JOINT ELECTRON TUBE ENGINEERING COUNCIL

E. I. A.
REGISTRATION

650 SALMON TOWER
11 WEST FORTY-SECOND STREET
NEW YORK 36, N.Y.
TELEPHONE: LONGACRE 5-3450

Announcement
of
Electron Device Type Registration

Release No. 1550

December 12, 1955

The Joint Electron Tube Engineering Council announces the registration of the following tube type designation

6333
6339
6445
6446
6447
6508

according to the ratings and characteristics found on the attached data sheets on the application of

Amperex Electronic Corp.
Hicksville, L. I., N. Y.

AMPEREX TUBE TYPE 6333

6333

AF Power Amplifier and Modulator
RF Power Amplifier and Oscillator

GENERAL CHARACTERISTICS

WATER COOLED TRIODE

ELECTRICAL

Filament	Tungsten
Two unit type, for single-phase or two-phase A.C., or D.C. operation	
Voltage (per unit)	11 volts
Current (per unit)	60 amperes
Starting current must never exceed 2.0 times the normal current.	
Amplification Factor	50
Grid to Plate Transconductance at a Plate Current of 0.75 amperes	7000 micromhos
Direct Interelectrode Capacitances	
Grid to Plate	32 uuf
Grid to Filament	17 uuf
Plate to Filament	1.8 uuf

MECHANICAL

Overall Dimensions	
Length (approx.)	17½ inches
Maximum Dia. (approx.)	4 inches
Mounting Position - Vertical	Anode Down
Type of Cooling	Water
Water Jacket	Amperex Type # DW-1580
Water Flow [1]	3-8 gal. per min.
Pressure Drop [2] (approx.)	4 lbs. per sq. in.
Max. Outlet Water Temp.	70°C.

ACCESSORIES

Stand-off Insulator	Amperex Type # SI-5000
External Fil. Lead	Amperex Type # S-13484
External Grid Connector	Amperex Type # Y-13326 (Supplied with tube without charge)
Net Weight (approx.)	3 lbs.
Shipping Weight (approx.) (one tube)	10 lbs.

1 Rated water flow must be continuous between the time any voltage is applied and for 5 minutes after voltage is removed.

2 The approximate water pressure is measured directly across the jacket alone and does not include connecting piping.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

A.F. Power Amplifier and Modulator—Class B

	Maximum Rating per Tube	Typical Operation Two Tubes		
A.C. Filament Voltage[1]		21	22	22
D.C. Plate Voltage	15000	6000	10000	12500
D.C. Grid Voltage	...	25	130	200
Load Resistance (per tube) (ohms)		1050	1600	2500
Effective Load Resistance (plate to plate) (ohms)		4200	6400	10000
Zero Signal D.C. Plate Current (amps)		0.4	0.4	0.2
Peak A.F. Grid to Grid Voltage		1200	1620	1580
Max. Signal D.C. Plate Current[2] (amps)	2	2.5	3.2	2.7
Max. Signal Plate Input[2] (kw)	20	15	32	34
Plate Dissipation[2] (kw)	7.5	7[4]	12[4]	12[4]
Minimum Grid Input Resistance (approx.) (ohms)		400	300	300
Max. Signal Driving Power (approx.) (watts)		150	240	170
Max. Signal Power Output (kw)		8	20	22

R.F. Power Amplifier—Class B—Telephony

(Carrier conditions for use with 1.0 maximum modulation factor)

Plate Volts & Input Max. %	100	85	75
For Frequencies Indicated (mc)	1.6	7.5	20

	Maximum Rating per Tube	Typical Operation One Tube		
D.C. Filament Voltage[1]		21	22	22
D.C. Plate Voltage	15000	6000	10000	14000
D.C. Grid Voltage	...	60	-120	200
Plate Load Resistance (ohms)		3300	3600	4000
Peak R.F. Grid Voltage		310	410	500
D.C. Plate Current (amps)	1	0.5	0.75	0.95
Plate Input (kw)	15	3	7.5	13.3
Plate Dissipation (kw)	10	2	5	8.8
D.C. Grid Current (approx.) (ma)	...	38	20	13
Driving Power (approx.)[3] (watts)	....	96	100	80
Power Output (kw)	....	1	2.5	4.5
F.C.C. Broadcast Rating (kw)	2.5	1	2.5	....

Plate Modulated R.F. Power Amplifier Class C—Telephony

(Carrier conditions for use with modulation factors up to 1.0)

Plate Volts & Input Max. %	100	85	75
For Frequencies Indicated (mc)	1.6	7.5	20

	Maximum Rating per Tube	Typical Operation One Tube		
A.C. Filament Voltage[1]		22	22	22
D.C. Plate Voltage	10000	6000	8000	10000
D.C. Grid Voltage	3000	1000	1250	1600
Plate Load Resistance (ohms)		3500	3740	6100
Peak R.F. Grid Voltage		1650	2000	2300
D.C. Plate Current (amps)	1	0.77	0.96	0.77
Plate Input (kw)	10	4.62	7.68	7.7
Plate Dissipation (kw)	6.8	1.12	1.68	1.33
D.C. Grid Current (approx.) (ma)	400	160	160	135
Driving Power (approx.) (watts)		250	310	300
Power Output (kw)		3.5	6	6.37
F.C.C. Broadcast Rating (kw)	5	....	5	5

R.F. Power Amplifier and Oscillator Class C—Telegraphy

(Key-down conditions without modulation)[5]

Plate Volts & Input Max. %	100	75	50
For Frequencies Indicated (mc)	1.6	7.5	20

	Maximum Rating per Tube	Typical Operation One Tube		
A.C. Filament Voltage[1]		22	22	22
D.C. Plate Voltage	15000	8000	10000	12000
D.C. Grid Voltage	3000	1000	1300	1600
Plate Load Resistance (ohms)		3000	3200	3500
Peak R.F. Grid Voltage		1800	2200	2600
D.C. Plate Current (amps)	2	1.2	1.4	1.55
Plate Input (kw)	30	9.6	14	18.60
Plate Dissipation (kw)	10	2.5	3.5	4.35
D.C. Grid Current (approx.) (ma)	400	165	160	165
Driving Power (approx.) (watts)	...	280	340	420
Plate Power Output (kw)	...	7.1	10.5	14.25

NOTES:

1 Two filament units in series.

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

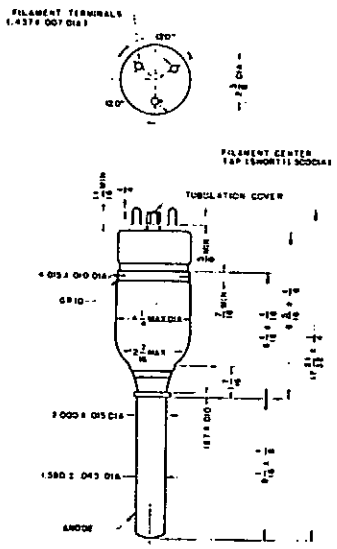
3 At crest of audio frequency cycle with modulation factor of 1.0.

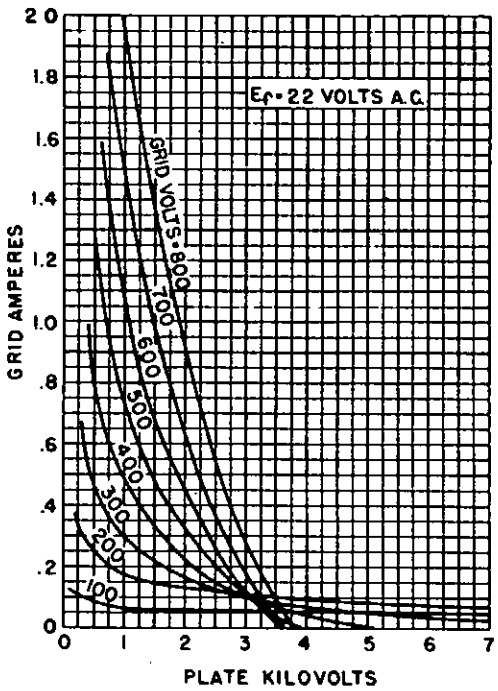
4 Averaged over an audio-frequency cycle of sine-wave form under maximum signal conditions.

