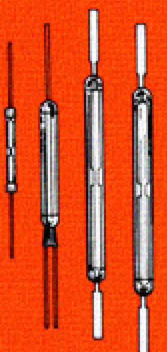
TUBES AND TRANSISTORS

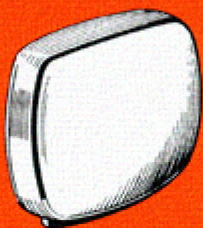
Essential Characteristics

PRINCIPAL RATINGS, ELECTRICAL AND PHYSICAL CHARACTERISTICS

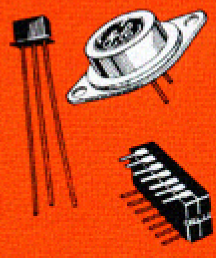
Receiving, Special-Purpose, Five-Star Tubes, and Compactrons



Reed Switches

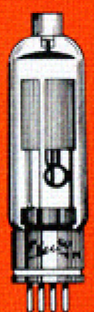


Picture Tubes

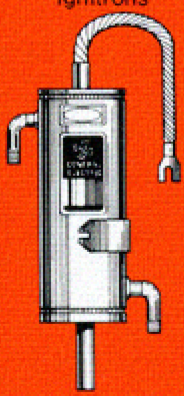


Entertainment Semiconductors, Accessories and Integrated Circuits

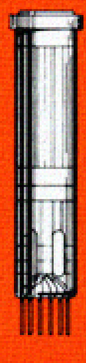
Thyratrons



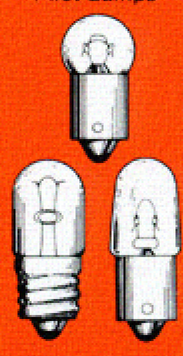
Ignitrons



Vidicons



Radio-TV Pilot Lamps



TUBE PRODUCTS DEPARTMENT

GENERAL ELECTRIC

ESSENTIAL CHARACTERISTICS

- Receiving Tubes
- Five-Star Tubes
- Special-Purpose Tubes
- Planar and Ceramic Tubes
- Thyratrons
- Ignitrons
- Vidicons
- Picture Tubes
- Entertainment Semiconductor Components
- Reed Switches
- Radio & TV Pilot Lamps

Fourteenth Edition

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FOREWORD

ESSENTIAL CHARACTERISTICS is especially prepared to provide the Service Technician with a single source of reference containing data on every tube likely to be found in any home receiver—AM, FM, Hi-Fi, or television—as well as special purposes, Planar and ceramic tubes, Thyratrons, Ignitrons, Vidicons, Reed Switches, Radio & TV Pilot Lamps and Entertainment Semiconductors.

Data presented include those characteristics and ratings essential to fast, efficient trouble-shooting. Basing diagrams for all tubes, including picture tubes, are in the back of the book with an index by tube type.

The electronics engineer, amateur, and experimenter will also find this a valuable quick-reference for tubes currently in use.

Included in the present edition of this hand book is a section listing the essential physical and electrical characteristics of television picture tubes both monochrome and color. For reference purposes and the convenience of the user, five-star, special purpose, planar, ceramic, thyratron, and ignition tubes have been included with receiving tubes.

A section entitled "Explanation of Terms and Data Used in This Book" is included to aid in the proper evaluation of the information presented. Following this section are tube classification charts arranged to provide a quick and convenient reference to the tubes that are available for specific classes of service in which the reader may be interested. The tube listings follow this section.

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(Continued on page 4)

Table of Contents (Continued)

X-RADIATION WARNING

The voltages employed in some television receivers and other high-voltage equipment are sufficiently high that high-voltage rectifier and shunt regulator tubes, television picture tubes and certain other high-voltage electron tubes may produce soft X-rays which can constitute a health hazard on prolonged exposure at close range, unless such tubes are adequately shielded. The need for this precaution must always be considered in equipment design.

Precautions must be exercised during the serving of equipment employing any of the above high-voltage tubes to assure that all shielding components are replaced to their intended positions before the equipment is operated.

Before operating any electron tube at 10,000 volts or higher, the tube manufacturer's detailed rating sheet for that particular tube should be reviewed.

EXPLANATION OF TERMS AND DATA USED IN THIS BOOK

RATING—A limiting value of voltage, current, frequency, etc., beyond which tube life may be seriously impaired.

CHARACTERISTIC—A property of a tube, inherent in its design, such as its ability to deliver a certain power output with specific electrode voltages applied.

BOGEY—An average *characteristic* value; a tube exhibiting these average values is termed a *bogey* tube.

RATING SYSTEMS

Maximum ratings given in this book are based on one of the three rating systems in common use: the design-center system, the design-maximum system, or the absolute-maximum system. Ratings based on the two latter systems are indicated by a footnote reference, and if the rating is not followed by a footnote symbol the design-center rating system is applicable. To determine whether or not a tube is used within ratings in a specific application, the rating system specified must be taken into account since each rating system requires a different procedure for determining conformance to ratings.

Design-Center Rating System To establish conformance to ratings in the design-center rating system, the ratings should not be exceeded with a *bogey* tube operating in the equipment under *average* conditions with respect to supply voltage, signal, temperature, component values, adjustment of controls, and other variables.

Design-Maximum Rating System To establish conformance to ratings in the design-maximum rating system, the ratings should not be exceeded with a *bogey* tube operating in the equipment under the *worst probable* combination of conditions with respect to supply voltage, signal, temperature, component values, adjustment of controls, and other variables.

Absolute-Maximum Rating System To establish conformance to ratings in the absolute-maximum rating system, the ratings should not be exceeded with *any tube of the specified type* operating in the equipment under the *worst probable* combination of conditions with respect to supply voltage, signal, temperature, component values, adjustment of controls, and other variables.

The term "worst probable combination of conditions" used above is not intended to include conditions under which useful performance of the equipment could not be obtained, since the equipment is not likely to be operated for long under such conditions.

ELECTRODE VOLTAGES

Electrode voltages indicated as "Max" in the tables are maximum ratings, and are measured with respect to the following reference points:

1. For cathode types, the reference point is the cathode terminal.
2. For filamentary types operated on direct current, the reference point is the negative terminal of the filament.
3. For filamentary types operated on alternating current, the reference point is the electrical center of the filament, usually located at the center-tap of the heater-supply transformer, rather than at the physical center of the filament.

POWER DISSIPATION

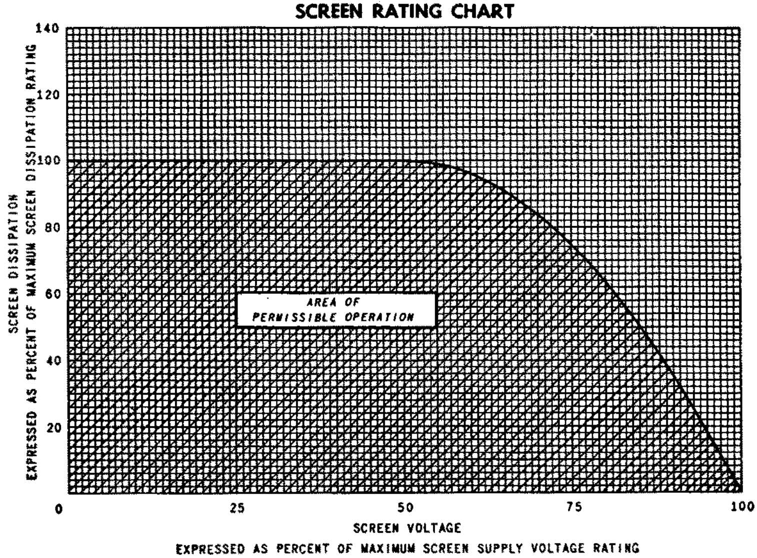
Plate Dissipation For Class A amplifiers, the maximum plate dissipation occurs at the zero-signal condition. The maximum peak input signal voltage should not exceed the bias voltage.

For Class B amplifiers, the maximum plate dissipation theoretically occurs at approximately 63 percent of the maximum-signal conditions, but practically may occur at any signal-voltage value.

For converters, the maximum plate dissipation occurs at the zero-signal condition and at the frequency at which the oscillator-developed bias is a minimum.

Screen Dissipation When a maximum screen voltage is shown in the data, the full rated screen dissipation is allowable at any screen voltage within the screen-voltage rating. When a maximum screen-supply voltage is shown, the allowable screen dissipation must be decreased, according to the accompanying screen-rating chart, if the screen voltage is greater than 50 percent of the rated screen-supply voltage.

SCREEN RATING CHART



SYMBOLS AND ABBREVIATIONS

The following symbols and abbreviations are used throughout the tube characteristics data:

E_b—Plate Voltage
E_c—Grid Voltage
E_{c1}—Grid-number 1 voltage
E_{c2}—Grid-number 2 voltage
E_{c3}—Grid-number 3 voltage
E_{cc}—Grid supply voltage
E_{cc1}—Grid-number 1 supply voltage
E_{cc2}—Grid-number 2 supply voltage
E_{cc3}—Grid-number 3 supply voltage
G—Grid
G_1—Grid number 1
G_2—Grid number 2
G_3—Grid number 3
G_4—Grid number 4
G_m—Transconductance
I_b—Plate current
I_c—Grid current
I_{c1}—Grid-number 1 current
I_{c2}—Grid-number 2 current
I_k—Cathode current
K—Cathode
μ—Amplification factor
P—Plate
R_g—Grid resistor
R_{g1}—Grid-number 1 resistor
R_{g2}—Grid-number 2 resistor
R_{g3}—Grid-number 3 resistor
R_k—Cathode resistor
R_p—Plate resistor

ARRANGEMENT OF DATA

The essential characteristics listed for each receiving tube are presented in columns described as follows from left to right:

TUBE TYPE

Tubes are arranged in numerical-alphabetical order. Those having the same basic designation but differing in suffix (e.g., 6BG6-G and 6BG6-GA) are grouped together when the types have equivalent electrical characteristics. All of the information presented applies to each type in the group, with the possible exception of the information in the "Outline Drawing," "Capacitance in Picofarads," "Filament Volts," or "Filament Amp." columns. When this information differs, the values are horizontally aligned with the type designations to which they apply.

Type designations printed in boldface indicate metal tubes, and designations in italics indicate miniature tubes. The symbol ◉ is used for subminiature tubes, and the symbol ■ is used for compactrons. All other types listed are larger glass tubes or special shapes, with the exception of planar tubes and nuvistors, which are so identified in the "Classification by Construction" column.

The following suffix letters are in common use in tube designations and have the indicated significance:

G signifies a glass bulb and an octal base.

GT signifies a T-9, straight-sided glass bulb and an octal base.

A, B, C, D, E, and F assigned in that order signify a later and modified version which can be substituted for any previous version but not vice-versa. The assignment of a suffix in this series does not convey any information as to the nature of the modification incorporated.

X signifies a base composed of special low-loss material.

Y signifies a base composed of special intermediate-loss material.

The symbol ¶ indicates a type having heater warm-up time controlled for series-string service.

CLASSIFICATION BY CONSTRUCTION

This column presents a descriptive title for each tube. When the tube represents an improved or modified version of an older type, the basic prototype is given in parenthesis following the descriptive title. The inclusion of the prototype is done to give aid in identifying the general characteristics of the tube under consideration and does not necessarily imply direct interchangeability between this version and the prototype. Whether or not the tubes can be used interchangeably depends on the particular characteristics and requirements of each individual application.

X-RADIATION RATING

This column is applicable to High Voltage Rectifier, Shunt Regulator, and Cathode-Ray Tubes.

High Voltage Rectifier and Shunt Regulator Tubes — Information is presented on the maximum X-radiation rating $\boxed{\text{A}}$ in milliroentgens per hour (mR/hr) extracted from the latest available EIA published product information. The mR/hr maximum shown is based on known attenuation factors of tube construction materials and accumulated sample test data taken initially and during life test on the particular tube type, and the tubes do not exceed the maximum rating limit at any time throughout their useful life, when operated within the maximum ratings, including filament voltage, specified on the individual published product information sheets. This X-radiation maximum rating is based on the use of the Victoreen 440 RF/C Survey Meter as the standard instrument for X-radiation measurement with its plastic spacers four (4) inches from the external surface of the tube under test. Tube types having no X-radiation rating Ⓐ are identified. For X-radiation rated replacement tubes, see chart § on page 20.

Cathode-Ray Tubes—Reference is made to available JEDEC X-radiation isodose and limit curves. ⧅ Tube types having no X-radiation reference to isodose or limit curves are identified. Δ

BASE CONNECTIONS

The basing diagrams are arranged in numerical-alphabetical order in the back of this book with an index by tube type. These diagrams are schematic representations of the terminal connections and do not necessarily indicate internal tube construction.

As an additional feature, each basing diagram has listed all tube types having that particular basing arrangement; this listing is useful in a preliminary search for interchangeable tube types.

In tubes having more than one grid, the grids are numbered consecutively in accordance with their location proceeding from the cathode to the plate. Thus, grid number 1 is the grid which is physically located nearest the cathode. In pentodes, grid number 2 is generally referred to as the screen grid, and grid number 3 is generally referred to as the suppressor grid.

In multisection tubes that contain two or more structurally similar sections, the similar sections are designated as section 1, section 2, etc., depending upon the connection of the electrodes to the terminal pins. The highest section number is assigned to that section having an electrode connected to the lowest-numbered base pin, and successively lower numbers are assigned to additional sections according to the sequence in which the connections of the same type of electrode in all sections are made to successively higher-numbered base pins. When similar sections have one or more electrodes in common, the assignment of section designations is determined by whichever independent electrode is connected to the lowest-numbered base pin.

OUTLINE DRAWINGS

This column presents information on the physical characteristics of each tube. When the physical characteristics of a tube conform to standard or commonly used configurations, an outline drawing number is shown which refers to tube drawings presented in the section "Outline Drawings." If the physical characteristics of a tube do not conform to any of the standard outline drawings, the designation "T-X" is shown. In this case, reference should be made to the T-X Table at the end of the Outline Drawing Section which presents data relative to the physical characteristics of these special tubes.

FILAMENT VOLTS

Unless otherwise stated in this column, the filament or heater may be operated with either alternating or direct current. If two values of filament voltage are given, the tube has a center-tapped filament or heater and may be operated with the halves in series or parallel.

FILAMENT AMP

This column lists the filament or heater currents. These current values are for a bogey tube operated at the filament voltage specified in the "Filament Volts" column. If the filament or heater is center-tapped, the currents are aligned with the corresponding voltages for series and parallel operation.

MAX PLATE WATTS

The plate dissipation listed is a maximum rating. For interpretation of maximum ratings, see the section "Rating Systems."

MAX PLATE VOLTS

The plate voltage listed is a maximum rating. For interpretation of maximum ratings, see the section "Rating Systems."

MAX SCREEN VOLTS AND WATTS

The screen voltage and dissipation listed are maximum ratings. When the symbol ‡ is used, the screen voltage is a supply voltage. For interpretation of screen ratings, see the section "Rating Systems."

CAPACITANCE IN PICOFARADS

Unless otherwise noted, all capacitance values are average values, and those for glass tubes are measured with an external close-fitting metal shield connected to the cathode terminal. The symbol ♣ indicates a maximum value of capacitance, and the symbol ▲ indicates a value measured without external shield. All values are measured with the filament or heater cold and with no direct-current electrode voltages applied.

In measuring the capacitances, all metal parts except the input and output electrodes are connected to the cathode. These metal parts include internal and external shields, base sleeves, and unused pins. In multisection tubes, the electrodes of the sections not common to the section under test are connected to ground.

Input capacitance is measured from the input grid to all other electrodes except the plate, which is connected to ground.

Output capacitance is measured from the plate to all other electrodes except the input grid, which is connected to ground.

Grid-to-plate capacitance is measured from the input grid to the plate, with all other electrodes connected to ground.

The capacitance values for twin-section or triple-section tubes refer to each section unless subscript numbers are used to designate the values for each section. Subscript designations are also used with the capacitance values of dissimilar double-section and three-section tubes.

SERVICE

This column indicates a potential application of the type. The class of service listed is not necessarily the only one for which the tube is suitable.

Class A Amplifier is an amplifier in which the grid bias and applied alternating grid voltage are such that plate current in a specific tube flows at all times.

Class AB Amplifier is an amplifier in which the grid bias and applied alternating grid voltage are such that plate current in a specific tube flows for appreciably more than half but less than the entire electrical cycle.

Class C Amplifier is an amplifier in which the grid bias is appreciably greater than the cutoff value so that the plate current in each tube is zero when no alternating grid voltage is applied and so that plate current in a specific tube flows for appreciably less than one-half of each cycle when an alternating grid voltage is applied.

To denote that grid current does not flow during any part of the input cycle, the suffix "1" may be added to the letter or letters of the class identification. The suffix "2" may be used to denote that grid current flows during some part of the cycle.

OTHER COLUMNS—GENERAL

The columns to the right of the "Service" column show typical electrode voltages applied and the characteristics obtained with these voltages when a bogey tube is used. The electrode voltages shown are not the only ones at which the tube may be operated; they are selected to show concisely some guiding information as to the characteristics of each tube type.

The electrode voltages listed are measured with respect to the following reference points:

For cathode types, the reference point is the cathode terminal; except that when cathode bias is used, the reference point is the negative terminal of the cathode-bias resistor.

For filamentary types operated on direct current, the reference point is the negative terminal of the filament.

For filamentary types operated on alternating current, the reference point is the electrical center of the filament, usually located at the center-tap of the heater-supply transformer, rather than at the physical center of the filament.

Filament or heater voltages are measured between the filament or heater terminals.

The column headings used are not always applicable for tubes designed to serve as television deflection-amplifiers, television dampers, signal rectifiers, power rectifiers, and regulators. In these cases the data reads across the space normally occupied by the columns. In addition, some of the data given may be ratings rather than characteristics.

PLATE VOLTS

Other values of plate voltage may be used, provided that they do not exceed the maximum rated plate voltage.

SCREEN VOLTS

Other values of screen voltage may be used, provided that the maximum rated screen voltage is not exceeded or, if maximum supply voltage is specified, the limitations of the Screen Rating Chart are observed.

NEG GRID VOLTS

The values of grid voltage or cathode bias are chosen to adjust the plate and screen currents to levels that give satisfactory tube operation and hold the plate and screen dissipations within the maximum ratings.

PLATE MILLIAMPERES

These values are for bogey tubes under the conditions given in the adjacent columns. The symbol †, used with audio-output tubes, indicates that the current listed was measured without a signal input to the control grid of the tube; maximum-input-signal plate currents are usually higher.

SCREEN MILLIAMPERES

These values are for bogey tubes under the conditions given in the adjacent columns. The symbol †, used with audio-output tubes, indicates that the current listed was measured without a signal input to the control grid of the tubes; maximum-input-signal screen currents are usually higher.

Rp, OHMS

The plate resistance (Rp) of an electronic tube is the ratio of a small change in plate voltage to the corresponding change in plate current, with all other electrode voltages maintained constant.

Gm, μMHOS

The transconductance (Gm) of an electronic tube is the ratio of a small change in plate current to the small change in grid voltage that produces it, with all other electrode voltages maintained constant. Unless otherwise noted all transconductance values in this handbook are grid-number 1-to-plate transconductances.

μ FACTOR

The amplification factor (μ) of an electronic tube is the ratio of a small change in plate voltage to the small change in grid voltage when the plate current and all other electrode voltages are maintained constant.

LOAD FOR RATED OUTPUT, OHMS

When operating conditions are given for two tubes in push-pull, the symbol ‡ indicates that the load resistance given is the plate-to-plate value.

POWER OUTPUT, WATTS

For power-output tubes, the value given refers to the average tube power output (plate-input power minus plate dissipation) for the indicated operating conditions. The useful power output is the tube output less the circuit losses. In Class-A operation, the rated tube power output is measured with an audio-frequency sinusoidal input signal whose peak value is equal to or less than the d-c grid-number 1 bias voltage applied to the tube.

CLASSIFICATION CHARTS

FIVE-STAR TYPES

Special-Quality Tubes for Critical Applications

Classification			7-Pin Miniature	9-Pin Miniature	Octal
Diodes	Low-Current Rectifiers		5726 6919		
Diodes	Full-Wave Power Rectifiers		6202	6203	6087
Triodes	Single	μ<40	6135		
Triodes	Twin	μ<40	5844	5670 5687 5814-A 6189 6211-A 6386 7861	
Triodes	Twin	μ>40		5751 5965-A 6072-A 6201 6414 6829	
Pentodes	Voltage Amplifiers	Sharp Cutoff	5654 6136 6265 8425-A 8426-A	6688	
Pentodes	Voltage Amplifiers	Remote Cutoff	5749		
Pentodes	Voltage Amplifiers	Dual Control	5725		
Pentodes	Power Amplifiers		6005	5686 6216	
Pentodes	High-Voltage Regulators			7239	
Heptodes			5750 7036		
Thyratrons			5727		

Receiving Types

DIODES

Service	Max Output Current in Ma	Single Filament	Single Cathode	Twin Filament	Twin Cathode	Triple Cathode
TV High-Voltage Rectifier	0.5	1AD2-A 1AY2-A 1BC2-A 1BC2-B 1BH2-A 1BY2-A 1DG3 1DG3-A 1G3-GTA 1K3-A *1V2* *1X2-C*				
	0.6 to 1.9	*2AV2*	2AS2-A 2BU2 3AT2-B 3BN2-A			
	2.0 to 3.0	3CU3-A 3DC3	2CN3-B 3A3-C 3AW2-A 3BS2-B 3BT2-A 3BW2 3CN3-B 3DA3 3DB3 3DF3 3DF3-A 3DH3 3DJ3 3DR3 3DS3			
Low-Current Rectifier	1.0 per plate					*6BJ7*
	9.0 to 12 per plate				*6AL5* *12AL5*	*6BC7*
Power Rectifier	50 to 99				*6X4*	
	100 to 149		*35W4* *50DC4*	5Y3-GT		
	150 to 199				*6CA4*	
	200 to 299			5U4:GB		
TV Damping Diode	120 to 175		6AX3 6AX4-GTB 6AY3-B 6BJ3 6BW3 12AX3 12AY3-A 12BT3 17AX3 17AY3-A 17BW3 22BW3 ½32HQ7 ½33GT7 ½33GY7 ½33GY7-A			
	180 to 350		6BE3 6BS3-A 6BZ3 6CG3 6CJ3 6CL3 6DE4 6DN3 12BE3 12BS3-A 12CL3 ½12HE7 17BE3 17BS3-A 17BZ3 17DE4 19CG3 19DE3 22DE4 25CG3 34CE3 ½38HE7 ½38HK7			
	400 to 450		6DK3 6DQ3 6DQ3-A 19DK3 19DQ3 25DK3			

Type designations of miniature tubes are shown in italics.

TRIODES

Amplification Factor μ	Single — Heater Current in Milliamperes 600	450	300	150	Other	Twin or Doube — Heater Current in Milliamperes 600	450	300	150	Other
2.0 to 9.0	*12B4-A*		*12B4-A*			½10GF7-A	½11CY7 ½13GF7-A ½15EA7 ½15FY7			½6CY7 ½6EA7 ½6EM7 ½6FM7 ½6FY7 ½6GF7-A ½6GL7
10 to 19	*2AF4-B* *2DZ4* *6S4-A*	*3AF4-B* *3DZ4*		*6C4*	*6AF4-A* *6DZ4*	½4HA7 ⅓6BA11 *½6CM7* *6GU7* *12BH7-A*	½5HA7 ⅓8BA11	*12AU7-A* *12BH7-A* ½7247	*12AU7-A* *½7247*	½6FJ7
20 to 29	½13JZ8	½17JZ8	½25JZ8		½6JZ8 ½24JZ8	*6CG7* *½6CM7* *6FQ7* 6SN7-GTB ⅓16AK9	*8CG7* *8FQ7* ⅓23Z9	*12FQ7* 12SN7-GTA		⅓6AK9 ½6FJ7 ⅓31AL10
30 to 39							6J6-A			*6BQ7-A* *6BZ7*
40 to 59	½15MF8 ½16LU8 ½16LU8-A	½21LR8 ½21LU8			½6LR8 ½6LU8 ½6MF8	⅔8BU11 ⅓11BT11 ⅓11CA11 ⅓11CF11 ⅓11CH11 ⅓16AK9	*6BK7-B* *12AV7* ⅓14BL11 ⅓14BR11 ⅓15AF11 ⅓15BD11 ⅓23Z9	*12AY7*	*12AY7*	⅓6AK9 ⅓6AS11 ⅓6CA11 ⅔6BH11 ⅔6M11 *12AV7* ⅔16BX11 ⅓31AL10
60 to 69				*6AB4*		½10GF7-A	½11CY7 *12AZ7-A* ½13GF7-A ½15EA7 ½15FM7 ½15FY7	*6DT8* *12AT7*	*12AT7* *12DT8*	⅓6AS11 ⅓6CA11 ½6CY7 ½6EA7 ½6EM7 ½6FM7 ½6FY7 ½6GF7-A ½6GL7 *12AZ7-A*
70 to 79	*2GK5*	*3GK5* *3HA5* *3HM5*	*4GK5*		*6GK5* *6HA5* *6HM5*			6SL7-GT	12SL7-GT	
80 to 89					*6AM4*					
100						½4HA7	½5HA7	*6EU7* *12AX7* *12AX7-A* *7025* ½7247	*12AX7* *12AX7-A* *7025* ½7247	

TRIPLE OR THREE-SECTION TRIODES

Amplification Factor μ	Heater Current in Milliamperes 600	450	300	150	Other
Medium-μ 10 to 49	6AV11 ½6K11 ½6U10 9MN8		12AC10-A		6MD8 6MJ8 6MN8
High-μ 50 to 100	6AC10 6C10 ½6K11 ½6U10 9AK10 9AM10	6D10 *6EZ8* *6GY8* 8AC10		*19EZ8*	6AK10

Type designations of miniature tubes are shown in italics.

TRIODES WITH DIODES

Amplification Factor μ		Heater Current in Milliampers				
		600	450	300	150	Other
10 to 49	with 2 diodes	6B10	8B10			
50 to 100	with 2 diodes		*6FM8*	*6AV6*	*12AV6* *14GT8* *14JG8* *30AG11*	6AG11 6AY11
	with 3 diodes		*6T8-A*		*19T8*	

TRIODE-PENTODES

Transconductance, Pentode Section	Amplification Factor Triode Section	Heater Current in Milliamperes			
		600	450	300	Other
5500	40	*5CG8*	*6CG8-A*		
5500	70	*5JW8*	*6LX8*		*6JW8*
6000	43	*5FG7*	*6FG7*		
6400	40	*5EA8*	*6EA8* *6HB7*		*19EA8*
6500	45		*6FV8-A*		
6500	95				6T9
6500	70				*19HV8*
7500	46	*5GH8-A* *5KZ8*	*6GH8-A* *6JN8* *6KZ8*	*9GH8-A* *9KZ8*	*12JN8* *19JN8* *19KG8*
8000	43	*6AU8-A*			
9000	100	*6MV8*			
9500	70	*6AW8-A*	*8AW8-A*		
9500	110		*10LZ8*		
10000	40	*8CX8*			*6CX8*
10000	100	*6KT8*			
10700	70	*6JV8*	*8JV8*		
11000	46		*10JY8*		
11500	100	*8GN8*	*10GN8*		*6GN8*
12000	70		*11JE8*		*6JE8*
12500	100	*8EB8*			*6EB8*
13000	40				*6LJ8*
19000	75		*10LW8*		
20000	46	*10KR8*			*6KR8-A*
20000	100				*6LY8*
21000	20	9AH9			6AH9
30000	39				6AG9
30000	59	8AL9			6AL9

Type designations of miniature tubes are shown in italics.

