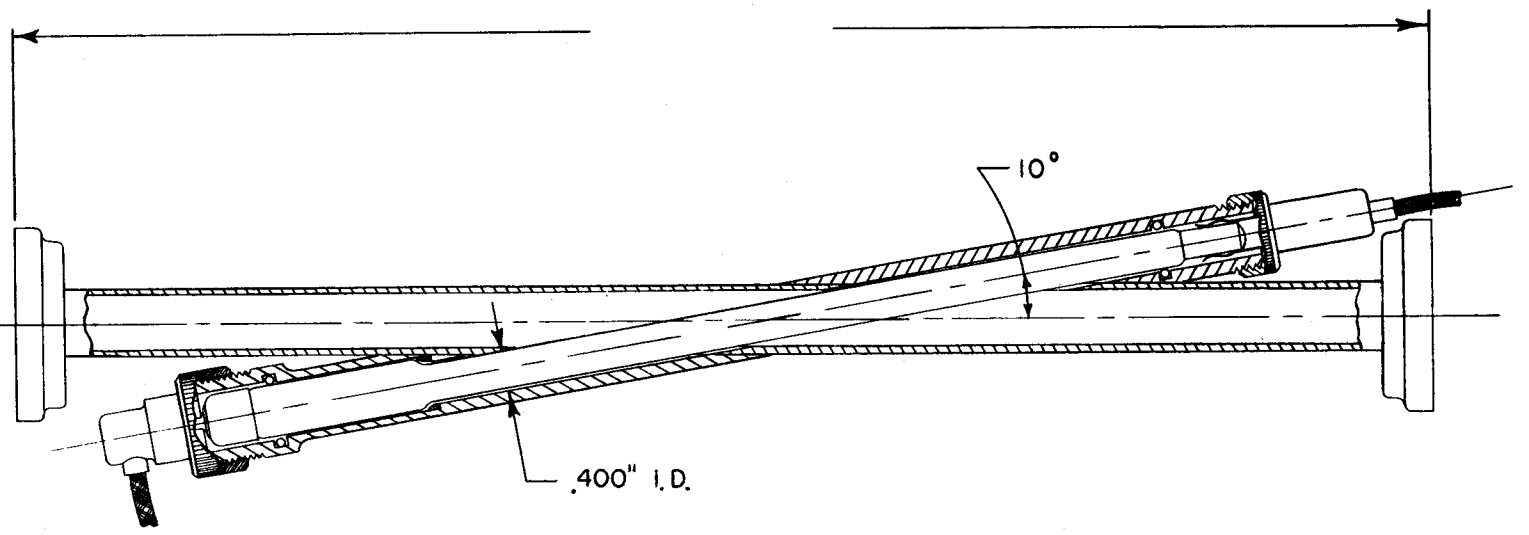
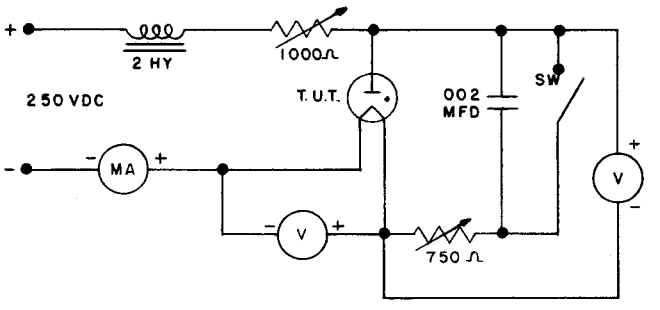
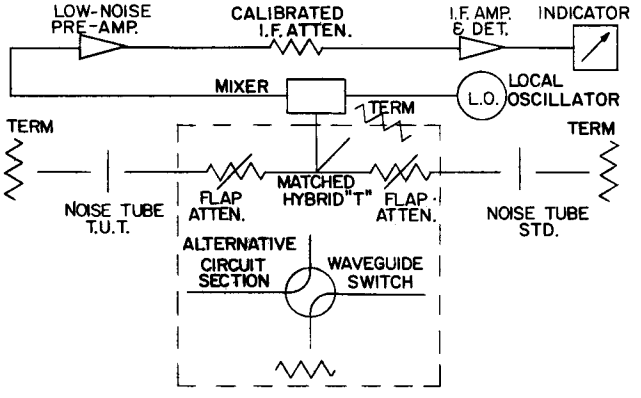


FIG. 2



D.C. TEST CIRCUIT

FIG. 3



TEST CIRCUIT FOR EXCESS NOISE MEASUREMENTS
FIG. 4