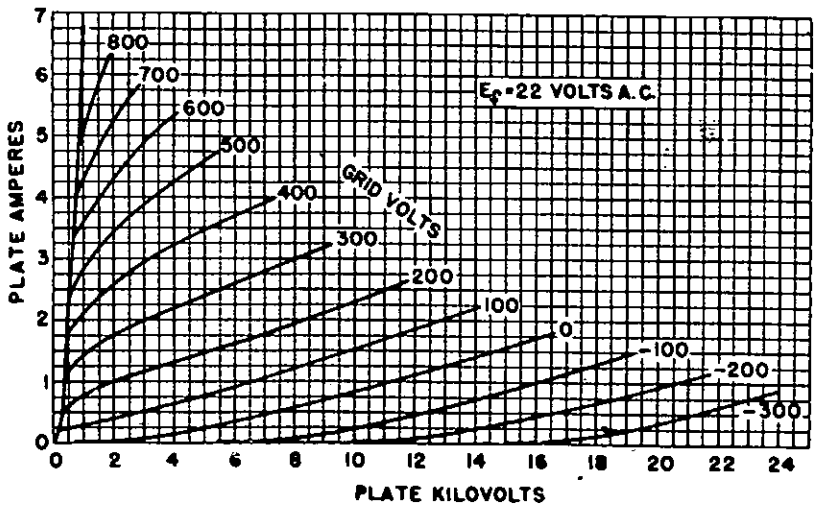
5 Modulation essentially negative may be used if the positive peak of the audio-frequency envelope does not exceed 115% of the carrier conditions.

6333

6333


FILAMENT TERMINALS
FILAMENT CENTER TAP (SHORTEST SOCKET)
TUBULATION COVER
GRID
ANODE


Ef = 22 VOLTS A.C.
GRID VOLTS
800
700
600
500
400
300
200
100
GRID AMPERES
PLATE KILOVOLTS


Ef = 22 VOLTS A.C.
800
700
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400
300
200
100
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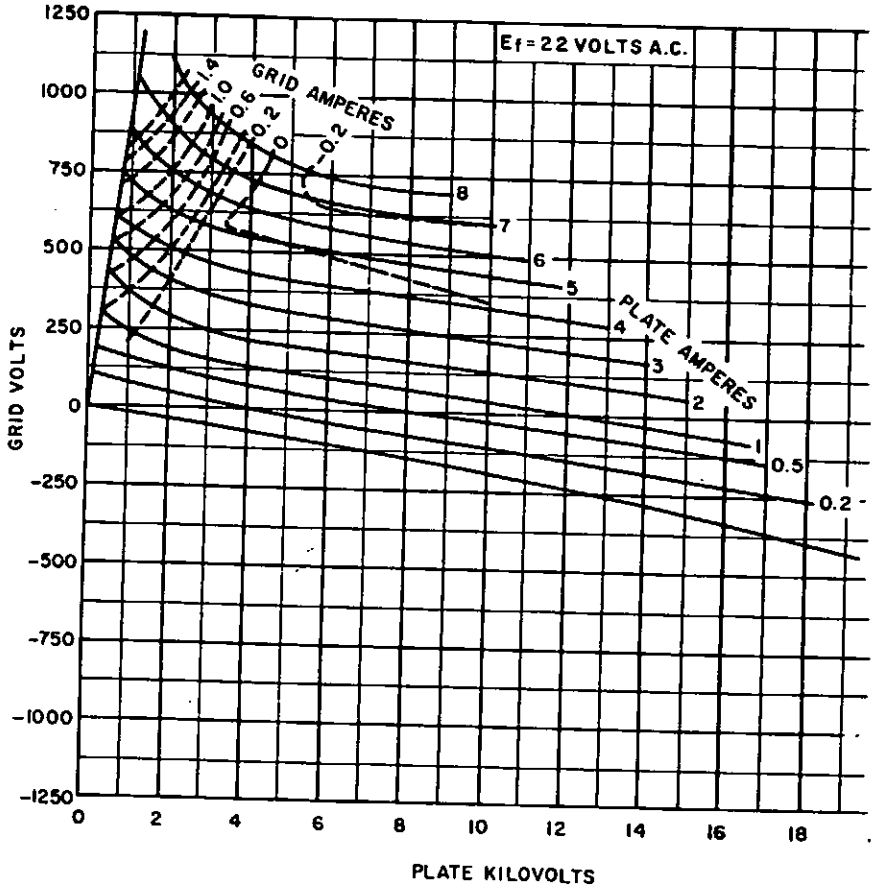
-100
-200
-300
GRID VOLTS
PLATE AMPERES
PLATE KILOVOLTS


Ef = 22 VOLTS A.C.
GRID AMPERES
1.4
1.0
0.6
0.2
0.0
-0.2
8
7
6
5
4
3
2
1
0.5
0.2
PLATE AMPERES
GRID VOLTS
PLATE KILOVOLTS

AMPEREX TUBE TYPE 6339

The 6339 is a high vacuum, external anode clipper diode and rectifier tube which is only 2 inches long (without leads) and 3/4 inch in diameter. A miniaturized and ruggedized version of the 3B29, the 6339 operates under more stringent conditions than its prototype. It is designed to be enclosed in a complete liquid cooled package including power supply and pulse modulator components.

Operation in air at reduced ratings is allowed for applications where oil cooling is not necessary or required.

Although developed primarily for radar applications, it shows interesting possibilities for use in high voltage circuitry where space requirements are critical

GENERAL CHARACTERISTICS

ELECTRICAL DATA	MIN.	BOGEY	MAX.	
Filament Voltage	5.7	6.3	6.9	volts
Filament Current at Bogey Voltage	1.40	1.55	1.70	amps
Filament Warm-up Time	60	--	--	sec.
Peak Cathode current [1]	--	--	8.0	amps
Peak Inverse Voltage	--	--	16.0	KV
Plate-Cathode Capacity	--	2.2	--	uuf

MECHANICAL DATA

Mounting Position	any
Cooling	liquid immersion (silicone oil)[2]
Coolant Temperature Range	−65° to + 165° C
Shock Resistance	300 G impact
Vibration Resistance	10 − 60 cycles per sec. 0.080 inches total displacement.
Dimensions (without leads)	
Length	2 1/16 inches
Diameter	13/16 inches
Length of leads (approx.)	1 1/2 inches
Lead Connections - Heavy	Heater, cathode terminal
Thin	Heater terminal
Socket for anode end	Standard 60 amp. fuse clip or equal
Connection (filament leads)	Lugs as shown or banana plug optional
Weight (approx.)	1 1/2 oz.

[1] Represents maximum useable cathode current for any condition of operation.

[2] Dow Corning #510 fluid, viscosity 50 - 60 centistokes, or an equivalent. For air cooling see data following.

6339

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

RECTIFIER (In Oil)

(Maximum ratings, absolute values)

Peak Inverse Voltage	10,000	16,000 volts
Peak Current	400	250 mA
Average Current	100	65 mA dc
Silicone Oil Coolant Temp.	−65° C to + 165° C	

Typical Operation (In Oil)

One Tube, Half-wave, Capacitor-Input Filter

Peak Inverse Voltage	10,000	16,000 volts
Peak Current	400	250 mA
Average Current - Load Current	100	65 mA
Load Voltage (approx.)	3300	5500 volts

Two Tubes, Single Phase, Full wave

Choke Input Filter

Peak Current (per tube)	200	130 mA
Average Current (per tube)	100	65 mA
Peak Inverse Voltage	10,000	16,000 volts
Load Current	200	130 mA
Load Voltage	2900	4900 volts

Three Phase Operation

Choke Input Filter

	Half Wave	Double Y	Bridge
No. of Tubes	3	6	6
Peak Inverse Voltage	10,000	10,000	16,000 volts
Peak Anode Current	300	300	195 mA
Average Anode Current (per tube)	100	100	65 mA dc
Output Voltage	4500	4500	14,000 volts dc
Ouptut Current	300	600	195 mA dc

6339

6339

RECTIFIER - (In Air)

(Maximum ratings, absolute values - air cooled at sea level)

	Without Auxiliary Cooler	With Auxiliary Cooler	
Peak Inverse Voltage	12,000	12,000	volts
Peak Current	200	400	mA
Average Current	50	100	mA dc
Ambient Temperature	−55 to + 85	−55 to + 85	°C

Typical Operation In Air Without Auxiliary Cooler

	Single Phase Operation Choke Input Filter Full Wave	Three Phase Operation Choke Input Filter Half Wave	Three Phase Operation Choke Input Filter Bridge	
No. of Tubes	2	3	6	
Peak Inverse Voltage	12,000	10,000	12,000	volts
Peak Anode Current	100	150	100	mA
Average Anode Current (per tube)	50	50	33	mAdc
Output Voltage	3500	4500	10,500	volts dc
Output Current	100	150	100	mAdc

