Electronic
TUBES

IMPORTANT RATINGS AND CHARACTERISTICS

Receiving Types

metal—glass—miniature

GENERAL ELECTRIC

INTRODUCTION

This manual has been compiled to aid those who work or experiment with receiving tubes. The technical and descriptive data have been carefully selected to present the essential characteristics needed specifically to define each tube type. These characteristics and ratings will be of assistance in the design of electronic circuits and of particular interest to the radio service man, radio technician, amateur and experimenter.

Your attention is invited to the section titled "Interpretation of Ratings and Technical Data" in order that the information presented in this manual may be interpreted correctly.

Following the "Interpretation of Ratings and Technical Data" section is the section titled "Recommended Types." The next section, titled "Characteristics and Ratings," presents electrical design characteristics, maximum ratings, and typical operating conditions for each tube type as well as references to the base connections and outline drawings located in the final section of the manual.

Requests for additional technical data will receive prompt attention if addressed to:

TUBE SALES SECTION
TUBE DIVISION
ELECTRONICS DEPARTMENT
GENERAL ELECTRIC COMPANY
SCHENECTADY 5, NEW YORK

INTERPRETATION OF RATINGS AND TECHNICAL DATA

General

The tube ratings in this manual have been prepared in accordance with the RMA system of Design Center Maximums and should be interpreted as defined in the following paragraphs.

1. Cathode

The heater or filament voltage is given as a normal value unless stated otherwise. This means that transformers or resistances in the heater or filament circuit should be designed to operate the heater or filament at rated value for full-load operating conditions under average supply-voltage conditions. A reasonable amount of leeway is incorporated in the cathode design so that moderate fluctuations of heater or filament voltage downward will not cause marked falling off in response; also, moderate voltage fluctuations upward will not reduce the life of the cathode to an unsatisfactory degree.

A. 1.4-volt Battery Tube Types

The filament power supply may be obtained from dry-cell batteries, from storage batteries, or from a power line. With dry-cell battery supply the filament may be connected either directly across a battery rated at a terminal potential of 1.5 volts, or in series with the filaments of similar tubes across a power supply consisting of dry cells in series. In either case, the voltage across each 1.4-volt section of filament should not exceed 1.6 volts. With power-line or storage-battery supply, the filament may be operated in series with the filaments of similar tubes. For such operation, design adjustments should be made so that, with tubes of rated characteristics, operating with all electrode voltages applied and on a normal line voltage of 117 volts or on a normal storage-battery voltage of 2.0 volts per cell (without a charger) or 2.2 volts per cell (with a charger), the voltage drop across each 1.4-volt section of filament will be maintained within a range of 1.25 to 1.4 volts with a nominal center of 1.3 volts. In order to meet the recommended conditions for operating filaments in series from dry-battery, storage batteries, or power-line sources it may be necessary to use shunting resistors across the individual 1.4-volt sections of filament.

B. 2.0-volt Battery Tube Types

The 2.0-volt line of tubes is designed to be operated with 2.0 volts across the filament. In all cases the operating voltage range should be maintained within the limits of 1.8 volts to 2.2 volts.

2. Positive Potential Electrodes

The power sources for the operation of radio equipment are subject to variations in their terminal potential. Consequently, the maximum ratings given in this manual have been established for certain Design Center Voltages which experience has shown to be representative. The Design Center Voltages to be used for the various power supplies together with other rating considerations are as given below.

A. A-C or D-C Power-line Service in U.S.A.

The design center voltage for this type of power supply is 117 volts. The maximum ratings of plate voltages, screen-supply voltages, dissipations, and rectifier output currents are design maximums and should not be exceeded in equipment operated at a line voltage of 117 volts.

B. Storage-battery Service

When storage-battery equipment is operated without a charger, it should be so designed that the published maximum values of plate voltages, screen-supply voltages, dissipations, and rectifier output currents are never exceeded for a terminal potential at the battery source of 2.0 volts per cell. When storage-battery equipment is operated with a charger it should be so designed that 90 of the same values are never exceeded for a terminal potential at the battery source of 2.2 volts per cell.

C. B-Battery Service

The design center voltage for B-batteries is the normal voltage rating of the battery block, such as 45 volts, 90 volts, etc. Equipment should be so designed that under no condition of battery voltage will the plate voltages, the screen-supply voltages, or dissipations ever exceed the recommended respective maximum values shown in the data for each tube type by more than 10 per cent.

D. Other Considerations

a. Class A Amplifiers

The maximum plate dissipation occurs at the Zero-signal condition. The maximum screen dissipation usually occurs at the condition where the peak-input signal voltage is equal to the bias voltage.

b. Class B Amplifiers

The maximum plate dissipation theoretically occurs at approximately 63 per cent of the Maximum-signal condition, but practically may occur at any signal-voltage value.

c. Converters

The maximum plate dissipation occurs at the Zero-signal condition and the frequency at which the oscillator-developed bias is a minimum. The screen dissipation for any reasonable variation in signal voltage must never exceed the rated value by more than 10 per cent.

d. Screen Ratings

The maximum screen voltage rating may be exceeded provided that all the following conditions are satisfied:

1. At any operating condition the screen voltage does not exceed the maximum plate voltage rating.
2. At any operating condition the average screen dissipation does not exceed the maximum rating.
3. At the operating condition which results in maximum screen current, the screen voltage does not exceed the value required for maximum screen dissipation. This condition, however, may not represent the maximum dissipation condition.

3. Typical Operation

For many receiving tubes, the data shows typical operating conditions in particular services. These typical operating values are given to show concisely some guiding information for the use of each type. They are not to be considered as ratings, because the tube can be used under any suitable conditions within its rating limitations.

4. Capacitance Ratings

Grid-plate ratings on r-f amplifier pentodes and tetrodes indicated in this manual are the maximum ratings. All other ratings are Design Center values. Unless otherwise noted capacitances on glass tubes are read with a close fitting metal shield as standardized by RMA.

5. Use of Pin No. 1 on Octal Types

Pin No. 1 on metal receiving tubes is usually connected to the outer shell of the tube. Certain glass tubes with octal bases have internal shields connected to this pin. In order to obtain correct operation of octal based tubes, Pin No. 1 should never be used as a terminal for any voltage or portion of the electrical circuit, but should be connected to ground whenever possible.

6. Use of GT/G Suffix

The use of the suffix GT/G on small glass receiving tubes has recently been eliminated and for this reason does not appear in this manual. Data on tubes which have been previously marked as GT/G types may be obtained by referring to the data under the GT listing (for example, characteristics of the 6J5-GT/G will be found under the 6J5-GT listing).

7. Metal Types

Metal tube type numbers are shown in boldface type on the following pages to facilitate the location of these types in the tabular material.

8. Miniature Types

The type numbers of miniature tubes are shown in italics on the following pages for ease of location in the tabular material.

RECOMMENDED TYPES

This list of Recommended Types has been prepared as a service to circuit designers. The use of these tubes will assure better quality, reduced initial cost and ready availabilty—important advantages which result from the use of tube types manufactured in larger quantities and for longer periods of time than those types for which there is a limited demand. The tubes included in the list of Recommended Types have been carefully selected to fulfill the needs of the circuit designer for practically any receiver circuit.

Filament	Rectifiers	Diode Detectors	Voltage Amplifiers: Triodes: Single	Voltage Amplifiers: Triodes: Twin	Voltage Amplifiers: Triodes: Single With Duplex Diodes	Voltage Amplifiers: Pentodes: Sharp-Cut-off: Low G_m	Voltage Amplifiers: Pentodes: Sharp-Cut-off: High G_m	Voltage Amplifiers: Pentodes: Remote-Cut-off: Low G_m	Voltage Amplifiers: Pentodes: Remote-Cut-off: High G_m	Voltage Amplifiers: Pentodes: With Diodes	Power Amplifiers	Converters
1.4 Volt						*1U4*		*1T4*		*1S5*	*3Q4* *3S4*	*1R5*
6.3 Volt	* 6X5-GT 5Y3-GT 5U4-G	*6AL5* **6H6**	*6C4* **6J5**	**6SC7** 6SL7-GT 6SN7-GT	*6AT6* **6SQ7** **6SR7** 6AQ7-GT 6AR7-GT	**6SJ7**	**6SH7**	**6SK7**	*6BA6* **6SG7**	**6SV7**	** 6L6-GA 6V6-GT 6K6-GT	*6BE6* **6SA7**
12.6 Volt & Above	*35W4* 35Z5-GT 117Z6-GT				*12AT6* **12SQ7**			**12SK7**	*12BA6* **12SG7**		35L6-GT *50B5* 50L6-GT	*12BE6* **12SA7**

*Miniature type under development—characteristics similar to 6X5-GT.
**Miniature type under development—characteristics similar to 6V6-GT.
Type numbers of metal tubes are shown in bold-face type.
Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
00A	Triode Detector	4D	14–1	Fil	D-C	5.0	0.25	45	—	3.2	2.0	8.5	Detector	0.0	—	—	45	1.5	30,000	666	20	—	—	00A
OA2	Glow-Discharge Diode Voltage Regulator	5BO	5–3	Cold	—	—	—	Anode supply = 185 volts d-c min { d-c operating current = 5 ma min / d-c operating current = 30 ma max } Ionization voltage = 155 volts d-c §; Operating voltage = 150 volts d-c §; Regulation (5 to 30 milliamperes) = 2.0 volts																*OA2*
OA3/VR-75	Glow-Discharge Diode Voltage Regulator	4AJ	12–7	Cold	—	—	—	Anode supply = 105 volts d-c min { d-c operating current = 5 ma min / d-c operating current = 40 ma max } Ionization voltage = 100 volts d-c §; Operating voltage = 75 volts d-c §; Regulation (5 to 40 milliamperes) = 5.0 volts																OA3/VR-75
OA4-G	Gas Triode	4V	12–7	Cold	—	—	—	Peak cathode current = 100 ma max; d-c cathode current = 25 ma max; Starter anode drop = 55 volts §; anode drop = 70 volts §																OA4-G
OB2	Glow-Discharge Diode Voltage Regulator	5BO	5–3	Cold	—	—	—	Anode supply = 133 volts d-c min { d-c operating current = 5 ma min / d-c operating current = 30 ma max } Ionization voltage = 115 volts d-c §; Operating voltage = 105 volts d-c §; Regulation (5 to 30 milliamperes) = 1.0 volts																*OB2*
OB3/VR-90	Glow-Discharge Diode Voltage Regulator	4AJ	12–7	Cold	—	—	—	Anode supply = 125 volts d-c min { d-c operating current = 5 ma min / d-c operating current = 40 ma max } Ionization voltage = 110 volts d-c §; Operating voltage = 90 volts d-c §; Regulation (5 to 40 milliamperes) = 8.0 volts																OB3/VR-90
OC3/VR-105	Glow-Discharge Diode Voltage Regulator	4AJ	12–7	Cold	—	—	—	Anode supply = 133 volts d-c min { d-c operating current = 5 ma min / d-c operating current = 40 ma max } Ionization voltage = 115 volts d-c §; Operating voltage = 105 volts d-c §; Regulation (5 to 40 milliamperes) = 2.0 volts																OC3/VR-105
OD3/VR-150	Glow-Discharge Diode Voltage Regulator	4AJ	12–7	Cold	—	—	—	Anode supply = 185 volts d-c min { d-c operating current = 5 ma min / d-c operating current = 40 ma max } Ionization voltage = 160 volts d-c §; Operating voltage = 150 volts d-c §; Regulation (5 to 40 milliamperes) = 4.0 volts																OD3/VR-150
OY4	Half-Wave Gas Rectifier	4BU	8–1	Cold	—	—	—	Pins 7 and 8 must be connected; peak current = 500 ma max; d-c output current = 75 ma max, 40 ma min; max starting voltage = 95 volts d-c; peak inverse voltage = 300 volts max																**OY4**
OY4-G	Half-Wave Gas Rectifier	4BU	7A-1	Cold	—	—	—	Pins 7 and 8 must be connected; peak current = 500 ma max; d-c output current = 75 ma max, 40 ma min; max starting voltage = 95 volts d-c; peak inverse voltage = 300 volts max																OY4-G
OZ4	Full-Wave Gas-filled Rectifier	4RM	8–3	Cold	—	—	—	Starter supply voltage per plate = 300 peak volts min; max d-c output = 75 milliamperes; peak current per plate = 200 milliamperes																OZ4
OZ4-G	Full-Wave Gas-filled Rectifier	4RG	7A-1	Cold	—	—	—	Starter supply voltage per plate = 300 peak volts min; max d-c output = 75 milliamperes; peak current per plate = 200 milliamperes																OZ4-G
O1-A	Triode Detector Amplifier	4D	14–1	Fil	D-C	5.0	0.25	135	—	3.1	2.2	8.1	Class A Amplifier	9.0	—	—	135	3.0	10,000	800	8	—	—	O1-A
1A3	R-F Diode	5AP	5–2	Htr	A-C	1.4	0.15	Rms plate voltage = 117 volts; peak inverse voltage = 330 volts max; peak plate current = 5.0 ma max; d-c output current = 0.5 ma avg																*1A3*
1A4-p	Remote-Cut-Off R-F Amplifier Pentode	4M	12–6	Fil	D-C	2.0	0.06	180	67.5	5.0▲	11.0▲	0.007	Class A Amplifier	3	67.5	0.8	180	2.3	1,000,000	750	750	—	—	1A4-p
1A4-t	Remote-Cut-Off R-F Amplifier Pentode	4M	12–6	Fil	D-C	2.0	0.06	180	67.5	5.0▲	11.0▲	0.007	Class A Amplifier	3	67.5	0.7	180	2.3	960,000	750	720	—	—	1A4-t
1A5-GT	Power Amplifier Pentode	6X	9–11	Fil	D-C	1.4	0.05	110	110	—	—	—	Power Amplifier	4.5 4.5	90 85	0.8 0.7	90 85	4.0 3.5	300,000 300,000	850 800	255 240	25,000 25,000	0.115 0.100	1A5-GT
1A6	Pentagrid Converter	6L	12–6	Fil	D-C	2.0	0.06	180	67.5	Anode = 180 volts thru 20,000 ohms; I_p = 2.3 ma			Converter	3.0	67.5	2.4	180	1.3	500,000	Conversion Transconductance = 300			—	1A6
										Anode = 135 volts; I_p = 2.3 ma			Oscillator Section	3.0	67.5	2.5	135	1.2	400,000	Conversion Transconductance = 275			—	
1A7-G	Pentagrid Converter	7Z	9–28	Fil	D-C	1.4	0.05	110	60	Anode = 90 volts; I_p = 1.2 ma			Oscillator Mixer	0.0	45	0.7	90	0.6	600,000	Conversion Transconductance = 250				1A7-G
1A7-GT	Pentagrid Converter	7Z	9–18	Fil	D-C	1.4	0.05	110	60	Anode = 90 volts; I_p = 1.2 ma			Oscillator Mixer	0.0	45	0.7	90	0.6	600,000	Conversion Transconductance = 250				1A7-GT
1AB5	R-F Amplifier Pentode	5BF	9–29	Fil	D-C	1.2	0.130	150	150	2.8	4.2	0.25	R-F Amplifier	1.5 0.0	150 90	2.0 0.8	150 90	6.8 3.5	125,000 275,000	1,350 1,100	— —	— —	— —	1AB5
1B4-p	Sharp-Cut-Off R-F Amplifier Pentode	4M	12–6	Fil	D-C	2.0	0.06	180	67.5	5.0▲	11▲	0.007	R-F Amplifier	3.0 3.0	67.5 67.5	0.6 0.7	180 90	1.7 1.6	1,500,000 1,000,000	650 600	1,000 550	— —	— —	1B4-p
1B5/25-S	Duplex-Diode Triode	6M	12–5	Fil	D-C	2.0	0.06	135	—	1.6▲	1.9▲	3.6▲	Class A Amplifier	3.0	—	—	135	0.8	35,000	575	20	—	—	1B5/25-S

▲Without external shield. § Approximate.

Type numbers of metal tubes are shown in bold-face type.
Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
1B7-G	Pentagrid Converter	7Z	9–28	Fil	D-C	1.4	0.10	110	65	Anode =90 volts Ip =1.6 ma			Oscillator Mixer	0.0	45	1.3	90	1.5	350,000	Conversion Transconductance =350			—	1B7-G
1B7-GT	Pentagrid Converter	7Z	9–18	Fil	D-C	1.4	0.10	110	65	Anode =90 volts Ip =1.6 ma			Oscillator Mixer	0.0	45	1.3	90	1.5	350,000	Conversion Transconductance =350			—	1B7-GT
1B8-GT	Diode-Triode Power Amplifier Pentode	8AW	9–17	Fil	D-C	1.4	0.10	110	110	Pentode Section			Class A Amplifier	6.0	90	1.4	90	6.3	—	1,150	—	14,000	0.210	1B8-GT
								110	—	Triode Section			Class A Amplifier	0.0	—	—	90	0.15	240,000	275	—	—	—	
1C5-GT	Power Amplifier Pentode	6X	9–11	Fil	D-C	1.4	0.10	110	110	—	—	—	Class A Power Amplifier	7.5	90	1.6†	90	7.5†	115,000	1,550	180	8,000	0.240	1C5-GT
													Class A Power Amplifier	7.0	83	1.6†	83	7.0†	110,000	1,500	165	9,000	0.240	
1C6	Pentagrid Converter	6L	12–6	Fil	D-C	2.0	0.12	180	67.5	—	—	—	Converter	3.0	67.5	2.0	180	1.5	700,000	Conversion Transconductance =325			—	1C6
														3.0	67.5	2.5	135	1.3	600,000	Conversion Transconductance =300				
1C7-G	Pentagrid Converter	7Z	12–8	Fil	D-C	2.0	0.12	180	67.5	—	—	—	Converter	3.0	67.5	2.0	180	1.5	700,000	Conversion Transconductance =325			—	1C7-G
														3.0	67.5	2.5	135	1.3	600,000	Conversion Transconductance =300				
1D5-Gp	Remote-Cut-Off R-F Amplifier Pentode	5Y	12–8	Fil	D-C	2.0	0.06	180	67.5	5.0▲	11.0▲	0.007	R-F Amplifier	3.0	67.5	0.8	180	2.3	1,000,000	750	750	—	—	1D5-Gp
1D5-Gt	Remote-Cut-Off R-F Amplifier Pentode	5R	12–8	Fil	D-C	2.0	0.06	180	67.5	—	—	—	R-F Amplifier	3.0	67.5	0.7	180	2.2	600,000§	650	390	—	—	1D5-Gt
1D7-G	Pentagrid Converter	7Z	12–8	Fil	D-C	2.0	0.06	180	67.5	Anode =180 volts thru 20,000 ohms Ip =2.3 ma			Converter	3.0	67.5	2.4	180	1.3	500,000	Conversion Transconductance =300			—	1D7-G
										Anode =135 volts Ip =2.3 ma			Oscillator Section	3.0	67.5	2.5	135	1.2	400,000	Conversion Transconductance =275			—	
1D8-GT	Diode-Triode Power Amplifier Pentode	8AJ	9–17	Fil	D-C	1.4	0.10	110	110	Pentode Section			Class A Amplifier	9.0	90	1.0	90	5.0	200,000§	925	—	—	—	1D8-GT
								110	—	Triode Section			Class A Amplifier	0.0	—	—	90	1.1	43,500§	575	25	—	—	
1E4-G	Amplifier Triode	5S	9–25	Fil	D-C	1.4	0.05	110	—	2.4	6.0	2.4	Class A Amplifier	0.0	—	—	90	4.5	11,200	1,300	14.5	—	—	1E4-G
														3.0	—	—	90	1.4	19,000	760	14.5	—	—	
1E5-Gp	Remote-Cut-Off R-F Amplifier Pentode	5Y	12–8	Fil	D-C	2.0	0.06	180	67.5	5.0▲	11.0▲	0.007	R-F Amplifier	3.0	67.5	0.6	180	1.7	1,500,000	650	1,000	—	—	1E5-Gp
														3.0	67.5	0.7	90	1.6	1,000,000	600	550	—	—	
1E7-G	Twin-Pentode Power Amplifier	8C	12–7	Fil	D-C	2.0	0.24	135	135	One Section			Class A Amplifier	4.5	135	2.2	135	7.5	260,000	1,425	—	16,000	0.29	1E7-G
										Push-pull			Class A Amplifier	7.5	135	2.0†, §	135	7.0†, §	—	—	—	24,000	0.575¶	
1F4	Power Amplifier Pentode	5K	14–1	Fil	D-C	2.0	0.12	180	180	—	—	—	Class A Power Amplifier	4.5	135	2.4	135	8	200,000§	1,700	340	16,000	0.310¶	1F4
														3.0	90	1.1	90	4	240,000§	1,400	336	—	—	
1F5-G	Power Amplifier Pentode	6X	12–7	Fil	D-C	2.0	0.12	180	180	—	—	—	Class A Power Amplifier	4.5	135	2.4	135	8	200,000§	1,700	340	16,000	0.310¶	1F5-G
														3.0	90	1.1	90	4	240,000§	1,400	336	—	—	
1F6	Sharp-Cut-Off Duplex-Diode Pentode	6W	12–6	Fil	D-C	2.0	0.06	180	67.5	4.0▲	9.0▲	0.007	Class A Amplifier	1.5	67.5	0.7	18.0	2.2	1,000,000	650	650	—	—	1F6
1F7-GH	Sharp-Cut-Off Duplex-Diode Pentode	7AD	12–8	Fil	D-C	2.0	0.06	180	67.5	3.8	9.5	0.01	Class A Amplifier	1.5	67.5	0.7	18.0	2.2	1,000,000	650	650	—	—	1F7-GH

▲Without external shield. § Approximate. † Zero signal per element. ¶ Undistorted.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
1F7-GV	Sharp-Cut-Off Duplex-Diode Pentode	7AD	12–8	Fil	D-C	2.0	0.06	180	67.5	3.8	9.5	0.01	Class A Amplifier	1.5	67.5	0.7	18.0	2.2	1,000,000	650	650	—	—	1F7-GV
1G4-GT	Detector Amplifier Triode	5S	9–11	Fil	D-C	1.4	0.05	110	—	2.2▲	3.4▲	2.8▲	Class A Amplifier	6	—	—	90	2.3	10,700	825	8.8	—	—	1G4-GT
1G5-G	Power Amplifier Pentode	6X	12–7	Fil	D-C	2.0	0.12	135	135	—	—	—	Class A Amplifier	13.5 6.0	135 90	2.5 2.5	135 90	8.7 8.5	160,000 133,000	1,550 1,500	250 —	9,000 8,500	0.55 0.25	1G5-G
1G6-GT	Power Amplifier Twin Triode	7AB	9–11	Fil	D-C	1.4	0.10	110	—	—	—	—	Class B Amplifier	0.0	—	—	90	1.0†	450,000§	675	30	12,-000‡	700	1G6-GT
1H4-G	Detector Amplifier Triode	5S	12–7	Fil	D-C	2.0	0.06	180	—	Single Tube			Class A Amplifier	13.5	—	—	180	3.1	10,300	900	9.3	—	—	1H4-G
										Two Tubes			Class B Amplifier	15.0	—	—	157.5	0.5†	Input Signal = .260 watt			8,000‡	2.1	
1H5-G	Diode High-Mu Triode	5Z	9–28	Fil	D-C	1.4	0.05	110	—	1.1	6.0	1.0	Class A Amplifier	0.0	—	—	90	0.15	240,000	275	65	—	—	1H5-G
1H5-GT	Diode High-Mu Triode	5Z	9–18	Fil	D-C	1.4	0.05	110	—	1.1	6.0	1.0	Class A Amplifier	0.0	—	—	90	0.15	240,000	275	65	—	—	1H5-GT
1H6-G	Duplex-Diode Triode	7AA	12–7	Fil	D-C	2.0	0.06	135	—	1.6▲	1.9▲	3.6▲	Class A Amplifier	3.0	—	—	135	0.8	35,000	575	20	—	—	1H6-G
1J5-G	Power Amplifier Pentode	6X	14–3	Fil	D-C	2.0	0.12	135	135	—	—	—	Class A Amplifier	16.5	135	2.0	135	7.0	105,300§	950	100	135,-000	0.45	1J5-G
1J6-G	Power Amplifier Twin Triode	7AB	12–7	Fil	D-C	2.0	0.24	135	—	—	—	—	Class B Power Amplifier	0.0	—	—	135	5.0†	Input Signal = .170 watt			10,-000‡	2.1§	1J6-G
1J6-GX	Power Amplifier Twin Triode	7AB	12–7	Fil	D-C	2.0	0.24	135	—	—	—	—	Class B Power Amplifier	0.0	—	—	135	5.0†	Input Signal = .170 watt			10,-000‡	2.1§	1J6-GX
1L4	Sharp-Cut-Off R-F Amplifier Pentode	6AR	5–2	Fil	D-C	1.4	0.05	110	90	3.6▲	7.5▲	0.008▲	Class A Amplifier	0.0	90	2.0	90	4.5	350,000	1,025	—	—	—	*1L4*
1LA4	Power Amplifier Pentode	5AD	9–30	Fil	D-C	1.4	0.05	110	110	—	—	—	Power Amplifier	4.5 4.5	90 85	0.8 0.7	90 85	4.0 3.5	300,000 300,000	850 800	255 240	25,000 25,000	0.115 0.100	1LA4
1LA6	Pentagrid Converter	7AK	9–30	Fil	D-C	1.4	0.05	90	55	—	—	—	Converter	0.0	45	0.6	90	0.55	750,000	Conversion Transconductance = 250			—	1LA6
1LB4	Power Amplifier Pentode	5AD	9–30	Fil	D-C	1.4	0.05	110	110	—	—	—	Class A Amplifier	9.0	90	1.0	90	5.0	200,000§	925	—	12,000	0.200	1LB4
1LB6	Pentagrid Converter	8AX	9–30	Fil	D-C	1.4	0.05	90	67.5	—	—	—	Mixer	0.0	67.5	2.2	90	0.4	2,000,000§	Conversion Transconductance = 100			—	1LB6
1LC5	Super-Control R-F Pentode	7AO	9–30	Fil	D-C	1.4	0.05	110	45	3.2	7.0	0.007	Class A Amplifier	0.0	45	0.20	90	1.15	1,500,000§	775	—	—	—	1LC5
1LC6	Pentagrid Converter	7AK	9–30	Fil	D-C	1.4	0.05	90	90	E_{g2} = 45 volts I_{g2} = 1.4 ma I_{g1} = 0.35 ma			Oscillator Mixer	0.0	35	0.7	90	0.75	650,000	Conversion Transconductance = 275			—	1LC6
1LD5	Diode Pentode	6AX	9–30	Fil	D-C	1.4	0.05	90	45	3.2	6.0	0.18	Class A Amplifier	0.0	45	0.1	90	0.6	750,000	575	—	—	—	1LD5
1LE3	Amplifier Triode	4AA	9–30	Fil	D-C	1.4	0.05	110	—	1.7	3.0	1.7	Class A Amplifier	0.0 3.0	— —	— —	90 90	4.5 1.3	11,200 19,000	1,300 760	14.5 14.5	— —	— —	1LE3
1LH4	Diode High-Mu Triode	5AG	9–30	Fil	D-C	1.4	0.05	110	—	1.1	6.0	1.0	Class A Amplifier	0.0	—	—	90	0.15	240,000	275	65	—	—	1LH4
1LN5	Sharp-Cut-Off R-F Amplifier Pentode	7AO	9–30	Fil	D-C	1.4	0.05	110	110	3.4	8.0	0.007	Class A Amplifier	0.0	90	0.35	90	1.6	1,100,000§	800	—	—	—	1LN5
1N5-G	Sharp-Cut-Off R-F Amplifier Pentode	5Y	9–28	Fil	D-C	1.4	0.05	110	110	3.0	10.0	0.007	Class A Amplifier	0.0	90	0.30	90	1.2	1,500,000§	750	1,160	—	—	1N5-G

▲Without external shield. §Approximate. †Zero signal per element. ‡Plate-to-plate.

Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
1N5-GT	Sharp-Cut-Off R-F Amplifier Pentode	5Y	9–18	Fil	D-C	1.4	0.05	110	110	3.0	10.0	0.007	Class A Amplifier	0.0	90	0.30	90	1.2	1,500,000§	750	1,160	—	—	1N5-GT
1N6-G	Diode Power-Amplifier Pentode	7AM	9–27	Fil	D-C	1.4	0.05	110	110	—	—	—	Class A Amplifier	4.5	90	0.7†	90	3.4†	300,000§	800	—	25,000	0.100	1N6-G
1N6-GT	Diode Power-Amplifier Pentode	7AM	9–11	Fil	D-C	1.4	0.05	110	110	—	—	—	Class A Amplifier	4.5	90	0.7†	90	3.4†	300,000§	800	—	25,000	0.100	1N6-GT
1P5-G	Remote-Cut-Off R-F Amplifier Pentode	5Y	9–28	Fil	D-C	1.4	0.05	110	110	3.0	10.0	0.007	Class A Amplifier	0.0	90	0.7	90	2.3	800,000§	750	640§	—	—	1P5-G
1P5-GT	Remote-Cut-Off R-F Amplifier Pentode	5Y	9–18	Fil	D-C	1.4	0.05	110	110	3.0	10.0	0.007	Class A Amplifier	0.0	90	0.7	90	2.3	800,000§	750	640§	—	—	1P5-GT
1Q5-GT	Beam Power Amplifier	6AF	9–11	Fil	D-C	1.4	0.10	110	110	—	—	—	Class A Amplifier	4.5	90	1.3§	90	9.5	75,000§	2,200	—	8,000	0.270	1Q5-GT
														5.0	85	0.8§	85	7.0	70,000§	1,950	—	9,000	0.250	
1R4	R-F Diode	4AH	9–30	Fil	D-C	1.4	0.15	Max rms plate voltage =117 volts; max d-c output current =1.0 ma														—	—	1R4
1R5	Pentagrid Converter	7AT	5–2	Fil	D-C	1.4	0.05	90	67.5	Osc I_g =.25 thru .1 megohms			Converter	0.0	67.5	3.2	90	1.6	Conversion Transconductance =300		—		—	*1R5*
													Converter	0.0	67.5	3.2	67.5	1.4	Conversion Transconductance =280		—		—	
													Converter	0.0	45	1.9	45	0.7	Conversion Transconductance =235		—		—	
1S4	Power Amplifier Pentode	7AV	5–2	Fil	D-C	1.4	0.10	90	67.5	—	—	—	Class A Amplifier	7.0	67.5	1.4	90	7.4	100,000§	1,575	—	8,000	0.270	*1S4*
													Class A Amplifier	7.0	67.5	1.5	67.5	7.2	100,000§	1,550	—	5,000	0.180	
													Class A Amplifier	4.5	45.0	0.8	45	3.8	100,000§	1,250	—	8,000	0.065	
1S5	Sharp-Cut-Off Diode Pentode	6AU	5–2	Fil	D-C	1.4	0.05	90	90	—	—	—	Class A Amplifier	0.0	67.5	0.4	67.5	1.6	600,000§	625	—	—	—	*1S5*
1SA6-GT	R-F Pentode	6CA	9–12	Fil	D-C	1.4	0.05	90	67.5	5.2	8.6	0.01	Class A R-F Amplifier	0.0	67.5	0.68	90	2.45	800,000	970	—	—	—	1SA6-GT
1SB6-GT	Diode Pentode	6CB	9–11	Fil	D-C	1.4	0.05	90	67.5	3.2	3.0	0.25	Class A Amplifier	0.0	67.5	0.38	90	1.45	700,000	665	—	—	—	1SB6-GT
1T4	Remote-Cut-Off R-F Amplifier Pentode	6AR	5–2	Fil	D-C	1.4	0.05	90	67.5	3.6	7.5	0.01	Class A Amplifier	0.0	67.5	1.4	90	3.5	500,000§	900	—	—	—	*1T4*
													Class A Amplifier	0.0	67.5	1.5	67.5	3.4	250,000§	875	—	—	—	
													Class A Amplifier	0.0	45	0.7	45	1.7	350,000§	700	—	—	—	
1T5-GT	Beam Power Amplifier	6X	9–11	Fil	D-C	1.4	0.05	110	110	4.8	8.0	0.5	Class A Amplifier	6.0	90	0.8§	90	6.5	250,000§	1,150	—	14,000	0.170	1T5-GT
1U4	R-F Amplifier Pentode	6AR	5–2	Fil	D-C	1.4	0.05	110	110	3.6	7.5	0.008	Class A Amplifier	0.0	90	0.45	90	1.6	1,500,000§	900	—	—	—	*1U4*
1U5	Diode R-F Pentode	6BW	5–2	Fil	D-C	1.4	0.05	90	90	—	—	—	Class A Amplifier	0.0	67.5	0.4	67.5	1.6	600,000	625	—	—	—	*1U5*
1-v	Half-Wave High-Vacuum Rectifier	4G	12–5	Htr	A-C	6.3	0.3	Max rms voltage per plate =325 volts; max d-c output =45 ma; peak current per plate =270 ma; max peak inverse voltage =1000 v																1-v
1Z2	Half-Wave Rectifier	7CB	5A–1	Fil	A-C	1.5	0.30	Max rms plate voltage =7.8 kv; max d-c output current =2.0 ma. Max peak inverse voltage =20 kv																*1Z2*
2A3	Power-Amplifier Triode	4D	16–1	Fil	A-C	2.5	2.5	300	—	7.5	5.5	16.5	Class A Amplifier	45	—	—	250	60	800	5,250	4.2	2,500	3.5	2A3
									2 tubes push-pull				Class AB_1 Amplifier	62	—	—	300	80†	—	—	—	3,000‡	15	
2A4-G	Gas Triode	5S	12–7	Fil	A-c	2.5	2.5	Peak anode voltage =200 max volts inverse or forward; peak anode current =1.25 amp max; average anode current =0.1 amp max																2A4-G

§Approximate. †Zero signal per element. ‡Plate-to-plate.

Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
2A5	Power Amplifier Pentode	6B	14–1	Htr	A-C	2.5	1.75	375	285	Pentode Connection			Class A Amplifier	20.0	285	7.0†	285	38†	78,000§	2,500	—	7,000	4.8	2A5
								350	—	Triode Connection			Class A Amplifier	20.0	—	—	250	31.0	2,600	2,600	6.8	4,000	0.85¶	
								375	285	2 Tubes Pentode Connection			Class AB_2 Amplifier	26.0	250	5.0†	375	34.0†	—	—	—	10,000‡	18.5	
										2 Tubes Triode Connection			Class AB_2 Amplifier	38.0	—	—	350	48.0†	—	—	—	6,000‡	13.0	
2A6	Duplex Diode Hi-Mu Triode	6G	12–6	Htr	A-C	2.5	0.8	250	—	1.7	3.8	1.7	Class A Amplifier	2.0	—	—	250	0.9	91,000	1,100	100	—	—	2A6
2A7	Pentagrid Converter	7C	12–6	Htr	A-C	2.5	0.8	300	100	Anode =250 v thru 20 MΩ, I_p =4 ma			Converter	3.0	100	2.7	250	3.5	360,000§	Conversion Transconductance =550			—	2A7
										Anode =100 v, Ip =2.0 ma			Converter	1.5	50	1.3	100	1.1	600,000§	Conversion Transconductance =360			—	
2A7-S ★	Pentagrid Converter	7C	12–6	Htr	A-C	2.5	0.8	300	100	Anode =250 v thru 20 MΩ, I_p =4 ma			Converter	3.0	100	2.7	250	3.5	360,000§	Conversion Transconductance =550			—	2A7-S ★
										Anode =100 v, Ip =2.0 ma			Converter	1.5	50	1.3	100	1.1	600,000§	Conversion Transconductance =360			—	
2B7	Semi-Remote-Cut-Off Duplex-Diode Pentode	7D	12–6	Htr	A-C	2.5	0.8	300	125	3.5▲	9.5▲	0.007	Class A Amplifier	3.0	125	2.3	250	9.0	600,000§	1,125	—	—	—	2B7
													Class A Amplifier	3.0	100	1.5	250	6.0	800,000	1,000	—	—	—	
2B7-S ★	Semi-Remote-Cut-Off Duplex-Diode Pentode	7D	12–6	Htr	A-C	2.5	0.8	300	125	3.5▲	9.5▲	0.007	Class A Amplifier	3.0	125	2.3	250	9.0	600,000§	1,125	—	—	—	2B7-S ★
													Class A Amplifier	3.0	100	1.5	250	6.0	800,000	1,000	—	—	—	
2C21/1642	Twin Triode Oscillator Amplifier	7BH	12–6	Htr	A-C	6.3	0.60	250	—	Each Section			Class A Amplifier	16.5	—	—	250	8.3	7,600	1,375	10.4	—	—	2C21/1642
2C22	Amplifier Triode	4AM	9A-2	Htr	A-C	6.3	0.30	300	—	2.2	0.7	3.6	Class A Amplifier	10.5	—	—	300	11.0	6,600	3,000	20	—	—	2C22
2D21	Gas Tetrode	7BN	5–2	Htr	A-C	6.3	0.60	—	Peak forward anode voltage =650 v, max; peak inverse voltage =1300 v max; max d-c output =100 ma max; peak cathode current =500 ma max. Control grid bias =5 v rms; shield grid voltage =0; control-grid signal =5.0 v peak; max control-grid circuit resistance =10.0 megohms; load resistance =2000 ohms§													—	*2D21*
2E5	Electron-Ray Tube	6R	9–26	Htr	A-C	2.5	0.80	250	Plate voltage =250 v thru 1.0 meg. (Eg =0, shadow angle =90°, Ip =0.24 ma) (Eg = −8 v, shadow angle =0°) Target voltage =250														—	2E5
2-S/4-S ★	Twin Diode	5D	—	Htr	A-C	2.5	1.35	—	Plate voltage =50 volts per plate; cathode current =80 ma														—	2-S/4-S ★
2W3	Half-Wave Rectifier	4X	8–6	Fil	A-C	2.5	1.50	—	Rms voltage per plate =350 v; max d-c output =55 ma														—	2W3
2X2-A	Half-Wave Rectifier	4AB	12–6	Htr	A-C	2.5	1.75	—	Peak inverse =12,500 volts; peak plate current =100 ma, max; d-c output current =7.5														—	2X2-A
3A4	Power Amplifier Pentode	7BB	5–2	Fil	D-C	2.8 / 1.4	0.1 / 0.2	150	90	4.8	4.2	0.20	Class A Amplifier	8.4	90	2.2†	150	13.3†	100,000	1,900	—	8,000	0.7	*3A4*
3A5	High-Frequency Twin Triode	7BC	5–2	Fil	D-C	2.8 / 1.4	0.11 / 0.22	135	—	0.9	1.0	3.2	Class A Amplifier	2.5	—	—	90	3.7♠	8,300	1,800	15	—	—	*3A5*
3A8-GT	Sharp-Cut-Off R-F Amplifier Duplex-Triode Pentode	8AS	9–17	Fil	D-C	2.8 / 1.4	0.05 / 0.10	110	—	Triode Section			Class A Amplifier	0.0	—	—	90	0.2	200,000	275	—	—	—	3A8-GT
								110	110	Pentode Section			Class A Amplifier	0.0	90	0.5	90	1.5	800,000	750	—	—	—	
3B5-GT	Beam Power Amplifier	7AP	9–12	Fil	D-C	1.4	0.10	67.5	67.5	Parallel Filaments			Class A Amplifier	7.0	67.5	0.6	67.5	8.0	100,000	1,650	—	5,000	0.2	3B5-GT
						2.8	0.05	67.5	67.5	Series Filaments			Class A Amplifier	7.0	67.5	0.5	67.5	6.7	100,000	1,500	—	5,000	0.18	
3B7	Twin Triode Amplifier	7BE	9–30	Fil	D-C	1.4	0.22	180	—	Push-Pull			Class B Amplifier	0.0	—	—	135	9.5†,♠	—	19,000♠	20♠	16,000	1.5	3B7
3C5-GT	Power Amplifier Pentode	7AQ	9–12	Fil	D-C	1.4	0.10	110	110	Parallel Filaments			Class A Amplifier	9.0	90	1.4	90	6.0	—	1,550	—	8,000	0.24	3C5-GT
						2.8	0.05	110	110	Series Filaments			Class A Amplifier	9.0	90	1.4	90	6.0	—	1,450	—	10,000	0.26	

†Zero signal per element. §Approximate. ¶Undistorted. ‡Plate-to-plate. ★External shield connected to cathode pin.
▲Without external shield. ♠Per section.

Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
3C6	Twin Triode Amplifier	7BW	9-30	Fil	D-C	1.4	0.10	110	—	Section 1 Parallel / Section 2 Filaments			Class A Amplifier	0.0	—	—	90	4.5	11,200	1,300	14.5	—	—	3C6
														0.0	—	—	90	4.5	11,200	1,300	14.5	—	—	
						2.8	0.05	110	—	Section 1 Series / Section 2 Filaments			Class A Amplifier	0.0	—	—	90	4.5	11,200	1,300	14.5	—	—	
														0.0	—	—	90	3.2	12,800	1,100	14.1	—	—	
3D6	Beam Power Amplifier	6BB	9-30	Fil	D-C	1.4	0.22	180	135	7.5	6.5	0.30	Class A Amplifier	4.5	90	1.0†	150	9.8†	—	2,400	—	14,000	0.60	3D6
3LE4	Power Amplifier Pentode	6BA	9-30	Fil	D-C	1.4	0.10	110	110	Parallel Filaments			Class A Amplifier	9.0	90	2.0†	90	10.0†	100,000§	1,700	—	6,000	0.325	3LE4
						2.8	0.05	110	110	Series Filaments			Class A Amplifier	9.0	90	1.8†	90	8.8†	110,000§	1,600	—	6,000	0.300	
3Q4	Power Amplifier Pentode	7BA	5-2	Fil	D-C	1.4	0.1	90	90	Parallel Filaments			Class A Amplifier	4.5	90	2.1†	90	9.5†	100,000§	2,150	—	10,000	0.27	*3Q4*
						2.8	0.05	90	90	Series Filaments			Class A Amplifier	4.5	90	1.7†	90	7.7†	120,000§	2,000	—	10,000	0.24	
3Q5-GT	Beam Power Amplifier	7AP	9-11	Fil	D-C	1.4	0.1	110	110	Parallel Filaments			Class A Amplifier	6.6	110	1.4†	110	10.0	100,000§	2,200	—	8,000	0.400	3Q5-GT
						1.4	0.1	110	110	Parallel Filaments			Class A Amplifier	4.5	90	1.3†	90	9.5	90,000§	2,200	—	8,000	0.270	
						2.8	0.05	110	110	Series Filaments			Class A Amplifier	6.6	110	1.1†	110	8.5	110,000§	2,000	—	8,000	0.330	
						2.8	0.05	110	110	Series Filaments			Class A Amplifier	4.5	90	1.0†	90	8.0	80,000§	2,000	—	8,000	0.230	
3S4	Power Amplifier Pentode	7BA	5-2	Fil	D-C	1.4	0.10	90	67.5	Parallel Filaments			Class A Amplifier	7.0	67.5	1.4	90	7.4	100,000§	1,575	—	8,000	0.270	*3S4*
						1.4	0.1	90	67.5	Parallel Filaments			Class A Amplifier	7.0	67.5	1.5	67.5	7.2	100,000§	1,550	—	5,000	0.180	
						2.8	0.05	90	67.5	Series Filaments			Class A Amplifier	7.0	67.5	1.1	90	6.1	100,000§	1,425	—	8,000	0.235	
						2.8	0.05	90	67.5	Series Filaments			Class A Amplifier	7.0	67.5	1.2	67.5	6.0	100,000§	1,400	—	5,000	0.160	
3V4	Power Amplifier Pentode	6BX	5-2	Fil	D-C	1.4	0.100	90	90	Parallel Filaments			Class A Amplifier	4.5	90	2.1†	90	9.5†	100,000	2,150	—	10,000	0.27	*3V4*
						2.8	0.050	90	90	Series Filaments			Class A Amplifier	4.5	90	1.7†	90	7.7†	120,000	2,000	—	10,000	0.24	
4A6-G	Power Amplifier Twin Triode	8L	12-7	Fil	D-C	4.0 / 2.0	0.06 / 0.12	90	—	1 Section			Class A Amplifier	1.5	—	—	90	1.2	28,000	900	25	—	—	4A6-G
						4.0 / 2.0	0.06 / 0.12	90	—	2 Sections			Class B Amplifier	1.5	—	—	90	1.1	I_p = 10.8 max signal	—	—	8,000	1.0	
5R4-GY	Full-Wave High-Vacuum Rectifier	5T	16-3	Fil	A-C	5.0	2.0	Rms volts per plate = 1400 volts max; maximum d-c output = 250 ma max; peak current per plate = 650 ma max; peak inverse voltage = 2100 volts max																	5R4-GY
5T4	Full-Wave High-Vacuum Rectifier	5T	10-1	Fil	A-C	5.0	2.0	Rms volts per plate = 450 volts, max; maximum d-c output = 225 ma max; peak current per plate = 675 ma max; peak inverse voltage = 1550 volts max.																	**5T4**
5U4-G	Full-Wave High-Vacuum Rectifier	5T	16-3	Fil	A-C	5.0	3.0	Rms voltage per plate = 450 volts max; maximum d-c output = 225 ma max; peak current per plate = 675 ma max; peak inverse voltage = 1550 volts max																	5U4-G
5V4-G	Full-Wave High-Vacuum Rectifier	5L	14-3	Htr	A-C	5.0	2.0	Rms volts per plate = 375 volts max; max d-c output = 175 ma, max; peak current per plate = 525 ma max; peak inverse voltage = 1400 volts max																	5V4-G
5W4	Full-Wave High-Vacuum Rectifier	5T	8-6	Fil	A-C	5.0	1.5	Rms volts per plate = 700 volts max; max d-c output = 100 ma, max; peak current per plate = 300 ma max; peak inverse voltage = 1400 volts max																	**5W4**
5W4-GT	Full-Wave High-Vacuum Rectifier	5T	9-11	Fil	A-C	5.0	1.5	Rms volts per plate = 700 volts max; max d-c output = 100 ma, max; peak current per plate = 300 ma max; peak inverse voltage = 1400 volts max																	5W4-GT
5X4-G	Full-Wave High-Vacuum Rectifier	5Q	16-3	Fil	A-C	5.0	3.0	Rms voltage per plate = 450 volts max; maximum d-c output = 225 ma, max; peak current per plate = 675 ma max; peak inverse voltage = 1550 volts, max																	5X4-G
5Y3-G	Full-Wave High-Vacuum Rectifier	5T	14-3	Fil	A-C	5.0	2.0	Rms voltage per plate = 350 max; max d-c output = 125 ma; peak current per plate = 375 ma; peak inverse voltage = 1400 volts max																	5Y3-G
5Y3-GT	Full-Wave High-Vacuum Rectifier	5T	9-11	Fil	A-C	5.0	2.0	Rms voltage per plate = 350 volts max; maximum d-c output = 125 ma; peak current per plate = 375 ma; peak inverse voltage = 1400 volts max																	5Y3-GT
5Y4-G	Full-Wave High-Vacuum Rectifier	5Q	14-3	Fil	A-C	5.0	2.0	Rms voltage per plate = 350 volts, max; maximum d-c output = 125 ma, max; peak current per plate = 375 ma, max; peak inverse voltage = 1400 volts max																	5Y4-G

† Zero signal per element. § Approximate.

Type numbers of metal tubes are shown in bold-face type.
Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
5Z3	Full-Wave High-Vacuum Rectifier	4C	16-1	Fil	A-C	5.0	3.0	Rms voltage per plate = 450 volts, max; maximum d-c output = 225 ma, max; peak current per plate = 675 ma, max; peak inverse voltage = 1400 volts, max																5Z3
5Z4	Full-Wave High-Vacuum Rectifier	5L	8-6	Htr	A-C	5.0	2.0	Rms voltage per plate = 350 volts, max; max d-c output = 125 ma max; peak current per plate = 375 ma max; peak inverse voltage = 1400 volts max																**5Z4**
5Z4-GT	Full-Wave High-Vacuum Rectifier	5L	9-11	Htr	A-C	5.0	2.0	Rms voltage per plate = 350 volts max; max d-c output = 125 ma; peak current per plate = 375 ma; peak inverse voltage = 1400 volts max																5Z4-GT
6A3	Power Amplifier Triode	4D	16-1	Fil	A-C	6.3	1.0	250	—	—	—	—	Class A Amplifier	45	—	—	250	60	800	5,250	4.2	2,500	3.2¶	6A3
										2 tubes			Class AB Amplifier	68	—	—	325	40†	—	—	—	3,000‡	15.0¶	
6A4/LA	Power Amplifier Pentode	5B	14-1	Fil	A-C	6.3	0.3	180	180	—	—	—	Class A Amplifier	12	180	3.9	180	22.0	45,400§	2,200	100§	8,000	1.4	6A4/LA
6A5-G	Power Amplifier Triode	6T	16-3	Htr	A-C	6.3	1.25	250	1 tube				Class A Amplifier	45.0	—	—	250	60	800	5,250	4.2	2,500	3.75	6A5-G
									Push-pull 2 tubes				Class A Amplifier	68.0	—	—	325	80	—	—	—	3,000	15.0	
6A6	Twin Triode	7B	14-1	Htr	A-C	6.3	0.8	300	—	Single tube			Class B Amplifier	0.0	—	—	300	17.5†	Input signal = .350 watt		—	8,000 ‡	10.0§	6A6
										Parallel triode			Class A Amplifier	6.0	—	—	294	7.0	11,000	3,200	35	30,000 §	0.400 §	
6A7	Pentagrid Converter	7C	12-6	Htr	A-C	6.3	0.3	300	100	Anode = 250 volts thru 20M ohms I_p = 4.0 ma			Converter	3.0	100	2.7	250	3.5	360,000§	Conversion Transconductance, 550				6A7
										Anode = 100 volts I_p = 2.0 ma			Converter	1.5	50	1.3	100	1.1	600,000§	Conversion Transconductance, 360				
6A7-S ★	Pentagrid Converter	7C	12-6	Htr	A-C	6.3	0.3	300	100	Anode = 250 volts thru 20M ohms I_p = 4.0 ma			Converter	3.0	100	2.7	250	3.5	360,000§	Conversion Transconductance, 550				6A7-S ★
										Anode = 100 volts I_p = 2.0 ma			Converter	1.5	50	1.3	100	1.1	600,000§	Conversion Transconductance, 360				
6A8	Pentagrid Converter	7C	8-4	Htr	A-C	6.3	0.3	300	100	Anode = 250 volts thru 20M ohms I_p = 4.0 ma			Converter	3.0	100	2.7	250	3.5	360,000§	Conversion Transconductance, 550				**6A8**
										Anode = 100 volts I_p = 2.0 ma			Converter	1.5	50	1.3	100	1.1	600,000§	Conversion Transconductance, 360				
6A8-G	Pentagrid Converter	7C	12-8	Htr	A-C	6.3	0.3	300	100	Anode = 250 volts thru 20M ohms I_p = 4.0 ma			Converter	3.0	100	2.7	250	3.5	360,000§	Conversion Transconductance, 550				6A8-G
										Anode = 100 volts I_p = 2.0 ma			Converter	1.5	50	1.3	100	1.1	600,000§	Conversion Transconductance, 360				
6A8-GT	Pentagrid Converter	7C	9-18	Htr	A-C	6.3	0.3	300	100	Anode = 250 volts thru 20M ohms I_p = 4.0 ma			Converter	3.0	100	2.7	250	3.5	360,000§	Conversion Transconductance, 550				6A8-GT
										Anode = 100 volts I_p = 2.0 ma			Converter	1.5	50	1.3	100	1.1	600,000§	Conversion Transconductance, 360				
6AB5/6N5	Electron-Ray Tube	6R	9-26	Htr	A-C	6.3	0.15	180	Plate voltage = 135 volts through .25 meg. (E_g = 0, shadow angle = 90°; I_b = 0.5 ma) (E_g = −10 volts, shadow angle = 0°)																6AB5/6N5
6AB7/1853	Remote-Cut-Off High-g_m Amplifier Pentode	8N	8-1	Htr	A-C	6.3	0.45	300	200	8.0	5.0	0.015	Class A Amplifier	3.0	300	3.2	300	12.5	700,000§	5,000	3,500§	—	—	**6AB7/1853**
6AC5-GT	High-Mu Power Amplifier Triode	6Q	9-11	Htr	A-C	6.3	0.4	250	—	2 tubes			Class B Power Amplifier	0.0	—	—	250	5.0†	Input signal = .950 watt			10,000 ‡	8.0	6AC5-GT
6AC6-GT	Dynamic-Coupled Power Amplifier	7W	9-11	Htr	A-C	6.3	1.1	180	—	—	—	—	Class A Amplifier	0.0	180‖	7.0‖	180	45.0	18,000§	3,000	—	3,500	3.6	6AC6-GT
6AC7/1852	Sharp-Cut-Off High-g_m Amplifier Pentode	8N	8-1	Htr	A-C	6.3	0.45	300	150	Bias resistor 160 ohms			Class A Amplifier	—	300	2.5	300	10.0	1,000,000§	9,000	9,000	—	—	**6AC7/1852**
6AD6-G	Electron-Ray Twin Indicator	7AG	9-3	Htr	A-C	6.3	0.15	Target voltage = 150 volts max; shadow angle = 0° with control electrode = +75 volts, 90° with +8 volts																6AD6-G

¶ Undistorted. † Zero signal per element. ‡ Plate-to-plate. § Approximate.
★ External shield connected to cathode pin. ‖ Input plate.