PENTODE VOLTAGE AMPLIFIERS

	Sharp-Cutoff					Remote-Cutoff				
	Heater Current in Milliamperes					Heater Current in Milliamperes				
Gm μmhos	600	450	300	150	Other	600	450	300	150	Other
3,000 to 4,900				*6BH6*				*6BA6*	*12BA6*	*12DZ6*
5,000 to 7,900	⅓8BU11	*4AU6* ½9BJ11	*6AU6-A*	*12AU6*	⅓6BH11		½9BJ11			
8,000 to 8,900	*3CB6*	*4CB6* *4DE6* ½8BM11	*6CB6-A*		½6BW11	*3BZ6* *4LU6*	*4BZ6* *4JH6* ½8BM11	*6BZ6*		
9,000 to 9,900	*3DK6*	*4DK6*	*6DK6*							
10,000 to 11,000	*12DQ7*	⅓14BR11 ⅓15AF11 ⅓15BD11	*12DQ7*		⅓6AF11 ⅓6AS11 ⅓6BD11	*2FS5* 8AR11 ½8BQ11	*3FS5* 11AR11 ½11BQ11			6AR11 *6FS5* ½16BQ11
11,100 to 13,000	8BN11 ½8BQ11 8CB11 *12BY7-A*	½11BQ11	*12BY7-A*		6J11 *6JG5* ⅓6M11 ½16BQ11 ⅓16BX11		*4EH7* *5GM6*	*6EH7*		6BN11 ½6BW11 *6GM6*
14,000 to 14,900		*4JD6* *5EW6*	*6JD6*	*15EW6*	*6EW6*					
15,000 to 22,000	*2GU5* *3JC6* ⅓11BT11 ⅓11CA11 ⅓11CF11 ⅓11CH11	*4EJ7* *4JC6* ⅓14BL11	*6EJ7* *6JC6* *6JC6-A*		*6GU5*					⅓6CA11
30,000 to 40,000	*12GN7-A*	*7KY6*								*12HG7*

PENTODE POWER AMPLIFIERS

Service	Power Output in watts	Heater Current in Milliamperes					
		600	450	300	150	Other	
Output Amplifier	1.0 to 1.9	*12CA5*	½12AE10 ½13V10	*25EH5*	*6AK6* *35C5* *50EH5* *50HK6*	½18AJ10	
	2.0 to 2.9	*12C5* *12CU5*	*17CU5*	*25C5*	*50C5*	½6G11 *6CU5*	
	4.0 to 6.0	*5AQ5* *8BQ5* ½10AL10 ½10T10 ½10Z10 ½12BF11	*6AQ5-A* 6V6-GTA *10GK6* ½12AL11 ½12T10 ½13Z10 ½17AB10 ½17BF11 ½17BF11-A 7408			½6AD10 ½6AD10-A ½6AL11 ½6BF11 *6BQ5* ½6BY11	*6GK6* ½6T10 ½6Z10 ½24BF11 *7189-A*
	9.0 to 12.5					6L6-GC 6550-A	7355 7581-A
Horizontal-Deflection Amplifier		12DQ6-B 12GE5 12JF5 12JN6 16GY5 16KA6 21JS6-A 21LG6-A 24LQ6 26HU5 26LW6 26LX6	17DQ6-B 17GE5 17GV5 17JB6-A 17JM6 17JN6 21GY5 21HB5-A 21JV6 21JZ6 21KA6 31JS6-A ½33GT7 ½33GY7 ½33GY7-A 36KD6 ½38HE7 ½38HK7 40KD6	30JZ6 33JV6		6DQ6-B 6GE5 6GF5 6GV5 6GY5 6HB5 6HE5 6HF5 6JB6-A 6JE6-B 6JE6-C	6JM6 6JN6 6JS6-B 6JS6-C 6JZ6 6KD6 6LB6 6LW6 6LX6 ½12HE7 ½32HQ7 ½53HK7
Vertical-Deflection Amplifier		10JA5 ⅓16AK9 ½16LU8 ½16LU8-A	½21LR8 ½21LU8 ⅓23Z9			6EZ5 6HB6 6HE5 ½6LR8 ½6LU8 6JA5	6JB5 ⅓6AK9 ⅓31AL10

Type designations of miniature tubes are shown in italics.

BEAM TRIODES

Classification	Heater Current in Milliamperes: 600	450	300	150	Other
Shunt HV Regulators					6BK4-C 6EH4-A 6EJ4-A 6EL4-A 6EN4 6LH6-A 6LJ6-A 6MA6
Pulse Regulators					6HS5 6HV5-A 6JD5 6JH5 6JK5

PENTODES WITH DIODES

Classification		Heater Current in Milliamperes: 600	450	300	150	Other
Sharp-Cutoff Pentode	with 1 diode	*5AM8*	*6AM8-A*			
	with 2 diodes	*6LT8*	*8LT8*			*11LT8*

DUAL-CONTROL PENTODES

Classification	Heater Current in Milliamperes: 600	450	300	150	Other
Dual-Control Amplifier	*3DT6* ½10AL11 ½10T10 ½12BF11	*4DT6* *6GX6* *6GY6* *6HZ6* ½12AE10 ½12AL11 ½12T10 ½13V10 ½17BF11 ½17BF11-A	*6DT6* *6DT6-A*		½6AD10 ½6AD10-A ½6AL11 ½6BF11 ½6BY11 ½6G11 ½6T10 ½18AJ10 ½24BF11

HEPTODES

Service	Conversion Transconductance in Micromhos	Heater Current in Milliamperes: 600	450	300	150	Other
Converter	450 to 500			*6BE6*	*12BE6*	
Dual-Control Amplifier		*3CS6*	*4CS6*	*6CS6*		

MISCELLANEOUS TYPES

Classification	Heater Current in Milliamperes: 600	450	300	150	Other
Quadruple Diodes	*6JU8* *6JU8-A*				
Triode-Tetrodes		*6CL8-A*			
Tetrodes	*2CY5*				*6CY5*
Twin Pentodes	*3BU8* *3HS8* ⅔6BA11	*4BU8* *4HS8* *4MK8* ⅔8BA11 *10LE8* 12BV11	*6BU8* *6HS8* *6MK8-A*		*6BV11* *6LE8*
Gated-Beam Tube	½10Z10	½13Z10 ½17AB10	*6KS6*		½6Z10
Sheet-Beam Tube			*6AR8* *6HW8* *6JH8* *6ME8*		

Type designations of miniature tubes are shown in italics.

SPECIAL-PURPOSE TYPES

Classification	Diodes		Triodes				Tetrodes	Pentodes					
	Single	Twin	Single	Twin	Double	With Diodes		Sharp Cutoff	Remote Cut-off	Power Amplifier	Regulator	Heptodes Dual Control	Triode-Pentodes
Computer Types				*5844* *5963* *6211-A* *6350* *6463* *7044*						*6197*			
Low-Microphonic Types				*12AY7*									
Mobile-Communications Types		*6663*	*6664*	*6679* *6680* *6681*		*7724*	*7167* *7717*	*6661* *6676*	*6660* *6662*	*6669* *6677* *7701*			*6678* *7716* *8102*
Miscellaneous	5558 5561	5R4-GYA	*7233*	6AS7-GA *6DJ8* 5998-A 6080 *7025* *7370*	*7247*			*6485* *8136*		*6AK6* 5824 6046 *7189-A* 7355 7408 7581 7581-A 8068	*7239*		
Low-Power Transmitting										*2DF4* 807 6146-A 6146-B 6550-A 6883-A 6883-B 7984 *8106* 8156 8908			

Type designations of miniature tubes are shown in italics.

THYRATRONS

Classification	DC Cathode Current in Amperes	Peak Inverse Anode Voltage	Filament or Heater		Types
			Voltage in Volts	Current in Amperes	
Triodes	0.025	350	6.3	0.25	*6D4
	0.075	350	6.3	0.6	884
	0.5	500	2.5	5.0	FG-81A
	0.5	5000	2.5	5.0	5557
	1.0	1250	2.5	6.3	6014/C1K
	1.5	1250	2.5	7.0	3C23
	1.5	1250	2.5	7.0	393A
	1.6	20000	5.0	10.0	5563A
	1.6	15000	5.0	7.5	678
	2.5	1250	2.5	9.0	710/6011
	2.5	1250	2.5	9.0	710L/7518
	2.5	1000	5.0	4.5	5559
	2.5	1250	2.5	9.0	5632/C3J
	2.5	1000	5.0	4.5	5720
	2.5	1000	5.0	4.5	5728
	2.5	3500	2.5	9.0	7725
	2.5	3500	2.5	9.0	7726
	3.2	1500	2.5	12.0	5544
	5.0	3000	5.0	19.0	414
	6.4	1500	2.5	21.0	6807
	6.4	1500	2.5	21.0	6808
	6.4	1500	2.5	21.0	6809
	6.4	1500	2.5	21.0	6858/760
	6.4	1500	2.5	21.0	6859/760P
	12.5	10000	5.0	20.0	5830
	16.0	1250	2.5	31.0	5665/C16J
	18.0	1500	2.5	34.0	5855
Tetrodes	0.2	500	6.3	0.15	*5663
	0.028	500	6.3	0.15	*5696A
	0.1	1300	6.3	0.6	*2D21
	0.1	1300	6.3	0.6	502A
	0.1	1300	6.3	0.6	2050A
	0.1	1300	6.3	0.6	**5727
	0.5	1000	2.5	5.0	FG-97
	0.5	500	2.5	5.0	FG-98A
	0.5	1300	6.3	2.5	6012
	2.5	500	5.0	7.0	FG-154
	2.5	1000	5.0	4.5	5560
	3.2	2500	5.0	5.0	672A
	6.4	2500	5.0	10.0	FG-105
	6.4	2000	5.0	10.0	FG-172

*Miniature types **Five-Star Type

PLANAR AND CERAMIC TYPES

Classification	Type	Approx. Envelope Diameter	Type of Terminal	Maximum Ratings: Plate Dissipation (Watts)	Maximum Ratings: Current (Milliamperes)	Gm	μ	Typical Operation	Useful Frequencies Extend to *
Triode Class A Operation	2C40A	1.3″	Octal	6.5 ▲	ib = 25	5100	35	UHF Amp.	3370 MHz
	6299	0.5″	Coax.	2.0	ib = 12	15000	110	Low Noise UHF Amp.	3000 MHz
	6771	0.5″	Coax.	6.25 ▲	ib = 25	23000	90	UHF Amp.	4000 MHz
	7077	0.3″	Coax.	1.0	ik = 10	10000	90	Low Noise UHF Amp.	7500 MHz
	7296	0.5″	Lug(T)	5.5	ik = 30	16500	90	VHF Amp.	500 MHz
	7462	0.3″	Lug	1.0	ik = 10	10500	94	Low Noise VHF Amp.	500 MHz
	7644	0.5″	Coax.	2.0	ib = 12	15000	110	Low Noise VHF Amp.	3000 MHz
	7768	0.5″	Coax.	5.5	ik = 30	50000	225	Low Noise RF Amp.	3000 MHz
	7784	0.5″	Coax.	2.0	ib = 12	15000	110	Low Noise VHF Amp.	3000 MHz
	8083	0.3″	Lug(T)	1.0	ik = 10	10500	94	Low Noise VHF Amp.	500 MHz
Triode Class B or C Operation	2C39A	1.2″	Coax.	100 ▲	ik = 125	22000	100	UHF Power Amp., Osc., or Freq. Mult.	2500 MHz
	2C39B	1.3″	Coax.	100	ik = 125	24800	95	UHF Power Amp., Osc., or Freq. Mult.	2500 MHz
	2C39WA	1.3″	Coax.	100	ik = 125	24800	95	UHF Power Amp., Osc., or Freq. Mult.	2500 MHz
	2C40A	1.3″	Octal	6.5 ▲	ib = 25	5100	35	UHF Power Amp., or Osc.	3370 MHz
	2C43	1.3″	Octal	12.0 ▲	ib = 40	8100	50	UHF Power Amp., or Osc.	3000 MHz
	3CX100A5	1.3″	Coax.	100 ▲	ik = 125	25000	100	UHF Power Amp., Osc., or Freq. Mult.	3000 MHz
	6442	0.5″	Coax.	8.0 ▲	ib = 35	16500	50	UHF Power Amp., Osc., or Freq. Mult.	5000 MHz
	6771	0.5″	Coax.	6.25 ▲	ib = 25	23000	90	UHF Power Amp., Osc., or Freq. Mult.	6000 MHz
	6897	1.3″	Coax.	100 ▲	ik = 125	24800	95	UHF Power Amp., Osc., or Freq. Mult.	2500 MHz
	7289	1.0″	Coax.	100 ▲	ik = 125	25000	100	UHF Power Amp., Osc., or Freq. Mult.	3000 MHz
	7296	0.5″	Lug(T)	5.5	ik = 30	16500	90	VHF Power Amp., Osc., or Freq. Mult.	500 MHz
	7391	0.5″	Coax.	2.25 ▲	ib = 15	11000	62	UHF Power Amp., Osc., or Freq. Mult.	6000 MHz
	7486	0.3″	Coax.	1.0	ik = 10	10500	90	UHF Power Amp., Osc., or Freq. Mult.	7500 MHz
	7588	0.5″	Lug(T)	5.5	ik = 30	45000	175	Low Noise VHF Amp.	500 MHz
	7720	0.3″	Lug	1.0	ik = 10	10500	90	VHF Power Amp., Osc., or Freq. Mult.	500 MHz
	7913	0.5″	Coax.	5.5	ik = 30	40000	100	VHF Power Amp., Osc., or Freq. Mult.	3000 MHz
	8082	0.3″	Lug(T)	1.0	ik = 11	10500	90	VHF Power Amp., Osc., or Freq. Mult.	500 MHz
	GE12661	0.3″	Coax.	4.0	ik = 40	8500	40	Power Osc.	3000 MHz
	GE14501	0.3″	Coax.	2.0	ik = 80	12500	90	Power Amp. or Osc.	7500 MHz
	GE16411	0.3″	Coax.	1.0	ik = 40	12500	75	Power Amp. or Osc.	7500 MHz
	GE16841	0.3″	Coax.	1.5	ik = 20	17000	78	CW Amp. or Osc.	7500 MHz
Triode Pulse Operation	2C40A	1.3″	Octal	4.0 ▲	ib = 2000	5100	35	Pulsed Osc. or Amp.	3000 MHz
	2C42	1.3″	Octal	12.0 ▲	ik = 4000	8000	48	UHF Oscillator	3370 MHz
	2C43	1.3″	Octal	12.0	ik = 4000	8100	50	Pulsed Osc. or Amp.	3370 MHz
	2C46	1.3″	Octal	12.0	ib = 40	3500	60	UHF Osc.	3370 MHz
	6442	0.5″	Coax.	7.5 ▲	ik = 3750	16500	50	Pulsed Osc. or Amp.	5000 MHz
	6771	0.5″	Coax.	5.0 ▲	ik = 1950	23000	90	Pulsed Osc. or Amp.	5000 MHz
	7815	1.2″	Coax.	10.0 ▲	ip = 3000, Ig = 5.0	.....	...	Pulsed Osc. or Amp.	3000 MHz
	7815R	1.3″	Coax.	100 ▲	ip = 3000, Ig = 5.0	.....	...	Pulsed Osc. or Amp.	3000 MHz
	7910	0.3″	Coax.	1.5	ik = 800	16000	75	Pulsed Osc. or Amp.	7500 MHz
	7911	0.5″	Coax.	6.5	ik = 3500	25000	58	Pulsed Osc. or Amp.	6000 MHz
Triode Pulse Operation (contd)	GE13971	0.6″	Coax.	6.5	ik = 1810	25000	58	Pulsed Osc. or Amp.	6000 MHz
	GE14811	0.6″	Coax.	6.5	ik = 1200	29000	60	Pulsed Osc.	6000 MHz
	GE15371	0.5″	Coax.	10.0	ik = 2000	22000	85	Pulsed Osc. and Amp.	6000 MHz
	GE16231	0.6″	Coax.	6.5	ik = 600	50000	225	Pulsed Amp.	3000 MHz
	GE17241	0.7″	Coax.	10.0	ik = 3000	13500	95	Pulsed Osc. and Amp.	3000 MHz
	GE17701	0.7″	Coax.	30.0	ik = 6000	26000	58	Pulsed Osc. or Amp.	3000 MHz
	GE18651	0.6″	Coax.	6.5	ik = 1860	22000	58	Pulsed Osc. or Amp.	6000 MHz
	GL51025	1.2″	Coax.	110	ik = 15000	.....	...	Pulsed Osc.	1300 MHz
	GL51074		Coax.	110				High Voltage Version of GL51025	1300 MHz
Diodes	2B22	1.3″	Octal	Tube Voltage Drop: Ib = 20 Milliamperes				Power Detector or Mon.	1500 MHz
	7266	0.3″	Octal	Tube Voltage Drop: 1 Volt @ = 1.0 Milliamperes				Instrument Detector	7500 MHz
	7841	0.3″	Octal	Tube Voltage Drop: 2.6 Volts @ 5.0 Milliamperes Ib = 5 Milliamperes maximum				Signal Detector	7500 MHz
	GL6251	5.0″	Coax.	25KW	ik = 8000	.....	20	Power Amp. or Osc.	220 MHz

PLANAR AND CERAMIC TYPES (Cont'd)

Classification	Type	Approx. Envelope Diameter	Type of Terminal	Maximum Ratings: Plate Dissipation (Watts)	Maximum Ratings: Current (Milliamperes)	Gm	μ	Typical Operation	Useful Frequencies Extend to *
Tetrodes	GL6283	2.3"	Coax.	500	ib = 250	.....	14	Mil. Comm. System	1250 MHz
	GL6848	4.0"	Coax.	2.0KW	ib = 800	.....	20	Power Amp. or Osc.	800 MHz
	GL6942	3.5"	Coax.	1.5KW	ib = 700	.....	17	UHF Amp. or Osc.	1000 MHz
	GL7399	2.3"	Coax.	500	ib = 10000	.....	10.5	Pulsed Amp. or Osc.	1500 MHz
	GL7985	2.7"	Coax.	3.5KW	ib = 600	.....	20	Power Amp. or Osc.	800 MHz
	GL8500	2.3"	Coax.	500	ib = 250	.....	14	Power Amp.	1500 MHz
	GL8513	6.0"	Coax.	4.0KW		.....	20	Power Amp. or Osc.	800 MHz
	GL8866	1.7"	Coax.	150	ib = 5000	.....		Pulsed Amp. or Osc.	1500 MHz
	GL51038	2.0"	Coax.	600	ib = 10000	.....	...	Pulsed Amp.	1500 MHz
	GL51038R	2.0"	Coax.	600	ib = 10000	.....	...	Pulsed Amp.	1500 MHz
	GL51064	4.0"	Coax.	2.75KW	ib = 700	.....	17	VHF-UHF Mil. Comm.	1250 MHz
	GL51065	2.0"	Coax.	600	ib = 6000	.....	...	Detector Equip.	1500 MHz
	GL51070		Coax.	600				CW Version of GL51065	900 MHz

*The frequency listed is one at which significant application data are available or expected, and does not necessarily represent an absolute frequency limit.
(T) Provision is made for mounting with T-bolt.
▲At this dissipation level, anode cooling is usually necessary to prevent exceeding maximum permissible seal temperature.

IGNITRONS

Classification	Maximum Electrical Ratings: Supply Volts RMS	Maximum Demand KVA	Corresponding Average Anode Current Amperes	Maximum Average Anode Current Amperes	Corresponding Demand KVA	Types
Resistance Welding Control Service	250-600	300	12.1	22.4	100	GL-5550
	250-600	600	30.2	56	200	GL-5551A/GL-5551A-PC
	250-600	1200	75.6	140	400	GL-5552A/GL-5552A-PC
	250-600	2400	192	355	800	GL-5553B/GL-5553B-PC
	2400	1200	75	113	600	GL-5554
	2400	2400	135	207	1105	GL-5555
	2400	4800	270	414	2210	GL-5564
	Integral Thermostat Version of GL-5554. Same Ratings Apply.					GL-6512
	Integral Thermostat Version of GL-5555. Same Ratings Apply.					GL-6513
	Integral Thermostat Version of GL-5564. Same Ratings Apply.					GL-6515
	250-600	4800(1)	486	900	1600	GL-7151
	250-600	600	30.2	56	200	GL-7669/GL-7669-PC
	250-600	1200	75.6	140	400	GL-7671/GL-7671-PC
	250-600	2400	192	355	800	GL-7673/GL-7673-PC
	250-600	1800	135	220	600	GL-7681/GL-7681-PC
	250-600	1800	135	220	600	GL-7998/GL-7998-PC
	250-600	4800(1)	486	900	1600	GL-8205
	250-600	1000	43.2	75	200	GL-37250/GL-37250-PC
	250-600	1000	43.2	75	200	GL-37251/GL-37251-PC
	250-600	2000	108	150	380	GL-37252/GL-37252-PC
	250-600	2000	108	150	380	GL-37253/GL-37253-PC
	250-600	3000	224	400	1000	GL-37254/GL-37254-PC
	250-600	3000	224	400	1000	GL-37255/GL-37255-PC

IGNITRONS (Cont'd)

Classification	Peak Inverse Voltage Volts	Maximum Peak Anode Current Amperes	Corresponding Average Anode Current Amperes	Maximum Average Anode Current Amperes	Corresponding Peak Anode Current Amperes	Types
Frequency Changer Welding Control Service	1200	600	5	22.5	135	GL-5551A
	1500	480	4	18	108	GL-5551A-PC
	1200	3000	40	140	840	GL-5553B
	1500	2400	32	112	672	GL-5553B-PC
	1200	1500	20	70	420	GL-5822A
	1500	1200	16	56	336	GL-5822A-PC
	1200	600	5	22.5	135	GL-7669
	1500	480	4	18	108	GL-7669-PC
	1200	1500	20	70	420	GL-7672
	1500	1200	16	56	336	GL-7672-PC
	1200	3000	40	140	840	GL-7673
	1500	2400	32	112	672	GL-7673-PC
	1200	2250	30	105	630	GL-7681
	1500	1800	24	84	502	GL-7681-PC
	1200	2250	30	105	630	GL-7998
	1500	1800	24	84	502	GL-7998-PC

Classification	Peak Anode Voltage Volts		Peak Anode Current Amperes	Typical Discharge Rate Pulse Per Minute	Ionization Time-Micro-seconds	Types
	Forward	Inverse				
Capacitor Discharge Service	35,000	35,000	20,000	2	0.8	GL-5630
	50,000	50,000	30,000	2	0.8	GL-6228
	15,000	15,000	35,000	2	0.5	GL-7171
	20,000	20,000	100,000	2	0.5	GL-7703**
	25,000	25,000	300,000	500	0.5	GL-37207
	50,000	50,000	25,000	2	0.7	GL-37248**

(1) Maximum demand current below 500 volts should not exceed 9600 amperes RMS.
PC indicates plastic coated version.
**All ratings based on use of liquid cooling except GL-7171 (air cooled), GL-7703 & GL-37248 (liquid or air)

VIDICONS

Classification	Type
Monochrome Film & CC TV Cameras	7038 8572 8604
Broadcast Color Television Cameras	7038V Z7929R,B,G 8134V 8572V
General use in CC TV and Educational TV Cameras	7262A 7735A 8573A 8134
Ruggedized use in Military and CC TV Cameras	7263A Z7912
High Quality CC TV, Broadcast and Educational TV Cameras	7735B 8507A 8541A
Low Cost CC TV and Educational TV Cameras	Z7911 Z7919
Low Light Level for CC TV and Educational Cameras	8484H
High Quality Medical X-Ray TV Cameras	7735BX 8541X 8573X
Extremely Low Light Level for CC TV and Educational Cameras	Z7975B Z7975HRB Z7996B Z7996HRB Z7927B Z7927HRB

X-RADIATION RATED RECOMMENDED REPLACEMENTS FOR HIGH VOLTAGE RECTIFIER AND SHUNT REGULATOR TUBES

HIGH VOLTAGE RECTIFIERS

Tube Type	Replacement X-Radiation Rated Version	Current GE Renewal Branding
1AD2	1AD2A	1BY2A/1AD2A
1AD2A	1AD2A	1BY2A/1AD2A
1AJ2	—	—
1AU2	—	—
1AU3	—	—
1AX2	—	—
1AY2	1AY2A	1AY2A
1AY2A	1AY2A	1AY2A
1B3GT	1G3GTA	1G3GTA/1B3GT
1BC2	1BC2A	1BC2A
1BC2A	1BC2A	1BC2A
1BC2B	1BC2B	1BC2B
1BH2	1BH2A	1BH2A
1BH2A	1BH2A	1BH2A
1BK2	—	—
1BL2	—	—
1BV2	—	—
1BX2	1X2C	1X2C/1BX2
1BY2	1BY2A	1BY2A/1AD2A
1BY2A	1BY2A	1BY2A/1AD2A
1DG3	1DG3	1DG3
1DG3A	1DG3A	1DG3A
1G3GT	1G3GTA	1G3GTA/1B3GT
1G3GTA	1G3GTA	1G3GTA/1B3GT
1H2	—	—
1J3	1K3A	1K3A/1J3
1J3A	1K3A	1K3A/1J3
1K3	1K3A	1K3A/1J3
1K3A	1K3A	1K3A/1J3
1N2	—	—
1N2A	—	—
1S2	—	—
1S2A	—	1S2A/DY87
1T2	—	—
1V2	—	1V2
1X2	1X2C	1X2C/1BX2
1X2A	1X2C	1X2C/1BX2
1X2B	1X2C	1X2C/1BX2
1X2C	1X2C	1X2C/1BX2
1Y2	—	—
1Z2	—	—
2AH2	2BU2	2BU2/2AS2A/2AH2
2AS2	2AS2A	2BU2/2AS2A/2AH2
2AS2A	2AS2A	2BU2/2AS2A/2AH2
2AV2	—	2AV2
2AZ2	—	—
2B3	—	—
2BA2	—	—
2BJ2	2BJ2A	—
2BJ2A	2BJ2A	—
2BU2	2BU2	2BU2/2AS2A/2AH2
2CN3A	2CN3B	2CN3B
2CN3B	2CN3B	2CN3B
2J2	—	—
2L2	—	—
2V2	—	—
2V3G	—	—
2X2	—	—
2X2A	—	—
2Y2	—	—
3A2	3A2A	—
3A2A	3A2A	—
3A3	3A3C	3A3C/3AW3/3B2
3A3A	3A3C	3A3C/3AW3/3B2
3A3B	3A3C	3A3C/3AW3/3B2
3A3C	3A3C	3A3C/3AW3/3B2
3AT2	3AT2B	3AT2B
3AT2A	3AT2B	3AT2B
3AT2B	3AT2B	3AT2B
3AW2	3AW2A	3AW2A
3AW2A	3AW2A	3AW2A
3AW3	3A3C	3A3C/3AW3/3B2
3B2	3A3C	3A3C/3AW3/3B2
3BF2	—	—
3BL2	3BL2A	3BL2A
3BL2A	3BL2A	3BL2A
3BM2	3BM2A	3BM2A
3BM2A	3BM2A	3BM2A
3BN2	3BN2A	3BN2A
3BN2A	3BN2A	3BN2A
3BS2	3BS2B	3BW2/3BS2B/3BT2A
3BS2A	3BS2B	3BW2/3BS2B/3BT2A
3BS2B	3BS2B	3BW2/3BS2B/3BT2A
3BT2	3BT2A	3BW2/3BS2B/3BT2A
3BT2A	3BT2A	3BW2/3BS2B/3BT2A
3BW2	3BW2	3BW2/3BS2B/3BT2A
3C2	—	—
3CA3	3CA3A	3CA3A
3CA3A	3CA3A	3CA3A
3CN3	3CN3B	3CN3B
3CN3A	3CN3B	3CN3B
3CN3B	3CN3B	3CN3B
3CU3	3CU3A	3CU3A
3CU3A	3CU3A	3CU3A
3CV3	3CV3A	—
3CV3A	3CV3A	—
3CX3	3DA3	3DA3/3CX3
3CY3	3DB3	3DB3/3CY3
3CZ3	3CZ3A	3CZ3A
3CZ3A	3CZ3A	3CZ3A
3DA3	3DA3	3DA3/3CX3
3DB3	3DB3	3DB3/3CY3
3DC3	3DC3	3DC3
3DF3	3DF3	3DF3
3DF3A	3DF3A	3DF3A
3DH3	3DH3	3DH3
3DJ3	3DJ3	3DJ3
3DR3	3DR3	3DR3
3DS3	3DS3	3DS3
5642	—	—

SHUNT REGULATORS

Tube Type	Replacement X-Radiation Rated Version	Current GE Renewal Branding	Tube Type	Replacement X-Radiation Rated Version	Current GE Renewal Branding
6BD4	6BK4C	6BK4C/6EL4A	6EJ4	6EJ4A	6EJ4A
6BD4A	6BK4C	6BK4C/6EL4A	6EJ4A	6EJ4A	6EJ4A
6BK4	6BK4C	6BK4C/6EL4A	6EL4	6EL4A	6EL4A
6BK4A	6BK4C	6BK4C/6EL4A	6EL4A	6EL4A	6EL4A
6BK4B	6BK4C	6BK4C/6EL4A	6EN4	6EN4	6EN4
6BK4C	6BK4C	6BK4C/6EL4A	6LC6	6LJ6A	6LJ6A/6LH6A
6BU4	—	—	6LH6	6LH6A	6LJ6A/6LH6A
6BU5	—	—	6LH6A	6LH6A	6LJ6A/6LH6A
6EA4	6EH4A	6EH4A	6LJ6	6LJ6A	6LJ6A/6LH6A
6EF4	6EJ4A	6EJ4A	6LJ6A	6LJ6A	6LJ6A/6LH6A
6EH4	6EH4A	6EH4A	6MA6	6MA6	6MA6
6EH4A	6EH4A	6EH4A			

X-RADIATION SYMBOL DEFINITION

▲ The EIA Published Product Information, as of March 1, 1972, contains an X-radiation rating, as shown herein, for this tube type. Adequate shielding must be in place to limit X-radiation to a level consistent with Public Law 90-602 "Radiation Control for Health and Safety Act of 1968." For X-Radiation Characteristics, Controls, Measurements and Warning see JEDEC Publications 67A and 73A and the latest EIA Published Product Information for this type.