With Auxilary Cooler

No. of Tubes	2	3	6	
Peak Inverse Voltage	12,000	10,000	12,000	volts
Peak Anode Current	200	300	200	mA
Average Anode Current (per tube)	100	100	67	mAdc
Output Voltage	3500	4500	10,500	volts dc
Output Current	200	300	200	mAdc

SHUNT DIODE (In Oil)

(Maximum ratings, absolute values)

Peak Inverse Voltage	10,000 volts
Peak Current	8 amps
Average Current	18 mA
Pulse Duration in 100 microsecond interval	25 microseconds

Typical Operation (In Oil)

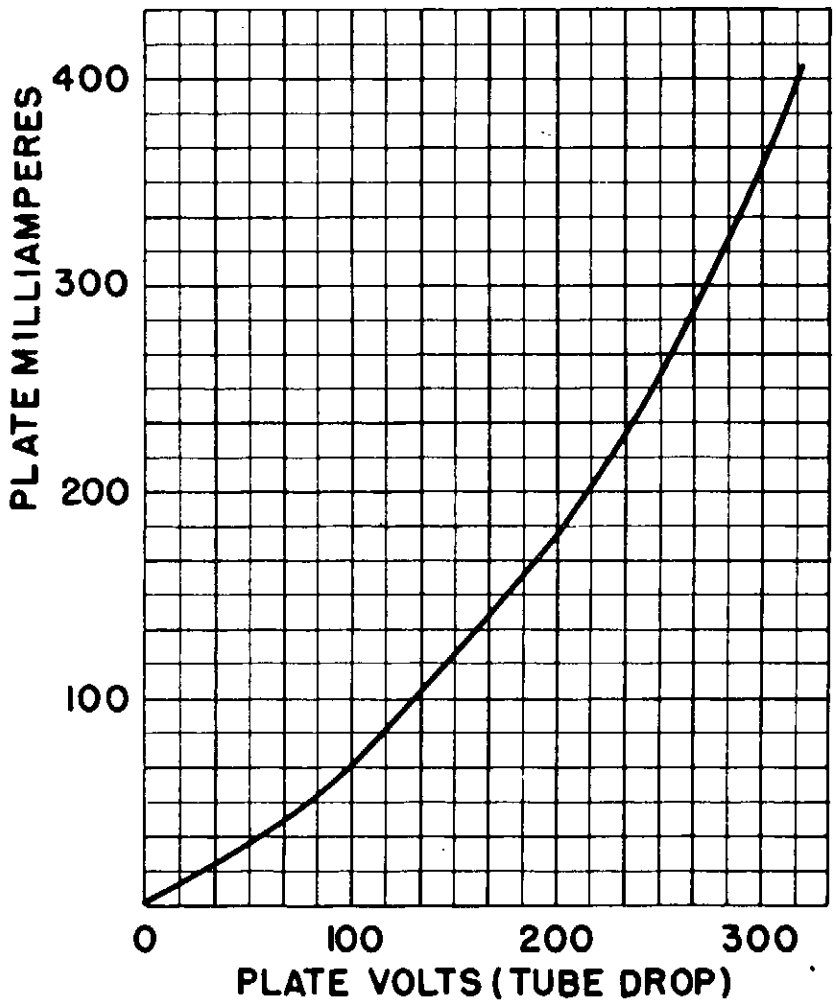
(One tube in hydrogen thyratron modulator circuit)

Pulse Time	1.0 microsecond
Network Impedance	50 ohms
Peak Thyratron Forward Voltage	10 KV
Repetition Rate	280 pulses per sec.
Diode Series Resistor	1000 ohms
Load Resistor[3]	0 ohms
Average Current Plate[3]	22 mA dc

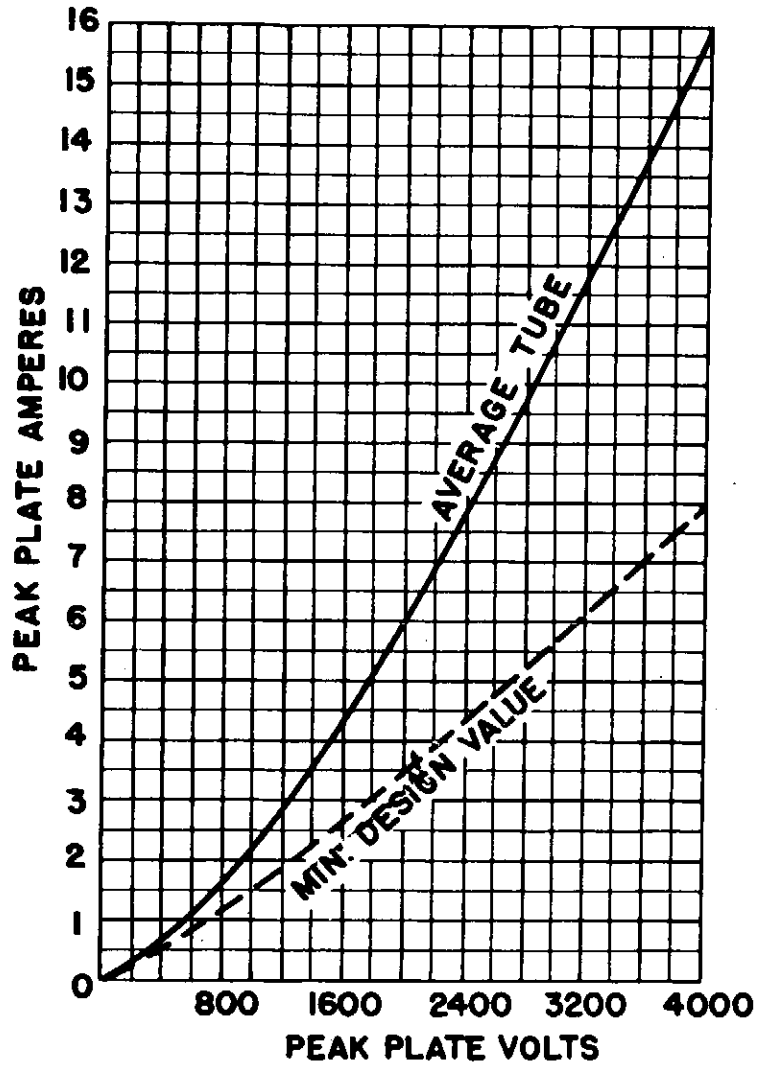
[3] This load resistor represents a short circuit or arc in the load. As a result, the average diode plate current of 22 MA, D.C. will momentarily exceed the maximum rating of 18 MA, D.C. This circuit should be so designed that the high voltage will automatically shut off if continual short circuit exists in the load. The 6339 will operate, however, for longer than 500 hours under short circuit conditions which produce the average current as shown.

6339

AMPEREX TUBE TYPE 6339
AVERAGE PLATE CURRENT VS.
PLATE VOLTAGE.
(TUBE DROP CURVE FOR
RECTIFIER APPLICATION)

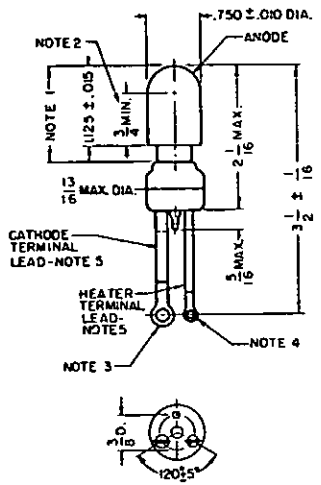


AMPEREX TUBE TYPE 6339
PEAK PLATE CURRENT VS. PEAK
PLATE VOLTAGE.
(TOTAL TUBE EMISSION CURVE
FOR SHUNT DIODE APPLICATION)

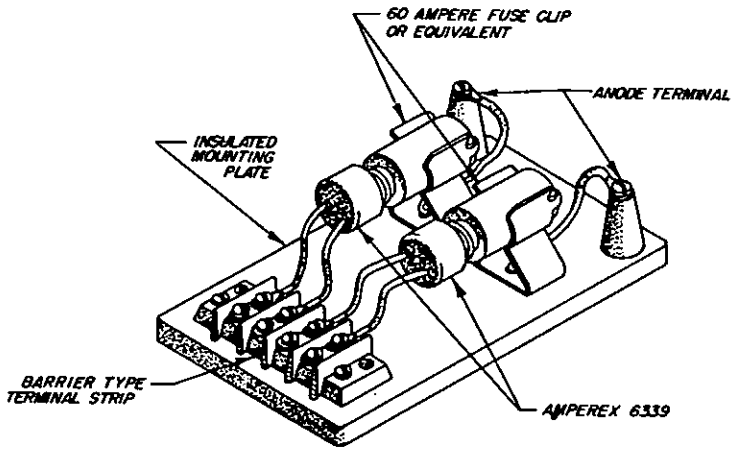


6339

6339



NOTES:
1. THIS SURFACE SILVER-PLATED.
2. SURFACE AVAILABLE FOR SUPPORT.
3. TINNED LUG FOR NO.8 SCREW-CRIMPED AND SOLDERED.
4. TINNED LUG FOR NO.6 SCREW-CRIMPED AND SOLDERED.
5. FLEXIBLE LEAD-INSULATED WITH FIBERGLASS.

