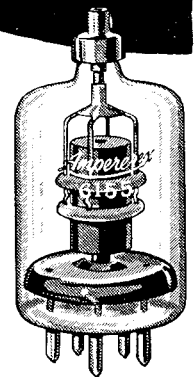
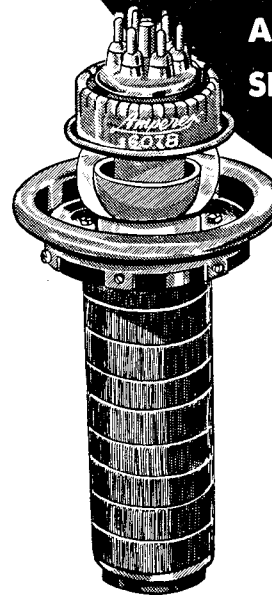
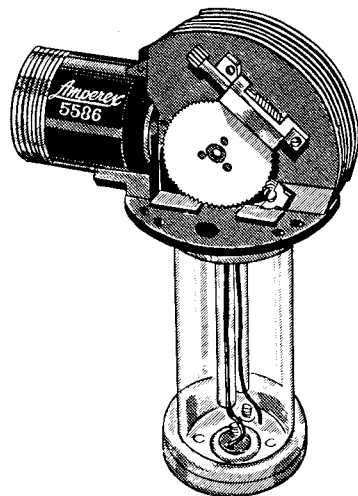
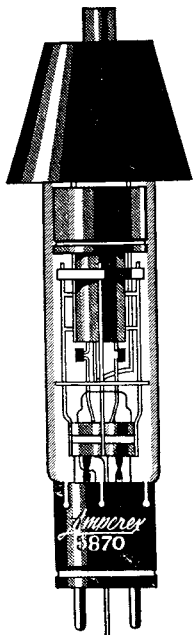


**ELECTRON  
TUBES &  
SEMICONDUCTORS**  
by

# **AMPEREX<sup>®</sup>**

for  
**COMMUNICATION  
INDUSTRIAL USE  
RECTIFICATION  
RADIATION DETECTION  
ELECTRO-MEDICAL USE  
AMATEUR USE  
SPECIAL PURPOSES**





## FOREWORD

This condensed catalog has been compiled for those in the engineering field who seek the proper tubes to suit their applications.

It is also intended to serve as a quick reference tube guide for initial equipment as well as for replacement purposes.

More detailed data sheets and brochures on the various products listed herein are available upon request. A detailed engineering transmitting, and power tube manual giving complete tube characteristics and application data is available to qualified engineers at the nominal cost of \$2.50 each. A semiconductor and special purpose tube manual is also available at \$2.50 each.

AMPEREX is always interested in quoting on all tube requirements. Our research, development and manufacturing facilities are such that we welcome inquiries on new products.

AMPEREX ELECTRONIC CORPORATION

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POWER TUBES  
TRIODES, TETRODES & PENTODES

TYPE NO.	FILAMENT		Mu	Max. Diss. Watts	TYPICAL OPERATION						MAX. FREQ. mc/sec	
	Volts	Amps			PLATE			GRID		SCREEN		Full Input Watts
					Volts DC	Amps DC	Output Watts	Volts DC	Amps DC	Volts DC		
2C39A	6.3	1.0	100	100	800	0.090	40	-40	0.030	-	2500	
4X150A	6.0	2.6	5**	150	1,250	0.200	195	-90	0.011	250	500	
AX4-125A/4D21											(See Tube Type 6155)	
AX4-250A/5D22											(See Tube Type 6156)	
4X250B	6.0	2.6	5**	250	2,000	0.250	410	-90	0.012	250	500	
4X500A	5.0	13.5	6.2**	500	4,000	0.315	835	-150	0.016	500	120	
HF-200	10.0	4	18	200	2,500	0.200	380	-300	0.020	-	30	
HF-201A	10.5	4	18	200	2,500	0.200	380	-300	0.018	-	30	
250-TH	5.0	10.5	37	250	3,000	0.333	750	-220	0.100	-	40	
250-TL	5.0	10.5	14	250	3,000	0.350	750	-500	0.050	-	40	
HF-300	11.0	4	23	200	3,000	0.250	600	-400	0.028	-	20	
450-TH	7.5	12.0	38	450	5,000	0.450	1,800	-300	0.090	-	40	
450-TL	7.5	12.0	18	450	5,000	0.450	1,800	-500	0.054	-	40	
501-R/5759	7.5	24	24	1,000	3,500	0.870	2,175	-250	0.133	-	150	
502/5760	7.5	24	17	1,500	3,500	0.860	2,175	-450	0.150	-	150	
502-R/5761	7.5	24	17	1,500	3,500	0.860	2,175	-450	0.150	-	150	
504R	7.5	24	17	1,000	3,500	0.860	2,175	-750	0.150	-	150	
508/6246	30	80	28	25,000	15,000	3.75	40,000	-900	0.420	-	40	
750TL	7.5	21	15	750	6,000	0.625	3,000	-700	105	-	40	
805	10.0	3.25	50	125	1,500	0.200	215	-105	0.025	-	30	
807	6.3	0.9	8**	25	600	0.100	40	-45	0.004	250	60	
810	10.0	4.5	36	125	2,250	0.275	475	-160	0.010	-	30	
813	10.0	5.0	8.5**	100	1,500	0.180	190	-70	0.006	300	30	
828	10.0	3.25	-	80	1,500	0.180	200	-100	-	400	30	
832-A	6.3 12.6	1.6 0.8	6.5**	10	600	0.036	35	-65	-	200	200	
833-A	10.0	10.0	35	400	4,000	0.450	1,440	-200	0.075	-	30	
838	10.0	3.25	50	100	1,250	0.160	150	-150	0.026	-	30	
845*	10.0	3.25	5.3	100	1,250	0.220	105	-105	0.030	-	15	

\* Conditions given are for Audio Amplifier Operation.  
\*\* Grid No. 2 to Grid No. 1.

NOTE: Typical operation as R-F amplifier and oscillator Class C telegraphy, key down conditions per tube, without modulation for frequencies indicated.

INTERELECTRODE CAPACITANCE - $\mu\mu\text{f}$			DESCRIPTION	TYPE NO.
G-P	G-F	P-F		
2.0	6.6	0.035	Forced-air cooled triode. UHF oscillator, frequency multiplier or R-F amplifier. Suited to cavity type circuits. Features low interelectrode capacitance, high (closely controlled) transconductance and high plate dissipations. Indirectly heated, oxide coated cathode.	2C39A
0.03	15.7	4.3	Forced-air cooled external anode tetrode. Suited for high power mobile applications. Makes an excellent wide-band amplifier for video application.	4X150A
Pg. 8)				AX4-125A/4D21
Pg. 8)				AX4-250A/5D22
0.03	15.7	4.5	Forced-air cooled external anode tetrode. Brazed radiator. Interchangeable with 4X150A where higher plate dissipation is required.	4X250B
0.05	12.8	5.6	Forced-air cooled external anode tetrode. Useful as power amplifier in FM, TV and VHF communication transmitters.	4X500A
6.9	6.2	1.2	Radiation-cooled triode. Original Amperex design and ruggedness make it ideally suited for R-F heating as well as for broadcasters and amateurs.	HF-200
7.0	8.8	1.2	Radiation-cooled triode, similar to HF-200, with different tube capacitance. Low voltage, high current characteristics.	HF-201A
2.9	5.0	0.7	Radiation-cooled high power triode. Used in low powered A-M broadcast stations. Also in electronic heating generators.	250-TH
3.1	3.7	0.7	Radiation-cooled triode. Low mu version of 250-TH.	250-TL
7.0	6.0	1.0	Radiation-cooled triode. Ideally suited for initial equipment and replacement for competitive types. Widely used in R-F heating applications, many commercial, police, and amateur transmitters.	HF-300
5.0	8.8	0.8	Radiation-cooled triode. Very popular in A-M broadcast stations and Government transmitters. Also used in R-F heating applications.	450-TH
4.5	6.8	0.8	Radiation-cooled, medium mu version of 450-TH.	450-TL
10.0	14.0	1.3	Forced-air cooled triode. Low voltage, high current characteristics. Ideal for R-F heating. Has a thoriated-tungsten filament.	501-R/5759
10.0	14.0	1.3	Water-cooled triode. Thoriated-tungsten filament. Compactness and low voltage, high current make it ideally suitable for R-F heating.	502/5760
10.0	14.0	1.3	Forced-air version of 502.	502-R/5761
10.0	14.0	1.3	Forced-air cooled triode similar to AMPEREX 501R minus flexible leads. Interchangeable with 7C26 with very minor circuit changes.	504R
17.0	26.0	2.5	Water-cooled triode. 40 kw output makes it ideally suited as high power R-F heating oscillator and R-F amplifier in A-M transmitters.	508/6246
5.8	8.5	1.2	Medium mu power triode. Amplifier, oscillator and modulator.	750TL
6.5	6.5	6.8	Radiation-cooled triode. Amperex rugged design makes it the popular choice in R-F and A-F stages of A-M broadcast stations.	805
0.2	11.0	7.0	Radiation-cooled tetrode. Popular replacement as well as for initial equipment.	807
4.8	8.7	12.0	Radiation-cooled triode. Thousands of Amperex 810's are used yearly in initial equipment and as direct replacement.	810
0.2	16.3	14.0	Radiation-cooled low drive beam tetrode. Widely used in A-M broadcasting stations, Government, and amateur service.	813
.07	Input 12 Output 14		Radiation-cooled beam pentode. Used in A-M broadcasting stations throughout world.	828
.05	Input 7.5 Output 3.8		Radiation-cooled twin tetrode. Used in mobile and shipboard transmitters, as well as other communications fields.	832-A
6.3	12.3	8.5	Radiation and forced-air cooled triode used widely in A-M transmitters and also some R-F heating applications. (Refer to AX-9902 data)	833-A
8.0	6.5	3.0	Radiation-cooled zero bias triode. Still popular in amateur, commercial and Government transmitters.	838
11.5	5.0	3.5	Radiation-cooled triode. Still popular in amateur, commercial and Government transmitters.	845*