Type numbers of metal tubes are shown in bold-face type.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
6AD7-G	Triode-Power Amplifier Pentode	8AY	14-3	Htr	A-C	6.3	0.85	285	—	Triode section			Class A Amplifier	25.0	—	—	250	3.7	19,000§	325	6.0	—	—	6AD7-G
								375	285	Pentode section			Class A Amplifier	16.5	250	6.5	250	34.0	80,000§	2,500	—	7,000	3.2	
6AE5-GT	Amplifier Triode	6Q	9-11	Htr	A-C	6.3	0.3	300	—	—	—	—	Class A Amplifier	15.0	—	—	95	7.0	3,500	1,200	4.2	—	—	6AE5-GT
6AE6-G	Single Grid Twin Plate Control Tube	7AH	12-7	Htr	A-C	6.3	0.15	250	—	Remote-cut-off plate			Amplifier	1.5	—	—	250	6.5	25,000§	1,000	25	—	—	6AE6-G
										Sharp-cut-off plate			Amplifier	1.5	—	—	250	4.5	35,000§	950	33	—	—	
6AE7-GT	Twin Triode Amplifier	7AX	9-11	Htr	A-C	6.3	0.5	300	—	Grids and cathodes parallel connected			Amplifier	13.5	—	—	250	10.0	4,650	3,000	14	—	—	6AE7-GT
								300	—	Push-pull dynamic coupled			Amplifier	—	—	—	250	10.0	Grid to grid signal 44 volts RMS			10,000 ‡	9.5	
6AF5-G	Triode Voltage Amplifier	6Q	12-7	Htr	A-C	6.3	0.3	180	—	—	—	—	Class A Amplifier	18.0	—	—	180	7.0	4,900	1,500	7.4	—	—	6AF5-G
6AF6-G	Electron-Ray Tube	7AG	9-1	Htr	A-C	6.3	0.15	135	Target voltage = 135 volts max (shadow angle = 0° with control electrode = +75 volts, 90° with +8 volts)															6AF6-G
6AG5	Sharp-Cut-Off R-F Amplifier Pentode	7BD	5-2	Htr	A-C	6.3	0.3	300	150	—	Pentode connection		Class A Amplifier	Rk = 200	150	2.0	250	7.0	800,000§	5,000	—	—	—	*6AG5*
								300	—	—	Triode connection		Class A Amplifier	Rk = 825	—	—	250	5.5	11,000	3,800	42	—	—	
6AG7	Power Amplifier Pentode	8Y	8-6	Htr	A-C	6.3	0.65	300	300	13	7.5	0.06	Class A Amplifier	3.0	150	7.0	300	30	130,000	11,000	—	10,000	3.0	**6AG7**
6AH7-GT	Twin-Triode Amplifier	8BE	9-7	Htr	A-C	6.3	0.3	180	—	Each triode section			Class A Amplifier	6.5	—	—	180	7.6	8,400	1,900	16	—	—	6AH7-GT
6AJ5	High-Frequency Pentode	7PM	5-1	Htr	A-C	6.3	0.175	180	140	Cathode bias 200 ohms			Class A Amplifier	—	28	1.2	28	3.0	90,000	2,750	250	—	—	*6AJ5*
6AJ7	Sharp-Cut-Off High-G_m Amplifier Pentode	8N	8-1	Htr	A-C	6.3	0.45	300	150	Bias resistor 160 ohms			Class A Amplifier	—	300	2.5	300	10.0	1,000,000§	9,000	9,000	—	—	**6AJ7**
6AK5	High-Frequency Pentode	7PM	5-1	Htr	A-C	6.3	0.175	180	140	Cathode bias 200 ohms			Class A Amplifier	—	120	2.4	180	7.7	690,000	5,100	3,500	—	—	*6AK5*
6AK6	Power Amplifier Pentode	7BK	5-2	Htr	A-C	6.3	0.150	300	250	3.6▲	4.2▲	0.12▲	Class A Amplifier	9.0	180	2.5†	180	15.0†	200	2,300	—	10,000	1.1	*6AK6*
6AK7	Power Amplifier Pentode	8Y	8-6	Htr	A-C	6.3	0.65	300	300	13	7.5	0.06	Class A Amplifier	3.0	150	7.0	300	30	130,000	11,000	—	10,000	3.0	**6AK7**
6AL5	Twin Diode	6BT	5-1	Htr	A-C	6.3	0.3	Rms voltage per plate = 150 volts; max d-c output = 9.0 ma; peak current per plate = 54 ma; peak inverse voltage = 420																*6AL5*
6AL6-G	Beam Power Amplifier	6AM	16-4	Htr	A-C	6.3	0.90	350	300	—	—	—	Class A Power Amplifier	14.0	250	5.0	250	72.0	22,500	6,000	—	2,500	6.5	6AL6-G
6AL7-GT	Electron-Ray Tube	8CH	9-3	Htr	A-C	6.3	0.15	400	Outer edge of any of the three illuminated areas displaced 1/16 in. minimum outward with application of +5 volts to its electrode. Similar displacement inward with application of −5 volts. Entire pattern disappears with application of −6 volts to control grid															6AL7-GT
6AN6	Twin Diode	7BJ	5-2	Htr	A-C	6.3	0.20	—	Rms voltage per plate = 75 volts; d-c output = 3.5 ma with 25,000 ohms and 8 μμf load; peak current per plate = 10 ma; peak inverse voltage = 210														—	—	*6AN6*
6AQ6	Duplex Diode Triode	7BT	5-2	Htr	A-C	6.3	0.150	300	—	1.7	1.5	1.8	Class A Amplifier	3.0	—	—	250	1.0	58,000	1,200	70	—	—	*6AQ6*
6AQ7-GT	Duplex Diode Triode	8CK	9-11	Htr	A-C	6.3	0.30	250	—	2.3▲	1.5▲	2.8▲	Class A Amplifier	2.0	—	—	250	2.3	44,000	1,600	70	—	—	6AQ7-GT
6AR6	Beam Power Amplifier	6BQ	9A-3	Htr	A-C	6.3	1.20	630	315	11.0▲	7.0▲	0.8▲	Class B Power Amplifier	36.0	300	4.0	300	58.0	22,000	4,300	95	—	—	6AR6
6AR7-GT	Duplex Diode Triode	8CG	9-7	Htr	A-C	6.3	0.30	300	—	1.4▲	1.0▲	2.0▲	Class A Amplifier	2.0	—	—	250	1.3	66,500§	1,050	70	—	—	6AR7-GT
6AS6	Sharp-Cut-Off R-F Amplifier Pentode	7CN	5-1	Htr	A-C	6.3	0.175	180	140	4.0	3.0	0.02	Class A Amplifier	2.0	120	3.5§	120	5.5§	—	3,500	—	—	—	*6AS6*

§ Approximate. ‡ Plate-to-plate. ▲Without external shield. † Zero signal per element.

Type numbers of metal tubes are shown in bold-face type:
Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volt	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
6AT6	Duplex Diode Triode	7BT	5-2	Htr	A-C	6.3	0.30	300	—	2.3▲	1.1▲	2.1▲	Class A Amplifier	3.0	—	—	250	1.0	58,000	1,200	70	—	—	*6AT6*
6AU6	R-F Amplifier Pentode	7BK	5-2	Htr	A-C	6.3	0.30	300	150	5.5▲	5.0▲	0.0035▲	Class A Amplifier	1.0	150	4.3	250	10.8	2,000,000§	5,200	—	—	—	*6AU6*
6B4-G	Power Amplifier Triode	5S	16-3	Fil	A-C	6.3	1.0	250	—	—	—	—	Class A Amplifier	45	—	—	250	60	800	5,250	4.2	2,500	3.2¶	6B4G
										2 tubes			Class AB Amplifier	68	—	—	325	40†	—	—	—	3,000‡	15.0¶	
6B5	Direct-Coupled Power Amplifier	6AS	14-1	Htr	A-C	6.3	0.8	300	—	—	—	—	Class A Amplifier	0.0	.300‖	8.0‖	300	45.0	24,000§	2,400	—	7,000	4.0¶	6B5
6B6-G	Duplex Diode High-Mu Triode	7V	12-8	Htr	A-C	6.3	0.3	250	—	1.7	3.8	1.7	Class A Amplifier	2.0	—	—	250	0.9	91,000	1,100	100	—	—	6B6-G
6B7	Semi-Remote-Cut-Off Duplex-Diode Pentode	7D	12-6	Htr	A-C	6.3	0.3	300	125	3.5▲	9.5▲	.007	Class A Amplifier	3.0	125	2.3	250	9.0	600,000§	1,125	—	—	—	6B7
6B7-S★	Semi-Remote-Cut-Off Duplex-Diode Pentode	7D	12-6	Htr	A-C	6.3	0.3	300	125	—	—	—	Class A Amplifier	3.0	125	2.3	250	9.0	600,000§	1,125	—	—	—	6B7-S★
6B8	Semi-Remote-Cut-Off Duplex-Diode Pentode	8E	8-4	Htr	A-C	6.3	0.3	300	125	6.0	9.0	.005	Class A Amplifier	3.0	125	2.3	250	10.0	600,000§	1,325	—	—	—	**6B8**
6B8-G	Semi-Remote-Cut-Off Duplex-Diode Pentode	8E	12-8	Htr	A-C	6.3	0.3	300	125	3.6	9.5	.01	Class A Amplifier	3.0	125	2.3	250	10.0	600,000§	1,325	—	—	—	6B8-G
6B8-GT	Semi-Remote-Cut-Off Duplex-Diode Pentode	8E	9-20	Htr	A-C	6.3	0.3	300	125	4.5	10.0	0.005	Class A Amplifier	3.0	125	2.3	250	10.0	600,000§	1,325	—	—	—	6B8-GT
6BA6	Remote-Cut-Off R-F Amplifier Pentode	7CC	5-2	Htr	A-C	6.3	0.30	300	125	5.5▲	5.0▲	0.0035▲	Class A Amplifier	Rk = 68Ω	100	4.2	250	11.0	1,500,000	4,400	—	—	—	*6BA6*
6BE6	Pentagrid Converter	7CH	5-2	Htr	A-C	6.3	0.30	300	100	Osc I_g = 0.5 ma thru 20,000 ohms			Converter	1.5	100	7.1	250	3.0	1,000,000§	Conversion Transconductance, 475				*6BE6*
6C4	Detector Amplifier Triode	6BG	5-2	Htr	A-C	6.3	0.15	300	—	1.8▲	1.3▲	1.6▲	Class A Amplifier	8.5	—	—	250	10.5	7,700	2,200	17	—	—	*6C4*
6C5	Detector Amplifier Triode	6Q	8-1	Htr	A-C	6.3	0.3	300	—	3.0	11.0	2.0	Class A Amplifier	8.0	—	—	250	8.0	10,000	2,000	20	—	—	**6C5**
6C5-GT♦	Detector Amplifier Triode	6Q	9-12	Htr	A-C	6.3	0.3	300	—	4.4	12.0	2.2	Class A Amplifier	8.0	—	—	250	8.0	10,000	2,000	20	—	—	6C5-GT♦
6C6	Sharp-Cut-Off Detector-Amplifier Pentode	6F	12-2	Htr	A-C	6.3	0.3	300	125	5.0▲	6.5▲	0.007	Class A Amplifier	3.0	100	0.5	250	2.0	1,000,000*	1,225	—	—	—	6C6
6C7	Duplex Diode Triode	7G	12-2	Htr	A-C	6.3	0.3	250	—	—	—	—	Class A Amplifier	9.0	—	—	250	4.5	16,000	1,250	20	—	—	6C7
6C8-G	Twin Triode Amplifier	8G	12-8	Htr	A-C	6.3	0.3	250	—	Each triode			Class A Amplifier	4.5	—	—	250	3.2†	22,500	1,600	36	—	—	6C8-G
6D4	Gas Triode	5AY	5-2	Htr	A-C	6.3	0.25	Max voltage between elements = 450; peak anode current = 100 ma; average anode current = 25 ma; tube voltage drop at 25 ma = 16 volts														—	—	*6D4*
6D6	Remote-Cut-Off Amplifier Pentode	6F	12-2	Htr	A-C	6.3	0.3	300	100	4.7▲	6.5▲	0.007	Class A Amplifier	3.0	100	2.0	250	8.2	800,000§	1,600	—	—	—	6D6
6D7	Sharp-Cut-Off Detector-Amplifier Pentode	7H	12-2	Htr	A-C	6.3	0.3	300	125	5.2▲	6.8▲	0.01▲	Class A Amplifier	3.0	100	0.5	250	2.0	1,000,000*	1,225	—	—	—	6D7
6D8-G	Pentagrid Converter	8A	12-8	Htr	A-C	6.3	0.15	300	100	—	—	—	Converter	3.0	100	2.6	250	3.5	400,000§	Conversion Transconductance, 550				6D8-G
6E5	Electron-Ray Tube	6R	9-26	Htr	A-C	6.3	0.3	250	Plate voltage = 250 through one meg (E_g = 0, shadow angle = 90°, I_p = .24 ma) (E_g = −8 volts, shadow angle = 0°) target voltage = 250																6E5
6E6	Twin Triode Power Amplifier	7B	14-1	Htr	A-C	6.3	0.6	250	—	—	—	—	Class A Amplifier	27.5	—	—	250	18.0†	3,500	1,700	6.0	14,000‡	1.6¶	6E6

▲Without external shield. ¶ Undistorted. † Zero signal per element. ‡ Plate-to-plate. ‖ Input plate.
§ Approximate. ★ External shield connected to cathode pin. ♦ Internal shield connected to pin #1. * Minimum.

Type numbers of metal tubes are shown in bold-face type.
Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
6E7	Remote-Cut-Off R-F Amplifier Pentode	7H	12-2	Htr	A-C	6.3	0.3	300	100	5.2▲	6.8▲	0.01▲	Class A Amplifier	3.0	100	2.0	250	8.2	800,000	1,600	1,280	—	—	6E7
6F4	Triode Amplifier (Acorn)	7BR	4-2	Htr	A-C	6.3	0.225	150	—	2.0▲	0.6▲	1.9▲	Class A Amplifier	Rk = 150Ω	—	—	80	13.0	2,900	5,800	17	—	—	6F4
6F5	High-Mu-Amplifier Triode	5M	8-4	Htr	A-C	6.3	0.3	300	—	—	—	—	Class A Amplifier	2.0	—	—	250	0.9	66,000	1,500	100	—	—	**6F5**
6F5-G	High-Mu-Amplifier Triode	5M	12-8	Htr	A-C	6.3	0.3	300	—	—	—	—	Class A Amplifier	2.0	—	—	250	0.9	66,000	1,500	100	—	—	6F5-G
6F5-GT	High-Mu-Amplifier Triode	5M	9-11	Htr	A-C	6.3	0.3	300	—	—	—	—	Class A Amplifier	2.0	—	—	250	0.9	66,000	1,500	100	—	—	6F5-GT
6F6	Power Amplifier Pentode	7S	8-6	Htr	A-C	6.3	0.7	375	285	Pentode connection			Class A Power Amplifier	20.0	285	7.0†	285	38.0†	78,000§	2,550	—	7,000	4.8	**6F6**
								350	—	Triode connection			Class A Power Amplifier	20.0	—	—	250	31.0	2,600	2,600	6.8	4,000	0.850¶	
								375	250	Pentode connection			Class AB Amplifier	26.0	250	5.0†	375	34.0†	—	—	—	10,000‡	18.5	
								350	—	Triode connection			Class AB Amplifier	38.0	—	—	350	48.0†	—	—	—	6,000‡	13.0	
6F6-GT	Power Amplifier Pentode	7S	9-15	Htr	A-C	6.3	0.7	375	285	Pentode connection			Class A Power Amplifier	20.0	285	7.0†	285	38.0†	78,000§	2,550	—	7,000	4.8	6F6-GT
								350	—	Triode connection			Class A Power Amplifier	20.0	—	—	250	31.0	2,600	2,600	6.8	4,0000	.850¶	
								375	250	Pentode connection			Class AB Amplifier	26.0	250	5.0†	375	34.0†	—	—	—	10,000‡	18.5	
								350	—	Triode connection			Class AB Amplifier	38.0	—	—	350	48.0†	—	—	—	6,000‡	13.0	
6F7	Remote-Cut-Off Amplifier Triode Pentode	7E	12-6	Htr	A-C	6.3	0.3	250	100	Pentode section			Class A Amplifier	3.0	100	1.5	250	6.5	850,000	1,100	900	—	—	6F7
								100	—	Triode section			Class A Amplifier	3.0	—	—	100	3.5	16,000	500	8.0	—	—	
6F7-S★	Remote-Cut-Off Amplifier Triode Pentode	7E	12-6	Htr	A-C	6.3	0.3	250	100	Pentode section			Class A Amplifier	3.0	100	1.5	250	6.5	850,000	1,100	900	—	—	6F7-S★
								100	—	Triode section			Class A Amplifier	3.0	—	—	100	3.5	16,000	500	8.0	—	—	
6F8-G	Twin-Triode Amplifier	8G	12-8	Htr	A-C	6.3	0.6	300	—	Each triode			Class A Amplifier	8.0	—	—	250	9.0	7,700§	2,600§	20	—	—	6F8-G
6G6-G	Power Amplifier Pentode	7S	12-7	Htr	A-C	6.3	0.15	300	250	Pentode connection			Class A Amplifier	9.0	180	2.5†	180	15.0†	175,000	2,300	400	10,000	1.1	6G6-G
								300	—	Triode connection			Class A Amplifier	12.0	—	—	180	11.0	4,750	2,000	9.5	12,000	0.25	
6H4-GT	Diode	5AF	9-11	Htr	A-C	6.3	0.15	Rms volts per plate =100 volts; maximum d-c output =4 ma													—	—	—	6H4-GT
6H6	Twin Diode	7Q	8-5	Htr	A-C	6.3	0.3	Rms voltage per plate =100 volts; max d-c output =8 ma; peak current per plate =48 ma; peak inverse voltage =420 volts													—	—	—	**6H6**
6H6-GT♦	Twin Diode	7Q	9-11	Htr	A-C	6.3	0.3	Rms voltage per plate =100 volts; max d-c output =8 ma; peak current per plate =48 ma; peak inverse voltage =420 volts													—	—	—	6H6-GT♦
6J4	High-Frequency Triode	7BQ	5-2	Htr	A-C	6.3	0.4	150	Cathode bias 200 ohms				Class A Amplifier	—	—	—	150	15.0	4,500	12,000	55	—	—	*6J4*
6J5	Detector Amplifier Triode	6Q	8-1	Htr	A-C	6.3	0.3	300	—	3.4	3.6	3.4	Class A Amplifier	8.0	—	—	250	9.0	7,700	2,600	20	—	—	**6J5**
6J5-GT	Detector Amplifier Triode	6Q	9-12	Htr	A-C	6.3	0.3	300	—	4.2	5.0	3.8	Class A Amplifier	8.0	—	—	250	9.0	7,700	2,600	20	—	—	6J5-GT
6J6	Twin Triode	7BE	5-2	Htr	A-C	6.3	0.45	300	Cathode bias 50 ohms⊕				Class A Amplifier	—	—	—	100	8.5♠	7,100	5,300	38	—	—	*6J6*

▲Without external shield. † Zero signal per element. ‡ Plate-to-plate. § Approximate.
♦Internal shield connected to pin #1. ★External shield connected to cathode pin. ⊕Both sections. ♠Per section.

Type numbers of metal tubes are shown in bold-face type.
Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Capacitance in Micromicrofarads: Output	Capacitance in Micromicrofarads: Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
6J7	Sharp-Cut-Off Detector-Amplifier Pentode	7R	8-4	Htr	A-C	6.3	0.3	300	125	Pentode connected			Class A Amplifier	3.0	100	0.5	250	2.0	1,000,000*	1,225	—	—	—	**6J7**
								250	—	Triode connected			Class A Amplifier	8.0	—	—	250	6.5	10,500	1,900	20	—	—	
6J7-G ♦	Sharp-Cut-Off Detector-Amplifier Pentode	7R	12-8	Htr	A-C	6.3	0.3	300	125	Pentode connected			Class A Amplifier	3.0	100	0.5	250	2.0	1,000,000*	1,225	—	—	—	6J7-G ♦
								250	—	Triode connected			Class A Amplifier	8.0	—	—	250	6.5	10,500	1,900	20	—	—	
6J7-GT ♦	Sharp-Cut-Off Detector-Amplifier Pentode	7R	9-18	Htr	A-C	6.3	0.3	300	125	Pentode connected			Class A Amplifier	3.0	100	0.5	250	2.0	1,000,000*	1,225	—	—	—	6J7-GT ♦
								250	—	Triode connected			Class A Amplifier	8.0	—	—	250	6.5	10,500	1,900	20	—	—	
6J8-G	Triode-Heptode Converter	8H	12-8	Htr	A-C	6.3	0.3	300	100	Osc Anode = 250 v thru 20,000 ohms; I_p = 5.8 ma			Converter	3.0	100	3.5	250	1.3	2,500,000§	Conversion Transconductance = 290			—	6J8-G
6K5-G	High-Mu Triode	5U	12-8	Htr	A-C	6.3	0.3	250	—	—	—	—	Class A Amplifier	3.0	—	—	250	1.1	50,000§	1,400	70§	—	—	6K5-G
6K5-GT	High-Mu Triode	5U	9-17	Htr	A-C	6.3	0.3	250	—	2.4▲	3.6▲	2.0▲	Class A Amplifier	3.0	—	—	250	1.1	50,000§	1,400	70§	—	—	6K5-GT
6K6-GT	Power-Amplifier Pentode	7S	9-11	Htr	A-C	6.3	0.4	315	285	Single Tube			Class A Amplifier	21.0	250	4.0†	315	25.5†	75,000§	2,100	—	9,000	4.5	6K6-GT
								315	285	2 Tubes, Push-pull			Class A Amplifier	25.5	285	4.5, ♠†	285	27.5†, ♠	Peak Grid to Grid Voltage = 51 V			12,000 ‡	10.5	
6K7	Remote-Cut-Off R-F Amplifier Pentode	7R	8-4	Htr	A-C	6.3	0.3	300	125	7.0	12.0	0.005	Class A Amplifier	3.0	125	2.6	250	10.5	600,000§	1,650	—	—	—	**6K7**
6K7-G	Remote-Cut-Off R-F Amplifier Pentode	7R	12-8	Htr	A-C	6.3	0.3	300	125	5.0	12.0	0.007	Class A Amplifier	3.0	125	2.6	250	10.5	600,000§	1,650	—	—	—	6K7-G
6K7-GT	Remote-Cut-Off R-F Amplifier Pentode	7R	9-18	Htr	A-C	6.3	0.3	300	125	4.6	12.0	0.005	Class A Amplifier	3.0	125	2.6	250	10.5	600,000§	1,650	—	—	—	6K7-GT
6K8	Triode-Hexode Converter	8K	8-2	Htr	A-C	6.3	0.3	300	150	Osc Anode = 100 V *I_p = 3.8 ma			Converter	3.0	100	6.0	250	2.5	600,000§	Conversion Transconductance = 350			—	**6K8**
6K8-G	Triode-Hexode Converter	8K	12-8	Htr	A-C	6.3	0.3	300	150	Osc Anode = 100 v *I_p = 3.8 ma			Converter	3.0	100	6.0	250	2.5	600,000§	Conversion Transconductance = 350			—	6K8-G
6K8-GT	Triode-Hexode Converter	8K	9-24	Htr	A-C	6.3	0.3	300	150	Osc Anode = 100 v *I_p = 3.8 ma			Converter	3.0	100	6.0	250	2.5	600,000§	Conversion Transconductance = 350			—	6K8-GT
6L5-G	Detector-Amplifier Triode	6Q	12-7	Htr	A-C	6.3	0.15	250	—	3.0	5.0	2.7	Class A Amplifier	9.0	—	—	250	8.0	9,000	1,900	17	—	—	6L5-G
6L6	Beam Power Amplifier	7AC	10-1	Htr	A-C	6.3	0.9	360	270	Single Tube			Class A Amplifier	14.0	250	5.0†	250	72.0†	22,500	6,000	—	2,500	6.5	**6L6**
								360	270	Single Tube			Class A Amplifier	18.0	250	2.5†	350	54.0†	33,000	5,200	—	4,200	10.8	
								360	270	2 Tubes			Class A Amplifier	17.5	270	11.0†	270	134.0†	23,500	5,700	—	5,000	17.5	
								360	270	2 Tubes			Class AB_1 Amplifier	22.5♥	270	5.0†	360	88.0†	—	—	—	3,800	18.0	
								360	270	2 Tubes			Class AB_2 Amplifier	22.5§	270	5.0†	360	88.0†	—	—	—	3,800	47.0	
6L6-G	Beam Power Amplifier	7AC	16-3	Htr	A-C	6.3	0.9	360	270	Single Tube			Class A Amplifier	14.0	250	5.0†	250	72.0†	22,500	6,000	—	2,500	6.5	6L6-G
								360	270	Single Tube			Class A Amplifier	18.0	250	2.5†	350	54.0†	33,000	5,200	—	4,200	10.8	
								360	270	2 Tubes			Class A Amplifier	17.5	270	11.0†	270	134.0†	23,500	5,700	—	5,000	17.5	
								360	270	2 Tubes			Class AB_1 Amplifier	22.5♥	270	5.0†	360	88.0†	—	—	—	3,800	18.0	
								360	270	2 Tubes			Class AB_2 Amplifier	22.5§	270	5.0†	360	88.0†	—	—	—	3,800	47.0	