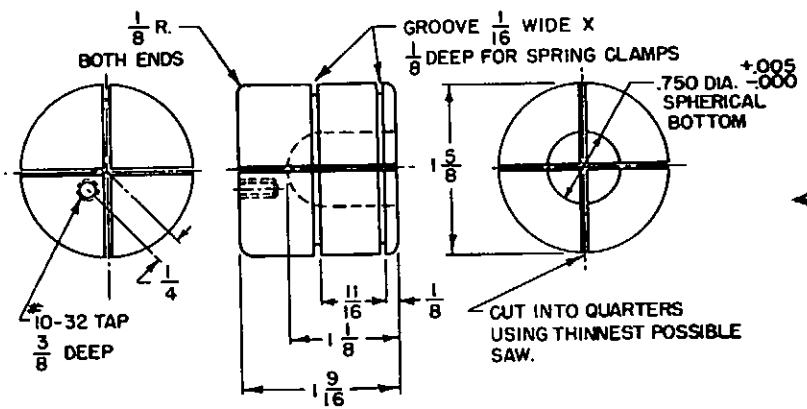


SUGGESTED MOUNTING FOR 6339 AIR COOLED OR LIQUID COOLED.

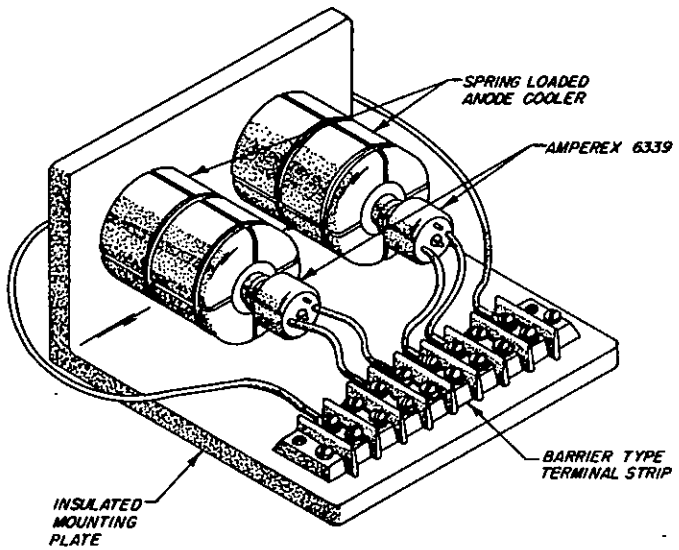
RECOMMENDED DESIGN

6339 ANODE HOLDER
(AUXILIARY COOLER)

MATERIAL: ALUMINUM



TWO SPRING CLAMPS OF HEAVY MUSIC WIRE REQUIRED.



SUGGESTED MOUNTING FOR 6339 WITH AUXILIARY COOLER

6445

MAXIMUM RATINGS AND TYPICAL OPERATION CONDITIONS

A.F. POWER AMPLIFIER OR MODULATOR - CLASS B

Maximum Ratings

D.C. Plate Voltage	12,500 volts
D.C. Plate Current, Max. Signal [2]	2.0 amps
Plate Input, Max. Signal [2]	12,500 watts
Plate Dissipation [2]	5,000 watts

Typical Operation
(Values are for two tubes)

A.C. Filament Voltage [3]	21	22 volts
D.C. Plate Voltage	6,000	10,000 volts
D.C. Plate Current, Zero Signal	0.4	0.5 amps
D.C. Plate Current, Max. Signal	2.5	2.5 amps
D.C. Grid Voltage	−25	−120 volts
Grid to Grid Voltage, Peak AF	1200	1400 volts
Effective Load, Plate to Plate	4200	8400 ohms
Minimum Grid Input Resistance	400	300 ohms
Maximum Signal Drive Power (approx.)	150	300 watts
Maximum Signal Plate Input [2]	15	25 kilowatts
Maximum Signal Power Output	8	17 kilowatts

R.F. POWER AMPLIFIER - CLASS B

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

Maximum Ratings

D.C. Plate Voltage	12,500 volts
D.C. Plate Current	1.1 amps
Plate Input	6,000 watts
Plate Dissipation	5,000 watts

Typical Operation

D.C. Filament Voltage [3]	21	22 volts
D.C. Plate Voltage	6000	8000 volts
D.C. Plate Current	0.5	0.75 amps
D.C. Grid Voltage	−60	−80 volts
D.C. Grid Current (approx.)	38	20 ma
Grid Voltage, Peak R.F.	310	380 volts
Driving Power (approx.)	96	30 watts
Power Output	1000	2000 watts

PLATE MODULATED, R.F. POWER AMPLIFIER CLASS C - TELEPHONY

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

Maximum Ratings

D.C. Plate Voltage	10,000 volts
D.C. Plate Current	1.0 amp
Plate Input	10,000 watts
Plate Dissipation	3,000 watts
D.C. Grid Voltage	−3,000 volts
D.C. Grid Current	0.4 amps

Typical Operation

A.C. Filament Voltage [3]	22	22 volts
D.C. Plate Voltage	6,000	8,000 volts
D.C. Plate Current	0.77	0.96 amp
D.C. Grid Voltage	−1000	−1250 volts
Grid Voltage, Peak R.F.	1650	2000 volts
D.C. Grid Current (approx.)	0.160	0.156 amp
Driving Power (approx.)	250	310 watts
Power Output	3500	6000 watts

R.F. POWER AMPLIFIER OR OSCILLATOR CLASS C - TELEGRAPHY

(Key down conditions per tube without modulation)

Maximum Ratings

D.C. Plate Voltage	12,500 volts
D.C. Plate Current	2.0 amps
Plate Input	18,000 watts
Plate Dissipation	5,000 watts
D.C. Grid Voltage	−3,000 volts
D.C. Grid Current	0.4 amp

Typical Operation

A.C. Filament Voltage [3]	22	22 volts
D.C. Plate Voltage	8000	10,000 volts
D.C. Plate Current	1.2	1.4 amp
D.C. Grid Voltage	−1000	−1300 volts
Grid Voltage, Peak R.F.	1800	2200 volts
D.C. Grid Current (approx.)	0.165	0.160 amp
Driving Power (approx.)	280	340 watts
Power Output	7100	10,500 watts

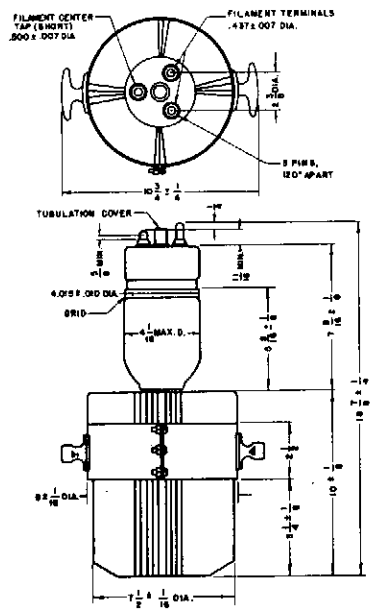
Maximum ratings apply up to 5 megacycles, but operation at higher frequencies is possible provided the input is reduced according to the following chart and the glass-to-metal seal temperatures are not exceeded.