POWER TUBES  
TRIODES, TETRODES & PENTODES

TYPE NO.	FILAMENT		Mu	Max. Diss. Watts	TYPICAL OPERATION						MAX. FREQ. mc/sec
	Volts	Amps			PLATE			GRID		SCREEN	
					Volts DC	Amps DC	Output Watts	Volts DC	Amps DC	Volts DC	
849	11.0	5	19	500	2,500	0.350	630	-250	0.013	-	3
849-A	11.0	7.7	19	500	3,000	0.500	1,200	-500	0.100	-	20
880	12.6	315	20	20,000	10,000	6.0	40,000	-1200	0.800	-	25
889-A	11.0	125	21	5,000	7,500	2.0	10,000	-800	0.240	-	50
889-RA	11.0	125	21	5,000	7,500	2.0	10,000	-800	0.240	-	25
891	22.0	60.0	8	6,000	10,000	1.45	10,000	-3000	0.150	-	1.6
891-R	22.0	60.0	8	4,000	10,000	1.4	10,000	-2000	0.150	-	1.6
892	22.0	60.0	50	10,000	12,000	1.55	14,250	-1600	0.165	-	1.6
892-R	22.0	60.0	50	4,000	10,000	1.40	10,500	-1300	0.160	-	1.6
ZB-3200	22.0	40.5	75	2,500	8,000	0.960	5,800	-400	0.150	-	10
5604	11.0	176.0	19	10,000	12,000	2.5	22,500	-1170	0.220	-	22.5
5619	11.0	176.0	19	20,000	12,000	2.5	22,500	-1170	0.220	-	22.5
5658	12.0	290.0	20.5	10,000	10,000	3.8	28,000	-870	0.550	-	15
5666	11.0	120.0	21	12,500	9,000	2.0	12,200	-750	0.210	-	22.5
5667	11.0	120.0	21	7,500	9,000	2.0	12,200	-750	0.210	-	22.5
5736	6.0	60.0	22	2,500	5,000	1.0	4,100	-850	0.210	-	60
5771	7.5	170	20	22,500	12,500	4.8	44,000	-630	0.750	-	25
5866/AX-9900	6.3	5.4	25	135	2,500	0.200	390	-300	0.045	-	150
5867/AX-9901	5.25	14.1	25	250	3,000	0.363	950	-400	0.080	-	100
5868/AX-9902	10.0	10.0	27	450	4,000	0.475	1,673	-350	0.100	-	100
5894	12.6 6.3	0.9 1.8	8.2**	CCS=40 ICAS=45	CCS=600 ICAS=750	0.200	CCS=85 ICAS=105	-80	0.005	250	250
5923/AX-9904	12.6	33.0	32	6,000	6,000	1.5	6,900	-400	0.310	-	75
5924/AX-9904-R	12.6	33.0	32	6,000	6,000	1.5	6,900	-400	0.310	-	75
5924A	12.6	33.0	32	CLASS B, TV SERVICE, SYNC. LEVEL						-	75 Full Input 220 Derated
				6,000	5,000	1.90	6,250	-140	0.350		
6075/AX-9907	6.3 6.3	33.5 33.5	7.5** 7.5**	3,000 3,000	4,000 5,000	1.10 1.10	3,300 4,100	-250 -250	0.070 0.070	800 800	220 75
6076/AX-9907-R	6.3 6.3	33.5 33.5	7.5 7.5	3,000 3,000	4,000 5,000	1.10 1.10	3,300 4,100	-250 -250	0.070 0.070	800 800	220 75
6077/AX-9906	18.0	196.0	27	100,000	12,000	12.0	108,000	-1000	2.250	-	30
6078/AX-9906-R	18.0	196.0	27	45,000	10,000	12.0	108,000	-1000	2.6	-	30
6079/AX-9908	10.0	9.7	9.5**	500	5,000	0.452	1,760	-200	0.030	700	75

\*\*Grid No. 2 to Grid No. 1.

NOTE: Typical operation as R-F amplifier and oscillator Class C telegraphy,  
key down conditions per tube, without modulation for frequencies indicated.

INTERELECTRODE CAPACITANCE - $\mu\mu\text{f}$			DESCRIPTION	TYPE NO.
G-P	G-F	P-F		
33.0	11.0	2.0	Radiation and forced-air-cooled triode. Still popular as replacement in some A-M broadcast transmitters and R-F heating.	849
11.5	14.0	1.8	Same information as above. Interelectrode capacitance different.	849-A
26.0	29.0	2.6	Water-cooled triode. This rugged "powerhouse" very popular in broadcasting stations and ideal for R-F heating applications.	880
17.8	19.5	3.0	Water-cooled triode. Another rugged high power R-F tube for broadcasting stations and R-F heating applications.	889-A
20.7	19.5	3.0	Forced-air-cooled triode version of 889-A, with improved radiator design.	889-RA
28.0	16.0	3.0	Water-cooled triode. This is one of the tubes that built Amperex reputation. Used in 5 and 10 kw broadcasting stations. Also popular in R-F heating.	891
30.0	16.0	3.0	Forced-air-cooled version of 891.	891-R
32.0	17.0	1.8	Water-cooled triode. Widely used all over the world in broadcasting stations. Also another ideal R-F heating tube.	892
32.0	17.0	2.0	Forced-air-cooled version of 892.	892-R
10.0	13.0	2.0	Forced-air-cooled triode. Original Amperex design. 5.8 kw output at 10 mc with zero bias. Used principally in broadcasting.	ZB-3200
25.0	30.0	1.25	Forced-air-cooled triode. Ideal oscillator for R-F heating and broadcast service.	5604
24.0	30.0	1.0	Water-cooled version of 5604.	5619
24.0	39.0	2.5	Industrial water-cooled version of type 880	5658
18.0	23.5	2.6	Water-cooled triode. Heavy duty version of 889-A for industrial R-F heating application.	5666
18.5	23.5	3.0	Forced-air cooled triode. Heavy duty version of 889-RA for industrial R-F heating application.	5667
14.5	17.5	0.5	Thoriated tungsten filament power triode, Modulator, amplifier or oscillator for H.F. transmitters and R.F. power amplifier in wide-band TV service.	5736
24.5	47.0	3.0	Improved version of 880 with thoriated tungsten filament for high emission capability and a saving of 70% in filament power. Has rugged Kovar grid and filament seals. For industrial & communication applications.	5771
5.5	5.8	0.1	Radiation and/or forced-air-cooled H.F. triode of original Amperex design. Powdered glass dish-type base with extremely low lead inductance makes this tube ideally suited for almost any H-F application.	5866/AX-9900
5.3	7.0	0.15	Radiation and/or forced-air-cooled H.F. low drive triode of original Amperex design.	5867/AX-9901
8.0	11.0	0.35	Radiation and/or forced-air-cooled H-F triode with rugged 100 watt filament. Of original Amperex design, for all heavy duty R-F applications.	5868/AX-9902
0.08	Input 6.7 Output 2.1 (Push-Pull)		Radiation and/or forced-air-cooled twin-tetrode of original Amperex design as H-F version of conventional 829-B. Makes ideal multiplier, as well as straight amplifier and modulator.	5894
11.0	16.0	0.3	Water-cooled low drive H.F. triode. Rugged for H.F. heating application.	5923/AX-9904
11.0	16.0	0.3	Forced-air cooled version of type 5923.	5924/AX-9904-R
11.0	16.0	0.3	Forced-air cooled triode for FM & TV transmitters. Brazed radiator shell & external surfaces silverplated throughout.	5924A
	24.0 24.0	8.5 8.5	Water-cooled low drive, H-F tetrode designed for F-M and television transmitter power amplifier.	6075/AX-9907
0.2 0.2	24.0 24.0	8.5 8.5	Forced-air-cooled external anode version of 6075/AX-9907	6076/AX-9907-R
6.0	116.0	3.4	Water-cooled triode, thoriated-tungsten filament. Designed for high power communication and industrial R-F heating services.	6077/AX-9906
86.0	116.0	3.4	Forced-air-cooled version of 6077/AX-9906. Improved radiator with unique air flow chamber design for minimum air flow requirements. Highest power air cooled tube in the world.	6078/AX-9906-R
0.24	Input 25 Output 7.2		Radiation and/or forced-air-cooled low drive H-F tetrode for F-M and A-M transmitters. Also ideal in screen modulator stages.	6079/AX-9908



POWER TUBES  
TRIODES, TETRODES & PENTODES

TYPE NO.	FILAMENT		Mu	Max. Diss. Watts	TYPICAL OPERATION						MAX. FREQ. mc/sec	Full Input Watts
	Volts	Amps			PLATE			GRID		SCREEN		
					Volts DC	Amps DC	Output Watts	Volts DC	Amps DC	Volts DC		
6083/AX-9909	12.6	1.35	6.7	45	1,000	0.017	132	-120	0.005	250	60	
6146	6.3	1.25	4.5	CCS=20 ICAS=25	600 750	0.112 0.12	52 70	-58 -62	0.0028 0.0031	150 160	60	
6155	5.0	6.5	6.2**	125	2,500	0.200	375	-150	0.010	350	120	
6156	5.0	14.5	6.0**	250	3,500	0.345	800	-500	0.020	600	75	
6252/AX-9910	12.6 6.3	0.65 1.3	8.5**	CCS=20 ICAS=25	600 750	0.100 0.150	42 79	-60 -60	0.0014 0.002	250 250	300	
6333	22.0	60.0	50	10,000	12,000	1.55	14,250	-1600	0.165	-	5	
6360	12.6 6.3	0.410 0.820	7.5**	CCS=10 ICAS=14	300	0.100	ICAS 18.5	-45	0.003	200	200	
6445	22.0	60.0	50	5,000	10,000	1.40	10,500	-1300	0.160	-	5	
6446	22.0	60.0	50	20,000	15,000	2.0	20,000	-1250	0.250	-	5	
6447	22.0	60.0	50	10,000	12,000	2.0	17,500	-500	0.230	-	5	
6617	8.0	98	34	20,000	12,000	4.5	39,000	-1000	0.800	-	30	
6618	8.0	98	34	15,000	12,000	4.5	39,000	-1000	0.800	-	30	
6756	7.5	100	13.5	20,000	12,000	3.5	30,640	-1220	0.210	-	30	
6757	7.5	100	13.5	15,000	12,000	3.5	30,640	-1220	0.210	-	30	
6800	7.5	100	19.5	20,000	12,500	3.5	33,000	-1200	0.250	-	22.5	
6801	7.5	100	19.5	10,000	11,800	3.5	31,000	-1200	0.250	-	22.5	
6907	12.6 6.3	0.65 1.3	8.5**	CCS=20 ICAS=25	600 750	0.100 0.150	42 79	-60 -60	0.0014 0.002	250 250	300	
6939	12.6 6.3	0.375 0.75	33**	CCS= 6 ICAS=7.5	180 200	0.055 0.060	5.8 7.5	-20 -20	0.002 0.002	180 200	500	
6960	12.6	33	32	6,000	6,500	2.0	10,000	-450	0.600	-	55	
6961	12.6	33	32	6,000	6,500	2.0	10,000	-450	0.600	-	55	
6979	6.0	2.6	5**	250	2,000	0.250	410	-90	0.012	250	250	
7004	3.4	19.0	32	300	2,500	0.260	45	-200	0.100	-	175 900†	
7092	6.3	32.5	22	800 1,200+	5,000 5,550	0.700 0.855	2,720 3,685	-400 -490	0.160 0.195	-	50	

\*\* Grid No. 2 to Grid No. 1  
† Derated for 155 watts output  
+ 50% duty cycle



NOTE: Typical operation as R-F amplifier and oscillator Class C telegraphy, key down conditions per tube, without modulation for frequencies indicated.

