

RAYTHEON

Radio Tube Data and Substitution Chart



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RADIO TUBE DATA AND SUBSTITUTION CHART



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Raytheon's recognized leadership in the electronic field is based on precepts of painstaking research and manufacturing proficiency. Raytheon has long dedicated manifold and skilled talents to the advancement of the science of electronics. For more than two decades Raytheon has been the foremost specialist in the manufacture of radio and electronic tubes. Numerous developments and improved techniques have continually been attained and adopted. In the large Raytheon plants and laboratories of today many of the latest and far-reaching electronic refinements have been developed — and to the further pursuit of technical achievement devoted research is constantly maintained.

Raytheon radio-electronic tubes are of the highest quality. In manufacture the most constant care is given to their every precision detail by expert tube technicians. Before each tube receives the Raytheon brand of approval it must completely satisfy the most rugged and exacting Raytheon specifications of tube testing. Raytheon tubes have a *plus-extra* performance quality — infixed through Raytheon craftsmanship.

RAYTHEON tubes fulfill the demands of the most exacting electronic applications. RAYTHEON tubes fulfill the demands of the most discriminating in radio performance. For complete satisfaction install RAYTHEONS.



INTRODUCTION

Raytheon through the years has continued to furnish the results of its abundant study to those rendering service and research to the radio trade.

In publishing this new edition of Raytheon Tube Data a very comprehensive summary of the vital information on American Receiving Tubes has been made. A considerable amount of information not previously available has now been organized and included. Every currently used tube bearing RMA type designation appears with its essential features and operating characteristics. A vast quantity of new tube types has been incorporated for the first time, along with many new special purpose types. All these will be found arranged in proper RMA sequence. For each active tube type listed complete information on the following is offered, effectively described and diagrammed:

Electrical Characteristics	Basing Connections
Style and Size of Base	Style and Size of Bulb
Outline Dimension of Complete Tube	

The technical data on Raytheon Flat Hearing Aid Tubes also have been introduced into this manual. These tubes are the acknowledged choice of Hearing Aid manufacturers and are used extensively in their products.

During the war period shortages in many of the popular types of receiving tubes have developed. A most complete substitution chart therefore comprises a part of this booklet. In this chart an attempt has been made to work out every conceivable tube type substitution. Some of these substitutions have been previously published, but never in so complete a form as here. This substitution chart should prove indispensable to those concerned in the servicing and maintenance of radio and electronic equipment.

The Raytheon Radio Receiving Tube Division publishes this newest edition of Radio Tube Data, now all inclusive, confident that it will prove of even greater usefulness and value than its predecessors. This is only one of many Service and Sales Helps available to the Trade. For complete information, consult your nearest Raytheon Distributor.

BEFORE USING THE TUBE DATA CHART

Please read the following notes carefully. They explain the symbols and abbreviations which are used.

The following system for describing the type of base and for referring to the base connection diagram is used in the column headed "Basing Data":

The symbol at the left of the hyphen refers to the base connection diagram.

The symbol at the right of the hyphen indicates the type of base and the number of contact pins in accordance with the following:

First Letter — M=Miniature Base
 O=Octal Base
 L=Locking Base
 S=Standard Base

Second Letter — B=Button Base (a shell is not incorporated)
 M=Medium Shell (bakelite)
 S=Small Shell (bakelite)
 W=Wafer Base (metal tube or bantam tube with metal shell)
 GT=Intermediate (bantam) Shell (bakelite)

Numeral indicates the number of pins in base.

"B" after numeral indicates bayonet pin in base.

Examples:

4C-SS4B Diagram 4C, standard small shell with bayonet, 4 pin.
 6G-SM6 Diagram 6G, standard medium shell, 6 pin.
 7Q-OW7 Diagram 7Q, octal wafer base, 7 pin.

The column headed "Max Size View" shows the number of the tube outline drawing which gives dimensions. Although the letter in the symbol is arbitrarily chosen, the number refers to the bulb size. Thus 14C means that the tube has a size 14 bulb and that its outline drawing and dimensions are given in the "C" drawing for size 14 bulbs. Since the unit of bulb size is $\frac{1}{8}$ ", a size 14 bulb is nominally $1\frac{3}{4}$ " at its largest diameter.

* Indicates that capacitance is measured with standard tube shield connected to cathode. In the case of a metal type, the metal shell is connected to cathode.

"C" after figure in "Mutual Conductance" column indicates that value is for conversion transconductance. (Used for converter types only.)

"S" after figure in "Plate Volts" column indicates that value shown is anode supply voltage and that it is applied through the indicated value of G_2 resistor. (Also used only for converter types.)

Capacities shown for converter types are for the mixer section only.

Values of Plate Ma., Screen Ma., and Output Watts for push-pull operation are for two tubes, and value of load resistance is from plate to plate.

Values of Grid Volts for filament type tubes are measured from the negative filament terminal.

Values of Cutoff Bias are approximate.

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TYPE	DESIGN	CATHODE		BASING DATA	MAX SIZE VIEW	CAPACITIES		USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE		
		TYPE	HTR OR FIL VOLTS			G-P mmfd	IN mmfd														OUT mmfd	
00A	TRIODE	FIL	5.0	.25	4D-SM4B	14B	8.5	3.2	2.0	DETECTOR	45	0	1.5	20	30000	666				00A		
01A	TRIODE	FIL	5.0	.25	4D-SM4B	14D	8.1	3.1	2.2	AMP CL A	135	-9	3	8	10000	800				01A		
0A3/VR75	DIODE	COLD			4AJ-OS8	12E	GAS FILLED		VOLT REG	75v	OUTPUT THROUGH A CURRENT RANGE 5-30ma										0A3/VR75	
0A4C	GAS TRI	COLD			4V-OS6	12E			RELAY TUBE	MAX PEAK CATHODE CURRENT 100ma, MAX DC CATHODE CURRENT 25ma, STARTER ANODE DROP APPROX 60v, ANODE DROP APPROX 70v											0A4C	
0B3/VR90	DIODE	COLD			4AJ-OS8	12E	GAS FILLED		VOLT REG	OUTPUT THROUGH A CURRENT RANGE 5-30ma											0B3/VR90	
0C3/VR105	DIODE	COLD			4AJ-OS8	12E	GAS FILLED		VOLT REG	OUTPUT THROUGH A CURRENT RANGE 5-30ma											0C3/VR105	
0D3/VR150	DIODE	COLD			4AJ-OS8	12E	GAS FILLED		VOLT REG	OUTPUT THROUGH A CURRENT RANGE 5-30ma											0D3/VR150	
0Z4	TWIN DIODE	COLD			4R-OW6	8D	GAS FILLED		FULL WAVE RECTIFIER	300 RMS MAX 75 ma MAX 30 ma MIN TUBE DROP 24v											0Z4	
0Z4G	TWIN DIODE	COLD			4R-OT5	7A	GAS FILLED		FULL WAVE RECTIFIER	300 RMS MAX 75 ma MAX 30 ma MIN TUBE DROP 24v											0Z4G	
0Z4A/1003	TWIN DIODE	COLD			4R-OW6	8D	GAS FILLED		FULL WAVE RECTIFIER	265 RMS MAX 85ma MAX -30ma MIN. TUBE DROP 24v CONDITION I = SINGLE TUBE OPERATION (Applies to above) 365 RMS MAX 85ma MAX -30ma MIN. TUBE DROP 24v CONDITION II = RESISTANCE PARALLEL OPERATION (Applies to above)											0Z4A/1003	
1A3	DIODE	HTR	1.4	0.15	5AP-MB7	5B			DETECTOR	117	MAX	0.5 MAX										1A3
1A4P	PENTODE	FIL	2.0	.06	4M-SS4	12H	.007*	5.0*	12*	AMP CL A	180	-3	67.5	2.3	0.8	1	MEG	750		-15	1A4P	
1A4-T	TETRODE	FIL	2.0	.06	4K-SS4	12H	.012*	4.6	11	AMP CL A	180	-3	67.5	2.3	0.7	.96	MEG	750		-15	1A4-T	
1A5CT/G	PENTODE	FIL	1.4	.05	6X-OGT7	9H			POWER AMP CLASS A	90	-4.5	90	4.0	0.8	.3	MEG	850	.115	25000		1A5CT/G	
1A6	HEPTODE	FIL	2.0	.06	6L-SS6	12H	.25*	10.5	9.0	OSC SECT MIXER	135S	.05MEG	2.3	2.4	GRID #2 RES. .02 MEG					-22.5	1A6	
1A7G	HEPTODE	FIL	1.4	.05	7Z-OS8	9P	.30*	6.5*	11*	OSC SECT MIXER	90	.2	MEG	1.2	0.6	.6	MEG	250C		-3	1A7G	
1A7GT	HEPTODE	FIL	1.4	.05	7Z-OW8	9F			OSC SECT MIXER	90	0	45	0.55	0.6							1A7GT	
1B4/951	PENTODE	FIL	2.0	.06	4M-SS4	12H	.007*	5.0	11	AMP CL A	180	-3	67.5	1.7	0.6	1.5	MEG	650		-8	1B4/951	
1B5/25S	DUO-DI TRIODE	FIL	2.0	.06	6M-SS6	12B	3.6	2.0	3.0	AMPLIFIER CLASS A	135	-3		0.8	20	35000	575				1B5/25S	
1B7C	HEPTODE	FIL	1.4	.1	7Z-OS8	9P	.34*	7.0*	7.5*	OSC SECT MIXER	90	.2	MEG	1.6	1.3	.35	MEG	350C		-14.5	1B7C	
1B7GT	HEPTODE	FIL	1.4	.1	7Z-OW8	9F			OSC SECT MIXER	90	0	45	1.5	1.3							1B7GT	
1B8GT	DI-TRI PENTODE	FIL	1.4	0.1	8AJ-OS8	9F			TRI CL A	90	0	90	6.3	1.4	66	0.24	275	1150	.210	14000	1B8GT	
1C5CT/G	PENTODE	FIL	1.4	.1	6X-OGT7	9H			PENT CL A	90	-6.0	90	7.5	1.6	180	.12	MEG	1550	.240	8000	1C5CT/G	
1C6	HEPTODE	FIL	2.0	.12	6L-SS6	12H	.3*	10	10	OSC SECT MIXER	180S	.05MEG	3.3	2.0	GRID #2 RES. .02 MEG					-14	1C6	
1C7G	HEPTODE	FIL	2.0	.12	7Z-OS8	12F	.26*	10*	14*	MIXER	180	-3	67.5	1.5	2.0	.7	MEG	325C			1C7G	
1D5G-P	PENTODE	FIL	2.0	.06	5Y-OS7	12F	.007*	5.0*	11*	AMPLIFIER CLASS A	180	-3	67.5	2.3	0.8	1	MEG	750		-15	1D5G-P	
1D5GT	TETRODE	FIL	2.0	.06	5R-OS7	12F	.012*	4.6*	11*	AMP CL A	180	-3	67.5	2.3	0.7	.96	MEG	750		-15	1D5GT	
1D7G	HEPTODE	FIL	2.0	.06	7Z-OS8	12F	.30*	10*	14*	OSC SECT MIXER	180S	.05MEG	2.3	2.4	GRID #2 RES. .02 MEG					-22.5	1D7G	

SEE PAGE 5 FOR DATA CHART REFERENCE NOTES

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TYPE	DESIGN	CATHODE		BASING DATA	MAX SIZE VIEW	CAPACITIES			USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
		HTR OR FIL TYPE	HTR OR FIL VOLTS			C-P mmfd	IN mmfd	OUT mmfd													
1D8GT	DI-TRI PENTODE	FIL	1.4	.1	8AJ-OGT8	9J			TRI CL A PENT CL A	90 90	0 -9	90	1.1 5.0	1.0	25	.43500 .2 MEG	575 925	.200	12000		1D8GT
1E4C	TRIODE	FIL	1.4	.05	5S-OS7	9N	2.4	2.4	AMPLIFIER CLASS A	90 90	-3 0		1.4 4.5		14.5 14.5	19000 11200	760 1300				1E4C
1E5C-P	PENTODE	FIL	2.0	.06	5Y-OS7	12F	.007*	5.5*	12* CLASS A	180 90	-3 -3	67.5 67.5	1.7 1.6	0.6 0.7	975 600	1.5MEG 1 MEG	650 600			-8 -8	1E5C-P
1E7G	TWIN PENTODE	FIL	2.0	.24	8C-OS8	12E			CL A 1 SECT CL A 2 SECT	135 135	-4.5 -7.5	135 135	7.5 14	2.2 4.0		.26MEG	1425	.250 .575	16000 24000		1E7G
1F4 1F5G	PENTODE	FIL	2.0	.12	5K-SM5 6X-OM7	14D 14C			PR AMP CL A CL AB 2 TUBE	135 180	-4.5 -7.5	135 180	8.0 19	2.4 5.5		.20MEG	1700	.310 1.25	16000 20000		1F4 1F5G
1F6 1F7C-H	DUO-DI PENTODE	FIL	2.0	.06	6W-SS6 7AD-OS8	12H 12F	.007* .01*	4 3.8*	9 9.5*	180	-1.5	67.5	2.2	0.7		1 MEG	650			-12	1F6 1F7C-H
1G4GT/C	TRIODE	FIL	1.4	.05	5S-OGT7	9H			AMP CL A	90	-6		2.3		8.8	10700	825				1G4GT/C
1G5C	PENTODE	FIL	2.0	.12	6X-OM7	14C			POWER AMP CLASS A	135 90	-13.5 -6	135 90	8.7 8.5	2.5 2.5		.16MEG .13MEG	1550 1500	.550 .250	9000 8500		1G5C
1G6GT/C	TWIN TRIODE	FIL	1.4	.1	7AB-OGT8	9H			CL A 1 SECT CL B 2 SECT	90 90	0 0		1.0 2.0	MAX SIG	30	45000	675	.675	12000		1G6GT/C
1H4C	TRIODE	FIL	2.0	.06	5S-OS6	12E	5.0*	3.0*	AMP CL A CL B 2 TUBE	180 157.5	-13.5 -15		3.1 1.0		9.3	10300	900	(SEE TYPE 30 ALSO) 2.1	8000		1H4C
1H5C 1H5GT/C	DIODE TRIODE	FIL	1.4	.05	5Z-OS7 5Z-OW7	9P 9F	1.1	.36	4.0 CLASS A	90	0		0.15		65	.24MEG	275				1H5C 1H5GT/C
1H6C	DUO-DI TRIODE	FIL	2.0	.06	7AA-OS8	12E	3.6*	2.0*	3.0* CLASS A	135	-3		0.8		20	35000	575				1H6C
1J5C	PENTODE	FIL	2.0	.12	6X-OM7	14C			PR AMP CL A	135	-16.5	135	7.0	2.0	100	.1 MEG	1000	.45	13500		1J5C
1J6C	TWIN TR	FIL	2.0	.24	7AB-OS8	12E			CLASS B TWO SECT	135 135	0 -6		10 NO SIG 0.1 NO SIG					2.1 1.6	10000 10000		1J6C
1L4	PENTODE	FIL	1.4	0.05	6AR-MB7	5B	0.008	3.6	7.5 AMP CL A	90 90	0 0	90 67.5	4.5 2.0	2.0 1.2		0.35 0.6	1025 925			-8 -6	1L4
1LA4	PENTODE	FIL	1.4	.05	5AD-L8	9A			POWER AMP CLASS A	90 85	-4.5 -4.5	90 85	4.0 3.5	0.8 0.7		.3 MEG .3 MEG	850 800	.115 .100	25000 25000		1LA4
1LA6	HEPTODE	FIL	1.4	.05	7AK-L8	9A	.40	7.7	8.0 OSC SECT MIXER	90 90	.2 MEG 0	45 45	1.2 0.55	0.6		.6 MEG	250C			-3	1LA6
1LB4	PENTODE	FIL	1.4	.05	5AD-L8	9A			PR AMP CL A	90 45	-9 -4.5	90 45	5.0 1.6	1.0 0.3		.2 MEG .3 MEG	925 650	.200 .035	12000 20000		1LB4
1LB6	HEPTODE	FIL	1.4	0.05	8AX-L8	9A	0.20	8.0	7.0 MIXER SECT OSC SECT	90 OSC Grid Volt = 0	0 0	67.5	0.40 2.2	2.2		2 MEG	100C			-4.5	1LB6
1LC5	PENTODE	FIL	1.4	0.05	7AC-L8	9A	0.007	3.2	7.0 AMP CL A	90 45	0 0	45 45	1.15 1.10	0.20 0.25		1.5 0.7	775 750			-3 -3	1LC5
1LC6	HEPTODE	FIL	1.4	0.05	7AK-L8	9A	0.28	9.0	5.5 MIXER SECT OSC SECT	90 45	0 .2 MEG	95	0.70 1.4	0.70		.65	275C			-3	1LC6
1LD5	DI-PENT	FIL	1.4	0.05	6AX-L8	9A	0.20	3.2	6.0 AMP CL A	90 45	0 0	45 45	0.60 0.55	0.10 0.12		0.95 0.90	600 550				1LD5
1LE3	TRIODE	FIL	1.4	0.05	4AA-L8	9A	1.7	1.7	3.0 AMP CL A	90 90	-3 0		1.4 4.5			19000 11200	760 1300				1LE3

SEE PAGE 5 FOR DATA CHART REFERENCE NOTES

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TYPE	DESIGN	CATHODE HTR OR FIL VOLTS	BASING DATA	MAX SIZE VIEW	CAPACITIES		USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
					G-P mmfds	IN mmfds													
1LH4	DI-TRI	FIL 1.4	.05 SAG-L8	9A	1.2	2.0	2.4	AMP CL A	90	0	0.15		65	.24MEG	275				1LH4
1LN5	PENTODE	FIL 1.4	.05 7AO-L8	9A	.007	3.4	8.0	AMP CL A	90	0	1.6	0.35	880	1.1MEG	800			-4.5	1LN5
1NSG 1NS5CT/G	PENTODE	FIL 1.4	.05 5Y-OS7 5Y-OW7	9P 9F	.007*	3.0	10.0	AMP CL A	90	0	1.2	0.3	1160	1.5MEG	750			-4	1NSG 1NS5CT/G
1NG6 1NG6GT	DI-PENT	FIL 1.4	.05 7AM-OS8 7AM-OW8	9N 9H				PR AMP CL A	90	-4.5	3.4	0.7		.3 MEG	800	.10	25000		1NG6 1NG6GT
1P5CT/G	PENTODE	FIL 1.4	.05 5Y-OW7	9F	.007*	3.0	10.0	AMP CL A	90	0	2.3	0.7		.8 MEG	750			-12	1P5CT/G
1Q5CT/G	BEAM PWR AMP	FIL 1.4	.1 6AF-OGT7	9H				POWER AMP CLASS A	90 85	-4.5 -5.0	9.5 7.0	1.3 0.8			2200 1950	.27 .25	8000 9000		1Q5CT/G
1R4/1294	DIODE	HTR 1.4	0.15 4AH-L8	9A				DETECTOR	10 MAX	5.0 MAX									1R4/1294
1R5	HEPTODE	FIL 1.4	.05 7AT-MB7	5B	.4	7.0	7.0	OSC SECT MIXER	OSC GRID RES -1 MEG 90	67.5 0	1.7 1.7	3.0	OSC GRID CUR -25 MA .5 MEG 300C					-15	1R5
1S4	PENTODE	FIL 1.4	.1 7AV-MB7	5B				PR AMP CL A	90 45	67.5 45	7.4 3.8	1.4 0.8		.1 MEG .1 MEG	1575 1250	.270 .065	8000 8000		1S4
1S5	DIODE PENTODE	FIL 1.4	.05 6AU-MB7	5B				DETECTOR AMP CL A	67.5	0	1.6	0.4		.6 MEG	625				1S5
1SA6GT	PENTODE	FIL 1.4	0.05 6BD-OW8	9E	0.01	5.2	8.6	AMP CL A	90 45	67.5 45	2.45 1.10	0.68 0.30		0.8 0.7	970 750			-5.5 -3.5	1SA6GT
1SB6GT	DI-PENT	FIL 1.4	0.05 6BE-OS7	9H	0.25	3.2	3.0	DET AMP CL A	90 45	67.5 45	1.45 0.6	0.38 0.16		0.7 0.9	665 500				1SB6GT
1T4	PENTODE	FIL 1.4	.05 6AR-MB7	5B	.01	3.6	7.5	AMP CL A	90 45	67.5 45	3.5 1.7	1.4 0.7		.5 MEG .35MEG	900 700			-16 -10	1T4
1T5GT	BM PWR	FIL 1.4	.05 6X-OGT7	9H				PR AMP CL A	90	-6	6.5	0.8			1150	.17	14000		1T5GT
1-V	DIODE	HTR 6.3	.3 4G-SS4	12B				H W RECT	325 RMS MAX					45 DC MAX TUBE DROP 20v AT 90ma DC					1-V
2A3	TRIODE	FIL 2.5	2.5 4D-SM4	16B				PR AMP CL A PUSH-PULL CL AB 2 TUBE	250 300 300	-45 -62 SELF	60 80 80	4.2	800	5250	3.5 15 10	2500 3000 5000			2A3
2A4C	GAS TRI	FIL 2.5	2.5 5S-OS7	12E				THYRATRON	200 RMS MAX					100 DC MAX TUBE DROP 12v				-9	2A4C
2A5	PENTODE	HTR 2.5	1.75 6B-SM6	14D				PR AMP CL A CL AB 2 TUBE	250 350	-20 -38	31 48	6.8	2600	(SEE TYPE 6F6G ALSO)	.85 13.0	4000 6000			2A5
2A6	DUO-DI TRIODE	HTR 2.5	.8 6G-SS6	12H	1.7	2.0	3.5	AMPLIFIER CLASS A	250	-2	0.9		100	91000	1100				2A6
2A7 2A7S	HEPTODE	HTR 2.5	.8 7C-SS7 7C-SS7	12H	.3*	8.5	9.0	OSC SECT MIXER	250S 250	.05MEG -3	4.0 3.5	2.7		GRID #2 RES .02 MEG .36MEG 550C				-35	2A7 2A7S
2B7 2B7S	DUO-DI PENTODE	HTR 2.5	.8 7D-SS7 7D-SS7	12H	.007*	3.5	9.5	AMPLIFIER CLASS A	250 100	-3 -3	125 100	2.3 1.7		.65MEG .30MEG	1125 950			-21 -17	2B7 2B7S
2C22	TRIODE	HTR 6.3	0.3 4AM-OW8	9S	3.6	2.2	0.7	AMP CL A	300	-10.5	11	20	6600	3000					2C22
2E5	ELEC RAY	HTR 2.5	.8 6R-SS6	12B				TUNING IND	250 THRU 1 MEG, TARGET 250v, GRID 0v FOR 90°, -8v FOR 0°										2E5
2S/4S	DUO DIODE	HTR 2.5	1.35 5D-SS5					DETECTOR						40 APPROX PER PLATE AT 50v DC					2S/4S