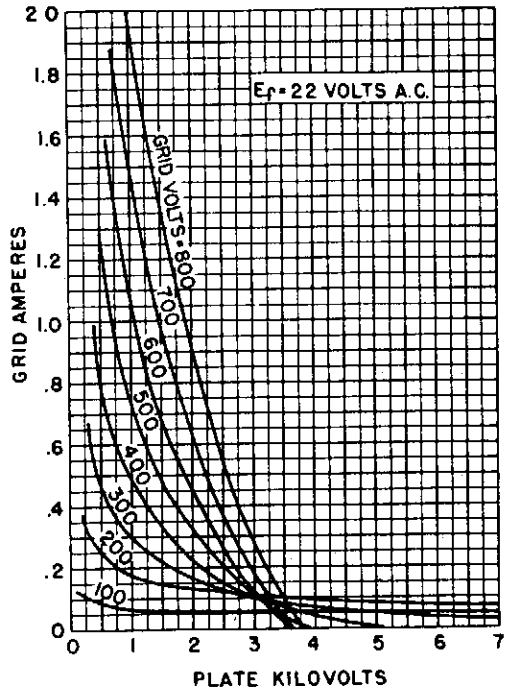
Frequency	5	12.5	20 mc.
Percent of Maximum Rated Plate Voltage and Plate Input	100	75	50 percent

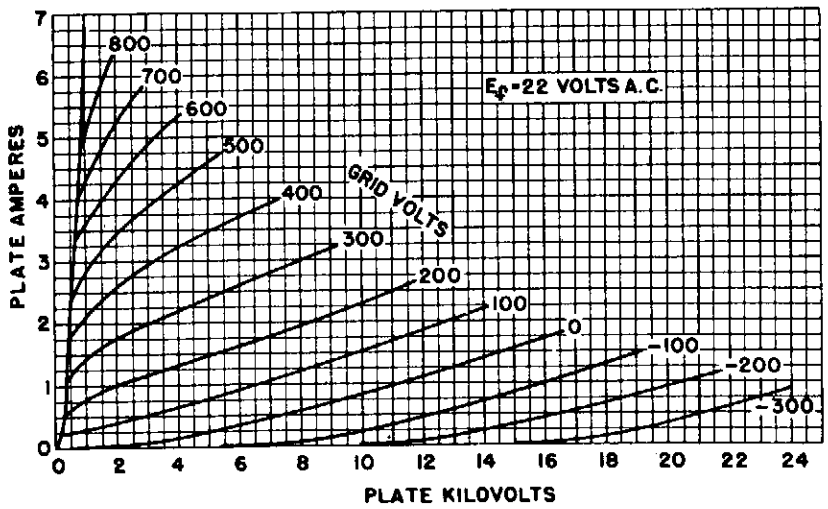
[2] Averaged over any audio-frequency cycle of sine-wave form.

[3] Two filament units in series

[4] At crest of audio-frequency cycle with modulation factor of 1.0.







AMPEREX TUBE TYPE 6445

The 6445 is an improved version of the standard type 892R, forced air-cooled triode, and is interchangeable with it in every respect. Incorporating the latest developments in tube design and techniques, the 6445 fills industrial and communication requirements for a tube which is completely interchangeable with the popular 892R and is superior in mechanical construction and electrical performance.

Among the outstanding features of the new AMPEREX 6445 are:

1. A rugged, powdered glass stem which replaces the conventional stem press construction.
2. A Kovar ring grid connection instead of the projecting feather-edge seal grid arm.
3. Lower grid lead inductance because of a strong conical internal grid support instead of the 3 legged, riveted construction.
4. Shorter overall length - approx. 3 inches.
5. A rugged Kovar anode seal to eliminate the more fragile feather-edge, copper seal.
6. A new, stronger spiral filament providing more uniform heat distribution over the anode surface.

GENERAL CHARACTERISTICS

FORCED AIR-COOLED TRIODE

ELECTRICAL

Filament	Two unit, tungsten type for single or two phase AC or DC operation.	
Voltage (per unit)	11	volts
Current (per unit)	60	amps
(Starting current must never exceed 120 amps per unit, even momentarily)		
Amplification Factor	50	
Transconductance (Grid to Plate at I_b = 0.75A)	7000	micromhos
Direct Interelectrode Capacitances		
Plate to grid	32	uuf
Grid to filament	17	uuf
Plate to filament	1.8	uuf

MECHANICAL

Maximum Overall Dimensions		
Length	19 1/8	inches
Diameter (incl. radiator handles)	11	inches

MECHANICAL (Con't)

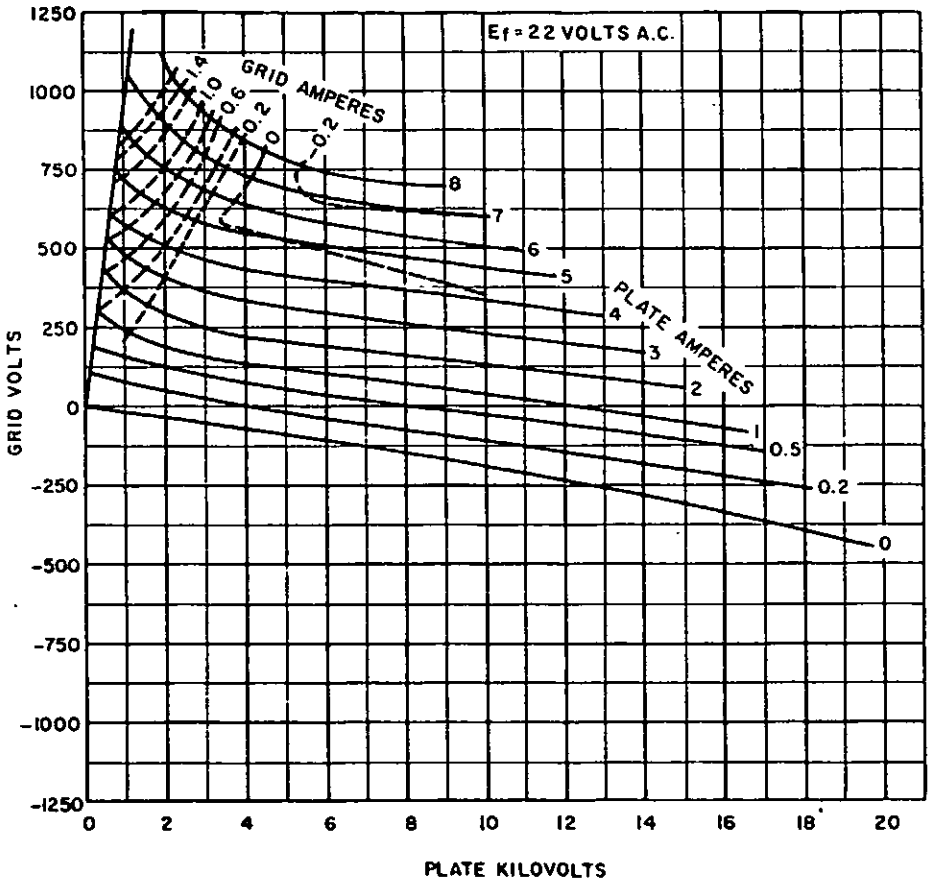
Mounting Position				Vertical - anode down
Type of cooling [1]				Forced - air
Plate Dissipation	5.0	4.0	3.0	KW
Air Flow to Radiator	530	450	360	cfm
Back Pressure	0.67	0.50	0.33	inches water

Maximum Temperatures	
Glass-to-Metal Seals	180°C
Radiator	230°C
Incoming Air	45°C
Net Weight (approx.)	35 lbs.

ACCESSORIES

External Filament Connector	AMPEREX #S-13484
External Grid Connector	AMPEREX #Y-13326 (supplied with tube without charge)

[1] Rated air flow must be continuous between the time any voltage is applied and for 5 minutes after voltage is removed.



AMPEREX TUBE TYPE 6446

6446

The 6446 is an improved, ruggedized, heavy wall version of the standard type 892 tube.

Incorporating the latest developments in tube design and techniques, the 6446 fills the requirements of the industrial field for a tube which is electrically similiar to the 892 tube, but with higher dissipation reserve allowing for extreme mismatch of load to tube impedance. The tube is, therefore, protected against maladjustment of misuse of equipment.

Among the outstanding features of the new AMPEREX tube are the following:

1. Heavy wall, high conductivity copper anode (7/16" thick)
2. Rugged powdered glass stem which takes the place of the stem press construction.
3. Elimination of the projecting feather-edge seal grid arm by the incorporation of a Kovar ring grid connection.
4. Addition of a strong, conical internal grid support instead of the 3 legged riveted construction. This also provides much lower inductance.
5. Elimination of the more fragile copper feather-edge anode seal and replacement with a Kovar seal.
6. New, stronger spital filament providing more uniform heat distribution over the anode surface.
7. Only one-half the water flow required for 892 for equivalent anode dissipation.