* Minimum. ♠ Per section. ♦ Internal shield connected to pin # 1. ‡ Plate-to-plate. § Approximate. § Grids driven positive. ▲ Without external shield. ♥ Grids never driven positive. † Zero signal per element. **Type numbers of metal tubes are shown in bold-face type.**

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
6L6-GA	Beam Power Amplifier	7AC	14-3	Htr	A-C	6.3	0.9	360	270	Single Tube			Class A Amplifier	14.0	250	5.0†	250	72.0†	22,500	6,000	—	2,500	6.5	6L6-GA
								360	270	Single Tube			Class A Amplifier	18.0	250	2.5†	350	54.0†	33,000	5,200	—	4,200	10.8	
								360	270	2 Tubes			Class A Amplifier	17.5	270	11.0†	270	134.0†	23,500	5,700	—	5,000	17.5	
								360	270	2 Tubes			Class AB_1 Amplifier	22.5♥	270	5.0†	360	88.0†	—	—	—	3,800	18.0	
								360	270	2 Tubes			Class AB_2 Amplifier	22.5‡	270	5.0†	360	88.0†	—	—	—	3,800	47.0	
6L7	Pentagrid Mixer Amplifier	7T	8-4	Htr	A-C	6.3	0.3	300	150	(E_{c3} = −15 v)			Mixer	6.0	150	9.2	250	3.3	1,000,000*	Conversion Transconductance = 350			—	**6L7**
								300	100	(E_{c3} = −3.0 v)			Class A Amplifier	3.0	100	6.5	250	5.3	600,000§	1,100	670			
6L7-G	Pentagrid Mixer Amplifier	7T	12-8	Htr	A-C	6.3	0.3	300	150	(E_{c3} = −15 v)			Mixer	6.0	150	9.2	250	3.3	1,000,000*	Conversion Transconductance = 350			—	6L7-G
								300	100	(E_{c3} = −3.0 v)			Class A Amplifier	3.0	100	6.5	250	5.3	600,000§	1,100	670			
6N4	U-H-F Amplifier Oscillator Triode	6CA	5-1	Htr	A-C	6.3	0.20	180	—	3.0	1.6	1.1	Class A Amplifier	3.5	—	—	180	12.0	5,400§	6,000§	32	—	—	*6N4*
6N6-G	Direct-Coupled Power Amplifier	7AU	14-3	Htr	A-C	6.3	0.8	300	300‖	Single Tube			Class A Amplifier	0.0	300‖	8.0‖	300	45	24,000§	2,400	—	7,000	4.0¶	6N6-G
6N7	Twin Triode	8B	8-6	Htr	A-C	6.3	0.8	300	—	Single Tube			Class B Amplifier	0.0	—	—	300	17.5†	—	—	—	8,000	10.0	**6N7**
								300	—	Parallel Triodes			Class A Amplifier	6.0	—	—	294	7.0	11,000	3,200	—	—	—	
6N7-G	Twin Triode	8B	14-3	Htr	A-C	6.3	0.8	300	—	Single Tube			Class B Amplifier	0.0	—	—	300	17.5†	—	—	—	8,000	10.0	6N7-G
								300	—	Parallel Triodes			Class A Amplifier	6.0	—	—	294	7.0	11,000	3,200	—	—	—	
6N7-GT	Twin Triode	8B	9-11	Htr	A-C	6.3	0.8	300	—	Single Tube			Class B Amplifier	0.0	—	—	300	17.5†	—	—	—	8,000	10.0	6N7-GT
								300	—	Parallel Triodes			Class A Amplifier	6.0	—	—	294	7.0	11,000	3,200	—	—	—	
6P5-GT	Detector Amplifier Triode	6Q	9-11	Htr	A-C	6.3	0.3	250	—	3.4	5.5	2.6	Class A Amplifier	13.5	—	—	250	5.0	9,500	1,450	13.8	—	—	6P5-GT
6P7-G	Remote-Cut-Off Amplifier Triode Pentode	7U	12-8	Htr	A-C	6.3	0.3	250	100	Pentode Section			Class A Amplifier	3.0	100	1.5	250	6.5	850,000	1,100	900	—	—	6P7-G
								100	—	Triode Section			Class A Amplifier	3.0	—	—	100	3.5	16,000	500	8.0	—	—	
6Q7	Duplex Diode High-Mu Triode	7V	8-4	Htr	A-C	6.3	0.3	300	—	5.0	3.8	1.4	Class A Amplifier	3.0	—	—	250	1.0	58,000	1,200	70	—	—	**6Q7**
6Q7-G	Duplex Diode High-Mu Triode	7V	12-8	Htr	A-C	6.3	0.3	300	—	3.2	5.0	1.5	Class A Amplifier	3.0	—	—	250	1.0	58,000	1,200	70	—	—	6Q7-G
6Q7-GT	Duplex Diode High-Mu Triode	7V	9-18	Htr	A-C	6.3	0.3	300	—	2.2	5.0	1.6	Class A Amplifier	3.0	—	—	250	1.0	58,000	1,200	70	—	—	6Q7-GT
6R7	Duplex Diode Triode	7V	8-4	Htr	A-C	6.3	0.3	250	—	4.8	3.8	2.4	Class A Amplifier	9.0	—	—	250	9.5	8,500	1,900	16	—	—	**6R7**
6R7-G	Duplex Diode Triode	7V	12-8	Htr	A-C	6.3	0.3	250	—	—	—	—	Class A Amplifier	9.0	—	—	250	9.5	8,500	1,900	16	—	—	6R7-G
6R7-GT	Duplex Diode Triode	7V	9-17	Htr	A-C	6.3	0.3	250	—	—	—	—	Class A Amplifier	9.0	—	—	250	9.5	8,500	1,900	16	—	—	6R7-GT
6S7	Remote-Cut-Off R-F Amplifier Pentode	7R	8-2	Htr	A-C	6.3	0.15	300	100	6.5	10.5	0.005	Class A Amplifier	3.0	100	2.0	250	8.5	1,000,000§	1,750	—	—	—	**6S7**
6S7-G♦	Remote-Cut-Off R-F Amplifier Pentode	7R	12-8	Htr	A-C	6.3	0.15	300	100	4.4	8.0	0.008	Class A Amplifier	3.0	100	2.0	250	8.5	1,000,000§	1,750	—	—	—	6S7-G♦

♥Grids never driven positive. ‡ Grids driven positive. † Zero signal per element. * Minimum. § Approximate.
‖ Input plate. ¶ Undistorted. ♦ Internal shield connected to pin # 1.

Type numbers of metal tubes are shown in bold-face type.
Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
6S8-GT	Triple Diode Triode	8CB	9A–4	Htr	A-C	6.3	0.30	300	—	1.2	5.0	2.0	Class A Amplifier	2.0	—	—	250	0.9	91,000	1,100	100	—	—	6S8-GT
6SA7♦	Pentagrid Converter	8R	8–1	Htr	A-C	6.3	0.3	300	100	Osc I_g = 1.0 ma thru 20,000 ohms			Converter	2.0◉	100	8.5	250	3.5	1,000,000§	Conversion Transconductance = 450			—	**6SA7♦**
6SA7-GT	Pentagrid Converter	8AD	9–18	Htr	A-C	6.3	0.3	300	100	Osc I_g = 1.0 ma thru 20,000 ohms			Converter	2.0◉	100	8.5	250	3.5	1,000,000§	Conversion Transconductance = 450			—	6SA7-GT
6SB7-Y	Pentagrid Converter	8R	8–1	Htr	A-C	6.3	0.3	300	100	Osc I_g = 0.5 ma thru 20,000 ohms			Converter	1.5	100	8.5	250	4.0	—	Conversion Transconductance = 880			—	**6SB7-Y**
6SC7	Twin-Triode Amplifier	8S	8–1	Htr	A-C	6.3	0.3	250	—	Each Triode			Class A Amplifier	2.0	—	—	250	2.0†	53,000§	1,325§	70	—	—	**6SC7**
6SC7-GT	Twin-Triode Amplifier	8S	9–11	Htr	A-C	6.3	0.3	250	—	Each Triode			Class A Amplifier	2.0	—	—	250	2.0†	53,000§	1,325§	70	—	—	6SC7-GT
6SD7-GT	Amplifier Pentode	8M	9–12	Htr	A-C	6.3	0.3	300	125	9.0	7.5	0.0035	Class A Amplifier	2.0	125	3.0	250	9.5	700,000	4,250	—	—	—	6SD7-GT
6SE7-GT	Amplifier Pentode	8N	9–12	Htr	A-C	6.3	0.3	300	125	8.0	7.5	0.005	Class A Amplifier	1.5	100	1.5	250	4.5	1,000,000	3,400	—	—	—	6SE7-GT
6SF5	High-Mu Amplifier Triode	6AB	8–1	Htr	A-C	6.3	0.3	300	—	4.0	3.6	2.4	Class A Amplifier	2.0	—	—	250	0.9	66,000	1,500	100	—	—	**6SF5**
6SF5-GT	High-Mu Amplifier Triode	6AB	9–11	Htr	A-C	6.3	0.3	300	—	—	—	—	Class A Amplifier	2.0	—	—	250	0.9	66,000	1,500	100	—	—	6SF5-GT
6SF7	Remote-Cut-Off Amplifier Diode Pentode	7AZ	8–1	Htr	A-C	6.3	0.3	300	100	5.5	6.0	0.004	Class A Amplifier	1.0	100	3.3	250	12.4	700,000§	2,050	—	—	—	**6SF7**
6SG7	Semi-Remote-Cut-Off High gm Amplifier Pentode	8BK	8–1	Htr	A-C	6.3	0.3	300	200	8.5	7.0	0.003	Class A Amplifier	2.5	150	3.4	250	9.2	1,000,000*	4,000	—	—	—	**6SG7**
6SH7	Sharp-Cut-Off H-F Amplifier Pentode	8BK	8–1	Htr	A-C	6.3	0.3	300	150	8.5	7.0	0.003	Class A Amplifier	1.0	150	4.1	250	10.8	900,000§	4,900	—	—	—	**6SH7**
6SH7-GT♦	Sharp-Cut-Off H-F Amplifier Pentode	8BK	9–12	Htr	A-C	6.3	0.3	300	150	8.5▲	7.0▲	0.003▲	Class A Amplifier	1.0	150	4.1	250	10.8	900,000§	4,900	—	—	—	6SH7-GT♦
6SJ7	Sharp-Cut-Off Detector-Amplifier Pentode	8N	8–1	Htr	A-C	6.3	0.3	300	125	Pentode Connection			Class A Amplifier	3.0	100	0.8	250	3.0	1,000,000*	1,650	—	—	—	**6SJ7**
								250	—	Triode Connection			Class A Amplifier	8.5	—	—	250	9.2	7,600	2,500	19	—	—	
6SJ7-GT	Sharp-Cut-Off Detector-Amplifier Pentode	8N	9–12	Htr	A-C	6.3	0.3	300	125	Pentode Connection			Class A Amplifier	3.0	100	0.8	250	3.0	1,000,000*	1,650	—	—	—	6SJ7-GT
								250	—	Triode Connection			Class A Amplifier	8.5	—	—	250	9.2	7,600	2,500	19	—	—	
6SJ7-Y	Sharp-Cut-Off Detector-Amplifier Pentode	8N	8–1	Htr	A-C	6.3	0.3	300	125	Pentode Connection			Class A Amplifier	3.0	100	0.8	250	3.0	1,000,000*	1,650	—	—	—	**6SJ7-Y**
								250	—	Triode Connection			Class A Amplifier	8.5	—	—	250	9.2	7,600	2,500	19	—	—	
6SK7	Remote-Cut-Off R-F Amplifier Pentode	8N	8–1	Htr	A-C	6.3	0.3	300	125	6.0	7.0	0.003	Class A Amplifier	3.0	100	2.6	250	9.2	800,000§	2,000	—	—	—	**6SK7**
6SK7-GT	Remote-Cut-Off R-F Amplifier Pentode	8N	9–12	Htr	A-C	6.3	0.3	300	125	6.5	7.5	0.005	Class A Amplifier	3.0	100	2.6	250	9.2	800,000§	2,000	—	—	—	6SK7-GT
6SL7-GT	Twin-Triode Amplifier	8BD	9–11	Htr	A-C	6.3	0.3	250	—	Each Unit			Class A Amplifier	2.0	—	—	250	2.3	44,000	1,600	70	—	—	6SL7-GT
6SN7-GT	Twin-Triode Amplifier	8BD	9–11	Htr	A-C	6.3	0.6	300	—	Each Unit			Class A Amplifier	8.0	—	—	250	9.0	7,700	2,900	20	—	—	6SN7-GT
6SQ7	Duplex Diode High-Mu Triode	8Q	8–1	Htr	A-C	6.3	0.6	300	—	3.2	3.0	1.6	Class A Amplifier	2.0	—	—	250	0.9	91,000	1,100	100	—	—	**6SQ7**
6SQ7-GT	Duplex Diode High-Mu Triode	8Q	9–12	Htr	A-C	6.3	0.6	300	—	4.2	3.4	1.8	Class A Amplifier	2.0	—	—	250	0.9	91,000	1,100	100	—	—	6SQ7-GT

◉ Maximum frequency obtained at 100 per cent maximum rated input.
† Zero signal per element.
§ Approximate.
* Minimum.
♦ Internal shield connected to pin #1.
▲ Without external shield.

Type numbers of metal tubes are shown in bold-face type.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
6SR7	Duplex Diode Triode	8Q	8-1	Htr	A-C	6.3	0.3	250	—	3.6	2.8	2.4	Class A Amplifier	9.0	—	—	250	9.5	8,500	1,900	16	10,000	0.300	**6SR7**
6SR7-GT	Duplex Diode Triode	8Q	9-11	Htr	A-C	6.3	0.3	250	—	—	—	—	Class A Amplifier	9.0	—	—	250	9.5	8,500	1,900	16	10,000	0.300	6SR7-GT
6SS7	Remote-Cut-Off R-F Amplifier Pentode	8N	8-1	Htr	A-C	6.3	0.15	300	100	5.5	7.0	0.004	Class A Amplifier	3.0	100	2.0	250	9.0	1,000,000§	1,850	—	—	—	**6SS7**
6ST7	Duplex Diode Triode	8Q	8-1	Htr	A-C	6.3	0.15	250	—	2.8	3.0	1.5	Class A Amplifier	9.0	—	—	250	9.5	8,500	1,900	16	—	—	**6ST7**
6SU7-GTY	Twin Triode Amplifier	8BD	9-11	Htr	A-C	6.3	0.3	250	—	Each Unit			Class A Amplifier	2.0	—	—	250	2.3	44,000	1,600	70	—	—	6SU7-GTY
6SV7	Diode R-F Pentode	7AZ	8-1	Htr	A-C	6.3	0.30	300	150	6.5	6.0	0.004	Class A Amplifier	1.0	150	2.8	250	7.5	800,000§	3,400	—	—	—	**6SV7**
6SZ7	Duplex-Diode High-Mu Triode	8Q	8-1	Htr	A-C	6.3	0.15	300	—	2.6	2.8	1.1	Class A Amplifier	3.0	—	—	250	1.0	58,000	1,200	70	—	—	**6SZ7**
6T5	Electron-Ray Indicator	6R	9-26	Htr	A-C	6.3	0.3	250	Plate voltage =250 through 1 megohm; target voltage =250 volts; (E_g =0 for min illumination, I_b =3 ma; E_g = −22 for max illumination)													—	—	6T5
6T7-G	Duplex Diode High-Mu Triode	7V	12-8	Htr	A-C	6.3	0.15	250	—	1.8	3.1	1.7	Class A Amplifier	3.0	—	—	250	1.2	62,000	1,050	65	—	—	6T7-G
6U5/6G5	Electron-Ray Indicator	6R	9-26	Htr	A-C	6.3	0.3	285	Plate voltage =250 through 1 megohm (E_g =0, shadow angle =90°, I_b =.24 ma) (E_g =22, shadow angle =0°) target voltage =250													—	—	6U5/6G5
6U6-GT	Beam Power Amplifier	7AC	9-11	Htr	A-C	6.3	0.75	200	135	—	—	—	Class A Anplifier	14.0	135	3.0†	200	55.0†	20,000	6,200	—	3,000	5.5	6U6-GT
6U7-G	Remote-Cut-Off R-F Amplifier Pentode	7R	12-4	Htr	A-C	6.3	0.3	300	100	5.0	9.0	0.007	Class A Amplifier	3.0	100	2.0	250	8.2	800,000§	1,600	—	—	—	6U7-G
6V6	Beam Power Amplifier	7AC	8-6	Htr	A-C	6.3	0.45	315	285	Single Tube			Class A Amplifier	13.0	225	2.2†	315	34.0†	77,000	3,750	—	8,500	5.5	**6V6**
										2 Tubes			Class AB_1 Amplifier	15.0♥	250	5.0	250	70.0	60,000	3,750	—	10,-000‡	10.0¶	
6V6-GT	Beam Power Amplifier	7AC	9-11	Htr	A-C	6.3	0.45	315	285	Single Tube			Class A Amplifier	13.0	225	2.2†	315	34.0†	77,000	3,750	—	8,500	5.5	6V6-GT
										2 Tubes			Class AB_1 Amplifier	15.0♥	250	5.0	250	70.0	60,000	3,750	—	10,-000‡	10.0¶	
6V7-G	Duplex Diode Triode	7V	12-8	Htr	A-C	6.3	0.3	250	—	2.0	3.5	1.7	Class A Amplifier	20.0	—	—	250	8.0	7,500	1,100	8.3	20,000	0.350	6V7-G
6W5-G	Full-Wave High-Vacuum Rectifier	6S	12-7	Htr	A-C	6.3	0.9	Rms voltage per plate (choke input) =450 v; maximum d-c output =90 ma; peak current per plate = 270 ma; peak inverse voltage =1,250 v														—	—	6W5-G
6W7-G	Sharp-Cut-Off Detector-Amplifier Pentode	7R	12-8	Htr	A-C	6.3	0.15	300	300	5.0	8.5	0.007	Class A Amplifier	3.0	100	0.5	250	2.0	1,500,000§	1,225	—	—	—	6W7-G
6X5	Full-Wave High-Vacuum Rectifier	6S	8-6	Htr	A-C	6.3	0.6	Rms voltage per plate (choke input) =450; max d-c output =70 ma; peak current per plate =210 ma; peak inverse voltage =1,250 v														—	—	**6X5**
6X5-GT	Full-Wave High-Vacuum Rectifier	6S	9-11	Htr	A-C	6.3	0.6	Rms voltage per plate (choke input) =450 v; max d-c output =70 ma; peak current per plate =210 ma; peak inverse voltage =1,250 v														—	—	6X5-GT
6Y6-G	Beam Power Amplifier	7AC	14-3	Htr	A-C	6.3	1.25	200	135	15.0	8.0	0.7	Class A Amplifier	14.0	135	2.2§	200	61.0	18,300§	7,100	—	2,600	6.0	6Y6-G
6Y6-GT	Beam Power Amplifier	7AC	9-11	Htr	A-C	6.3	1.25	200	135	—	—	—	Class A Amplifier	14.0	135	2.2§	200	61.0	18,300§	7,100	—	2,600	6.0	6Y6-GT
6Y7-G	Twin-Triode Amplifier	8B	12-7	Htr	A-C	6.3	0.6	250	—	Single Tube		—	Class B Power Amplifier	0.0	—	—	250	5.3†	—	—	—	14,-000‡	8.0§	6Y7-G
6Z4/84	Full-Wave High-Vacuum Rectifier	5D	12-5	Htr	A-C	6.3	0.5	Rms voltage per plate (choke input) =450 v; max d-c output =60 ma; peak current per plate =180 ma; peak inverse voltage =1,250 v														—	—	6Z4/84

† Zero signal per element.
§ Approximate.
♥ Grids never driven positive.
‡ Plate-to-plate.
¶ Undistorted.

Type numbers of metal types are shown in bold-face type.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
6Z5	Full-Wave High-Vacuum Rectifier	6K	12–5	Htr	A-C	6.3 / 12.6	0.8 / 0.4	Rms voltage per plate = 230 v; max d-c output = 60 ma													—	—	—	6Z5
6Z7-G	Twin-Triode Power Amplifier	8B	12–7	Htr	A-C	6.3	0.3	180	—	Single Tube			Class B Power Amplifier	0.0	—	—	180	4.2†	Power input = 320 watts			12,000‡	4.2	6Z7-G
6ZY5-G	Full-Wave High-Vacuum Rectifier	6S	12–7	Htr	A-C	6.3	0.3	Rms voltage per plate (choke input) = 450 v; max d-c output = 40 ma; peak current per plate = 120 ma; peak inverse voltage = 1,250 v														—	—	6ZY5-G
7A4	Detector Amplifier Triode	5AC	9–30	Htr	A-C	6.3	0.3	300	—	3.4	3.0	4.0	Class A Amplifier	8.0	—	—	250	9.0	7,700	2,600	20	—	—	7A4
7A5	Beam Power Amplifier	6AA	9–31	Htr	A-C	6.3	0.75	125	125	—	—	—	Class A Amplifier	9.0	125	3.3†	125	44.0†	17,000§	6,000	—	2,700	2.2	7A5
7A6	Twin Diode	7AJ	9–30	Htr	A-C	6.3	0.15	Rms voltage per plate = 150 v; max d-c output = 8 ma													—	—	—	7A6
7A7	Remote-Cut-Off R-F Amplifier Pentode	8V	9–30	Htr	A-C	6.3	0.3	250	100	6.0	7.0	0.005	Class A Amplifier	3.0	100	2.0	250	8.6	800,000	2,000	—	—	—	7A7
7A8	Octode Converter	8U	9–30	Htr	A-C	6.3	0.15	300	100	Anode = 250 v thru 20,000 ohms I_p = 4.0 ma			Converter	3.0	100	3.2	250	3.0	700,000§	Conversion Transconductance = 550			—	7A8
7AF7	Twin Triode Amplifier	8AC	9–30	Htr	A-C	6.3	0.3	300	—	2.2	1.6	2.3	Class A Amplifier	10.0	—	—	250	9.0♠	7,600	2,100	16	—	—	7AF7
7B4	Hi-Mu Triode	5AC	9–30	Htr	A-C	6.3	0.3	300	—	3.6	3.4	1.6	Class A Amplifier	2.0	—	—	250	0.9	66,000	1,500	100	—	—	7B4
7B5	Power-Amplifier Pentode	6AE	9–31	Htr	A-C	6.3	0.4	315	285	—	—	—	Class A Amplifier Class A Amplifier	21.0 18.0	250 250	4.0† 5.5†	315 250	25.5† 32.0†	75,000 68,000	2,100 2,300	— —	9,000 7,600	4.5 3.4	7B5
7B6	Duplex Diode Hi-Mu Triode	8W	9–30	Htr	A-C	6.3	0.3	250	—	—	—	—	Class A Amplifier	2.0	—	—	250	0.9	91,000	1,100	100	—	—	7B6
7B7	Remote-Cut-Off R-F Amplifier Pentode	8V	9–30	Htr	A-C	6.3	0.15	250	100	5.0	7.0	0.005	Class A Amplifier	3.0	100	2.0	250	8.5	700,000	1,700	—	—	—	7B7
7B8	Pentagrid Converter	8X	9–30	Htr	A-C	6.3	0.3	250	100	Anode = 250 v thru 20,000 ohms I_p = 4.0			Converter	3.0	100	2.7	250	3.5	360,000§	Conversion Transconductance = 550			—	7B8
7C4	Diode	4AH	9–30	Htr	A-C	6.3	0.150	Rms plate voltage = 117 max; max d-c output = 5 ma												—	—	—	—	7C4
7C5	Beam Power Amplifier	6AA	9–31	Htr	A-C	6.3	0.4	315	250	—	—	—	Class A Amplifier Class A Amplifier	13.0 8.5	225 180	2.2† 3.0†	315 180	34.0† 29.0†	77,000 58,000	3,750 3,700	— —	8,500 5,500	5.5 2.0	7C5
7C6	Duplex Diode Hi-Mu Triode	8W	9–30	Htr	A-C	6.3	0.15	250	—	2.4	3.0	1.4	Class A Amplifier	1.0	—	—	250	1.3	100,000	1,000	100	—	—	7C6
7C7	Sharp-Cut-Off Detector Amplifier Pentode	8V	9–30	Htr	A-C	6.3	0.15	300	100	5.5	6.5	0.007	Class A Amplifier	3.0	100	0.5	250	2.0	2,000,000§	1,300	—	—	—	7C7
7D7	Triode-Hexode Converter	7D7	9–31	Htr	A-C	6.3	0.15	250	100	Triode I_p = 250 thru 20,000 ohms I_p = 5.0 ma			Converter	3.0	100	2.8	250	1.3	1,500,000	Conversion Transconductance = 275			—	7D7
7E5	High-Frequency Triode	8BN	9–30	Htr	A-C	6.3	0.15	250	—	3.6	2.8	1.5	Class A Amplifier	3.0	—	—	180	5.5	12,000	3,000	36	—	—	7E5
7E6	Duplex Diode Triode	8W	9–30	Htr	A-C	6.3	0.3	250	—	—	—	—	Class A Amplifier	9.0	—	—	250	9.5	8,500	1,900	16	—	—	7E6
7E7	Remote-Cut-Off Duplex-Diode Pentode	8AE	9–30	Htr	A-C	6.3	0.3	250	100	4.6	4.6	0.005	Class A Amplifier	3.0	100	1.6	250	7.5	700,000§	1,300	—	—	—	7E7
7F7	Twin Triode Amplifier	8AC	9–30	Htr	A-C	6.3	0.3	250	—	Each Triode Unit			Class A Amplifier	2.0	—	—	250	2.3	44,000§	1,600	70	—	—	7F7