SEE PAGE 5 FOR DATA CHART REFERENCE NOTES

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TYPE	DESIGN	CATHODE		BASING DATA	MAX SIZE VIEW	CAPACITIES			USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
		HTR OR FIL	TYPE			HTR VOLTS	AMPS	G-P mmfd													
2W3CT	DIODE	FIL	2.5	1.5	4X-OW5	9E			H W RECT	350 RMS MAX			55 DC MAX								2W3CT
2X2/879	DIODE	HTR	2.5	1.75	4AB-SS4	12H			H W RECT	4500 RMS MAX			7.5 DC MAX								2X2/879
3A4	BM PWR	FIL	1.4	0.2	7BB-MB7	5B	0.2	4.8	4.2	150 135	-8.4 -7.5	90 90	13.3 14.8	2.2 2.6		0.10 0.09	1900 1900	700 600	8000 8000		3A4
3A5	TWIN TRIODE	FIL	1.4 or 2.8	.22 .11	7BC-MB7	5B	3.2L 3.2R	0.9L 0.9R	1.0L 1.0R	90	-2.5		3.7	15		8300	1800				3A5
3A8CT	DI-TRI PENTODE	FIL	1.4 or 2.8	.1 .05	8AS-OGT8	9L	.012 3.0	2.6* 4.2	4.2 10*	90 90	-FIL -FIL	90	0.20 1.5	0.5		.20MEG .8 MEG	325 750				3A8CT
3B5CT	BM PWR	FIL	1.4 or 2.8	0.10 0.05	7AP-OGT7	9H	PARALLEL SERIES FIL		PR AMP CL A	45 67.5	-4.5 -7	45 67.5	4.4 6.7	0.3 0.5		0.1 0.1	1400 1500	.070 .180	8000 5000		3B5CT
3B7/1291	TWIN TRIODE	FIL	1.4	.22	7BE-L8	9A	2.6L 2.6R	1.4L 1.4R	1.8L 2.6R	135 90	0		19 10.4	20 20		1900 1850	1.5 1.0	16000 8000		3B7/1291	
3C5CT	BM PWR	FIL	1.4 or 2.8	0.1 0.05	7AP-OGT7	9H	PARALLEL SERIES FIL		PR AMP CL A	90 90	-9 -9	90 90	6 6	1.4 1.4		1550 1450	.240 .260	10000 10000			3C5CT
3D6/1299	BM PWR	FIL	1.4 or 2.8	.220 .110	6BB-L8	9A	PARALLEL SERIES FIL		PR AMP CL A	150 135	-4.5 -4.5	90 90	9.8 9.8	1.0 1.2		2400 2400	.500 .600	14000 12000			3D6/1299
3LE4	BM PWR	FIL	1.4 or 2.8	0.1 0.05	6BA-L8	9A	PARALLEL SERIES FIL		PR AMP CL A	90 90	-9 -9	90 90	10.0 8.8	2 1.8		0.10 0.11	1700 1600	.325 .300	6000 6000		3LE4
3LF4	BM PWR	FIL	1.4 or 2.8	0.1 0.05	6BA-L8	9A	PARALLEL SERIES FIL		PR AMP CL A	90 90	-4.5 -4.5	90 90	9.5 8.0	1.3 1.0		0.75 0.80	2200 2000	.270 .230	8000 8000		3LF4
3Q4	BM PWR	FIL	1.4 or 2.8	0.1 0.05	7BA-MB7	5B	PARALLEL SERIES FIL		PR AMP CL A	90 90	-4.5 -4.5	90 90	9.5 7.7	2.1 1.7		0.10 0.12	2150 2000	.250 .240	10000 10000		3Q4
3Q5CT/G	BM PWR	FIL	1.4 or 2.8	.1 .05	7AP-OGT7	9H	PARALLEL SERIES FIL		PR AMP CL A	90 90	-4.5 -4.5	90 90	9.5 8.0	1.3 1.0		.075MEG .08 MEG	2200 2000	.270 .230	8000 8000		3Q5CT/G
3S4	PENTODE	FIL	1.4 or 2.8	.1 .05	7BA-MB7	5B	PARALLEL SERIES FIL		POWER AMP CLASS A	90	-7	67.5	7.4	1.4		.1 MEG .1 MEG	1550 1425	.270 .235	8000 8000		3S4
4A6G	TWIN TRIODE	FIL	2.0 or 4.0	.06	8L-OS8	12E			CL A 1 SECT CL B 2 SECT	90 90	-1.5 -1.5		1.1 1.1	20 MAX SIG PLATE CUR	26600	750	1.0	8000			4A6G
5R4GY	TWIN DIODE	FIL	5.0	2.0	5T-OM5	16A			FULL WAVE RECTIFIER	1000 RMS MAX 950 RMS MAX	CHOKE IN 150 DC MAX CHOKE IN 175 DC MAX										5R4GY
5T4	TWIN DIODE	FIL	5.0	2.0	5T-OW5	10C			FULL WAVE RECTIFIER	450 RMS MAX 550 RMS MAX	CHOKE IN 225 DC MAX CHOKE IN 225 DC MAX										5T4
5U4G	TWIN DIODE	FIL	5.0	3.0	5T-OM8	16A			FULL WAVE RECTIFIER	450 RMS MAX 550 RMS MAX	CHOKE IN 225 DC MAX CHOKE IN 225 DC MAX										5U4G
5V4G	TWIN DIODE	HTR	5.0	2.0	5L-OM5	14C			FULL WAVE RECTIFIER	375 RMS MAX 500 RMS MAX	CHOKE IN 175 DC MAX CHOKE IN 175 DC MAX										5V4G
5W4 5W4CT/G	TWIN DIODE	FIL	5.0	1.5	5T-OW5 5T-OGT5	8H 9HB			FULL WAVE RECTIFIER	350 RMS MAX 500 RMS MAX	CHOKE IN 100 DC MAX CHOKE IN 100 DC MAX										5W4 5W4CT/G
5X3	TWIN DI	FIL	5.0	2.0	4C-SM4	14D			F W RECT	1275 RMS MAX	CHOKE IN 30 DC MAX										5X3
5X4G	TWIN DI	FIL	5.0	3.0	5Q-OM8	16A			F W RECT	450 RMS MAX 550 RMS MAX	CHOKE IN 225 DC MAX CHOKE IN 225 DC MAX										5X4G

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TYPE	DESIGN	CATHODE TYPE	HTR OR FIL VOLTS	AMP AMPS	BASING DATA	MAX SIZE VIEW	CAPACITIES C-P IN OUT mmfd. mmfd. mmfd.	USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
5Y3GT/G 5Y4G	TWIN DIODE	FIL	5.0	2.0	5T-OM5 5Q-OM8	9HB 14C		FULL WAVE RECTIFIER	350 500	RMS MAX	COND IN 125 DC MAX			TUBE DROP 60v AT 125ma DC					5Y3GT/G 5Y4G	
5Z3	TWIN DI	FIL	5.0	3.0	4C-SM4	16B		F W RECT	450 550	RMS MAX	COND IN 225 DC MAX			TUBE DROP 58v AT 225ma DC					5Z3	
5Z4 5Z4GT/G	TWIN DIODE	HTR	5.0	2.0	5L-OW5 5L-OGT5	8H 9H		FULL WAVE RECTIFIER	350 500	RMS MAX	COND IN 125 DC MAX			TUBE DROP 20v AT 125ma DC					5Z4 5Z4GT/G	
6A3	TRIODE	FIL	6.3	1.0	4D-SM4	16B	7	PR AMP CL A PUSH-PULL CL AB 2 TUBE	250 325 325	-45 -68 SELF	60 80 80	750	OHM BIAS RES	5250	3.2 15 10	2500 3000 5000			6A3	
6A4/LA	PENTODE	FIL	6.3	.3	5B-SM5	14D		PR AMP CL A PUSH-PULL CL AB 2 TUBE	180 250	-12 SELF	22 32	3.9 700	OHM BIAS RES	45500 2200	1.4 4.2	8000 16000			6A4/LA	
6A5G	TRIODE	HTR	6.3	1.25	6T-OM8	16A	7	PR AMP CL A PUSH-PULL CL AB 2 TUBE	250 325 325	-45 -68 -SELF	60 80 80	4.2	OHM BIAS RES	5250	3.75 15 10	2500 3000 5000			6A5G	
6A6	TWIN TRIODE	HTR	6.3	.8	7B-SM7	14D	(SEE TYPE 6N7G ALSO)	AMP CL A TRI IN PAR'L	294 250	-6 -5	7 6	35 35	11000 3100						6A6	
6A7 6A7S 6A8 6A8C 6A8GT	HEPTODE	HTR	6.3	.3	7C-SS7 7C-SS7 8A-OW8 8A-OS8 8A-OW8	12H 8F 12F 9F	.3* .03 .26* .26*	OSC SECT MIXER	250S 100 250 100	.05MEG .05MEG -3 -1.5	4.0 2.0 3.5 1.1		GRID #2 RES .02 MEG .36MEG 550C .6 MEG 360C						6A7 6A7S 6A8 6A8C 6A8GT	
6AB5/6N5	ELEC RAY	HTR	6.3	.15	6R-SS6	9R		TUNING IND	135	THRU .25 MEG	TARGET 135v	GRID 0v	FOR 90°, -10.0v	FOR 0°					6AB5/6N5	
6AB6G	DUO TRIODE	HTR	6.3	0.5	7AU-OS7	12K		DIR C/P'D AMP	250 250	0 +	5 34		4000	1800	3.5	8000			6AB6G	
6AB7/1853	PENTODE	HTR	6.3	.45	8N-OW8	8E	.015 8 5	HIGH FREQ AMPLIFIER	300 300	-3 -3	200 300	12.5 THRU .03 MEG	3.2	.7 MEG 5000					6AB7/1853	
6AC5G	TRIODE	HTR	6.3	.4	6Q-OS6	12E		DIR C/P'D AMP PUSH-PULL CL B 2 TUBE	250 250 250	SUPPLIED BY DRIVERS	32 64	125	36700	3400	3.7 9.5 8	7000 10000 10000			6AC5G	
6AC5GT	DUO TRIODE	HTR	6.3	1.1	7AU-OGT7	9H		DIR C/P'D AMP	180 180	0 +	7 45		18000	3000	3.8	4000			6AC5GT	
6AC7/1852	PENTODE	HTR	6.3	.45	8N-OW8	8E	.015 11 5	HIGH FREQ AMPLIFIER	300 300	SELF SELF	150 300	10 THRU .06 MEG	2.5	1.0MEG 9000	160 OHM-BIAS RES				6AC7/1852	
6AD5G	TRIODE	HTR	6.3	0.3	6Q-OS6	12E	3.3 4.1 3.9	AMP CL A	250	-2	0.9		100	66000	1500				6AD5G	
6AD6G	TWIN ELEC RAY	HTR	6.3	.15	7AG-OW7	9C		TUNING INDICATOR	TARGET 150v TARGET 100v	CONTROL ELECTRODE 45v AT 0°, 8v AT 90°, -50v AT 135°									6AD6G	
6AD7G	TRIODE	HTR	6.3	.85	8AY-OM8	14C		AMP CL A	250 250	-25 -16.5	3.7 34	6 6.5	19000 80000	325 2500	3.2	7000			6AD7G	
6AE5GT/G	TRIODE	HTR	6.3	.3	6Q-OGT6	9H		AMP CL A	95	-15	7	4.2	3500	1200					6AE5GT/G	
6AE6G	DUO TRIODE	HTR	6.3	.15	7AH-OS7	12E		CONTROL FOR 6AD6G-6AF6G	250 250	-1.5 -1.5	6.5 4.5	25 33	1000 950	PLATE R PLATE L					6AE6G	

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TYPE	DESIGN	CATHODE		BASING DATA	MAX SIZE VIEW	CAPACITIES		USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE	
		TYPE	HTR OR FIL VOLTS			G-P mmfda	IN mmfda														OUT mmfda
6AE7GT	TWIN TRIODE	HTR	6.3	.5	7AX-OGT8	9H		DRIVER 1 SEC TRIODE	250	-13.5		5		14	9300	1500					6AE7GT
6AF5G	TRIODE	HTR	6.3	.3	6Q-OS6	12E		AMP CL A	180	-18		7		7.4	4900	1500					6AF5G
6AF6G	TWIN ELEC RAY	HTR	6.3	.15	7AG-OS7	9M		TUNING INDICATOR	TARGET 135v TARGET 100v												6AF6G
6AG5	PENTODE	HTR	6.3	0.3	7BD-MB7	5B	0.025	AMP CL A	250	-2	150	7	2		0.8MEG	5000			-8		6AG5
6AG7	PENTODE	HTR	6.3	.65	8Y-OW8	8H	.06*	AMP CL A	300	-3	150	30	7		0.13	11000	3	10000	-8		6AG7
6AH5G	PWR AMP	HTR	6.3	0.9	6AP-OM8	16A		PR AMP CL A	350	-18	250	54	2.5		33000	5200	10.8	4200			6AH5G
6AH7GT	TWIN TRI	HTR	6.3	.3	8BE-OGT8	9D	2.2(1) 3.0(2)	CL A 1 SECT	250	-9		12		16	6600	2400			-30		6AH7GT
6AK5	PENTODE	HTR	6.3	0.175	7BD-MB7	5A	0.01	AMP CL A	180	-2	120	7.7	2.4		0.69MEG	5100			-12		6AK5
6AK6	PENTODE	HTR	6.3	0.15	7BK-MB7	5B	0.12	POWER AMPLIFIER	180	-9	180	15	2.5	400	.19MEG	2300	1.1	10000			6AK6
6AL6G	BEAM PWR AMP	HTR	6.3	.9	6AM-OM7	16C		POWER AMP CLASS A	250	-14	250	72	5	170	22500	6000	6.5	2500			6AL6G
6B4G	TRIODE	FIL	6.3	1.0	5S-OM8	16A	16	PR AMP CL A PUSH-PULL CL AB 2 TUBE	250	-45		60		4.2	800	5250	3.2	2500			6B4G
6B5	DUO-TRI	HTR	6.3	.8	6AS-SM6	14D		DIR CP'D AMP 2 TUBES CL A	325	0		9					13.5	10000			6B5
6B6G	DUO-DI TRIODE	HTR	6.3	.3	7V-OS7	12F	1.3	AMPLIFIER CLASS A	250	-2		0.9		100	91000	1100					6B6G
6B7	DUO-DI PENTODE	HTR	6.3	.3	7D-SS7	12H	.007*	AMPLIFIER CLASS A	250	-3	125	9.0	2.3		.6 MEG	1125			-21		6B7
6B7S	DUO-DI PENTODE	HTR	6.3	.3	7D-SS7	12H	.007*	AMPLIFIER CLASS A	100	-3	100	5.8	1.7		.3 MEG	950			-17		6B7S
6B8	DUO-DI PENTODE	HTR	6.3	.3	8E-OW8	8F	.005	AMPLIFIER CLASS A	250	-3	125	10	2.3		.6 MEG	1325			-21		6B8
6B8G	DUO-DI PENTODE	HTR	6.3	.3	8E-OS8	12F	.01*	AMPLIFIER CLASS A	100	-3	100	5.8	1.7		.3 MEG	950			-17		6B8G
6B8GT	DUO-DI PENTODE	HTR	6.3	.3	8E-OW8	9G	0.005*	AMPLIFIER CLASS A	100	-3	100	5.8	1.7		.3 MEG	950			-17		6B8GT
6C4	TRIODE	HTR	6.3	0.15	6BG-MB7	5B	1.6	H-F POWER TRIODE	250	-8.5		10.5			7700	2200					6C4
6C5	TRIODE	HTR	6.3	.3	6Q-OW6	8D	2.0	AMPLIFIER CLASS A	250	-8		8		20	10000	2000					6C5
6C5G	TRIODE	HTR	6.3	.3	6Q-OS6	12E	2.2*	AMPLIFIER CLASS A	250	-3	100	2.0	.5		1.5MEG	1226			-7		6C5G
6C5GT/G	TRIODE	HTR	6.3	.3	6Q-OW6	9E	2.2*	AMPLIFIER CLASS A	100	-3	100	2.0	.5		1 MEG	1185			-7		6C5GT/G
6C6	PENTODE	HTR	6.3	.3	6F-SS6	12J	.007*	AMP CL A	250	-9		5.5		20	16000	1250					6C6
6C7	DUO-DI TRIODE	HTR	6.3	.3	7G-SS7			AMP CL A	250	-9											6C7
6C8G	TWIN TR	HTR	6.3	.3	8G-OS8	12F		CL A 1 SECT	250	-4.5		3.2		36	22500	1600					6C8G
6D6	PENTODE	HTR	6.3	.3	6F-SS6	12J	.007*	AMP CL A	250	-3	100	8.2	2.0		.8 MEG	1600			-50		6D6
									100	-3	100	8.0	2.2		.25MEG	1500			-50		

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TYPE	DESIGN	CATHODE HTR OR FIL VOLTS	BASING DATA	MAX SIZE VIEW	CAPACITIES		USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
					C-P mmfd	IN mmfd													
6D7	PENTODE	HTR	6.3	.3	7H-SS7			250	-3	100	2.0	.5		1.5MEG	1226			-7	6D7
6D8G	HEPTODE	HTR	6.3	.15	8A-OS8		OSC SECT MIXER	250S	.05MEG	100	2.0	.5		1 MEG	1185			-7	6D8G
6E5	ELEC RAY	HTR	6.3	.3	6R-SS6		TUNING IND	250	-3	100	3.5	2.6		GRID #2 RES .02 MEG .4 MEG 550C				-35	6E5
6E6	TWIN TRI	HTR	6.3	.6	7B-SM7		CL A 1 SECT CL A 2 SECT	250	-27.5		18		6	3500	1700	1.6	14000		6E6
6E7	PENTODE	HTR	6.3	.3	7H-SS7		AMP CL A	250	-3	100	8.2	2.0		.8 MEG	1600			-50	6E7
6F5	TRIODE	HTR	6.3	.3	5M-OW5		AMPLIFIER	250	-3	100	8.0	2.2		.25MEG	1500			-50	6F5
6F5G		HTR	6.3	.3	5M-OS5		CLASS A	250	-2		0.9		100	66000	1500				6F5G
6F5CT		HTR	6.3	.3	5M-OW5		CLASS A	100	-1		0.4		100	85000	1150				6F5CT
6F6	PENTODE	HTR	6.3	.7	7S-OW7		PENTODE CONNECTION	285	-20	285	38	7		78000	2550	4.8	7000		6F6
6F6G		HTR	6.3	.3	7S-OM7		PR AMP CL A	250	-16.5	250	34	6.5		80000	2500	3.2	7000		6F6G
6F7	TRIODE	HTR	6.3	.3	7E-SS7		PUSH-PULL CL AB 2 TUBE	375	-26	.250	34	5				18.5	10000		6F7
6F7S	PENTODE	HTR	6.3	.3	7E-SS7		TRI CL A	100	-3	100	3.5	1.5		16000	500		(SEE 6P7G ALSO)		6F7S
6F8G	TWIN TR	HTR	6.3	.6	8G-OS8		PENT CL A	250	-3		6.5		8	.85MEG	1100			-35	6F8G
6G6G	PENTODE	HTR	6.3	.15	7S-OS7		AMP CL A	250	-8		9.0		20	7700	2600				6G6G
6H4CT	DIODE	HTR	6.3	.15	5AF-OGT5		ONE SECT	90	0		10.0		20	6700	3000				6H4CT
6H6	TWIN DIODE	HTR	6.3	.3	7Q-OW7		POWER AMP CLASS A	180	-9	180	15	2.5	400	.18MEG	2300	1.1	10000		6H6
6H6G		HTR	6.3	.3	7Q-OS7		DETECTOR	135	-6	135	11.5	2.0	360	.17MEG	2100	0.6	12000		6H6G
6H6CT		HTR	6.3	.3	7Q-OW7		DETECTOR	100	MAX					1000 AT .25ma					6H6CT
6J5	TRIODE	HTR	6.3	.3	6Q-OW6		CLASS A	250	-8		9.0		20	7700	2600				6J5
6J5CT/G		HTR	6.3	.3	6Q-OW6		CLASS A	90	0		10.0		20	6700	3000				6J5CT/G
6J6	TWIN TRIODE	HTR	6.3	0.45	7BF-MB7		OSCILLATOR	100	-1		8.5		38	6000	5300				6J6
6J7	PENTODE	HTR	6.3	.3	7R-OW7		AMP CL A	250	-3	100	2.0	0.5		1.5MEG	1225			-7	6J7
6J7G		HTR	6.3	.3	7R-OS7		PENT CONN	100	-3	100	2.0	0.5		1.0MEG	1185			-7	6J7G
6J7CT		HTR	6.3	.3	7R-OW7		TRI CONN	250	-8		6.5		20	10500	1900				6J7CT
6J8G	TRIODE HEPTODE	HTR	6.3	.3	8H-OS8		OSC-TRIODE MIXER HEPT	250S	.05MEG		5.0	2.9		TRIODE PLATE RESISTOR .02 MEG				-20	6J8G
6K5C	TRIODE	HTR	6.3	.3	5U-OS7		AMP CL A	250	-3	100	1.2		70	50000	1400				6K5C
6K6CT/G	PENTODE	HTR	6.3	.4	7S-OGT7		POWER AMP CLASS A	315	-21	250	25.5	4.0		75000	2100	4.5	9000		6K6CT/G
6K7	PENTODE	HTR	6.3	.3	7R-OW7		AMPLIFIER CLASS A	250	-3	125	10.5	2.6		.6 MEG	1650			-52.5	6K7
6K7C		HTR	6.3	.3	7R-OS7		CLASS A	250	-3	100	7.0	1.7		.8 MEG	1450			-42.5	6K7C
6K7CT		HTR	6.3	.3	7R-OW7		CLASS A	100	-1	100	9.5	2.7		.13MEG	1650			-38.5	6K7CT