RF Power Amplifier and Oscillator

TENTATIVE DATA

GENERAL CHARACTERISTICS

WATER COOLED TRIODE

ELECTRICAL

Filament	Tungsten
Two unit type, for single-phase or two-phase A.C., or C.D. operation	
Voltage (per unit)	11 volts
Current (per unit)	60 amperes
Starting current must never exceed 2.0 times the normal current.	
Amplification Factor	50
Grid to Plate transconductance at a Plate Current of 0.75 amperes	7000 micromhos
Direct Interelectrode Capacitances	
Grid to Plate	32 uuf
Grid to Filament	17 uuf
Plate to Filament	1.8 uuf

MECHANICAL

Overall Dimensions	
Length (approx.)	17½ inches
Maximum Dia. (approx.)	4 inches
Mounting Position - Vertical	Anode Down
Type of Cooling	Water
Water Jacket	Amperex Type # S-15096
Water Flow [1]	3-8 gal. per min.
Pressure Drop [2] (approx.)	1-5 lbs. per sq. in.
Max. Outlet Water Temp.	70°C.

ACCESSORIES

External Fil. Lead	Amperex Type # S-13484
External Grid Connector	Amperex Type # Y-13326 (supplied with tube without charge)
Net Weight (approx.)	10 lbs.
Shipping Weight (approx.) (one tube)	18 lbs.

[1] Rated water flow must be continuous between the time any voltage is applied and for 5 minutes after voltage is removed.

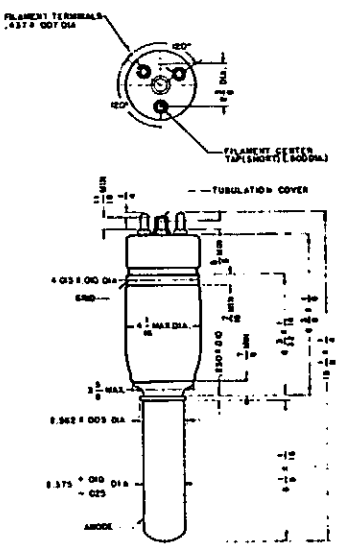
[2] The approximate water pressure is measured directly across the jacket alone and does not include connecting piping.

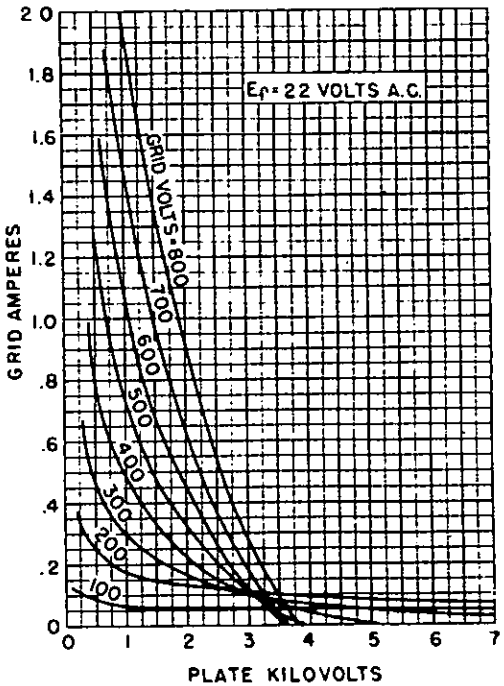
MAXIMUM RATING AND TYPICAL OPERATING CONDITIONS

RF POWER AMPLIFIER AND OSCILLATOR - CLASS "C"

PLATE VOLTS AND INPUT MAX. %		100	75	50	
FOR FREQUENCIES INDICATED (mc)		5	12.5	20	
	MAXIMUM RATING PER TUBE	TYPICAL OPERATION ONE TUBE			
A.C. Filament Voltage	———	21.2	21.5	21.8	22.0 volts
D.C. Plate Voltage	15,000	8,000	10,000	12,000	15,000 volts
D.C. Grid Voltage	−3,000	−300	−400	−500	−1,250 volts
Peak R.F. Grid Voltage	———	1,000	1,200	1,400	2,400 volts
D.C. Plate Current	2.0	1.6	1.8	2.0	2.0 amps
Plate Input	30	12.8	18.0	24.0	30.0 KW
Plate Dissipation	20	4.1	5.2	6.5	10.0 KW
D.C. Grid Current	400	210	220	230	250 mA
Drive Power (Approx.)	———	200	250	300	620 watts
Plate Power Output	———	8.7	12.8	17.5	20.0 KW
Tube Output	———	494	715	996	1138BTU/Min

6446


FILAMENT TERMINALS
FILAMENT CENTER TAP (SHORTEST 5.000 DIA)
TUBULATION COVER
GRID
ANODE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GRID VOLTS
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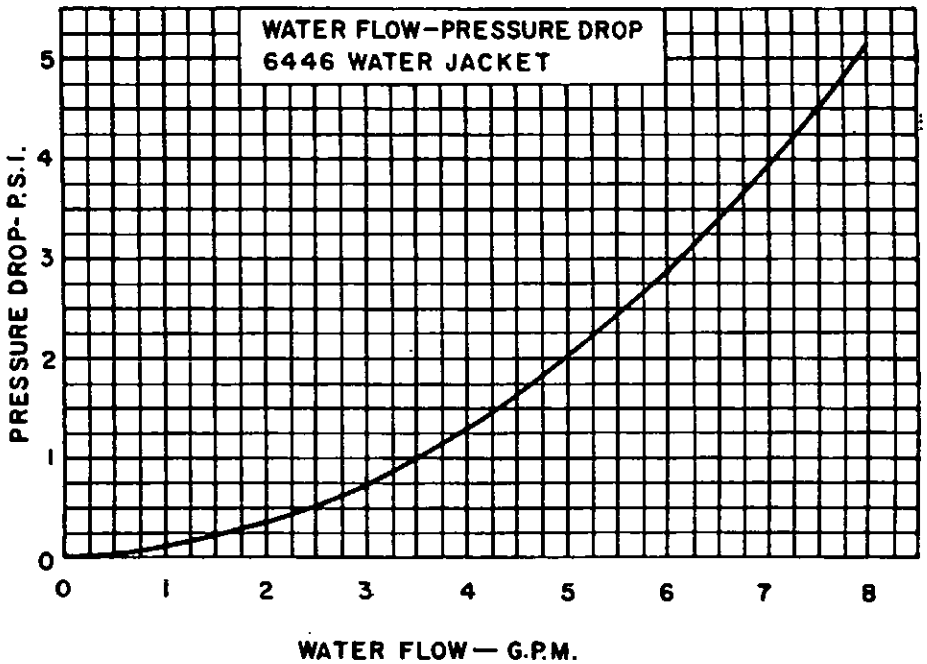
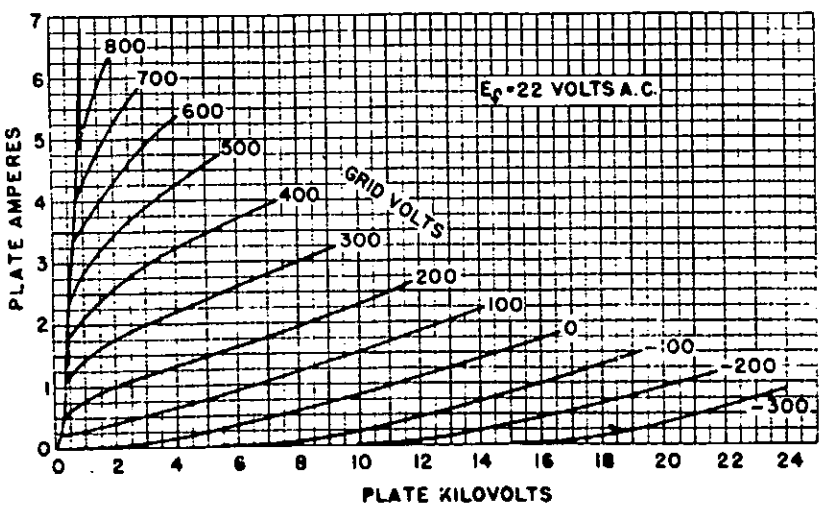
700
600
500
400
300
200
100
GRID AMPERES
PLATE KILOVOLTS