INTERELECTRODE CAPACITANCE - $\mu\mu\text{f}$			DESCRIPTION	TYPE NO.
G-P	G-F	P-F		
0.1	22.5	11.0	Radiation-cooled pentode with low voltage - high current characteristics. Powder glass dish type base with short internal lead connections. Up to 150 watts, Class C Telephony, ICAS.	6083/AX-9909
0.22	13.5	8.5	Beam power tube for use as R-F power amplifier, oscillator, frequency multiplier, AF power amplifier or modulator for mobile and fixed equipment. Anode capable of dissipating 25 watts ICAS.	6146
0.05	10.8	3.1	Convection and forced-air-cooled tetrode. "Magnisorb" anode and low drive make it excellent R-F amplifier tube in F.M. broadcasting. Improved version of 4-125A/4D21.	6155
0.12	12.7	4.5	Convection and forced-air-cooled tetrode. "Magnisorb" anode and low drive characteristics with "sintered" glass base. Improved version of 4-250A/5022.	6156
-	Input 4.0 Output 1.3		Radiation and/or forced-air-cooled twin tetrode of Amperex design. H.F. version of conventional 832A. Makes ideal multiplier as well as straight amplifier and modulator. Useful up to 700 mc. at reduced ratings. Delivers 15 watts at 600 mc. under CCS conditions.	6252/AX-9910
32.0	17.0	1.8	Improved ruggedized version of standard 892 with spiral filament, Kovar seals, powdered glass stem. Grid side arm deleted and replaced with Kovar ring. Excellent industrial tube for heavy duty, also communication.	6333
<0.1	Input 6.2 Output 2.6		High-gain, twin tetrode for use as Class C amplifier, oscillator, frequency multiplier and modulator. ICAS plate input = 30 watts up to 200 mc. Capable of delivering 18.5 watts output at 200 mc.	6360
32.0	17.0	1.8	Forced-air-cooled version of type 6333. See above.	6445
32.0	17.0	1.8	Improved, ruggedized, heavy-wall version of type 892. Has powdered glass stem, Kovar grid ring, Kovar anode seal, stronger spiral filament giving more uniform heat distribution over anode surface. Also has strong conical, low-inductance grid support. An unusual industrial tube without equal.	6446
32.0	17.0	1.8	Forced-air-cooled version of type 6446. See above.	6447
30.0	37.0	0.5	Thoriated tungsten filamentary triode. 20 kw anode dissipation. Water-cooled. High power, low impedance, R.F. amplifier and industrial oscillator.	6617
30.0	37.0	0.5	Same as 6617 except 15 kw anode dissipation. Forced-air-cooled.	6618
47.6	25.1	1.5	Water-cooled triode with special characteristics as a low impedance. R.F. industrial oscillator. Particularly suited to induction and dielectric heating applications.	6756
50.0	25.1	2.0	Forced-air-cooled version of type 6756.	6757
26.0	25.0	1.0	Thoriated tungsten filamentary triode. 20 kw anode dissipation. Water-cooled. High power RF amplifier and industrial oscillator.	6800
27.0	25.0	1.25	Same as 6800 except 10 kw anode dissipation. Forced air-cooled.	6801
-	Input 4.0 Output 1.3		Twin tetrode, radiation-cooled. Special AMPEREX design for mobile service. HF version of conventional 832A. Ideal multiplier and straight amplifier and modulator. Useful up to 1000 mc. Delivers 15 watts at 600 mc, CCS.	6907
-	Input 3.8 Output 0.8		High-gain twin tetrode for use as Class C amplifier, oscillator, frequency multiplier and modulator. ICAS plate input = 14 watts up to 500 mc. Capable of delivering 7.5 watts output at 500 mc.	6939
11.0	16.0	0.3	Industrial water-cooled triode with large overload capacity on grid and plate currents. Suitable for 7.5 kw induction and dielectric heaters and 10 kw plastic sealers.	6960
11.0	16.0	0.3	Forced-air cooled version of 6960. Suitable for 7.5 kw induction and dielectric heaters and 10 kw plastic sealers.	6961
0.03	15.7	4.5	Forced-air cooled external anode tetrode. Brazed radiator. Interchangeable with 4X150A where higher plate dissipation is required.	6979
4.0	9.0	0.12 Max.	Compact, coaxial transmitting triode. Forced-air cooled. UHF oscillator, amplifier and frequency multiplier. Useful up to 900 mc.	7004
6.2	10.5	0.25	Radiation cooled triode for industrial oscillator and amplifier applications. Rugged construction. Graphite anode with unusual overload capability. Thoriated tungsten filament.	7092



### HIGH QUALITY TUBES FOR HI-FI APPLICATIONS

TYPE NO.	FILAMENT		TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS										
			Circuit Application	Applied Voltages			Plate Current (mA)	Screen Current (mA)	Amplification Factor	Plate Resistance (K ohms)	Transconductance (micromhos)	Max. Pow. 2 Tubes Clas	
	Volts	Amps		Plate	Screen	Grid							
EF86/6267	6.3	0.2	Voltage Amplifier	250	140	-2.0	3.0	0.6	-	2500	2000	-	
ECC81/12AT7	12.6 6.3	0.15 0.30	Voltage Amplifier	250	-	-2.0	10.0	-	55	-	5500	-	
ECC82/12AU7	12.6 6.3	0.15 0.30	Voltage Amplifier	250	-	-8.5	10.5	-	17	7.7	2200	-	
ECC83/12AX7	12.6 6.3	0.15 0.30	Voltage Amplifier	250	-	-2.0	1.2	-	100	62.5	1600	-	
ECC85/6AQ8	6.3	0.435	RF Amplifier and Mixer	RF Amp 230	-	-2.0	10.0	-	57	9.7	6000	-	
				Mixer 190	-	**	5.2	-	57	2.2	2300†	-	
EL84/6BQ5	6.3	0.76	Power Output Tube	300	300	-14.5	2 X 46	2 X 11	-	-	11,300	17	
6CA7/EL34	6.3	1.5	Power Output Tube	800	400	-39	2 X 91	2 X 19	-	-	11,300	100	
EZ80/6V4	6.3	0.6	Full Wave Rectifier									AC Supply (Plate-to-Plate) Voltage (RMS) = 2 X DC Output Current (max.) = 90 Max. Capacity Condenser Input Filter = 50 DC Output Voltage = 310	
EZ81/6CA4	6.3	1.0	Full Wave Rectifier									AC Supply (Plate-to-Plate) Voltage (RMS) = 2 X DC Output Current (max.) = 150 Max. Capacity Condenser Input Filter = 50 DC Output Voltage = 347	
GZ34/5AR4	5.0	1.9	Full wave Rectifier									AC Supply (Plate-to-Plate) Voltage (RMS) = 2 X DC Output Current (max.) = 250 Max. Capacity Condenser Input Filter = 60 DC Output Voltage = 610	

\*\*Grid leak resistance = 1 megohm

† Conversion conductance



### HYDROGEN THYRATRONS

TYPE NO.	Peak Forward Anode Voltage Max.	Peak Anode Current Max. (Amps)	Av. Anode Current Max. (mA)	Pulse Width Max.
6268/AX-9911	8,000	90	100	6 μsec
6279/AX-9912	16,000	325	200	6 μsec



### SUB-MINIATURE TUBES (SCREEN GRID TYPES) - MAXIMUM RATINGS

TYPE NO.	Filament		Capacitances μμf			Plate		Grid #1 Volts	Grid #2 Volts	Plate	
	D-C Volts	Current mA	G-P	Input	Output	Volts	Diss. Milliwatts			Micro-Amps	Resistanc Megohms
6007/5913	1.25	13.3	0.2	2.5	2.2	45	25	-0.2	45	475	0.4
6008/5911	0.625	13.3	0.2		1.5	45	1.5	-0.2	45	50	0.4

Output-Push-Pull B	Load Resistance (K ohms)	Cut-Off Bias (volts)	DESCRIPTION	TYPE NO.
-	-	-	High gain pentode particularly suitable for preamplifier and input stages in which hum, noise and microphony must be kept to a minimum. Electrode structure rigid. Heater is bifilar, twisted pair of wires with magnetic field of one opposed to that of the other.	EF86/6267
-	-	-12.0	Medium-gain dual triode with low hum, noise and microphonics. Replaces the 12AT7 without circuit changes.	ECC81/12AT7
-	-	-	Low noise dual triode with low hum, noise and microphonics. Replaces the 12AU7 without circuit changes.	ECC82/12AU7
-	-	-	High-gain dual triode with low hum, noise and microphonics. Replaces the 12AX7 without circuit changes.	ECC83/12AX7
-	-	-	Twin triode specifically designed for use in "front-end" stages of FM receivers as a combined RF Amplifier and self-oscillating additive mixer. Features extensive internal screening between the two triodes which reduces oscillator radiation. The high mutual conductance, input resistance and amplification factor make possible an average overall "front-end" gain of 350.	ECC85/6A08
-	8 Plate-to-Plate	-	High quality pentodes designed especially for high fidelity audio systems. High efficiency with low distortion. High sensitivity. Exceedingly small spread in characteristics between individual tubes so that maximum rated output is obtained with all tubes.	EL84/6BQ5
-	11 Plate-to-Plate	-		6CA7/EL34
300 volts mA $\mu$ f volts dc			Indirectly heated, full-wave rectifier with 90 mA output capacity and 9 pin miniature construction.	EZ80/6V4
350 volts mA $\mu$ f volts dc			Indirectly heated, full-wave rectifier with 6.3 volt, 1 amp heater, 150 mA output capacity and 9 pin miniature construction.	EZ81/6CA4
550 volts mA $\mu$ f volts dc			Indirectly heated, full-wave rectifier with 5.0 volt, 1.9 amp heater and 250 mA output capacity. Octal base.	GZ34/5AR4

DESCRIPTION	TYPE NO.
These tubes are used as drivers for pulsing magnetrons and other oscillators and as high speed switches. Hydrogen-filled, they have extremely low de-ionization time. They are zero bias tubes, triggered by a positive grid pulse. Maximum pulse repetition frequency (prf in pulses per second) will depend on the peak forward anode voltage (epy in volts) according to formula: $(epy)^2 \times (prf) = 2.6 \times 10^{11} \text{ max.}$	
Completely interchangeable with 4C35 in every respect except that it has self-contained source of hydrogen providing life expectancy of minimum 1000 hours.	6268/AX-9911
Completely interchangeable with 5C22 in every respect except that it has self-contained source of hydrogen providing life expectancy of minimum 1000 hours.	6279/AX-9912

Trans-conductance Micromhos	Output Milliwatts	DESCRIPTION	TYPE NO.
420	6	Radiation-cooled pentode output amplifier for hearing aids and other purposes, where small size, light weight and low battery drain are important. An ideal tube for receivers, etc.	6007/5913
100	2.25	Same as above except this tube is a voltage amplifier.	6008/5911



RECTIFIERS - DIODES

TYPE NO.	Filament		Fil. Heating Time (sec)	Tube Drop Volts	Peak Inverse Anode Volts	Anode Current		Surge Current Amps
	Volts	Amps				Peak Amps	Average Amps	
3B-28	2.5	5.0	5	10.0	10,000	1.0	0.250	-
4B-32	5.0	7.5	30	10.0	10,000	5.0	1.25	50.0
249-B	2.5	7.5	15	15.0	7,500	2.5	0.640	-
575-A	5.0	10.0	30	10.0	15,000	6.0	1.5	60.0
673	5.0	10.0	30	10.0	15,000	6.0	1.5	60.0
857-B	5.0	30.0	60	10.0	22,000	40.0	10.0	400.0
866-AX	2.5	5.0	20	10.0	10,000	1.0	0.250	-
869-B	5.0	18.0	60	10.0	20,000	10.0	2.50	-
869-BL	5.0	18.0	60	10.0	20,000	10.0	2.50	-
872-AX	5.0	7.5	30	10.0	10,000	5.0	1.25	50.0
6339	6.3	1.5	30	-	WITH LIQUID COOLING			
					16,000	0.250	0.065	-
					10,000	0.400	0.100	-
					WITHOUT COOLING - AIR OPE			
					12,000	0.200	0.050	-
6508	5.0	12.5	90	12.0	21,000	10.0	2.5	100.0
6693	5.0	11.5	60	12.0	2,500	10.0	5.0	200.0
					15,000	12.0	3.0	120.0
7136	5.0	11.5	60	12.0	15,000	12.0	2.5	120.0
8008-AX	5.0	7.5	30	10.0	10,000	5.0	1.25	50.0
8020-AX	5.0	6.0	5	200V at 100ma	40,000	0.750	0.100	-



RUGGEDIZED MINIATURE TUBES A.R.I.N.C. TYPES

TYPE NO.	PROTOTYPE	HEATER		AMPLIFICATION FACTOR	TRANSCONDUCTANCE (MICROMHOS)	TYPICAL OPERATION					
		VOLTS	AMPS			PLATE			GRID VOLTS DC	SCREEN	
						VOLTS DC	CURRENT mA-DC	RESISTANCE K OHMS		VOLTS DC	CURRE mA-D
5726	6AL5	6.3	0.3	Max. plate 117 V. rms at 9 mA-DC total output; Peak plate current 54 mA ma							
5654	6AK5	6.3	0.175	-	5000	120	7.5	340	R <sub>k</sub> =200	120	2.5