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TYPE	DESIGN	TYPE	CATHODE HTR OR FIL VOLTS / AMPS	BASING DATA	MAX SIZE VIEW	CAPACITIES			USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
						C-P mmfds	IN mmfds	OUT mmfds													
6K8	TRIODE	HTR	6.3	8K-OW8	8GA	.03	6.6	3.5	OSC-TRIODE	100	.05MEG	100	3.8	6.0	.6 MEG	3000	(TRIODE GRID Ov)			6K8	
6K8G	HEXODE			8K-OS8	12F	.08*	4.6*	4.8*	MIXER HEX	250	-3	100	2.5	6.0	.4 MEG	350C				6K8G	
6K8GT				8K-OW8	9GA	.08*	4.6*	4.8*		100	-3	100	2.3	6.2		325C				6K8GT	
6L5G	TRIODE	HTR	6.3	6Q-OS8	12E	2.7*	3*	5*	AMP CL A	250	-9		8	17	8900	1900				6L5G	
6L6	BEAM	HTR	6.3	7AC-OW7	10C				POWER AMP	350	-18	250	54	2.5	33000	5200	4200			6L6	
6L6G	PWR AMP			7AC-OW8	16A				CLASS A	250	-14	250	72	5.0	22500	6000	2500			6L6G	
									PP CL A	270	-17.5	270	134	11	23500	5700	5000				
									PP CL AB	360	-22.5	270	88	5		26.5	6600				
									PP CL AB 2	360	-22.5	270	88	5		47	3800				
6L7	HEPTODE	HTR	6.3	7T-OW7	8F	.001	7.5	11	AMP CL A	250	-3	100	5.3	6.5	.6 MEG	1100	G3 AT	-3v	-15	6L7	
6L7G				7T-OS7	12F	.005*	6*	10*	MIXER	250	-6	150	3.3	9.2	1 MEG	350C	G3 AT	-15v	-45	6L7G	
6M8GT	TRIODE PENTODE	HTR	6.3	8AU-OGT8	9L	2.5	3.7	4.3	CL A TRIODE	100	-1	100	0.5	2.7	91000	1100				6M8GT	
						0.015	5.2	1.0	CL A PENTODE	100	-3		8.5		0.2MEG	1900					
6N6G	DUO TRI	HTR	6.3	7AU-OM7	14C				DIR C/P'D AMP	300	0		8		(SEE TYPE 6B5 ALSO)	2400	4	7000		6N6G	
									DRIVER TRIODE	300	+		45								
									OUTPUT TRIODE	300			35		MAX SIG PLATE CUR—70ma	10	8000				
6N7	TWIN	HTR	6.3	8B-OW8	8H	(SEE TYPE 6A6 ALSO)			POWER AMP	300	0									6N7	
6N7G	TRIODE			8B-OM8	14C				CL B 2 SECT	300	0									6N7G	
6P5G	TRIODE	HTR	6.3	6Q-OS6	12E	2.6*	3.4*	5.5*	AMPLIFIER	250	-13.5		5	13.8	9500	1450				6P5G	
6P5GT				6Q-OGT6	9H				CLASS A	100	-5		2.5	13.8	12000	1150				6P5GT	
6P7G	TRIODE- PENTODE	HTR	6.3	7U-OS8	12F	2.0*	3.5*	3.0*	OSC-TRIODE	100	-3	100	2.4	0.6	2 MEG	300C				6P7G	
						.008*	3.5*	12*	MIXER PENT	250	-3		2.8		(SEE TYPE 6F7 ALSO)						
6Q7	DUO- DIODE	HTR	6.3	7V-OW7	8F	1.5	5.5	5.0	AMPLIFIER	250	-3		1.0	70	58000	1200				6Q7	
6Q7G	TRIODE			7V-OS7	12F	1.3	2.7	4.5	CLASS A	100	-1.0		0.8	70	58000	1200				6Q7G	
6Q7GT				7V-OW7	9F	1.6*	2.2*	5.0*		250	-3		7.0	1160	0.8MEG	1450				6Q7GT	
6R6G	PENTODE	HTR	6.3	6AW-OS6	12F	0.007	4.5	11	AMPLIFIER TELEVISION CIRCUITS	250	-3	100	7.0	1.7						6R6G	
										250	-3									-42.5	
6R7	DUO DI TRIODE	HTR	6.3	7V-OW7	8F	2.5	5.5	4.0	AMPLIFIER	250	-9		9.5	16	8500	1900	.28	10000		6R7	
6R7G				7V-OS7	12F	3.5	2.5	4.5	CLASS A	250	-9										
6R7GT				7V-OGT7	9J					250	-9										
6S7	PENTODE	HTR	6.3	7R-OW7	8GA	.005	6.5	10.5	AMPLIFIER	250	-3	100	8.5	2.0	1 MEG	1750				6S7	
6S7G				7R-OS7	12F	.008*	4.4*	8.0*	CLASS A	135	-3	67.5	3.7	0.9	1 MEG	1250				6S7G	
6SA7	HEPTODE	HTR	6.3	8R-OW8	8E	.13	9.5	12	OSC SECT	OSC GRID RES—.02 MEG										6SA7	
6SA7GT/G				8AD-OW8	9E	.20	11.0	12	MIXER	250	-2	100	3.5	8.5	1.0MEG	450C				6SA7GT/G	
6SC7	TWIN TRI	HTR	6.3	8S-OW8	8E				CL A 1 SECT	250	-2		2	70	53000	1325				6SC7	
6SC7GT				8S-OW8	9H					250	-2									6SC7GT	
6SD7GT	PENTODE	HTR	6.3	8N-OW8	9E	.0035	9.0	7.5	AMP CL A	250	-2	100	6.0	1.9	1.0MEG	3600				6SD7GT	
										100	-2	100	5.7	2.0	.25MEG	3350					
6SE7GT	PENTODE	HTR	6.3	8N-OW8	9E	0.005	8.0	7.5	AMP CL A	250	-1.5	100	4.5	1.5	1.0MEG	3100				6SE7GT	
6SF5	TRIODE	HTR	6.3	6AB-OW6	8E	2.6	4.2	3.8	AMPLIFIER	250	-2		0.9	100	66000	1500				6SF5	
6SF5GT				6AB-OGT6	9H	2.6*	4.2*	3.8*	CLASS A	100	-1		0.4	100	85000	1150				6SF5GT	
6SF7	DIODE PENTODE	HTR	6.3	7AZ-OW8	8E				AMP CL A	250	-1	100	12.4	3.3	.7 MEG	2050				6SF7	
										100	-1	100	12.0	3.4	.2 MEG	1975					

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TYPE	DESIGN	CATHODE		BASING DATA	MAX SIZE VIEW	CAPACITIES		USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
		HTR OR FIL VOLTS	AMPS			G-P mmfd	IN mmfd													
6SC7	PENTODE	HTR	6.3	.3	8BK-OW8	8E			250	-1	125	11.8	4.4		.9 MEG	4700			-14	6SC7
6SH7GT	PENTODE	HTR	6.3	0.3	8BK-OW8	9E	0.003	8.5	250	-1	100	8.2	3.2		.25MEG	4100			-11.5	6SH7GT
6SJ7	PENTODE	HTR	6.3	.3	8N-OW8	8E	.005	6.0	250	-3	100	3.0	0.8	2500	1.5MEG	1650			-9	6SJ7
6SK7	PENTODE	HTR	6.3	.3	8N-OW8	8E	.003	6.0	250	-3	100	2.9	0.9	1100	0.7MEG	1575			-9	6SK7
6SK7GT/C	TWIN TR	HTR	6.3	0.3	8BD-OGT8	9H	.005*	6.5*	250	-1	100	9.2	2.6	2000	0.8MEG	2000			-35	6SK7GT/C
6SL7GT	TWIN TR	HTR	6.3	0.3	8BD-OGT8	9H			250	-2		2.3	4.0	2350	.12MEG	2350			-35	6SL7GT
6SN7GT	TWIN TR	HTR	6.3	.60	8BD-OGT8	9H	4L	3.2L	250	-8		9	20	7700	2600					6SN7GT
6SQ7	DUO-DI THODE	HTR	6.3	.3	8Q-OW8	8E	1.8	4.2	250	-2		0.9	100	91000	1100					6SQ7
6SR7	DUO-DI THODE	HTR	6.3	.3	8Q-OW8	8E	2.0	3.4	250	-1		0.4	100	110000	900					6SR7
6SR7GT	PENTODE	HTR	6.3	0.15	8N-OW8	8E	0.004	5.5	250	-9		9.5	16	8500	1900					6SR7GT
6SS7	DUO-DI THODE	HTR	6.3	0.15	8Q-OW8	8E	1.5	2.8	250	-3		9.0	2.0	1.0MEG	1850					6SS7
6ST7	DUO-DI THODE	HTR	6.3	.15	7V-OS7	12F	1.3	2.7	250	-1		12.2	3.1	0.12MEG	1930					6ST7
6T7G-6Q6G	ELEC RAY	HTR	6.3	.3	6R-SS6	9R			250	-9		9.5	16	8500	1900					6T7G-6Q6G
6U5/6G5	BEAM PWR AMP	HTR	6.3	.75	7AC-OGT7	9H			250	-3		9.0	2.0	1.0MEG	1850					6U5/6G5
6U6GT	PENTODE	HTR	6.3	.3	7R-OS7	12L	.007*	5*	200	-14	135	55	3	20000	6200	5.5	3000			6U6GT
6U7G	BEAM PWR AMP	HTR	6.3	.3	7R-OS7	12L			110	-10.5	110	44	4	10000	5600	2.0	2000			6U7G
6V6	PENTODE	HTR	6.3	.45	7AC-OW7	8H			250	-3		8.2	2.0	8 MEG	1600					6U7G
6V6GT/C	BEAM PWR AMP	HTR	6.3	.45	7AC-OW7	9H	2 TUBES		315	-13	225	34	2.2	77000	3750	5.5	8500			6V6
6V7G	TWIN DI	HTR	6.3	.3	7V-OS7	12F	1.7	2.0	250	-12.5	250	45	4.5	52000	4100	4.5	5000			6V6GT/C
6W5G	TETRODE PWR AMP	HTR	6.3	1.25	7AC-OGT7	9H			250	-15	250	70	5.0	60000	3750	10	10000			6V7G
6W6GT	PENTODE	HTR	6.3	.15	7R-OS7	12F	.007*	5.0*	285	-19	285	70	4.0	65000	3600	14	8000			6W5G
6W7G	TWIN DIODE	HTR	6.3	.6	6S-OW6	8H			250	-20		8	8.3	7500	1100	.35	20000			6W6GT
6X5	PENTODE	HTR	6.3	.6	6S-OW6	8H			180	-13.5		6	8.3	8500	975	.16	20000			6W7G
6X5GT/C	TWIN DIODE	HTR	6.3	.6	6S-OGT6	9H			325 RMS MAX COND IN 90 DC MAX					TUBE DROP 24v AT 90ma DC						6X5
									450 RMS MAX CHOKE IN 90 DC MAX					TUBE DROP 22v AT 70ma DC						6X5GT/C

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TYPE	DESIGN	TYPE	CATHODE HTR OR FIL VOLTS	AMP AMPS	BASING DATA	MAX SIZE VIEW	CAPACITIES			USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
							C.P. mmfd	IN mmfd	OUT mmfd													
6Y5	TWIN DIODE	HTR	6.3	.8	6J-SS6	12E	(MERCURY VAPOR)	325 RMS MAX COND IN 60 DC MAX 450 RMS MAX CHOKE IN 60 DC MAX	RECTIFIER	200 135	-14 -13.5	135 135	61 58	2.2 3.5		18300 9300	7100 7000	6.0 3.6	2800 2000		6Y5	
6Y6G	BEAM PWR AMP	HTR	6.3	1.25	7AC-OM7	14C		POWER AMP CLASS A		250 180	0 0		10.6 NO SIG 7.6 NO SIG					8 5.5	14000 7000		6Y6G	
6Y7G	TWIN TRIODE	HTR	6.3	.6	8B-OS8	12E		CL B AMP 2 SECTIONS		180	0										6Y7G	
6Z5	TWIN DIODE	HTR	12.6 or 6.3	.4 .8	6K-SS6	12B		FULL WAVE RECTIFIER		325 RMS MAX COND IN 60 DC MAX 450 RMS MAX CHOKE IN 60 DC MAX											6Z5	
6Z7G	TWIN TRIODE	HTR	6.3	.3	8B-OS8	12E		CL B AMP 2 SECTIONS		180 135	0 0		8.4 NO SIG 6.0 NO SIG					4.2 2.5	12000 9000		6Z7G	
6ZY5G	TWIN DI	HTR	6.3	.3	6S-OS6	12E		FULL WAVE RECTIFIER		325 RMS MAX COND IN 40 DC MAX 450 RMS MAX CHOKE IN 40 DC MAX											6ZY5G	
7A4	TRIODE	HTR	6.3	.3	5AC-L8	9A	4	3.4	3.0	250 90	-8 0		9 10	20 20	7700 6700	2800 3000					7A4	
7A5	PENTODE	HTR	6.3	.75	6AA-L8	9B			POWER AMP CLASS A	125 110	-9 -7.5	125 110	44.0 3.0	3.3 3.0	17000 14000	8000 5800	2.2 1.5	2700 2500			7A5	
7A6	DUO-DI	HTR	6.3	.15	7AJ-L8	9A	.05PP		DETECTOR	150 RMS MAX											7A6	
7A7	PENTODE	HTR	6.3	.3	8V-L8	9A	.005	6.0	7.0	250 100	-3 -1	100 100	9.2 13.0	2.6 4.0	1600 1600	2000 2350				-35 -35	7A7	
7A8	OCTODE	HTR	6.3	.15	8U-L8	9A	.15	7.5	9.0	250S 250	.05MEG -3	100	4.2 3.0	3.2		GRID #2 RES .02 MEG .7 MEG 550C				-30	7A8	
7B4	TRIODE	HTR	6.3	.3	5AC-L8	9A	1.6*	3.6*	3.4*	100 250	-1 -2		0.5 0.9		85000 66000	1175 1500					7B4	
7B5	PENTODE	HTR	6.3	.4	6AE-L8	9B			POWER AMP CLASS A	315 100	-24 -7	250 100	25.5 9.0	4.0 1.6	75000 .1 MEG	2100 1500	4.5 .35	9000 12000			7B5	
7B6	DUO-DI TRIODE	HTR	6.3	.3	8W-L8	9A	1.5	3.0	3.0	250 100	-2 -1		0.9 0.4		91000 11000	1100 900					7B6	
7B7	PENTODE	HTR	6.3	.15	8V-L8	9A	.007	5.0	6.0	250 100	-3 -3	100 100	8.5 8.2	1.7 1.8	.7 MEG .3 MEG	1700 1675				-40 -40	7B7	
7B8	HEPTODE	HTR	6.3	.3	8X-L8	9A			OSC SECT MIXER	250S 100 250 100	.05MEG .05MEG -3 -1.5	50	4.0 2.0 3.5 1.1		GRID #2 RES .02 MEG .36MEG 550C .6 MEG 360C				-35 -20	7B8		
7C4/1203A	DIODE	HTR	6.3	0.150	4AH-L8	9A	0.8	2.2	3.0	117 MAX											7C4/1203A	
7C5	BEAM PWR AMP	HTR	6.3	.45	6AA-L8	9B			AMPLIFIER CLASS A PP CL AB	315 250 250 285	-13 -12.5 -15 -19	225 250 250 285	34 45 70	2.2 4.5 5.0 4.0	77000 52000 60000 65000	3750 4100 3750 3600	5.5 4.5 10 14	8500 5000 10000 8000			7C5	
7C6	DUO-DI TRIODE	HTR	6.3	.15	8W-L8	9A	1.4	2.4	3.0	250 100	-1 0		1.3 1.0		.1 MEG .1 MEG	1000 850					7C6	

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TYPE	DESIGN	CATHODE		BASING DATA	MAX SIZE VIEW	CAPACITIES		USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
		HTR OR FIL TYPE	HTR OR FIL VOLTS			G-P mmfda	IN mmfda													
7C7	PENTODE	HTR	6.3	.15	8V-L8	9A	.007* 5.5*	6.5* AMPLIFIER CLASS A	250	-3	100	2.0	0.5		2 MEG	1300			-7	7C7
7E5/1201	TRIODE	HTR	6.3	.150	8BN-L8	9A	1.5 3.6	2.8 AMPLIFIER	180	-3.0		5.5		36	12000	3000				7E5/1201
7E6	DUO-DI TRIODE	HTR	6.3	.3	8W-L8	9A	1.5 3.0	3.4 AMP CL A	250	-9		9.5		16	8500	1900				7E6
7E7	DUO-DI PENTODE	HTR	6.3	.3	8AE-L8	9A	.005* 4.6*	4.6* AMPLIFIER CLASS A	250 100	-3 -1	100 100	7.5 10.0	1.6 2.7		.7 MEG .15MEG	1300 1600			-42.5 -36.0	7E7
7F7	TWIN TR	HTR	6.3	.3	8AC-L8	9A		CL A 1 SECT	250	-2		2.3		70	44000	1600				7F7
7G7/1232	PENTODE	HTR	6.3	.45	8V-L8	9A	.007* 9.0*	7.0* AMP CL A	250	-2	100	6.0	2.0		.8 MEG	4500			-6	7G7/1232
7H7	PENTODE	HTR	6.3	.3	8V-L8	9A	.007* 8.0*	7.0* AMP CL A	250 100	-2.5 -1	150 100	9.5 8.2	3.5 3.3		.8 MEG .25MEG	3800 3800			-19 -12	7H7
7J7	TRI HEX	HTR	6.3	.3	8AR-L8	9A	.01* 5.5*	7.5* OSC-TRIODE MIXER HEX	250S 250	.05MEG -3	100	5.4 1.3	2.9		TRIODE PLATE RESISTOR .02 MEG 1.5MEG 300C				-20	7J7
7K7	DUO-DIODE	HTR	6.3	.3	8BF-L8	9A		AMPLIFIER CLASS A	250	-2		2.3		70	44000	1600				7K7
7L7	PENTODE	HTR	6.3	.3	8V-L8	9A	.01* 8.0*	6.5* AMP CL A	250 100	-1.5 -1	100 100	4.5 5.5	1.5 2.4		1 MEG .1 MEG	3100 3000			-5 -5	7L7
7N7	TWIN TRIODE	HTR	6.3	.3	8AC-L8	9B	3.0L* 3.0R* 2.9R*	2.0L* CL A 1 SECT 2.4R*	250 90	-8 0		9 10		20 20	7700 6700	2600 3000				7N7
7Q7	HEPTODE	HTR	6.3	.3	8AL-L8	9A	.2* 9.0*	9.0* MIXER	OSC GRID RES - .02 MEG 250	-2	100	3.5	8.5		5ma 1.0MEG	550C			-35	7Q7
7R7	DUO-DI PENTODE	HTR	6.3	.3	8AE-L8	9A	.004 5.6	5.3 AMP CL A	250 100	-1 -1	100 100	5.7 5.5	1.7 2.0		1.0MEG .35MEG	3200 3000			-20 -16	7R7
7S7	TRI. HEX	HTR	6.3	0.30	8AR-L8	9A	0.04 5.5	7.0 OSC-TRIODE MIXER HEX	250S 250	.05MEG -2	100	5.0 1.7	2.2		TRIODE PLATE RESISTOR .02 MEG 2 MEG	600C			-21	7S7
7T7	PENTODE	HTR	6.3	0.3	8V-L8	9A	0.005 7.5	5.5 AMP CL A	250 100	-1 -1	150 100	10.8 5.3	4.1 2.1		0.9MEG 0.3MEG	4900 4000			-5.5 -4.0	7T7
7V7	PENTODE	HTR	6.3	0.45	8V-L8	9A	0.004 9.5	6.5 HIGH FREQ AMPLIFIER	300	-2	150	9.6	3.9		.3 MEG	5800			-6	7V7
7W7	PENTODE	HTR	6.3	0.45	8B1-L8	9A	0.0025 9.5	7.0 HIGH FREQ AMPLIFIER	300 300	-2 -2	150 300	10.0 THRU .04 MEG	3.9		.3 MEG	5800			-6 -14	7W7
7Y4	TWIN DI	HTR	6.3	.5	5AB-L8	9A		F W RECT	325 RMS MAX COND IN 60 DC MAX 450 RMS MAX CHOKE IN 60 DC MAX											7Y4
7Z4	TWIN DI	HTR	6.3	0.90	5AB-L8	9B		F W RECT	325 RMS MAX COND IN 100 DC MAX 450 RMS MAX CHOKE IN 100 DC MAX											7Z4
10	TRIODE	FIL	7.5	1.25	4D-SM4	16B	7 4	3 POWER AMP CLASS A	425 350	-39 -22.0		18 10	8 8	5000 8000	1600 1330	1.8 0.4	10200 13000			10
12A	TRIODE	FIL	5.0	.25	4D-SM4B	14D	7.5 4.0	3.0 AMPLIFIER CLASS A	180 135	-13.5 -9		7.7 6.2	8.5 8.5	4700 5100	1800 1650	.285 .130	10650 9000			12A