WATER FLOW—PRESSURE DROP
6446 WATER JACKET
PRESSURE DROP- P.S.I.
WATER FLOW— G.P.M.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GRID VOLTS
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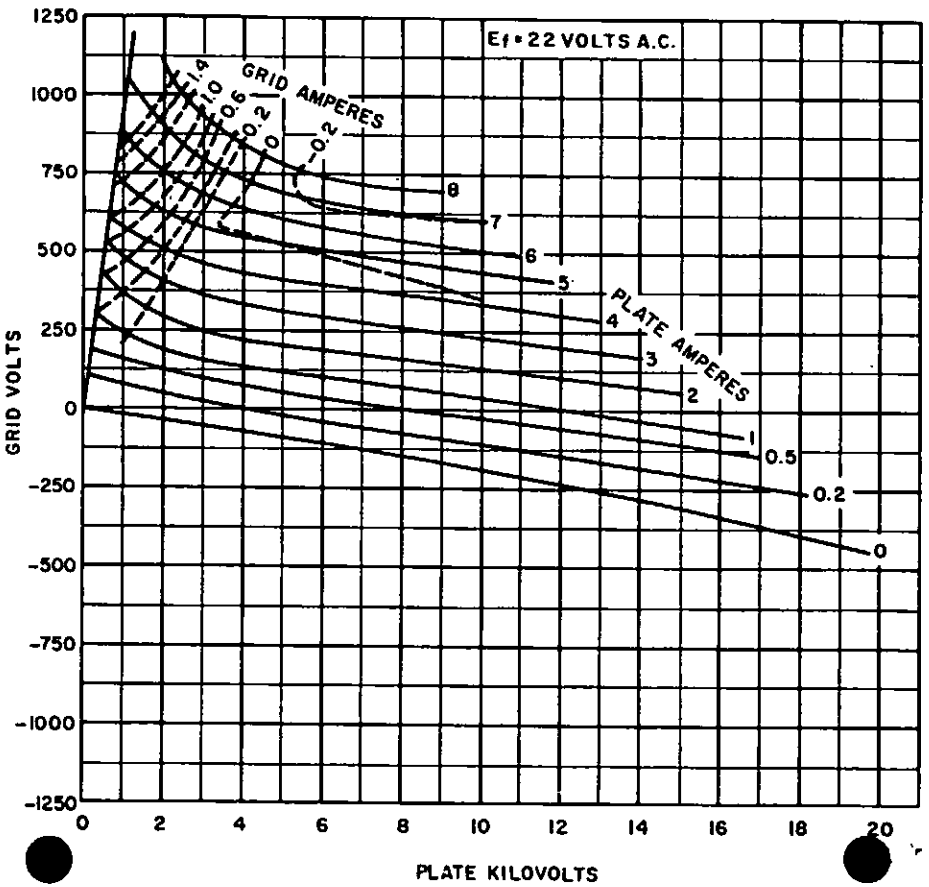
-300
PLATE AMPERES
PLATE KILOVOLTS


Ef = 22 VOLTS A.C.
GRID AMPERES
1.4
1.0
0.6
0.2
0.0
-0.2
PLATE AMPERES
8
7
6
5
4
3
2
1
0.5
0.2
0
GRID VOLTS
PLATE KILOVOLTS

AMPEREX TUBE TYPE 6447

The 6447 is an improved, ruggedized, heavy-wall version of the standard type 892R tube. Incorporating the latest developments in tube design and techniques, the 6447 fills the requirements of the industrial field for a tube similar to the 892R but with higher anode dissipation reserve. This allows for extreme mismatch of load to tube impedance and, therefore, protects the tube against maladjustment or misuse of equipment which cause excessive dissipation.

Among the outstanding features of the new AMPEREX tube are the following:

1. Heavy wall, high conductivity copper anode (7/16" thick)
2. Rugged powdered glass stem which takes the place of the stem press construction.
3. Elimination of the projecting feather-edge seal grid arm by the incorporation of a Kovar ring grid connection.
4. Addition of a strong, conical internal grid support instead of the 3 legged riveted construction. This also provides much lower inductance.
5. Elimination of the more fragile copper feather-edge anode seal and replacement with a Kovar seal.
6. New, stronger spiral filament providing more uniform heat distribution over the anode surface.

GENERAL CHARACTERISTICS

FORCED AIR-COOLED TRIODE

ELECTRICAL	
Filament	Tungsten
Two unit type for single-phase or two-phase A.C., or D.C. operation	
Voltage (per unit)	11 volts
Current (per unit)	60 amps
Starting current must never exceed 120 amps/unit, even momentarily	
Amplification Factor	50
Transconductance (Grid to Plate at I_b = 0.75 amp)	7000 micromhos
Direct Interelectrode Capacitances	
Grid to Plate	32 uuf
Grid to Filament	17 uuf
Plate to Filament	1.8 uuf
MECHANICAL	
Maximum Overall Dimensions	
Length	19 1/8 inches
Diameter	11 inches
Mounting Position	Vertical-anode down
Type of Cooling [1]	Forced air

[1] Rated air flow must be continuous between the time any voltage is applied and for 5 minutes after voltage is removed.

Cooling Characteristics

Plate Dissipation	10.0	8.0	6.0	KW
Air Flow to Radiator	700	500	350	cfm
Back Pressure	0.9	0.6	0.3	inches water
Maximum Temperatures				
Glass-to-metal Seals				180° C
Radiator				230° C
Net Weight (approx.)				60 lbs.

ACCESSORIES

External Filament Connector	AMPEREX #S-13484
External Grid Connector	AMPEREX #Y-13326 (supplied with tube without charge)

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Maximum ratings apply up to 5 megacycles. Operation at higher frequencies is permissible provided the input is reduced and attention given to the glass-to-metal seal temperature:

Frequency	5	12.5	20	mc
Percent of Maximum Rated Plate Voltage and Plate Input	100	75	50	%

R.F. POWER AMPLIFIER AND OSCILLATOR - CLASS C - TELEGRAPHY

(Key down conditions per tube without modulation)

Maximum Ratings

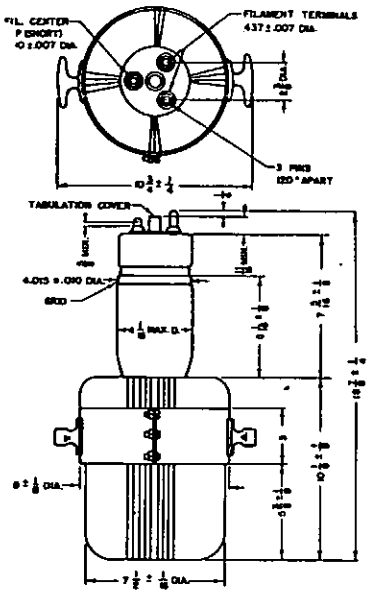
D.C. Plate Voltage	14.0 KV
D.C. Plate Current	2.0 amps
Plate Input	26.0 KW
Plate Dissipation	10.0 KW
D.C. Grid Voltage	− 3.0 KV
D.C. Grid Current	0.40 amp

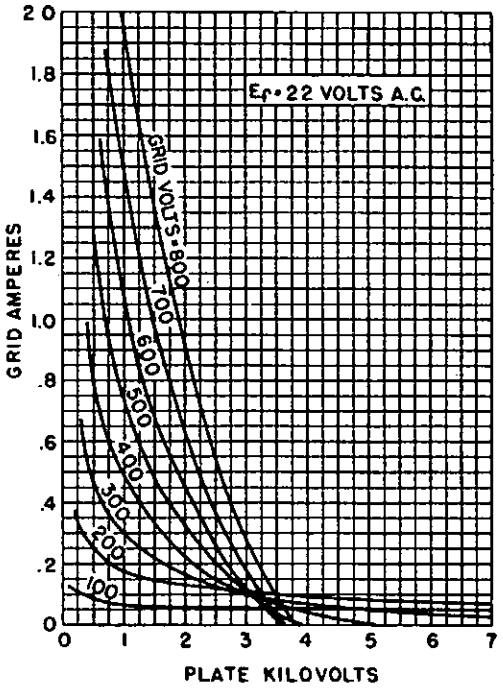
Typical Operation

Filament Voltage	21.4	21.5	21.8 volts
D.C. Plate Voltage	8.0	10.0	12.0 KV
D.C. Plate Current	1.75	1.8	2.0 amps
D.C. Grid Voltage	−500	−600	−800 volts
Grid Voltage, Peak RF	1300	1420	1740 KV
D.C. Grid Current	0.21	0.20	0.20 amps
Driving Power (approx.)	273	284	348 watts
Power Output	9.4	12.3	17.1 KW
Tube Output	530	700	970 BTU/min.