Temperature Range °C		DESCRIPTION	TYPE NO.
Ambient	Mercury		
-	-	Xenon gas filled half-wave rectifier with wider temperature ranges than mercury-vapor tubes. Used largely by armed services to replace 866-A's.	3B-28
-	-	Xenon gas filled half-wave rectifier with wider temperature ranges than mercury-vapor tubes. Used largely by armed services to replace 872-A's.	4B-32
-	+25 to +70°	Convection-cooled mercury-vapor half-wave rectifier. Used in most Western Electric r-f equipment.	249-B
-	+20 to +50°	Convection-cooled mercury-vapor half-wave rectifier. Widely used in broadcast and industrial power supplies.	575-A
-	+20 to +50°	Convection-cooled mercury-vapor half-wave rectifier. Popular in high voltage and current applications.	673
-	+30 to +40°	Mercury-vapor half-wave rectifier with low voltage drop. Extremely popular in most high power broadcasting stations. Convection cooled.	857-B
-	+25 to +70°	Mercury-vapor half-wave rectifier of Amperex own design. More rugged trouble-free operation at only slight additional cost. Convection cooled.	866-AX
-	+30 to +40°	Mercury-vapor half-wave rectifier and probably the most popular intermediate high voltage tube in use today with broadcasters and industrial users. Convection cooled.	869-B
-	+30 to +40°	Electrically same as 869-B. Base has flexible filament leads with spade lugs for better, low-resistance contact with socket.	869-BL
-	+20 to +60°	Mercury-vapor half-wave rectifier. Universally used by almost every user and designer of H-V equipment. Convection cooled.	872-AX
-65 to +165°	-	High vacuum clipper diode and rectifier. Miniature version of 3B29 for liquid immersion cooling or air operation.	6339
T10N			
-55 to +85°	-		
-	+25 to +45°	Mercury vapor rectifier for relatively high voltage and current. A high quality, long-life tube priced lower than any tube in its class on the market.	6508
+15 to +55° +15 to +35°	+25 to +75° +25 to +55°	Single-anode, mercury vapor rectifier with ratings, intermediate between standard types 575A and 869B. Delivers 9 amps up to 12 KV in a full wave, 3 phase power supply. Three tubes in a three phase half-wave power supply deliver 6 KV at 9 amps using only one filament transformer. Has large contact area, industrial base preventing base contact oxidation. Priced low for replacement market and original equipment.	6693
+15 to +35°	+25 to +55°	Single anode, mercury vapor, high voltage rectifier. Plate current ratings intermediate between types 575A and 6693. Cathode and anode design similar to 6693 but with 575A base. Recommended replacement for 575A in older equipment. For new equipment design, the 6693 is recommended.	7136
-	+20 to +60°	Mercury-vapor half-wave rectifier similar to 872-A characteristics; with heavy long pin industrial base. Used by armed services and in commercial applications. Convection cooled.	8008-AX
-	-	Half-wave, high vacuum rectifier with high inverse voltage and low average current. Used in radar and precipitator power supplies.	8020-AX

POWER OUTPUT Watts	LOAD RESISTANCE K ohms	CUT-OFF BIAS Volts	CAPACITANCES- $\mu\mu\text{f}$			DESCRIPTION	TYPE NO.
			G-P	INPUT	OUTPUT		
-	-	-	-	-	3.2	High permeance twin diode. Rugged and reliable. For use in critical applications in which operational dependability is of primary importance.	5726
-	-	-12	0.02	4.0	2.9	Sharp cut-off pentode particularly suited for use as a wide band, high frequency amplifier. Ruggedized construction makes it suitable for critical applications in which operational dependability is of primary importance.	5654



PREMIUM QUALITY, 10,000 HOUR TUBES

TYPE	Heater		Capacitances			MAXIMUM RATINGS					TYPICAL CHARACTERISTICS							
	Voltage	Current	Cold Values	Input	Output	Max. Anode Dissipation	Anode Voltage	Suppressor Grid Voltage	Screen Grid Voltage	Cathode Current	Screen Grid Voltage	Anode Voltage	Cathode Resistor	Anode Current	Screen Grid Current	Mutual Conductance	Amplification Factor	
	volts	amp.		$\mu\text{f}$	$\mu\text{f}$	watts	volts	volts	volts	mA	volts	volts	ohms	mA	mA	micromhos		
E81L/6686 Power Pentode	6.3	0.375	-	11.5	6.5	4.5 (design center value)	210	0	210	30	210	210	120	20	5.3	11,000	36	
E83F/6689 wide-band amplifier pentode	6.3	0.3	-	8.5	3.6	2.1 (design center value)	210	0	210	16	120	210	165	10	2.1	9,000	34	
E92CC Twin Triode	6.3	0.4	one section	3.5	0.3	2.0 $\ddagger$ (absolute value)	300	-	-	15	-	150	-	8.5	-	6,000	50	
5920/E90CC Twin Triode	6.3	0.4	one section	3.4	0.35	2.0 $\ddagger$ (absolute value)	300	-	-	15	-	100	-	8.5	-	6,000	27	
7062 Twin Triode	6.3	0.400	one section	3.5	0.5	2.0 $\ddagger$ (absolute value)	600	-	-	20	-	150	-	8.5	-	6,300	45	
	12.6	0.200																
7119/E182CC Twin Triode	Series 12.6	0.4	one section	6.5	1.1	4.5 (absolute value)	330	-	-	60	-	120	-	36	-	15,500	24.	
	Par. 6.3	0.8																
Rugged Construction	E88CC/6922 Twin Triode	6.3	0.3	one section	3.3	0.2	1.5 $\ddagger$ (design center value)	220	-	-	20	-	100	680	15	-	12,500	33
	E180F/6688 Broad-band amplifier pentode	6.3	0.3	-	7.5	3.0	3.0 (absolute value)	210	0	175	25	160	190	630	13	3.3	16,500	50
	6084/E80F Sharp cut-off amplifier pentode	6.3	0.3	-	5.0	7.3	1.3 (absolute value)	300	0	200	9	100	250	550	3	0.65	1,850	25
	6085/E80CC Twin Triode	12.6	0.3	one section	2.6	3.5	2.0 $\ddagger$ (absolute value)	300	-	-	12	-	250	920	6	-	2,700	27
		6.3	0.6															
6227/E80L Power Pentode	6.3	0.75	-	11.5	7.0	8.0 (absolute value)	300	0	300	50	250	250	130	30	4.1	9,000	21.	

$\ddagger$  Ratings and operating conditions apply to one section

Typical Operation

Plate Resistance	Anode Current	Anode Resistance	Screen Grid Resistor	Cathode Resistor	Cathode By-Pass Capacitor	Input Resistance Following Amplifier Stage	Grid Leak Resistor	Output Voltage	Amplification	Distortion	Output Power	Input Voltage	Base Connections	Life	Maximum Length	Maximum Diameter	TYPE
megohms	mA	kilohms	kilohms	kilohms	$\mu$ f	kilohms	megohms	volts effective	$V_o \setminus V_i$	%	watts	volts effective			inches	inches	
0.3	20	15	-	0.12	50	-	0.1	-	-	5	1.0	-		LONGER THAN 10,000 HOURS	2-5/8	7/8	E81L/6686 Power Pentode
0.5	8.3	20	5.6	0.18	50	-	0.1	-	-	10	0.66	1.1			2-5/8	7/8	E83F/6689 wide-band amplifier pentode
0.0083	-	-	-	-	-	-	-	-	-	-	-	-			2-5/8	3/4	E92CC Twin Triode
0.0045	-	-	-	-	-	-	-	-	-	-	-	-			2-5/8	3/4	5920/E90CC Twin Triode
0.0072	-	-	-	-	-	-	-	-	-	-	-	-			2-5/8	7/8	7062 Twin Triode
0.0016	-	-	-	-	-	-	-	-	-	-	-	-			2-5/8	7/8	7119/E182CC Twin Triode
0.00264	-	-	-	-	-	-	-	-	-	-	-	-			2-3/16	7/8	E88CC/6922 Twin Triode
0.09	-	1.0	-	-	-	-	0.5	-	-	0.9	-	0.1			1-3/4	7/8	E180F/6688 Broad-band amplifier pentode
1.5	0.8	220	1200	1.5	50	680	1.0	25	175	1.4	-	-			2-5/8	7/8	6084/E80F Sharp cut-off amplifier pentode
0.01	0.67	220	-	3.9	50	680	-	29	21	2.6	-	-			3-1/16	7/8	6085/E80CC Twin Triode
0.09	24	10	1.0	0.27	50	-	1.0	-	-	10	2.8	2.9		3-1/16	7/8	6227/E80L Power Pentode	

Rugged Construction



### MERCURY VAPOR AND INERT GAS THYRATONS - TRIODES AND TETRODES

TYPE NO.	Heater or Filament		Filament Heating Time (sec.)	Tube Drop (Volts)	Peak Voltage		Anode Current		Max. Grid Volts	Ionization Time $\mu$ sec.	Deionization Time $\mu$ sec.
	Volts	Amps			Forward Volts	Inverse Volts	Peak Amps	Average Amps			
2D21	6.3	0.6	10	8	650	1300	0.5	0.1	-100	0.5	-
AX-105	5.0	10.0	300	16	10000	10000	8.0	4.0	-500	10	1000
AX-255	5.0	16.0	300	12	1500	2500	80.0	12.5	-300	10	1000
AX-260	5.0	25.0	600	10	1500	2500	160.0	25.0	-300	10	1000
678	5.0	7.5	60	15	15000	15000	6.0	1.6	-500	-	-
1701	2.5	5.0	5	16	2500	5000	1.0	0.5	-500	10	1000
5544	2.5	12.0	60	16	1500	1500	40.0	3.2	-250	-	400
5545	2.5	21.0	60	16	1500	1500	80.0	6.4	-250	-	500
5559	5.0	4.5	300	16	1000	1500	15.0	2.5	-500	10	1000
5560/FG95	5.0	4.5	300	16	1000	1000	15.0	2.5	-1000	10	1000
5685/C6J	2.5	21.0	60	9	750	1250	12.8	6.4	-100	-	1000
5727	6.3	0.6	10	8	650	1300	0.5	0.1	-100	0.5	35 min.
5869/AGR-9950	5.0	6.5	120	15	13000	13000	4.0	1.0	-100	10	250
5870/AGR-9951	5.0	14.0	120	12	27000	27000	10.0	2.5	-100	10	250
6786	5.0	15-20	600	12	15000	15000	45.0	10-15	-	-	-



### MAGNETRONS - Typical operating conditions

TYPE NO.	Frequency mc/sec.		Power Output Pulsed KW	Power Output Av. Watts	Plate Voltage Pulsed (KV)	Plate Current Pulsed (Amperes)	Plate Current Average (mA)	Magnetic Field (Gauss)	Duty Factor
	Min.	Max.	Min.	Approx.					
JP9-15	9345	9405	18	3.6	7.5	6.5	1.3	Packaged	.0002
				18					6.5
2J42	9345	9405	7.0	7.0	5.5	4.5	4.5	Packaged	.001
2J48 <sup>1</sup>	9310	9320	38	38	10.5	10.0	10	4850	.001
2J55	9345	9405	40	40	12.0	12.0	12	Packaged	.001
2J56	9215	9275	40	40	12.0	12.0	12	Packaged	.001
4J47	2785	2820	700	350	25.0	60.0	30	2700	.0005
4J57	6475	6575	180	180	17.5	30.0	30	Packaged	.001
4J58	6375	6475	180	180	17.5	30.0	30	Packaged	.001
4J59	6275	6375	180	180	17.5	30.0	30	Packaged	.001
5586 <sup>2</sup>	2700	2900	800	400	30.0	70.0	35	2700	.0005
5657 <sup>2</sup>	2900	3100	800	400	30.0	70.0	35	2700	.0005
6507 <sup>3</sup>	9345	9405	65	65	15.0	15.0	15.0	Packaged	.001
6589 <sup>2</sup>	3350	3500	500	250	28.0	50.0	25	2700	.0005
6972	9345	9405	75	75	15.0	15.0	15.0	Packaged	.001

**NOTES:**

<sup>1</sup>Tube can be operated with external stabilizing cavity, in which case frequency is  $9310 \pm 1$  mc/sec.