† Zero signal per element. ‡ Plate-to-plate. § Approximate. ♠ Per section.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	Gm, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
7F8	Twin Triode	8BW	9–29	Htr	A-C	6.3	0.30	300	—	2.8	1.8	1.2	Class A Amplifier	2.5	—	—	250	10.0	—	5,000	52	—	—	7F8
7G7	Sharp-Cut-Off Amplifier Pentode	8V	9–30	Htr	A-C	6.3	0.45	250	100	9.0	7.0	0.007	Class A Amplifier	2.0	100	2.0	250	6.0	800,000§	4,500	—	—	—	7G7
7G8	Twin Tetrode	8BV	9–29	Htr	A-C	6.3	0.30	300	100	3.4	2.6	0.15	Class A Amplifier	2.5	100	0.8	250	4.5	225,000	2,100	—	—	—	7G8
7H7	Remote-Cut-Off R-F Amplifier Pentode	8V	9–30	Htr	A-C	6.3	0.3	350	150	8.0	7.0	0.007	Class A Amplifier	2.5	150	3.5	250	9.5	800,000§	3,800	—	—	—	7H7
7J7	Triode Heptode Converter	8AR	9–30	Htr	A-C	6.3	0.3	300	100	Osc. Anode = 250 v thru 20,000 ohms; I_p = 5.4 ma			Converter	3.0	100	2.9	300	1.3	1,500,000	Conversion Transconductance = 300			—	7J7
7K7	Duplex Diode Hi-Mu Triode	8BF	9–30	Htr	A-C	6.3	0.3	250	—	—	—	—	Class A Amplifier	2.0	—	—	250	2.3	44,000	1,600	70	—	—	7K7
7L7	Pentode Amplifier	8V	9–30	Htr	A-C	6.3	0.3	300	125	8.0	6.5	0.01	Class A Amplifier	1.5	100	1.5	250	4.5	1,000,000§	3,100	—	—	—	7L7
7N7	Twin Triode Amplifier	8AC	9–31	Htr	A-C	6.3	0.6	300	—	—	—	—	Class A Amplifier	8.0	—	—	250	9.0♠	7,700	2,600	20	—	—	7N7
7Q7	Pentagrid Converter	8AL	9–30	Htr	A-C	6.3	0.3	300	100	Osc I_g = 0.5 thru 20,000 ohms			Converter	2.0	100	8.5	300	3.5	1,000,000§	Conversion Transconductance = 550			—	7Q7
7R7	Duplex Diode Pentode	8AE	9–30	Htr	A-C	6.3	0.3	250	100	5.6	5.3	0.004	Class A Amplifier	1.0	100	2.1	250	5.7	1,000,000§	3,200	—	—	—	7R7
7S7	Triode Heptode Converter	8BL	9–30	Htr	A-C	6.3	0.3	175	100	E_{pt} = 250 v thru 20,000 ohms; I_{pt} = 5.0 ma; I_{gt} = 0.5 ma			Converter	2.0	100	3.0	250	1.8	1,250,000§	Conversion Transconductance = 525			—	7S7
7T7	R-F Amplifier Pentode	8V	9–30	Htr	A-C	6.3	0.30	300	150	8.0	7.0	0.005	Class A Amplifier	1.0	150	4.1	250	10.8	900,000	4,900	—	—	—	7T7
7V7	Pentode Amplifier	8V	9–30	Htr	A-C	6.3	0.45	300	150	E_{sg} = 300 v thru 40,000 ohms; R_k = 160 ohms			Class A Amplifier	—	—	3.9	300	10	300,000§	5,800	—	—	—	7V7
7W7	Amplifier Pentode	8BJ	9–30	Htr	A-C	6.3	0.45	300	150	Cathode Resistor, R_k = 160 ohms			Class A Amplifier	—	150	3.9	300	10	300,000	5,800	—	—	—	7W7
7X7	Duplex Diode High-Mu Triode	8BZ	9–31	Htr	A-C	6.3	0.30	300	—	—	—	—	Class A Amplifier	1.0	—	—	250	1.9	67,000	1,500	100	—	—	7X7
7Y4	Full-Wave High-Vacuum Rectifier	5AB	9–30	Htr	A-C	6.3	0.5	Rms voltage per plate (choke input) = 450 v; max D-c output = 60 ma; peak current per plate = 180 ma; peak inverse voltage = 1250															—	7Y4
7Z4	Full-Wave High-Vacuum Rectifier	5AB	9–31	Htr	A-C	6.3	0.9	Rms voltage per plate (choke input) = 450 v; max d-c output = 100 ma; peak current per plate = 300 ma; peak inverse voltage = 1250															—	7Z4
10	Power Amplifier Triode	4D	19A-1	Fil	A-C	7.5	1.25	425	—	4.0	3.0 (2 Tubes)	7.0	Class A Power Amplifier	40.0	—	—	425	18.0	5,000	1,600	8.0	10,200	1.6¶	10
													Class B Power Amplifier	50.0	—	—	425	4.0†, ♠	Power Input = 2.5 Watt			8,000‡	25.0	
12A	Detector Amplifier Triode	4D	14–1	Fil	D-C	5.0	0.25	180	—	4.0▲	2.0▲	8.5▲	Class A Amplifier	13.5	—	—	180	7.7	4,700	1,800	8.5	10,650	0.285¶	12A
12A5	Power Amplifier Pentode	7F	12–5	Htr	A-C	12.6 / 6.3	0.3 / 0.6	180	180	—	—	—	Class A Amplifier	25.0	180	8.0†	180	45.0†	35,000§	2,400	—	3,300	3.4	12A5
12A6	Beam Power Amplifier	7AC	8–6	Htr	A-C	12.6	0.15	250	250	—	—	—	Class A Power Amplifier	12.5	250	3.5	250	30.0	70,000§	3,000	—	7,500	3.4	**12A6**
12A6-GT	Beam Power Amplifier	7AC	9–9	Htr	A-C	12.6	0.15	250	250	—	—	—	Class A Power Amplifier	12.5	250	3.5	250	30.0	70,000§	3,000	—	7,500	3.4	12A6-GT

§ Approximate. ‡ Plate-to-plate. ♠ Per section. ▲ Without external shield. † Zero signal per element. ¶ Undistorted.

Type numbers of metal tubes are shown in bold-face type.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output Ohms	Power Output, Watts	Tube Type
12A7	Diode Pentode	7K	12-6	Htr	A-C	12.6	0.3	135	135	Pentode Section			Class A Amplifier	13.5	135	2.5	135	9.0	102,000	975	—	13,500	0.55	12A7
										Diode Section			Rectifier	Rms plate voltage =125 v max; d-c output current =30 ma max										
12A8-GT	Pentagrid Converter	7C	9-18	Htr	A-C	12.6	0.15	300	100	Anode =250 volts thru 20,000 ohms I_p =4.0 ma			Converter	3.0	100	2.7	250	3.5	360,000§	Conversion Transconductance =550			—	12A8-GT
										Anode =100 volts I_p =2.0 ma			Converter	1.5	50	1.3	100	1.1	600,000§	Conversion Transconductance =360			—	
12AH7-GT	Twin Triode	8BE	9-7	Htr	A-C	12.6	0.15	180	—	Each Triode Section			Class A Amplifier	6.5	—	—	180	7.6	8,400	1,900	16.0	—	—	12AH7-GT
12AT6	Duplex Diode Triode	7BT	5-2	Htr	A-C	12.6	0.15	300	—	2.3▲	1.1▲	2.1▲	Class A Amplifier	3.0	—	—	250	1.0	58,000	1,200	70	—	—	*12AT6*
12B8-GT	Remote-Cut-Off Amplifier Triode Pentode	8T	9-24	Htr	A-C	12.6	0.3	90	90	Pentode Section			Class A Amplifier	3.0	90	2.0	90	7.0	200,000	1,800	360	—	—	12B8-GT
										Triode Section			Class A Amplifier	0.0	—	—	90	2.8	37,000	2,400	90	—	—	
12BA6	Remote-Cut-Off R-F Amplifier Pentode	7CC	5-2	Htr	A-C	12.6	0.15	300	125	5.5▲	5.0▲	0.0035▲	Class A Amplifier	Rk = 68Ω	100	4.2	250	11.0	1,500,000	4,400	—	—	—	*12BA6*
12BE6	Pentagrid Converter	7CH	5-2	Htr	A-C	12.6	0.15	300	100	Osc I_g =0.5 ma thru 20,000 ohms			Converter	1.5	100	7.1	250	3.0	1,000,000§	Conversion Transconductance =475			—	*12BE6*
12C8	Semi-Remote-Cut-Off Duplex Diode Pentode	8E	8-4	Htr	A-C	12.6	0.15	300	125	6.0	9.0	0.005	Class A Amplifier	3.0	125	2.3	250	10.0	600,000§	1,325	—	—	—	**12C8**
12C8-Y	Semi-Remote-Cut-Off Duplex-Diode Pentode	8E	8-4	Htr	A-C	12.6	0.15	300	125	6.0	9.0	0.005	Class A Amplifier	3.0	125	2.3	250	10.0	600,000§	1,325	—	—	—	**12C8-Y**
12E5-GT	Amplifier Triode	6Q	9-11	Htr	A-C	12.6	0.15	250	—	3.4	5.5	2.6	Class A Amplifier	13.0	—	—	250	5.0	9,500	1,450	13.8	—	—	12E5-GT
12F5-GT	High-Mu Amplifier Triode	5M	9-17	Htr	A-C	12.6	0.15	300	—	1.9	3.4	2.4	Class A Amplifier	2.0	—	—	250	0.9	66,000	1,500	100	—	—	12F5-GT
12H6	Twin Diode	7Q	8-5	Htr	A-C	12.6	0.15	Rms voltage per plate =100 v; max d-c output =8 ma; peak current per plate =48 ma; peak inverse voltage =420 v															–	**12H6**
12J5-GT	Detector Amplifier Triode	6Q	9-11	Htr	A-C	12.6	0.15	300	—	3.4	3.6	3.4	Class A Amplifier	8.0	—	—	250	9.0	7,700	2,600	20	—	—	12J5-GT
12J7-GT♦	Sharp-Cut-Off Detector-Amplifier Pentode	7R	9-18	Htr	A-C	12.6	0.15	300	125	Pentode Connected			Class A Amplifier	3.0	100	0.5	250	2.0	1,000,000*	1,225	—	—	—	12J7-GT♦
								250	—	Triode Connected			Class A Amplifier	8.0	—	—	250	6.5	10,500	1,900	20	—	—	
12K7-GT	Remote-Cut-Off R-F Amplifier Pentode	7R	9-8	Htr	A-C	12.6	0.15	300	125	4.6	12.0	0.005	Class A Amplifier	3.0	125	2.6	250	10.5	600,000§	1,650	—	—	—	12K7-GT
12K8	Triode Hexode Converter	8K	8-2	Htr	A-C	12.6	0.15	300	150	Osc Anode =100 v I_p =3.8 ma			Converter	3.0	100	6.0	250	2.5	600,000§	Conversion Transconductance =350			—	**12K8**
12K8-GT	Triode Hexode Converter	8K	9-24	Htr	A-C	12.6	0.15	300	150	Osc Anode =100 v I_p =3.8 ma			Converter	3.0	100	6.0	250	2.5	600,000§	Conversion Transconductance =350			—	12K8-GT
12K8-Y	Triode Hexode Converter	8K	8-2	Htr	A-C	12.6	0.15	300	150	Osc Anode =100 v I_p =3.8 ma			Converter	3.0	100	6.0	250	2.5	600,000§	Conversion Transconductance =350			—	**12K8-Y**
12L8-GT	Twin Pentode Power Amplifier	8BU	9-11	Htr	A-C	12.6	0.15	180	180	5.0▲	6.0▲	0.70▲	Class A Amplifier	9.0	180	2.8	180	13.0	160,000	2,150	—	10,000	1.0	12L8-GT
12Q7-GT	Duplex Diode High-Mu Triode	7V	9-18	Htr	A-C	12.6	0.15	300	—	2.2	5.0	1.6	Class A Amplifier	3.0	—	—	250	1.0	58,000	1,200	70	—	—	12Q7-GT
12SA7	Pentagrid Connector	8R	8-1	Htr	A-C	12.6	0.15	300	100	Osc I_g =1.0 ma thru 20,000 ohms			Converter	2.0◉	100	8.5	250	3.5	1,000,000§	Conversion Transconductance =450			—	**12SA7**
12SA7-GT	Pentagrid Connector	8AD	9-18	Htr	A-C	12.6	0.15	300	100	Osc I_g =1.0 ma thru 20,000 ohms			Converter	2.0◉	100	8.5	250	3.5	1,000,000§	Conversion Transconductance =450			—	12SA7-GT
12SC7	Twin Triode Amplifier	8S	8-1	Htr	A-C	12.6	0.15	250	—	Each Triode			Class A Amplifier	2.0	—	—	250	2.0†	53,000§	1,325§	70	—	—	**12SC7**

▲ Without external shield. * Minimum. ♦ Internal shield connected to pin #1.
§ Approximate. ◉ Maximum frequency obtained at 100 per cent maximum rated input. † Zero signal per element.

Type numbers of metal tubes are shown in bold-face type.
Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	Rp, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
12SF5	High-Mu Amplifier Triode	6AB	8–1	Htr	A-C	12.6	0.15	300	—	4.0	3.6	2.4	Class A Amplifier	2.0	—	—	250	0.9	66,000	1,500	100	—	—	**12SF5**
12SF5-GT	High-Mu Amplifier Triode	6AB	9–11	Htr	A-C	12.6	0.15	300	—	—	—	—	Class A Amplifier	2.0	—	—	250	0.9	66,000	1,500	100	—	—	12SF5-GT
12SF7	Remote-Cut-Off Amplifier Triode Pentode	7A2	8–1	Htr	A-C	12.6	0.15	300	100	5.5	6.0	0.004	Class A Amplifier	1.0	100	3.3	250	12.4	700,000§	2,050	—	—	—	**12SF7**
12SG7	Semi-Remote-Cut-Off High-gm Amplifier Pentode	8BK	8–1	Htr	A-C	12.6	0.15	300	200	8.5	7.0	0.003	Class A Amplifier	2.5	150	3.4	250	9.2	1,000,000*	4,000	—	—	—	**12SG7**
12SH7	Sharp-Cut-Off H-F Amplifier Pentode	8BK	8–1	Htr	A-C	12.6	0.15	300	150	8.5	7.0	0.003	Class A Amplifier	1.0	150	4.1	250	10.8	900,000§	4,900	—	—	—	**12SH7**
12SJ7	Sharp-Cut-Off Detector-Amplifier Pentode	8N	8–1	Htr	A-C	12.6	0.15	300	125	Pentode Connection			Class A Amplifier	3.0	100	0.8	250	3.0	1,000,000*	1,650	—	—	—	**12SJ7**
								250	—	Triode Connection			Class A Amplifier	8.5	—	—	250	9.2	7,600	2,500	19	—	—	
12SJ7-GT	Sharp-Cut-Off Detector-Amplifier Pentode	8N	9–12	Htr	A-C	12.6	0.15	300	125	Pentode Connection			Class A Amplifier	3.0	100	0.8	250	3.0	1,000,000*	1,650	—	—	—	12SJ7-GT
								250		Triode Connection			Class A Amplifier	8.5	—	—	250	9.2	7,600	2,500	19	—	—	
12SK7	Remote-Cut-Off R-F Amplifier Pentode	8N	8–1	Htr	A-C	12.6	0.15	300	125	6.0	7.0	0.003	Class A Amplifier	3.0	100	2.6	250	9.2	800,000§	2,000	—	—	—	**12SK7**
12SK7-GT	Remote-Cut-Off R-F Amplifier Pentode	8N	9–12	Htr	A-C	12.6	0.15	300	125	6.0	7.0	0.003	Class A Amplifier	3.0	100	2.6	250	9.2	800,000§	2,000	—	—	—	12SK7-GT
12SL7-GT	Twin Triode Amplifier	8BD	9–11	Htr	A-C	12.6	0.15	250	—	Each Unit			Class A Amplifier	2.0	—	—	250	2.3	44,000	1,600	70	—	—	12SL7-GT
12SN7-GT	Twin Triode Amplifier	8BD	9–11	Htr	A-C	12.6	0.3	300	—	Each Unit			Class A Amplifier	8.0	—	—	250	9.0	7,700	2,900	20	—	—	12SN7-GT
12SQ7	Duplex Diode High-Mu Triode	8Q	8–1	Htr	A-C	12.6	0.15	300	—	3.2	3.0	1.6	Class A Amplifier	2.0	—	—	250	0.9	91,000	1,100	100	—	—	**12SQ7**
12SQ7-G7	Duplex Diode High-Mu Triode	8Q	9–12	Htr	A-C	12.6	0.15	300	—	4.2	3.4	1.8	Class A Amplifier	2.0	—	—	250	0.9	91,000	1,100	100	—	—	12SQ7-GT
12SR7	Duplex Diode Triode	8Q	8–1	Htr	A-C	12.6	0.15	250	—	3.6	2.8	2.4	Class A Amplifier	9.0	—	—	250	9.5	8,500	1,900	16	10,000	0.300	**12SR7**
12SR7-GT	Duplex Diode Triode	8Q	9–11	Htr	A-C	12.6	0.15	250	—	3.5	3.8	2.3	Class A Amplifier	9.0	—	—	250	9.5	8,500	1,900	16	10,000	0.300	12SR7-GT
12SY7	Heptode Pentagrid Converter	8R	8–1	Htr	A-C	12.6	0.15	300	100	{Osc I_g = 0.5 ma thru 20,000 ohms}			Converter	2.0◉	100	8.5	250	3.5	1,000,000§	Conversion Transconductance = 450				**12SY7**
										{Osc I_g = 0.1 ma thru 20,000 ohms}			Converter	1.0	28	1.8	28	0.5	—	Conversion Transconductance = 250				
12SY7-GT	Heptode Pentagrid Converter	8AD	9–12	Htr	A-C	12.6	0.15	300	100	{Osc I_g = 0.5 ma thru 20,000 ohms}			Converter	2.0◉	100	8.5	250	3.5	1,000,000§	Conversion Transconductance = 450				12SY7-GT
										{Osc I_g = 0.5 ma thru 20,000 ohms}			Converter	1.0	28	1.8	28	0.5	—	Conversion Transconductance = 250				
12Z3	Half-Wave High-Vacuum Rectifier	4G	12–5	Htr	A-C	12.6	0.3	Rms voltage per plate (condenser input) = 235 volts; max d-c output = 55 ma; peak current per plate = 330 ma; peak inverse voltage = 700 v																12Z3
14A4	Triode Voltage Amplifier	5AC	9–30	Htr	A-C	12.6	0.15	300	—	3.4	3.0	4.0	Class A Amplifier	8.0	—	—	250	9.0	7,700	2,600	20	—	—	14A4
14A5	Beam Power Amplifier	6AA	9–30	Htr	A-C	12.6	0.15	250	250	—	—	—	Class A Amplifier	12.5	250	3.5	250	30.0	70,000§	3,000	—	7,500	2.8	14A5
													Class A Amplifier	12.5	250	5.5	250	32.0	70,000	3,000	—	7,500	2.8	
14A7/12B7	Remote-Cut-Off Amplifier Pentode	8V	9–30	Htr	A-C	12.6	0.15	300	125	6.0	7.0	0.005	Class A Amplifier	3.0	100	2.6	250	9.2	800,000§	2,000	—	—	—	14A7/12B7

§ Approximate. *Minimum. ◉ Maximum frequency obtained at 100 per cent maximum rated input.

Type numbers of metal tubes are shown in bold-face type.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
14AF7	Twin Triode Amplifier	8AC	9–30	Htr	A-C	12.6	0.15	300	—	2.2	1.6	2.3	Class A Amplifier	10.0	—	—	250	9.0♠	7,600	2,100	16	—	—	14AF7
14B6	Duplex Diode Triode	8W	9–30	Htr	A-C	12.6	0.15	300	—	—	—	—	Class A Amplifier	2.0	—	—	250	0.9	91,000	1,100	100	—	—	14B6
14B8	Pentagrid Converter	8X	9–30	Htr	A-C	12.6	0.15	300	100	E_{c2} =250 v thru 20,000 ohms I_{c2} =4.0 ma			Converter	3.0	100	2.7	250	3.5	360,000§	Conversion Transconductance =550			—	14B8
14C5	Beam Power Amplifier	6AA	9–31	Htr	A-C	12.6	0.225	315	285	—	—	—	Class A Amplifier	13.0	225	2.2	315	34.0	77,000§	3,750	—	8,500	5.5	14C5
14C7	Pentode Voltage Amplifier	8V	9–30	Htr	A-C	12.6	0.15	300	100	6.0	6.5	0.007	Class A Amplifier	3.0	100	0.7	250	2.2	1,000,000§	1,575	—	—	—	14C7
14E6	Duplex Diode High-Mu Triode	8W	9–30	Htr	A-C	12.6	0.15	250	—	—	—	—	Class A Amplifier	9.0	—	—	250	9.5	8,500	1,900	16	—	—	14E6
14E7	Duplex Diode Pentode	8AE	9–30	Htr	A-C	12.6	0.15	250	100	4.6	5.3	0.005	Class A Amplifier	3.0	100	1.6	250	7.5	700,000§	1,300	—	—	—	14E7
14F7	Twin-High-Mu Amplifier	8AC	9–30	Htr	A-C	12.6	0.15	250	—	—	—	—	Class A Amplifier	2.0	—	—	250	2.3♠	44,000§	1,600	70	—	—	14F7
14H7	Voltage Amplifier Pentode	8V	9–30	Htr	A-C	12.6	0.15	300	150	8.0	7.0	0.007	Class A Amplifier	2.5	150	3.5	250	9.5	800,000§	3,800	—	—	—	14H7
14J7	Triode-Heptode Converter	8BL	9–30	Htr	A-C	12.6	0.15	300	100	E_{pt} =250 v thru 20,000 ohms I_{pt} =5.0 ma			Converter	3.0	100	2.8	250	1.4	1,500,000§	Conversion Transconductance =290 I_{g1} =0.4 ma			—	14J7
14N7	Twin Triode Amplifier	8AC	9–31	Htr	A-C	12.6	0.30	300	—	—	—	—	Class A Amplifier	8.0	—	—	250	9.0♠	7,700	2,600	20	—	—	14N7
14Q7	Pentagrid Converter	8AL	9–30	Htr	A-C	12.6	0.15	300	100	—	—	—	Converter	2.0	100	8.5	250	3.5	1,000,000§	Conversion Transconductance =550			—	14Q7
14R7	Duplex Diode Pentode	8AE	9–30	Htr	A-C	12.6	0.15	250	100	5.6	5.3	0.004	Class A Amplifier	1.0	100	2.1	250	5.7	1,000,000	3,200	—	—	—	14R7
14S7	Triode-Heptode Converter	8BL	9–30	Htr	A-C	12.6	0.15	300	100	E_{pt} =250 v thru 20,000 ohms I_{pt} =5.0 ma			Converter	2.0	100	3.0	250	1.8	1,250,000§	Conversion Transconductance =525			—	14S7
14W7	Amplifier Pentode	8BJ	9–30	Htr	A-C	12.6	0.225	300	150	Cathode Resistor, R_k =160 Ohms			Class A Amplifier	—	150	3.9	300	10.0	300,000	5,800	—	—	—	14W7
14Y4	Full-Wave High-Vacuum Rectifier	5AB	9–30	Htr	A-C	12.6	0.30	Rms volts per plate =450 v; max d-c output =70 ma; peak current per plate =210 ma; peak inverse voltage =1250													—	—	—	14Y4
15	Sharp-Cut-Off R-F Amplifier Pentode	5F	12–6	Fil	D-C	2.0	0.22	135	67.5	2.35▲	7.80▲	0.01	Class A Amplifier	1.5	67.5	0.3	135	1.85	800,000	750	600	—	—	15
													Class A Amplifier	1.5	67.5	0.3	67.5	1.85	630,000	710	450	—	—	
19	Twin Triode Power Amplifier	6C	12–5	Fil	D-C	2.0	0.26	135	—	Single Tube			Class B Power Amplifier	0.0	—	—	135	5.0†	Input Signal =0.170 watt			10,-000‡	2.1§	19
20	Power Amplifier Triode	4D	8A-1	Fil	D-C	3.3	0.132	135	—	2.0	2.3	4.1	Class A Amplifier	22.5	—	—	135	6.5	6,300	525	3.3	6,500	0.110	**20**
22	R-F Amplifier Tetrode	4K	14–8	Fil	D-C	3.3	0.132	135	67.5	3.5	10.0	0.02	Class A Amplifier	1.5	67.5	1.3♠	135	3.7	325,000	500	160	—	—	22
24A	Sharp-Cut-Off Amplifier Tetrode	5E	14–8	Htr	A-C	2.5	1.75	250	90	5.3▲	10.5▲	0.007	Class A Amplifier	3.0	90	1.7♣	250	4.0	600,000	1,050	630	—	—	24A
25A6	Power Amplifier Pentode	7S	8–6	Htr	A-C	25.0	0.3	160	135	8.5	12.5	0.2	Class A Amplifier	18.0	120	6.5†	160	33.0†	42,000	2,375	—	5,000	2.2	**25A6**
25A6-GT	Power Amplifier Pentode	7S	9–11	Htr	A-C	25.0	0.3	160	135	—	—	—	Class A Amplifier	18.0	120	6.5†	160	33.0†	42,000	2,375	—	5,000	2.2	25A6-GT

♠ Per section. ‡ Plate-to-plate. § Approximate. ♣ Maximum. ▲ Without external shield. † Zero signal per element.