6447

6447


FILAMENT TERMINALS
3 PINS 120° APART
TABULATION COVER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GRID VOLTS
800
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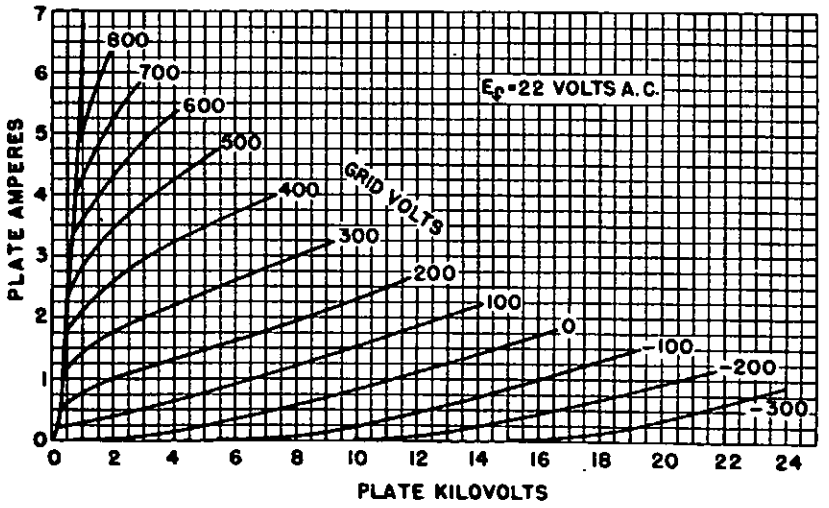
200
100
GRID AMPERES
PLATE KILOVOLTS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GRID VOLTS
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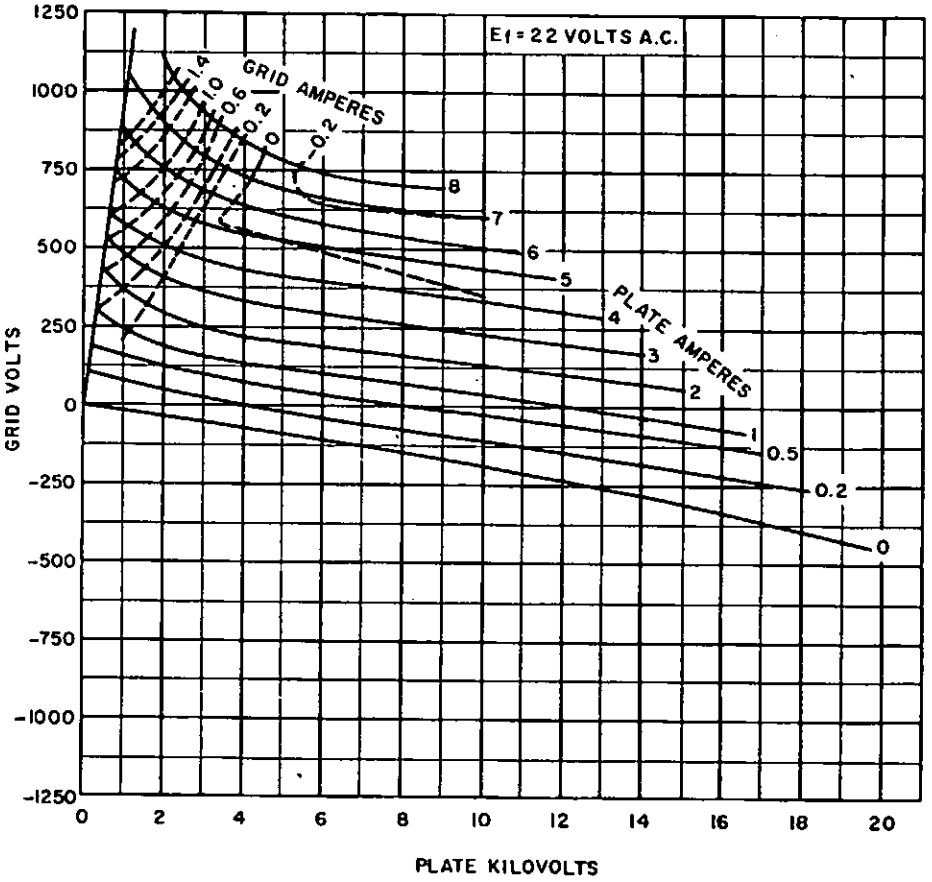
PLATE AMPERES
PLATE KILOVOLTS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GRID AMPERES
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0.6
0.2
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-0.2
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4
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2
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0.5
0.2
0
PLATE AMPERES
GRID VOLTS
PLATE KILOVOLTS

AMPEREX TUBE TYPE 6508

The 6508 is a two electrode mercury-vapor rectifier tube and is designed for rectifier application of relatively high voltage and current. The cathode is directly heated, oxide coated. The physical design of this tube is similar to the popular AMPEREX types 5869 and 5870 thyratrons. The top bakelite cup is intended to prevent mercury condensation on the anode and thus eliminates arc-back.

Maximum Ratings, Absolute Values

Peak Inverse Voltage (max.)	21,000	15,000	10,000 volts
Condensed Mercury Temperature Limits	+25 to +45	+25 to +50	+25 to +60 °C
Maximum plate current			
Peak		10 amps	
Average (Averaging time max. 30 sec)		2.5 amps	
Surge, for design only (Maximum duration 0.1 second)		100 amps	
Frequency Range		25 - 150 cps	

Electrical Data

	Min.	Bogey	Max.	
Filament Voltage	4.75	5.0	5.25	volts
Filament Current at 5.0 volts	—	12.5	13.7	amps
Filament Heating Time (Note 3) (before applying plate voltage)	90	—	—	seconds
Tube Voltage Drop (Output current = 2.5 amps)	—	12	—	volts

Operating conditions for 21 KV, Peak Inverse Voltage

Circuit	Input Voltage rms value kv	DC Output voltage to filter kv	DC Output current amp
Single-phase full-wave 2 tubes	7.4	6.7	5
Three-phase half-wave 3 tubes	8.6	10	7.5
Three-phase, double Y 6 tubes parallel	8.6	10	15
Four-phase half-wave 4 tubes	7.4	9.5	10
Single-phase full-wave 4 tubes	14.8	13.4	5
Three-phase full-wave 6 tubes	14.8	20	7.5
Four-phase full-wave 8 tubes	14.8	19	10

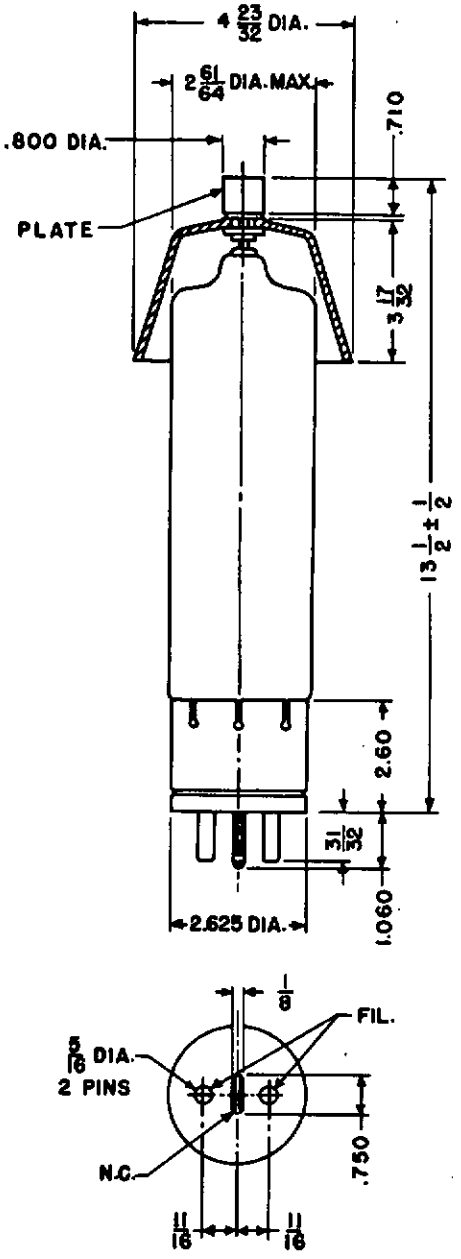
Mechanical Data

Type of cooling	Convection
Equilibrium Condensed-Mercury Temperature Rise	
At Full Load, approximate	+15 °C
At No Load, approximate	+13 °C
Mounting position	Vertical with base down
Net weight (approximate)	25 ounces

NOTES:

1. In order to obtain maximum life it is recommended that a filament voltage phase shift of 90° ±30° with respect to plate voltage be applied.
2. The tube should always be used with the bakelite cap attached.
3. The minimum heating time refers only to the filament. Sufficient additional time must be allowed to permit the condensed mercury temperature to rise to the minimum condensed mercury temperature limit and to permit all the mercury to condense on the lower part of the bulb.
4. The metallic shell of the base should not be allowed to reach a potential different from the cathode potential.

6508


4 23/32 DIA.
2 61/64 DIA. MAX.
.800 DIA.
.710
PLATE
3 17/32
13 1/2 ± 1/2
2.60
31/32
1.060
2.625 DIA.
1/8
FIL.
5/16 DIA.
2 PINS
N.C.
.750
11/16
11/16