Ⓐ The EIA Published Product Information, as of March 1, 1972, does not contain an X-radiation rating for this type. Replace only with the latest X-radiation rated version of the same type or an X-radiation rated equivalent as shown in the High Voltage Rectifier and Shunt Regulator Interchangeability chart. Adequate shielding must be in place to limit X-radiation to a level consistent with Public Law 90-602 "Radiation Control for Health and Safety Act of 1968."

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Output	Grid-plate
OOA	Triode Detector	4D	14–1	5.0 DC	0.25	—	45	—	3.2	2.0	8.5
O1-A	Low-Mu Triode	4D	14–1	5.0 DC	0.25	—	135	—	3.1	2.2	8.1
OA2	Glow-Discharge Diode Voltage Regulator	5BO	5–3	—	—	—	Anode supply =185 volts d-c min				
OA3	Glow-Discharge Diode Voltage Regulator	4AJ	12–7	—	—	—	Anode supply =105 volts d-c min				
OA3A	Glow-Discharge Diode Voltage Regulator	4AJ	9–7	—	—	—	Anode supply =105 volts d-c min				
OA4-G	Gas Triode	4V	12–7	—	—	—	—	—	—	—	—
OA5	Gas Pentode	6CB	T–X	—	—	—	—	—	—	—	—
OB2	Glow-Discharge Diode Voltage Regulator	5BO	5–3	—	—	—	Anode supply =133 volts d-c min				
OB3	Glow-Discharge Diode Voltage Regulator	4AJ	12–7	—	—	—	Anode supply =125 volts d-c min				
OB3A	Glow-Discharge Diode Voltage Regulator	4AJ	9–7	—	—	—	Anode supply =130 volts d-c min				
OC2	Glow-Discharge Diode Voltage Regulator	5BO	5–3	—	—	—	Anode supply =115 volts d-c min				
OC3	Glow-Discharge Diode Voltage Regulator	4AJ	12–7	—	—	—	Anode supply =133 volts d-c min				
OC3A	Glow-Discharge Diode Voltage Regulator	4AJ	9–7	—	—	—	Anode supply =133 volts d-c min				
OD3	Glow-Discharge Diode Voltage Regulator	4AJ	12–7	—	—	—	Anode supply =185 volts d-c min				
OD3A	Glow-Discharge Diode Voltage Regulator	4AJ	9–7	—	—	—	Anode supply =185 volts d-c min				
OY4 OY4-G	Half-Wave Gas Rectifier	4BU	8–3 T-X	— —	— —	—	Pins 7 and 8 must be connected together				
OZ4 OZ4-G	Full-Wave Gas Rectifier	4R	8–3 T-X	— —	— —	— —	— —	— —	— —	— —	— —
OZ4-A	Full-Wave Gas Rectifier	4R	8–1	—	—	—	—	—	—	—	—
1A3	High-Frequency Diode	5AP	5–2	1.4	0.15	—	—	—	—	—	—
1A4-p 1A4-t	Remote-Cutoff RF Pentode	4M 4K	12–6	2.0 DC	0.06	—	180	67.5	5.0▲	11.0▲	0.007
1A5-GT	Power Amplifier Pentode	6X	9–11	1.4 DC	0.05	—	110	110	—	—	—
1A6	Pentagrid Converter	6L♦	12–6	2.0 DC	0.06	—	180	67.5	Osc I_{c1} =0.2 ma R_{g1} =50,000 ohms		

■Compactron.
† Zero signal.
♦Per section.
‡ Plate-to-plate.
✠Maximum.
‖ Supply voltage.
◉Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
#Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Detector	45	—	0	1.5	—	30,000	666	20	—	—	OOA
Class A Amplifier	135	—	9.0	3.0	—	10,000	800	8	—	—	O1-A
{ 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*
{ 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
{ d-c operating current = 5 ma min d-c operating current = 40 ma max } Ionization voltage = 105 volts d-c Operating voltage = 75 volts d-c Regulation (5 to 40 milliamperes) = 6.5 volts											OA3A
Peak cathode current = 100 ma max; d-c cathode current = 25 ma max; Starter anode drop = 55 volts; anode drop = 70 volts											OA4-G
Peak Cathode current = 10 ma min; Max power input = 1.0 watts; Anode firing voltage = 15 volts min											*OA5*
{ 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 volt											*OB2*
{ 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
{ d-c operating current = 5 ma min d-c operating current = 30 ma max } Ionization voltage = 125 volts d-c Operating voltage = 90 volts d-c Regulation (5 to 30 milliamperes) = 6.0 volts											OB3A
{ d-c operating current ▣ = 5 ma min d-c operating current ▣ = 30 ma max } Ionization voltage = 105 volts d-c Operating voltage = 75 volts d-c Regulation (5 to 30 milliamperes) = 3.0 volts											*OC2*
{ 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
{ d-c operating current = 5 ma min d-c operating current = 40 ma max } Ionization voltage = 127 volts d-c Operating voltage = 105 volts d-c Regulation (5 to 40 milliamperes) = 4.0 volts											OC3A
{ 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
{ d-c operating current = 5 ma min d-c operating current = 40 ma max } Ionization voltage = 180 volts d-c Operating voltage = 150 volts d-c Regulation (5 to 40 milliamperes) = 5.5 volts											OD3A
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
Starter supply voltage per plate ◆ = 300 peak volts min; min d-c output ◆ = 30 milliamperes; max d-c output = 90 milliamperes; peak current per plate = 270 milliamperes; max peak inverse voltage = 880 volts											**OZ4** OZ4-G
Full-Wave Rectifier	Max d-c output current = 110 ma; minimum d-c output current = 30 ma; max peak inverse voltage = 880 volts; minimum starter supply voltage per plate = 300 volts; max peak plate current per plate = 330 ma										**OZ4-A**
Half-Wave Rectifier	Max d-c output current = 0.5 ma; max peak inverse voltage = 330 volts; rms supply voltage = 117 volts; max peak current = 5.0 ma										*1A3*
Class A Amplifier	180	67.5	3	2.3	0.8	1,000,000	750	—	—	—	1A4-p 1A4-t
Class A Amplifier	90 85	90 85	4.5 4.5	4.0† 3.5†	0.8† 0.7†	300,000 300,000	850 800	— —	25,000 25,000	0.115 0.100	1A5-GT
Converter	180	67.5	3.0	1.3	2.4	500,000	300 #	E_{c2} (Osc Plate) = 180 thru 20,000 ohms I_{c2} = 2.3 ma			1A6

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✠ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
1A7-G 1A7-GT	Pentagrid Converter		7Z◆	9–28 9–18	1.4 DC	0.05	—	110	60	Osc I_{c1} = 0.035 ma R_{g1} = 200,000 ohms		
1AB5	Remote-Cutoff RF Pentode		5BF	9–32	1.2 DC	0.130	1.0	150	150‡ 0.3	2.8	4.2	0.25 ♣
1AC5 ◉	Power Amplifier Pentode		8CP	3–5	1.25 DC	0.04	—	67.5	67.5	—	—	—
1AD2 ■ ●	Half-Wave High-Voltage Rectifier	(▲)	12GV	9–98	1.25	0.2	—	Tube Voltage Drop: 225 volts at 7.0 ma d-c				
1AD2-A ■ ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	12GV	9-144	1.25	0.2	—	Tube Voltage Drop: 225 volts at 7.0 ma d-c				
1AD4 ◉	Sharp-Cutoff RF/AF Pentode		1AD4	2–1	1.25 DC	0.1	—	45	45	4.5	4.5	0.01 ♣
1AD5 ◉	Sharp-Cutoff RF Pentode		8CP	3–5	1.25 DC	0.04	—	67.5	67.5	1.9	3.0	0.009 ♣
1AE4	Sharp-Cutoff RF Pentode		6AR	5–2	1.25 DC	0.1	—	90	90	3.6	4.4	0.008 ♣
1AE5 ◉	Heptode Mixer		1AE5 ♥	T-X	1.25 DC	0.06	—	45	45	I_{c1} (Injection) = 15 μa R_{g1} = 200,000 ohms		
1AF4	Sharp-Cutoff Pentode		6AR	5–2	1.4 DC	0.025	—	110	90	3.8	7.6	0.009 ♣
1AF5	Diode Sharp-Cutoff Pentode		6AU	5–2	1.4 DC	0.025	—	110	110	2.5	4.8	0.17
1AG4 ◉	Power Amplifier Pentode		512AX	2–1	1.25 DC	0.04	—	90	90	—	—	—
1AG5 ◉	Diode-Pentode		1AG5	2–1	1.25	0.03	—	50 ⊞	50 ⊞	—	—	—
1AH4 ◉	RF Pentode		1AD4	2-1	1.25 DC	0.04	—	90	90	3.5 ▲	4.5 ▲	0.01 ♣ ▲
1AJ2 ■ ●	Half-Wave High-Voltage Rectifier	(▲)	12EL	9–98	1.25	0.2	—	Tube Voltage Drop: 140 volts at 7.0 ma d-c				
1AJ5 ◉	Diode Sharp-Cutoff Pentode		1AG5	2–1	1.25 DC	0.04	—	90	90	1.7	2.4	0.10
1AK4 ◉	Sharp-Cutoff RF Pentode		1AD4	2–1	1.25 DC	0.02	—	90	90	3.5 ▲	4.5 ▲	0.01 ♣ ▲
1AK5 ◉	Diode Sharp-Cutoff Pentode		1AG5	2–1	1.25 DC	0.02	—	90	90	2.0	2.7	0.10 ♣
1AM4	Remote-Cutoff RF Pentode		6AR	5–2	1.4 DC	0.025	—	90	67.5	3.6 ▲	7.5 ▲	0.01 ♣
1AQ5	Pentagrid Converter		7AT ♥	5–2	1.4 DC	0.025	—	90	67.5	Osc I_{c1} = 0.14 ma R_{g1} = 100,000 ohms		
1AR5	Diode Sharp-Cutoff Pentode		6AU	5–2	1.4 DC	0.025	—	90	90	—	—	—
1AS5	Diode Sharp-Cutoff Pentode		6BW	5–2	1.4 DC	0.025	—	90	90	—	—	—
1AU2	Half-Wave High-Voltage Rectifier		9U	6–2	1.1	0.19	—	Tube Voltage Drop: 100 volts at 4.5 ma d-c				
1AU3 ●	Half-Wave High-Voltage Rectifier	(▲)	3C	12–18	1.25	0.2	—	Tube Voltage Drop: 225 volts at 7.0 ma d-c				
1AX2 ●	Half-Wave High-Voltage Rectifier	(▲)	9Y	6–7	1.4	0.65	—	Tube Voltage Drop: 200 volts at 7.0 ma d-c				

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—[▲]—X-Radiation Rated, and (▲)—No X-Radiation Rating.

■Compactron. **‡ Plate-to-plate.** **◉Subminiature type.** **⊕Total for all similar sections.**
† Zero signal. **♣Maximum.** **▲Without external shield.** **⊞Absolute maximum rating.**
♠Per section. **‡Supply voltage.** **◆Design maximum rating.** **#Conversion transconductance.**

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Converter	90	45	0	0.6	0.7	600,000	250 #	E_{c3} (Osc Plate) =90 I_{c3} =1.2 ma			1A7-G 1A7-GT
Class A Amplifier	150 90	150 90	1.5 Rg_1 = 1 meg	6.8 3.5	2.0 0.8	125,000 275,000	1350 1100	— —	— —	— —	1AB5
Class A Amplifier	67.5 45 30	67.5 45 30	4.5 3.0 2.0	2.0 1.0 0.5	0.4 0.2 0.1	150,000 170,000 200,000	750 600 450	— — —	25,000 40,000 50,000	0.050 0.015 0.005	1AC5 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 26,000 volts (d-c component ◈ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Terminals 4 and 10 may be used as tie points for components at or near filament potential.										1AD2 ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 26,000 volts (d-c component ▣ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Terminals 4 and 10 may be used as tie points for components at or near filament potential.										1AD2-A ■ ●
Class A Amplifier	45	45	R_{g1} = 2 meg	3.0	0.8	500,000	2000	—	—	—	1AD4 ●
Class A Amplifier	67.5 30	67.5 30	0 0	1.85 0.45	0.75 0.16	700,000 700,000	735 430	— —	— —	— —	1AD5 ●
Class A Amplifier	90	90	0	3.5	1.2	500,000	1550	—	—	—	*1AE4*
Mixer	45	45	0	0.9	2.0	200,000	200 #	—	—	—	1AE5 ●
Class A Amplifier	90 67.5	90 67.5	0 0	1.8 1.2	0.55 0.32	1,800,000 2,200,000	1050 925	— —	— —	— —	*1AF4*
Class A Amplifier	90 67.5	90 67.5	0 0	1.1 0.7	0.4 0.25	2,000,000 2,800,000	600 550	— —	— —	— —	*1AF5*
Class A Amplifier	41.4	41.4	3.6	2.4†	0.6†	180,000	1,000	—	12,000	0.035	1AG4 ●
Class A Amplifier	45 22.5	45 22.5	2.0 0	0.28 0.17	0.12 0.043	2,500,000 700,000	250 235	— —	— —	— —	1AG5 ●
Class A Amplifier	45	45	R_{g1} = 5 meg	0.75	0.2	1,500,000	750	—	—	—	1AH4 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 26,000 volts (d-c component ◈ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Terminals 2 and 10 may be used as tie points for components at or near filament potential.										1AJ2 ■ ●
Class A Amplifier	45	45	R_{g1} = 5 meg	1.0	0.3	300,000	425	—	—	—	1AJ5 ●
Class A Amplifier	45	45	R_{g1} = 5 meg	0.75	0.2	1,500,000	750	—	—	—	1AK4 ●
Class A Amplifier	45	45	R_{g1} = 5 meg	0.5	0.2	400,000	280	—	—	—	1AK5 ●
Class A Amplifier	90	67.5	0	2.4	0.9	500,000	350	—	—	—	*1AM4*
Converter	90	45	0	0.64	—	800,000	250 #	—	—	—	*1AQ5*
Class A Amplifier	67.5	67.5	0	0.9	0.25	800,000	500	—	—	—	*1AR5*
Class A Amplifier	67.5	67.5	0	0.9	0.25	800,000	500	—	—	—	*1AS5*
TV Focus Rectifier	Max inverse voltage (d-c and peak) ◈ = 8,250 volts (d-c component ◈ = 7,000 volts); max d-c output current ◈ = 0.6 ma; max peak current ◈ = 11 ma. Socket terminals 2, 3, 6, 7 and 8 may not be used as tie points.										*1AU2*
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 30,000 volts (d-c component ◈ = 26,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential; 1, 3, 5 and 8 may be connected to terminal 7.										1AU3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 25,000 volts (d-c component = 20,000 volts); max d-c output current = 0.5 ma; max peak current = 45 ma. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential.										*1AX2* ●

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦G3 and G5 are screen. G4 is signal-input grid.
▼G2 and G4 are screen. G3 is signal-input grid.
$_1$, $_2$, $_3$, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✚ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
1AY2 ●	Half-Wave High-Voltage Rectifier	(▲)	1AY2	9–128	1.25	0.2	—	Tube Voltage Drop: 75 volts at 7.0 ma d-c				
1AY2-A ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	1AY2	9–128	1.25	0.2	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
1B3-GT ●	Half-Wave High-Voltage Rectifier	(▲)	3C	9–51 or 9–52	1.25	0.2	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
1B4-p	Sharp-Cutoff RF Pentode		4M	12–6	2.0 DC	0.06	—	180	67.5	5.0▲	11▲	0.007 ♣
1B5/25-S	Duplex-Diode Medium-Mu Diode		6M	12–5, 9–26	2.0 DC	0.06	—	135	—	1.6▲	1.9▲	3.6▲
1B7-G 1B7-GT	Pentagrid Converter		7Z♦	9–28 9–18	1.4 DC	0.1	—	110	65	Osc I_{c1} = 0.035 ma R_{g1} = 200,000 ohms		
1B8-GT	Diode-Triode Power Amplifier Pentode		8AW	9–17	1.4 DC	0.1	—	110	110	Pentode Section		
								110	—	Triode Section		
1BC2 ●	Half-Wave High-Voltage Rectifier	(▲)	9RG	6–18	1.25	0.2	—	Tube Voltage Drop: 80 volts at 7.0 ma d-c				
1BC2-A ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	9RG	6–18	1.25	0.2	—	Tube Voltage Drop: 80 volts at 7.0 ma d-c				
1BC2-B ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	9RG	6–18	1.25	0.2	—	Tube Voltage Drop: 80 volts at 7.0 ma d-c				
1BH2 ●	Half-Wave High-Voltage Rectifier	(▲)	9RG	T-X	1.25	0.2	—	Tube Voltage Drop: 80 volts at 7.0 ma d-c				
1BH2-A ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	9RG	T-X	1.25	0.2	—	Tube Voltage Drop: 80 volts at 7.0 ma d-c				
1BK2 ●	Half-Wave High-Voltage Rectifier	(▲)	9Y	6–7	1.4	0.55	—	Tube Voltage Drop: 100 volts at 11 ma d-c				
1BL2 ●	Half-Wave High-Voltage Rectifier	(▲)	1AY2	6–19	1.25	0.2	—	Tube Voltage Drop: 130 volts at 7.0 ma d-c				
1BV2 ●	Half-Wave High-Voltage Rectifier	(▲)	1BV2	T-X	1.25	0.2	—	Tube Voltage Drop: 80 volts at 7.0 ma d-c				
1BX2 ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	9Y	6–7	1.25	0.2	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
1BY2 ■ ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	12HZ	9–98	1.25	0.2	—	Tube Voltage Drop: 225 volts at 7.0 ma d-c				
1BY2-A ■ ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	12HZ	9–144	1.25	0.2	—	Tube Voltage Drop: 225 volts at 7.0 ma d-c				

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
[▲]—X-Radiation Rated, and (▲)—No X-Radiation Rating.

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ⊞Absolute maximum rating.
♠Per section. ✚Supply voltage. ♦Design maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 26,000 volts (d-c component ◈ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma.										1AY2 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 26,000 volts (d-c component ▣ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma.										1AY2-A ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 26,000 volts (d-c component ◈ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential; 1, 3, 5 and 8 may be connected to terminal 7.										1B3-GT ●
Class A Amplifier	180 90	67.5 67.5	3.0 3.0	1.7 1.6	0.6 0.7	1,500,000 1,000,000	650 600	— —	— —	— —	1B4-p
Class A Amplifier	135	—	3.0	0.8	—	35,000	575	20	—	—	1B5/25-S
Converter	90	45	0	1.5	1.3	350,000	350 #	E_{c2} (Osc Plate) = 90 I_{c2} = 1.6 ma			1B7-G 1B7-GT
Class A Amplifier	90	90	6.0	6.3†	1.4†	—	1,150	—	14,000	0.210	1B8-GT
Class A Amplifier	90	—	0	0.15	—	240,000	275	—	—	—	
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 18,000 volts (d-c component ◈ = 15,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma. Socket terminal 7 may be used as tie point for components at or near filament potential.										*1BC2* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 18,000 volts (d-c component ▣ = 15,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma. Socket terminal 7 may be used as tie point for components at or near filament potential.										*1BC2-A* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 18,000 volts (d-c component ▣ = 15,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma. Socket terminal 7 may be used as tie point for components at or near filament potential.										*1BC2-B* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 18,000 volts (d-c component ◈ = 15,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma. Socket terminal 7 may be used as tie point for components at or near filament potential.										*1BH2* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 18,000 volts (d-c component ▣ = 15,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma. Socket terminal 7 may be used as tie point for components at or near filament potential.										*1BH2-A* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 24,000 volts (d-c component ◈ = 20,000 volts); max d-c output current ◈ = 0.88 ma; max peak current ◈ 44 ma. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential.										*1BK2* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 22,000 volts (d-c component ◈ = 18,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma.										*1BL2* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 18,000 volts (d-c component ◈ = 15,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma. Socket terminal 7 may be used as tie point for components at or near filament potential.										*1BV2* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 22,000 volts (d-c component ◈ = 18,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential.										*1BX2* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 26,000 volts (d-c component ▣ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 3, 4, 7 and 10 may be used as tie points for components near filament potential.										*1BY2* ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 26,000 volts (d-c component ▣ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 3, 4, 7 and 10 may be used as tie points for components at or near filament potential.										1BY2-A ■ ●

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	X-Radiation Rating §	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	♣ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
1C3	Medium-Mu Triode		5CF	5–2	1.4 DC	0.05	—	110	—	0.9	4.2	1.8
1C5-GT	Power Amplifier Pentode		6X	9–11	1.4 DC	0.1	—	110	110	—	—	—
1C6	Pentagrid Converter		6L♦	12–6	2.0 DC	0.12	0.3	180	67.5 0.2	Osc I_{c1} = 0.2 ma R_{g1} = 50,000 ohms		
1C7-G	Pentagrid Converter		7Z♦	12–8	2.0 DC	0.12	0.3	180	67.5 0.2	Osc I_{c1} = 0.2 ma R_{g1} = 50,000 ohms		
1C8 ◉	Pentagrid Converter		8CN ♥	3–2	1.25 DC	0.04	—	67.5	45	Osc I_{c1} = 0.070 ma R_{g1} = 100,000 ohms		
1D3 ●	Low-Mu High Frequency Triode		8DN	3–2	1.25 AC/DC	0.3	—	110 ▣	—	1.0	1.0	2.6
1D5-Gp	Remote-Cutoff RF Pentode		5Y	12–8	2.0 DC	0.06	—	180	67.5	5.0 ▲	11.0 ▲	0.007 ♣
1D5-Gt	Remote-Cutoff RF Tetrode		5R	12–8	2.0 DC	0.06	—	180	67.5	—	—	—
1D7-G	Pentagrid Converter		7Z♦	12–8	2.0 DC	0.06	—	180	67.5	Osc I_{c1} = 0.2 ma R_{g1} = 50,000 ohms		
1D8-GT	Diode-Triode Power Amplifier Pentode		8AJ	9–17	1.4 DC	0.1	—	110 110	110 —	Pentode Section Triode Section		
1DG3 ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	8ND	9–168	1.25	0.2	—	Tube Voltage Drop: 225 volts at 7.0 ma d-c				
1DG3-A ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	8ND	9–168	1.25	0.2	—	Tube Voltage Drop: 225 volts at 7.0 ma d-c				
1DN5	Diode-Pentode		6BW	5–2	1.4 DC	0.05	—	90	90	—	—	—
1DY4¶	UHF Triode Oscillator		7DK	5–2	1.6	0.6	1.5◈	135◈	—	3.5	1.15	2.0
1DY4-A ¶	UHF Triode Oscillator		7DK	5–1	1.6	0.6	1.5◈	135◈	—	3.5	1.15	2.0
1E4-G	Medium-Mu Triode		5S	9–25	1.4 DC	0.05	—	110	—	2.4	6.0	2.4
1E5-Gp	Sharp-Cutoff RF Pentode		5Y	12–8	2.0 DC	0.06	—	180	67.5	5.0 ▲	11.0 ▲	0.007 ♣
1E7-G 1E7-GT	Twin-Pentode Power Amplifier		8C	12–7 9–11, 9–41	2.0 DC	0.24	1.5♠ —	135	135 0.5	Each Section Both Sections in Push-pull		
1E8 ◉	Pentagrid Converter		8CN ♥	3–5	1.25 DC	0.04	—	67.5	45	Osc I_{c1} = 0.070 ma R_{g1} = 100,000 ohms		
1F4	Power Amplifier Pentode		5K	14–1	2.0 DC	0.12	1.75	180	180 0.75	—	—	—
1F5-G	Power Amplifier Pentode		6X	12–7	2.0 DC	0.12	1.75	180	180 0.75	—	—	—
1F6	Duplex-Diode Sharp-Cutoff Pentode		6W	12–6	2.0 DC	0.06	0.	180	67.5 0.05	4.0 ▲	9.0 ▲	0.007 ♣
1F7-GH 1F7-GV	Duplex-Diode Sharp-Cutoff Pentode		7AF	12–8	2.0 DC	0.06	—	180	67.5	3.8	9.5	0.01 ♣
1G3-GT ●	Half-Wave High-Voltage Rectifier	(▲)	3C	9–53 or 9–54	1.25	0.2	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
1G3-GTA ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	3C	T-X	1.25	0.2	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
[▲]—X-Radiation Rated, and (▲)—No X-Radiation Rating.