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TYPE	DESIGN	CATHODE TYPE	HTR OR FIL VOLTS	BASING DATA	MAX SIZE VIEW	CAPACITIES			USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE	
						G-P mmfds	IN mmfds	OUT mmfds														
12A5	PENTODE	HTR	12.6 or 6.3	7F-SS7	12B				POWER AMP CLASS A	180 100	-25 -15	180 100	45 17	8 3	35000 50000	2400 1700	3.4 .08	3300 4500			12A5	
12A6CT	BEAM PWR AMP	HTR	12.6	7AC-OGT7	9H	0.6	9.0	9.0	AMPLIFIER CLASS A	250	-12.5	250	30	3.5		3000	3.0	7500			12A6CT	
12A7	DIODE PENTODE	HTR	12.6	7K-SS7	12H				H W RECT AMP CL A	125 RMS MAX 135	-13.5	135	9	2.5	TUBE DROP 15v AT 60mc DC		.55	13500			12A7	
12A8GT	HEPTODE	HTR	12.6	8A-OW8	9F	2.6*	9.5*	12*	OSC SECT MIXER	250S 100 250 100	.05MEG .05MEG -3 -1.5	100 50	4.0 3.5 1.1	2.7 1.3	GRID #2 RES .02 MEG						12A8GT	
12AH7CT	TWIN TR	HTR	12.6	8BE-OGT8	9D	3.0L 2.2R	2.9L 3.2R	2.6L 3.0R	CL A 1 SECT	250 100	-9 -3.6		12 3.7	16 16	6600 10300	2400 1550						12AH7CT
12B8GT	TRIODE PENTODE	HTR	12.6	8T-OGT8	9L	2.3 0.15	5.0 5.2	6.3 9.6	AMP TRIODE CLASS A AMP PENT CLASS A	100 90 100 90	-1 0 -3 -3	100 90	0.6 2.8 8 7	110 90 360 360	73000 37000 .17MEG .20MEG	1500 2400 2100 1800						12B8GT
12C8	DUO-DI PENTODE	HTR	12.6	8E-OW7	8F	.005	6	9	AMPLIFIER CLASS A	250 100	-3 -3	125 100	10 5.8	2.3 1.7	6 MEG .3 MEG		1325 950					12C8
12E5GT	TRIODE	HTR	12.6	6Q-OGT6	9E	2.8	3.8	2.6	AMP CL A	250 100	-13.5 -5		5.0 2.5	13.8 13.8	9500 12000	1450 1150						12E5GT
12F5GT	TRIODE	HTR	12.6	5M-OW5	9J	2.0*	6*	12*	AMPLIFIER CLASS A	250 100	-2 -1		0.9 0.4	100 100	66000 85000	1500 1150						12F5GT
12H6	DUO DI	HTR	12.6	7Q-OW7	8C	3.0	3.4	0.10	DETECTOR	450 MAX					8 MAX EACH DIODE							12H6
12J5GT	TRIODE	HTR	12.6	6Q-OW6	9H	3.8*	4.2*	5.0*	AMPLIFIER CLASS A	250 90	-8 0		9.0 10.0	20 20	7700 6700	2600 3000						12J5GT
12J7GT	PENTODE	HTR	12.6	7R-OW7	9F	.005*	4.6*	12*	AMP CL A PENT CONN TRI CONN	250 100 250	-3 -3 -8	100 100	2.0 2.0 6.5	0.5 0.5	1.5MEG 1.0MEG	1225 1185						12J7GT
12K7GT	PENTODE	HTR	12.6	7R-OW7	9F				AMPLIFIER CLASS A	250 250 100	-3 -3 -1	125 100 100	10.5 7.0 9.5	2.6 1.7 2.7	.6 MEG .8 MEG .15MEG	1650 1450 1650						12K7GT
12K8GT	TRIODE HEXODE	HTR	12.6	8K-OW8	9GA	.08*	4.6*	4.8*	OSC TRIODE MIXER HEX	100 250 100	.05MEG -3 -3	100 100	3.8 2.5 2.3	6.0 6.2	3000 350C 4 MEG	325C						12K8GT
12L8GT	TWIN PENTODE	HTR	12.6	8BU-OGT8	9H	0.7	5.0	6.0	POWER AMP CLASS A	180	-9	180	13	2.4	0.16MEG	2150	1.0	10000				12L8GT
12Q7GT	DUO-DI TRIODE	HTR	12.6	7V-OW7	9F	1.6*	2.2*	5*	AMPLIFIER CLASS A	250 100	-3 -1.0		1.0 0.8	70 70	58000 58000	1200 1200						12Q7GT
12SA7 12SA7CT/G	HEPTODE	HTR	12.6	8R-OW8 8AD-OW8	8E 9E	.13 .20	9.5 11.0*	12 12.0*	OSC SECT MIXER	OSC GRID RES - .02 MEG 250	-2 -2	100 100	3.5 3.5	8.5	OSC GRID CUR - .5mc 1.0MEG 450C							12SA7 12SA7CT/G
12SC7	TWIN TRI	HTR	12.6	8S-OW8	8E				AMP CL A 1 SEC	250	-2		2	70	53000	1925						12SC7
12SF5 12SF5CT	TRIODE	HTR	12.6	6AB-OW6 6AB-OGT6	8E 9H	2.6 2.6*	4.2 4.2*	3.8 3.8*	AMPLIFIER CLASS A	250 100	-2 -1		0.9 0.4	100 100	66000 85000	1500 1150						12SF5 12SF5CT

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TYPE	DESIGN	CATHODE		BASING DATA	MAX SIZE VIEW	CAPACITIES			USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
		HTR OR FIL TYPE	HTR VOLTS			G-P mmfd	IN mmfd	OUT mmfd													
12SF7	DIODE PENTODE	HTR	12.6	0.15	7AZ-OW8	8E	0.004	5.5	6.5	AMP CL A	250	125	12.4	3.3	0.7MEG	2050				-35	12SF7
12SC7	PENTODE	HTR	12.6	0.15	8BK-OW8	8E	0.003	8.5	7.0	AMP CL A	250	125	11.8	4.4	0.9MEG	4700				-14	12SC7
12SH7	PENTODE	HTR	12.6	0.15	8BK-OW8	8E	0.003	8.5	7.0	AMP CL A	250	100	10.8	4.1	0.9MEG	4900				-5.5	12SH7
12SJ7	PENTODE	HTR	12.6	.15	8N-OW8	8E	.005	6.0	7.0	AMPLIFIER CLASS A	250	100	3.0	0.8	1.5MEG	1650				-9	12SJ7
12SK7	PENTODE	HTR	12.6	.15	8N-OW8	8E	.005	6.0	7.0	AMPLIFIER CLASS A	250	100	9.2	2.6	0.8MEG	2000				-35	12SK7
12SK7GT/G	PENTODE	HTR	12.6	0.15	8N-OW8	9E	.005	6.5	7.5	AMPLIFIER CLASS A	250	100	13.0	4.0	.12MEG	2350				-35	12SK7GT/G
12SL7GT	TWIN TRI	HTR	12.6	0.15	8BD-OGT8	9H				CL A 1 SECT	250		2.3		44000	1600					12SL7GT
12SN7GT	TWIN TRI	HTR	12.6	0.3	8BD-OGT8	9H	4L 4R	3.2L 3.8R	3.4L 2.6R	CL A 1 SECT	250		9		7700	2600					12SN7GT
12SQ7	DUO-DI TRIODE	HTR	12.6	.15	8Q-OW8	8E	1.8	4.2	3.4	AMPLIFIER CLASS A	250		0.9		91000	1100					12SQ7
12SR7	DUO-DI TRIODE	HTR	12.6	.15	8Q-OW8	9E				AMPLIFIER CLASS A	100		0.4		110000	900					12SR7
12SR7GT	DIODE	HTR	12.6	.3	4G-SS4	12B	2.3*	3.5*	3.8*	AMP CL A	250		9.5		8500	1900					12SR7GT
12Z3	TRIODE	HTR	12.6	0.15	5AC-L8	9A	4.0	3.4	3.0	H W RECT	235		55		TUBE DROP 17v AT 110ma DC						
14A4	PENTODE	HTR	12.6	0.15	6AA-L8	9B				AMP CL A	250		9		7700	2600					14A4
14A5	PENTODE	HTR	12.6	0.15	8V-L8	9A	0.005*	5.5*	7.0*	POWER AMP CLASS A	250		30	3.5	50000	3000					14A5
14A7/12B7	PENTODE	HTR	12.6	.15	8V-L8	9A				AMP CL A	250		9.2	2.6	.8 MEG	2000					14A7/12B7
14AF7	TWIN TRI	HTR	12.6	0.150	8AC-L8	9A	2.3L 2.3R	2.2L 2.2R	1.6L 1.6R	CL A 1 SECT	250		9.0		7600	2100					14AF7
14B6	DUO-DI TRIODE	HTR	12.6	0.15	8W-L8	9A				DETECTOR AMPLIFIER	250		0.9		91000	1100					14B6
14B8	HEPTODE	HTR	12.6	0.15	8X-L8	9A	0.20	10	9.0	OSC SECT MIXER	250		4.0		.36MEG	550C				-35	14B8
14C5	BEAM PWR AMP	HTR	12.6	0.225	6AA-L8	9B				PR AMP CL A CL AB 2 TUBE	315		34	2.2	77000	3750					14C5
14C7	PENTODE	HTR	12.6	0.15	8V-L8	9A	0.007	6.0	6.5	AMP CL A	250		2.2	0.7	1 MEG	1575				-9	14C7
14E6	DUO-DI TRIODE	HTR	12.6	0.15	8W-L8	9A				AMP CL A	250		9.5		8500	1900					14E6
14E7	DUO-DI PENTODE	HTR	12.6	0.15	8AE-L8	9A	0.005	4.6	5.3	DETECTOR AMPLIFIER	250		7.5	1.6	0.7MEG	1300				-42.5	14E7
14F7	TWIN TRI	HTR	12.6	0.15	8AC-L8	9A				CL A 1 SECT	250		2.3	0.65	44000	1600					14F7
14H7	PENTODE	HTR	12.6	.15	8V-L8	9A	.007*	8.0*	7.0*	AMP CL A	250		9.5	3.5	.8 MEG	3800				-19	14H7

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TYPE	DESIGN	CATHODE TYPE	HTR OR FIL VOLTS	AMP	BASING DATA	MAX SIZE VIEW	CAPACITIES			USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
							G-P mmfd	IN mmfd	OUT mmfd													
14J7	TRI HEX	HTR	12.6	0.15	8AR-L8	9A	0.01	5.5	7.5	OSC-TRIODE MIXER HEX	250S 250	-.3	100	5.4 1.3	2.9		TRIODE PLATE RESIS 300C		.02 MEG	-20	14J7	
14N7	TWIN TRI	HTR	12.6	0.30	8AC-L8	9B	3.0R 3.0L	2.9R 3.4R	2.4R 2.0L	CL A 1 SECT	250 90	-8 0		9 10		20 20	7700 6700	2600 3000			14N7	
14Q7	HEPTODE	HTR	12.6	0.15	8AL-L8	9A	.2	9.0	9.0	OSC SECT MIXER	OSC GRID RESIS 250	-2	100	3.5	8.5		1.0MEG	550C			-35	14Q7
14R7	DUO-DI PENTODE	HTR	12.6	0.150	8AE-L8	9A	0.004	3.6	5.3	AMP CL A	250 100	-1 -1	100 100	5.7 5.5	1.7 2.0	1.0 0.35	3200 3000			-20 -16	14R7	
14S7	TRI HEX	HTR	12.6	0.15	8AR-L8	9A	0.02	5.0	8.0	OSC-TRIODE MIXER	250	-2	100	5.0	3.0		TRIODE PLATE RESIS 525C		.02 MEG	-21	14S7	
14V7	PENTODE	HTR	12.6	0.225	8V-L8	9A	0.004	9.5	6.5	HI FREQ AMP	300	-2	150	9.6	3.9	3 MEG	5800			-6	14V7	
14W7	PENTODE	HTR	12.6	0.225	8BJ-L8	9A	0.0025	9.5	7.0	AMP CL A	300 300	-2 -2	150 300	10.0 THRU .04 MEG	3.9	3 MEG	5800		(OTHER VALUES SAME AS ABOVE)	-6 -14	14W7	
14Y4	TWIN DI	HTR	12.6	0.3	5AB-L8	9B				F W RECT	325 RMS MAX COND IN 60 DC MAX 450 RMS MAX CHOKE IN 60 DC MAX										14Y4	
15	PENTODE	HTR	2.0	.22	5F-SS5	12H	.01*	2.4	7.8	AMPLIFIER CLASS A	135 67.5	-1.5 -1.5	67.5 67.5	1.85 1.85	0.3 .3	600 450	8 MEG .63MEG	750 710				15
19	TWIN TR	FIL	2.0	.26	6C-SS6	12B				CLASS B TWO SECT	135	0 -6		10 NO SIG 0.1 NO SIG				2.1 1.6	10000 10000			19
20	TRIODE	FIL	3.3	.132	4D-SS4	9Q	4.1	2.0	2.3	PR AMP CL A	135	-22.5		6.5	3.3	6300	525	.11	6500			20
22	TETRODE	FIL	3.3	.132	4K-SM4	14E	.02*	3.3	12	AMP CL A	135	-1.5	67.5	3.7	1.3	.33MEG	500					22
24A 24S	TETRODE	HTR	2.5	1.75	5E-SM5 5E-SM5	14E	.007*	5.3	10.5	AMPLIFIER CLASS A	250 180	-3 -3	90 90	4 4	1.7 1.7	630 400	.6 MEG .4 MEG	1050 1000				24A 24S
25A6 25A6G 25A6GT	PENTODE	HTR	25	.3	7S-OW7 7S-OM7 7S-OW7	8H 14C 9H				AMPLIFIER CLASS A	160 135 95	-18 -20 -15	120 135 95	33 37 20	6.5 8 4	42000 35000 45000	2375 2450 2000	2.2 2.0 0.9	5000 4000 4500			25A6 25A6G 25A6GT
25A7GT/G	DIODE PENTODE	HTR	25	.3	8F-OGT8	14C 9H				H W RECT AMP CL A	117 RMS MAX 100	-15	100	75 DC MAX 20.5	4	90	50000	1800	.77	4500		25A7GT/G
25AC5C 25AC5CT	TRIODE	HTR	25	.3	6Q-OS6 6Q-OGT6	12K 9H				DIR CPD AMP	110 FROM DRIVER			45				2	2000			25AC5C 25AC5CT
25B5	DUO-TRI	HTR	25	0.3	6AS-SS6	14D				DIR CPD AMP 2 TUBES CL A	180	-20		5.8 46			15200	2300	3.8	4000		25B5
25B6G	PENTODE	HTR	25	.3	7S-OM7	14C				POWER AMP CLASS A	200 135 105	-23 -22 -16	135 135 105	62 61 48	1.8 2.5 2.0	18000 15000 15500	5000 5000 4800	7.1 4.3 2.4	2500 1700 1700			25B6G
25B8CT	TRIODE PENTODE	HTR	25	.15	8T-OGT8	9L				CL A TRIODE CL A PENTODE	100 100	-1 -3	100	0.6 7.6	2.0	.08MEG .19MEG	1500 2000			-2.5 -41		25B8CT
25C6G	BM PWR	HTR	25	.3	7AC-OM7	14C				POWER AMP CLASS A	200 135	-14 -13.5	135 135	61 58	2.2 3.5	18300 9300	7100 7000	6.0 3.6	2600 2000			25C6G
25D8CT	DIODE TRIODE PENTODE	HTR	25	0.15	8AU-OGT8	9HA	2.5 0.015	3.7 5.2	4.5 10	DETECTOR CL A TRIODE CL A PENTODE	100 100	-1 -3	100	0.5 8.5	2.7	100	91000 0.2MEG	1100 1900			-35	25D8CT

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TYPE	DESIGN	CATHODE		BASING DATA	MAX SIZE VIEW	CAPACITIES		USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
		TYPE	HTR OR FIL VOLTS			G-P mmfd	IN mmfd													
25L6 25L6CT/G	BEAM PWR AMP	HTR	25	.3	7AC-OW7 7AC-OGT7	8H 9H		POWER AMP CLASS A	110 200	-7.5 -8.0	110 110	49 50	4 1.5		10000 35000	8200 8250	2.1 4.3	2000 3000		25L6 25L6CT/G
25X6CT	TWIN DIODE	HTR	25	0.15	7Q-OGT7	9H		H W RECT V DOUBLER	250 RMS MAX 125 RMS MAX			60 DC MAX 60 DC MAX								25X6CT
25Y4CT	DIODE	HTR	25	0.15	5AF-OGT7	9H		H W RECT	125 RMS MAX			75 DC MAX								25Y4CT
25Y5	TWIN DIODE	HTR	25	.3	6E-SS6	12B		H W RECT V DOUBLER	250 RMS MAX 117 RMS MAX			85 DC MAX 85 DC MAX								25Y5
25Z4CT	DIODE	HTR	25	0.3	5AF-OGT7	9H		H W RECT	125 RMS MAX			125 DC MAX								25Z4CT
25Z5 25Z6 25Z6CT/G	TWIN DIODE	HTR	25	.3	6E-SS6 7Q-OW7 7Q-OGT7	12B 8H 9H		H W RECT V DOUBLER	235 RMS MAX 117 RMS MAX			75 DC MAX 75 DC MAX								25Z5 25Z6 25Z6CT/G
26	TRIODE	FIL	1.5	1.05	4D-SM4	14D	8.1	AMP CL A	180	-14.5		6.2		8.3	7300	1140				26
27 27S	TRIODE	HTR	2.5	1.75	5A-SS5 5A-SS5	12B	3.3	AMPLIFIER CLASS A	250 135	-21 -9		5.2 4.5		9 9	9250 9000	975 1000				27 27S
28D7	TW PENT	HTR	28	0.40	8BS-L8	9B		PR AMP CL A	28	-3.5	28	12.5	1.0		3000	3000	.1	4000		28D7
28Z5	TWIN DI	HTR	28	0.24	6BJ-L8	9B		FULL WAVE RECTIFIER	325 RMS MAX 450 RMS MAX			IN 100 DC MAX IN 100 DC MAX								28Z5
30	TRIODE	FIL	2.0	.06	4D-SS4	12B	6.0	AMP CL A BIAS DET	180 180	-13.5 -18		3.1 0.2	9.3 WITH NO SIGNAL		10300	900				30
31	TRIODE	FIL	2.0	.13	4D-SS4	12B	5.7	AMPLIFIER CLASS A	180 135	-30 -22.5		12.3 8		3.8 3.8	3600 4100	1050 925	.375 .185	5700 7000		31
32	TETRODE	FIL	2.0	.06	4K-SM4	14E	.015*	AMPLIFIER CLASS A	180 135	-3 -3	67.5 67.5	1.7 1.7	0.4 0.4	780 610	1.2MEG .95MEG	650 640				32
32L7CT	DIODE BM PWR	HTR	32.5	.3	8Z-OGT8	9H		H W RECT POWER AMP CLASS A	125 RMS MAX 110 90	-7.5 -7	110 90	27 2	3		15000 17000	6000 4800	1.5 1.0	2500 2600		32L7CT
33	PENTODE	FIL	2.0	.26	5K-SM5	14D		POWER AMP CLASS A	180 135	-18 -13.5	180 135	22 14.5	5 3	90 70	55000 50000	1700 1450	1.4 0.7	6000 7000		33
34	PENTODE	FIL	2.0	.06	4M-SM4	14E	.015*	AMPLIFIER CLASS A	180 67.5	-3 -3	67.5 67.5	2.8 2.7	1.0 1.1	620 224	1 MEG 0.4MEG	620 560		-22.5 -22.5		34
35/51 35S/51S	TETRODE	HTR	2.5	1.75	5E-SM5 5E-SM5	14E	.007*	AMPLIFIER CLASS A	250 180	-3 -3	90 90	6.5 6.3	2.5 2.5	420 305	0.4MEG 0.3MEG	1050 1020			-40.0 -40.0	35/51 35S/51S
35A5	BM PWR	HTR	32	.15	6AA-L8	9B		POWER AMP CLASS A	110 200	-7.5 -8.0	110 110	40 41	3.0 2.0		14000 40000	5800 5900	1.5 3.3	2500 4500		35A5
35L6CT/G	BM PWR	HTR	35	.15	7AC-OGT7	9H		POWER AMP CLASS A	110 200	-7.5 -8.0	110 110	40 41	3.0 2.0		13800 40000	5800 5900	1.5 3.3	2500 4500		35L6CT/G
35Y4	DIODE	HTR	35	0.15	5AL-L8	9B		H W RECT LAMP TAP	235 RMS MAX			100 DC MAX	or 60 DC MAX							35Y4
35Z3	DIODE	HTR	32	.15	4Z-L8	9B		H W RECT	235 RMS MAX			100 DC MAX								35Z3

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TYPE	DESIGN	CATHODE TYPE	HTR OR FIL VOLTS	FIL AMPS	BASING DATA	MAX SIZE VIEW	CAPACITIES G-P IN OUT mmfd mmfd mmfd	USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
35Z4CT	DIODE	HTR	35	.15	5A-OGT6	9H		H W RECT	235 RMS MAX											35Z4CT
35Z5CT/G	DIODE	HTR TAP	35 7.5	.15 .15	6A-D-OGT6	9H		H W RECT LAMP TAP	235 RMS MAX											35Z5CT/G
35Z6G	TWIN DIODE	HTR	35	.3	7Q-OM7	14C		H W RECT V DOUBLER	235 RMS MAX 117 RMS MAX											35Z6G
36	TETRODE	HTR	6.3	.3	5E-SS5	12H	.007*	AMP CL A BIAS CL A	250 250	-3 -8	90 90	3.2 0.1	1.7 WITH NO SIGNAL	595 WITH NO SIGNAL	.55MEG	1080				36
37	TRIODE	HTR	6.3	.3	5A-SS5	12B	2.0	AMP CL A BIAS DET	250 250	-18 -28		7.5 .2	9.2 WITH NO SIGNAL	8400	1100					37
38	PENTODE	HTR	6.3	.3	5F-SS5	12H	.3	POWER AMP CLASS A	250 135	-25 -13.5	250 135	22 9	3.8 1.5	.1 MEG .13MEG	1200 925	2.5 0.55	10000 13500			38
39/44	PENTODE	HTR	6.3	.3	5F-SS5	12H	.007*	AMPLIFIER CLASS A	250 90	-3 -3	90 90	5.8 5.6	1.4 1.6	1.0MEG .38MEG	1050 950				-42.5 -42.5	39/44
40	TRIODE	FIL	5.0	.25	4D-SM4	14D	8.8	AMP CL A	180	-3		0.2		15MEG	200 PL RESISTOR	.25MEG				40
41	PENTODE	HTR	6.3	.4	6B-SS6	12B		POWER AMP CLASS A	315 250	-21 -18	250 250	23.5 32	4.0 5.5	75000 80000	2100 3.4	4.5 7600				41
42	PENTODE	HTR	6.3	.7	6B-SM6	14D		PR AMP CL A CL AB 2 TUBE PUSH-PULL	285 250 375 315	-20 -16.5 -26 -24	285 250 250 285	38 34 34 62	7 6.5 5 12	78000 80000	2550 2500	4.8 3.2 18.5 11	7000 7000 10000 10000			42
43	PENTODE	HTR	25	.3	6B-SM6	14D		AMPLIFIER CLASS A	160 135 95	-18 -20 -15	120 135 95	33 37 20	6.5 8 4	42000 35000 45000	2375 2450 2000	2.2 2.0 0.9	5000 4000 4500			43
45	TRIODE	FIL	2.5	1.5	4D-SM4	14D	7	POWER AMP CLASS A CL AB 2 TUBE PUSH-PULL	275 180 275	-56 -31.5 -68		36 31 28	3.5 3.5	1700 1650	2050 2125	4600 2700 3200				45
45Z3	DIODE	HTR	45	0.075	5A-M-MB7	5B		H W RECT	117 RMS MAX											45Z3
45Z5CT	DIODE	HTR	45	.15	6A-D-OGT6	9H		H W RECT LAMP TAP	235 RMS MAX											45Z5CT
46	DUAL GRID TRIODE	FIL	2.5	1.75	5C-SM5	16B	G2 TIED TO P G1 TIED TO G2	PR AMP CL A PR AMP CL B 2 TUBES	250 400 300	-33 0 0		22 12 8	5.6 NO SIGNAL NO SIGNAL	2380	2350	1.25 20 16	6400 5800 5200			46
47	PENTODE	FIL	2.5	1.75	5B-SM5	16B		PR AMP CL A	250	-16.5	250	31	6	60000	2500	2.7	7000			47
48	PENTODE	HTR	30	.4	6B-SM6	16B		PR AMP CL A	125	-20	100	56	9.5		3900	2.5	1500			48
49	DUAL GRID TRIODE	FIL	2.0	.12	5C-SM5	14D	G2 TIED TO P G1 TIED TO G2	PR AMP CL A PR AMP CL B 2 TUBES	135 180 135	-20 0 0		6 4 2.6	4.7 NO SIGNAL NO SIGNAL	4175	1125	.17 3.5 2.3	11000 12000 8000			49
50	TRIODE	FIL	7.5	1.25	4D-SM4B	19A		POWER AMP CLASS A	450 350	-84 -63		55 45	3.8 3.8	1800 1900	2100 2000	4.6 2.4	4350 4100			50
50A5	PENTODE	HTR	50	0.15	6A-A-18	9B		PR AMP CL A	200	-8	110	50	1.5	35000	8250	4.7	3000			50A5
50C6G	BM PWR	HTR	50	.15	7A-C-OM7	14C		POWER AMP CLASS A	200 135	-14 -13.5	135 135	61 58	2.2 3.5	18300 9300	7100 7000	6.0 3.6	2600 2000			50C6G
50L6CT	BM PWR	HTR	50	.15	7A-C-OGT7	9H		POWER AMP CLASS A	110 200	-7.5 -8.0	110 110	49 50	4 1.5	10000 35000	8200 8250	2.1 4.3	2000 3000			50L6CT