Type numbers of metal tubes are shown in bold-face type

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
25A7-GT	Diode Pentode	8F	9–11	Htr	A-C	25.0	0.3	117	117	—	—	—	Class A Amplifier	15.0	100	4.0	100	20.5	50,000	1,800	90	4,500	0.77	25A7-GT
25AC5-GT	High-Mu Power Amplifier Triode	6Q	9–11	Htr	A-C	25.0	0.3	180	Two tubes				Class B Power Amplifier	0.0	—	—	180	4.0	—	—	—	4,800 ‡	6.0	25AC5-GT
			Dynamic-coupled with 6AE5-GT driver										Class A Amplifier	—	—	—	110	45.0	Driver I_b = 7.0 ma			2,000	2.0	
25B5	Direct-Coupled Power Amplifier	6D	12–1	Htr	A-C	25.0	0.30	180	—	—	—	—	Class A Amplifier	0.0	100‖	5.8‖	180	46.0	15,000	2,300	—	4,000	3.8	25B5
25B6-G	Power Amplifier Pentode	7S	14–3	Htr	A-C	25.0	0.3	200	135	—	—	—	Class A Amplifier	23.0	135	1.8†	200†	62.0	18,000	5,000		2,500	7.1	25B6-G
25B8-GT	Remote-Cut-Off Amplifier Triode Pentode	8T	9–18	Htr	A-C	25.0	0.15	100	100	Pentode Section			Class A Amplifier	3.0	100	2.0	100	7.6	185,000	2,000	—	—	—	25B8-GT
										Triode Section			Class A Amplifier	1.0	—	—	100	0.6	75,000	1,500	112	—	—	
25C6-G	Beam Power Amplifier	7AC	14–3	Htr	A-C	25.0	0.3	200	135	—	—	—	Class A Amplifier	14.0	135	2.2†	200	61.0†	18,300†	7,100	—	2,600	6.0	25C6-G
25D8-GT	Diode-Triode-Pentode	8AF	9–23	Htr	A-C	25.0	0.15	100	100	Pentode Section			Class A Amplifier	3.0	100	2.7	100	8.5	200,000	1,900	—	—	—	25D8-GT
										Triode Section			Class A Amplifier	1.0	—	—	100	0.5	91,000	1,100	—	—	—	
25L6	Beam Power Amplifier	7AC	8–6	Htr	A-C	25.0	0.3	200	117	16.0	13.5	0.3	Class A Amplifier	8.0	110	2.0†	200	50.0†	30,000†	9,500	—	3,000	4.3	**25L6**
													Class A Amplifier	7.5	110	4.0†	100	49.0†	13,000	9,000	—	2,000	2.1	
25L6-GT	Beam Power Amplifier	7AC	9–11	Htr	A-C	25.0	0.3	200	117	15.0	10.0	0.8	Class A Amplifier	8.0	110	2.0†	200	50.0†	30,000†	9,500	—	3,000	4.3	25L6-GT
													Class A Amplifier	7.5	110	4.0†	100	49.0†	13,000	9,000	—	2,000	2.1	
25N6-G	Direct-Coupled Power Amplifier	7W	12–3	Htr	A-C	25.0	0.30	180	—	—	—	—	Class A Amplifier	0.0	100‖	5.8	180	46.0	15,000	2,300	—	4,000	3.8	25N6-G
25X6-GT	High-Vacuum Rectifier Doubler	7Q	9–11	Htr	A-C	25.0	0.15	Rms volts per plate = 125; max d-c output = 60 ma											—	—	—	—	—	25X6-GT
25Y5	High-Vacuum Rectifier Doubler	6E	12–5	Htr	A-C	25.0	0.3	Rms voltage per plate = 235 volts; max d-c output = 75 ma; peak current per plate = 450 ma; peak voltage = 700 volts												—	—	—	—	25Y5
25Z4	Half-Wave High-Vacuum Rectifier	5AA	8–1	Htr	A-C	25.0	0.30	Max plate voltage = 235 rms; max peak inverse voltage = 700; max peak plate current = 750 ma; max d-c output = 125 ma													—	—	—	**25Z4**
25Z5	High-Vacuum Rectifier Doubler	6E	12–5	Htr	A-C	25.0	0.3	Half-wave operation: max voltage = 235 volts rms; max d-c output = 75 ma per plate Voltage doubler operation: max voltage = 117 volts rms; max d-c output = 75 ma													—	—	—	25Z5
																					—	—	—	
25Z6	High-Vacuum Rectifier Doubler	7Q	8–6	Htr	A-C	25.0	0.3	Half-wave operation: max voltage = 235 volts rms; max d-c output = 75 ma per plate voltage doubler operation: max voltage = 117 volts rms; max d-c output = 75 ma														—	—	**25Z6**
25Z6-GT	High-Vacuum Rectifier Doubler	7Q	9–11	Htr	A-C	25.0	0.3	Half-wave operation: max voltage = 235 volts rms; max d-c output = 75 ma per plate voltage doubler operation: max voltage = 117 volts rms; max d-c output = 75 ma																25Z6-GT
26	Amplifier Triode	4D	14–1	Fil	A-C	1.5	1.05	180	—	2.8	2.5	8.1	Class A Amplifier	14.5	—	—	180	6.2	7,300	1,150	8.3	—	—	26
26A7-GT	Twin Pentode Power Amplifier	8BU	9A–1	Htr	A-C	26.5	0.60	50	50	16.0 ▲	13.0 ▲	1.2 ▲	Class A Amplifier	4.5	26.5	2.0 †, ♠	26.5	20.0 †, ♠	2,500	5,500	—	1,500	0.20	26A7-GT
27	Detector Amplifier Triode	5A	12–5	Htr	A-C	2.5	1.75	275	—	3.1	2.3	3.3	Class A Amplifier	21.0	—	—	250	5.2	9,250	975	9.0	—	—	27
27S★	Detector Amplifier Triode	5A	12–5	Htr	A-C	2.5	1.75	275	—	—	—	—	Class A Amplifier	21.0	—	—	250	5.2	9,250	975	9.0	—	—	27S★
28D7	Double Beam-power Amplifier	8BS	9–31	Htr	A-C	28.0	0.40	100	67.5	—	—	—	Class A Power Amplifier	3.5	28.0	1.0 †, ♠	28.0	12.5 †, ♠	4,200	3,400	—	4,000 ♠	0.100 ♠	28D7

‡ Plate-to-plate. ‖ Input plate. † Zero signal per element. ▲ Without external shield. **Type numbers of metal tubes are shown in bold-face type.**
♠ Per section. ★ External shield connected to cathode pin.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
28Z5	Full-Wave High-Vacuum Rectifier	5AB	9–31	Htr	A-C	28.0	0.24	—	Rms voltage per plate =450 volts; max d-c output =100 ma; peak current per plate =300 ma; peak inverse voltage =1250 volts												—	—	—	28Z5
30	Detector Amplifier Triode	4D	12–5	Fil	D-C	2.0	0.06	180	Single tube				Class A Amplifier	13.5	—	—	180	3.1	10,300	900	9.3	—	—	30
									Two tubes				Class B Amplifier	15.0	—	—	157.5	0.5†	Input signal =.260 watt			8,000 ‡	2.1	
31	Power Amplifier Triode	4D	12–5	Fil	D-C	2.0	0.130	180	—	3.5	2.7	5.7	Class A Amplifier	30.0	—	—	180	12.3	3,600	1,050	3.8	5,700	0.375	31
32	Sharp-Cut-Off R-F Amplifier Tetrode	4K	14–8	Fil	D-C	2.0	0.06	180	67.5	5.3▲	10.5▲	0.015	Class A Amplifier	3.0	67.5	0.4	180	1.7	1,200,000	650	780	—	—	32
32L7-GT	Diode Beam-power Amplifier	8Z	9–11	Htr	A-C	32.5	0.3	90	90	—	—	—	Class A Amplifier	7.0	90	2.0	90	27.0	17,000	4,800	—	2,600	1.0	32L7-GT
													Class A Amplifier	5.0	90	3.0	90	38.0	15,000	6,000	—	2,600	0.8	
33	Power Amplifier Pentode	5K	14–1	Fil	D-C	2.0	0.26	180	180	8.0	12.0	1.0	Class A Amplifier	18.0	180	5.0	180	22.0	55,000§	1,700	90§	6,000	1.4	33
34	Remote-Cut-Off R-F Amplifier Pentode	4M	14–8	Fil	D-C	2.0	0.06	180	67.5	6.0▲	11.0▲	0.015	Class A Amplifier	3.0	67.5	1.0	180	2.8	1,000,000	620	620	—	—	34
35-51	Remote-Cut-Off R-F Amplifier Pentode	5E	14–8	Htr	A-C	2.5	1.75	275	90	5.3▲	10.5▲	0.007	Class A Amplifier	3.0	90	2.5♣	250	6.5	400,000	1,050	420	—	—	35-51
35A5	Beam Power Amplifier	6AA	9–31	Htr	A-C	35.0	0.15	200	117	—	—	—	Class A Amplifier	8.0	110	2.0 †, §	200	41.0†	40,000§	5,900	—	4,500	3.3	35A5
35L6-GT	Beam Power Amplifier	7AC	9–11	Htr	A-C	35.0	0.15	200	117	13.0	9.5	0.8	Class A Amplifier	8.0	110	2.0 †, §	200	41.0†	40,000§	5,900	—	4,500	3.3	35L6-GT
35S/51S★	Remote-Cut-Off R-F Amplifier Pentode	5E	14–8	Htr	A-C	2.5	1.75	250	90	—	—	—	Class A Amplifier	3.0	90	2.5♣	250	6.5	400,000	1,050	420	—	—	35S/51S★
35W4	Half-Wave High-Vacuum Rectifier	5BQ	5–3	Htr	A-C	35.0	0.15	Without panel lamp: max d-c output =100 ma; max peak inverse plate voltage =330; max peak plate current =600 ma															—	*35W4*
						32.0	0.15	With panel lamp: max d-c output =80 ma; max peak inverse plate voltage =330; max peak plate current =600 ma													—	
35Y4	Half-Wave High-Vacuum Rectifier	5AL	9–31	Htr	A-C	35.0	0.15	Rms voltage per plate =235 volts; max d-c output =100 ma; peak current per plate = 600 ma; peak inverse voltage =700 volts															—	—	35Y4
35Z3	Half-Wave High-Vacuum Rectifier	4Z	9–31	Htr	A-C	35.0	0.15	Rms voltage per plate =235 volts; max d-c output =100 ma; peak current per plate =600 ma; peak inverse voltage =700 volts															—	—	35Z3
35Z4-GT	Half-Wave High-Vacuum Rectifier	5AA	9–11	Htr	A-C	35.0	0.15	Rms voltage per plate =235 volts; max d-c output =100 ma; peak current per plate =600 ma; peak inverse voltage =700 volts															—	—	35Z4-GT
35Z5-GT	Half-Wave High-Vacuum Rectifier	6AD	9–11	Htr	A-C	35.0	0.15	Without panel lamp: Rms plate voltage =235 volts; max d-c output =100 ma; peak plate current =600 ma; peak inverse voltage =700 volts															—	—	35Z5-GT
								With panel lamp: Rms plate voltage =235 volts; max d-c output =60 ma; peak inverse voltage =700 volts													—	—	
35Z6-G	High-Vacuum Rectifier Doubler	7Q	14–3	Htr	A-C	35.0	0.30	Rms voltage per plate =125 volts; max d-c output =110 ma; peak current per plate =500 ma															—	—	35Z6-G
36	Sharp-Cut-Off R-F Amplifier Tetrode	5E	12–6	Htr	A-C	6.3	0.3	250	90.0	3.8▲	9.0▲	0.007	Class A Amplifier	3.0	90	1.7♣	250	3.2	550,000	1,080	595	—	—	36
37	Detector Amplifier Triode	5A	12–5	Htr	A-C	6.3	0.3	250	—	3.5	2.9	2.0	Class A Amplifier	18.0	—	—	250	7.5	8,400	1,100	9.2	—	—	37
38	Power Amplifier Pentode	5F	12–6	Htr	A-C	6.3	0.3	250	250	3.5	7.5	0.30	Class A Amplifier	25.0	250	3.8	250	22.0	100,000	1,200	120	10,000	2.5	38
39/44	Remote-Cut-Off R-F Amplifier Pentode	5F	12–6	Htr	A-C	6.3	0.3	250	90	3.8▲	10.0▲	0.007	Class A Amplifier	3.0*	90	1.4	250	5.8	1,000,000	1,050	1,050	—	—	39/44
40	Voltage Amplifier Triode	4D	14–1	Fil	D-C	5.0	0.25	180	—	2.8	2.2	2.0	Class A Amplifier	3.0	—	—	180	0.2	150,000	200	30	250000	—	40

† Zero signal per element.
§ Approximate.
‡ Plate-to-plate.
♣ Maximum.
▲ Without external shield.
★ External shield connected to cathode pin.

Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
41	Power Amplifier Pentode	6B	12-5	Htr	A-C	6.3	0.4	315	285	Single tube			Class A Amplifier	21.0	250	4.0†	315	25.5†	75,000§	2,100	—	9,000	4.5	41
										Two tubes push-pull			Class A Amplifier	25.5	285	4.5 †, ♠	285	27.5 †, ♠	Peak grid-to-grid voltage = 51 volts			12,000 ‡	10.5	
42	Power Amplifier Pentode	6B	14-1	Htr	A-C	6.3	0.7	375	285	Pentode connection			Class A Amplifier	20.0	285	7.0†	285	38.0†	78,000§	2,550	—	7,000	4.8	42
								350	—	Triode connection			Class A Amplifier	20.0	—	—	250	31.0	2,600	2,600	6.8	4,000	0.850 ¶	
								375	250	Pentode connection			Class AB Amplifier	26.0	250	5.0†	375	34.0†	—	—	—	10,000 ‡	18.5	
								350	—	Triode connection			Class AB Amplifier	38.0	—	—	350	48.0†	—	—	—	6,000 ‡	13.0	
43	Power Amplifier Pentode	6B	14-1	Htr	A-C	25.0	0.3	160	135	8.5	12.5	0.2	Class A Amplifier	18.0	120	6.5†	160	33.0†	42,000	2,375	—	5,000	2.2	43
45	Power Amplifier Triode	4D	14-1	Fil	A-C	2.5	1.5	275	—	4.0	3.0	7.0	Class A Amplifier	56.0	—	—	275	36.0	1,700	2,050	3.5	4,600	2.0¶	45
										Two tubes			Class AB_2 Amplifier	68.0	—	—	275	14.0 †, ♠	—	Power input = 0.656 w		3,200 ‡	18.0	
45Z3	Half-Wave High-Vacuum Rectifier	5AM	5-2	Htr	A-C	45.0	0.075	Rms voltage per plate = 117 volts; max d-c output = 65 ma; peak current per plate = 390 ma; peak inverse voltage = 350 volts													—	—	—	*45Z3*
45Z5-GT	Half-Wave High-Vacuum Rectifier	6AD	9-11	Htr	A-C	45.0	0.15	Rms voltage per plate = 235 volts; max d-c output = 100 ma; peak current per plate = 600 ma; peak inverse voltage = 700 volts													—	—	—	45Z5-GT
46	Power Amplifier Tetrode	5C	16-1	Fil	A-C	2.5	1.75	400	—	2 tubes push-pull, G_1 & G_2 tied			Class B Power Amplifier	0.0	—	—	400	6.0†	Input signal = .650 watt			5,800 ‡	20.0§	46
										Single tube, G_1 & P tied			Class A Amplifier	33.0	—	—	250	22.0	2,380	2,350	5.6	6,400	1.25¶	
47	Power Amplifier Pentode	5B	16-1	Fil	A-C	2.5	1.75	250	250	8.6	13.0	1.2	Class A Amplifier	16.5	250	6.0	250	31.0	60,000	2,500	150	7,000	2.7	47
48	Power Amplifier Tetrode	6A	16-1	Htr	D-C	30.0	0.4	125	100	Tetrode connected Single tube			Class A Amplifier	20.0	100	9.5	125	56.0	—	3,900	—	1,500	2.5	48
								125	—	Triode connected Single tube			Class A Amplifier	32.5	—	—	125	52.0	675	3,700	2.5	—	—	
										Tetrode connected 2 tubes push-pull			Class A Amplifier	20.0	100	—	125	50.0 †, ♠	—	—	—	3,000 ‡	5.0	
										Triode connection 2 tubes push-pull			Class A Amplifier	32.5	—	—	125	50.0 ‡, ♠	—	—	—	1,250 ‡	3.0	
49	Power Amplifier Tetrode	5C	14-1	Fil	D-C	2.0	0.120	180	—	Single tube G_2 & P tied			Class A Amplifier	20.0	—	—	135	6.0	4,125	1,125	4.7	11,000	0.170 §	49
										Two tubes G_1 & G_2 tied			Class B Amplifier	0.0	—	—	180	2.0 ‡, ♠	—	—	—	12,000	3.5§	
50	Power Amplifier Triode	4D	19A-1	Fil	A-C	7.5	1.25	450	—	4.2	3.4	7.1	Class A Amplifier	84.0	—	—	450	55.0	1,800	2,100	3.8	4,350	4.6¶	50
50A5	Beam Power Amplifier	6AA	9-31	Htr	A-C	50.0	0.15	200	117	—	—	—	Class A Amplifier	8.0	110	1.5†	200	50.0†	35,000	8,250	—	3,000	4.7	50A5
50B5	Beam Power Amplifier	7BZ	5-3	Htr	A-C	50.0	0.15	117	117	13.0▲	6.5▲	0.50▲	Class A Amplifier	7.5	110	4.0	110	49.0	14,000§	7,500	—	2,500	1.9†	*50B5*
50C6-G	Beam Power Amplifier	7AC	14-3	Htr	A-C	50.0	0.15	200	135	—	—	—	Class A Amplifier	13.5	135	3.5	135	58.0	9,300	7,000	—	2,000	3.6	50C6-G
													Class A Amplifier	13.5	135	11.5	135	60.0	9,300	7,000	—	2,000	3.6	
50L6-GT	Beam Power Amplifier	7AC	9-11	Htr	A-C	50.0	0.15	200	117	—	—	—	Class A Amplifier	8.0	110	2.0 †, §	200	50.0†	30,000§	9,500	—	3,000	4.3	50L6-GT
50Y6-GT	High-Vacuum Rectifier Doubler	7Q	9-1	Htr	A-C	25.0	0.3	Half-wave operation: max voltage = 235 volts rms; max d-c output = 75 ma per plate voltage doubler operation: max voltage = 117 volts rms; max d-c output = 75 ma																50Y6-GT
50Z6-G	Full-Wave High-Vacuum Rectifier	7Q	14-3	Htr	A-C	50.0	0.30	Rms voltage per plate = 235; max d-c output = 250 ma; peak current per plate = 750 ma; peak inverse voltage = 700													—	—	—	50Z6-G

† Zero signal per element.
§ Approximate.
♠ Per section.
¶ Undistorted.
‡ Plate-to-plate.
▲ Without external shield.

Type numbers of miniature tubes are shown in italics.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
50Z7-G	High-Vacuum Rectifier Doubler	8AN	12-7	Htr	A-C	50.0	0.15	Rms voltage per plate = 235 volts; max d-c output = 65 ma per plate; peak current per plate = 400 ma; peak inverse voltage = 700 volts																50Z7-G
53	Twin Triode	7B	14-1	Htr	A-C	2.5	2.0	300	—	Single tube			Class B Amplifier	0.0	—	—	300	17.5†	—	—	—	8,000	10.0	53
								300	—	Parallel triodes			Class A Amplifier	6.0	—	—	294	7.0	11,000	3,200	—	—	—	
55	Duplex Diode Triode	6G	12-6	Htr	A-C	2.5	1.0	250	—	1.5	4.3	1.5	Class A Amplifier	20.0	—	—	250	8.0	7,500	1,100	8.3	20,000	0.350 ¶	55
55-S★	Duplex Diode Triode	6G	12-6	Htr	A-C	2.5	1.0	250	—	—	—	—	Class A Amplifier	20.0	—	—	250	8.0	7,500	1,100	8.3	20,000	0.350 ¶	55-S★
56	Super Control Amplifier Detector Triode	5A	12-5	Htr	A-C	2.5	1.0	250	—	3.2	2.4	3.2	Class A Amplifier	13.5	—	—	250	5.0	9,500	1,450	13.8	—	—	56
56-AS★	Super Control Amplifier Detector Triode	5A	12-5	Htr	A-C	2.5	1.0	250	—	—	—	—	Class A Amplifier	13.5	—	—	250	5.0	9,500	1,450	13.8	—	—	56-AS★
56-S★	Super Control Amplifier Detector Triode	5A	12-5	Htr	A-C	2.5	1.0	250	—	—	—	—	Class A Amplifier	13.5	—	—	250	5.0	9,500	1,450	13.8	—	—	56-S★
57	Sharp-Cut-Off Detector-Amplifier Pentode	6F	12-2	Htr	A-C	2.5	1.0	300	125	Pentode connected			Class A Amplifier	3.0	100	0.5	250	2.0	1,000,000*	1,225	—	—	—	57
								250	—	Triode connected			Class A Amplifier	8.0	—	—	250	6.5	10,500	1,900	20.0	—	—	
57-AS★	Sharp-Cut-Off Detector-Amplifier Pentode	6F	12-2	Htr	A-C	2.5	1.0	300	125	Pentode connected			Class A Amplifier	3.0	100	0.5	250	2.0	1,000,000*	1,225	—	—	—	57-AS★
								250	—	Triode connected			Class A Amplifier	8.0	—	—	250	6.5	10,500	1,900	20.0	—	—	
57-S★	Sharp-Cut-Off Detector-Amplifier Pentode	6F	12-2	Htr	A-C	2.5	1.0	300	125	Pentode connected			Class A Amplifier	3.0	100	0.5	250	2.0	1,000,000*	1,225	—	—	—	57-S★
										Triode connected			Class A Amplifier	8.0	—	—	250	6.5	10,500	1,900	20.0	—	—	
58	Remote-Cut-Off R-F Amplifier Pentode	6F	12-2	Htr	A-C	2.5	1.0	300	100	4.7▲	6.3▲	0.007	Class A Amplifier	3.0	100	2.0	250	8.2	800,000§	1,600	—	—	—	58
58-AS★	Remote-Cut-Off R-F Amplifier Pentode	6F	12-2	Htr	A-C	6.3	0.4	300	100	—	—	—	Class A Amplifier	3.0	100	2.0	250	8.2	800,000§	1,600	—	—	—	58-AS★
58-S★	Remote-Cut-Off R-F Amplifier Pentode	6F	12-2	Htr	A-C	2.5	1.0	300	100	—	—	—	Class A Amplifier	3.0	100	2.0	250	8.2	800,000§	1,600	—	—	—	58-S★
59	Power Amplifier Pentode	7A	16-1	Htr	A-C	2.5	2.0	250	—	{Triode connection G_2, G_3 & P tied}			Class A Amplifier	28.0	—	—	250	26.0	2,300	2,600	6.0	5,000	1.25¶	59
								250	250	Pentode connection			Class A Amplifier	18.0	250	9.0	250	35.0	40,000	2,500	100	6,000	3.0	
								400	—	{2 triodes, G_1 & G_2 tied, G_3 & P tied}			Class B Amplifier	0.0	—	—	400	13.0†	Input signal = 1.5 watts			6,000 ‡	20.0	
70A7-GT	High-Voltage Rectifier Beam Power Amplifier	8AB	9-11	Htr	A-C	70.0	0.15	110	110	—	—	—	Class A Amplifier Rectifier	7.5	110	3.0	110	40	—	5,800	—	2,500	1.5	70A7-GT
														Rms voltage per plate = 125 volts; max d-c output = 60 ma										
70L7-GT	High-Voltage Rectifier Beam Power Amplifier	8AA	9-11	Htr	A-C	70.0	0.15	117	117	—	—	—	Class A Amplifier Rectifier	7.5	110	3.0†§	110	40.0†	15,000	7,500	—	2,000	1.8	70L7-GT
														Rms voltage per plate = 117 volts; max d-c output = 70 ma; peak current per plate = 420 ma; peak inverse voltage = 350										
71-A	Power Amplifier Triode	4D	14-1	Fil	A-C	5.0	0.25	180	—	3.2	2.9	7.5	Class A Amplifier	40.5	—	—	180	20.0	1,750	1,700	3.0	4,800	0.790 †	71-A
75	Duplex Diode High-Mu Triode	6G	12-6	Htr	A-C	6.3	0.3	250	—	1.7▲	3.8▲	1.7▲	Class A Amplifier	3.0	125	2.3	250	9.0	600,000§	1,125	—	—	—	75
75-S★	Duplex Diode High-Mu Triode	6G	12-6	Htr	A-C	6.3	0.3	250	—	—	—	—	Class A Amplifier	3.0	125	2.3	250	9.0	600,000§	1,125	—	—	—	75-S★
76	Detector Amplifier Triode	5A	12-5	Htr	A-C	6.3	0.3	250	—	3.5	2.5	2.8	Class A Amplifier	13.5	—	—	250	5.0	9,500	1,450	13.8	—	—	76

† Zero signal per element.
★External shield connected to cathode pin.
‡ Plate-to-plate.
§ Approximate.
¶ Undistorted
▲Without external shield.
* Minimum.

CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
77	Sharp-Cut-Off Detector Amplifier Pentode	6F	12-6	Htr	A-C	6.3	0.3	300	100	4.7▲	11.0▲	0.007	Class A Amplifier	3.0	100	0.5	250	2.3	1,000,000*	1,250	—	—	—	77
78	Remote-Cut-Off R-F Amplifier Pentode	6F	12-6	Htr	A-C	6.3	0.3	300	125	4.5	11.0	0.00	Class A Amplifier	3.0	125	2.6	250	10.5	600,000§	1,650	—	—	—	78
79	Twin Triode Power Amplifier	6H	12-6	Htr	A-C	6.3	0.6	250	—	Single tube			Class B Power Amplifier	0.0	—	—	250	5.3†	Input signal = .380 watt		—	14,000 ‡	8.0§	79
80	Full-Wave High-Vacuum Rectifier	4C	14-1	Fil	A-C	5.0	2.0	Rms voltage per plate = 350 volts max; max d-c output = 125 ma; peak current per plate = 375 ma; peak inverse voltage = 1400 volts													—	—	—	80
81	Half-Wave High-Vacuum Rectifier	4B	19A-1	Fil	A-C	7.5	1.25	Rms voltage per plate = 700 volts max; max d-c output = 85 ma; peak current per plate = 500 ma; peak inverse voltage = 2000 volts													—	—	—	81
82	Full-Wave Mercury-Vapor Rectifier	4C	14-1	Fil	A-C	2.5	3.0	Rms voltage per plate (choke input) = 550 volts; max d-c output = 115 ma; peak current per plate = 600 ma; peak inverse voltage = 1550 volts													—	—	—	82
83	Full-Wave Mercury-Vapor Rectifier	4C	16-1	Fil	A-C	5.0	3.0	Rms voltage per plate (choke input) = 550 volts; max d-c output = 225 ma; peak current per plate = 1000 ma; peak inverse voltage = 1550 volts													—	—	—	83
83-V	Full-Wave High-Vacuum Rectifier	4AD	14-1	Fil	A-C	5.0	2.0	Rms voltage per plate (choke input) = 500 volts; max d-c output = 175 ma; peak current per plate = 525 ma; peak inverse voltage = 1400 volts													—	—	—	83-V
84/6Z4	Full-Wave High-Vacuum Rectifier	5D	12-5	Htr	A-C	6.3	0.5	Rms voltage per plate (choke input) = 450 volts; max d-c output = 60 ma; peak current per plate = 180 ma; peak inverse voltage = 1250 volts													—	—	—	84/6Z4
85	Duplex Diode Triode	6G	12-6	Htr	D-C	6.3	0.3	250	—	1.5	4.3	1.5	Class A Amplifier	20.0	—	—	250	8.0	7,500	1,100	8.3	20,000	0.350 ¶	85
85-AS ★	Duplex Diode Triode	6G	12-6	Htr	D-C	6.3	0.3	250	—	—	—	—	Class A Amplifier	9.0	—	—	250	5.5	—	1,250	20.0	—	—	85-AS ★
89	Power Amplifier Pentode	6F	12-6	Htr	A-C	6.3	3.4	250	—	{Triode connection G_2, G_3 & P tied}			Class A Amplifier	31.0	—	—	250	32.0	2,600	1,800	4.7	5,500	0.900 ¶	89
								250	250	Pentode connection			Class A Amplifier	25.0	250	5.5	250	32.0	70,000	1,800	125.0	6,750	3.4	
								180	—	Two tubes, G_1 & G_2 tied			Class B Amplifier	0.0	—	—	180	3.0†	Input signal = .350 watt		—	9,400‡	3.5§	
V99	Detector Amplifier Triode	4E	8A-4	Fil	D-C	3.3	0.063	90	—	2.5	2.5	3.3	Class A Amplifier	4.5	—	—	90	2.5	15,500	425	6.6	—	—	V99
X99	Detector Amplifier Triode	4D	8A-1	Fil	D-C	3.3	0.063	90	—	2.5	2.5	3.3	Class A Amplifier	4.5	—	—	90	2.5	15,500	425	6.6	—	—	X99
117L7/M7-GT	Rectifier Beam Power Amplifier	8AO	9-15	Htr	A-C	117	0.09	117	117	—	—	—	Class A Amplifier	5.2	105	4.0†	105	43.0†	17,000§	5,300	—	4,000	0.85	117L7/M7-GT
													Half-wave Rectifier	Rms voltage per plate = 117 volts max; max d-c output = 75 ma; peak current per plate = 450 ma; peak inverse voltage = 350 volts									
117N7-GT	Rectifier Beam Power Amplifier	8AV	9-15	Htr	A-C	117	0.09	117	117	—	—	—	Class A Amplifier	6.0	100	5.0†	100	51.0†	16,000§	7,000	—	3,000	1.2	117N7-GT
													Half-wave Rectifier	Rms voltage per plate = 117 volts max; max d-c output = 75 ma; peak current per plate = 450 ma; peak inverse voltage = 350 volts									
117P7-GT	Rectifier Beam Power Amplifier	8AV	9-15	Htr	A-C	117	0.09	117	117	—	—	—	Class A Amplifier	5.2	105	4.0†	105	43.0†	17,000§	5,300	—	4,000	0.85	117P7-GT
													Half-wave Rectifier	Rms voltage per plate = 117 volts max; max d-c output = 75 ma; peak current per plate = 450 ma; peak inverse voltage = 350 volts									
117Z3	Half-Wave Rectifier	4BR	5-3	Htr	A-C	117	0.04	Max rms plate voltage = 117; max d-c output = 90 ma; peak inverse voltage = 330 max																*117Z3*
117Z4-GT	High-Vacuum Half-Wave Rectifier	5AA	9-5	Htr	A-C	117	0.04	Rms voltage per plate = 117 volts max; max d-c output = 90 ma; peak inverse voltage = 350 volts; peak plate voltage = 540															—	—	117Z4-GT
117Z6-GT	High-Vacuum Rectifier Doubler	7Q	9-11	Htr	A-C	117	0.075	Rms voltage per plate = 117 half-wave rectifier max rms volts per plate = 235; max d-c output = 60 ma; peak current per plate = 360 ma; peak inverse voltage = 700 volts															—	—	117Z6-GT
182-B/482B	Power Amplifier Triode	4D	14-1	Fil	A-C	5.0	1.25	250	—	—	—	—	Class A Amplifier	35.0	—	—	250	18.0	—	1,500	5.0	—	—	182-B/482B

§ Approximate. ‡ Plate-to-plate. * Minimum. ¶ Undistorted. † Zero signal per element. ★ External shield connected to cathode pin. ▲ Without external shield.

Type numbers of miniature tubes are shown in italics.

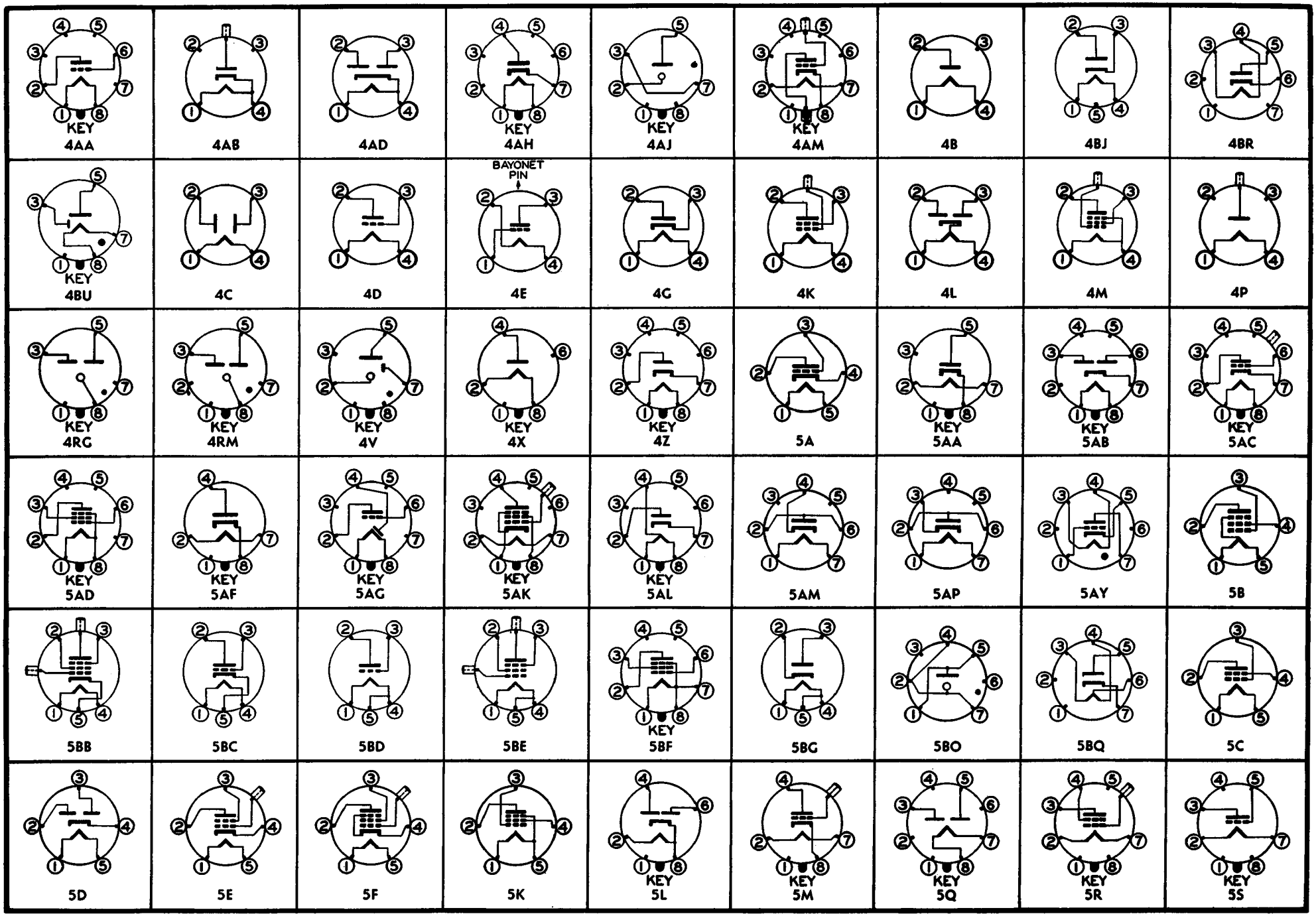
CHARACTERISTICS AND RATINGS

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Type Cathode	Filament Supply	Filament Volts	Filament Amp	Max Plate Volts	Max Screen Volts	Capacitance in Micromicrofarads: Input	Output	Grid-plate	Service	Neg Grid Volts	Screen Volts	Screen Milliamperes	Plate Volts	Plate Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
183/483	Power Amplifier Triode	4D	14–1	Fil	A-C	5.0	1.25	250	—	—	—	—	Class A Amplifier	60.0	—	—	250	30.0	1,750	1,700	3.0	—	—	183/483
485	Detector Amplifier Triode	5A	12–5	Htr	A-C	3.0	1.25	180	—	—	—	—	Class A Amplifier	9.0	—	—	180	5.8	8,900	1,400	12.5	—	—	485
950	Power Amplifier Pentode	5K	14–1	Fil	D-C	2.0	0.12	135	135	—	—	—	Class A Amplifier	16.5	135	2.0	135	7.0	105,300	950	100	13,500	0.450	950
954	Detector Amplifier Pentode (Acorn)	5BB	4–3	Htr	A-C	6.3	0.15	250	100	3.4	3.0	0.007	Class A Amplifier	3.0	100	0.7	250	2.0	1,000,000*	1,400	—	—	—	954
													Class A Amplifier	3.0	90	0.5	90	1.2	1,000,000	1,100	—	—	—	
955	Detector Amplifier Oscillator Triode (Acorn)	5BC	4–1	Htr	A-C	6.3	0.15	250	—	1.0	0.6	1.4	Class A1 Amplifier	7.0	—	—	250	6.3	11,400	2,200	25.0	—	—	955
								250	—	—	—	—	Class A Amplifier	5.0	—	—	180	4.5	12,500	2,000	25.0	20,000	0.135	
								250	—	—	—	—	Class A Amplifier	2.5	—	—	90	2.5	14,700	1,700	25.0	—	—	
								180	—	—	—	—	Class C Power Amplifier	35.0§	—	—	180	7.0	—	—	—	—	0.5	
956	Super Control R-F Amplifier Pentode (Acorn)	5BB	4–3	Htr	A-C	6.3	0.15	250	100	3.4	3.0	0.007	Class A Amplifier	3.0	100	2.7	250	6.7	700,000§	1,800	—	—	—	956
957	Detector Amplifier Oscillator Triode (Acorn)	5BD	4–1	Fil	D-C	1.2	0.05	135	—	0.3	0.7	1.2	Class A Amplifier	5.0	—	—	135	2.0	20,800§	650	13.5	—	—	957
958-A	Amplifier Triode (Acorn)	5BD	4–1	Fil	D-C	1.25	0.10	135	—	0.6	0.8	2.6	Class A Amplifier	7.5	—	—	135	3.0	10,000§	1,200	12.0	—	—	958-A
													Class C Power Amplifier	20.0	—	—	135	7.0	Power input = 0.035 watt			—	0.600	
959	Detector Amplifier Pentode (Acorn)	5BE	4–3	Fil	D-C	1.25	0.05	145	67.5	1.8	2.5	0.015	Class A Amplifier	3.0	67.5	0.4	135	1.7	800,000§	600	—	—	—	959
1629	Electron-Ray Tube	7AL	9–27	Htr	A-C	12.6	0.15	250	Plate voltage = 250 thru 1 meg (Eg = 0, shadow angle = 90°, I_p = 0.24 ma) (Eg = −8 volts, shadow angle = 0°) Target voltage = 250; target current = 4 ma at 90°												—	—	—	1629
9001	Detector Amplifier Pentode	7PM	5–1	Htr	A-C	6.3	0.15	250	100	3.6	3.0	0.01	Class A Amplifier	3.0	100	0.7	250	2.0	1,000,000*	1,400	—	—	—	*9001*
9002	Detector Amplifier Triode	7TM	5–1	Htr	A-C	6.3	0.15	250	—	1.2	1.1	1.4	Class A Amplifier	7.0	—	—	250	6.3	11,400	2,200	25	—	—	*9002*
9003	Remote-Cut-Off Amplifier Pentode	7PM	5–1	Htr	A-C	6.3	0.15	250	100	3.6	3.0	0.01	Class A Amplifier	3.0	100	2.7	250	6.7	700,000	1,800	—	—	—	*9003*
9004	Diode Rectifier (Acorn)	4BJ	4–1	Htr	A-C	6.3	0.15	Max Rms plate voltage = 117; max d-c output = 5 ma; plate-cathode capacitance = 1.3 μμf; plate-heater capacitance = 0.3 μμf; heater-cathode capacitance = 2.2 μμf.													—	—	—	9004
9005	Diode Rectifier (Acorn)	5BG	4–1	Htr	A-C	6.3	0.15	Max Rms plate voltage = 117; max d-c output = 1.0 ma; plate-cathode capacitance = 0.8 μμf; plate-heater capacitance = 0.2 μμf. Heater-cathode capacitance = 1.1 μμf.													—	—	—	9005
9006	Diode Rectifier	6BH	5–1	Htr	A-C	6.3	0.15	Max Rms plate voltage = 270; max d-c output = 5 ma; peak plate current = 15 ma; peak inverse voltage = 750													—	—	—	*9006*

* Minimum. § Approximate.

Type numbers of miniature tubes are shown in italics.

BASE CONNECTIONS (Bottom View)



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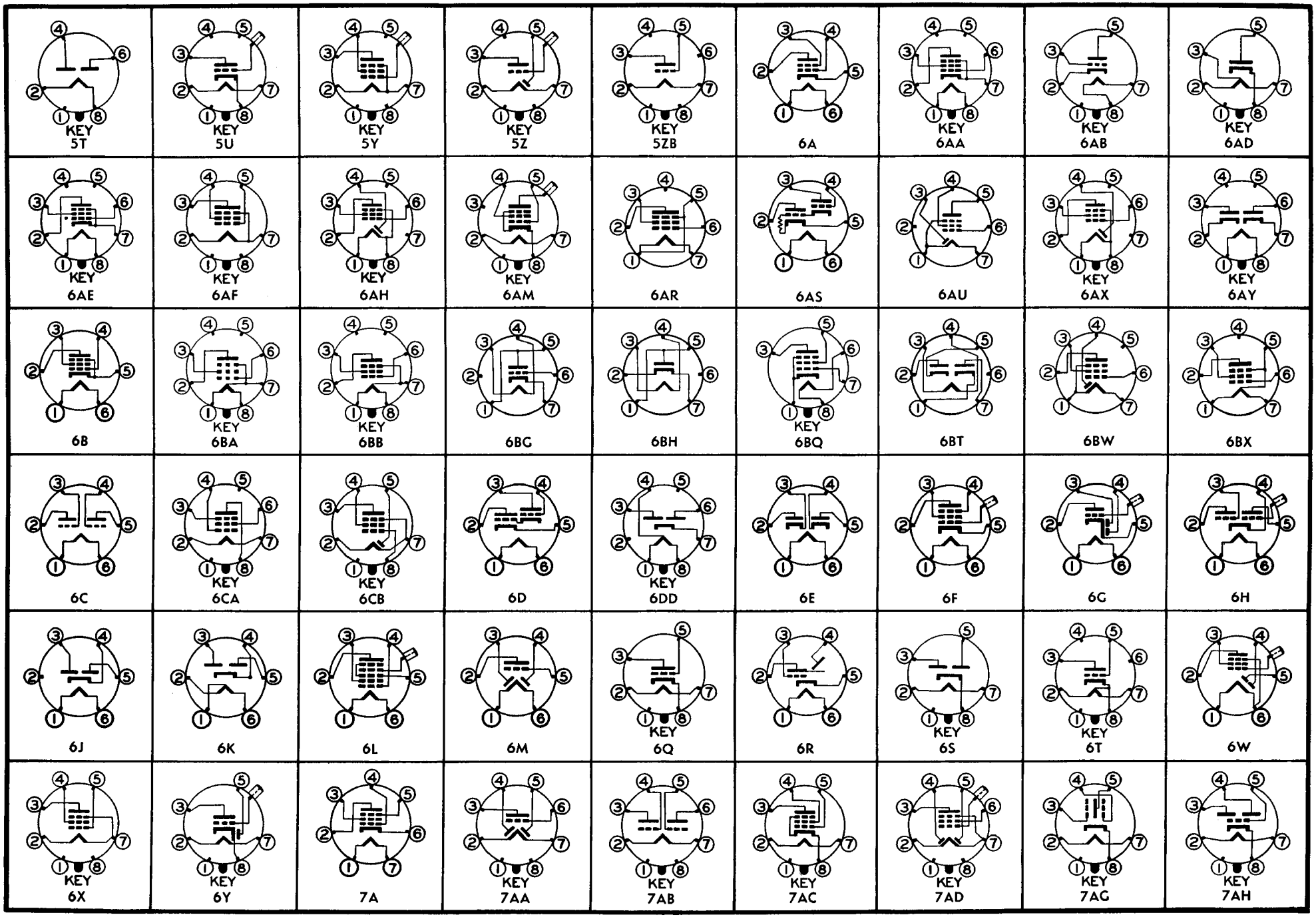

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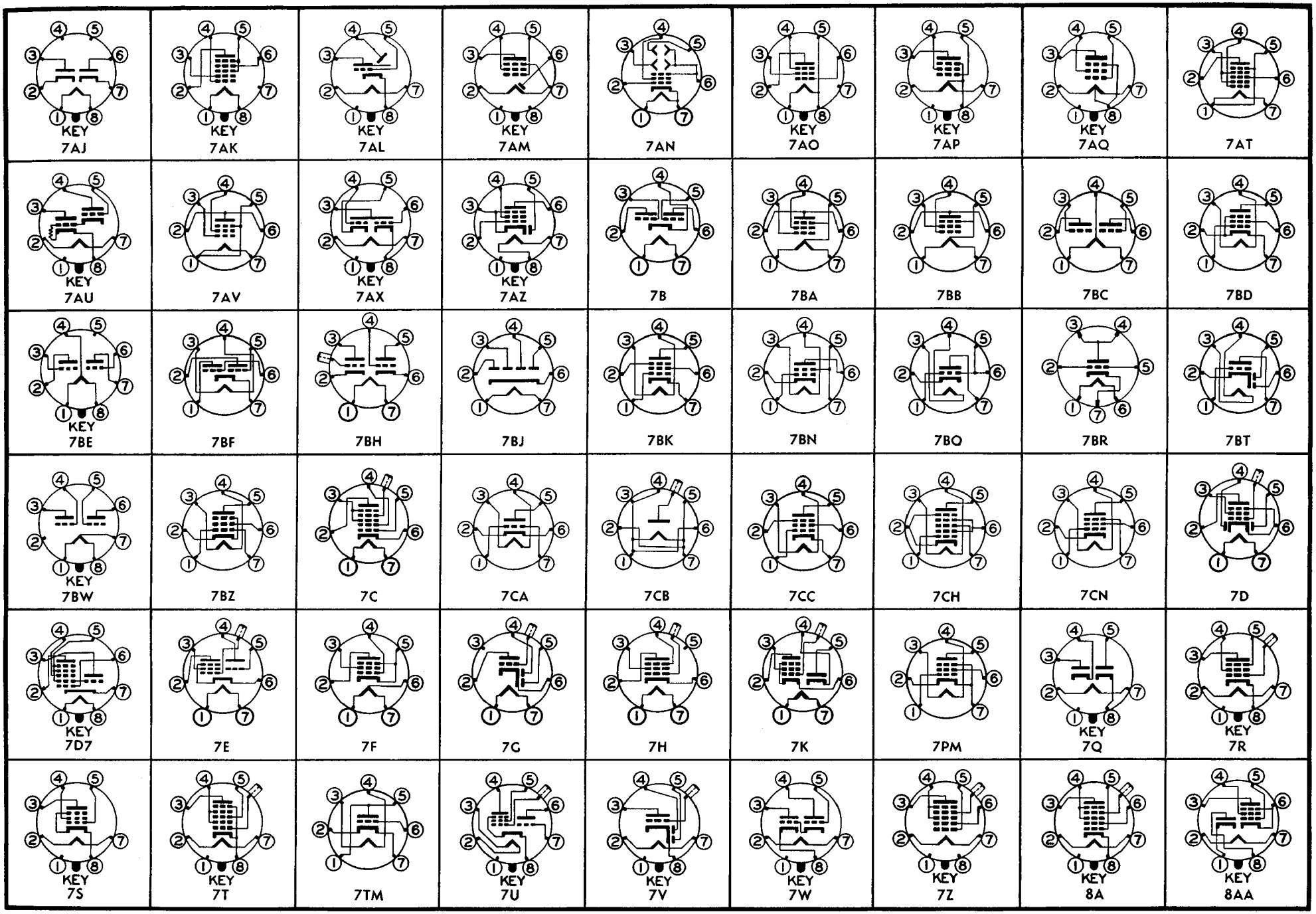
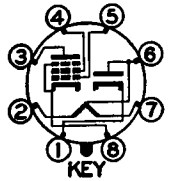
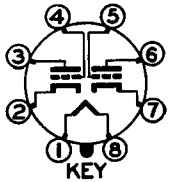
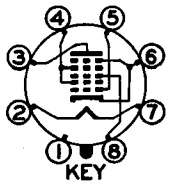
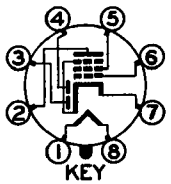
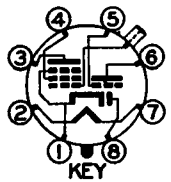
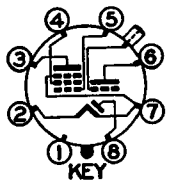
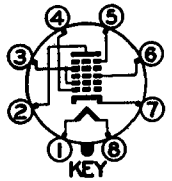
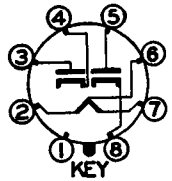
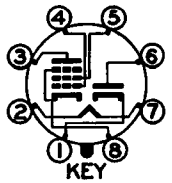
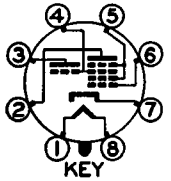
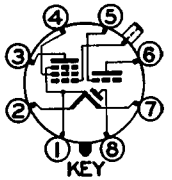
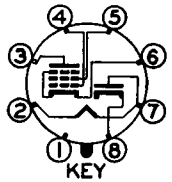
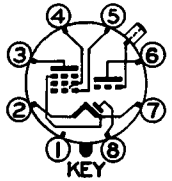
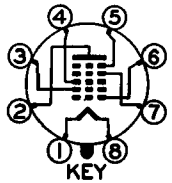
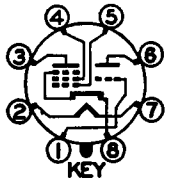
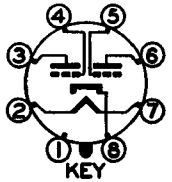
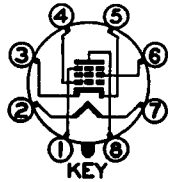
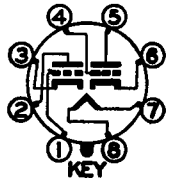
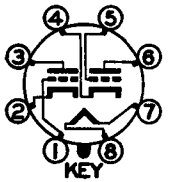
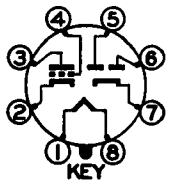
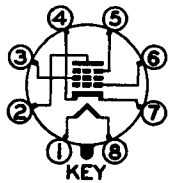
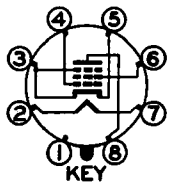
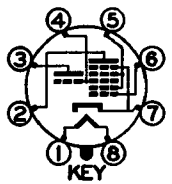
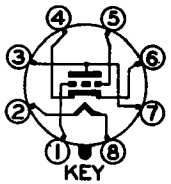
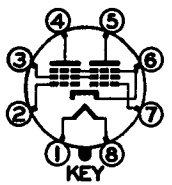
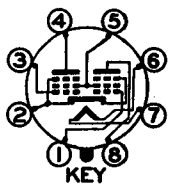
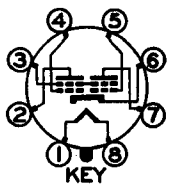
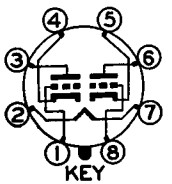
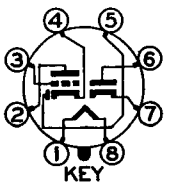
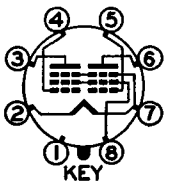
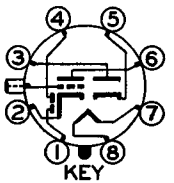
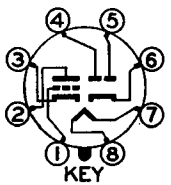
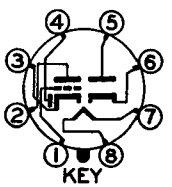
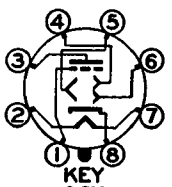
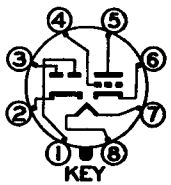
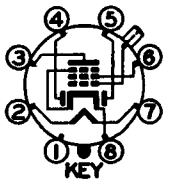
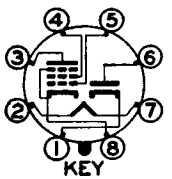
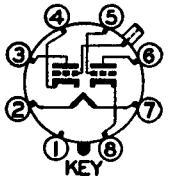
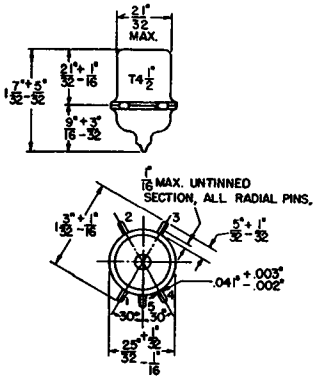


BASE CONNECTIONS (Bottom View)