<sup>2</sup>Tunable type, mechanical tuning.



Condensed Mercury Temp. Range - °C	DESCRIPTION	TYPE NO.
-	High control ratio, temperature independent Thyatron with high circuit sensitivity. Inert gas filled. Negative control characteristics.	2D21
+40° to +80°	Radiation-cooled mercury-vapor thyatron-tetrode.	AX-105
+35° to +75°	Heavy-duty, mercury vapor thyatron for motor control and A.C. welder control.	AX-255
+35° to +75°	Heavy-duty, mercury vapor thyatron for motor control and A.C. welder control.	AX-260
+25° to +50°	Negative-control, H.V. mercury vapor tube. Especially suitable for relay uses where current flow is desired in absence of grid excitation.	678
+30° to +80°	Radiation-cooled mercury-vapor low voltage thyatron. Similar in structure to 866-A.	1701
-	Xenon filled thyatron with reliable operation over wide temperature range. For electronic control of D.C. motor speed, regulation of current and voltage, counting and sorting devices and electronic switching machines.	5544
-	Same as for type 5544 above.	5545
+40° to +75°	Indirectly heated, mercury-vapor triode with negative control characteristics.	5559
+40° to +80°	Four electrode, mercury vapor thyatron with negative control characteristics. Designed for applications where the available grid power is very small and where it is desired to actuate the grid from a high impedance source.	5560/FG95
-	Grid-control, Xenon thyatron. Tantalum anode provides good heat dissipation and gettering properties.	5685/C6J
-	Ruggedized version of 2D21. Particularly suitable for mobile and aircraft operation where mechanical strength and reliability are important. Designed for relay, servo control applications, etc.	5727
+25° to +55°	Radiation-cooled mercury-vapor thyatron. Oxide coated filament. Used for stepless control of voltage output and D-C motor control.	5869/AGR-9950
+30° to +45°	Same as above for type 5869/AGR-9950.	5870/AGR-9951
+25° to +55°	High voltage, grid controlled mercury vapor thyatron. For industrial RF generators and transmitting equipment.	6786

Starting Filament		DESCRIPTION
(Volts)	(Amps)	
6.3	0.6	<p>The Amperex family of magnetrons operate in the VUHF frequency bands ranging from 2700 to 9405 mc/sec. at peak power levels ranging from 0.5 kw to 800 kw. Designed for radar application but also suitable in applications requiring short pulses of R.F. power of high intensity. Detailed data sheets for each of the magnetrons shown are available on request.</p>
6.3	0.6	
6.3	1.0	
6.3	1.0	
6.3	1.0	
12.6	1.45	
12.6	3.62	
12.6	3.62	
12.6	3.62	
16.0	3.1	
16.0	3.1	
12.6	2.1	
16.0	3.1	
10.0	2.85	

<sup>3</sup>This tube also operates at pulse width = 14  $\mu$ sec., duty factor .001. Also pulse width = 5  $\mu$ sec., duty factor .0025. For more detailed information, write to Magnetron Engineering Section.



### UHF TRIODES AND SPECIAL PURPOSE TUBES - MAXIMUM RATINGS

TYPE NO.	Filament		Plate Dissipation Watts	Mu	Transcon- ductance (micromhos)	Plate		Power Output Characteristics	Max. Fre mc/sec	
	Volts	Amps				Volts	Amps			
6Q4/EC80	6.3	0.45	4	30	12,000	550	0.015	15 db gain at 300 mc (Bandwidth 4.5 mc)	500	
6R4/EC81	6.3	0.24	5	16	5,500	300	0.0277	Power Output 1.1 w at 750 mc	1200	
EA52	6.3	0.3	-	-	-	1000 V at <100 mc $1000 \times \frac{f_0}{f}$ at >100 mc	0.0003	-	1000	
EFP60	6.3	0.37	2	-	25,000	300	0.020	-	-	
DX144	6.3	0.65	10	43	19,000	Max. Plt. volts 300	Max. Avg. Cath. Current - Amp. 0.035	0.5 w at 4000 mc	4000	
DX145	6.3	0.65	10	43	19,000	300	0.070	1.8 w at 4000 mc	4000	
5847	6.3	0.3	3.0	-	12,500	180	0.35	-	-	
E91H/6687	6.3	0.27	<b>OPERATING CHARACTERISTICS</b> with either control at -10 volts and plate voltage at 150 volts, the plate current less than 0.2 mA. With both control grids at 0 volts, the plate current is nomin							

‡ fo = 100 mc.



### KLYSTRONS - FIXED FREQUENCY ‡

TYPE NO.	Frequency Range** (mc)	Power Output (watts)	Filament		TYPICAL				
			Voltage (volts-AC or DC)	Current (amps)	Frequency (mc)	Anode Voltage (volts-DC)	Grid Voltage	Beam Current (ma)	Power Output (watts)
DX-122	8500-10,500	5	9.0 - 11.0	0.8-1.2	9,300	2750	0	35	5
DX-123	8500-10,500	20-35	9.0 - 11.0	0.8-1.2	9,700	4350	0	71	33
DX-124	8500-10,500	100-200	9.0 - 11.0	0.8-1.2	10,000	8800	0	180	210

‡ More detailed information available on request.    \*\*These tubes are available at any fixed frequency in the range



### REFLEX KLYSTRONS

TYPE NO.	Max. Frequency Range (mc)	Frequency (mc)	Wavelength (cm)	TYPICAL			
				Power Output (mw)		Reflector Potential (Volts-D.C.)	Beam Voltage (Volts-D.C.)
				Ave.	Min.		
2K25	8500-9660	9370	3.21	32	20	-128 to -183	300

Capacitances in $\mu\mu\text{f}$			DESCRIPTION	TYPE NO.
G-P	Input	Output		
0.06	5.4	3.4	Radiation-cooled triode, button type base, indirectly heated cathode. For use as amplifier and mixer up to 500 mc. Ideally suited for UHF television, balloon sondes, measuring equipment, etc.	6Q4/EC80
1.5	1.7	0.5	Radiation-cooled triode, standard button base, indirectly heated cathode. Used as oscillator up to 1200 mc. High efficiency at high frequencies.	6R4/EC81
-	$\leq 0.5$	-	Disc-seal, vacuum diode for UHF voltmeters and monitoring devices. Anode pin connection adaptable for use as probe contact.	EA52
0.004	9.2	6	Secondary emission pentode for wide band amplifier application where stability and high ratio of transconductance to capacities is important. Used in high speed computer service and high quality TV applications.	EFP60
1.6	3.3	0.04	Disc-seal triode, indirectly heated. Features "L" type, high emission, long life cathode. For frequencies up to 4000 mc. General purpose, low level amplifier.	DX144
1.6	3.3	0.04	Same as DX144 except higher current rating	DX145
0.05	7.0	2.5	High-gain miniature pentode with high figure of merit. For broad-band applications. Plug-in replacement for Western Electric 404A.	5847
will be ly 5.75 mA.			Dual control heptode for use as gated amplifier in computer and "on-off" control circuits. Direct replacement for 5915A.	E91H/6687

OPERATION				DESCRIPTION	TYPE NO.
Electronic * Tuning (KC/sec./volt)	Temp. Coefficient (mc/sec./ $^{\circ}\text{C}$ )	Pulling Figure (mc/sec.)	Output Connector		
10	0.2	10	Waveguide RG-52U	The quietest, CW, high-power microwave generators available on the market. Microphonic effects are orders of magnitude less than in comparable tubes using flexible diaphragms as a part of the resonant circuit. Feature high power output, excellent frequency stability, very low microphonics and rugged construction. Require no mechanical adjustment, are simple to operate, easily modulated AM or FM and have minimum life expectancy of 1000 hours due to use of a new, impregnated cathode. No instruments required to align the tubes or to peak the operation. Tubes deliver rated output at rated frequency on application of potentials. Base connections are made directly on stem pins. Water-cooled (approx. 1/2 gal. per minute.) Size - approx. 7-1/2 x 4-5/8 x 2 inches.	DX-122
7.5	0.2	10	Waveguide RG-52U		DX-123
5.0	0.2	10	Waveguide RG-52U		DX-124

indicated; tolerance  $\pm 20$  mc. \*Tube may also be grid modulated, AM or FM.

OPERATION			Type of Cavity	Type of Tuning	Type of Output Coupling	Base	TYPE NO.
Electronic Tuning E.Ref./ $\frac{P_o}{2}$ (mc)	Max. Thermal Drift mc/ $^{\circ}\text{C}$	Fil. Current at 6.3V. (amps)					
55 Average	0 to -0.2	0.440	Self Contained	Mechanical Capacitive	Waveguide RG-52U	Modified Standard Octal	2K25



## VACUUM CAPACITORS (Fixed)

TYPE NO.	Capacity mmfd	Max. Peak KV	Max. RMS Current Amps	Freq. at Max. Current Megacycles	TYPE NO.
*VC25/20	25	20	60	27	*VC25/20
VC50/20	50	20	60	13	VC50/20
VC100/20	100	20	60	6.8	VC100/20

TYPE NO.	Capacity mmfd	Max. Peak KV	Max. RMS Current Amps	Freq. at Max. Current Megacycles	TYPE NO.
*VC25/32	25	32	60	16	*VC25/32
VC50/32	50	32	60	7.7	VC50/32
VC100/32	100	32	60	4	VC100/32
VC250/32	250	32	60	3.7	VC250/32

**NOTE:** All metal parts of Amperex fixed vacuum capacitors are OFHC (oxygen free high conductivity) copper.

The above condensers should not be confused with old style vacuum condensers of nickel construction which results in high R-F losses, high temperature co-efficient, seal puncture and low voltage breakdown.

Amperex vacuum capacitors employ large elements with glass to copper seals. This results in low temperature co-efficient, low R-F losses and low inductance.

Maximum current ratings of Amperex vacuum condensers are based on a maximum glass to metal seal temperature of 180°C. The internal condenser losses are largely ohmic, I<sup>2</sup>R, losses and decrease as the frequency decreases; therefore the maximum RMS current ratings (ie; VC100) increases from 40 amperes at 40 mc to 70 amperes at 5 mc.

Capacitors identified with \* (asterisk) have a capacity tolerance of ±1 mmfd. All other capacitors have a tolerance of ±2% of rated value.



## VOLTAGE REFERENCE AND REGULATOR TUBES

TYPE NO.	Operating Voltage (Approx.) Volts	Operating Voltage Limits Volts	Recommended Quiescent Current Milliamperes	Ignition Voltage <sup>②</sup> Volts	Internal Resistance Max. Ohms	Current Range Milliamperes	Regulation <sup>⑥</sup> Max. Volts	
0A2	150	144-164	17.5	185 max.	240	5-30	6	
0B2	108	106-111	17.5	133 max.	140	5-30	3.5	
90C1	90	86-94	20	125 max.	350	1-40	14	
6354/150B2	150	146-154 <sup>④</sup>	10	180 max.	500	5-15	5	
Voltage Reference Tubes	0E3/85A1 <sup>⑤</sup>	85	83-87	4	120 max.	-	1-8	3.15
	0G3/85A2 <sup>⑤</sup>	85	83-87	6	125 max.	450	1-10	4
	5651	87	82-92	2.5	115 min.	-	1.5-3.5	3

① Spread in operating voltage from tube to tube at recommended quiescent current

② Over tube life

③ Over full current range

④ Drift in operating voltage during 1000 hours: max. 1%

⑤ Drift in operating voltage during the first 300 hours of life: max. 0.3%

Short term drift in operating voltage (100 hours max.) after the first 300 hours of operation: max. 0.1%

Temperature coefficient of operating voltage = -2.7 mV/°C



**IGNITRONS High efficiency, rugged construction, for WELDER CONTROL SERVICE.**

TYPE NO.	R.M.S. Volts Range	Max. KVA Demand & Corresponding Average Current		Max. Average Current & Corresponding KVA Demand		Type Cooling
		K.V.A.	Amps	K.V.A.	Amps	
5554/679	2400	1200	75.0	600	113	Water
5555/653B	2400	2400	135.0	1105	207	Water
5822	220-600	424	20	188	70	Water

**High efficiency, rugged construction, for CONTINUOUS RECTIFIER SERVICE.**

TYPE NO.	Typical D.C. Output Voltage (v)	Max. Peak Inverse & Forward Voltage (v)	Max. Peak Anode Current (A)	Max. Continuous Average Anode Current (A)	Max. Average Current (A) 1 minute	Type Cooling
5554/679	300*	2100	900	100	200	Water
	600*	2100	600	75	150	
5555/653B	300*	2100	1800	200	400	Water
	600*	2100	1200	150	300	

\*Six-phase, double Y, single way circuits.