SEE PAGE 5 FOR DATA CHART REFERENCE NOTES

RAYTHEON

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TYPE	DESIGN	TYPE	CATHODE		MAX SIZE VIEW	BASING DATA	CAPACITIES C-P IN OUT mmfd mmfd mmfd	USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
			HTR OR FIL VOLTS	AMPS																
50Y6GT/G	TWIN DIODE	HTR	50	.15	9H	7Q-OM7		H W RECT V DOUBLER	235 RMS MAX 117 RMS MAX	0	0	43	75 DC MAX 75 DC MAX	5.2	3000	1.5	2000			50Y6GT/G
50Z7G	TWIN DIODE	HTR	50	.15	12E	8AN-OS7		H W RECT V DOUBLER LAMP TAP	117 RMS MAX 117 RMS MAX 2.5v - 150mg PANEL LAMP	0	0	65 DC MAX 85 DC MAX	65 DC MAX 85 DC MAX							50Z7G
52	2 GRID TRIODE	FIL	6.3	.3	14D	5C-SM5	G2 TIED TO P G1 TIED TO G2	PR AMP CL A CL B 2 TUBE	110 180	0	0	3	NO SIGNAL	5.2	1750	3000	1.5 5	2000 16000		52
53	TWIN TRIODE	HTR	2.5	2.0	14D	7B-SM7		POWER AMP CL B 2 SECT	300	0	0	35	MAX SIG PL CUR—70ma (SEE TYPE 6A6 ALSO)			10	8000			53
55	DUC-DI TRIODE	HTR	2.5	1.0	12H	6G-SS6	1.7	AMPLIFIER	250	-20		8	8.3	7500	1100	.3	20000			55
55S	TRIODE	HTR	2.5	1.0	12H	6G-SS6	2.0	CLASS A	135	-10.5		3.7	8.3	11000	750	.075	25000			55S
56	TRIODE	HTR	2.5	1.0	12B	5A-SS5	3.2	AMPLIFIER	250	-13.5		5	13.8	9500	1450					56
56S	TRIODE	HTR	2.5	1.0	12B	5A-SS5	3.2	CLASS A	100	-5		2.5	13.8	12000	1150					56S
56AS	TRIODE	HTR	6.3	.3	12J	5A-SS5	3.2	BIAS DET	250	-20		0.2	WITH NO SIGNAL							56AS
57	PENTODE	HTR	2.5	1.0	12J	6F-SS6	.007*	AMPLIFIER CLASS A	250	-3	100	2	0.5	1500	1225				-7	57
57S	PENTODE	HTR	2.5	1.0	12J	6F-SS6	.007*	AMPLIFIER CLASS A	100	-3	100	2	0.5	1185	1185				-7	57S
57AS	PENTODE	HTR	6.3	.4	12J	6F-SS6	.007*	AMPLIFIER CLASS A	250	-3	100	8.2	2	1280	1600				-50	57AS
58	PENTODE	HTR	2.5	1.0	12I	6F-SS6	5.0	AMPLIFIER CLASS A	250	-3	100	8	2.2	375	1500				-50	58
58S	PENTODE	HTR	2.5	1.0	12I	6F-SS6	5.0	AMPLIFIER CLASS A	100	-3	100	8	2.2	375	1500				-50	58S
58AS	PENTODE	HTR	6.3	.4	12I	6F-SS6	5.0	AMPLIFIER CLASS A	250	-3	100	8	2.2	375	1500				-50	58AS
59	PENTODE	HTR	2.5	2.0	16B	7A-SM7		PR AMP CL A TRI CONN PR AMP CL B G ₁ TO G ₂	250 250 400 0	-18 -28 0 0	250	35	9	100	2500	3	6000			59
70A7GT	DI BEAM PR AMP	HTR	70	.15	9H	8AB-OGT8		H W RECT PR AMP CL A	125 RMS MAX 110	-7.5	110	40	3	80	5800	1.5	2500			70A7GT
70L7GT	DIODE EM PWR	HTR	70	.15	9H	8AA-OGT8		H W RECT PR AMP CL A	125 RMS MAX 110	-7.5	110	40	3		15000	1.8	2000			70L7GT
71A	TRIODE	FIL	5	.25	14D	4D-SM4B		POWER AMP CLASS A	180 90	-40.5 -16.5		20	3	1750	1700	.79	4800			71A
75	DUC-DI TRIODE	HTR	6.3	.3	12H	6G-SS6	1.7	AMPLIFIER CLASS A	250	-2		0.9	100	91000	1100					75
75S	TRIODE	HTR	6.3	.3	12H	6G-SS6	1.7	AMPLIFIER CLASS A	250	-2		0.9	100	91000	1100					75S
76	TRIODE	HTR	6.3	.3	12B	5A-SS5		AMPLIFIER CLASS A	250	-13.5		5	13.8	9500	1450					76
77	PENTODE	HTR	6.3	.3	12H	6F-SS6	.007*	AMPLIFIER CLASS A	250	-3	100	2.3	0.5	1.5MEG	1250				-7.5	77
78	PENTODE	HTR	6.3	.3	12H	6F-SS6	.007*	AMPLIFIER CLASS A	100	-1.5	60	1.7	0.4	0.6MEG	1100				-5.5	78
79	TWIN TR	HTR	6.3	.6	12H	6H-SS6		CL B AMP 2 SECTIONS	250 180	0 0		10.6	NO SIG			8	14000			79
80	TWIN DI	FIL	5.0	2.0	14D	4C-SM4		FULL WAVE RECTIFIER	350 RMS MAX 500 RMS MAX	CHOKE IN 125 DC MAX		85 DC MAX								80
81	DIODE	FIL	7.5	1.25	16B	4B-SM4		H W RECT	700 RMS MAX			85 DC MAX								81

SEE PAGE 5 FOR DATA CHART REFERENCE NOTES

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TYPE	DESIGN	CATHODE TYPE	HTR OR FIL VOLTS	AMPS	BASING DATA	MAX SIZE VIEW	CAPACITIES G-P IN OUT	USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE		
82	TWIN DI	FIL	2.5	3.0	4C-SM4	14D	(MERCURY VAPOR)	FULL WAVE RECTIFIER	450 RMS MAX COND IN 115 DC MAX 550 RMS MAX CHOKO IN 115 DC MAX											82		
83	TWIN DI	FIL	5.0	3.0	4C-SM4	16B	(MERCURY VAPOR)	FULL WAVE RECTIFIER	450 RMS MAX COND IN 225 DC MAX												83	
83V	TWIN DI	HTR	5.0	2.0	4AD-SM4	14D		FULL WAVE RECTIFIER	375 RMS MAX COND IN 175 DC MAX 500 RMS MAX CHOKO IN 175 DC MAX												83V	
84/6Z4	TWIN DI	HTR	6.3	.5	5D-SS5	12B		FULL WAVE RECTIFIER	325 RMS MAX COND IN 80 DC MAX 450 RMS MAX CHOKO IN 60 DC MAX												84/6Z4	
85	DUO-DI TRIODE	HTR	6.3	.3	6G-SS6	12H		AMP CL A	250 -20 180 -13.5		8			8.3	7500	1100 .35	20000				85	
85AS	DUO-DI TRIODE	HTR	6.3	0.3	6G-SS6			AMP CL A	250 -9		5.5			20	8500	975 .16	20000				85AS	
89	PENTODE	HTR	6.3	.4	6F-SS6	12H	G ₂ TIED TO K G ₁ TIED TO G ₂	PENT PR AMP CLASS A CL B 2 TUBE	250 -25 135 -13.5 180 0		32	5.5	125	1800 3.4	70000	1800 3.4	6750				89	
V99 X99	TRIODE	FIL	3.3	.063	4E-SV4 4D-SS4	8A 9Q		AMP CL A BIAS DET	90 -4.5 90 -10.5		2.5		6.6	15500	425							V99 X99
117L/M7GT	DI BEAM PR AMP	HTR	117	.09	8AO-OGT8	9HA		H W RECT PR AMP CL A	117 RMS MAX 105 -5.2 105		75 DC MAX 43 4				TUBE DROP 16v AT 160ma DC						117L/M7GT	
117N7GT	DI BEAM PR AMP	HTR	117	.09	8AV-OGT8	9HA		H W RECT PR AMP CL A	117 RMS MAX 100 -6 100		75 DC MAX 51 6.0				TUBE DROP 16v AT 150ma DC						117N7GT	
117P7GT	DI BEAM PWR AMP	HTR	117	0.09	8AV-OGT8	9HA		H W RECT PR AMP CL A	117 RMS MAX 105 -5.2 105		75 DC MAX 43 4				TUBE DROP 16v AT 50ma DC						117P7GT	
117ZACT	DIODE	HTR	117	0.04	5AA-OGT6 7Q-OGT7	9H		H W RECT RECTIFIER V DOUBLER	117 RMS MAX 117 RMS MAX		90 DC MAX 60 DC MAX 60 DC MAX				TUBE DROP 22.5v AT 180ma DC						117ZACT	
117Z6CT	TWIN DIODE	HTR	117	.075	7Q-OGT7	9H		RECTIFIER	117 RMS MAX		60 DC MAX				TUBE DROP 15.5v AT 125ma DC						117Z6CT	
182B/482B	TRIODE	FIL	5.0	1.25	4D-SM4	14D		PR AMP CL A	250 -35		18		5	1500							182B/482B	
183/483	TRIODE	FIL	5.0	1.25	4D-SM4	14D		PR AMP CL A	250 -58		20		3	1500							183/483	
485	TRIODE	HTR	3.0	1.25	5A-SS5	.12B		AMP CL A	180 -10		5.2		12.8	1300							485	
950	PENTODE	FIL	2.0	.12	5K-SM5	14D		PR AMP CL A	135 -16.5 135		7.0	2.0	100	.1 MEG	1000 .45	13500					950	
BA	TWIN DI	COLD			4J-SM4	19B	GAS FILLED	F W RECT	350 RMS MAX		350 DC MAX				TUBE DROP 80v						BA	
BH	TWIN DI	COLD			4J-SM4	14A	GAS FILLED	F W RECT	350 RMS MAX		125 DC MAX				TUBE DROP 90v						BH	
BR	DIODE	COLD			4H-SM4	12A	GAS FILLED	H W RECT	300 RMS MAX		50 DC MAX				TUBE DROP 60v						BR	
CK1003/ 0Z4A								SEE 0Z4A/1003													CK1003/ 0Z4A	
VR75-30								SEE 0A3/VR75													VR75-30	
VR90-30								SEE 0B3/VR90													VR90-30	
VR105-30								SEE 0C3/VR105													VR105-30	
VR150-30								SEE 0D3/VR150													VR150-30	
XXD	TWIN TRIODE	HTR	12.6	.15	8AC-L8	9A	2.3	2.2	1.6	AMP CL A 1 SEC	250 -10 100 0	9		16	7600	2100					XXD	
XXL	TRIODE	HTR	6.3	.3	5AC-L8	9A	2.0	3.4	2.6	AMP CL A	250 -8 100 0	8	10	20	8700	2300					XXL	

SEE PAGE 5 FOR DATA CHART REFERENCE NOTES

RAYTHEON SPECIAL PURPOSE TUBES

RAYTHEON

TYPE	DESIGN	CATHODE HTR OR FIL TYPE	HTR OR FIL VOLTS	AMPS	BASING DATA	MAX SIZE VIEW	CAPACITIES		USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	AMP FACT	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	CUT OFF VOLTS	TYPE
							G-P mmfd	IN mmfd													
717A	PENTODE	HTR	6.3	0.175	8BK-OGT8	9T	.025	4.8	3.2	AMP CL A	120	-2.0	120	7.5	2.5	.39MEG	4000				717A
954	PENTODE	HTR	6.3	0.15	954	4A	0.007	3.4	3.0	AMP CL A	250	-3	100	2.0	0.7	1.5MEG	1300			-7	954
955	TRIODE	HTR	6.3	0.15	955	4B	1.4	1.0	0.6	AMP OSC	250	-7		6.3	25	11400	2200				955
956	PENTODE	HTR	6.3	0.15	956	4A	0.007	3.4	3.0	AMP CL A	250	-3	100	6.7	2.7	0.7MEG	1800			-45	956
957	TRIODE	FIL	1.25	0.05	957	4B	1.2	0.3	0.7	AMP OSC	135	-5		2.0		24600	650				957
1005/ CK1005	TWIN DIODE	FIL	6.3	0.1	5AQ-OW8	8E				FULL WAVE RECTIFIER	160										1005/ CK1005
1006/ CK1006	TWIN DIODE	COLD FIL	1.75	2.00	4C-SM4	14D				FULL WAVE RECTIFIER	560										1006/ CK1006
CK1007	TWIN DIODE	COLD FIL	1.0	1.2	1007-OW6	8E				FULL WAVE RECTIFIER	285										CK1007
9001	PENTODE	HTR	6.3	0.15	7BD-MB7	5A	0.01	3.6	3.0	AMPLIFIER CLASS A	250 90	-3 -3	100 90	2.0 1.2	0.7 0.5	1.5MEG 1.0MEG	1400 1100			-8 -6	9001
9002	TRIODE	HTR	6.3	0.15	6BG-MB7	5A	1.4	1.2	1.1	AMP OSC	250 90	-7 -2.5		6.3 2.5	25 25	11400 14700	1700				9002
9003	PENTODE	HTR	6.3	0.15	7BD-MB7	5A	0.01	3.4	3.0	AMP CL A	250	-3	100	6.7	2.7	0.7MEG	1800			-45	9003
9006	DIODE	HTR	6.3	0.15	6BH-MB7	5A	2.0	0.6	3.2	DETECTOR	300 RMS MAX			5ma MAX							9006

RAYTHEON FLAT HEARING AID TUBES

RAYTHEON

TYPE	DESIGN	CATHODE HTR OR FIL TYPE	HTR OR FIL VOLTS	AMPS	BASING DATA	MAX SIZE VIEW	CAPACITIES		USED AS	PLATE VOLTS	GRID VOLTS	SCR VOLTS	PLATE MA	SCR MA	VOLTAGE GAIN	PLATE RESIS OHMS	MUT COND mmho	OUT PUT WATTS	LOAD RESIS OHMS	TUBE WEIGHT OUNCES	TYPE
							G-P mmfd	IN mmfd													
CK502AX	PENTODE	FIL	1.25	0.030	Term Conn. See Max. Size View	3C	.14	3.0	5.7	POWER OUTPUT	45	-1.5	45	.45	.11	.25MEG	500	.006	0.1MEG	.09	CK502AX
CK503AX	PENTODE	FIL	1.25	0.030	Term Conn. See Max. Size View	3C	.1	3.7	6.3	POWER OUTPUT	45	-2.5	45	0.5	.18	.4 MEG	475	.010	0.05MEG	.09	CK503AX
CK505AX	PENTODE	FIL	0.625	0.030	Term Conn. See Max. Size View	3B	.07	2.7	6.2	VOLTAGE AMPLIFIER	30	0	30	.20	.07	.5 MEG	180		1MEG	.07	CK505AX
CK506AX	PENTODE	FIL	1.25	0.050	Term Conn. See Max. Size View	3C	.09	3.5	6.2	POWER OUTPUT	45	-4.5	45	1.25	0.4		500	.025	.03MEG	.09	CK506AX
CK507AX	PENTODE	FIL	1.25	0.050	Term Conn. See Max. Size View	3C	.1	3.7	6.3	POWER OUTPUT	45	-2.5	45	.6	.21	.3 MEG	500	.012	0.05MEG	.09	CK507AX
CK509AX	TRIODE	FIL	0.625	0.030	Term Conn. See Max. Size View	3A	.8	1.7	3.5	VOLTAGE AMPLIFIER	45	0		.15		.15MEG	160		1MEG	.07	CK509AX

† Direct interelectrode capacity measurements made with a low resistance metallic coating applied directly to the bulb and extending to approximately $\frac{1}{8}$ inch from the lead end.

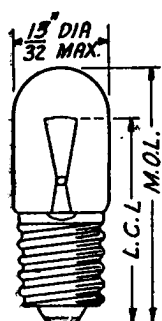
SEE PAGE 5 FOR DATA CHART REFERENCE NOTES

RADIO PANEL LAMPS

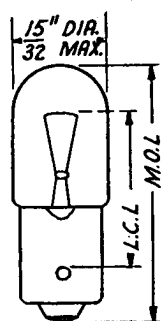
Raytheon Dependable Radio Panel Lamps are of the highest quality and are designed especially to meet the requirements of the renewal market.

TYPE NO.	VOLTS	AMPS.	APPROX. CANDLE POWER	BULB	BASE	BEAD COLOR	LIGHT CENTER LENGTH	MAX. OVERALL LENGTH	TYPE NO.
40	6-8	0.15	0.5	T-3¼	Min. Screw	Brown	$\frac{33}{32}$ "	1½"	40
40-A	6-8	0.15	0.5	T-3¼	Min. Bayonet	Brown	$\frac{33}{32}$ "	1½"	40-A
41	2.5	0.5	0.5	T-3¼	Min. Screw	White	$\frac{33}{32}$ "	1½"	41
42	3.2	0.5	0.75	T-3¼	Min. Screw	Green	$\frac{33}{32}$ "	1½"	42
43	2.5	0.5	0.5	T-3¼	Min. Bayonet	White	$\frac{33}{32}$ "	1½"	43
44	6-8	0.25	0.8	T-3¼	Min. Bayonet	Blue	$\frac{33}{32}$ "	1½"	44
45	3.2	0.5	0.75	T-3¼	Min. Bayonet	Green	$\frac{33}{32}$ "	1½"	45
46	6-8	0.25	0.8	T-3¼	Min. Screw	Blue	$\frac{33}{32}$ "	1½"	46
47	SAME CHARACTERISTICS AS 40A, WITH WHICH IT IS INTERCHANGEABLE								47
48	2.0	0.06	0.03	T-3¼	Min. Screw	Pink	$\frac{33}{32}$ "	1½"	48
49	2.0	0.06	0.03	T-3¼	Min. Bayonet	Pink	$\frac{33}{32}$ "	1½"	49
49-A	2.1	0.12	0.07	T-3¼	Min. Bayonet	White	$\frac{33}{32}$ "	1½"	49-A
50	6-8	0.2	1.0	G-3½	Min. Screw	White	$\frac{33}{32}$ "	1½"	50
51	6-8	0.2	1.0	G-3½	Min. Bayonet	White	$\frac{1}{2}$ "	1½"	51
55	6-8	0.4	1.5	G-4½	Min. Bayonet	White	$\frac{1}{2}$ "	1½"	55
292	2.9	0.17	0.3	T-3¼	Min. Screw	White	$\frac{33}{32}$ "	1½"	292
292-A	2.9	0.17	0.3	T-3¼	Min. Bayonet	White	$\frac{33}{32}$ "	1½"	292-A

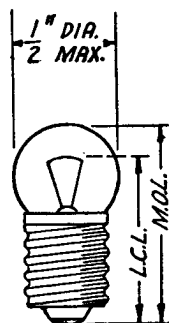
Note: The color of the bead inside the lamp bulb may be used to identify the more common Raytheon types. This information is shown in the column headed "Bead Color."