■Compactron. † Zero signal. ♠Per section. ‡ Plate-to-plate. ♣Maximum. ‡Supply voltage. ◉Subminiature type. ▲Without external shield. ◈Design maximum rating. ⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	90 90	— —	3.0 0	1.4 4.5	— —	19,000 11,200	760 1,300	14.5 14.5	— —	— —	*1C3*
Class A Amplifier	90 83	90 83	7.5 7.0	7.5† 7.0†	1.6† 1.6†	115,000 110,000	1,550 1,500	— —	8,000 9,000	0.240 0.200	1C5-GT
Converter	180	67.5	3.0	1.5	2.0	700,000	325 #	E_{c2} (Osc Plate) = 180 thru 20,000 ohms I_{c2} = 4.0 ma			1C6
Converter	180	67.5	3.0	1.5	2.0	700,000	325 #	E_{c2} (Osc Plate) = 180 thru 20,000 ohms I_{c2} = 4.0 ma			1C7-G
Converter	67.5	67.5‡	0	1.0	1.5	400,000	150 #	R_{g2} = 20,000 ohms			1C8 ●
Class A Amplifier	90	—	5.0	12.5	—	—	3,400	8.7	—	—	1D3 ●
Class A Amplifier	180	67.5	3.0	2.3	0.8	1,000,000	750	—	—	—	1D5-Gp
Class A Amplifier	180	67.5	3.0	2.2	0.7	600,000	650	—	—	—	1D5-Gt
Converter	180	67.5	3.0	1.3	2.4	500,000	300 #	E_{c2} (Osc Plate) = 180 thru 20,000 ohms I_{c2} = 2.3 ma			1D7-G
Class A Amplifier Class A Amplifier	90 90	90 —	9.0 0	5.0 1.1	1.0 —	200,000 43,500	925 575	— 25	12,000 —	0.20 —	1D8-GT
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 26,000 volts (d-c component ▣ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 1 and 7 may be used as tie points for components at or near filament potential.										**1DG3** ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 26,000 volts (d-c component ▣ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 1 and 7 may be used as tie points for components at or near filament potential.										1DG3-A ●
Class A Amplifier	67.5	67.5	0	2.1	0.55	600,000	630	—	—	—	*1DN5*
Class A Amplifier	90	—	R_k = 180	10.4	—	—	11,000	28	—	—	*1DY4*¶
Class A Amplifier	90	—	R_k = 180	10.4	—	—	11,000	28	—	—	*1DY4-A*¶
Class A Amplifier	90 90	— —	0 3.0	4.5 1.4	— —	11,200 19,000	1,300 760	14.5 14.5	— —	— —	1E4-G
Class A Amplifier	180 90	67.5 67.5	3.0 3.0	1.7 1.6	0.6 0.7	1,500,000 1,000,000	650 600	— —	— —	— —	1E5-Gp
Class A Amplifier Class A Amplifier	{135 { 90 135	135 90 135	4.5 3.0 7.5	7.5† 3.8† 7.0†	2.2† 1.1† 2.0†	260,000 340,000 —	1,425 1,150 —	— — —	16,000 20,000 24,000 ‡	0.29 0.11 0.575	1E7-G 1E7-GT
Converter	67.5	67.5‡	0	1.0	1.5	400,000	150 #	R_{g2} = 20,000 ohms			1E8 ●
Class A Amplifier	135 90	135 90	4.5 3.0	8† 4	2.4† 1.1	200,000 240,000	1,700 1,400	— —	16,000 —	0.31 —	1F4
Class A Amplifier	135 90	135 90	4.5 3.0	8† 4	2.4† 1.1	200,000 240,000	1,700 1,400	— —	16,000 —	0.31 —	1F5-G
Class A Amplifier	180	67.5	1.5	2.2	0.7	1,000,000	650	—	—	—	1F6
Class A Amplifier	180	67.5	1.5	2.2	0.7	1,000,000	650	—	—	—	1F7-GH 1F7-GV
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 26,000 volts (d-c component = 21,000 volts); max d-c output current = 0.5 ma; max peak current = 50 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential; 1, 3, 5 and 8 may be connected to terminal 7.										1G3-GT ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 26,000 volts (d-c component ▣ = 21,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential; 1, 3, 5 and 8 may be connected to terminal 7.										1G3-GTA ●

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
‡Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✠ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
1G4-GT	Medium-Mu Triode		5S	9–11	1.4 DC	0.05	—	110	—	2.2▲	3.4▲	2.8▲
1G5-G	Power Amplifier Pentode		6X	12–7	2.0 DC	0.12	1.25	135	135 0.6	—	—	—
1G6-GT	Twin-Triode Power Amplifier		7AB	9–11 or 9–41	1.4 DC	0.1	—	110	—	—	—	—
1H2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	9LX	6–9	1.4	0.55	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
1H4-G 1H4-GT	Medium-Mu Triode		5S	12–7 9–11, 9–41	2.0 DC	0.06	—	180	—	Single Tube 2 Tubes Push-pull		
1H5-G 1H5-GT	Diode High-Mu Triode		5Z	9–28 9–18	1.4 DC	0.05	—	110	—	0.75	4.6	1.1
1H6-G 1H6-GT	Duplex-Diode Medium-Mu Triode		7AA	12–7 9–11, 9–41	2.0 DC	0.06	—	135	—	—	—	—
1J3 ●	Half-Wave High-Voltage Rectifier	Ⓐ	3C	9–51 or 9–52	1.25	0.2	—	Tube Voltage Drop: 225 volts at 7.0 ma d-c				
1J3-A ●	Half-Wave High-Voltage Rectifier	Ⓐ	3C	9–51 or 9–52	1.25	0.2	—	Tube Voltage Drop: 225 volts at 7.0 ma d-c				
1J5-G	Power Amplifier Pentode		6X	14–3	2.0 DC	0.12	—	135	135	—	—	—
1J6-G 1J6-GT	Twin-Triode Power Amplifier		7AB	12–7 9–16	2.0 DC	0.24	—	135	—	Both Sections in Push-pull		
1K3 ●	Half-Wave High-Voltage Rectifier	Ⓐ	3C	9–53 or 9–54	1.25	0.2	—	Tube Voltage Drop: 225 volts at 7.0 ma d-c				
1K3-A ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr ▣	3C	T-X	1.25	0.2	—	Tube Voltage Drop: 225 volts at 7.0 ma d-c				
1L4	Sharp-Cutoff RF Pentode		6AR	5–2	1.4 DC	0.05	—	110	90	3.6▲	7.5▲	0.008▲ ♣
1L6	Pentagrid Converter		7DC♦	5–2	1.4 DC	0.05	—	110	65	Osc I_{c1} = 0.035 ma R_{g1} = 200,000 ohms		
1LA4	Power Amplifier Pentode		5AD	9–30	1.4 DC	0.05	—	110	110	—	—	—
1LA6	Pentagrid Converter		7AK♦	9–30	1.4 DC	0.05	—	110	65	Osc I_{c1} = 0.035 ma R_{g1} = 200,000 ohms		
1LB4	Power Amplifier Pentode		5AD	9–30	1.4 DC	0.05	—	110	110	—	—	—
1LB6	Pentagrid Mixer		8AX	9–30	1.4 DC	0.05	—	90	67.5	E_{c3} (Injection) = 10 v peak		
1LC5	Sharp-Cutoff RF Pentode		7AO	9–30	1.4 DC	0.05	—	110	45	3.2	7.0	0.007 ♣
1LC6	Pentagrid Converter		7AK♦	9–30	1.4 DC	0.05	—	110	45	Osc I_{c1} = 0.035 ma R_{g1} = 200,000 ohms		
1LD5	Diode Sharp-Cutoff Pentode		6AX	9–30	1.4 DC	0.05	—	90	45	3.2	6.0	0.18 ♣
1LE3	Medium-Mu Triode		4AA	9–30	1.4 DC	0.05	—	110	—	1.7	3.0	1.7
1LF3	Medium-Mu Triode		4AA	9–30	1.4 DC	0.05	—	110	—	1.7	3.0	1.7
1LG5	Semi-Remote-Cutoff RF Pentode		7AO	9–30	1.4 DC	0.05	—	110	110	3.2	7.0	0.007 ♣
1LH4	Diode High-Mu Triode		5AG	9–30	1.4 DC	0.05	—	110	—	2.0	2.4	1.2
1LN5	Sharp-Cutoff RF Pentode		7AO	9–30	1.4 DC	0.05	—	110	110	3.0	8.0	0.007 ♣

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
▣ —X-Radiation Rated, and Ⓐ — No X-Radiation Rating.

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ⊞Absolute maximum rating.
♦Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	90	—	6	2.3	—	10,700	825	8.8	—	—	1G4-GT
Class A Amplifier	135 90	135 90	13.5 6.0	8.7† 8.5†	2.5† 2.5†	160,000 133,000	1,550 1,500	— —	9,000 8,500	0.55 0.25	1G5-G
Class A Amplifier ♠ Class B Amplifier ⊕	90 90	— —	0 0	1.0 2.0†	— —	40,000 —	825 —	33 —	— 12,000 ‡	— 0.675	1G6-GT
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 30,000 volts (d-c component ◈ = 24,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential.										*1H2* ●
Class A Amplifier Class B Amp.	180 90 157.5	— — —	13.5 4.5 15.0	3.1 2.5 1.0†	— — —	10,300 11,000 Input Signal = .260 watt	900 850	9.3 9.3	— — 8,000‡	— — 2.1	1H4-G 1H4-GT
Class A Amplifier	90	—	0	0.15	—	240,000	275	65	—	—	1H5-G 1H5-GT
Class A Amplifier	135	—	3.0	0.8	—	35,000	575	20	—	—	1H6-G 1H6-GT
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 26,000 volts (d-c component ◈ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential; 1, 3, 5 and 8 may be connected to terminal 7.										1J3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 28,000 volts (d-c component ◈ = 24,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential; 1, 3, 5 and 8 may be connected to terminal 7.										1J3-A ●
Class A Amplifier	135	135	16.5	7.0	2.0	105,300	950	—	135,000	0.45	1J5-G
Class B Amplifier	135	—	0	5.0† ♠	—	Input Signal = .170 watt			10,000‡	2.1	1J6-G 1J6-GT
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 26,000 volts (d-c component ◈ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential; 1, 3, 5 and 8 may be connected to terminal 7.										1K3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 26,000 volts (d-c component ▣ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential; 1, 3, 5 and 8 may be connected to terminal 7.										1K3-A ●
Class A Amplifier	90	90	0	4.5	2.0	350,000	1,025	—	—	—	*1L4*
Converter	90	45	0	0.5	0.6	650,000	300 #	E_{c2} (Osc Plate) = 90 I_{c2} = 1.2 ma			*1L6*
Class A Amplifier	90 85	90 85	4.5 4.5	4.0† 3.5†	0.8† 0.7†	300,000 300,000	850 800	— —	25,000 25,000	0.115 0.100	1LA4
Converter	90	45	0	0.55	0.6	750,000	250 #	E_{c2} (Osc Plate) = 90 I_{c2} = 1.2 ma			1LA6
Class A Amplifier	90	90	9.0	5.0†	1.0†	250,000	925	—	12,000	0.20	1LB4
Mixer	90	67.5	0	0.4	2.2	2,000,000	100 #	G_2 & $_4$ are screen; G_1 is signal grid			1LB6
Class A Amplifier	90	45	0	1.15	0.30	1,000,000	775	—	—	—	1LC5
Converter	90	35	0	0.75	0.7	650,000	275 #	E_{c2} (Osc Plate) = 45 I_{c2} = 1.4 ma			1LC6
Class A Amplifier	90	45	0	0.6	0.1	750,000	575	—	—	—	1LD5
Class A Amplifier	90 90	— —	0 3.0	4.5 1.4	— —	11,200 19,000	1,300 760	14.5 14.5	— —	— —	1LE3
Class A Amplifier	90 90	— —	0 3.0	4.5 1.4	— —	11,200 19,000	1,300 760	14.5 14.5	— —	— —	1LF3
Class A Amplifier	90 90	45 90	0 1.5	1.7 3.7	0.4 0.9	1,000,000 500,000	800 1,150	—	—	—	1LG5
Class A Amplifier	90	—	0	0.15	—	240,000	275	65	—	—	1LH4
Class A Amplifier	90	90	0	1.6	0.35	1,100,000	800	—	—	—	1LN5

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✤ Max. Screen Volts and Watts	Capacitance in Picofarads: Input	Output	Grid-Plate
1N2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	3C	12–18	1.25	0.2	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
1N2-A ●	Half-Wave High-Voltage Rectifier	Ⓐ	3C	T-X	1.25	0.2	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
1N5-G 1N5-GT	Sharp-Cutoff RF Pentode		5Y	9–28 9–18	1.4 DC	0.05	—	110	110	3.0 2.8	10.0 9.0	0.007 ♣
1N6-G 1N6-GT	Diode Power-Amplifier Pentode		7AM	T-X 9–11	1.4 DC	0.05	—	110	110	—	—	—
1P5-G 1P5-GT	Remote-Cutoff RF Pentode		5Y	9–28 9–18	1.4 DC	0.05	—	110	110	3.0 —	10.0 —	0.007 ♣
1Q5-GT	Beam Power Amplifier		6AF	9–11, 9–41	1.4 DC	0.1	—	110	110	—	—	—
1Q6 ●	Diode Pentode		8CO	3–2	1.25 DC	0.04	—	100	100	1.8	4.2	0.085
1R4	High-Frequency Diode		4AH	9–30	1.4	0.15	—	Tube Voltage Drop: 8 v at 2 ma d-c				
1R5	Pentagrid Converter		7AT ♥	5–2	1.4 DC	0.05	—	90	67.5	Osc I_{c1} = 0.25 ma R_{g1} = 100,000 ohms Osc I_{c1} = 0.15 ma R_{g1} = 100,000 ohms		
1S2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	9DT	6–7	1.4	0.550	—	—	—	—	—	—
1S2-A ●	Half-Wave High-Voltage Rectifier	Ⓐ	9DT	6–7	1.4	0.550	—	—	—	—	—	—
1S4	Power Amplifier Pentode		7AV	5–2	1.4 DC	0.1	—	90	67.5	—	—	—
1S5	Diode Sharp-Cutoff Pentode		6AU	5–2	1.4 DC	0.05	—	90	90	—	—	—
1S6 ●	Diode-Pentode		8DA	3–2	1.25 DC	0.04	—	100	100	—	—	—
1SA6-GT	RF Pentode		6BD	9–12	1.4 DC	0.05	—	90	67.5	5.2	8.6	0.01 ♣
1SB6-GT	Diode Pentode		6BE	9–11	1.4 DC	0.05	—	90	67.5	3.2	3.0	0.25
1T2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	1AY2	T-X	1.4	0.14	—	Tube Voltage Drop: 4.0 ma at 46 volts d-c				
1T4	Remote-Cutoff Pentode		6AR	5–2	1.4 DC	0.05	—	90	90	3.6	7.5	0.01 ♣
1T5-GT	Beam Power Amplifier		6X	9–11	1.4 DC	0.05	—	110	110	4.8	8.0	0.5
1T6 ●	Diode-Pentode		8DA	3–5	1.25 DC	0.04	—	67.5	67.5	—	—	—
1U4	Sharp-Cutoff RF Pentode		6AR	5–2	1.4 DC	0.05	—	120 ◈	120 ◈	3.6	7.5	0.01 ♣
1U5	Diode Sharp-Cutoff Pentode		6BW	5–2	1.4 DC	0.05	—	100 ◈	100 ◈	—	—	—
1U6	Pentagrid Converter		7DC♦	5–2	1.4 DC	0.025	—	110	65	Osc I_{c1} = 0.028 ma R_{g1} = 200,000 ohms		
1-V	Half-Wave High-Vacuum Rectifier		4G	12–5	6.3	0.3	—	Tube Voltage Drop: 20 v at 90 ma d-c				
1V2	Half-Wave High-Voltage Rectifier		9U	6–2	0.625	0.3	—	Tube Voltage Drop: 135 volts at 7.0 ma d-c				

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[A]—X-Radiation Rated, and Ⓐ—No X-Radiation Rating.

■ Compactron. † Zero signal. ♦ Per section.
‡ Plate-to-plate. ♣ Maximum. ✤ Supply voltage.
● Subminiature type. ▲ Without external shield. ◈ Design maximum rating.
⊕ Total for all similar sections. ⊞ Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 28,000 volts (d-c component ◈ = 24,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential; 1, 3, 5 and 8 may be connected to terminal 7.										1N2 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 28,000 volts (d-c component ◈ = 24,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential; 1, 3 5 and 8 may be connected to terminal 7.										1N2-A ●
Class A Amplifier	90	90	0	1.2	0.3	1,500,000	750	—	—	—	1N5-G 1N5-GT
Class A Amplifier	90	90	4.5	3.4†	0.7†	300,000	800	—	25,000	0.100	1N6-G 1N6-GT
Class A Amplifier	90	90	0	2.3	0.7	800,000	750	—	—	—	1P5-G 1P5-GT
Class A Amplifier	90 85	90 85	4.5 5.0	9.5† 7.0†	1.3† 0.8†	90,000 70,000	2,200 1,950	— —	8,000 9,000	0.27 0.25	1Q5-GT
Class A Amplifier	67.5 30	67.5 30	0 0	1.6 0.33	0.40 0.09	400,000 500,000	600 330	— —	— —	— —	1Q6 ●
Half-Wave Rectifier	Max d-c output current = 1.0 ma; max rms supply voltage = 117 volts									—	1R4
Converter	90	67.5	0	1.5	3.5	400,000	280 #	—	—	—	*1R5*
Converter	45	45	0	0.7	2.1	500,000	210 #	—	—	—	
TV Flyback Rectifier	Max inverse voltage (d-c and peak) = 27,000 volts (d-c component = 22,000 volts); max d-c output current = 0.8 ma; max peak current = 40 ma. Socket terminals 3 and 7 may be used as tie points for components at or near heater potential.										*1S2* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) = 27,000 volts (d-c component = 22,000 volts); max d-c output current = 08 ma; max peak current = 40 ma. Socket terminals 3 and 7 may be used as tie points for components at or near heater potential.										*1S2-A* ●
Class A Amplifier	90 67.5 45	67.5 67.5 45.0	7.0 7.0 4.5	7.4† 7.2† 3.8†	1.4† 1.5† 0.8†	100,000 100,000 100,000	1,575 1,550 1,250	— — —	8,000 5,000 8,000	0.270 0.180 0.065	*1S4*
Class A Amplifier	67.5	67.5	0	1.6	0.4	600,000	625	—	—	—	*1S5*
Class A Amplifier	67.5 30	67.5 30	0 0	1.6 0.33	0.4 0.10	400,000 500,000	600 330	— —	— —	— —	1S6 ●
Class A Amplifier	90	67.5	0	2.45	0.68	800,000	970	—	—	—	1SA6-GT
Class A Amplifier	90	67.5	0	1.45	0.38	700,000	665	—	—	—	1SB6-GT
TV Flyback Rectifier	Max inverse voltage (d-c and peak) = 15,000 volts; max d-c output current = 20 ma; max peak current = 12 ma.										*1T2* ●
Class A Amplifier	90 90 67.5 45	67.5 45 67.5 45	0 0 0 0	3.5 1.8 3.4 1.7	1.4 0.67 1.5 0.7	500,000 800,000 250,000 350,000	900 750 875 700	— — — —	— — — —	— — — —	*1T4*
Class A Amplifier	90	90	6.0	6.5†	0.8 †	250,000	1,150	—	14,000	0.170	1T5-GT
Class A Amplifier	67.5 30	67.5 30	0 0	1.6 0.33	0.4 0.10	400,000 500,000	600 330	— —	— —	— —	1T6 ●
Class A Amplifier	90	90	0	1.6	0.5	1,000,000	900	—	—	—	*1U4*
Class A Amplifier	67.5	67.5	0	1.6	0.4	600,000	625	—	—	—	*1U5*
Converter	90	45	0	0.6	0.6	500,000	300 #	E_{c2} (Osc Plate) = 90 I_{c2} = 1.1 ma			*1U6*
Half-Wave Rectifier	Max d-c output current = 45 ma; max peak inverse voltage = 1000 volts; max rms supply voltage = 325 v; max peak current = 270 ma										1-V
TV Focus Rectifier	Max inverse voltage (d-c and peak ◈ = 8,250 volts (d-c component ◈ = 7,000 volts); max d-c output current ◈ = 0.6 ma; max peak current ◈ = 11 ma.										*1V2*

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✠ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
1V5 ●	Power Amplifier Pentode		8CP	3–2	1.25 DC	0.04	—	100	100	—	—	—
1V6 ●	Triode-Pentode Converter		1V6	2–3	1.25 DC	0.04	—	90	90	Osc I_{c1} = 12 µa R_{g1} = 1 meg		
1W4	Power Amplifier Pentode		5BZ	5–2	1.4 DC	0.05	—	110	110	3.6	7.0	0.1
1W5 ●	Sharp-Cutoff RF Pentode		8CP	3–2	1.25 DC	0.04	—	100	100	2.3	3.0	0.009 ♣
1X2 ●	Half-Wave High-Voltage Rectifier	(▲)	9Y	6–7	1.25	0.2	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
1X2-A ●	Half-Wave High-Voltage Rectifier	(▲)	9Y	6–7	1.25	0.2	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
1X2-B ●	Half-Wave High-Voltage Rectifier	(▲)	9Y	6–7	1.25	0.2	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
1X2-C ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	9Y	6–7	1.25	0.2	—	Tube Voltage Drop: 80 volts at 7.0 ma d-c				
1Y2 ●	Half-Wave High-Voltage Rectifier	(▲)	4P	T-X	1.5	0.29	—	Tube Voltage Drop: 100 volts at 8.0 ma d-c				
1Z2 ●	Half-Wave High-Voltage Rectifier	(▲)	7CB	T-X	1.5	0.3	—	Tube Voltage Drop: 50 volts at 5.0 ma d-c				
C1K	Thyratron same as 6014											
2A3	Power Amplifier Triode		4D	16–1	2.5	2.5	15	300	—	7.5▲	5.5▲	16.5▲
										2 tubes, push-pull		
2A4-G	Thyratron		5S	12–7	2.5	2.5	—	Anode Voltage Drop = 15 volts				
2A5	Power Amplifier Pentode		6B	14–1	2.5	1.75	11	375	285 3.75	Pentode Connection		
							—	350	—	Triode Connection (G2 & P tied)		
2A6	Duplex-Diode High-Mu Triode		6G	12–6	2.5	0.8	—	250	—	1.7	3.8	1.7
2A7	Pentagrid Converter		7C♦	12–6	2.5	0.8	1.0	300	100 0.3	Osc I_{c1} = 0.4 ma R_{g1} = 50,000 ohms		
2AF4¶ *2AF4-A*¶	UHF Triode Oscillator		7DK	5–2 5–1	2.35	0.6	2.5◈	150◈	—	2.2	1.4	1.9
2AF4-B¶	UHF Triode Oscillator		7DK	5–1	2.35	0.6	2.5◈	150◈	—	2.2	1.4	1.9
2AH2 ■ ●	Half-Wave High-Voltage Rectifier	(▲)	12DG	9–99	2.5	0.3	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
2AS2 ■ ●	Half-Wave High-Voltage Rectifier	(▲)	12EW	9–146	2.5	0.33	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
2AS2-A ■ ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	12EW	9–100	2.5	0.33	—	Tube Voltage Drop: 75 volts at 7.0 ma d-c				

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[▲]—X-Radiation Rated, and (▲)—No X-Radiation Rating.

■Compactron. † Zero signal. ♠Per section. ‡ Plate-to-plate. ♣Maximum. ≬ Supply voltage. ●Subminiature type. ▲Without external shield. ◈Design maximum rating. ⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	67.5 45 30	67.5 45 30	4.5 3.0 2.0	2.0 1.0 0.5	0.4 0.2 0.1	150,000 175,000 200,000	750 600 450	— — —	25,000 40,000 50,000	0.050 0.015 0.005	**1V5** ●
Converter	45	45	R_g = 5 meg	0.4	0.15	1,000,000	200 #	E_b (Triode Osc) = 45 I_b (Triode) = 0.4 ma			**1V6** ●
Class A Amplifier	90 67.5 45	90 67.5 45	9.0 6.0 4.5	5.0† 3.8† 1.6†	1.0† 0.8† 0.3†	250,000 300,000 400,000	925 875 650	— — —	12,000 16,000 20,000	0.20 0.10 0.035	*1W4*
Class A Amplifier	67.5 30.0	67.5 30.0	0 0	1.85 0.45	0.75 0.16	700,000 700,000	735 430	— —	— —	— —	**1W5** ●
TV Flyback Rectifier	Max inverse voltage (d-c component = 15,000 volts); max d-c output current = 1.0 ma; max peak current = 10 ma. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential.										*1X2* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 20,000 volts (d-c component ◈ = 16,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential.										*1X2-A* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 20,000 volts (d-c component ◈ = 18,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential.										*1X2-B* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 22,000 volts (d-c component ▣ = 18,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential.										*1X2-C* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) = 50,000 volts; max d-c output current = 2.0 ma; max peak current = 10 ma. Socket terminals 2 and 3 may be used as tie points for components at or near filament potential.										1Y2
Half-Wave Rectifier	Max inverse voltage (d-c and peak) = 20,000 volts; max d-c output current = 2.0 ma; max peak current = 10 ma.										*1Z2* ●
Class A Amplifier	250	—	45	60†	—	800	5,250	4.2	2,500	3.5	2A3
Class AB_1 Amplifier	300	—	62	80†	—	—	—	—	3,000‡	15	
Relay Control	Max d-c anode current = 100 ma; max peak inverse voltage = 200max volts; peak anode current = 1.25 amperes										2A4-G
Class A Amplifier	285	285	20.0	38†	7.0†	78,000	2,500	—	7,000	4.8	2A5
Class A Amplifier	250	—	20.0	31	—	2,600	2,600	6.8	4,000	0.85	
Class A Amplifier	250	—	2.0	0.9	—	91,000	1,100	100	—	—	2A6
Converter	250	100	3.0	3.5	2.7	360,000	550 #	E_{c2} (Osc Plate) = 250 thru 20,000 ohms I_{c2} = 4.0 ma			2A7
Class A Amplifier	80	—	R_k = 150	17.5	—	2,100	6,500	13.5	—	—	***2AF4*¶** ***2AF4-A*¶**
Class A Amplifier	80	—	R_k = 150	17.5	—	2,100	6,500	13.5	—	—	***2AF4-B*¶**
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 30,000 volts (d-c component ◈ = 24,000 volts); max d-c output current = 1.5 ma; max peak current ◈ = 80 ma. Socket terminals 4 and 10 may be used as tie points for components at or near heater potential.										2AH2 ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 30,000 volts (d-c component ◈ = 24,000 volts); max d-c output current ◈ = 1.5 ma; max peak current ◈ = 80 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near heater potential.										2AS2 ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 30,000 volts (d-c component ▣ = 24,000 volts); max d-c output current ◈ = 1.7 ma; max peak current ◈ = 90 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near heater potential.										2AS2-A ■ ●

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	♣ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
2AV2	Half-Wave High-Voltage Rectifier		9U	6–2	1.8	0.225	—	Tube Voltage Drop: 20 volts at 1.0 ma d-c				
2AZ2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	9Y	6–7	2.1	0.275	—	Tube Voltage Drop: 70 volts at 7.0 ma d-c				
2B3 ●	Half-Wave High-Voltage Rectifier	Ⓐ	8HC	T-X	1.75	0.25	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
2B7	Duplex-Diode Semi-Remote Cutoff Pentode		7D	12–6	2.5	0.8	2.25	300	125 0.3	3.5▲	9.5▲	0.007 ♣
2B22	High-Frequency Diode (Planar)		2B22	T-X	6.3	0.75	—	—	Tube Voltage Drop: 6.0 volts at 20 ma d-c			
2BA2	Half-Wave High-Voltage Rectifier		9U	6–2	1.8	0.3	—	Tube Voltage Drop: 55 volts at 6.5 ma d-c				
2BJ2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	9RT	6–7	2.3	0.3	—	Tube Voltage Drop: 80 volts at 7.0 ma d-c				
2BJ2-A ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [A]	9RT	6–7	2.3	0.3	—	Tube Voltage Drop: 80 volts at 7.0 ma d-c				
2BN4¶	High Frequency Triode		7EG	5–2	2.3	0.6	2.2◈	275◈	—	3.2	1.4	1.2
2BN4-A¶	High-Frequency Triode		7EG	5–2	2.35	0.6	2.2	275	—	3.2	1.4	1.2
2BU2 ■ ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr	12JB	9–146	2.5	0.33	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
2C21/1642	Medium-Mu Twin Triode		7BH	12–6	6.3	0.6	2.1♠	250	—	—	—	—
2C22	Medium-Mu Triode		4AM	T-X	6.3	0.3	3.3	300	—	2.2	0.7	3.6
2C39	Hi Mu Triode Planar		2C39	TX	6.3	1.1		1000		6.5	0.035	1.95
2C39-A	Hi Mu Triode Planar		2C39A	TX	6.3	1.03	100	1000	—	6.5	0.035	1.95
2C39WA	Hi Mu Triode Planar		2C39 WA	TX	6.3	1.03	100	1000	—	6.5	0.035	2.01
2C39B	High-Mu Triode (Planar)		2C39B	T-X	6.3	1.03	100▣	1,000 ▣	—	6.5▲	0.023 ▲	2.01▲
2C40	Medium-Mu Triode (Planar)		2C40	T-X	6.3	0.75	6.5 ▣	500▣	—	2.15▲	0.03▲	1.3▲
2C40-A	Medium-Mu Triode (Planar)		2C40	T-X	6.3	0.75	6.5▣	500▣	—	2.15▲	0.03▲	1.3▲
2C42	Plate Pulsed UHF Oscillator (Planar)		2C40	T-X	6.3	0.9	12▣	3,000 ▣peak	—	2.9▲	0.05 ▲♣	1.7▲
2C43	High-Mu Triode (Planar)		2C43	T-X	6.3	0.9	12▣	500▣	—	3.0▲	0.04▲ ♣	1.8▲
2C46	UHF Triode Oscillator (Planar)		2C40	T-X	6.3	0.75	12▣	500▣	—	2.2▲	0.025 ▲♣	1.7▲
2C50	Medium-Mu Twin Triode		8BD	T-X	12.6	0.3	3.85♠ ▣	—	—	—	—	—
2C51	High-Frequency Twin Triode		8CJ	6–1	6.3	0.3	1.5♠	300	—	2.3	1.3	1.3
2C52	High-Mu Twin Triode		8BD	9–12	12.6	0.3	1.0♠	300	—	2.3	0.75	2.7

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—

[A] —X-Radiation Rated, and Ⓐ— No X-Radiation Rating.