 KEY 8AB	 KEY 8AC	 KEY 8AD	 KEY 8AE	 KEY 8AF	 KEY 8AJ	 KEY 8AL	 KEY 8AN	 KEY 8AO
 KEY 8AR	 KEY 8AS	 KEY 8AV	 KEY 8AW	 KEY 8AX	 KEY 8AY	 KEY 8B	 KEY 8BC	 KEY 8BD
 KEY 8BE	 KEY 8BF	 KEY 8BJ	 KEY 8BK	 KEY 8BL	 KEY 8BN	 KEY 8BS	 KEY 8BU	 KEY 8BV
 KEY 8BW	 KEY 8BZ	 KEY 8C	 KEY 8CB	 KEY 8CF	 KEY 8CG	 KEY 8CH	 KEY 8CK	 KEY 8E
 KEY 8F	 KEY 8G	 KEY 8H	 KEY 8K	KEY 8L	KEY 8M	KEY 8N	KEY 8Q	KEY 8R
KEY 8S	KEY 8T	KEY 8U	KEY 8V	KEY 8W	KEY 8X	KEY 8Y	KEY 8Z	

OUTLINE DRAWINGS



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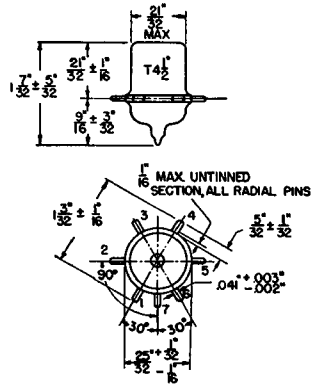

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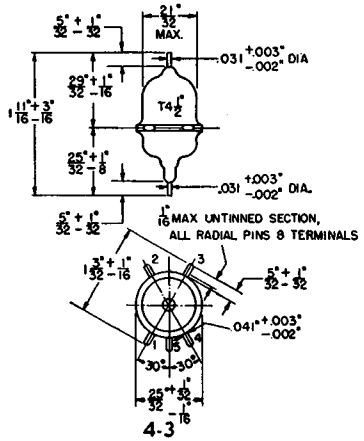

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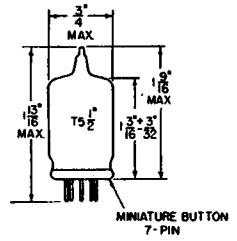
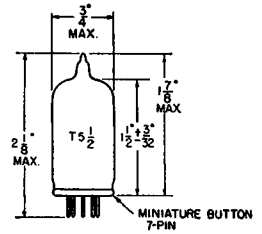


5-1



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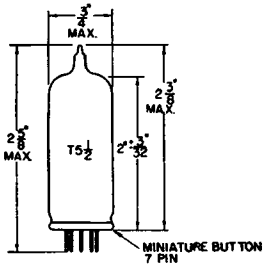
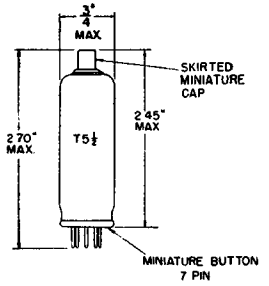
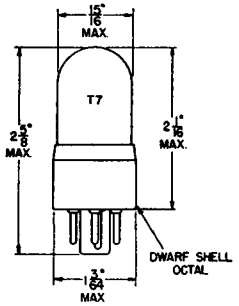


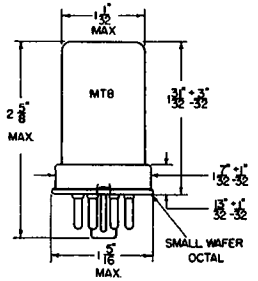
5-3



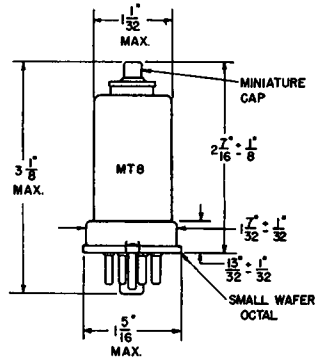
5A-1



7A-1



8-1



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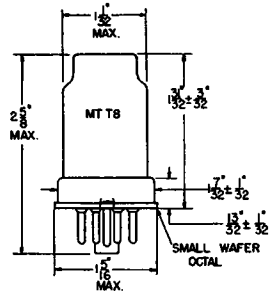

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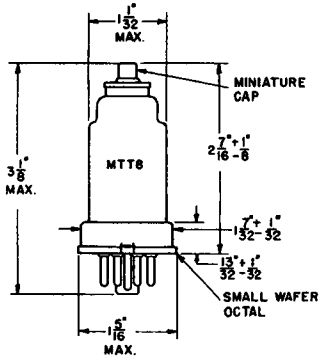

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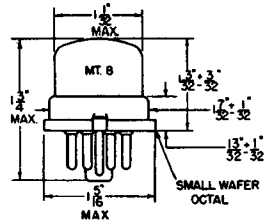

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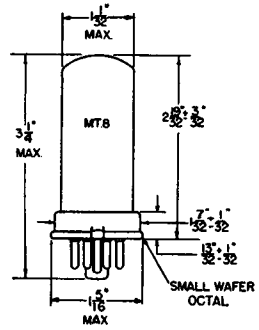

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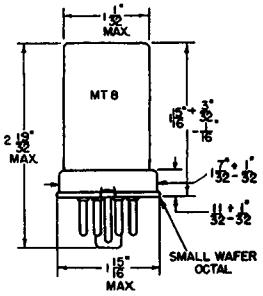
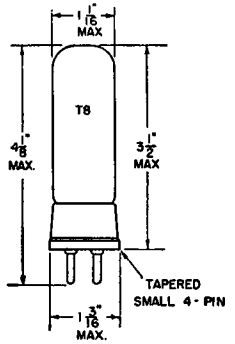
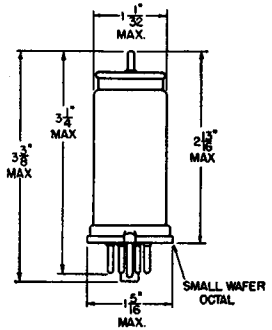


8-9

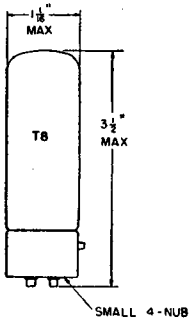
OUTLINE DRAWINGS



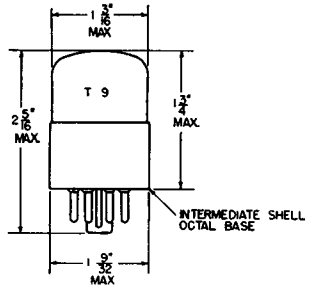
8A-1



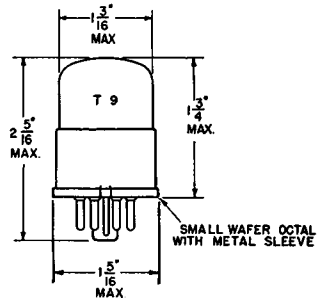
8A-2



8A-4



9-1



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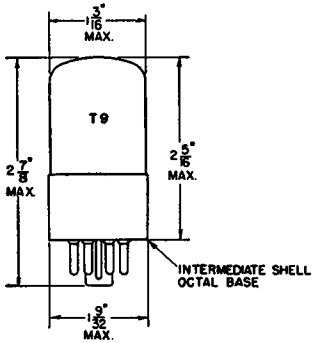

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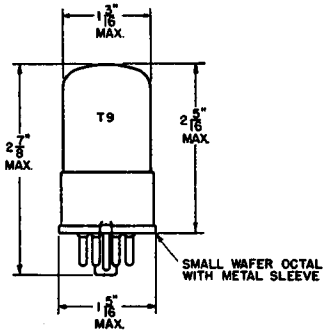

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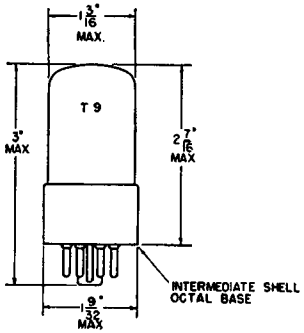

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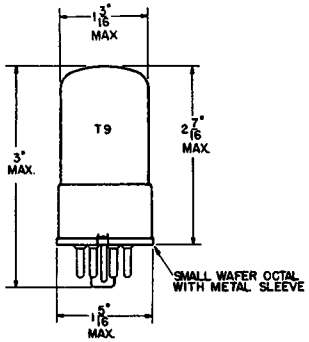

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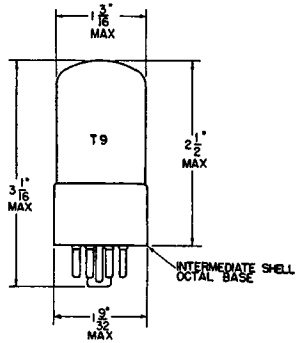

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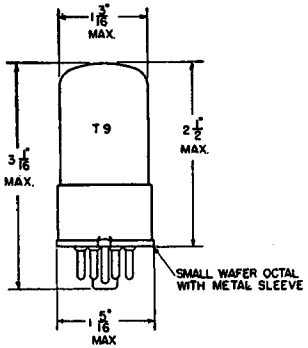

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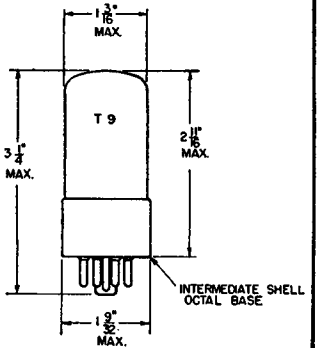

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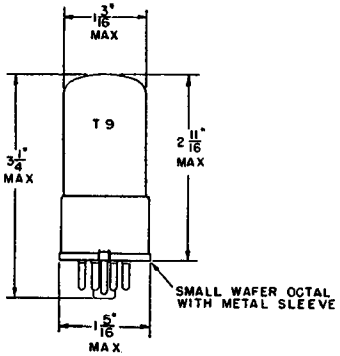

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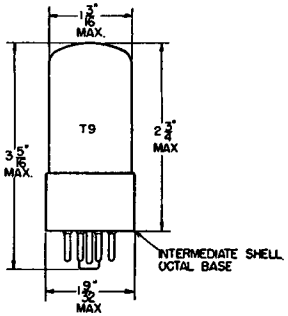

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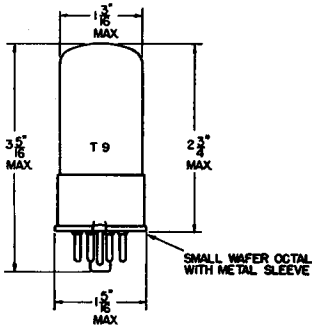

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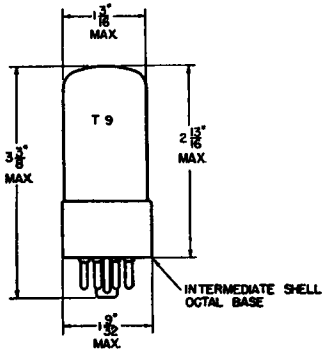
OUTLINE DRAWINGS



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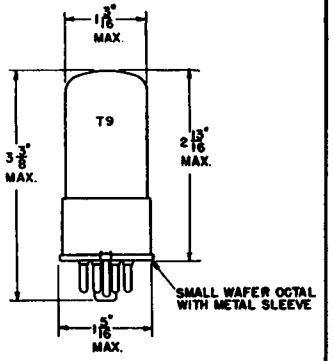

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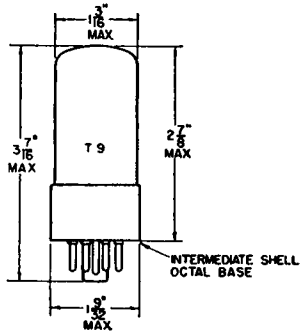

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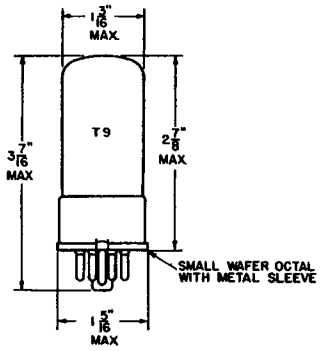

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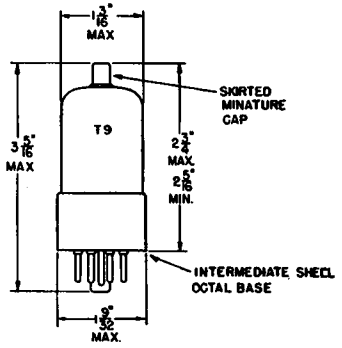

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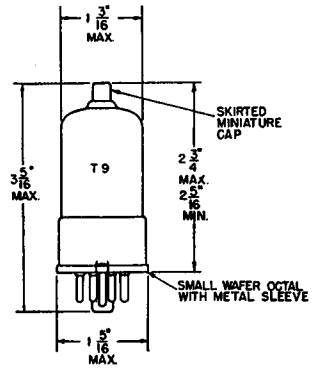

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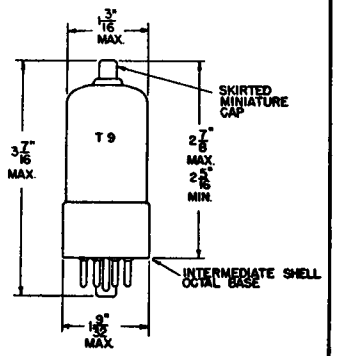

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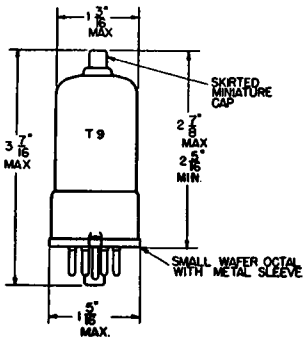

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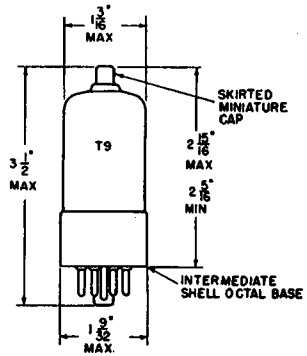

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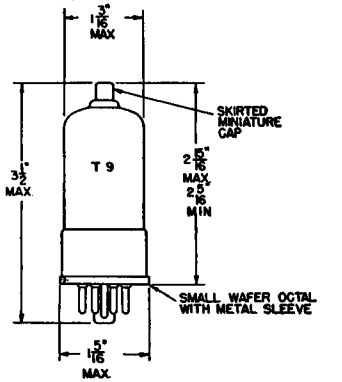

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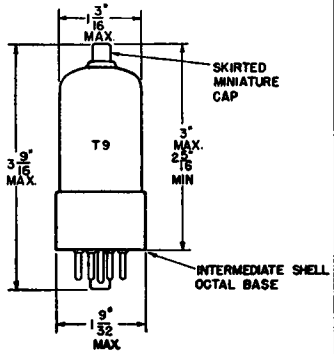

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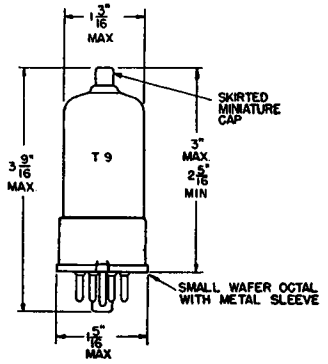

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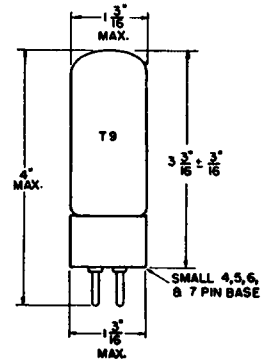

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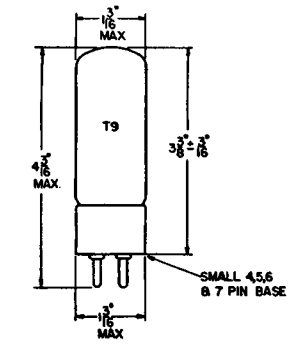

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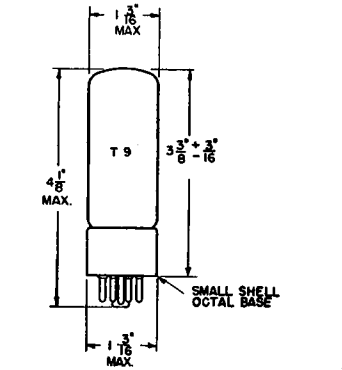

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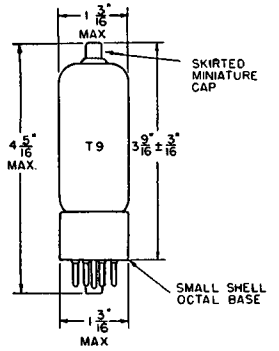
OUTLINE DRAWINGS



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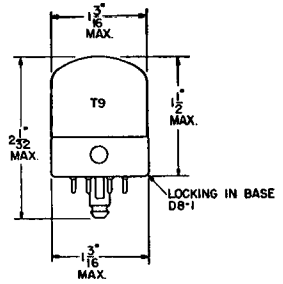

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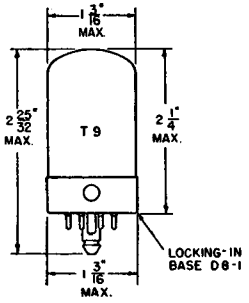

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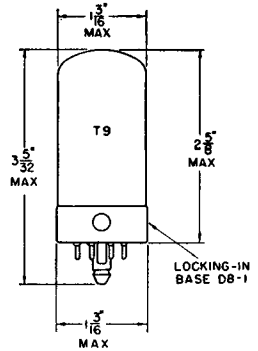

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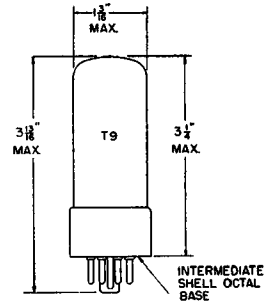
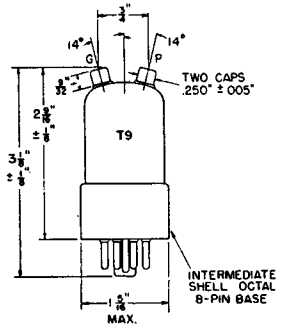


9A-1



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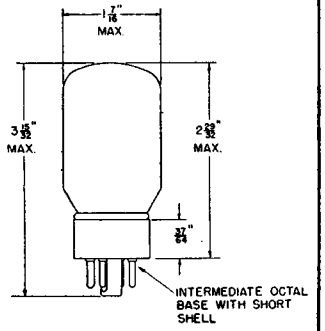

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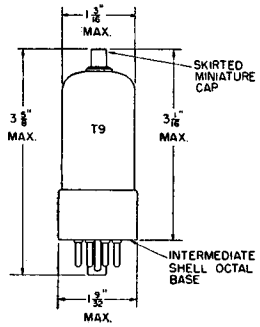

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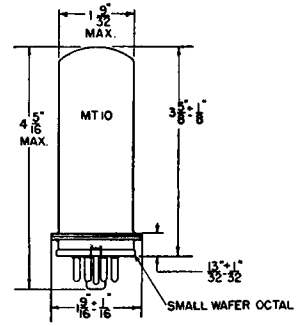

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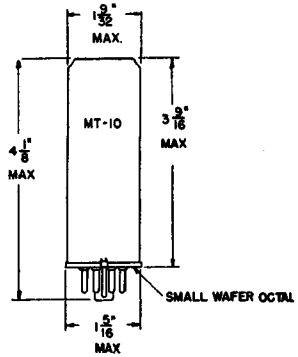

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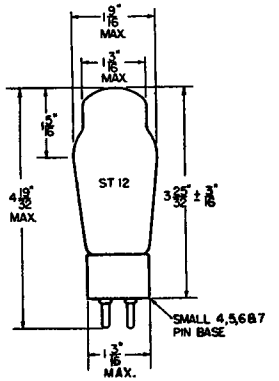

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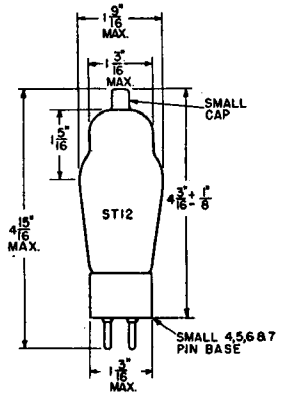

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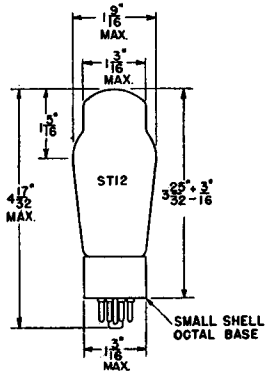

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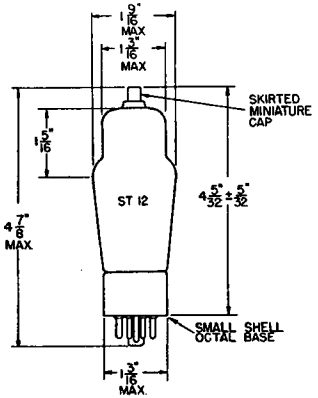

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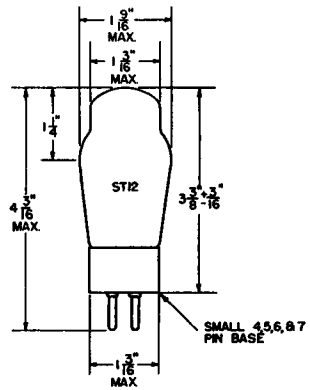
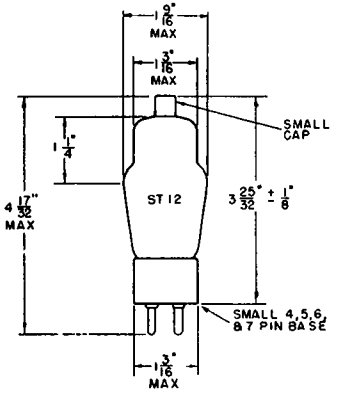


12-5

OUTLINE DRAWINGS



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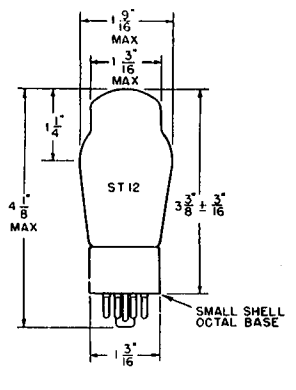

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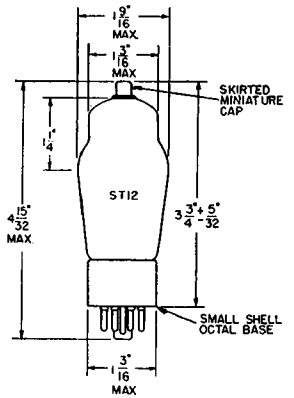

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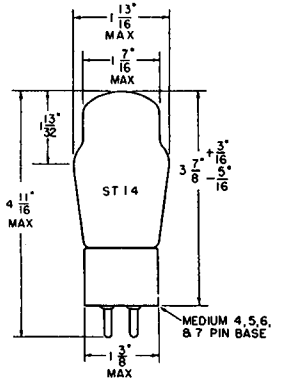

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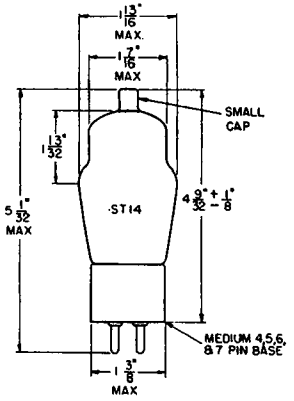

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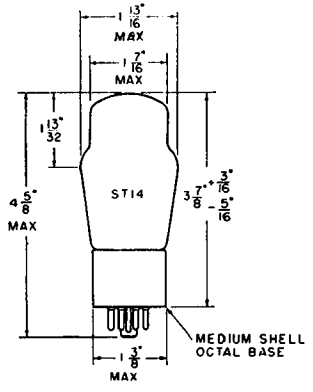

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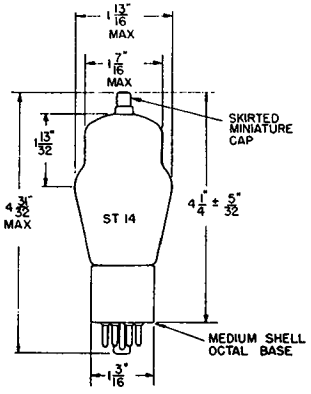

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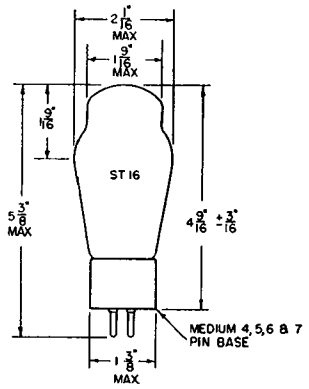

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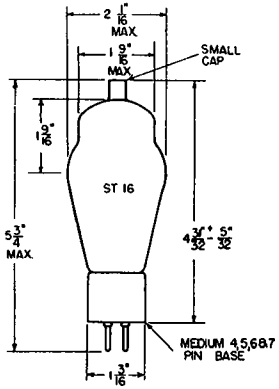

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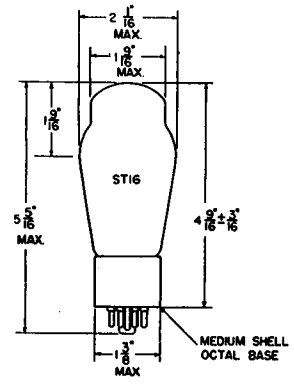

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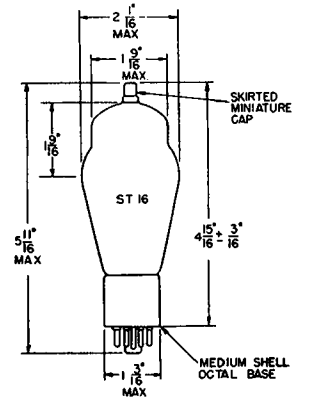

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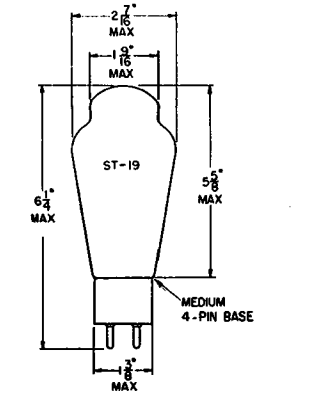

19A-1