**IGNITRONS - THERMOSTATICALLY CONTROLLED**

TYPE NO.	R.M.S. Volts Range	Max. KVA Demand & Corresponding Average Current		Max. Average Current & Corresponding KVA Demand		Type Cooling
		K.V.A.	Amps	K.V.A.	Amps	
5551-A	250-600	600	30.2	200	56	Water
5552-A	250-600	1200	75.6	400	140	Water
5553-B	250-600	2400	192.0	800	355	Water



**IGNITRONS - WITH INSULATED COATING †**

TYPE NO.	Description	R.M.S. Volts Range	Max. KVA Demand & Corresponding Average Current		Max. Average Current & Corresponding KVA Demand		Type Cooling
			K.V.A.	Amps	K.V.A.	Amps	
5551A/P	Coated Thermostatically Controlled	250-600	600	30.2	200	56	Water
5552A/P	Coated Thermostatically Controlled	250-600	1200	75.6	400	140	Water
5553/P	Coated	250-600	2400	192.0	800	355	Water
5822/P	Coated	220-600	424	20	188	70	Water

† These ignitrons are partially insulated to reduce, as far as practicable, the possibility of accidental electric shock.

‡ These tubes are identical with the corresponding types 5551, 5552 and 5553 except that they are fitted with a "sensing" plate for adaption of a thermostat. They do not include the thermostat or thermostat mounting under these designations. If thermostatic control is required one of the following accessory groups should be ordered with each tube:

(A) AMPEREX "Water Saver" Thermostat Assembly, Cat. No. S-17024 (Consists of Thermostat No. C 4391-7-51, mounting clamp, terminal block and four sets of nuts, bolts and washers)

(B) AMPEREX "Overload Protection" Thermostat Assembly, Cat. No. S-17025. (Consists of Thermostat No. C 4391-7-52, mounting clamp, terminal block and four sets of nuts, bolts and washers)



PERMANENT SENSITIVITY, RADIATION COUNTER TUBES □

TYPE NO.	Filling	Operating Voltage	Plateau	Slope Plateau	Dead Time (Approx.)	Background (Shielded 2" Lead)
75N-7 <sup>†</sup>	Neon + quenching admixture	700 D.C. <sup>†</sup>	in excess of 125 volts	15% per 100 volts max.	100 micro-seconds	50 counts per minute max.
75NB3-7 <sup>†</sup>	Neon + quenching admixture	700 D.C. <sup>†</sup>	in excess of 125 volts	15% per 100 volts max.	100 micro-seconds	50 counts per minute max.
90NB	Neon + quenching admixture	900 D.C.	in excess of 200 volts	10% per 100 volts max.	100 micro-seconds	50 counts per minute max.
100C	Argon + quenching admixture	1200 D.C.	in excess of 300 volts	5% to 10% per 100 volts	200 micro-seconds	50 counts per minute max.
100CB	Argon + quenching admixture	1200 D.C.	in excess of 300 volts	5% to 10% per 100 volts	200 micro-seconds	50 counts per minute max.
100N	Neon + quenching admixture	700 D.C.	in excess of 200 volts	5% to 10% per 100 volts	200 micro-seconds	50 counts per minute max.
100NB	Neon + quenching admixture	700 D.C.	in excess of 200 volts	5% to 10% per 100 volts	200 micro-seconds	50 counts per minute max.
120C	Argon + quenching admixture	1200 D.C.	in excess of 300 volts	5% to 10% per 100 volts	300 micro-seconds	100 counts per minute max.
120N	Neon + quenching admixture	700 D.C.	in excess of 200 volts	5% to 10% per 100 volts	300 micro-seconds	100 counts per minute max.
120NB	Neon + quenching admixture	700 D.C.	in excess of 200 volts	5% to 10% per 100 volts	300 micro-seconds	100 counts per minute max.
150N	Neon + quenching admixture	700 D.C.	in excess of 180 volts	10% per 100 volts max.	150 micro-seconds	75 counts per minute max.
150NB	Neon + quenching admixture	700 D.C.	in excess of 180 volts	10% per 100 volts max.	150 micro-seconds	75 counts per minute max.
153C	Argon + quenching admixture	1500 D.C.	in excess of 400 volts	3% to 8% per 100 volts	150 micro-seconds	60 counts per minute max.
200C	Argon + quenching admixture	1200 D.C.	in excess of 300 volts	5% to 10% per 100 volts	200 micro-seconds	50 counts per minute max.
200CB	Argon + quenching admixture	1200 D.C.	in excess of 300 volts	5% to 10% per 100 volts	200 micro-seconds	50 counts per minute max.
200N	Neon + quenching admixture	700 D.C.	in excess of 200 volts	5% to 10% per 100 volts	200 micro-seconds	50 counts per minute max.
200NB	Neon + quenching admixture	700 D.C.	in excess of 200 volts	5% to 10% per 100 volts	200 micro-seconds	50 counts per minute max.
230N	Neon + quenching admixture	850 D.C.	in excess of 150 volts	Less than 15% per 100 volts	100 micro-seconds	15 counts per minute max.
240C	Neon + quenching admixture	1200 D.C.	in excess of 200 volts	Less than 10% per 100 volts	100 micro-seconds	50 counts per minute max.
240N	Neon + quenching admixture	850-900 D.C.	in excess of 150 volts	Less than 15% per 100 volts	100 micro-seconds	50 counts per minute max.
912NB*	Neon + quenching admixture	900 D.C.	in excess of 200 volts	10% per 100 volts max.	100 micro-seconds	75 counts per minute max.

NOTE: All cathodes are stainless steel.  
 Life expectancy unlimited by use.  
 Operating temperature range, -55°C to +75°C.

Average Mica Window or Wall Thickness	Effective Dia. of Mica Window	Effective Cathode Dimensions (Inches)	Max. Overall Tube Dimensions (Inches)	Application	TYPE NO.
150 mg/cm <sup>2</sup>	—	2-11/16 long x 5/8 O.D. x .009" Wall	5/8 x 4-3/8	Gamma	75N-7 †
150 mg/cm <sup>2</sup>	—	2-11/16 long x 5/8 O.D. x .009" Wall	5/8 x 4-5/16 (3 Pin Base)	Gamma	75NB3-7 †
30-40 mg/cm <sup>2</sup>	—	3 long x 5/8 O.D.	5/8 O.D. x 5-5/8 (3 Pin Base)	Beta & Gamma	90NB
.0005 in. = 3.5 mg/cm <sup>2</sup> = 12.70 microns	1-3/32"	1-1/2 lg. x 1-3/16 O.D. x 3/32 Wall	1-1/2 x 3-3/4	Beta & X-Ray	100C
.0005 in. = 3.5 mg/cm <sup>2</sup> = 12.70 microns	1-3/32"	1-1/2 lg. x 1-3/16 O.D. x 3/32 Wall	1-3/8 x 4-11/32 (4 Pin Base)	Beta & X-Ray	100CB
.0005 in. = 3.5 mg/cm <sup>2</sup> = 12.70 microns	1-3/32"	1-1/2 lg. x 1-3/16 O.D. x 3/32 Wall	1-1/2 x 3-3/4	Beta	100N
.0005 in. = 3.5 mg/cm <sup>2</sup> = 12.70 microns	1-3/32"	1-1/2 lg. x 1-3/16 O.D. x 3/32 Wall	1-3/8 x 4-11/32 (4 Pin Base)	Beta	100NB
.0008 in. = 5.6 mg/cm <sup>2</sup> = 20.32 microns	1-29/32"	2-11/16 lg. x 2 O.D. x 5/64 Wall	2-3/8 x 5-1/8	Beta & X-Ray	120C
.0008 in. = 5.6 mg/cm <sup>2</sup> = 20.32 microns	1-29/32"	2-11/16 lg. x 2 O.D. x 5/64 Wall	2-3/8 x 5-1/8	Beta	120N
.0008 in. = 5.6 mg/cm <sup>2</sup> = 20.32 microns	1-29/32"	2-11/16 lg. x 2 O.D. x 5/64 Wall	2-5/16 x 5-3/4 (4 Pin Base)	Beta	120NB
.0005 in. = 3.5 mg/cm <sup>2</sup> = 12.70 microns	25/32"	4 lg. x 7/8 O.D. x 3/64 Wall	1 x 6-5/8 (4 Pin Base)	Beta & Gamma	150N
.0005 in. = 3.5 mg/cm <sup>2</sup> = 12.70 microns	25/32"	4 lg. x 7/8 O.D. x 3/64 Wall	1-5/32 x 7-1/8	Beta & Gamma	150NB
.0005 in. = 3.5 mg/cm <sup>2</sup> = 12.70 microns	25/32"	4-3/8 lg. x 7/8 O.D.	1 O.D. x 6 lg.	X-Ray	153C
.0002 in. = 1.4 mg/cm <sup>2</sup> = 5.08 microns	1-3/32"	1-1/2 lg. x 1-3/16 O.D. x 3/32 Wall	1-1/2 x 3-3/4	Alpha, Beta, Gamma & X-Ray	200C
.0002 in. = 1.4 mg/cm <sup>2</sup> = 5.08 microns	1-3/32"	1-1/2 lg. x 1-3/16 O.D. x 3/32 Wall	1-3/8 x 4-11/32 (4 Pin Base)	Alpha, Beta, Gamma & X-Ray	200CB
.0002 in. = 1.4 mg/cm <sup>2</sup> = 5.08 microns	1-3/32"	1-1/2 lg. x 1-3/16 O.D. x 3/32 Wall	1-1/2 x 3-3/4	Alpha & Beta	200N
.0002 in. = 1.4 mg/cm <sup>2</sup> = 5.08 microns	1-3/32"	1-1/2 lg. x 1-3/16 O.D. x 3/32 Wall	1-3/8 x 4-11/32 (4 Pin Base)	Alpha & Beta	200NB
.0002 in. = 1.4 mg/cm <sup>2</sup> = 5.08 microns	13/32"	1-1/4 lg. x 5/8 O.D. x .010" Wall	5/8 x 3-1/4 (3 Pin Base)	Alpha & Beta	230N
.0002 in. = 1.4 mg/cm <sup>2</sup> = 5.08 microns	13/32"	4 lg. x 5/8 O.D. x .010" Wall	5/8 x 5-7/8 (3 Pin Base)	Alpha, Beta & Gamma	240C
.0002 in. = 1.4 mg/cm <sup>2</sup> = 5.08 microns	13/32"	4 lg. x 5/8 O.D. x .010" Wall	5/8 x 5-7/8 (3 Pin Base)	X-Ray	240N
30-40 mg/cm <sup>2</sup>	—	7 lg. x 5/8 O.D.	5/8 O.D. x 11-25/32 (4 Pin Base)	Beta & Gamma	912NB*

† Also available in 600 volt operating voltage. Specify Type 75N-6 or 75NB3-6. For 900 volt operation, specify Type 75N-9 or 75NB3-9.