■Compactron.
† Zero signal.
♠Per section.
‡ Plate-to-plate.
♣Maximum.
⁑ Supply voltage.
◉Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
TV Focus Rectifier	Max inverse voltage (d-c and peak) ▣ = 8,250 volts (d-c component ◈ = 7,000 volts); max d-c output current ◈ = 0.6 ma; max peak current ◈ = 11 ma.										*2AV2*
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 22,000 volts (d-c component ◈ = 18,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 45 ma. Socket terminals 3 and 7 may be used as tie points for components at or near filament potential.										*2AZ2* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 27,000 volts (d-c component ◈ = 22,000 volts); max d-c output current ◈ = 0.5 ma; max peak current ◈ = 50 ma. Socket terminals 3 and 5 may be used as tie points for components at or near filament potential; do not connect to any other circuit.										2B3 ●
Class A Amplifier	250 250	125 100	3.0 3.0	9.0 6.0	2.3 1.5	600,000 800,000	1,125 1,000	— —	— —	— —	2B7
Detector	Max d-c output current ▣ =20 ma; max peak inverse voltage ▣ =300 volts; max peak current ▣ =700 ma										2B22
TV Focus Rectifier	Max inverse voltage (d-c and peak) ◈ = 8,250 volts (d-c component ◈ = 7,000 volts); max d-c output current ◈ = 0.6 ma; max peak current ◈ = 50 ma.										*2BA2*
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 20,000 volts; max d-c output current ◈ = 1.0 ma; max peak current ◈ = 80 ma.										*2BJ2* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 22,000 volts (d-c component ▣ = 20,000 volts); max d-c output current ◈ = 1.0 ma; max peak current ◈ = 80 ma.										*2BJ2-A* ●
Class A Amplifier	150	—	R_k = 220	9.0	—	6,300	6,800	43	—	—	*2BN4*¶
Class A Amplifier	150	—	R_k = 220	9.0	—	5,400	8,000	43	—	—	*2BN4-A*¶
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 30,000 volts (d-c component ▣ = 24,000 volts); max d-c output current ◈ = 1.5 ma; max peak current ◈ = 80 ma. Socket terminals 4, 10 and 11 may be used as tie points for components at or near heater potential.										2BU2 ■ ●
Class A Amplifier ♠	250	—	16.5	8.3	—	7,600	1,375	10.4	—	—	2C21/1642
Class A Amplifier	300	—	10.5	11	—	6,600	3,000	20	—	—	2C22
CW Oscillator	800	—	48	58			17000	100	—	25	2C39
Oscillator at 500Mc	900	—	22	90	—	—	—	—	—	27	2C39-A
Oscillator at 500Mc	900	—	40	90	—	—	—	—	—	40	2C39WA
Oscillator at 500 Mc	900	—	40	90	—	—	—	—	—	40	2C39B
Oscillator at 3,370 Mc	250	—	5.0	20	—	—	—	—	—	0.075	2C40
Plate-Pulsed Oscillator at 3,000 Mc	1,400 Peak	—	—	1,000 Peak	—	—	—	—	—	300 Peak	2C40-A
Plate-Pulsed Oscillator at 1,050 Mc	Peak plate voltage =3,000 volts; PRF =1,000; PD =1.0 microseconds; Peak power output =1,750 watts.										2C42
Plate-Pulsed Oscillator at 3,370 Mc	3,000 Peak	—	—	2,500 Peak	—	—	—	—	—	1,750 Peak	2C43
UHF Oscillator at 1,100 Mc	150	—	—	8.0	—	—	—	—	—	0.02	2C46
Class A Amplifier ♠	200	—	11	18	—	3,450	2,900	10	—	—	2C50
Class A Amplifier ♠	150	—	R_k = 240	8.2	—	6,500	5,500	35	—	—	*2C51*
Class A Amplifier ♠	250	—	2.0	1.3	—	—	1,900	100	—	—	2C52

Metal tubes are shown in bold-face type, ***miniature tubes in italics.***
♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	♣ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
2CN3-A ●	Half-Wave High-Voltage Rectifier	Ⓐ	8MU	T-X	1.8	0.9	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
2CN3-B ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr ▣A	8MU	9–153	1.8	0.9	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
2CW4¶	High-Mu Triode (Nuvistor)		12AQ	4–4	2.1	0.45	1.5◈	135◈	—	4.3▲	1.8▲	0.92▲
2CY5¶	Sharp-Cutoff RF Tetrode		7EW	5–2	2.4	0.6	2.0◈	180◈	180◈⁑ 0.5◈	4.5	3.0	0.03
2D21	Thyratron		7BN	5–2	6.3	0.6	—	Anode voltage drop = 8 volts				
2DF4	Pentode		9JL	6–2	2.5 1.25	0.345 0.69	4.5▣	250▣	125▣ 1.5▣	7.5▲	5.5▲	0.25 ▲♣
2DS4¶	High-Mu Triode (Nuvistor)		12AQ	4–4	2.1	0.45	1.5◈	135◈	—	4.3▲	1.8▲	0.92▲
2DV4¶	Medium-Mu Triode (Nuvistor)		12EA	4–4	2.1	0.45	1.0◈	125◈	—	4.4▲	1.9▲	1.8▲
2DX4¶	UHF Triode Oscillator		7DK	5–1	2.4	0.6	2.2◈	150◈	—	3.9	1.5	1.6
2DY4¶	UHF Triode Oscillator		7DK	5–2	2.05	0.45	1.5◈	135◈	—	3.5	1.15	2.0
2DY4-A¶	UHF Triode Oscillator		7DK	5–1	2.05	0.45	1.5◈	135◈	—	3.5	1.15	2.0
2DZ4¶	UHF Triode Oscillator		7DK	5–1	2.35	0.6	2.3◈	135◈	—	2.2	1.3	1.8
2E5	Electron-Ray Indicator		6R	9–26 or 12–5	2.5	0.8	—	250⁑	Max target voltage = 250 Min target voltage = 125			
2E24	Beam Pentode		7CL	T-X	6.3	0.65	10▣	300▣	200▣ 2.5▣	9.5▲	7.0▲	0.12♣▲
2E26	Beam Pentode		7CK	T-X	6.3	0.8	10▣	600▣	250▣ 2.5▣	Pentode Connection Two Tubes Push Pull		
							10▣	400▣	200▣ 2.5▣	Pentode Connection Two Tubes, Push Pull		
2E30	Beam Power Amplifier		7CQ	5–3	{6.0 3.0	0.65} 1.30}	10	250	250 5.2	9.6	14	0.18♣
2E31◉	Sharp-Cutoff RF Pentode		2E31	T-X	1.25 DC	0.05	—	45	45	4.2	4.0	0.018♣
2E32◉	Sharp-Cutoff RF Pentode		2E31	T-X	1.25 DC	0.05	—	45	45	4.2	4.0	0.018♣
2E35◉	Power Amplifier Pentode		2E31	T-X	1.25 DC	0.03	—	45	45	2.7	5.7	0.2♣
2E36◉	Power Amplifier Pentode		2E31	T-X	1.25 DC	0.03	—	45	45	2.7	5.7	0.2♣
2E41◉	Diode Pentode		2E41	T-X	1.25 DC	0.03	—	45	45	2.7	4.3	0.10
2E42◉	Diode Pentode		2E41	T-X	1.25 DC	0.03	—	45	45	2.7	4.3	0.10
2EA5¶	Sharp-Cutoff RF Tetrode		7EW	5–2	2.4	0.6	3.25◈	250◈	150◈ 0.5◈	4.5	3.0	0.05♣
2EG4	High-Mu Triode (Nuvistor)		12AQ	4–4	1.7	0.6	1.5◈	135◈	—	4.3▲	1.8▲	0.92▲
2EN5¶	Twin Diode		7FL	5–2	2.1	0.45	—	Tube Voltage Drop:♠ 5.0 volts at 20 ma d-c				
2ER5	High-Frequency Triode		7FP	5–2	2.3	0.6	2.2	250	—	4.4	4.0	0.36
2ES5¶	High-Frequency Triode		7FP	5–2	2.35	0.6	2.2◈	250◈	—	3.2	4.0	0.5
2EV5¶	Sharp-Cutoff RF Tetrode		7EW	5–2	2.4	0.6	3.25◈	275◈	180◈⁑ 0.2◈	4.5	2.9	0.035♣
2FH5¶	High-Frequency Triode		7FP	5–2	2.35	0.6	2.2◈	150◈	—	3.2	4.0	0.52

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
▣A—X-Radiation Rated, and Ⓐ—No X-Radiation Rating.

■Compactron. † Zero signal. ♠Per section. ‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage. ◉Subminiature type. ▲Without external shield. ◈Design maximum rating. ⊕Total for all similar sections ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 38,000 volts (d-c component ◈ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4, 10 and 11 may be used as tie points for components at or near heater potential.										2CN3-A ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4, 10 and 11 may be used as tie points for components at or near heater poetntial.										2CN3-B ●
Class A Amplifier	110	—	R_k = 130	7.2	—	6,600	9,800	65	—	—	2CW4¶
Class A Amplifier	125	80	1.0	10	1.5	100,000	8,000	—	—	—	*2CY5*¶
Controlled Rectifier	Max d-c cathode current ▣ = 100 ma; max peak inverse voltage ▣ = 1,300 volts; max peak cathode current ▣ = 500 ma										*2D21*
Class A Amplifier	120	120	3.6	40	3.5	—	7,500	—	—	—	*2DF4*
Class A Amplifier	110	—	R_k = 130	6.5	—	7,000	9,000	63	—	—	2DS4¶
Class A Amplifier	75	—	R_k = 100	10.5	—	3,100	11,500	35	—	—	2DV4¶
Class A Amplifier	85	—	R_k = 150	10	—	2,700	11,000	30	—	—	*2DX4*¶
Class A Amplifier	90	—	R_k = 180	10.4	—	—	11,000	28	—	—	*2DY4*¶
Class A Amplifier	90	—	R_k = 180	10.4	—	—	11,000	28	—	—	*2DY4-A*¶
Class A Amplifier	80 With 2,700 ohm resistor in plate circuit	—	—	15	—	2,000	6,700	14	—	—	*2DZ4*¶
Tuning Indicator	Plate voltage = 250 thru 1 meg, target voltage = 250 (E_c = −8 volts, shadow = 0°) (E_c = 0 volt, shadow = 90°, plate current = 0.24 ma, target current = 4 ma)										2E5
Class A Amplifier	250	160	8.0	35†	2.6†	—	—	—	6,000	3.9	2E24
Class AB1 Amplifier	500	250	40	13†	—	—	—	—	8,650	40	2E26
Class AB2 Amplifier	400	125	15	20†	—	—	—	—	6,200‡	42	
Class A Amplifier	250	250	20	40†	3.3†	63,000	3,700	—	4,500	4.5	*2E30*
Class A Amplifier	22.5	22.5	R_g = 5 meg	0.4	0.3	350,000	500	—	—	—	2E31 ●
Class A Amplifier	22.5	22.5	R_g = 5 meg	0.4	0.3	350,000	500	—	—	—	2E32 ●
Class A Amplifier	45	45	1.25	0.45	0.11	250,000	500	—	100,000	0.006	2E35 ●
Class A Amplifier	45	45	1.25	0.45	0.11	250,000	500	—	100,000	0.006	2E36 ●
Class A Amplifier	22.5	22.5	R_g = 5 meg	0.35	0.12	250,000	375	—	—	—	2E41 ●
Class A Amplifier	22.5	22.5	R_g = 5 meg	0.35	0.12	250,000	375	—	—	—	2E42 ●
Class A Amplifier	250	140	1.0	10	0.95	150,000	8,000	—	—	—	*2EA5*¶
Class A Amplifier	110	—	R_k = 130	6.5	—	7,000	9,000	63	—	—	2EG4
Half-Wave Rectifier	Max d-c output current per plate ◈ = 5.0 ma										*2EN5*¶
Class A Amplifier	200	—	1.2	10	—	—	10,500	80	—	—	*2ER5*
Class A Amplifier	200	—	1.0	10	—	8,000	9,000	75	—	—	*2ES5*¶
Class A Amplifier	250	80	1.0	11.5	0.9	150,000	8,800	—	—	—	*2EV5*¶
Class A Amplifier	135	—	1.0	11	—	5,600	9,000	50	—	—	*2FH5*¶

Metal tubes are shown in bold-face type, ***miniature tubes in italics.***
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✚ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
2FQ5¶	High-Frequency Triode		7FP	5-2	2.3	0.6	2.5◈	200◈	—	4.8	4.0	0.4
2FQ5-A¶	High-Frequency Triode		7FP	5-2	2.3	0.6	2.5◈	200◈	—	5.0	3.5	0.52
2FS5¶	"Shadow-Grid" Beam Pentode		7GA	5-2	2.4	0.6	3.25◈	300◈	150◈ 0.15◈	4.8	2.8	0.016
2FV6¶	Sharp-Cutoff RF Tetrode		7FQ	5-2	2.4	0.6	2.0◈	275◈	180◈‡ 0.5◈	4.5	3.0	0.03♣
2FY5	High-Mu Triode		7FP	5-2	2.4	0.6	2.2▣	200▣	—	4.75	4.3	0.48
2G21 ◉	Triode-Heptode Converter		2G21 ♥	T-X	1.25 DC	0.05	—	45	45	Osc I_{c1} = 0.030 ma R_{g1} = 50,000 ohms		
2G22 ◉	Triode-Heptode Converter		2G21 ♥	T-X	1.25 DC	0.05	—	45	45	Osc I_{c1} = 0.030 ma R_{g1} = 50,000 ohms		
2GK5¶	High-Frequency Triode		7FP	5-2	2.3	0.6	2.5◈	200◈	—	5.0	3.5	0.52
2GU5¶	"Shadow-Grid" Beam Pentode		7GA	5-2	2.4	0.6	3.0◈	300◈	150◈ 0.15◈	0.7▲	3.2▲	0.018▲
2GW5¶	High-Mu Triode		7GK	5-2	2.45	0.6	2.5◈	200◈	—	5.5	4.0	0.6
2HA5	High-Mu Triode		7GM	5-1	2.2	0.6	2.6◈	220◈	—	4.3	2.9	0.36
2HK5¶	High-Frequency Triode		7GM	5-2	2.3	0.6	2.3◈	200◈	—	4.4	2.6	0.29
2HM5¶	High-Mu Triode		7GM	5-2	2.0	0.6	2.6◈	200◈	—	4.5	3.0	0.34♣
2HQ5¶	Triode		7GM	5-2	2.4	0.6	2.5◈	200◈	—	5.0	3.5	0.52
2HR8	Pentode		9BJ	6-2	2.5	0.6	1.0	300	300 0.2	3.5▲	5.0▲	0.05♣▲
2J2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	9DT	T-X	2.0	0.35	—	—	—	—	—	—
2L2 ●	Miniature High-Voltage Rectifier	Ⓐ	—	T-X	2.0	0.2	—	—	—	—	—	—
2T4¶	UHF Triode Oscillator		7DK	5-1	2.35	0.6	3.5	200	—	2.6▲	0.4▲	1.7▲
2V2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	8FV	T-X	2.5 1.25	0.2 0.4	—	Tube Voltage Drop: 150 volts at 7.0 ma d-c				
2V3-G ●	Half-Wave High-Voltage Rectifier	Ⓐ	4Y	12-8	2.5	5.0	—	—	—	—	—	—
2W3 2W3-GT	Half-Wave High-Vacuum Rectifier		4X	8-6 9-12	2.5	1.5	—	—	—	—	—	—
2X2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	4AB	12-6	2.5	1.75	—	Tube voltage drop: 98 volts at 15 mA d-c				
2X2A ●	Half-Wave High-Voltage Rectifier	Ⓐ	4AB	12-6	2.5	1.75	—	—	—	—	—	—
2Y2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	4P	12-6	2.5	1.75	—	—	—	—	—	—
3A2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	9RT	6-7	3.15	0.22	—	Tube Voltage Drop: 70 volts at 7.0 ma d-c				
3A2-A ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr 🅰	9RT	6-7	3.15	0.22	—	Tube Voltage Drop: 70 volts at 7.0 ma d-c				
3A3 ●	Half-Wave High-Voltage Rectifier	Ⓐ	8EZ	9-52	3.15	0.22	—	—	—	—	—	—
3A3-A ●	Half-Wave High-Voltage Rectifier	Ⓐ	8EZ	T-X	3.15	0.22	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
🅰—X-Radiation Rated, and Ⓐ—No X-Radiation Rating.

■Compactron. † Zero signal. ✚Per section. ‡ Plate-to-plate. ♣Maximum. ‡ Supply voltage. ◉Subminiature type. ▲Without external shield. ◈Design maximum rating. ⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	135	—	1.2	11.5	—	5,500	11,000	60	—	—	*2FQ5*¶
Class A Amplifier	135	—	1.2	8.9	—	6,300	12,000	74	—	—	*2FQ5-A*¶
Class A Amplifier	275	135	0.2	9.0	0.17	240,000	10,000	—	—	—	*2FS5*¶
Class A Amplifier	125	80	1.0	10	1.5	100,000	8,000	—	—	—	*2FV6*¶
Class A Amplifier	135	—	1.0	11	—	—	13,000	70	—	—	*2FY5*
Converter	22.5	22.5	0	0.2	0.3	500,000	60 #	E_b(Triode Osc) = 22.5 I_b(Triode) = 1.0 ma			2G21 ●
Converter	22.5	22.5	0	0.2	0.3	500,000	60 #	E_b(Triode Osc) = 22.5 I_b(Triode) = 1.0 ma			2G22 ●
Class A Amplifier	135	—	1.0	11.5	—	5,400	15,000	78	—	—	*2GK5*¶
Class A Amplifier	275	135	0.4	10	0.17	165,000	15,500	—	—	—	*2GU5*¶
Class A Amplifier	135	—	1.0	12.5	—	5,800	15,000	70	—	—	*2GW5*¶
Class A Amplifier	135	—	1.0	11.5	—	—	14,500	72	—	—	*2HA5*
Class A Amplifier	135	—	1.0	12.5	—	5,000	15,000	75	—	—	*2HK5*¶
Class A Amplifier	135	—	1.0	12.5	—	—	14,500	78	—	—	*2HM5*¶
Class A Amplifier	135	—	1.0	11.5	—	5,400	15,000	78	—	—	*2HQ5*¶
Class A Amplifier	250	140	2.0	3.0	0.6	2,500,000	2,000	—	—	—	*2HR8*
Flyback Rectifier	Max peak inverse voltage (absolute) ▣ = 27,000 volts; max peak inverse voltage (design center) ◈ = 23,500 volts; max d-c output current = 0.2 ma; max peak current = 80 ma.										2J2 ●
Flyback Rectifier	Max peak inverse voltage (no load) = 22,000 volts; max peak inverse voltage (on load) = 19,000 volts; max d-c output current = 0.5 mA max. peak current = 25 mA.										2L2 ●
Class A Amplifier	80	—	R_k = 150	18	—	1,860	7,000	13	—	—	*2T4*¶
TV Flyback Rectifier	Max inverse voltage (d-c and peak) = 21,000 volts; max d-c output current = 1.0 ma; max peak current = 80 ma. Socket terminals 1 and 3 may be used as tie points for components at or near filament potential.										2V2 ●
Half-Wave Rectifier	Max inverse voltage (d-c and peak) = 16,500 volts; max d-c output current = 2.0 ma; max peak current = 12 ma. Socket terminals 1, 3, 4, 5 and 6 may be used as tie points for components at or near filament potential.										2V3-G ●
Half-Wave Rectifier	Max d-c output current = 55 ma; max rms supply voltage = 350 volts										**2W3** 2W3-GT
Half-Wave Rectifier	Max. peak inverse voltage ▣ = 12500 volts; d-c output current = 7.5 mA; max. peak current = 100 mA.										2X2 ●
Half-Wave Rectifier	Max. peak inverse voltage = 12500 volts; d-c output current = 7.5 mA; max. peak current = 100 mA.										2X2A ●
Half-Wave Rectifier	Max. peak inverse voltage = 12000 volts; max. d-c output current = 5.0 mA.										2Y2
TV Flyback Rectifier	Max inverse voltage (d-c and peak) = 18,000 volts; mas d-c output current = 1.7 ma; max peak current = 80 ma.										*3A2* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 20,000 volts (d-c component ▣ = 18,000 volts); max d-c output current ◈ = 1.5 ma; max peak current ◈ = 80 ma.										*3A2-A* ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 30,000 volts; max d-c output current ◈ = 1.5 ma; max peak current ◈ = 88 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3A3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 30,000 volts; max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3A3-A ●

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	* Max. Screen Volts and Watts	Capacitance in Picofarads: Input	Output	Grid-Plate
3A3-B ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8EZ	T-X	3.15	0.22	—	Tube Voltage Drop: 100 volts at 7.0 ma d-c				
3A3-C ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8EZ	9–169	3.15	0.22	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3A4	Power Amplifier Pentode		7BB	5–2	2.8 1.4 DC	0.1 0.2	2.3	150	90 0.4	4.8	4.2	0.20 ♣
3A5	High-Frequency Twin Triode		7BC	5–2	2.8 1.4 DC	0.11 0.22	0.5♠	135	—	0.9	1.0	3.2
3A8-GT	Diode-Triode Sharp-Cutoff RF Pentode		8AS	9–17	2.8 1.4 DC	0.05 0.1	— —	110 110	— 110	Triode Section Pentode Section		
3AF4-A¶ *3AF4-B¶*	UHF Triode Oscillator		7DK	5–1	3.2	0.45	2.5◈	150◈	—	2.2	1.4	1.9
3AL5¶	Twin Diode		6BT	5–1	3.15	0.6	—	Tube Voltage Drop:♠ 10 v at 60 ma d-c				
3AT2 ■ ●	Half-Wave High-Voltage Rectifier	(A)	12FV	9–100	3.15	0.22	—	Tube Voltage Drop: 77 volts at 7.0 ma d-c				
3AT2-A ■ ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	12FV	9–100	3.15	0.22	—	Tube Voltage Drop: 77 volts at 7.0 ma d-c				
3AT2-B ■ ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	12FV	9–146	3.15	0.22	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3AU6¶	Sharp-Cutoff RF Pentode		7BK	5–2	3.15	0.6	3.5◈ 3.5◈	330◈ 275◈	330◈⁑ 0.75◈ —	Pentode Connection Triode Connection (G_2, G_3, & P tied)		
3AV6¶	Duplex-Diode High-Mu Triode		7BT	5–2	3.15	0.6	0.5	300	—	2.2	1.2	2.0
3AW2 ■ ●	Half-Wave High-Voltage Rectifier	(A)	12HA	9–100	3.15	0.35	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3AW2-A ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	12HA	9–146	3.15	0.35	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3AW3 ●	Half-Wave High-Voltage Rectifier	(A)	8EZ	9–53	3.15	0.22	—	Tube Voltage Drop: 110 volts at 7.0 ma d-c				
3B2 ●	Half-Wave High-Voltage Rectifier	(A)	8GH	T-X	3.15	0.22	—	Tube Voltage Drop: 135 volts at 7.0 ma d-c				
3B4	Beam Power Amplifier		7CY	5–2	1.25 2.50 DC	0.33 0.165	3.0▣	150▣	135▣ 1	4.6▲	7.6▲	0.16▲ ♣
3B5-GT	Beam Power Amplifier		7AQ	9–12	1.4 2.8 DC	0.1 0.05	— —	67.5 67.5	67.5 67.5	Parallel Filaments Series Filaments		
3B7	High-Frequency Twin Triode		7BE	9–30	1.4 2.8 DC	0.22 0.11	2.7♠	180	—	Both Sections in Push-pull		

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
[▲]—X-Radiation Rated, and (A)—No X-Radiation Rating.

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‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 30,000 volts (d-c component ▣ = 24,000 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3A3-B ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3A3-C ●
Class A Amplifier	150	90	8.4	13.3†	2.2†	100,000	1,900	—	8,000	0.7	*3A4*
Class A Amplifier ♠	90	—	2.5	3.7	—	8,300	1,800	15	—	—	*3A5*
Class A Amplifier	90	—	0	0.2	—	200,000	275	—	—	—	3A8-GT
Class A Amplifier	90	90	0	1.5	0.5	800,000	750	—	—	—	
Class A Amplifier	80	—	R_k = 150	17.5	—	2,100	6,500	13.5	—	—	*3AF4-A*¶ *3AF4-B*¶
Half-Wave Rectifier	Max d-c output current per plate =9 ma; max peak inverse voltage =330 volts; max rms supply voltage per plate =117 volts; max peak current per plate =54 ma										*3AL5*¶
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 30,000 volts; max d-c output current ◈ = 1.7 ma; max peak current ◈ = 88 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near heater potential.										3AT2 ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 30,000 volts (d-c component ▣ = 24,000 volts); max d-c output current ◈ = 1.7 ma; max peak current ◈ = 88 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near heater potential.										3AT2-A ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 1.7 ma; max peak current ◈ = 88 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near heater potential.										3AT2-B ■ ●
Class A Amplifier	250	150	R_k = 68	10.6	4.3	1,000,000	5,200	—	—	—	*3AU6*¶
	100	100	R_k = 150	5.0	2.1	500,000	3,900	—	—	—	
Class A Amplifier	250	—	R_k = 330	12.2	—	—	4,800	36	—	—	
Class A Amplifier	250	—	2.0	1.2	—	62,500	1,600	100	—	—	*3AV6*¶
	100	—	1.0	0.5	—	80,000	1,250	100	—	—	
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 38,000 volts (d-c component ◈ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4, 7and 10 may be used as tie points for components at or near heater potential.										3AW2 ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near heater potential.										3AW2-A ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 30,000 volts; max d-c output current ◈ = 1.7 ma; max peak current ◈ = 88 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3AW3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 35,000 volts (d-c component = 25,000 volts); max d-c output current = 1.1 ma; max peak current = 80 ma. Socket terminal 4 may be used as tie point for components at or near heater potential.										3B2 ●
Class C Amplifier	150	135	38	25	6.2	Input Signal =0.07 watt			—	1.25	*3B4*
Class A Amplifier	67.5	67.5	7.0	8.0†	0.6†	100,000	1,650	—	5,000	0.2	3B5-GT
Class A Amplifier	67.5	67.5	7.0	6.7†	0.5†	100,000	1,500	—	5,000	0.18	
Class AB_2 Amplifier	135	—	0	18.2†	—	—	1,900 ♠	20 ♠	16,000 ‡	1.5	3B7

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

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♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✠ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
3B28	Half-Wave Gas Rectifier		4P	T-X	2.5	5.0	—	Tube Voltage Drop = 10 Volts				
3BA6¶	Remote-Cutoff RF Pentode		7BK	5-2	3.15	0.6	3.4◆	330◆	330◆⁑ 0.7◆	5.5	5.5	0.0035 ♣
3BC5¶	Sharp-Cutoff RF Pentode		7BD	5-2	3.15	0.6	2.3◆	330◆	330◆⁑ 0.55◆	Pentode Connection		
							2.9◆	330◆	—	Triode Connection (G_2 & P tied)		
3BE6¶	Pentagrid Converter		7CH ♥	5-2	3.15	0.6	1.0	300	100 1.0	Osc I_{c1} = 0.5 ma R_{g1} = 20,000 ohms		
3BF2 ●	Half-Wave High-Voltage Rectifier	Ⓐ	12GQ	9-100	3.6	0.225	—	—	—	—	—	—
3BL2 ■ ●	Half-Wave High-Voltage Rectifier	Ⓐ	12HK	9-100	3.3	0.285	—	Tube Voltage Drop: 50 volts at 7.0 ma d-c				
3BL2-A ■ ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [A]	12HK	9-100	3.3	0.285	—	Tube Voltage Drop: 50 volts at 7.0 ma d-c				
3BM2 ■ ●	Half-Wave High-Voltage Rectifier	Ⓐ	12HK	9-100	3.0	0.3	—	Tube Voltage Drop: 50 volts at 7.0 ma d-c				
3BM2-A ■ ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [A]	12HK	9-100	3.0	0.3	—	Tube Voltage Drop: 50 volts at 7.0 ma d-c				
3BN2 ■ ●	Half-Wave High-Voltage Rectifier	Ⓐ	12FV	9-100	3.15	0.3	—	Tube Voltage Drop: 150 volts at 7.0 ma d-c				
3BN2-A ■ ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [A]	12FV	9-146	3.15	0.3	—	Tube Voltage Drop: 150 volts at 7.0 ma d-c				
3BN4¶	High-Frequency Triode		7EG	5-2	3.0	0.45	2.2◆	275◆	—	3.2	1.4	1.2
3BN4-A¶	High-Frequency Triode		7EG	5-2	3.0	0.45	2.2	275	—	3.2	1.4	1.2
3BN6¶	Gated-Beam Discriminator		7DF	5-3	3.15	0.6	—	330◆⁑	110◆	E_{c1} = 1.25 volts RMS		
3BS2 ■ ●	Half-Wave High-Voltage Rectifier	Ⓐ	12HY	9-100	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3BS2-A ■ ●	Half-Wave High-Voltage Rectifier	Ⓐ	12HY	9-100	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3BS2-B ■ ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [A]	12HY	9-100	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3BT2 ■ ●	Half-Wave High-Voltage Rectifier	Ⓐ	12HY	9-100	3.15	0.48	—	Tube Voltage Drop: 70 volts at 7.0 ma d-c				
3BT2-A ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [A]	12HY	9-100	3.15	0.48	—	Tube Voltage Drop: 70 volts at 7.0 ma d-c				

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[A] —X-Radiation Rated, and Ⓐ — No X-Radiation Rating.