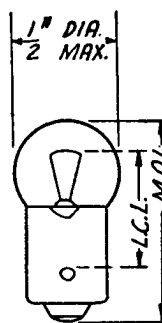
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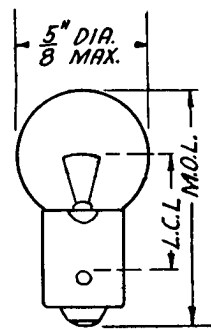
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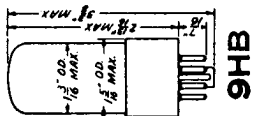
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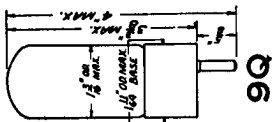
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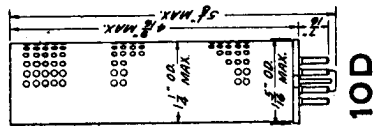
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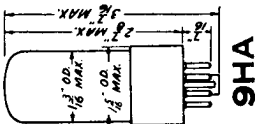
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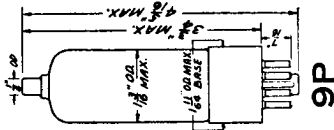
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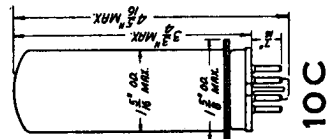
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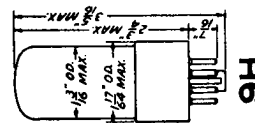
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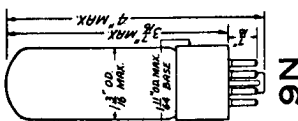
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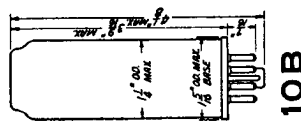
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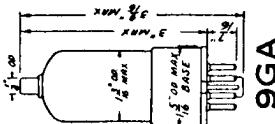
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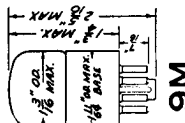
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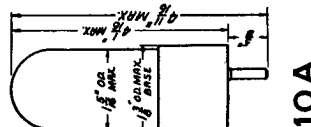
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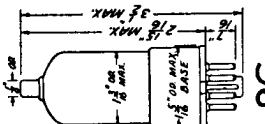
9GA



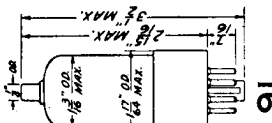
9M



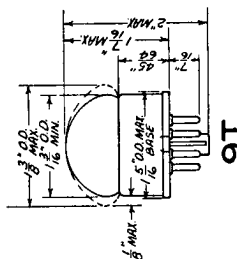
10A



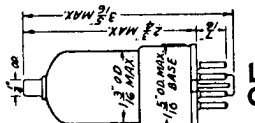
9G



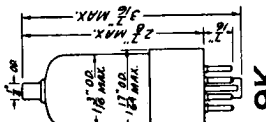
9L



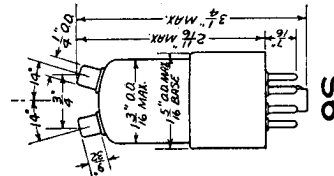
9T



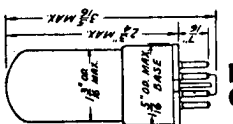
9F



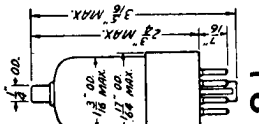
9K



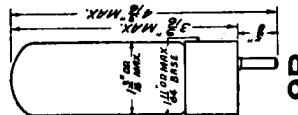
9S



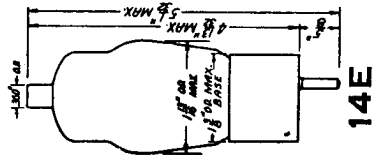
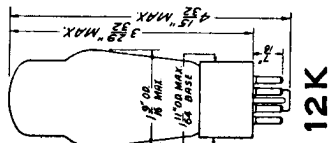
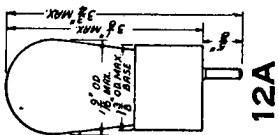
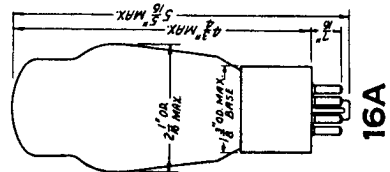
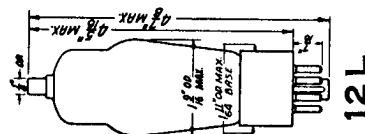
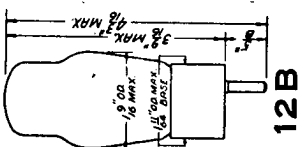
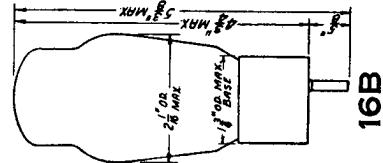
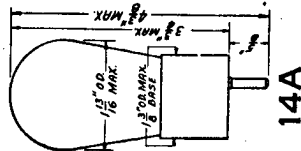
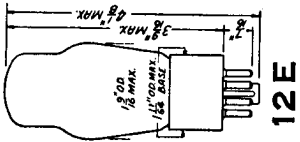
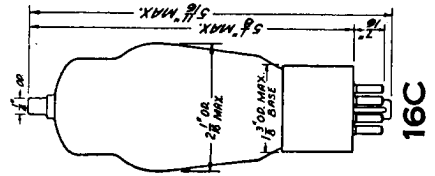
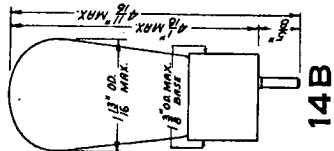
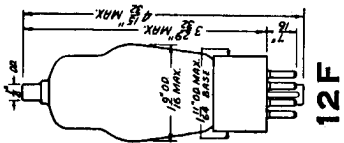
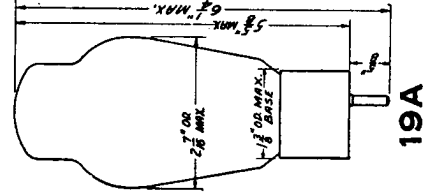
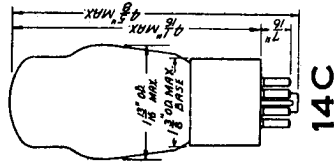
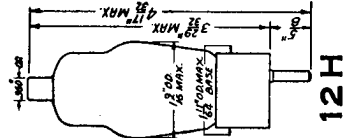
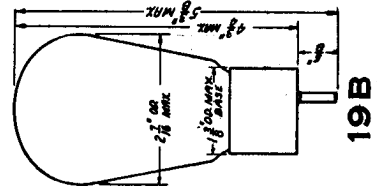
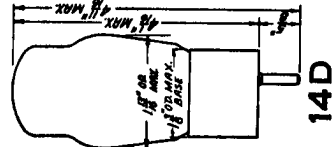
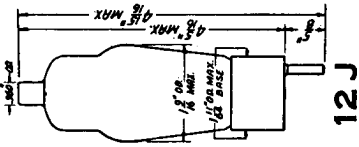
9E



9J



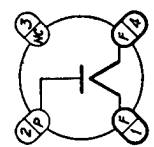
9R



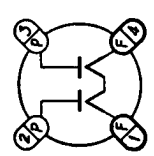
LIST OF SYMBOLS

- A ANODE
- A_s STARTER ANODE
- D DIODE PLATE
- D_b DIODE PLATE—BOTTOM
- DL DIODE PLATE—LEFT
- DR DIODE PLATE—RIGHT
- D_t DIODE PLATE—TOP
- DEF DEFLECTOR PLATES
- Ec CONTROL ELECTRODE
- F FILAMENT
- Ft FILAMENT TAP
- G GRID
- G₁ GRID NO. 1
- G₂ GRID NO. 2
- G₃ GRID NO. 3
- G₄ GRID NO. 4
- G₅ GRID NO. 5
- G₆ GRID NO. 6
- G_{1H} HEPTODE GRID NO. 1
- G_{2H} HEPTODE GRID NO. 2
- G_{3H} HEPTODE GRID NO. 3
- G_{4H} HEPTODE GRID NO. 4
- G_{5H} HEPTODE GRID NO. 5
- G_{1HX} HEXODE GRID NO. 1
- G_{2HX} HEXODE GRID NO. 2
- G_{3HX} HEXODE GRID NO. 3
- G_{4HX} HEXODE GRID NO. 4
- G_{1L} GRID NO. 1—LEFT
- G_{1P} PENTODE GRID NO. 1
- G_{2P} PENTODE GRID NO. 2
- G_{3P} PENTODE GRID NO. 3
- G_{1R} GRID NO. 1—RIGHT
- G_{1N} GRID—INPUT SECT.
- G_L GRID—LEFT
- G_R GRID—RIGHT
- Gt TRIODE GRID
- H HEATER
- Ht HEATER TAP
- IS INTERNAL SHIELD
- K CATHODE
- Kd DIODE CATHODE
- KL CATHODE—LEFT
- Kr CATHODE—RIGHT
- Kp PENTODE CATHODE
- Kr CATHODE—RIGHT
- Kt TRIODE OR TETRODE CATH.
- NC NO CONNECTION
- P PLATE
- Ph HEPTODE PLATE
- P_{HX} HEXODE PLATE
- P_N PLATE—INPUT SECT.
- P_L PLATE—LEFT
- P_O PLATE—OUTPUT SECT.
- Pp PENTODE PLATE
- Pr PLATE—RIGHT
- Pt TRIODE OR TETRODE PLATE
- SH SHELL
- T TARGET
- X_S EXTERNAL SHIELD
- SH DESIGNATION FOR GT TYPES INDICATES METAL BASE SHELL.
- SUBSCRIPTS R & L INDICATE RIGHT & LEFT ELEMENTS WHEN LOOKING DOWN ON TOP OF TUBE WITH LOCATING LUG OF KEY OR FILAMENT PINS AT FRONT.

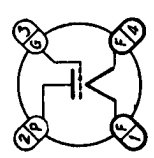
4B



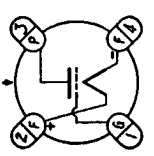
4C



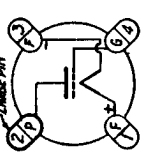
4D



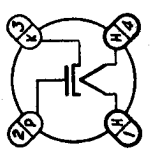
4E



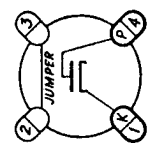
4F



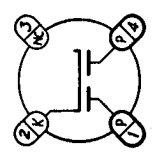
4G



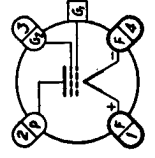
4H



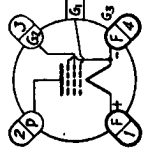
4J



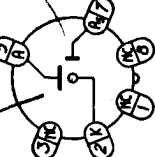
4K



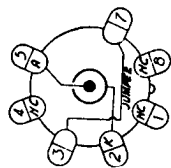
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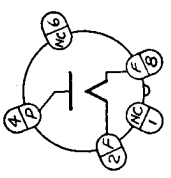
4V



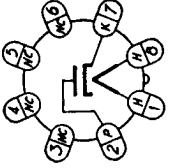
4W



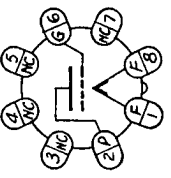
4X



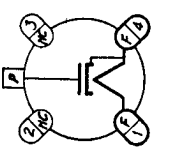
4Z



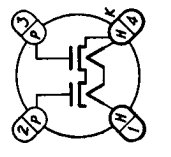
4AA



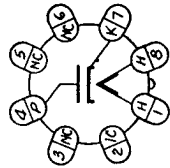
4AB



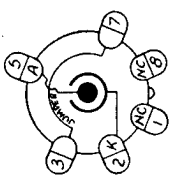
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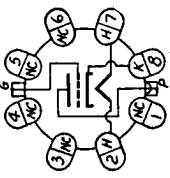
4AH



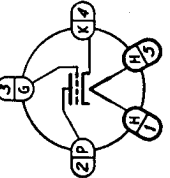
4AJ



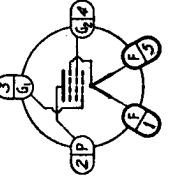
4AM



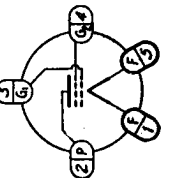
5A



5B



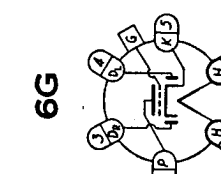
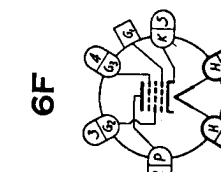
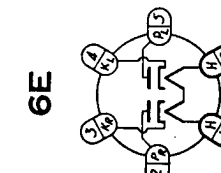
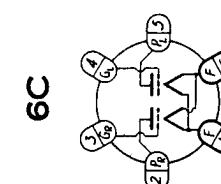
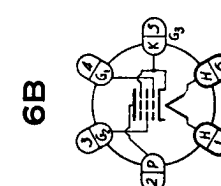
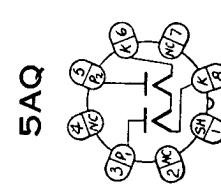
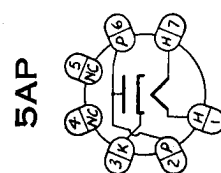
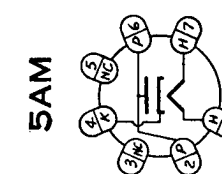
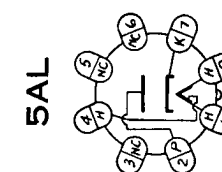
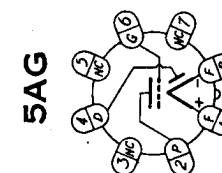
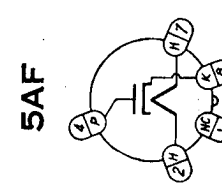
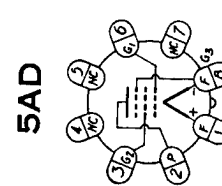
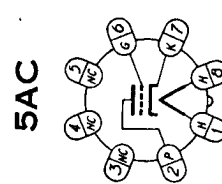
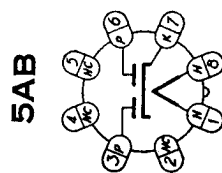
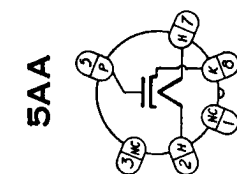
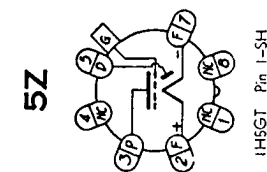
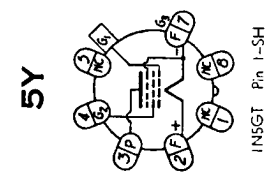
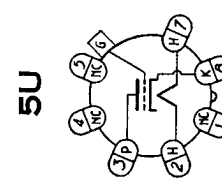
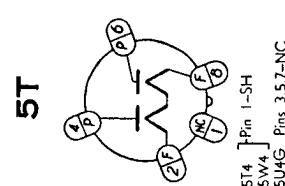
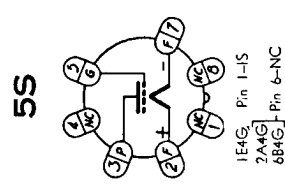
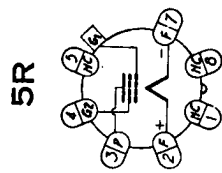
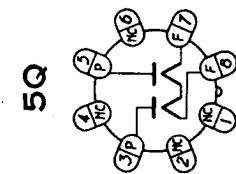
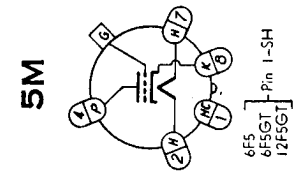
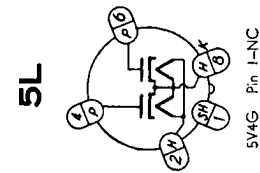
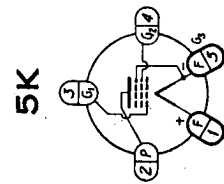
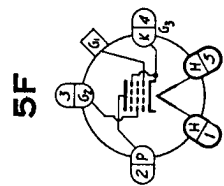
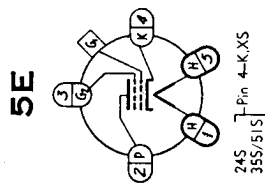
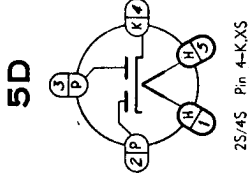
5C



0Z4G—Pin 1—NC
Pin 2—Omitted

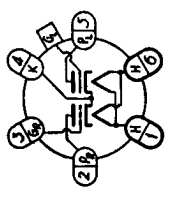
27S—Pin 4—K, X_S
56S—Pin 4—K, X_S
56AS—Pin 4—K, X_S

BASE CONNECTION DIAGRAMS (RMA NUMBERING SYSTEM)
(VIEWED FROM BOTTOM OF BASE)

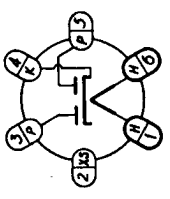


BASE CONNECTION DIAGRAMS
(VIEWED FROM BOTTOM OF BASE) (RMA NUMBERING SYSTEM)

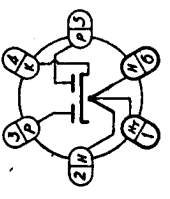
6H



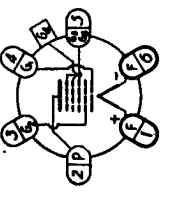
6J



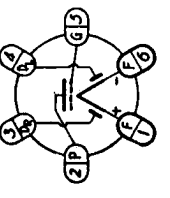
6K



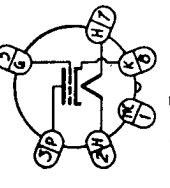
6L



6M

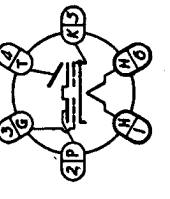


6Q

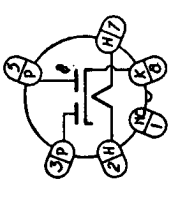


6CS Pin 1-SH
 6J5GT Pin 1-SH
 12Z5GT Pin 1-S
 6CS5G Pin 1-S

6R

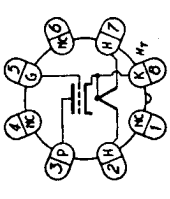


6S

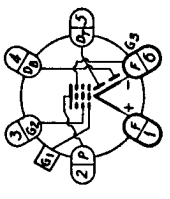


6XS Pin 1-SH

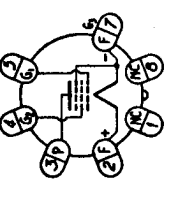
6T



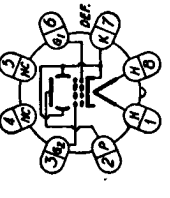
6W



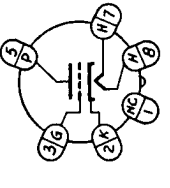
6X



6AA

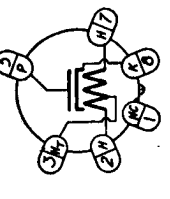


6AB

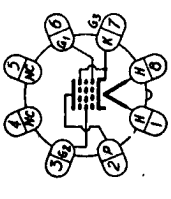


6SFS Pin 1-SH

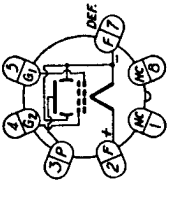
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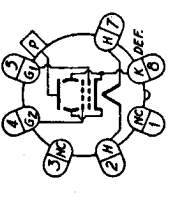
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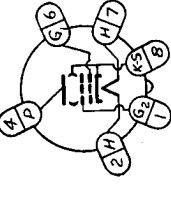
6AF



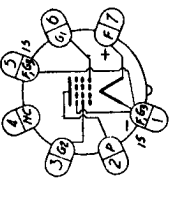
6AM



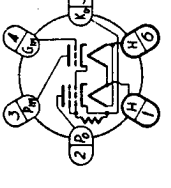
6AP



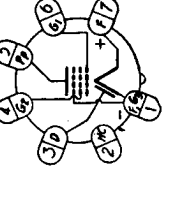
6AR



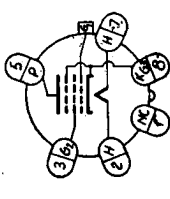
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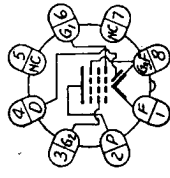
6AU



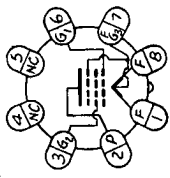
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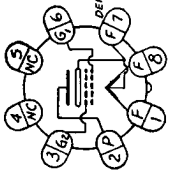
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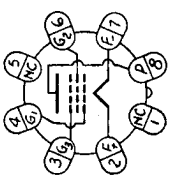
6BA



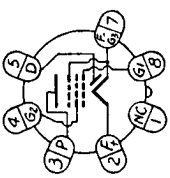
6BB



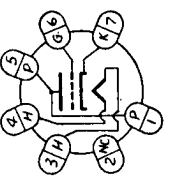
6BD



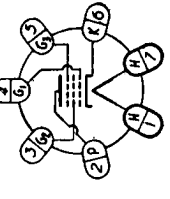
6BE



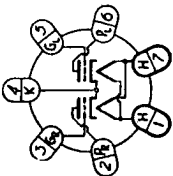
6BG



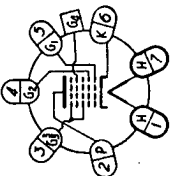
7A



7B

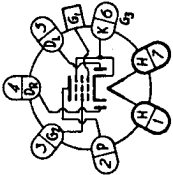


7C



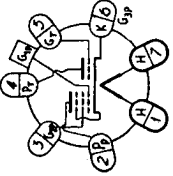
2A7S Pin 6-K, X, S
6A7S

7D



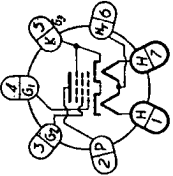
2B7S Pin 6-K, G₁, X, S
6B7S

7E

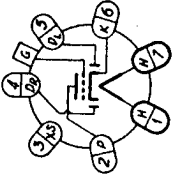


6F7S Pin 6-K, G₁, X, S

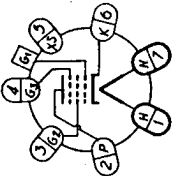
7F



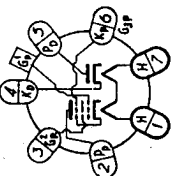
7G



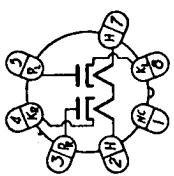
7H



7K

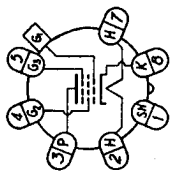


7Q



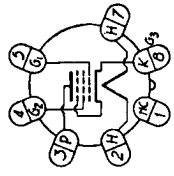
6H6 Pin 1-SHIS
6H6G Pin 1-IS
6H6GT Pin 1-SHIS
25Z6 Pin 1-SH

7R



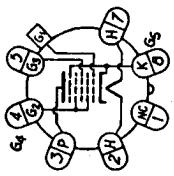
6J7G Pin 1-IS
6K7G Pin 1-IS
6S7G Pin 1-NC
6U7G
6W7G Pin 1-SHIS