Detailed catalogue available upon request.

\* Also available with 3 Pin Base, specify Type 912NB-3. Overall tube length = 11-3/8".



GERMANIUM DIODES - ALL GLASS, HERMETICALLY SEALED (Characteristics at 25°C)

CONSTRUCTION (ALL GLASS)			DESCRIPTION	MAX. CONTINUOUS OPERATING INVERSE VOLTAGE (VOLTS)	MAXIMUM PEAK INVERSE VOLTAGE (VOLTS)	MAXIMUM PEAK RECTIFIED CURRENT (MA)	MAXIMUM AVERAGE RECTIFIED CURRENT (MA)	MIN. FORWARD CURRENT (MA) AT				
CLIP-IN	SOLDER-IN	SUB-MINIATURE						+1 VOLT	+3 VOLTS	-1.5 VOLTS	- VOLT	
IN34A	IN34		General Purpose	60	75	150	50	5				
IN38A	IN38		High Peak Voltage	100	120	150	50	4			5 at -3V.	
	G48 <sup>1</sup>		General Purpose	70	85	150	50	4				
IN54A	IN54		High Back Resistance	50	75	150	50	5				
IN58A	IN58		High Peak Voltage	100	120	150	50	4				
C60 <sup>1</sup>	IN60		Video Detector	25	30	150	50	1.55 volts output in circuit, 150 K ohms t				
IN63	G63 <sup>1</sup>		High Back Resistance	100	125	150	50	4				
C67 <sup>1</sup>	G67 <sup>1</sup>	IN67A	High Back Resistance	80	100	90	30	4				
C68 <sup>1</sup>	G68 <sup>1</sup>	IN68A	High Peak Voltage	100	130	90	30	3				
	IN87*	IN87A*	Video Detector	25	30	150	50	0.1 at 0.25V.			25	
	IN88		D.C. Restorer	85	110	150	50	2.5				
C89 <sup>1</sup>	G89 <sup>1</sup>	IN89	General Purpose	80	100	90	30	3.5				
		IN90	General Purpose	60	75	90	30	5				
C95 <sup>1</sup>		IN95	General Purpose	60	75	90	30	10				
C99 <sup>1</sup>		IN99	High Back Resistance	80	100	90	30	10				
C116 <sup>1</sup>		IN116	High Back Resistance	60	75	90	30	5				
C117 <sup>1</sup>		IN117	High Back Resistance	60	75	90	30	10				
IN119 <sup>5</sup>	IN480 <sup>5</sup> *		Computer	60	90	150	35	5			400 K ohms at 55°C, -20	
IN120 <sup>5</sup>	IN490 <sup>5</sup> *		Computer	60	90	150	35	5			200 K ohms at 55°C, -20	
		IN126	General Purpose	60	75	90	30	5				
		IN128	General Purpose	40	50	90	30	3				
		IN198	General Purpose	80	100	90	30	5				
IN477 <sup>2</sup> *	IN476 <sup>2</sup> *		High Peak Voltage	90	115	150	50	3		25		
IN479 <sup>2</sup> *	IN478 <sup>2</sup> *		High Peak Voltage	90	115	150	50	5		30		5
	IN541*		A.M. Detector	30	45	100	10	1.5	18		2.8	
	IN542*		Ratio Detector	The IN542 is a matched pair of IN541 diodes								
	IN616 <sup>2</sup> *		Video Detector	30	40	150	30	8			18	
		IN617 <sup>2</sup> *	High Peak Voltage	90	115	150	50	3		25		
		IN618 <sup>2</sup> *	High Peak Voltage	90	115	150	50	5		35		4.5
SINGLE ENDED			High-Current Computer Switching Gold Bonded	100	100	350	115	200				-5
0A5												

\*Detailed data sheets available upon request

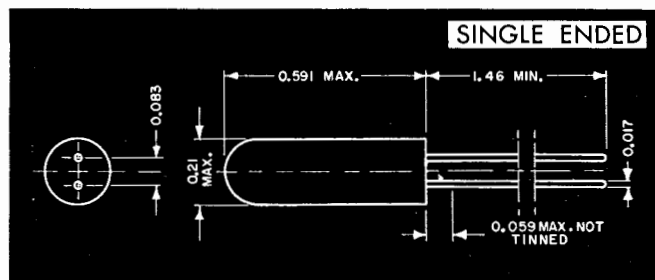
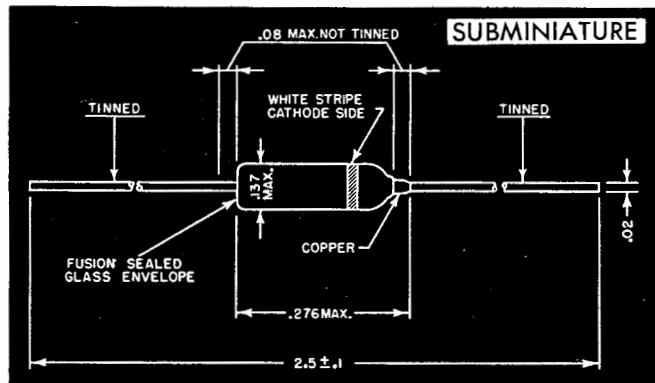
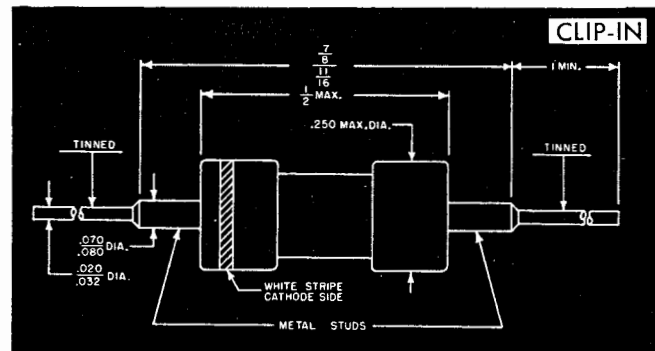
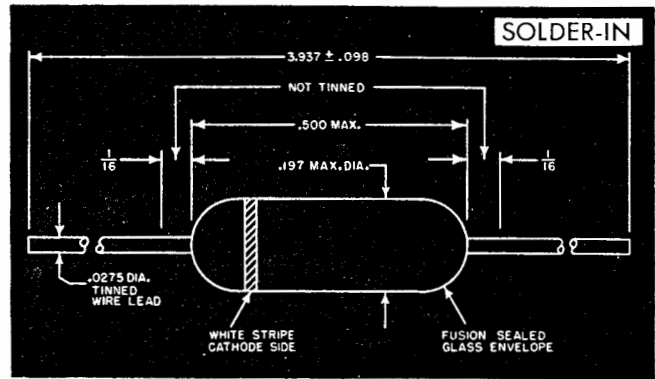
Notes:

1. Non-RETMA numbers. Diode types meet electrical specifications as shown.
2. Both minimum and maximum limits are listed on detailed specifications. Characteristics are also specified at 60°C.
3. These values tested at 75°C.
4. Shunt capacitance for all types = 1.0 mmf maximum.

POINT CONTACT DIODES NOT SHOWN ON THIS CHART ARE ALSO AVAILABLE ON QUANTITY REQUIREMENTS



TS	MAXIMUM INVERSE CURRENT (MICROAMPS) AT				MAXIMUM SURGE CURRENT (MA) MAXIMUM 1 SECOND
	-10 VOLTS	-50 VOLTS	-75 VOLTS	-100 VOLTS	
	30	500			500
				500	500
	50	833			400
	7	100			500
	50			600	500
test cir- -10 volts					500
		50			400
		50			250
				625	350
60% rect. eff. damping resistance = 3000 ohms in specified test circuit.					400
		100			400
		100			250
		500			250
		500			300
		50			300
		100			300
		100			300
to -50 volts					500
to -50 volts					500
	50	850			300
	10				300
	75 <sup>a</sup>	250 <sup>a</sup>			300
	11	80	180	275	500
-3v.	7	65	155	250	500
	18	150at-30V.	350at-45V.		200
	150at-30V., 350at-45V.				200
	11	87	180	275	500
	7	50	115	250	500
	-6	-9		30	500



5. Reverse recovery time for these diodes is specified and defined as the time required for the diode to recover to a given reverse current when the operating voltage necessary to give 30 mA forward current is rapidly switched to -35 volts.

	Recovery Time (μsec.)	Reverse Current (μAmp)
IN119 & IN480	0.5	700
	3.5	87.5
IN120 & IN490	0.5	700
	3.5	175

For information on AMPEREX gold bonded and germanium power diodes, write to the factory.



P-N-P ALLOY JUNCTION GERMANIUM TRANSISTORS

TYPE NUMBER	APPLICATION	ABSOLUTE MAXIMUM RATINGS							
		V <sub>CE</sub> (volts)	V <sub>CB</sub> (volts)	V <sub>EB</sub> (volts)	I <sub>C</sub> (mA)	I <sub>E</sub> (mA)	I <sub>B</sub> (mA)	T <sub>j</sub> (°C)	K (°C/mW)
2N115**	Audio Gen. Purpose High Power	-32	-32	-10	-3000	3300	-500	75 <sup>1</sup>	.0018
2N279*	Audio Gen. Purpose Low Power	-30	-30	-	-50	55	-	75 <sup>1</sup>	0.4
2N280*	Audio Gen. Purpose Low Power	-30	-30	-	-50	55	-	75 <sup>1</sup>	0.4
2N281*	Audio Gen. Purpose Medium Power	-32	-32	-10	-250	250	-125	75 <sup>1</sup>	0.3
2N282*	Audio Gen. Purpose Medium Power	Matched P							
2N283*	Tight Tolerance Audio Gen. Purpose Low Power	-30	-32	-30	-10	-10	-	75 <sup>1</sup>	0.4
2N284*	Switching and D.C. Converter Circuits	-32	-32	-10	-250	250	-125	75 <sup>1</sup>	0.4 0.3 <sup>4</sup>
2N284A*	Switching and D.C. Converter Circuits	-60	-60	-10	-250	250	-125	75 <sup>1</sup>	0.4 0.3 <sup>4</sup>
0C44*	R.F. Converters, Mixer-Oscillator Circuits	-15	-15	-12	-10	10	-	75 <sup>1</sup>	0.5
0C45*	I.F. Amplifier Circuits	-15	-15	-12	-10	10	-	75 <sup>1</sup>	0.5
0C65**	Subminiature Audio Gen. Purpose Low Power	-10	-10	-10	-10	10	-2	75 <sup>1</sup>	0.65
0C66**	Subminiature Audio Gen. Purpose Low Power	-10	-10	-10	-10	10	-2	75 <sup>1</sup>	0.65
2N109/ 2N217 EQUIV.*	Audio Gen. Purpose Medium Power	-32	-32	-10	-70	70	-	75 <sup>1</sup>	0.4

<sup>1</sup> Intermittent operation at a junction temperature of 90°C is allowed providing adequate stabilization is assured  
<sup>2</sup> Minimum value. <sup>3</sup> Maximum value. <sup>4</sup> With cooling clamp attached to appropriate heat sink.