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ⊞Absolute maximum rating.
♠Per section. ⁑Supply voltage. ◆Design maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Half-Wave Rectifier	Max d-c output current ▣ =0.5 amperes; max peak inverse voltage ▣ = 5,000 volts; max peak current ▣ =2.0 amperes										3B28
Class A Amplifier	250	100	R_k = 68	11	4.2	1,000,000	4,400	—	—	—	*3BA6*¶
	100	100	R_k = 68	10.8	4.4	250,000	4,300	—	—	—	
Class A Amplifier	250	150	R_k = 180	7.5	2.1	800,000	5,700	—	—	—	*3BC5*¶
	125	125	R_k = 100	8.0	2.4	500,000	6,100	—	—	—	
	100	100	R_k = 180	4.7	1.4	600,000	4,900	—	—	—	
Class A Amplifier	250	—	R_k = 820	6.0	—	9,000	4,400	40	—	—	
	180	—	R_k = 330	8.0	—	6,000	6,000	42	—	—	
Converter	250	100	1.5	2.9	6.8	1,000,000	475 #	—	—	—	*3BE6*¶
	100	100	1.5	2.6	7.0	400,000	455 #	—	—	—	
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 35,000 volts; max d-c output current ◈ = 2.2 ma; max peak current ◈ = 115 ma.										3BF2 ■
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 33,000 volts (d-c component ◈ = 27,500 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near filament potential.										3BL2 ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 33,000 volts (d-c component ▣ = 27,500 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near filament potential.										3BL2-A ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 33,000 volts (d-c component ◈ = 27,500 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near filament potential.										3MB2 ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 33,000 volts (d-c component ▣ = 27,500 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near filament potential.										3BM2-A ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 30,000 volts (d-c component ◈ = 27,500 volts); max d-c output current ◈ = 1.7 ma; max peak current ◈ = 88 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near heater potential.										3BN2 ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 30,000 volts (d-c component ▣ = 27,500 volts); max d-c output current ◈ = 1.7 ma; max peak current ◈ = 88 ma. Socket terminals 4, 7 and 10 may be used as tie points for components at or near heater potential.										3BN2-A ■ ●
Class A Amplifier	150	—	R_k = 220	9.0	—	6,300	6,800	43	—	—	*3BN4*¶
Class A Amplifier	150	—	R_k = 220	9.0	—	5,400	8,000	43	—	—	*3BN4-A*¶
FM Limiter-Discriminator	285‡	100	R_k = 200 to 400	0.49	9.8	—	—	—	330,000	—	*3BN6*¶
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 38,000 volts (d-c component ◈ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 10 may be used as tie points for components at or near heater potential.										3BS2 ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 38,000 volts (d-c component ◈ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 10 may be used as tie points for components at or near heater potential.										3BS2-A ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 10 may be used as tie points for components at or near heater potential.										3BS2-B ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 10 may be used as tie points for components at or near heater potential.										3BT2 ■ ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts; max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 10 may be used as tie points for components at or near heater potential.										3BT2-A ■ ●

Metal tubes are shown in bold-face type, ***miniature tubes in italics.***

♦G3 and G5 are screen. G4 is signal-input grid.
▼G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✠ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
3BU8¶	Twin Pentode		9FG	6–3	3.15	0.6	1.1◈ ♠	300◈	150◈ 0.75	—	—	—
3BU8-A¶	Twin Pentode		9FG	6–3	3.15	0.6	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
3BW2■ ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	12HY	9–146	3.15	0.48	—	Tube Voltage Drop: 70 volts at 7.0 ma d-c				
3BY6¶	Dual Control Heptode		7CH	5–2	3.15	0.6	2.3◈	330◈	330◈⁑ 1.1◈	—	—	—
3BZ6¶	Semi-Remote-Cutoff RF Pentode		7CM	5–2	3.15	0.6	2.3◈	330◈	330⁑◈ 0.55◈	7.0	3.0	.0015 ♣
3C2 ●	Half-Wave High-Voltage Rectifier	(▲)	8FV	12–19	3.15 1.58	0.21 0.42	—	Tube Voltage Drop: 62 volts at 7.0 ma d-c				
3C5-GT	Power-Amplifier Pentode		7AQ	9–12	1.4 2.8 DC	0.1 0.05	— —	110 110	110 110	Parallel Filaments Series Filaments		
3C6	Medium-Mu Twin Triode		7BW	9–30	1.4 2.8 DC	0.1 0.05	— —	110 110	— —	Section 1 {Parallel Section 2 Filaments} Section 1 {Series Section 2 Filaments}		
3C23	Thyratron		3G	T-X	2.5	7.0	—	Anode Voltage Drop = 15 Volts				
3CA3 ●	Half-Wave High-Voltage Rectifier	(▲)	8MH	9–51	3.6	0.225	—	Tube Voltage Drop: 100 volts at 11 ma d-c				
3CA3-A ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8EZ	T-X	3.6	0.225	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3CB6¶	Sharp-Cutoff RF Pentode		7CM	5–2	3.15	0.6	2.3◈	330◈	330⁑◈ 0.55◈	6.5	3.0	0.015 ♣
3CE5¶	Sharp-Cutoff RF Pentode		7BD	5–2	3.15	0.6	2.0	300	150 0.5	6.5▲	1.9▲	0.03 ♣▲
3CF6¶	Sharp-Cutoff RF Pentode		7CM	5–2	3.15	0.6	2.3◈	330◈	330⁑◈ 0.55◈	6.5	3.0	0.015 ♣
3CN3 ●	Half-Wave High-Voltage Rectifier	(▲)	8MU	T-X	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3CN3-A ●	Half-Wave High-Voltage Rectifier	(▲)	8MU	T-X	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3CN3-B ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8MU	9–153	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—[▲]—X-Radiation Rated, and (▲)—No X-Radiation Rating.

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ⊞Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Sync Separator and AGC Keyer	100	67.5	I_{c1} = 0.1 ma	2.2	5.0	—	—	—	E_{c3} =0 volts		*3BU8*¶
	100	67.5	0	—	—	—	1,500	—	E_{c3} =0 volts		
	(Characteristics given are for each section separately with plate and grid number 3 of opposite section grounded)										
Sync Separator and AGC Keyer	100	67.5	I_{c1} = 0.1 ma	2.2	3.3	—	—	—	E_{c3} =0 volts		*3BU8-A*¶
	100	67.5	0	—	—	—	1,500	—	E_{c3} =0 volts		
	(Characteristics given are for each section separately with plate and grid number 3 of opposite section grounded)										
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 10 may be used as tie points for components at or near heater potential.										3BW2 ■ ●
Gated Amplifier	250	100	2.5	6.5	9	—	1,900	E_{c3} = −2.5 volts			*3BY6*¶
	10	25	0	1.4	3.5	—	—	E_{c3} =0 volts			
Class A Amplifier	125	125	R_k = 56	14	3.6	260,000	8,000	—	—	—	*3BZ6*¶
	125	125	4.5	—	—	—	700	—	—	—	
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 33,000 volts (d-c component ◈ = 28,000 volts); max d-c output current ◈ = 1.1 ma; max peak current ◈ = 80 ma. Socket terminals 1 and 3 may be used as tie points for components at or near filament potential; do not connect to any other circuit.										3C2 ●
Class A Amplifier	90	90	9.0	6.0†	1.4†	—	1,550	—	8,000	0.24	3C5-GT
Class A Amplifier	90	90	9.0	6.0†	1.4†	—	1,450	—	10,000	0.26	
Class A Amplifier	90	—	0	4.5	—	11,200	1,300	14.5	—	—	3C6
	90	—	0	♦ 4.5	—	11,200	1,300	14.5	—	—	
Class A Amplifier	90	—	0	4.5	—	11,200	1,300	14.5	—	—	
	90	—	0	3.2	—	12,800	1,100	14.1	—	—	
Controlled Rectifier	Max d-c cathode current ▣ =1.5 amperes; max peak inverse voltage ▣ = 1,250 volts; max peak cathode current ▣ =6.0 amperes										3C23
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 30,000 volts; max d-c output current ◈ = 100 ma; max peak current ◈ = 100 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3CA3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3CA3-A ●
Class A Amplifier	125	125	R_k = 56	13	3.7	280,000	8,000	—	—	—	*3CB6*¶
	125	125	3.0	2.8	—	—	—	—	—	—	
Class A Amplifier	125	125	1.0	11	2.8	300,000	7,600	—	—	—	*3CE5*¶
Class A Amplifier	125	125	R_k = 56	12.5	3.7	300,000	7,800	—	—	—	*3CF6*¶
	125	125	3.0	2.2	—	—	—	—	—	—	
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 38,000 volts (d-c component ◈ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3CN3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 38,000 volts (d-c component ◈ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3CN3-A ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3CN3-B ●

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✠ Max. Screen Volts and Watts	Capacitance in Picofarads		
										Input	Output	Grid-Plate
3CS6¶	Dual Control Heptode		7CH ♥	5-2	3.15	0.6	1.0	300	300⁑ 1.0	5.5	7.5	0.07 ♣
3CU3 ●	Half-Wave High-Voltage Rectifier	(▲)	8MK	T-X	3.15	0.28	—	Tube Voltage Drop: 50 volts at 7.0 ma d-c				
3CU3-A ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8MK	9-153	3.15	0.28	—	Tube Voltage Drop: 50 volts at 7.0 ma d-c				
3CV3 ●	Half-Wave High-Voltage Rectifier	(▲)	8EZ	9-51	3.15	0.25	—	Tube Voltage Drop: 100 volts at 9.5 ma d-c				
3CV3-A ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8EZ	9-153	3.15	0.27	—	Tube Voltage Drop: 100 volts at 9.5 ma d-c				
3CX3 ●	Half-Wave High-Voltage Rectifier	(▲)	8MT	T-X	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3CY3 ●	Half-Wave High-Voltage Rectifier	(▲)	8MX	9-161	3.15	0.22	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3CY5¶	Sharp-Cutoff RF Tetrode		7EW	5-2	2.9	0.45	2.0◈	180◈	180◈⁑ 0.5◈	4.5	3.0	0.03
3CZ3 ●	Half-Wave High-Voltage Rectifier	(▲)	8EZ	T-X	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3CZ3-A ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8EZ	T-X	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3D6	Beam Power Amplifier		6BA	9-30	1.4 DC	0.22	4.5	180	135 0.9	7.5	6.5	0.30
3DA3 ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8MY	9-161	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3DB3 ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8MX	9-161	3.15	0.245	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3DC3 ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8MZ	9-153	3.15	0.280	—	Tube Voltage Drop: 50 volts at 7.0 ma d-c				
3DF3 ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8MT	9-161	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3DF3-A ●	Half-Wave High-Voltage Rectifier	8.0 mR/hr [▲]	8MT	T-X	3.15	0.48	—	Tube Voltage Drop: 60 volts at 7.0 ma d-c				
3DG4	Full-Wave High-Vacuum Rectifier		5DE	12-16	3.3	3.8	—	—	Tube Voltage Drop:♠ 32 volts at 350 ma d-c			

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—[▲]—X-Radiation Rated, and (▲)—No X-Radiation Rating.

■Compactron. † Zero signal. ♠Per section. ‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage. ●Subminiature type. ▲Without external shield. ◈Design maximum rating. ⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Gated Amplifier	100 100 10	30 30 30	1.0 0 0	1.0 0.8 2.0	1.3 5.5 4.5	1,000,000 700,000 —	1,100 — —	E_{c3} = 0 volts E_{c3} = −1.0 volts E_{c3} = 0 volts			*3CS6*¶
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 33,000 volts (d-c component ◈ = 27,500 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential.										3CU3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4 and 6 may be used as tie points for components at or near filament potential.										3CU3-A ●
TV Flyback Rectifier	Mas inverse voltage (d-c and peak) ▣ = 35,000 volts (d-c component ▣ = 27,500 volts); max d-c output current ◈ = 1.9 ma; max peak current ◈ = 100 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3CV3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak ▣ = 35,000 volts (d-c component ▣ = 27,500 volts); max d-c output current ◈ = 1.9 ma; max peak current ◈ = 100 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3CV3-A ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 38,000 volts (d-c component ◈ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 1 and 7 may be used as tie points for components at or near heater potential.										3CX3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3CY3 ●
Class A Amplifier	125	80	1.0	10	1.5	100,000	8,000	—	—	—	*3CY6*¶
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ◈ = 38,000 volts (d-c component ◈ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3CZ3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3CZ3-A ●
Class A Amplifier	150	90	4.5	9.8†	1.0†	—	2,400	—	14,000	0.60	3D6
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 1 and 7 may be used as tie points for components at or near heater potential.										3DA3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3DB3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4, 6 and 8 may be used as tie points for components at or near filament potential.										3DC3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 1 and 7 may be used as tie points for components at or near heater potential.										3DF3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 1 and 7 may be used as tie points for components at or near heater potential.										3DF3-A ●
Full-Wave Rectifier	Max d-c output current per plate ◈ = 400 ma; max peak inverse voltage ◈ = 1050 volts; max RMS supply voltage per plate ◈ = 325 volts; max peak current per plate ◈ = 1200 ma										3DG4

Metal tubes are shown in bold-face type, ***miniature tubes in italics.***

♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✱ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
3DH3 ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8NM	9–161	3.15	0.48	—	Tube Voltage Drop: 70 volts at 7.0 ma d-c				
3DJ ●	Half-Wave High-Voltage Rectifier	25.0 mR/hr [▲]	8MX	9–169	3.15	0.3	—	Tube Voltage Drop: 70 volts at 7.0 ma d-c				
3DK6¶	Sharp-Cutoff Pentode		7CM	5–2	3.15	0.6	2.3◈	330◈	330◈❢ 0.55◈	6.3▲	1.9▲	0.025 ▲♣
3DR3 ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	8NL	12–141	3.15	0.3	—	Tube Voltage Drop: 70 volts at 7.0 ma d-c				
3DS3 ●	Half-Wave High-Voltage Rectifier	0.5 mR/hr [▲]	8NL	T-X	3.15	0.48	—	Tube Voltage Drop: 70 volts at 7.0 ma d-c				
3DT6¶	Sharp-Cutoff Pentode		7EN	5–2	3.15	0.6	1.7◈	330◈	330◈❢ 1.1◈	— I_{c1} = 0.6 ma	—	—
3DT6-A¶	Sharp-Cutoff Pentode		7EN	5–2	3.15	0.6	1.7◈	330◈	330◈❢ 1.1◈	—	—	—
3DX4¶	UHF Triode Oscillator		7DK	5–1	3.0	0.45	2.2◈	150◈	—	3.9	1.5	1.6
3DY4¶	UHF Triode Oscillator		7DK	5–2	2.9	0.3	1.5◈	135◈	—	3.5	1.15	2.0
3DY4-A¶	UHF Triode Oscillator		7DK	5–1	2.9	0.3	1.5◈	135◈	—	3.5	1.15	2.0
3DZ4¶	UHF Triode Oscillator		7DK	5–1	3.2	0.45	2.3◈	135◈	—	2.2	1.3	1.8
3E5	Beam Power Amplifier		6BX	5–2	1.4	0.05	—	135	90	Parallel Filaments		
					2.8 DC	0.025	—	135	90	Series Filaments		
3E6	Sharp-Cutoff RF Pentode		7CJ	9–30	2.8	0.05	—	110	110	Series Filaments		
					1.4 DC	0.1	—	110	110	Parallel Filaments		
3EA5¶	Sharp-Cutoff RF Tetrode		7EW	5–2	2.9	0.45	3.25◈	250◈	150◈ 0.5◈	4.5	3.0	0.05♣
3EH7	Remote-Cutoff Pentode		9AQ	T-X	3.4	0.6	2.5	250	250 0.65	9.5	3.0	0.005 ♣
3EJ7	Sharp-Cutoff Pentode		9AQ	T-X	3.4	0.6	2.5	250	250 0.9	10	3.0	0.005 ♣
3ER5	High-Frequency Triode		7FP	5–2	2.8	0.45	2.2	250	—	4.4	4.0	0.36
3ES5¶	High-Frequency Triode		7FP	5–2	3.0	0.45	2.2◈	250◈	—	3.2	4.0	0.5
3EV5¶	Sharp-Cutoff RF Tetrode		7EW	5–2	2.9	0.45	3.25◈	275◈	180◈❢ 0.2◈	4.5	2.9	0.035 ♣
3FH5¶	High-Frequency Triode		7FP	5–2	3.0	0.45	2.2◈	150◈	—	3.2	4.0	0.52
3FQ5¶	High-Frequency Triode		7FP	5–2	2.8	0.45	2.5◈	200◈	—	4.8	4.0	0.4
3FQ5-A¶	High-Frequency Triode		7FP	5–2	2.8	0.45	2.5◈	200◈	—	5.0	3.5	0.52
3FS5¶	"Shadow Grid" Beam Pentode		7GA	5–2	2.9	0.45	3.25◈	300◈	150◈ 0.15◈	4.8	2.8	0.016

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—[▲]—X-Radiation Rated, and (▲)—No X-Radiation Rating.

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ⊞Absolute maximum rating.
♠Per section. ❢Supply voltage. ◈Design maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 1, 2 and 7 may be used as tie points for components at or near heater potential.										3DH3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.0 ma; max peak current ◈ = 100 ma. Socket terminals 4 and 6 may be used as tie points for components at or near heater potential.										3DJ3 ●
Class A Amplifier	125	125	R_k = 56	12	3.8	350,000	9,800	—	—	—	*3DK6*¶
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current = 2.0 ma; max peak current = 100 ma. Socket terminals 4 and 7 may be used as tie points for components at or near heater potential.										3DR3 ●
TV Flyback Rectifier	Max inverse voltage (d-c and peak) ▣ = 38,000 volts (d-c component ▣ = 30,000 volts); max d-c output current ◈ = 2.2 ma; max peak current ◈ = 110 ma. Socket terminals 4 and 7 may be used as tie points for components at or near near heater potential.										3DS3 ●
Class A Amplifier	150	100	R_k = 560	1.1	2.1	150,000	800	—	E_{c3} = 0 volts		*3DT6*¶
FM Limiter-Discriminator	250⁑	100	R_k = 560	0.22	5.5	E_{c3} = −6.0 volts		—	270,-000	—	
Class A Amplifier	150	100	R_k = 560	1.55	1.8	150,000	1,350	E_{c3} = 0 volts		—	*3DT6-A*¶
Class A Amplifier	85	—	Rk = 150	10	—	2,700	11,000	30	—	—	*3DX4*¶
Class A Amplifier	90	—	Rk = 180	10.4	—	—	11,000	28	—	—	*3DY4*¶
Class A Amplifier	90	—	Rk = 180	10.4	—	—	11,000	28	—	—	*3DY4-A*¶
Class A Amplifier	80 With 2,700 ohm resistor in plate circuit	—	—	15	—	2,000	6,700	14	—	—	*3DZ4*¶
Class A Amplifier	90	90	7.0	8.0	1.6	100,000	1,550	—	8,000	0.250	*3E5*
	67.5	67.5	5.0	5.5	1.1	120,000	1,400	—	8,000	0.125	
Class A Amplifier	90	90	7.0	6.8	1.4	120,000	1,450	—	9,000	0.225	
	67.5	67.5	5.0	4.4	0.9	130,000	1,300	—	11,000	0.115	
Class A Amplifier	90	90	R_g = 2 meg	2.9	1.2	325,000	1,700	—	—	—	3E6
Class A Amplifier	90	90	R_g = 2 meg	4.2	1.7	250,000	2,000	—	—	—	
Class A Amplifier	250	140	1.0	10	0.95	150,000	8,000	—	—	—	*3EA5*¶
Class A Amplifier	200	90	2.0	12	4.5	500,000	12,500	—	—	—	*3EH7*
Class A Amplifier	200	200	2.5	10	4.1	350,000	15,000	—	—	—	*3EJ7*
Class A Amplifier	200	—	1.2	10	—	—	10,500	80	—	—	*3ER5*
Class A Amplifier	200	—	1.0	10	—	8,000	9,000	75	—	—	*3ES5*¶
Class A Amplifier	250	80	1.0	11.5	0.9	150,000	8,800	—	—	—	*3EV5*¶
Class A Amplifier	135	—	1.0	11	—	5,600	9,000	50	—	—	*3FH5*¶
Class A Amplifier	135	—	1.2	11.5	—	5,500	11,000	60	—	—	*3FQ5*¶
Class A Amplifier	135	—	1.2	8.9	—	6,300	12,000	74	—	—	*3FQ5-A*¶
Class A Amplifier	275	135	0.2	9.0	0.17	240,000	10,000	—	—	—	*3FS5*¶

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✠Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads		
									Input	Out-put	Grid-plate
3FW7¶ ◉	Double Triode	8LM	T-X	3.5	0.6	—	150◈	—	Section 1 (Pins 6, 7, 8)		
						—	150◈	—	Section 2 (Pins 1, 2, 3)		
3FX7¶ ◉	Twin Triode	8LK	T-X	3.5	0.6	1.7◈♠ 3.2 Total†	100◈	—	—	—	—
3GK5¶	High-Frequency Triode	7FP	5–2	2.8	0.45	2.5◈	200◈	—	5.0	3.5	0.52
3GS8¶	Twin Pentode	9LW	6–3	3.15	0.6	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
3GU5¶	"Shadow-Grid" Beam Pentode	7GA	5–2	3.1	0.45	3.0◈	300◈	150◈ 0.15◈	7.0▲	3.2▲	0.018 ▲
3GW5¶	High-Mu Triode	7GK	5–2	3.0	0.45	2.5◈	200◈	—	5.5	4.0	0.6
3HA5	High-Mu Triode	7GM	5–1	2.7	0.45	2.6◈	220◈	—	4.3	2.9	0.36
3HK5¶	High-Frequency Triode	7GM	5–2	2.9	0.45	2.3◈	200◈	—	4.4	2.6	0.29
3HM5¶	High-Mu Triode	7GM	5–2	2.9	0.45	2.6◈	200◈	—	4.5	3.0	0.34♣
3HM6¶	Sharp-Cutoff RF Pentode	9PM	6–2	3.15	0.6	2.5◈	250◈	250❚◈ 0.6◈	8.7	3.0	0.024
3HQ5¶	Triode	7GM	5–2	3.0	0.45	2.5◈	200◈	—	5.0	3.5	0.52
3HS8¶	Twin Pentode	9FG	6–3	3.15	0.6	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
3HT6¶	Semi-Remote-Cutoff RF Pentode	9PM	6–2	3.15	0.6	2.5◈	250◈	250❚◈ 0.6◈	8.7	3.0	0.024
3JC6¶	Sharp-Cutoff Pentode	9PM	6–2	3.5	0.6	2.5◈	330◈	330❚◈ 0.6◈	8.2▲	3.0▲	0.019 ♣▲
3JC6-A	Sharp Cutoff Pentode	9PM	6–2	3.5	0.6	3.1◈	330◈	330❚◈ 0.7◈	8.5▲	3.0▲	0.019 ♣▲
3JD6¶	Sharp-Cutoff Pentode	9PM	6–2	3.5	0.6	2.5◈	330◈	330❚◈ 0.6◈	8.2▲	3.0▲	0.019 ♣▲
3KF8¶	Twin Pentode	9FG	6–3	3.15	0.6	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
3KT6	Semi-Remote-Cutoff Pentode	9PM	6–2	3.5	0.6	3.1◈	330◈	330❚◈ 0.6◈	9.5▲	3.0▲	0.019 ♣▲
3LE4	Power Amplifier Pentode	6BA	9–30	1.4	0.1	—	110	110	Parallel Filaments		
				2.8 DC	0.05	—	110	110	Series Filaments		
3LF4	Beam Power Amplifier	6BB	9–30	2.8	0.05	—	110	110	Series Filaments		
				1.4 DC	0.1	—	110	110	Parallel Filaments		
3Q4	Power Amplifier Pentode	7BA	5–2	1.4	0.1	—	90	90	Parallel Filaments		
				2.8 DC	0.05	—	90	90	Series Filaments		
3Q5-GT	Beam Power Amplifier	7AP	9–11 or 9–41	1.4	0.1	—	110	110	Parallel Filaments		
				2.8 DC	0.05	—	110	110	Series Filaments		
3S4	Power Amplifier Pentode	7BA	5–2	1.4	0.1	—	90	67.5	Parallel Filaments		
				2.8 DC	0.05	—	90	67.5	Series Filaments		
3V4	Power Amplifier Pentode	6BX	5–2	1.4	0.1	—	100◈	100◈	Parallel Filaments		
				2.8 DC	0.05	—	100◈	100◈	Series Filaments		