7S



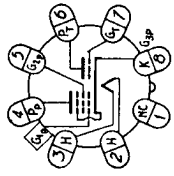
6F6 Pin 1-SH
25A6
25A6G

7T

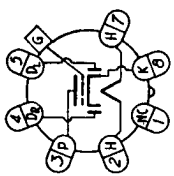


6L7 Pin 1-SH

7U

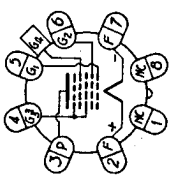


7V



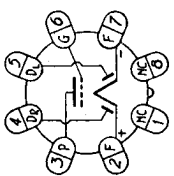
6O7
6O7GT Pin 1-SH
6R7
6R7GT
12O7GT

7Z

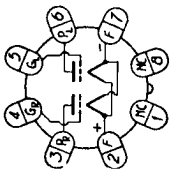


1A7GT Pin 1-SH

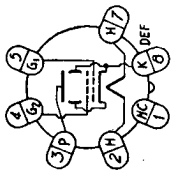
7AA



7AB

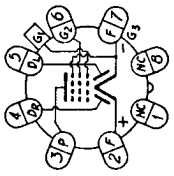


7AC

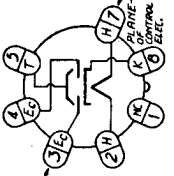


6L5
6V6 Pin 1-SH
25L6

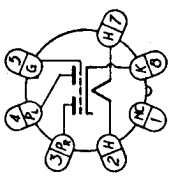
7AD



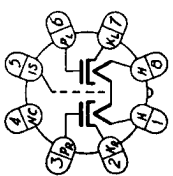
7AG



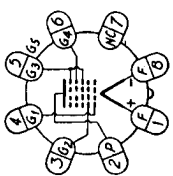
7AH



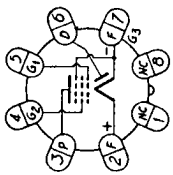
7AJ



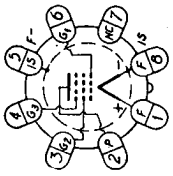
7AK



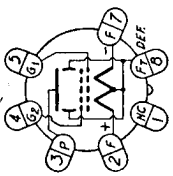
7AM



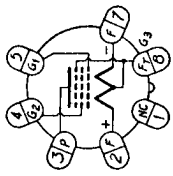
7AO



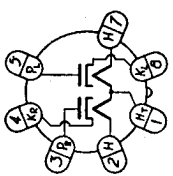
7AP



7AQ

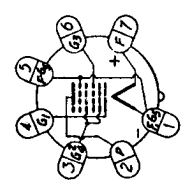


7AR

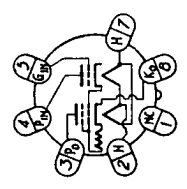


BASE CONNECTION DIAGRAMS
(VIEWED FROM BOTTOM OF BASE) (RMA NUMBERING SYSTEM)

7AT

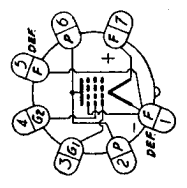


7AU

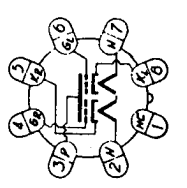


6N6MG Pin 1-SH

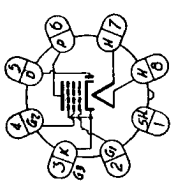
7AV



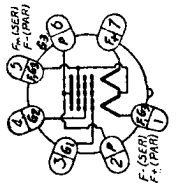
7AX



7AZ

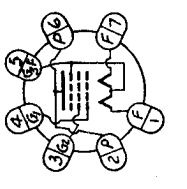


7BA

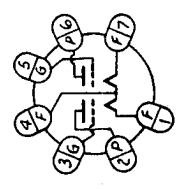


6A5SER1
F-1(PAR)

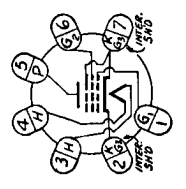
7BB



7BC

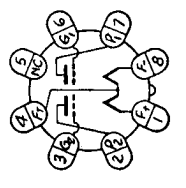


7BD

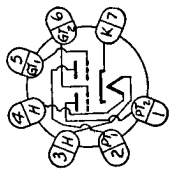


6A5SER1
F-1(PAR)

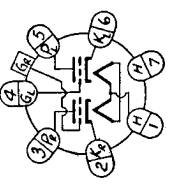
7BE



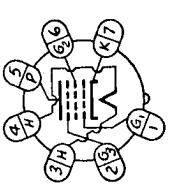
7BF



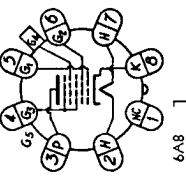
7BH



7BK

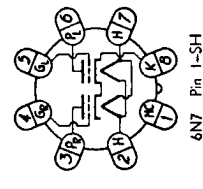


8A



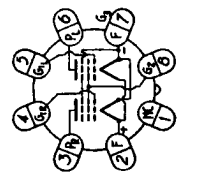
6A8
6A8GT Pin 1-SH
12A8GT

8B

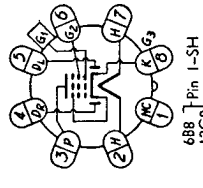


6N7 Pin 1-SH

8C

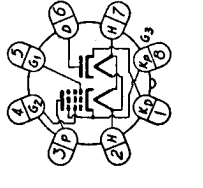


8E

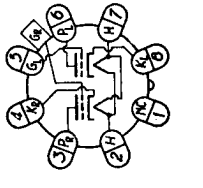


688 Pin 1-SH
12C8

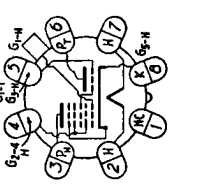
8F



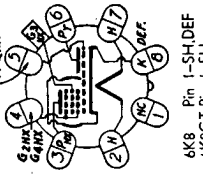
8G



8H

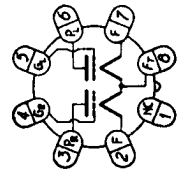


8K

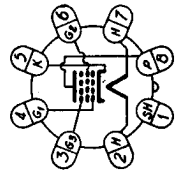


6K8
6K8GT Pin 1-SH,DEF
6K8GT Pin 1-SH

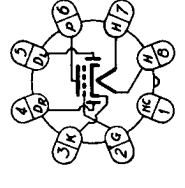
8L



8N

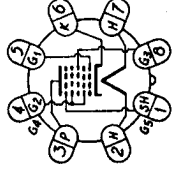


8Q

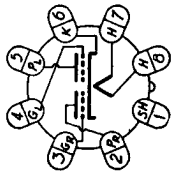


65Q7 Pin 1-SH
125Q7
65R7
65T7

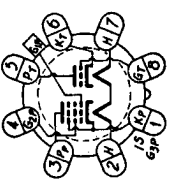
8R



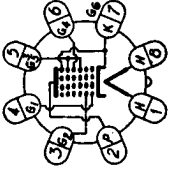
8S



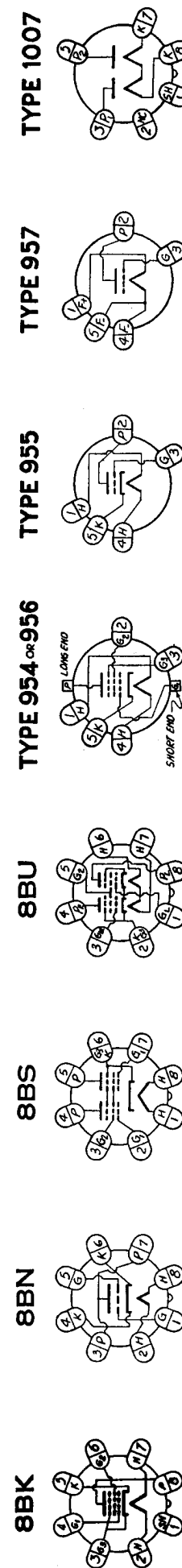
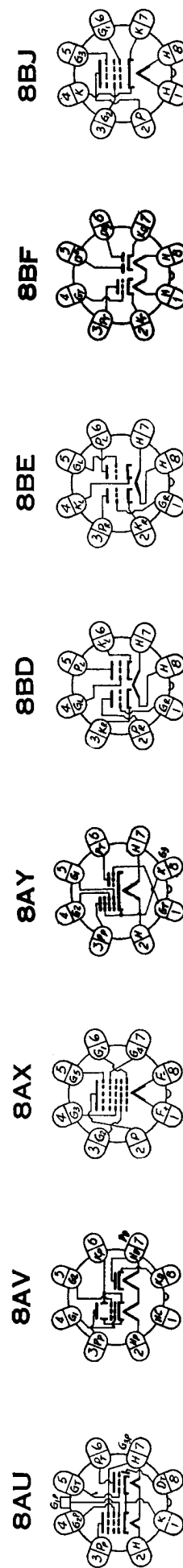
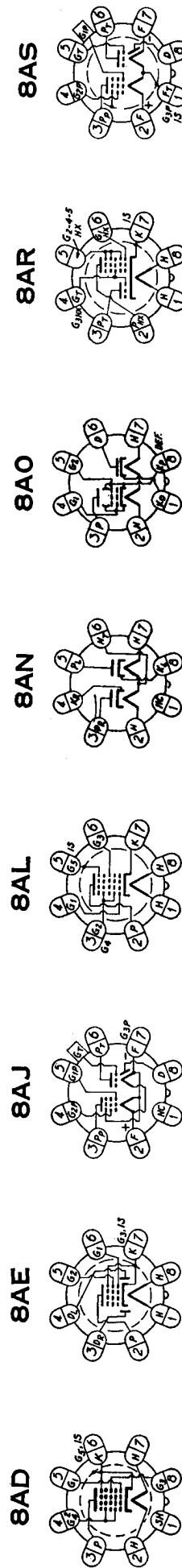
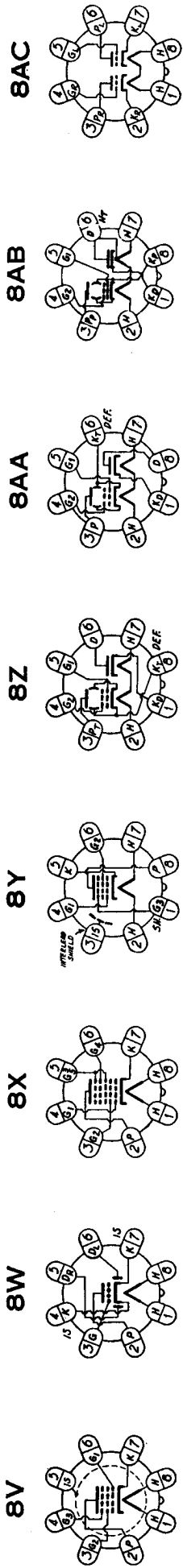
8T



8U



BASE CONNECTION DIAGRAMS
(VIEWED FROM BOTTOM OF BASE) (RMA NUMBERING SYSTEM)



BASE CONNECTION DIAGRAMS
[VIEWED FROM BOTTOM OF BASE] (RMA NUMBERING SYSTEM)

TUBE SUBSTITUTION CHART

Before any tube substitution is attempted, the careful reading of the following explanatory information on the subject is essential.

The substitutions shown in this chart are successful in practically all cases. There conceivably could be a few instances where circuit sensitivity to slight differences in tube characteristics might prevent wholly satisfactory operation, or where the substitute tube type may have shorter life than the original even though operation is satisfactory. It is impossible, however, to cover all the exceptions because of the many deviations in circuit design.

There are a number of tube types for which this chart offers no substitutes. These types have, however, been listed in the event the user should discover a suitable substitute. The information may then be entered on the chart.

Cross reference in the chart will be found quite complete but not always reversible. For example, detector diodes such as type 6H6GT should not be substituted for power diodes such as 6X5GT since the substitute would be extremely short-lived in this application.

In most cases types of the 6-volt series have identical counterparts in the 12-volt series, the only difference being in heater voltage. As examples: except for heater ratings a 6SK7GT is the same as a 12SK7GT; and a 7A7 is the same as a 14A7. Rare exceptions to this rule to be noted are:

a 6B8 is similar to a 12C8, not a 12B8;

a 6A7 is not similar to a 12A7.

★ ★

Where series connection of heaters is used, care must be taken to insure the correct amount of current through each heater when the substitute has a different heater current than the original. If the current is too high, tube life will be shortened. If the current is too low, operation may not be satisfactory. Compensating resistors therefore must be added to adjust the current. The following two examples will assist in calculating these resistors:

1. To replace a 150-milliampere tube, such as a 7B7, with a 300-milliampere tube, such as a 7A7: The series heaters of the original tubes of the receiver have a normal current of 150 milliamperes. Since the substitute type operates at 300 milliamperes, shunt resistors must be connected across each of the other tubes. The value of each resistor must be equal to the heater resistance of the tube to which it is connected, i.e., the heater resistance of any tube = $\frac{\text{Heater Voltage}}{\text{Heater Current}}$. No resistor should be connected across the substitute tube. In addition, a ballast tube or resistor cord, when used in the receiver, must be replaced by a unit having half the resistance of the original.

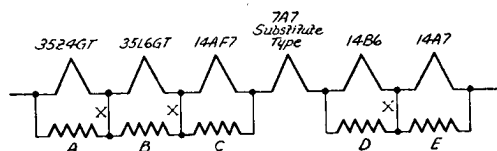


FIGURE (a)

Leads marked X in Figure (a) may be eliminated if care is observed that these are the only leads eliminated. This means that resistors A, B and C can be replaced with a single resistor equal to the sum of A, B and C. The same is true of resistors D and E.

★ ★

2. To replace a 300-milliampere tube, such as 7A7, with a 150-milliampere tube, such as a 7B7: The series heaters of the original tubes in the set have a current of 300 milliamperes. Since the substitute tube operates at 150 milliamperes, a shunt resistor equal in value to the resistance of the tube must be connected across it. The heater resistance of the 7B7 tube is equal to $\frac{\text{Heater Voltage}}{\text{Heater Current}} = \frac{6.3}{0.15} = 42$ ohms. See Figure (b).

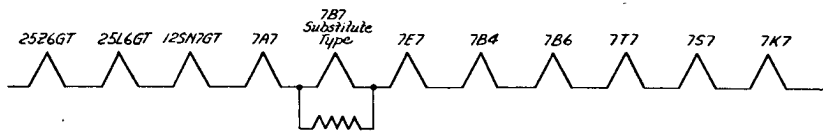


FIGURE (b)

The parallel combination will then pass twice the current of the tube, so that 150 milliamperes flow through the tube and 150 milliamperes through the 42-ohm shunting resistor. The current, flowing through the other tubes, will then be the same as in the original circuit.

★ ★

There are a number of cases where remote cutoff and sharp cutoff tubes may be interchanged. In some cases this may cause slight differences in the operation of the automatic volume control of the receiver. Metal, "G," "GT" and "GT/G" types are all directly interchangeable, although occasionally a tube shield may be necessary to prevent oscillation. Space limitations may prevent the use of the "G" types in certain installations.

★ ★

An adapter is strongly recommended in place of changing or reconnecting the socket. The use of the adapter permits the installation of the original tube type at a later date and avoids confusion in the use of published circuits for subsequent servicing. However, there will be some cases where necessary room for an adapter is not available, thereby requiring a change of the socket.

Many commercial adapters for substitute types are readily available, but an adapter can be easily assembled by the serviceman to meet his own requirements. The following suggestions on adapter construction may be helpful:

The use of a bakelite socket which fits snugly inside the top rim of the base makes a neater and more rugged wiring job. Number 20 tinned wire is ideal for connecting the top socket to the adapter base. Cut the leads about an inch longer than necessary, insulate with spaghetti to prevent short circuits, and pull leads taut when assembled. Cut leads flush with the end of the base pin, apply soldering flux and, holding the adapter upright, dip end of pin in a puddle of solder. A small hole drilled in the soldering iron tip will serve as a solder cup. Solder will flow up the pin, making a smooth, finished end. Where a top cap lead must be added, it should be shielded to avoid pick-up troubles.

The base diagrams of the original and substitute tube types should be used as a guide for the connection between the upper socket and the base adapter. Three examples are listed below to show the type of interconnection required:

(1) 6SA7GT replacing a 7Q7

Connect Top Socket Pin	→	1	2	3	4	5	6	7	8
to Bottom Base Pin	→	5	1	2	3	4	7	8	6
		↑					↑		
		Connect 5 and 7 together							

(2) 6SQ7GT replacing a 75

Connect Top Socket Pin	→	1	2	3	4	5	6	7	8
to Bottom Base Pin	→	No		Top	5	4	3	2	6
				Cap					1

(3) 75 replacing 6SQ7GT

Connect Top Socket Pin	→	1	2	3	4	5	6	7	8
to Bottom Base Pin	→	8	6	5	4	3	7	2	Top
									Cap

The continued operation of many receivers requiring tube types no longer readily available can be accomplished by the careful use of this tube substitution chart.

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TUBE SUBSTITUTION CHART

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ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
1F5G		1F4		
1F6		1F7G		
1F7G		1F6		
1G4CT	1E4G, 1H4G	1LE3, 30		
1G5G	1J5G	9S0		
1G6CT				
1H4C	1E4G, 1G4GT	1LE3, 30		
1H5GT/G		1LH4		
1H6G		1B5/25S		
1J5G	1G5G	9S0		
1J6G		19		
1L4				
1LA4	1LB4	1A5GT		
1LA6	1LC6	1A7GT, 1B7GT		
1LB4	1LA4	1C5GT, 1Q5GT, 1T5GT, 3Q5GT, 1A5GT		
1LB6				
1LC5		1SA6GT		
1LC6	1LA6	1A7GT, 1B7GT		
1LD5		1SB6GT, 1S5		
1LE3		30, 1E4G, 1G4GT, 1H4G		
1LH4		1H5GT/G		
1LN5		1N5GT/G		
1N5GT/G		1LN5		
1N6GT				
1P5GT/G				
1Q5GT	1C5GT, 1T5GT, 1A5GT	1LB4, 3Q5GT, 1LA4		
1R4/1294		1A3		
1R5				
1S4				

ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
00A	01A, 40			
01A	00A, 40			
0A3	VR75/30			
0A4G				
0B3	VR90/30			
0C3	VR105/30			
0D3	VR150/30			
0Z4			6X5GT/G	7Y4, 84
0Z4A/1003			6X5GT/G	7Y4, 84
0Z4C			6X5GT/G	7Y4, 84
1A3		1R4/1294		
1A4	1B4	1D5G, 1E5G		
1A5GT/G	1Q5GT, 1T5GT, 1C5GT	1LA4, 1LB4, 3Q5GT		
1A6	1C6	1C7G, 1D7G		
1A7GT	1B7GT	1LA6, 1LC6		
1B4	1A4	1E5G, 1D5G		
1B5/25S		1H6G		
1B7GT	1A7GT	1LA6, 1LC6		
1B8CT				
1C5GT	1Q5GT, 1T5GT, 1A5GT	1LB4, 3Q5GT, 1LA4		
1C6	1A6	1C7G, 1D7G		
1C7G	1D7G	1A6, 1C6		
1D5G	1E5G	1A4, 1B4		
1D7G	1C7G	1A6, 1C6		
1D8CT				
1E4C	1G4GT, 1H4G	1LE3, 30		
1E5G	1D5G	1B4, 1A4		
1E7G		2-type 1F5G		
1F4		1F5G		

READ EXPLANATORY NOTES (ON PAGE 35) BEFORE ATTEMPTING TUBE SUBSTITUTION

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TUBE SUBSTITUTION CHART

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ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
1S5		1SB6GT, 1LD5		
1SA6GT		1LC5		
1SB6GT		1LD5, 1S5		
1T4				
1T5GT	1C5GT, 1C5GT, 1A5GT	1LB4, 3Q5GT, 1LA4		
1V			12Z3	
2A3	45		6A3	6B4G, 6A5G
2A4C				
2A5			42, 41	6X6GT/G, 6Y6G, 6F6G, 7B5, 7C5
2A6			75	6SO7GT, 6Q7GT, 6T7G, 6Q6G, 7K7, 7C6, 7B6, 6B6G
2A7			6A7	6A8GT, 6D8G, 7A8, 6I8G, 7S7, 7B8, 7I7
2B7			6B7	6B8GT, 7E7
2C21				
2C22				
2C26				
2E5			6E5	
2W3CT				
3A4				
3A5				
3A8GT				
3B5GT		3S4		
3B7/1291		3A5		
3C5GT		3LE4		
3D6/1299	3LF4	3Q5GT, 3Q4		
3LE4		3C5GT		

ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
3LF4	3D6/1299	3Q5GT, 3Q4		
3Q4		3Q5GT, 3LF4, 3D6/1299		
3Q5GT/G		3Q4, 3LF4, 3D6/1299		
3S4				
4A6G				
5R4GY				
5T4	5U4G	5Z3, 5X4G		
5U4G	5T4	5Z3, 5X4G		
5V4G	5Z4GT, 5W4GT, 5Y3GT	83V, 5Y4G, 5X3, 80		
5W4GT/G	5Y3GT/G, 5V4G, 5Z4GT	80, 5Y4G, 5X3, 83V		
5X3	80, 83V	5Y3GT, 5W4GT, 5V4G, 5Y4G, 5Z4GT		
5X4G		5Z3, 5U4G, 5T4		
5Y3GT/G	5W4GT/G, 5V4G, 5Z4GT	80, 5Y4G, 5X3, 83V		
5Y4G		5X3, 5Y3GT, 80, 83V, 5W4G, 5V4G, 5Z4GT		
5Z3		5U4G, 5X4G, 5T4		
5Z4GT	5V4G, 5Y3GT, 5W4GT	83V, 5Y4G, 5X3, 80		
6A3		6B4G, 6A5G	45, 2A3	
6A4/LA	52			
6A5C	6B4G	6A3	45, 2A3	
6A6		6N7GT/G	53	
6A7		6A8GT, 6I8G, 6D8G, 7S7, 7I7, 7A8, 7B8	2A7	12A8GT, 14B7, 14I7, 14S7
6A8GT	6D8G	7A8, 7B8, 6A7	2A7, 12A8GT	14B8, 14I7, 14S7
6AB5-6N5	6E5		2E5	
6AB6C	6N6G	6B5		
6AB7/1853		7V7, 7W7		14W7
6AC5GT/G				

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TUBE SUBSTITUTION CHART

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ORIGINAL	DIRECTLY INTER- CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
6AC6C				
6AC7/1853				
6AD5G		6SF5GT, 6K5GT, 6F5GT, 7B4		12SF5GT, 12F5GT
6AD6C				
6AD7C				
6AE5CT/G				
6AE6C				
6AE7CT				
6AF5G	6P5GT			27
6AF6C				
6AG5	6AK5	717A		
6AG7				
6AH5C		6L6G, 6AL6G		
6AH7CT		6SN7GT, 7N7, 6F8G	12AH7GT	14N7 14AF7, 12SN7GT
6AK5	6AG5	717A		
6AK6		6G8G		
6AL6C		6L6G, 6AH5G		
6B4C	6A5G	6A3		45, 2A3
6B5		6N6G, 6AB6G		
6B6C	6T7G-6Q7G, 6Q7GT	6SQ7GT, 7B6, 7C6, 75, 7K7		2A6, 14B6, 12SQ7GT, 12Q7GT
6B7		6B8GT, 7E7	2B7	12SF7, 12C8, 14E7
6B8CT		6B7, 7E7		2B7, 12SF7, 12C8, 14E7
6C4		6J5GT, 7A4, 6C5G, 6L5G		14A4, 12J5GT
6C5CT/G	6J5GT/G, 6L5G	7A4, 6C4		14A4, 12J5GT
6C6	77, 6D6, 78	6J7GT, 6S7GT, 7C7, 6W7G, 6K7GT, 6SK7GT, 7B7, 6SS7, 6U7G, 7A7, 6S7G	57, 58	12J7GT, 12S7GT, 12SK7GT, 12K7GT, 14A7/12B7, 14C7
6C8C		6SL7GT, 7F7, 6SC7GT		