INDICATOR TUBES

TYPE NO.	FILAMENT		SUPPLY AND SCREEN VOLTS	SCREEN CURRENT AT START OF CONTROL (mA)	ANODE SERIES RESISTANCE (Megohms)	GRID BIAS FOR END OF CONTROL RANGE (Volts)	
	Volts	Amps					
EM34	6.3	0.2	250	2.0	1.0	Section 1 = -5 Section 2 = -16	
DM70/IM3	1.4	0.25	85	0.17	-	-10	
EM80	6.3	0.3	250	2.0	0.5	-16	
EM81	6.3	0.3	250	2.0	0.5	-16	
EM84	6.3	0.27	250	1.1	0.47	-22	
EIT/6370*	6.3	0.3	Special "Beam Deflecting" miniature cathode ray tube. D rate 100,000 cps. For nuclear scalars, computers, indus				
6977	1.0 A.C. or D.C.	0.30	ANODE VOLTAGE	MAX. LIGHT OUTPUT	ZERO LIGHT OUTPUT V <sub>f</sub> = 1.0 V.A.C.		
			+50V.D.C.	V <sub>g</sub> = 0 I <sub>a</sub> = 0.6 mA	One side grounded	Center tap grounded	Neg. terminal gro
					V <sub>g</sub> = 3.5 V.	V <sub>g</sub> = 3.0 V.	V <sub>g</sub> = 2.5 V.

\* Write for detailed application bulletin.

ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C)

Common Emitter						Common Base					
I <sub>CEO</sub> (μA)	V <sub>CE</sub> (volts)	I <sub>C</sub> (mA)	h <sub>FE</sub> (β)	f <sub>ae</sub> (KC/s)	NF (db)	I <sub>EBO</sub> (μA)	I <sub>CB0</sub> (μA)	V <sub>CB</sub> (volts)	I <sub>C</sub> (mA)	h <sub>fb</sub> (α)	f <sub>ab</sub> (KC/s)
-600	-14	-30	40	-	-	-10	-20	-7	-300	-	200
-110	-2	-0.5	30	15	10	-	-5	-2	-0.5	0.968	300
-150	-2	-3	47	-10	8	-	-4.5	-2	-3	0.979	300
-145	-5.4	-10	70	8 <sup>2</sup>	15 <sup>3</sup>	-4.5	-4.5	-6	-10	-	350
of 2N281 Transistors ( $\frac{h_{FE1}}{h_{FE2}} \leq 1.3$ )											
-	-10	-0.5	40	-	10	-3.5	-3.5	-10	-0.5	-	500
-200	-0.7	-125	25 <sup>2</sup>	-	15 <sup>3</sup>	-4.5	-4.5	-6	-10	-	350 <sup>2</sup>
-200	-0.7	-125	25 <sup>2</sup>	-	15 <sup>3</sup>	-4.5	-4.5	-6	-10	-	350 <sup>2</sup>
-25	-6	-1	100	-	-	-0.4	-0.5	-6	-1	-	15,000
-12	-6	-1	40	-	-	-0.4	-0.5	-6	-1	-	6,000
-110	-2	-0.5	30	15	9	-	-5	-2	-0.5	0.968	450
-150	-2	-3	47	10	9	-	-5	-2	-3	0.979	470
-125	-5.4	-10	70	8 <sup>2</sup>	15 <sup>3</sup>	-4.5	-4.5	-6	-10	-	350 <sup>2</sup>

\* Hermetically, glass-fusion sealed, using vacuum tube techniques.  
 \*\* Hermetically sealed, metal case.

NOTE: All values are average unless otherwise stated.

DESCRIPTION	TYPE NO.
Tuning indicator featuring double sensitivity, clear indication even with weak signals	EM34
Tuning indicator especially designed for battery operated sets featuring low filament consumption (25mA), subminiature size and "on-off" indication. Ideal for transistorized computers	DM70/IM3
9 pin miniature tuning indicator featuring small size, ease of installation and high sensitivity for weak signals	EM80
Same as EM80 except for different fluorescent pattern. Suitable for radios, tape recorders and measuring equipment. Pattern makes it useful also as a level indicator.	EM81
9 pin miniature tuning indicator for use in broadcast receivers and tape recorders. The deflection electrode is connected separately to a pin at the base. Converging dual fluorescent bar pattern.	EM84
counter with luminescent spot at numbers on face 0 to 9. Max. counting counters, control and memory applications.	EIT/6370*
Subminiature vacuum triode with fluorescent anode. Designed for electronic computer and business machine applications to replace neon lamps. Particularly suited to use in transistorized circuits. Designed for 20,000 hour life.	6977



TUBE ACCESSORIES

TYPE NO.	Water Jacket	Gasket	Stand Off Insulator	External Grid Connector	External Filament Lead or Connector	External Plate Connector	Socket Assembly
EIT	-	-	-	-	-	-	S-13264
4X150A	-	-	-	-	-	-	S-19931*
4X250B	-	-	-	-	-	-	S-19931*
EF60	-	-	-	-	-	-	S-13211
DM70/IM3	-	-	-	-	-	-	S-19883
502	DW-2200	1-55	SI-5002	-	-	-	-
508	DW-2500	1-51	SI-5003	1-66	-	-	-
833-A	-	-	-	1-65	-	1-65	1-64
880	S-13240	-	-	-	-	-	-
889-A	DW-2100	1-52	SI-5001	S-13483	S-13484	-	-
889-AR	-	-	-	S-13483	S-13484	-	-
891	DW-1580	1-53	-	1-66	1-62 & 1-63	-	-
891-R	-	-	-	1-66	1-62 & 1-63	-	-
892	DW-1580	1-53	-	1-66	1-62 & 1-63	-	-
892-R	-	-	-	1-66	1-62 & 1-63	-	-
ZB-3200	-	-	SI-5005	1-66	-	-	-
5604	-	-	-	S-13483	S-13484	-	-
5619 <sup>e</sup>	S-17427	-	-	S-13483	S-13484	-	-
5658	S-13240	-	-	-	-	-	-
5666 <sup>e</sup>	S-13241	-	-	S-13483	S-13484	-	-
5667	-	-	-	S-13483	S-13484	-	-
5771	S-13240	-	-	S-13483	S-13484	-	-
5868/AX-9902	-	-	-	-	-	S-3702	S-3703
5894	-	-	-	-	-	S-3712	-
5923/AX-9904	S-3737	-	-	S-3706	S-3707	-	-
5924/AX-9904R <sup>1</sup>	-	-	-	S-3706	S-3707	-	-
5924A <sup>1</sup>	-	-	-	S-3706	S-3707	-	-
6075/AX-9907	S-3737	-	-	S-3706	S-3707	-	-
6076/AX-9907R <sup>3</sup>	-	-	-	S-3706	S-3707	-	-
6077/AX-9906 <sup>5</sup>	S-3738	-	-	-	S-3739	-	-
6078/AX-9906R <sup>2</sup>	-	-	-	-	S-3739	-	-
6079/AX-9908	-	-	-	-	-	S-3702	S-3703
6155/4-125A	-	-	-	-	-	S-3702	-
6156/4-250A	-	-	-	-	-	S-3702	-
6252/AX-9910	-	-	-	-	-	S-3712	-
6333	DW-1580	-	-	Y-13326 <sup>4</sup>	S-13484	-	-
6445	-	-	-	Y-13326 <sup>4</sup>	S-13484	-	-
6446 <sup>e</sup>	S-15096	-	-	Y-13326 <sup>4</sup>	S-13484	-	-
6447	-	-	-	Y-13326 <sup>4</sup>	S-13484	-	-
6617	S-15936	-	-	S-15937	S-15938	-	-
6618 <sup>e</sup>	-	-	-	S-15937	S-15938	-	-
6756	S-15096	-	-	Y-13326 <sup>4</sup>	-	-	-
6757	-	-	-	Y-13326 <sup>4</sup>	-	-	-
6758	S-3737	-	-	S-17288	-	-	-
6759 <sup>7</sup>	-	-	-	S-17288	-	-	-
6800	S-17427	-	-	S-13483	S-13484	-	-
6960	S-3737	-	-	S-17288 <sup>10</sup> S-3706 <sup>11</sup>	S-3707 S-21000 <sup>9</sup>	-	-
6961 <sup>1</sup>	-	-	-	S-17288 <sup>10</sup> S-3706 <sup>11</sup>	S-3707 S-21000 <sup>9</sup>	-	-
6979	-	-	-	-	-	-	S-19931*
7092	-	-	-	-	-	S-3702	S-21421

<sup>1</sup> Airflow Chamber S-3705

<sup>2</sup> Airflow Chamber S-3740

<sup>3</sup> Airflow Chamber S-11882

<sup>4</sup> Supplied with each tube without charge

<sup>5</sup> Key for water jacket, S-13209

<sup>e</sup> Water Jacket mounting clamp S-17463  
Water Jacket mounting plate S-17464

<sup>7</sup> Airflow Chamber S-3705

<sup>9</sup> Airflow Chamber S-19489

<sup>9</sup> Filament center pin connector

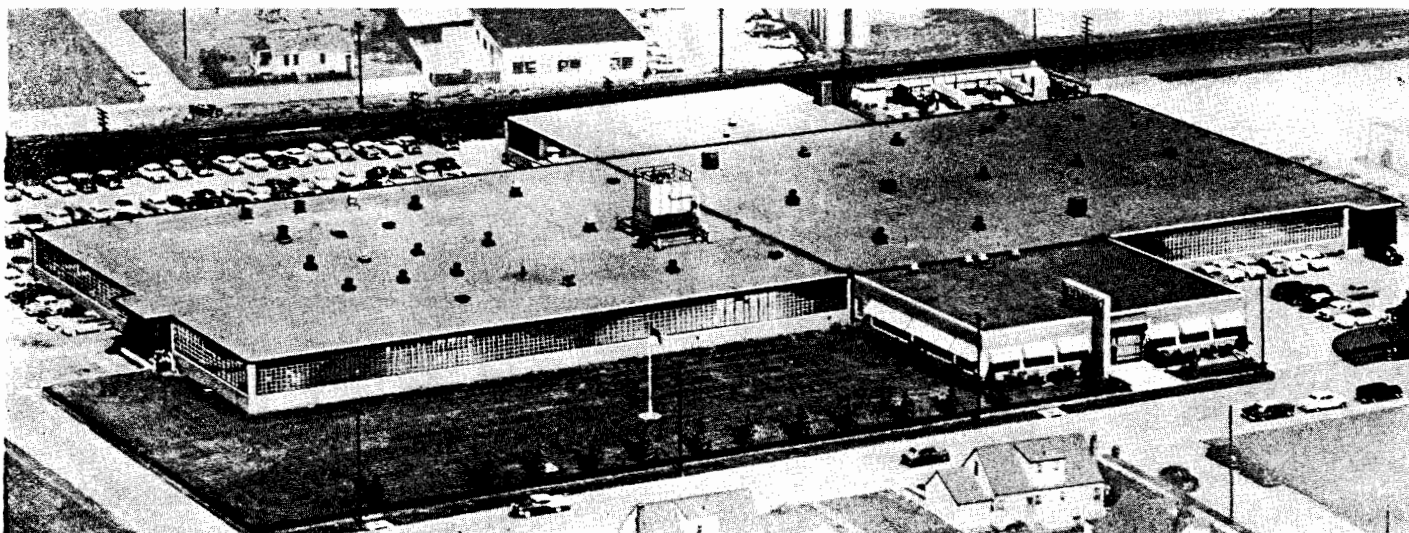
<sup>10</sup> For use up to 30 Mc.

<sup>11</sup> For use above 30 Mc.

\* Includes screen by-pass condenser and air system chimney.



## THE AMPEREX PLANT AT HICKSVILLE, L. I., NEW YORK



In line with the growth, complexity and new applications of electronics, The AMPEREX ELECTRONIC CORP. research laboratories are continuously improving existing tubes and developing new types.

Facilities for research and study of glass technology, metallurgy, chemistry, physics of gases, radiation detection, high voltage phenomena, etc. are utilized for the purpose of incorporating these tube improvements.

A modern, well-equipped Application Engineering Department is also available for the assistance of our customers who are concerned with circuit and application problems relating to tubes.

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