■ Compactron.
† Zero signal.
♠ Per section.
‡ Plate-to-plate.
♣ Maximum.
❚ Supply voltage.
◉ Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
▣ Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	Rp, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	90	—	1.0	7.0	—	6,000	6,000	36	—	—	3FW7¶ ◉
Class A Amplifier	90	—	1.0	9.0	—	3,800	9,500	36	—	—	
Class A Amplifier	90	—	1.0	9.0	—	3,800	9,500	36	—	—	3FX7¶ ◉
Class A Amplifier	135	—	1.0	11.5	—	5,400	15,000	78	—	—	*3GK5¶*
Sync Separator and AGC Keyer	100	67.5	I_{c1} = 0.1 ma	2.0♠	3.6	(Both sections operating)		—	E_{c3} = 0 volts		*3GS8¶*
	100	67.5	0	—	—	—	1,200♠	—	E_{c3} = 0 volts		
	(Plate and grid number 3 of opposite section grounded)										
Class A Amplifier	275	135	0.4	10	0.17	165,000	15,500	—	—	—	*3GU5¶*
Class A Amp	135	—	1.0	12.5	—	5,800	15,000	70	—	—	*3GW6¶*
Class A Amplifier	135	—	1.0	11.5	—	—	14,500	72	—	—	*3HA5*
Class A Amplifier	135	—	1.0	12.5	—	5,000	15,000	75	—	—	*3HK5¶*
Class A Amplifier	135	—	1.0	12.5	—	—	14,500	78	—	—	*3HM5¶*
Class A Amplifier	125	125	R_k = 56	13	3.2	156,000	15,000	—	—	—	*3HM6¶*
Class A Amplifier	135	—	1.0	11.5	—	5,400	15,000	78	—	—	*3HQ5¶*
Sync Separator and AGC Keyer	100	67.5	I_{c1} = 0.1 ma	2.0	4.4	(Both Sections Operating)			E_{c3} = 0 volts		*3HS8¶*
	100	67.5	0	—	—	—	1,100	—	E_{c3} = 0 volts		
	(Plate and grid number 3 of opposite section grounded)										
Class A Amplifier	125	125	R_k = 56	15	4.0	143,000	14,000	—	—	—	*3HT6¶*
Class A Amplifier	125	125	Rk = 56	13	3.2	180,000	15,000	—	—	—	*3JC6¶*
Class A Amplifier	125	125	R_k = 56	14	3.4	180,000	16,000	(g3 connected to k at socket)			*3JC6-A*
Class A Amplifier	125	125	Rk = 56	15	4.0	160,000	14,000	—	—	—	*3JD6¶*
Sync Separator and AGC Keyer	100	67.5	I_{c1} = 0.1 ma	2.8	—	—	270	—	E_{c3} = 0 volts		*3KF8¶*
	100	67.5	0	—	—	—	1,750	—	E_{c3} = 0 volts		
	(Characteristics given are for each section separately with plate and grid number 3 of opposite section grounded)										
Class A Amplifier	125	125	R_k = 56	17	4.2	160,000	18,000	—	E_{c3} = 0 volts		*3KT6*
Class A Amplifier	90	90	9.0	10†	2.0†	100,000	1,700	—	6,000	0.325	3LE4
Class A Amplifier	90	90	9.0	8.8†	1.8†	110,000	1,600	—	6,000	0.300	
Class A Amplifier	110	110	6.6	8.5	1.1	110,000	2,000	—	8,000	0.33	3LF4
	90	90	4.5	8.0	1.0	80,000	2,000	—	8,000	0.23	
Class A Amplifier	110	110	6.6	10	1.4	100,000	2,200	—	8,000	0.40	
	90	90	4.5	9.5	1.3	90,000	2,200	—	8,000	0.27	
Class A Amplifier	90	90	4.5	9.5†	2.1†	100,000	2,150	—	10,000	0.27	*3Q4*
Class A Amplifier	90	90	4.5	7.7†	1.7†	120,000	2,000	—	10,000	0.24	
Class A Amplifier	110	110	6.6	10†	1.4†	100,000	2,200	—	8,000	0.40	3Q5-GT
	90	90	4.5	9.5†	1.3†	90,000	2,200	—	8,000	0.27	
Class A Amplifier	110	110	6.6	8.5†	1.1†	110,000	2,000	—	8,000	0.33	
	90	90	4.5	8.0†	1.0†	80,000	2,000	—	8,000	0.23	
Class A Amplifier	90	67.5	7.0	7.4†	1.4†	100,000	1,575	—	8,000	0.270	*3S4*
	67.5	67.5	7.0	7.2†	1.5†	100,000	1,550	—	5,000	0.180	
Class A Amplifier	90	67.5	7.0	6.1†	1.1†	100,000	1,425	—	8,000	0.235	
	67.5	67.5	7.0	6.0†	1.2†	100,000	1,400	—	5,000	0.160	
Class A Amplifier	90	90	4.5	9.5†	2.1†	100,000	2,150	—	10,000	0.27	*3V4*
	85	85	5.0	6.9†	1.5†	120,000	1,975	—	10,000	0.25	
Class A Amplifier	90	90	4.5	7.7†	1.7†	120,000	2,000	—	10,000	0.24	

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✤	Capacitance in Picofarads Input	Output	Grid-plate
3W4	Power Amplifier Pentode	7BA	5–2	{1.4 2.8 DC	0.05 0.025}	—	90	90	—	—	—
C3J	Thyratron same as 5632										
4A6-G	Twin Triode Power Amplifier	8L	12–7	{4.0 2.0 DC	0.06 0.12}	—	90	—	—	—	—
4AU6¶	Sharp-Cutoff RF Pentode	7BK	5–2	4.2	0.45	3.0	300	150 0.65	Pentode Connection		
						3.2	250	—	Triode Connection (G_2, G_3, and P tied)		
4AV6¶	Duplex-Diode High-Mu Triode	7BT	5–2	4.2	0.45	0.55◈	330◈	—	2.2	1.2	2.0
4BA6¶	Remote-Cutoff RF Pentode	7BK	5–2	4.2	0.45	3.0	300	300§ 0.6	5.5	5.5	0.0035 ♣
4BC5¶	Sharp-Cutoff RF Pentode	7BD	5–2	4.2	0.45	2.0	300	300 0.5	Pentode Connection		
						2.5	300	—	Triode Connection (G_2 and P tied)		
4BC8¶	High-Frequency Twin Triode	9AJ	6–2	4.2	0.6	2.2◈ ♠	250◈	—	5.5_2	2.4_2	1.2
4BE6¶	Pentagrid Converter	7CH ♥	5–2	4.2	0.45	1.1◈	330◈	110◈ 1.1◈	Osc. I_{g1} = 0.5 ma R_{g1} = 20,000 ohms		
4BL8	Triode-Pentode	9AE	6–2	4.6	0.6	1.7	250	200 0.75	Pentode Section		
						1.5	250	—	Triode Section		
4BN4	High-Frequency Triode	7EG	5–2	4.2	0.3	2.2◈	275◈	—	3.2	1.4	1.2
4BN6¶	Gated-Beam Discriminator	7DF	5–3	4.2	0.45	—	330◈§	110◈	E_{c1} = 1.25 volts RMS		
4BQ7-A¶	High-Frequency Twin Triode	9AJ	6–2	4.2	0.6	2.0♠	250	—	2.6_1	1.2_1	1.2
4BS8¶	Medium-mu Twin Triode	9AJ	6–2	4.5	0.6	2.0♠	150	—	2.6_1	1.2_1	1.15
4BU8¶	Twin Pentode	9FG	6–3	4.2	0.45	1.1◈	300◈	150◈ 0.75◈	—	—	—
4BX8¶	High-Frequency Twin Triode	9AJ	6–2	4.5	0.6	2.0◈ ♠	150◈	—	2.4_2	1.25_2	1.4
4BZ6¶	Semi-Remote-Cutoff RF Pentode	7CM	5–2	4.2	0.45	2.3◈	330◈	330◈§ 0.55◈	7.0	3.0	0.015 ♣
4BZ7¶	High-Frequency Twin Triode	9AJ	6–2	4.2	0.6	2.0♠	250	—	2.6_1	1.2_1	1.2
4BZ8¶	High-Frequency Twin Triode	9AJ	6–2	4.2	0.6	2.2♠	250	—	—	—	—
4CB6¶	Sharp-Cutoff RF Pentode	7CM	5–2	4.2	0.45	2.3◈	330◈	330◈§ 0.55◈	6.5	3.0	0.015 ♣
4CE5¶	Sharp-Cutoff RF Pentode	7BD	5–2	4.2	0.45	2.0	300	300§ 0.5	6.5▲	1.9▲	0.03♣ ▲
4CS6¶	Dual-Control Heptode	7CH ♥	5–2	4.2	0.45	1.0	300	100 1.0	5.5	7.5	0.07♣
4CX7¶	Medium-mu Twin Triode	9FC	6–2	4.2	0.6	2.0♠	250	—	2.4_1	1.3_1	1.2_1
4CY5¶	Sharp-Cutoff RF Tetrode	7EW	5–2	4.5	0.3	2.0◈	180◈	180◈§ 0.5◈	4.5	3.0	0.03
4DE6¶	Sharp-Cutoff RF Pentode	7CM	5–2	4.2	0.45	2.3◈	330◈	330◈§ 0.55◈	6.5	3.0	0.015 ♣
4DK6¶	Sharp-Cutoff Pentode	7CM	5–2	4.2	0.45	2.3◈	330◈	330◈§ 0.55◈	6.3▲	1.9▲	0.025▲ ♣

■Compactron. ‡ Plate-to-plate. ⊛Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. § Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	85	85	5.2	6.8†	1.4†	150,000	1,700	—	11,000	0.25	*3W4*
Class A Amplifier ♠	90	—	1.5	1.2	—	28,000	900	25	—	—	4A6-G
Class A Amplifier	250 100	150 100	R_k = 68 R_k = 150	10.6 5.0	4.3 2.1	1,000,000 500,000	5,200 3,900	— —	— —	— —	*4AU6¶*
Class A Amplifier	250	—	R_k = 330	12.2	—	—	4,800	36	—	—	
Class A Amplifier	250 100	— —	2.0 1.0	1.2 0.5	— —	62,500 80,000	1,600 1,250	100 100	— —	— —	*4AV6¶*
Class A Amplifier	250 100	100 100	R_k = 68 R_k = 68	11 10.8	4.2 4.4	1,000,000 250,000	4,400 4,300	— —	— —	— —	*4BA6¶*
Class A Amplifier	250 125 100	150 125 100	R_k = 180 R_k = 100 R_k = 180	7.5 8.0 4.7	2.1 2.4 1.4	800,000 500,000 600,000	5,700 6,100 4,900	— — —	— — —	— — —	*4BC5¶*
Class A Amplifier	250 180	— —	R_k = 820 R_k = 330	6.0 8.0	— —	9,000 6,000	4,400 6,000	40 42	— —	— —	
Class A Amplifier ♠	150	—	R_k = 220	10	—	5,300	6,200	35	—	—	*4BC8¶*
Converter	250 100	100 100	1.5 1.5	2.9 2.6	6.8 7.0	1,000,000 400,000	475# 455#	— —	— —	— —	*4BE6¶*
Class A Amplifier Class A Amplifier	170 100	170 —	2.0 2.0	10 14	2.8 —	400,000 4,000	6,200 5,000	— 20	— —	— —	*4BL8*
Class A Amplifier	150	—	R_k = 220	9.0	—	6,300	6,800	43	—	—	*4BN4*
FM Limiter-Discriminator	285§	100	R_k = 200 to 400	0.49	9.8	—	—	—	330,000	—	*4BN6¶*
Class A Amplifier ♠	150	—	R_k = 220	9.0	—	5,900	6,400	38	—	—	*4BQ7-A¶*
Class A Amplifier ♠	150	—	R_k = 220	10	—	5,000	7,200	36	—	—	*4BS8¶*
Sync Separator and AGC Keyer	100 100	67.5 67.5	I_{c1} = 0.1 ma 0	2.2 —	5.0 —	— —	— 1,500	— —	E_{c3} = 0 volts E_{c3} = 0 volts		*4BU8¶*
(Characteristics given are for each section separately with plate and grid number 3 of opposite section grounded)											
Class A Amplifier ♠	65	—	1.0	9.0	—	3,750	6,700	25	—	—	*4BX8¶*
Class A Amplifier	125 125	125 125	R_k=56 4.5	14 —	3.6 —	260,000 —	8,000 700	— —	— —	— —	*4BZ6¶*
Class A Amplifier ♠	150	—	R_k = 220	10	—	5,300	6,800	36	—	—	*4BZ7¶*
Class A Amplifier ♠	125	—	R_k = 100	10	—	5,600	8,000	45	—	—	*4BZ8¶*
Class A Amplifier	125 125	125 125	R_k=56 3.0	13 2.8	3.7 —	280,000 —	8,000 —	— —	— —	— —	*4CB6¶*
Class A Amplifier	125	125	1.0	11	2.8	300,000	7,600	—	—	—	*4CE5¶*
Gated Amplifier	100 100 10	30 30 30	1.0 0 0	1.0 0.8 2.0	1.3 5.5 4.5	1,000,000 700,000 —	1,100 — —	E_{c3} = 0 volts E_{c3} = −1.0 volts E_{c3} = 0 volts			*4CS6¶*
Class A Amplifier ♠	150	—	R_k = 220	9.0	—	6,100	6,400	39	—	—	*4CX7¶*
Class A Amplifier	125	80	1.0	10	1.5	100,000	8,000	—	—	—	*4CY5¶*
Class A Amplifier	125 125	125 125	R_k=56 5.5	15.5 —	4.2 —	250,000 —	8,000 700	— —	— —	— —	*4DE6¶*
Class A Amplifier	125	125	R_k = 56	12	3.8	350,000	9,800	—	—	—	*4DK6¶*

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Out-put	Grid-plate
4DT6¶	Sharp-Cutoff Pentode	7EN	5–2	4.2	0.45	1.7◈	330◈	330◈**‡** 1.1◈	— I_{c1}=0.6 ma	—	—
4DT6-A¶	Sharp-Cutoff Pentode	7EN	5–2	4.2	0.45	1.7◈	330◈	330◈**‡** 1.1◈	—	—	—
4EH7	Remote-Cutoff Pentode	9AQ	T-X	4.4	0.45	2.5	250	250 0.65	9.5	3.0	0.005 ♣
4EJ7	Sharp-Cutoff Pentode	9AQ	T-X	4.4	0.45	2.5	250	250 0.9	10	3.0	0.005 ♣
4ES8¶	High-Frequency Twin Triode	9DE	6–2	4.0	0.6	1.8♠	130	—	—	—	—
4EW6¶	Sharp-Cutoff RF Pentode	7CM	5–2	4.2	0.6	3.1◈	330◈	330◈**‡** 0.65◈	10	3.4	0.03♣
4FS7	Triode-Pentode	9MP	6–2	4.6	0.6	2.0 1.5	250 125	150 0.5 —	Pentode Section Triode Section		
4GJ7	Triode-Pentode	9QA	T-X	4.1	0.6	2.4◈ 1.8◈	275◈ 140◈	275◈ 0.55◈ —	Pentode Section Triode Section		
4GK5¶	High-Frequency Triode	7FP	5–2	4.0	0.3	2.5◈	200◈	—	5.0	3.5	0.52
4GM6¶	Semi-Remote-Cutoff Pentode	7CM	5–2	4.2	0.6	3.1◈	330◈	330◈**‡** 0.65◈	10.0▲	2.4▲	0.036 ▲
4GS7	Triode-Pentode	9GF	6–2	4.0	0.6	2.0 1.5	250 125	150 0.5 —	Pentode Section Triode Section		
4GS8¶	Twin Pentode	9LW	6–3	4.2	0.45	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
4GW5¶	High-Mu Triode	7GK	5–2	4.2	0.3	2.5◈	200◈	—	5.5	4.0	0.6
4GX7¶	Triode-Pentode	9QA	6–2	4.2	0.6	2.2◈ 1.5◈	275◈ 275◈	275**‡**◈ 0.45◈ —	Pentode Section Triode Section		
4GZ5¶	Power Amplifier Pentode	7CV	5–2	4.0	0.6	4.8◈	300◈	300◈ 1.1◈	8.5▲	3.8▲	0.24▲
4HA5	High-Mu Triode	7GM	5–1	3.9	0.3	2.6◈	220◈	—	4.3	2.9	0.36
4HA7¶■	Dissimilar Double Triode	12FQ	9–56	4.2	0.6	2.75◈ 0.3◈	330◈ 330◈	— —	Section 1 (Pins 4, 9, 10) Section 2 (Pins 2, 3, 11)		
4HC7¶■	Dissimilar Double Triode	12FR	9–57	4.2	0.6	3.0◈ 1.2◈	330◈ 330◈	— —	Section 1 (Pins 4, 7, 9, 10) Section 2 (Pins 2, 3, 11)		
4HG8¶	Triode-Pentode	9MP	6–2	4.5	0.6	2.0 1.5	250 125	150 0.5 —	Pentode Section Triode Section		
4HK5	High-Frequency Triode	7GM	5–2	4.0	0.3	2.3◈	200◈	—	4.4	2.6	0.29
4HM5¶	High-Mu Triode	7GM	5–2	4.0	0.3	2.6◈	200◈	—	4.5	3.0	0.34♣
4HM6¶	Sharp-Cutoff RF Pentode	9PM	6–2	4.2	0.45	2.5◈	250◈	250**‡**◈ 0.6◈	8.7	3.0	0.024
4HQ5¶	Triode	7GM	5–2	4.2	0.3	2.5◈	200◈	—	5.0	3.5	0.52
4HR8	Pentode	9BJ	6–2	4.5	0.3	1.0	300	200 0.2	3.5▲	5.0▲	0.05♣ ▲
4HS8¶	Twin Pentode	9FG	6–3	4.2	0.45	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
4HT6¶	Semi-Remote-Cutoff RF Pentode	9PM	6–2	4.2	0.45	2.5◈	250◈	250**‡**◈ 0.6◈	8.7	3.0	0.024
4JC6¶	Sharp-Cutoff Pentode	9PM	6–2	4.5	0.45	2.5◈	330◈	330**‡**◈ 0.6◈	8.2▲	3.0▲	0.019 ♣▲

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. **‡** Supply voltage.
⊛Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ⊡Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	Rp, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	150	100	R_k = 560	1.1	2.1	150,000	800	E_{c3} =0 volts		—	*4DT6*¶
FM Limiter-Disc.	250✱	100	R_k = 560	0.22	5.5	E_{c3}= −6.0 volts		—	270,-000	—	
Class A Amplifier	150	100	R_k = 560	1.55	1.8	150,000	1,350	E_{c3} =0 volts		—	*4DT6-A*¶
Class A Amplifier	200	90	2.0	12	4.5	500,000	12,500	—	—	—	*4EH7*
Class A Amplifier	200	200	2.5	10	4.1	350,000	15,000	—	—	—	*4EJ7*
Class A Amplifier	90	—	1.2	15	—	—	12,500	—	—	—	*4ES8*¶
Class A Amplifier	125	125	R_k = 56	11	3.2	200,000	14,000	—	—	—	*4EW6*¶
Class A Amplifier	170	150	1.2	10	3.3	350,000	12,000	—	—	—	*4FS7*
Class A Amplifier	100	—	3.0	14	—	3,100	5,500	17	—	—	
Class A Amplifier	170	120	1.2	10	3.0	350,000	11,000	—	—	—	**4GJ7**
Class A Amplifier	100	—	3.0	15	—	—	9,000	20	—	—	
Class A Amplifier	135	—	1.0	11.5	—	5,400	15,000	78	—	—	**4GK5**¶
Class A Amplifier	125	125	R_k = 56	14	3.4	200,000	13,000	—	—	—	*4GM6*¶
Class A Amplifier	170	150	1.2	10	3.3	350,000	12,000	—	—	—	*4GS7*
Class A Amplifier	100	—	3.0	14	—	—	5,500	17	—	—	
Sync Separator and AGC Keyer	100	67.5	Ic1 = 0.1 ma	2.0	3.6	(Both sections Operating) Ec3 = 0 Volts					*4GS8*¶
	100	67.5	0	—	—	—	1,200	—	Ec3 =0 Volts		
	(Plate and grid number 3 of opposite section grounded)										
Class A Amp	135	—	1.0	12.5	—	5,800	15,000	70	—	—	*4GW5*¶
Class A Amplifier	125	125	1.0	8.0	2.5	200,000	11,000	—	—	—	*4GX7*¶
Class A Amplifier	125	—	1.0	13	—	4,700	8,500	40	—	—	
Class A Amplifier	250	250	R_k = 270	16†	2.7†	150,000	8,400	—	15,000	1.1	*4GZ5*¶
Class A Amplifier	135	—	1.0	11.5	—	—	14,500	72	—	—	*4HA5*
Class A Amplifier	250	—	8.5	10.5	—	7,700	2,200	17	—	—	**4HA7**¶■
Class A Amplifier	250	—	2.0	1.2	—	62,000	1,600	100	—	—	
Class A Amplifier	150	—	1.0	18	—	5,200	4,400	23	—	—	**4HC7**¶■
Class A Amplifier	150	—	1.0	1.0	—	53,000	1,900	100	—	—	
Class A Amplifier	170	150	1.2	10	3.3	350,000	12,000	—	—	—	*4HG8*¶
Class A Amplifier	100	—	3.0	14	—	3,100	5,500	17	—	—	
Class A Amplifier	135	—	1.0	12.5	—	5,000	15,000	75	—	—	*4HK5*
Class A Amplifier	135	—	1.0	12.5	—	—	14,500	78	—	—	*4HM5*¶
Class A Amplifier	125	125	R_k = 56	13	3.2	156,000	15,000	—	—	—	*4HM6*¶
Class A Amplifier	135	—	1.0	11.5	—	5,400	15,000	78	—	—	*4HQ5*¶
Class A Amplifier	250	140	2.0	3.0	0.6	2,500,000	2,000	—	—	—	*4HR8*
Sync Separator and AGC Keyer	100	67.5	I_{c1} = 0.1 ma	2.0	4.4	(Both Sections Operating) E_{c3} =0 Volts					*4HS8*¶
	100	67.5	0	—	—	—	1,100	—	E_{c3} =0 Volts		
	(Plate and grid number 3 of opposite section grounded)										
Class A Amplifier	125	125	R_k = 56	15	4.0	143,000	14,000	—	—	—	*4HT6*¶
Class A Amplifier	125	125	R_k = 56	13	3.2	180,000	15,000	—	—	—	*4JC6*¶

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads		
									Input	Out-put	Grid-plate
4JC6-A¶	Sharp-Cutoff Pentode	9PM	6–2	4.5	0.45	3.1◈	330◈	330‡◈ 0.7◈	8.5▲	3.0▲	0.019 ♣▲
4JD6¶	Sharp-Cutoff Pentode	9PM	6–2	4.5	0.45	2.5◈	330◈	330‡◈ 0.6◈	8.2▲	3.0▲	0.019 ♣▲
4JH6¶	Semi-Remote-Cutoff Pentode	7CM	5–2	4.2	0.45	2.3◈	300◈	300‡◈ 0.55◈	7.0	3.0	0.015 ♣
4JK6¶	Sharp-Cutoff RF Pentode	7CM	5–2	3.7	0.6	2.5◈	275◈	275‡◈ 0.6◈	9.5▲	2.7▲	0.02♣ ▲
4JL6¶	Semi-Remote-Cut-off RF Pentode	7CM	5–2	3.7	0.6	2.5◈	275◈	275‡◈ 0.6◈	9.3▲	2.7▲	0.02♣ ▲
4JW8¶	Triode-Pentode	9DC	6–2	4.3	0.6	1.2 1.4	250 250	250 0.8 —	Pentode Section Triode Section		
4KE8¶	Triode-Pentode	9DC	6–2	4.5	0.6	2.0◈ 2.0◈	280◈ 280◈	280‡◈ 0.5◈ —	Pentode Section Triode Section		
4KF8¶	Twin Pentode	9FG	6–3	4.2	0.45	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
4KN8¶	Twin Triode	9AJ	6–2	4.2	0.6	2.2▣ ♠	220▣	—	—	—	—
4KT6	Semi-Remote-Cutoff Pentode	9PM	6–2	4.5	0.45	3.1◈	330◈	330‡◈ 0.6◈	9.5▲	3.0▲	0.019 ♣▲
4LJ8¶	Triode-Pentode	9GF	6–2	4.3	0.6	2.0◈ 2.0◈	280◈ 280◈	280‡◈ 0.5◈ —	Pentode Section Triode Section		
4LU6¶	Semi-Remote-Cutoff RF Pentode	7CM	5–2	4.2	0.6	4.0◈	300◈	300‡◈ 1.5◈	7.3▲	2.2▲	0.058 ▲
4MK8¶	Twin Pentode	9FG	6–3	4.2	0.45	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
5AF4-A	UHF Triode Oscillator	7DK	5–1	4.7	0.3	2.5◈	150◈	—	2.2▲	1.4▲	1.9▲
5AM8¶	Diode Sharp-Cutoff RF Pentode	9CY	6–2	4.7	0.6	3.2◈ —	330◈	330◈‡ 0.55◈	6.5 Diode Section	2.6	0.015 ♣
5AN8¶	Triode-Pentode	9DA	6–2	4.7	0.6	2.3◈ 2.8◈	330◈ 330◈	330‡◈ 0.55◈ —	Pentode Section Triode Section		
5AQ5¶	Beam Power Amplifier	7BZ	5–3	4.7	0.6	12◈ 10◈	275◈ 275◈	275◈ 2.0◈ —	Pentode Connection Triode Connection (G_2 & P tied)		
5AR4	Full-Wave High-Vacuum Rectifier	5DA	T-X	5.0	1.9	—	—	—	—	—	—
5AS4-A	Full-Wave High-Vacuum Rectifier	5T	12–15	5.0	3.0	—	Tube Voltage Drop:♠ 50 volts at 275 ma d-c				—
5AS8¶	Diode Sharp-Cutoff RF Pentode	9DS	6–2	4.7	0.6	2.5	300	300‡ 0.5	Pentode Section Diode Section		
5AT4	Full-Wave High-Vacuum Rectifier	5L	T-X	5.0	5.5	—	Tube Voltage Drop:♠ 30 volts at 500 ma d-c				
5AT8¶	Triode-Pentode	9DW	6–2	4.7	0.6	2.3◈ 1.7◈	275◈ 275◈	275◈‡ 0.45◈ —	Pentode Section Triode Section		
5AU4	Full-Wave High-Vacuum Rectifier	5T	T-X	5.0	3.75	—	Tube Voltage Drop:♠ 50 v at 350 ma d-c				
5AV8¶	Triode-Pentode	9DZ	6–2	4.7	0.6	2.0 2.5	300 300	300‡ 0.5 —	Pentode Section Triode Section		