ORIGINAL	DIRECTLY INTER- CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
6D6	78, 77, 6C6	6J7GT, 6S7GT, 7C7, 6W7G, 6K7GT, 6SK7GT, 7B7, 6SS7, 6U7G, 7A7, 6S7G	57, 58	12J7GT, 12S7GT, 12SK7GT, 12K7GT, 14A7/12B7, 14C7
6D8C	6A8GT, 6J8G	6A7, 7A8, 7B8, 7J7, 7S7	2A7	
6E5	6AB5-6N5		2E5	
6E6				
6F5CT		6K5G, 6SF5GT, 7B4, 6AD5G		
6F6CT/G	6K6GT/G, 6V6GT/G	42, 41, 7C5, 7B5	2A5	14C5
6F7		6P7G		
6F8C		6SN7GT, 7N7, 6AH7GT		14N7, 12SN7GT
6G6C		6AK6		
6H4CT				
6H6CT/G	6X5GT/G, 6ZY5G	7A6, 7Y4, 7Z4, 84	12H6	14Y4
6J5CT/G	6C5GT, 6L5G	6C4, 7A4	12J5GT	14A4
6J6				
6J7CT	6W7G, 6S7G, 6U7G	6S7GT, 77, 7A7, 7B7, 7C7, 6C6, 6D6, 78, 6SK7GT, 6SS7	12J7GT, 12K7GT	12S7GT, 12SK7GT, 14C7, 58, 57, 14A7/12B7
6J8C	6A8GT, 6D8G	7J7, 7A8, 7B8, 7S7, 6A7	12A8GT	2A7, 14B8, 14J7, 14S7
6K5CT		7B4, 6AD5G, 6F5GT, 6SF5GT		12SF5GT, 12F5GT
6K6CT/G	6F6GT/G, 6V6GT/G	41, 42, 7B5, 7C5	2A5	14C5
6K7CT	6S7G, 6U7G, 6W7G	7A7, 7B7, 6SK7GT, 6D6, 78, 6SS7, 6C6, 6S7GT, 77	12J7GT, 12K7GT	12SK7GT, 12S7GT, 14A7/12B7, 14C7, 58, 57
6K8CT			12K8GT	
6L5C	6J5GT/G, 6C5GT	6C4, 7A4		14A4, 12J5GT
6L6C		6AH5G, 6AL6G		
6L7C				
6M8CT				

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TUBE SUBSTITUTION CHART

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ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
6N6C	6AB6G	6B5	25N6G	25B5
6N7GT/G		6A6		53
6P5CT	6AF5G	76		
6Q7CT	6T7G/6Q6G	6SQ7GT, 7B6, 7C6, 75	12Q7GT	12SQ7GT, 2A6, 14B6
6R7GT		6SR7GT, 6ST7, 7E6		12SR7GT, 14E6
6S7C	6K7GT, 6U7G, 6W7G	7A7, 7B7, 6SK7GT, 6D6, 78, 6SS7, 77, 7C7, 6SJ7GT	12K7GT, 12J7GT	12SK7GT, 58, 57, 12SJ7GT, 14C7, 14A7/12B7
6SA7GT/G		7Q7	12SA7GT	14Q7
6SC7CT	6SL7GT	7F7, 6C8G	12SL7GT, 12SC7	14F7
6SD7CT	6SE7GT, 6SG7, 6SH7GT	7G7, 7H7, 7L7, 7T7	12SG7, 12SH7GT	14H7
6SE7CT	6SD7GT, 6SG7, 6SH7GT	7G7, 7H7, 7L7, 7T7	12SG7, 12SH7GT	14H7
6SF5CT		7B4, 6AD5G, 6F5GT, 6K5GT	12SF5GT	12F5GT
6SF7		7E7, 6B7, 6B8GT	12SF7	2B7, 14E7, 12C8
6SC7	6SH7GT, 6SD7GT, 6SE7GT	7G7, 7H7, 7L7, 7T7	12SG7, 12SH7GT	14H7
6SH7CT	6SG7, 6SD7GT, 6SE7GT	7G7, 7H7, 7L7, 7T7	12SG7, 12SH7GT	14H7
6SJ7CT/G	6SS7, 6SK7GT	6J7GT, 6W7G, 7C7, 6C6, 77, 6K7GT, 6U7G, 6S7G, 78, 7A7, 7B7, 6D6	12SJ7GT, 12SK7GT	12J7GT, 12K7GT, 14C7, 58, 57, 14A7/12B7
6SK7CT/G	6SS7, 6SJ7GT	6J7GT, 6W7G, 7C7, 6C6, 77, 6K7GT, 6U7G, 6S7G, 78, 7A7, 7B7, 6D6	12SK7GT, 12SJ7GT	12J7GT, 12K7GT, 14C7, 58, 57, 14A7/12B7
6SL7CT		7F7, 6C8G, 6SC7GT	12SL7GT, 12SC7	14F7
6SN7CT		6AH7GT, 6F8G, 7N7	12SN7GT	14N7, 14AF7, 12AH7GT
6SQ7CT/G		6T7, 6Q6G-6Q7GT, 7B6, 6B6G, 75, 7K7, 7C6		2A6
6SR7CT	6ST7	6R7GT, 7E6	12SR7GT	14E6
6SS7	6SK7GT, 6SJ7GT	6K7GT, 6S7G, 6U7G, 6D6, 78, 7B7, 7A7, 6J7GT, 6W7G, 77, 12SJ7GT, 7C7, 6C6	12SK7GT, 12SJ7GT	58, 12K7GT, 14C7, 14A7/12B7, 57, 12J7GT

ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
6ST7	6SR7GT	6R7GT, 7E6	12SR7GT	14E6
6T7C-6Q6C	6B6G, 6Q7GT	6SQ7GT, 7B6, 7C6, 7K7, 75	12Q7GT	2A6, 14B6, 12SQ7GT
6U5-6C5				
6U6CT	6W6GT, 6Y6G	7A5	12A6GT	14A5
6U7C	6K7GT, 6S7G, 6W7G, 6J7GT	6D6, 6SK7GT, 6SS7, 7A7, 78, 6C6, 6SJ7GT, 77, 7B7, 7C7	12K7GT, 12J7GT	14A7/12B7, 14C7, 12SK7GT, 12SJ7GT, 58, 57
6V6CT/G	6K6GT, 6F6GT	7C5, 41, 42, 7B5		2A5
6V7C		85		55
6W5G	6X5GT/G, 6Z4, 6ZY5G	7Y4, 7Z4, 84		14Y4
6W6CT	6U6GT, 6Y6G	7A5	12A6GT	14A5
6W7C	6J7GT, 6K7GT, 6S7G	77, 6C6, 7C7, 6SS7, 6SJ7GT, 7A7, 7B7, 6SK7GT, 6D6, 78	12J7GT, 12K7GT	12SJ7GT, 12SK7GT, 14A7/12B7, 14C7, 58, 57
6X5CT/G	6W5G, 6Z4, 6ZY5G	84, 7Y4, 7Z4		
6Y6C	6U6GT, 6W6GT	7A5	12A6GT	14A5
6Y7C		79		
6Z7C				
6ZY5C	6X5GT/G, 6W5G, 6Z4	7Y4, 7Z4, 84		14Y4
7A4		6J5GT, 6L5G, 6C4, 6C5GT	14A4	12J5GT
7A5		6U6GT, 6Y6G, 6W6GT	14A5	12A6GT
7A6	7Y4, 7Z4	6H6GT/G, 6X5GT/G, 6ZY5G, 84	14Y4	
7A7	7B7, 7C7	6SK7GT, 6SS7, 6D6, 6K7GT, 6S7G, 6U7G, 78, 77, 6C6, 6J7GT, 6SJ7GT, 6W7G	14A7/12B7, 14C7	12K7GT, 12SJ7GT, 12J7GT, 12SK7GT, 57, 58
7A8	7B8, 7S7, 7J7	6A7, 6A8GT, 6D8G, 6J8G	14B8, 14J7, 14S7	2A7, 12A8GT
7B4		6AD5G, 6SF5GT, 6F5GT, 6K5GT		12SF5GT, 12F5GT
7B5	7C5	6K6GT, 6F6GT, 41, 6V6GT, 42		2A5, 14C5

READ EXPLANATORY NOTES (ON PAGE 35) BEFORE ATTEMPTING TUBE SUBSTITUTION

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TUBE SUBSTITUTION CHART

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ORIGINAL	DIRECTLY INTER- CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
7B6	7C6	6SQ7GT, 6T7G-6Q6G, 6B6G, 6Q7GT, 7K7, 75	14B6	2A6, 12SQ7GT, 12Q7GT
7B7	7A7, 7C7	6SK7GT, 6SS7, 6D6, 6K7GT, 6S7G, 6U7G, 78, 77, 6C6, 6J7GT, 6S17GT, 6W7G	14A7/12B7, 14C7	58, 12K7GT, 12J7GT, 12SK7GT, 12S7GT, 57
7B8	7A8, 7S7, 7J7	6A7, 6A8GT, 6D8G, 6J8G	14B8, 14J7, 14S7	2A7, 12A8GT
7C5	7B5	6K8GT, 6V6GT, 41, 42, 6F6GT	14C5	2A5
7C6	7B6	6B6G, 6Q7GT, 6SQ7GT, 7K7, 6T7G-6Q6G, 75	14B6	2A6, 12SQ7GT, 12Q7GT
7C7	7A7, 7B7	77, 6C6, 6S17GT, 78, 6J7GT, 6W7G, 6SS7G, 6K7GT, 6SK7GT, 6S7G, 6U7G, 6D6	14A7/12B7, 14C7	12S7GT, 12SK7GT, 12K7GT, 12J7GT, 57, 58
7E5				
7E6		6R7GT, 6S17, 6SR7GT	14E6	12SR7GT
7E7		6B8GT, 6B7	14E7	2B7, 12C8, 12SF7
7F7		6C8G, 6SL7GT, 6SC7GT	14F7	12SL7GT, 12SC7
7G7/1232	7H7, 7L7, 7T7	6SC7, 6SH7GT, 6SD7GT, 6SE7GT	14H7	12SG7GT, 12SH7GT
7H7	7G7, 7L7, 7T7	6SC7, 6SH7GT, 6SD7GT, 6SE7GT	14H7	12SG7GT, 12SH7GT
7J7	7A8, 7B8, 7S7	6A7, 6A8GT, 6D8G, 6J8G	14J7, 14B8, 14S7	2A7, 12A8GT
7K7		7B6, 7C6, 6SQ7GT, 6B6G, 6T7G-6Q6G, 6Q7GT, 75	14B6	2A6, 12SQ7GT, 12Q7GT
7L7	7G7, 7H7, 7T7	6SC7, 6SH7GT, 6SD7GT, 6SE7GT	14H7	12SG7, 12SH7GT
7N7		6F8G, 6SN7GT, 6AH7GT,	14N7, 14AF7	12SN7GT, 12AH7GT
7Q7		6SA7GT/G	14Q7	12SA7GT
7R7			14R7	
7S7	7J7, 7A8, 7B8	6A7, 6A8GT, 6D8G, 6J8G	14S7, 14J7, 14B8	2A7, 12A8GT
7T7	7L7, 7G7, 7H7	6SC7, 6SH7GT, 6SD7GT, 6SE7GT	14H7	12SG7, 12SH7GT
7V7		6AB7/1853	14W7	

ORIGINAL	DIRECTLY INTER- CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
7W7		6AB7/1853	14W7	
7Y4	7Z4	84, 6W5G, 6X5GT/G, 0Z4, 6ZY5G	14Y4	
7Z4	7Y4	6X5GT/G, 6ZY5G, 0Z4, 84, 6W5G	14Y4	
10				
12A	71A			
12A6GT		14A5		
12A7				
12A8GT		14B8, 14J7, 14S7	6A8GT, 6D8G, 6J8G	2A7, 6A7, 7B8, 7J7, 7A8, 7S7
12AH7GT		12SN7GT, 14N7	6AH7GT	6SN7GT, 7N7, 6F8G
12B8GT				
12C8		14E7	6B8GT	6B7, 7E7
12E5CT				
12F5CT		12SF5GT	6F5GT, 6K5GT	6SF5GT, 7B4, 6AD5G
12H6			6H6GT	7A6
12J5GT		14A4	6J5GT, 6C5G, 6L5G	6C4, 7A4
12J7GT	12K7GT	14C7, 14A7/12B7, 12S7GT, 12SK7GT	6J7GT, 6W7G, 6U7G, 6K7GT, 6S7G	6S17GT, 6SK7GT, 6SS7, 7C7, 6C6, 57, 77, 7A7, 7B7, 58, 78, 6D6
12K7GT	12J7GT	12SK7GT, 12S7GT, 14C7, 14A7/12B7	6J7GT, 6W7G, 6U7G, 6K7GT, 6S7G	6S17GT, 6SK7GT, 6SS7, 7C7, 6C6, 57, 77, 7A7, 7B7, 58, 78, 6D6
12K8CT			6K8GT	
12L8CT				
12Q7GT		12SQ7GT, 14B6	6Q7GT, 6T7G	7B6, 7C6, 75, 2A6, 6SQ7GT
12SA7GT/G		14Q7	6SA7GT	7Q7
12SC7	12SL7GT	14F7	6SC7GT	7F7, 6C8G, 6SL7GT
12SF5CT		12F5GT	6SF5GT	6F5GT, 6K5GT, 7B4, 6AD5G

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RAYTHEON TUBE SUBSTITUTION CHART

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ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
12SF7		14E7, 12C8	6SF7	7E7, 6B8GT, 6B7
12SC7		14H7, 12SH7GT	6SG7, 6SH7GT, 6SD7GT	7H7, 7G7, 7L7, 7T7
12SH7GT		12SG7GT, 14H7	6SG7, 6SH7GT, 6SD7GT	7H7, 7G7, 7L7, 7T7
12SJ7GT/G	12SK7GT/G	12K7GT, 12J7GT, 14A7/12B7, 14C7	6SJ7GT, 6SS7, 6SK7GT	6J7GT, 6K7GT, 57, 77, 6C6, 7C7, 6W7G, 58, 78, 6D6, 6U7G, 6S7G, 7B7, 7A7
12SK7GT/G	12SJ7GT/G	12K7GT, 12J7GT, 14A7/12B7, 14C7	6SJ7GT, 6SS7, 6SK7GT	6J7GT, 6K7GT, 57, 77, 6C6, 7C7, 6W7G, 58, 78, 6D6, 6U7G, 6S7G, 7B7, 7A7
12SL7GT	12SC7	14F7	6SL7GT	6SC7GT, 7F7, 6C8G
12SN7GT		14AF7, 12AH7GT, 14N7	6SN7GT	6SH7GT, 7N7, 6F8G, 6AH7GT
12SQ7GT		14B6	6SQ7GT	6Q7GT, 6T7G, 7B6, 7S
12SR7GT		14E6	6SR7GT, 6ST7	7E6
12Z3				
14A4		12J5GT	7A4	6J5GT, 6C6G, 6L5G
14A5		12A6GT	7A5	6U6GT, 6Y6G, 6W6GT
14A7/12B7	14C7	12SK7GT/G, 12K7GT, 12J7GT, 12SJ7GT	7A7, 7B7, 7C7	6D6, 78, 58, 6K7GT, 77, 6SK7GT, 6SS7, 6S7G, 6U7G, 57, 6K7GT, 7B7, 7A7, 6C6
14AF7	14N7	12AH7GT, 12SN7GT	7N7	6SN7GT, 6F8G, 6AH7GT
14B6		12SQ7GT/G, 12Q7GT	7B6, 7C6	7S, 6T7G, 6Q7GT, 6SQ7G
14B8	14J7, 14S7	12A8GT	7B8, 7A8, 7J7, 7S7	6A7, 6A8GT, 6B8G, 6D8G, 2A7
14C5			7C5, 7B5	6V6GT/G, 6K6GT, 41, 42, 6F6GT, 2A5

ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
14C7	14A7/12B7	12SJ7GT, 12J7GT, 12SK7GT, 12K7GT	7A7, 7B7, 7C7	57, 6C6, 6J7G, 6D6, 78, 58, 6K7GT, 6SK7GT, 6SS7, 6S7G, 6U7G, 6S7G, 6K7G, 7B7, 7A7
14E6		12SR7GT	7E6	6SR7GT, 6ST7
14F7		12C8, 12SF7	7E7	6SF7, 6B7, 6B8GT
14F7		12SC7GT, 12SL7GT	7F7	6SL7GT, 6SC7GT, 6C8G
14H7		12SG7, 12SH7GT	7H7, 7G7, 7L7, 7T7	6SD7GT, 6SG7, 6SH7GT
14J7	14B8, 14S7	12A8GT	7J7, 7A8, 7B8, 7S7	6A8GT, 6D8G, 6A7, 2A7, 6B8G
14N7	14AF7	12AH7GT, 12SN7GT	7N7	6SN7GT, 6AH7GT, 6F8G
14Q7		12SA7GT	7Q7	6SA7GT
14R7			7R7	
14S7	14B8, 14J7	12A8GT	7S7, 7A8, 7B8, 7J7	6A8GT, 6D8G, 6A7, 6B8G, 2A7
14W7			7W7	6AB7/18S3
14Y4			7Y4, 7Z4	84, 6X5GT, 6W5G, 0Z4
15				
19		1J6G		
20				
22				
24A	3S/5I			
25A6GT/G	25L6GT/G	43		
25A7GT/G				
25AC5GT				
25B5		25N6G		
25B8C				
25B8CT				
25C6C			50C6G	

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TUBE SUBSTITUTION CHART

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ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
25D8CT				
25L6CT/G	25A6GT/G		50L6GT	50A5
25N6G		25B5		
25X6CT	25Z6GT/G	25Z5	50Y6GT, 50Z6G	
25Y4GT	25Z4			
25Z4	25Y4GT			
25Z5		25Z6GT, 25X6GT		50Y6GT, 50Z6G
25Z6CT	25X6GT	25Z5	50Y6GT, 50Z6GT	
26				
27	56		37, 76	6AF5G, 6P5GT
28D7				
28Z5				
30		1E4G, 1H4G, 1LE3, 1G4G		
31				
32	34			
32L7CT				
33				
34	32			
35/51	24A			
35A5		35L6GT		
35L6CT/G		35A5		
35Y4		35Z5GT/G		
35Z3		35Z4GT		
35ZACT		35Z3		
35Z5CT/G		35Y4		
35Z6CT/G				
36	39/44			
37	76		27, 56	6AF5G, 6P5GT
38				

ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
39/44	36			
40	01A, 00A			
41	42	6K6GT/G, 6V6GT, 6F6GT, 7B5, 7C5	2A5	14C5
42	41	6F6GT, 6V6GT, 7B5, 7C5, 8K6GT	2A5	14C5
43		25A6GT/G		
45	2A3		6A3	6B4G, 6A5G
45Z3				
45Z5CT				
46				
47		2A5		41, 42, 6V6GT, 6F6GT, 7B5, 7C5, 6K6GT
48				
49				
50				
50A5		50L6GT		25L6GT
50C6C			25C6G	
50L6GT		50A5	25L6GT	
50Y6CT/G	50Z6G		25Z6GT	
50Z6C	50Y6GT/G		25Z6GT	
50Z7C	50Y6GT/G			
52	6A4/LA			
53			6A6	6N7GT
55			85	6V7G
56	27		76, 37, 6P5GT, 6AF5G	
57	58		77, 6C6, 6D6, 78	7C7, 6I7GT, 6W7G, 6S7GT, 12J7GT, 12S7GT, 12SK7GT, 6SK7GT, 12K7GT, 14A7/12B7, 14C7, 6K7GT, 6U7G, 7A7, 6SS7, 7B7, 6S7G

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RAYTHEON TUBE SUBSTITUTION CHART

ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
58	57		77, 6D6, 6C6, 78	7C7, 6I7GT, 6W7G, 6S7GT, 12J7GT, 12S7GT, 12SK7GT, 6SK7GT, 12K7GT, 14A7/12B7, 14C7, 6K7GT, 6U7G, 7A7, 6SS7, 7B7, 6S7G
59				
70A7GT		70L7GT		
70L7GT		70A7GT		
71A	12A			
75		6T7G-6Q6G, 7K7, 6B6G, 7B6, 7C6, 6Q7GT, 6SQ7GT	2A6	
VR75/30	0A3			
76	37	6P5GT, 6AF5G	56, 27	
77	6C6, 78	6SK7GT, 6S7GT, 6K7GT, 6I7GT, 7B7, 6SS7, 6S7G, 7A7, 6W7G, 6U7G, 7C7	57, 58	12I7GT, 12S7GT, 12K7GT, 12SK7GT, 14A7/12B7, 14C7
78	6C6, 77	6SK7GT, 6S7GT, 6K7GT, 6I7GT, 7B7, 6SS7, 6S7G, 7A7, 6W7G, 6U7G, 7C7	58, 57	12I7GT, 12S7GT, 12K7GT, 12SK7GT, 14A7/12B7, 14C7
79		6Y7G		
80	5X3	5W4GT, 5Y4G, 5Y3GT		
81				
82				
83				
83V		5Z4GT, 5V4G		
84/6Z4		6X5GT/G, 6ZY5G, 6W5G, 7Y4, 7Z4, 0Z4*		
85		6V7G	55	
89		41		
VR90/30	0B3			
99				
VR105/30	0C3			
117L/M7GT		117N7GT, 117P7GT		

ORIGINAL	DIRECTLY INTER-CHANGEABLE	USE WITH ADAPTER	CHANGE OR ADD FIL VOLTAGE	ADAPTER PLUS FIL VOLT CHANGE
117N7GT		117L/M7GT, 117P7GT		
117P7GT		117L/M7GT, 117N7GT		
117Z4GT				
117Z6GT				
VR150/30	0D3			
717A		6AK5, 6AG5		
950		1J5G, 1G5G		
954		9001		
955		9002		
956		9003		
957				
CK1003/0Z4A			6X5GT/G	7Y4, 84
1005/CK1005				
1006/CK1006				
CK1007				
1201				
1203				
1231		7V7, 7W7		
1284				
1291		3B7/1291		
1293				
1294		1R4/1294		
1299		3D6/1299		
2050				
2051				
9001		954		
9002		955		
9003		956		
9006		9001, 9002, 9003		

* Where sufficient peak plate voltage is available to start the 0Z4.

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