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‡ Plate-to-plate. ♣Maximum. ‡ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	125	125	R_k = 56	14	3.4	180,000	16,000	(g_3 connected to k at socket)			*4JC6-A*
Class A Amplifier	125	125	R_k = 56	15	4.0	160,000	14,000	—	—	—	*4JD6*¶
Class A Amplifier	125	125	R_k = 56	14	3.6	260,000	8,000	—	—	—	*4JH6*¶
Class A Amplifier	125	125	R_k = 68	11.5	3.9	150,000	18,000	—	—	—	*4JK6*¶
Class A Amplifier	125	60	R_k = 68	12.5	4.0	120,000	15,500	—	—	—	*4JL6*¶
Class A Amplifier	100	100	1.0	6.0	1.7	—	5,500	—	—	—	*4JW8*¶
Class A Amplifier	200	—	2.0	3.5	—	—	3,500	70	—	—	
Class A Amplifier	125	125	R_k = 33	10	2.8	125,000	12,000	—	—	—	*4KE8*¶
Class A Amplifier	125	—	R_k = 68	13	—	5,000	8,000	40	—	—	
Sync Separator and AGC Keyer	100	67.5	I_{c1} = 0.1 ma	2.8	—	—	270	—	E_{c3} = 0 Volts		*4KF8*¶
	100	67.5	0	—	—	—	1,750	—	E_{c3} = 0 Volts		
	(Characteristics given are for each section separately with plate and grid number 3 of opposite section grounded)										
Class A Amplifier ♠	110	—	1.0	16	—	2,800	16,000	45	—	—	*4KN8*¶
Class A Amplifier	125	125	R_k = 56	17	4.2	160,000	18,000	—	E_{c3} = 0 volts		*4KT6*
Class A Amplifier	125	125	R_k = 33	12	3.5	125,000	13,000	—	—	—	*4LJ8*¶
Class A Amplifier	125	—	R_k = 68	13	—	5,000	8,000	40	—	—	
Class A Amplifier	250	250	R_k = 820	9.0	2.3	280,000	3,900	—	—	—	*4LU6*¶
Color Demodulator ♠	100	67.5	—	2.0	4.4	(Both sections operating)			—	—	*4MK8*¶
	(Grid current adjusted for 100 microamperes d-c)								—	—	
Class A Amplifier	80	—	R_k = 150	17.5	—	2,100	6,500	13.5	—	—	*5AF4-A*
Class A Amplifier	125	125	R_k = 56	12.5	3.2	300,000	7,800	—	—	—	*5AM8*¶
Video Det.	Max d-c output current = 5 ma; voltage drop: 10 v at 50 ma d-c										
Class A Amplifier	125	125	R_k = 56	12	3.8	170,000	7,800	—	—	—	5AN8¶
Class A Amplifier	150	—	3.0	15	—	4,700	4,500	21	—	—	
Class A Amplifier	180	180	8.5	29†	3.0†	58,000	3,700	—	5,500	2.0	*5AQ5*¶
	250	250	12.5	45†	4.5†	52,000	4,100	—	5,000	4.5	
Vertical Amplifier	250	—	12.5	49.5	—	1,970	4,800	9.5	—	—	
	Max positive pulse plate voltage ◈ = 1,100 v; max plate dissipation ◈ = 10 watts; max d-c cathode current ◈ = 40 ma										
Full-Wave Rectifier	Max d-c output current = 250 ma; max peak inverse voltage = 1,500 volts; rms supply voltage per plate = 450 volts; max peak current per plate = 750 ma										5AR4
Full-Wave Rectifier	Max d-c output current = 275 ma; max peak inverse voltage = 1,550 volts; max rms supply voltage per plate = 450 volts; max peak current per plate = 1,000 ma										5AS4-A
Class A Amplifier	200	150	R_k = 180	9.5	3.0	300,000	6,200	—	—	—	*5AS8*¶
Detector	Max d-c output current = 5.0 ma; max peak inverse voltage = 330 volts; max peak current = 50 ma										
Full-Wave Rectifier	Max d-c output current = 800 ma; max peak inverse voltage = 1,550 volts; max RMS supply voltage per plate = 550 volts; max peak current per plate = 2,250 ma										5AT4
Class A Amplifier	125	125	1.0	9.0	2.2	300,000	5,500	—	—	—	*5AT8*¶
Class A Amplifier	125	—	1.0	12	—	6,000	6,500	40	—	—	
Full-Wave Rectifier	Max d-c output current = 325 ma; max peak inverse voltage = 1400 volts; rms supply voltage per plate = 400 volts; max peak current per plate = 1075 ma										5AU4
Class A Amplifier	200	150	R_k = 180	9.5	2.8	300,000	6,200	—	—	—	*5AV8*¶
Class A Amplifier	200	—	6.0	13	—	5,750	3,300	19	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✤ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Output	Grid-plate
5AW4	Full-Wave High-Vacuum Rectifier	5T	T-X	5.0	3.7	—	Tube Voltage Drop: ♠ 46 v at 250 ma d-c				
5AX4-GT	Full-Wave, High-Vacuum Rectifier	5T	9–13	5.0	2.5	—	Tube Voltage Drop: ♠ 65 v at 175 ma d-c				
5AZ3■	Full-Wave High-Vacuum Rectifier	12BR	12–62	5.0	3.0	—	Tube Voltage Drop: ♠ 44 Volts at 225 ma d-c				
5AZ4	Full-Wave High-Vacuum Rectifier	5T	9–31	5.0	2.0	—	Tube Voltage Drop: ♠ 60 v at 125 ma d-c				
5B8¶	Triode-Pentode	9EC	6–2	4.7	0.6	2.0 2.5	300 300	300⁑ 0.5 —	Pentode Section Triode Section		
5BC3	Full-Wave High-Vacuum Rectifier	9QJ	12–66	5.0	3.0	—	Tube Voltage Drop: ♠ 53 volts at 300 ma d-c				
5BC3-A	Full-Wave High-Vacuum Rectifier	9QJ	12–99	5.0	3.0	—	Tube Voltage Drop: ♠ 53 volts at 300 ma d-c				
5BE8¶	Triode-Pentode	9EG	6–2	4.7	0.6	2.8 2.5	300 300	300⁑ 0.5 —	Pentode Section Triode Section		
5BK7-A¶	High-Frequency Twin Triode	9AJ	6–2	4.7	0.6	2.7♠	300	—	3.0▲	1.0_1▲ 0.9_2▲	1.8▲
5BQ7-A¶	High-Frequency Twin Triode	9AJ	6–2	5.6	0.45	2.0♠	250	—	2.6_1	1.2_1	1.2
5BR8¶	Triode-Pentode	9FA	6–2	4.7	0.6	3.0 2.5	330 330	330⁑ 0.55 —	Pentode Section Triode Section		
5BS8¶	Medium-mu Twin Triode	9AJ	6–2	5.6	0.45	2.0♠	150	—	2.6_1	1.2_1	1.15
5BT8¶	Duplex-Diode Pentode	9FE	6–2	4.7	0.6	2.0	300	300⁑ 0.5	7.0▲ Diode Sections	2.3▲	0.04♣ ▲
5BW8¶	Duplex-Diode Pentode	9HK	6–2	4.7	0.6	3.0◈	330◈	330◈⁑ 0.55◈	4.8 Diode Sections	2.6	0.02♣
5BZ7¶	High-Frequency Twin Triode	9AJ	6–2	5.6	0.45	2.5♠	250	—	2.6_1	1.2_1	1.2
5CG4	Full-Wave High-Vacuum Rectifier	5L	9–13	5.0	2.0	—	—	—	—	—	—
5CG8¶	Triode-Pentode	9GF	6–2	4.7	0.6	2.3◈ 1.7◈	275◈ 275◈	275◈⁑ 0.45◈ —	Pentode Section Triode Section		
5CL8¶	Triode-Tetrode	9FX	6–2	4.7	0.6	2.8 2.7	300 300	300⁑ 0.5 —	Tetrode Section Triode Section		
5CL8-A¶	Triode-Tetrode	9FX	6–2	4.7	0.6	2.8 2.7	300 300	300⁑ 0.5 —	Tetrode Section Triode Section		
5CM6¶	Beam Power Amplifier	9CK	6–3	4.7	0.6	12 9.0 8.0	315 315 315	285 2.0 — 285 1.75	Pentode Connection Triode (G_2 and P tied) or Pentode Connection		
5CM8¶	Triode-Pentode	9FZ	6–2	4.7	0.6	2.0 1.0	300 300	300⁑ 0.5 —	Pentode Section Triode Section		
5CQ8¶	Triode-Tetrode	9GE	6–2	4.7	0.6	3.2◈ 3.1◈	330◈ 330◈	330◈⁑ 0.7◈ —	Tetrode Section Triode Section		
5CR8¶	Triode-Pentode	9GJ	6–2	4.7	0.6	2.3◈ 2.75◈	330◈ 330◈	330◈⁑ 0.55◈	Pentode Section Triode Section		

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Full-Wave Rectifier	Max d-c output current =250 ma; max peak inverse voltage =1550 volts; rms supply voltage per plate =450 volts; max peak current per plate =750 ma										5AW4
Full-Wave Rectifier	Max d-c output current =175 ma; max peak inverse voltage =1400 volts; max rms supply voltage per plate =350 volts; max peak current per plate =525 ma										5AX4-GT
Full-Wave Rectifier	Max d-c output current ◈ =275 ma; Max peak inverse voltage ◈ = 1,700 volts; RMS supply voltage per plate ◈ =600 volts; Max peak current per plate ◈ =1,000 ma.										5AZ3 ■
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1400 volts; max rms supply voltage per plate =350 volts; max peak current per plate = 375 ma										5AZ4
Class A Amplifier	200	150	R_k = 180	9.5	2.8	300,000	6,200	—	—	—	*5B8¶*
Class A Amplifier	200	—	6.0	13	—	5,750	3,300	19	—	—	
Full-Wave Rectifier	Max d-c output current ◈ =300 ma; max peak inverse voltage ◈ =1,700; RMS supply voltage per plate ◈ =500; max peak current per plate ◈ =1000ma										5BC3
Full-Wave Rectifier	Max d-c output current ◈ =300 ma; max peak inverse voltage ◈ =1,700; RMS supply voltage per plate ◈ =500; max peak current per plate ◈ = 1000 ma										5BC3-A
Class A Amplifier	250	110	R_k = 68	10	3.5	400,000	5,200	—	—	—	*5BE8¶*
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	
Class A Amplifier ♠	150	—	R_k = 56	18	—	4,600	9,300	43	—	—	*5BK7-A¶*
Class A Amplifier ♠	150	—	R_k = 220	9.0	—	5,900	6,400	38	—	—	*5BQ7-A¶*
Class A Amplifier	125	110	1.0	9.5	3.5	200,000	5,000	—	—	—	*5BR8¶*
Class A Amplifier	125	—	1.0	13.5	—	—	—	40	—	—	
Class A Amplifier ♠	150	—	R_k = 220	10	—	5,000	7,200	36	—	—	*5BS8¶*
Class A Amplifier	200	150	R_k = 180	9.5	2.8	300,000	6,200	—	—	—	*5BT8¶*
Horizontal Phase Detector	Max d-c output current ♠ =1.0 ma; voltage drop ♠: 10 volts at 8.0 ma d-c										
Class A Amplifier	250	110	R_k = 68	10	3.5	250,000	5,200	—	—	—	*5BW8¶*
Horizontal Phase Detector	Max d-c output current ♠ ◈ =5.0 ma; voltage drop ♠; 5 volts at 20 ma d-c										
Class A Amplifier ♠	150	—	R_k = 220	10	—	5,300	6,800	36	—	—	*5BZ7¶*
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1,400 volts; max peak current per plate =400 ma										5CG4
Class A Amp	125	125	1.0	9.0	2.2	300,000	5,500	—	—	—	*5CG8¶*
Class A Amp	125	—	1.0	12	—	6,000	6,500	40	—	—	
Class A Amplifier	125	125	1.0	12	4.0	100,000	5,800	—	—	—	*5CL8¶*
Class A Amplifier	125	—	R_k = 56	15	—	5,000	8,000	40	—	—	
Class A Amplifier	125	125	1.0	12	4.0	100,000	6,400	—	—	—	*5CL8-A¶*
Class A Amplifier	125	—	R_k = 56	15	—	5,000	8,000	40	—	—	
Class A Amplifier	250	250	12.5	45†	4.5†	50,000	4,100	—	5,000	4.5	*5CM6¶*
Vertical Amplifier	Max positive pulse plate voltage ▣ =2,000 volts; max d-c cathode current =40 ma										
Class A Amplifier	200	150	R_k = 180	9.5	2.8	600,000	6,200	—	—	—	*5CM8¶*
Class A Amplifier	250	—	2.0	1.8	—	50,000	2,000	100	—	—	
Class A Amplifier	125	125	1.0	12	4.2	140,000	5,800	—	—	—	*5CQ8¶*
Class A Amplifier	125	—	R_k = 56	15	—	5,000	8,000	40	—	—	
Class A Amplifier	125	125	R_k = 56	13	3.0	300,000	7,700	—	—	—	*5CR8¶*
Class A Amplifier	125	—	2.0	12	—	5,500	4,000	22	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Out-put	Grid-plate
5CU4	Full-Wave High-Vacuum Rectifier	8KD	12–16	5.0	3.5	—	Tube Voltage Drop:♠ 27 volts at 425 ma d-c				
5CZ5¶	Beam Power Amplifier	9HN	6–4	4.7	0.6	10◈	350◈	315◈ 2.2◈	9.0▲	6.0▲	0.04▲♣
5DH8¶	Triode-Pentode	9EG	6–2	5.2	0.6	2.2◈ 2.0◈	300◈ 300◈	300◈⁑ 0.55◈ —	Pentode Section Triode Section		
5DJ4	Full-Wave High-Vacuum Rectifier	8KS	12–16	5.0	3.0	—	Tube Voltage Drop:♠ 44 volts at 225 ma d-c				
5EA8¶	Triode-Pentode	9AE	6–2	4.7	0.6	3.1◈ 2.5◈	330◈ 330◈	330◈⁑ 0.55◈ —	Pentode Section Triode Section		
5EH8¶	Triode-Pentode	9JG	6–2	4.7	0.6	2.8◈ 2.5◈	300◈ 300◈	300◈⁑ 0.5◈ —	Pentode Section Triode Section		
5EU8¶	Triode-Pentode	9JF	6–2	4.7	0.6	3.1◈ 3.0◈	330◈ 330◈	330◈⁑ 0.55◈ —	Pentode Section Triode Section		
5EW6¶	Sharp-Cutoff RF Pentode	7CM	5–2	5.6	0.45	3.1◈	330◈	330⁑◈ 0.65◈	10	3.4	0.03
5FG7¶	Triode-Pentode	9GF	6–2	4.7	0.6	3.0◈ 2.5◈	330◈ 330◈	330◈⁑ 0.55◈ —	Pentode Section Triode Section		
5FV8¶	Triode-Pentode	9FA	6–2	4.7	0.6	2.3◈ 2.0◈	330◈ 330◈	330◈⁑ 0.55◈ —	Pentode Section Triode Section		
5GH8¶	Triode-Pentode	9AE	6–2	4.7	0.6	2.5◈ 2.5◈	350◈ 330◈	330◈⁑ 0.55◈ —	Pentode Section Triode Section		
5GH8-A¶	Triode-Pentode	9AE	6–2	4.7	0.6	2.5◈ 2.5◈	350◈ 330◈	330⁑◈ 0.55◈ —	Pentode Section Triode Section		
5GJ7	Triode-Pentode	9QA	T-X	5.6	0.45	2.4◈ 1.8◈	275◈ 140◈	275◈ 0.55◈ —	Pentode Section Triode Section		
5GM6¶	Semi-Remote-Cutoff-Pentode	7CM	5–2	5.6	0.45	3.1◈	330◈	330◈⁑ 0.65◈	10.0▲	2.4▲	0.036▲
5GS7	Triode-Pentode	9GF	6–2	5.4	0.45	2.0 1.5	250 125	150 0.5 —	Pentode Section Triode Section		
5GX6¶	Dual-Control Pentode	7EN	5–2	4.7	0.6	1.7◈	300◈	300⁑◈ 1.0◈	—	—	—
5GX7¶	Triode-Pentode	9QA	6–2	5.6	0.45	2.2◈ 1.5◈	275◈ 275◈	275⁑◈ 0.45◈ —	Pentode Section Triode Section		
5HA7¶■	Dissimilar Double Triode	12FQ	9–56	5.6	0.45	2.75◈ 0.3◈	330◈ 330◈	— —	Section 1 (Pins 4, 9, 10) Section 2 (Pins 2, 3, 11)		
5HB7¶	Triode-Pentode	9QA	6–2	4.7	0.6	3.1◈ 2.5◈	330◈ 330◈	330⁑◈ 0.55◈ —	Pentode Section Triode Section		
5HC7¶■	Dissimilar Double Triode	12FR	9–57	5.6	0.45	3.0◈ 1.2◈	330◈ 330◈	— —	Section 1 (Pins 4, 7, 9, 10) Section 2 (Pins 2, 3, 11)		
5HG8¶	Triode-Pentode	9MP	6–2	5.3	0.45	2.2◈ 1.9◈	250◈ 125◈	250⁑◈ 0.55◈ —	Pentode Section Triode Section		

■Compactron. **‡ Plate-to-plate.** **●Subminiature type.** **⊕Total for all similar sections.**
† Zero signal. **♣Maximum.** **▲Without external shield.** **▣Absolute maximum rating.**
♠Per section. **⁑ Supply voltage.** **◈Design maximum rating.** **# Conversion transconductance.**

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Full-Wave Rectifier	Max d-c output current ◈ =425 ma; max peak inverse voltage ◈ =800 volts; max RMS supply voltage per plate ◈ =285 volts; max peak current per plate ◈ =1,300 ma										5CU4
Vertical Amplifier	250	250	14	46	4.6	73,000	4,800	—	—	—	*5CZ5*¶
	75	250	0	130	16	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,200 volts; max d-c cathode current ◈ =45 ma										
Class A Amplifier	125	125	R_k= 56	13.5	3.8	150,000	8,600	—	—	—	*5DH8*¶
Class A Amplifier	250	—	R_k= 390	7.3	—	12,000	4,400	53	—	—	
Full-Wave Rectifier	Max d-c output current ◈ =300 ma; max peak inverse voltage ◈ =1,700 volts; max RMS supply voltage per plate ◈ =600 volts; max peak current per plate ◈ =1,000 ma										5DJ4
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,400	—	—	—	*5EA8*¶
Class A Amplifier	150	—	R_k= 56	18	—	5,000	8,500	40	—	—	
Class A Amplifier	125	125	1.0	12	4.0	170,000	6,000	—	—	—	*5EH8*¶
	100	70	0	—	—	—	6,500	—	—	—	
Class A Amplifier	125	—	1.0	13.5	—	—	7,500	40	—	—	
Class A Amplifier	125	25	1.0	12	4.0	80,000	6,400	—	—	—	*5EU8*¶
Class A Amplifier	150	—	R_k= 56	18	—	5,000	8,500	40	—	—	
Class A Amplifier	125	125	R_k= 56	11	3.2	200,000	14,000	—	—	—	*5EW6*¶
Class A Amplifier	125	125	1.0	11	4.0	180,000	6,000	—	—	—	*5FG7*¶
	100	100	0	—	—	—	7,400	—	—	—	
Class A Amplifier	125	—	1.0	13	—	5,700	7,500	43	—	—	
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,500	—	—	—	*5FV8*¶
Class A Amplifier	125	—	1.0	14	—	5,000	8,000	40	—	—	
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	*5GH8*¶
Class A Amplifier	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	*5GH8-A*
Class A Amplifier	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Class A Amplifier	170	120	1.2	10	3.0	350,000	11,000	—	—	—	5GJ7
Class A Amplifier	100	—	3.0	15	—	—	9,000	20	—	—	
Class A Amplifier	125	125	R_k= 56	14	3.4	200,000	13,000	—	—	—	*5GM6*¶
Class A Amplifier	170	150	1.2	10	3.3	350,000	12,000	—	—	—	*5GS7*
Class A Amplifier	100	—	3.0	14	—	—	5,500	17	—	—	
Class A Amplifier	150	100	R_k= 180	3.7	3.0	140,000	3,700	E_{c3} = 0 volts			*5GX6*¶
Class A Amplifier	125	125	1.0	8.0	2.5	200,000	11,000	—	—	—	*5GX7*¶
Class A Amplifier	125	—	1.0	13	—	4,700	8,500	40	—	—	
Class A Amplifier	250	—	8.5	10.5	—	7,700	2,200	17	—	—	5HA7¶ ■
Class A Amplifier	250	—	2.0	1.2	—	62,500	1,600	100	—	—	
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,400	—	—	—	*5HB7*¶
Class A Amplifier	150	—	R_k= 56	18	—	5,000	8,500	40	—	—	
Class A Amplifier	150	—	1.0	18	—	5,200	4,400	23	—	—	5HC7¶ ■
Class A Amplifier	150	—	1.0	1.0	—	53,000	1,900	100	—	—	
Class A Amplifier	170	150	1.2	10	3.3	350,000	12,000	—	—	—	*5HG8*¶
Class A Amp	100	—	3.0	14	—	3,100	5,500	17	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✠Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-plate
5HZ6¶	Dual-Control Pentode	7EN	5–2	4.75	0.6	1.7◈	300◈	300‡◈ 1.0◈	—	—	—
5J6¶	Medium-Mu Twin Triode	7BF	5–2	4.7	0.6	1.5♠ 1.5♠	300 300	— —	2.6 (Both Sections in Push-Pull)	1.6_1 1.0_2	1.5
5JK6¶	Sharp-Cutoff RF Pentode	7CM	5–2	4.9	0.45	2.5◈	275◈	275‡◈ 0.6◈	9.5▲	2.7▲	0.02♣▲
5JL6¶	Semi-Remote-Cut-off RF Pentode	7CM	5–2	4.9	0.45	2.5◈	274◈	275‡◈ 0.6◈	9.3▲	2.7▲	0.02♣▲
5JW8¶	Triode-Pentode	9DC	6–2	4.7	0.6	1.2 1.4	250 250	250 0.8 —	Pentode Section Triode Section		
5KD8¶	Triode-Pentode	9AE	6–2	5.6	0.45	3.0◈ 2.5◈	330◈ 330◈	330‡◈ 0.55◈ —	Pentode Section Triode Section		
5KE8¶	Triode-Pentode	9DC	6–2	5.6	0.45	2.0◈ 2.0◈	280◈ 280◈	280‡◈ 0.5◈ —	Pentode Section Triode Section		
5KZ8¶	Triode-Pentode	9FZ	6–2	4.7	0.6	2.5◈ 2.5◈	330◈ 330◈	330‡◈ 0.55◈ —	Pentode Section Triode Section		
5LJ8¶	Triode-Pentode	9GF	6–2	5.6	0.45	2.0◈ 2.0◈	280◈ 280◈	280‡◈ 0.5◈ —	Pentode Section Triode Section		
5MB8¶	Triode-Pentode	9FA	6–2	5.6	0.45	2.0◈ 2.0◈	280◈ 280◈	280‡◈ 0.5◈ —	Pentode Section Triode Section		
5MQ8¶	Triode-Pentode	9AE	6–2	5.6	0.6	2.5◈ 2.7◈	330◈ 330◈	330‡◈ 0.55◈ —	Pentode Section Triode Section		
5R4-G 5R4-GY	Full-Wave High-Vacuum Rectifier	5T	16–3 16–3	5.0	2.0	—	Tube Voltage Drop:♠ 67 v at 250 ma d-c				
5R4-GYA	Full-Wave High-Vacuum Rectifier	5T	T-X	5.0	2.0	—	Tube Voltage Drop:♠ 67 v at 250 ma d-c				
5R4-GYB	Full-Wave High-Vacuum Rectifier	5T	12–15	5.0	2.0	—	Tube Voltage Drop:♠ 63 volts at 250 ma d-c				
5T4	Full-Wave High-Vacuum Rectifier	5T	10–1	5.0	2.0	—	Tube Voltage Drop:♠ 45 v at 225 ma d-c				
5T8¶	Triple Diode High-Mu Triode	9E	6–2	4.7	0.6	1.1◈	330◈	—	1.7	2.4	1.7
5U4-G	Full-Wave High-Vacuum Rectifier	5T	16–3	5.0	3.0	—	Tube Voltage Drop:♠ 44 v at 225 ma d-c				
5U4-GA	Full-Wave High-Vacuum Rectifier	5T	T-X	5.0	3.0	—	Tube Voltage Drop:♠ 44 v at 225 ma d-c				
5U4-GB	Full-Wave High-Vacuum Rectifier	5T	12–16	5.0	3.0	—	Tube Voltage Drop:♠ 50 v at 275 ma d-c				
5U8¶	Triode-Pentode	9AE	6–2	4.7	0.6	3.0◈ 2.5◈	330◈ 330◈	330◈‡ 0.55◈ —	Pentode Section Triode Section		
5U9	Triode-Pentode	10K	6–2	5.9	0.45	2.1 1.5	250 250	250 0.7 —	Pentode Section Triode Section		
5V3	Full-Wave High-Vacuum Rectifier	5T	12–16	5.0	3.8	—	Tube Voltage Drop:♠ 47 v at 350 ma d-c				
5V3-A	Full-Wave High-Vacuum Rectifier	5T	12–16	5.0	3.0	—	Tube Voltage Drop:♠ 42 volts at 350 ma d-c				
5V4-G 5V4-GA	Full-Wave High-Vacuum Rectifier	5L	14–3 12–14	5.0	2.0	—	Tube Voltage Drop:♠ 25 v at 175 ma d-c				

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● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	150	100	R_k = 180	3.2	3.2	110,000	3,400	E_{c3} = 0 volts			*5HZ6*¶
Class A Amplifier ♠	100	—	R_k = 50 ⊕	8.5	—	7,100	5,300	38	—	—	*5J6*¶
Class C Amplifier	150	—	10.0	30	—	Input Signal = 0.35 watt I_{g1} = 16 ma d-c			—	3.5	
Class A Amplifier	125	125	R_k = 68	11.5	3.9	150,000	18,000	—	—	—	*5JK6*¶
Class A Amplifier	125	60	R_k = 68	12.5	4.0	120,000	15,500	—	—	—	*5JL6*¶
Class A Amplifier	100	100	1.0	6.0	1.7	—	5,500	—	—	—	*5JW8*¶
Class A Amplifier	200	—	2.0	3.5	—	—	3,500	70	—	—	
Class A Amplifier	125	110	1.0	9.5	3.5	200,000	5,000	—	—	—	*5KD8*¶
Class A Amp	125	—	1.0	13.5	—	—	7,500	40	—	—	
Class A Amplifier	125	125	R_k = 33	10	2.8	125,000	12,000	—	—	—	*5KE8*¶
Class A Amplifier	125	—	R_k = 68	13	—	5,000	8,000	40	—	—	
Class A Amplifier	125	110	1.0	9.5	3.5	200,000	5,000	—	—	—	*5KZ8*¶
Class A Amplifier	125	—	1.0	13.5	—	—	7,500	40	—	—	
Class A Amplifier	125	125	R_k = 33	12	3.5	125,000	13,000	—	—	—	*5LJ8*¶
Class A Amplifier	125	—	R_k = 68	13	—	5,000	8,000	40	—	—	
Class A Amplifier	125	125	R_k = 33	10	2.8	125,000	12,000	—	—	—	*5MB8*¶
Class A Amplifier	125	—	R_k = 68	13	—	5,000	8,000	40	—	—	
Class A Amplifier	125	125	R_k = 62	12	4.5	150,000	10,000	—	—	—	*5MQ8*¶
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	
Full-Wave Rectifier	Max d-c output current = 250 ma; max peak inverse voltage = 2800 volts; rms supply voltage per plate = 750 volts; max peak current per plate = 650 ma										5R4-G 5R4-GY
Full-Wave Rectifier	Max d-c output current = 250 ma; max peak inverse voltage = 2800 volts; rms supply voltage per plate = 750 volts; max peak current per plate = 650 ma										5R4-GYA
Full-Wave Rectifier	Max d-c output current ▣ = 250 ma; max peak inverse voltage ▣ = 3,100 volts; max RMS supply voltage per plate ▣ = 900 volts; max peak current per plate ▣ = 715 ma										5R4-GYB
Full-Wave Rectifier	Max d-c output current = 225 ma; max peak inverse voltage = 1550 volts; max rms supply voltage per plate = 450 volts; max peak current per plate = 675 ma										**5T4**
Class A Amplifier	250 100	— —	3.0 1.0	1.0 0.8	— —	58,000 54,000	1,200 1,300	70 70	— —	— —	*5T8*¶
Full-Wave Rectifier	Max d-c output current = 225 ma; max peak inverse voltage = 1550 volts; rms supply voltage per plate = 450 volts; max peak current per plate = 800 ma										5U4-G
Full-Wave Rectifier	Max d-c output current = 250 ma; max peak inverse voltage = 1550 volts; rms supply voltage per plate = 450 volts; max peak current per plate = 900 ma										5U4-GA
Full-Wave Rectifier	Max d-c output current = 275 ma; max peak inverse voltage = 1550 volts; rms supply voltage per plate = 450 volts; max peak current per plate = 1000 ma										5U4-GB
Class A Amplifier	125	110	1.0	9.5	3.5	200,000	5,000	—	—	—	*5U8*¶
Class A Amplifier	125	—	1.0	13.5	—	—	7,500	40	—	—	
Class A Amplifier	160	110	1.4	13	5.0	—	12,000	(E_{c3} = 0 volts)			*5U9*
Class A Amplifier	100	—	2.0	14	—	—	5,000	17	—	—	
Full-Wave Rectifier	Max d-c output current = 350 ma; max peak inverse voltage = 1,400 volts; rms supply voltage per plate = 425 volts; max peak current per plate = 1,200 ma										5V3
Full-Wave Rectifier	Max d-c output current ◈ = 415 ma; max peak inverse voltage ◈ = 1,550 volts; max RMS supply voltage per plate ◈ = 550 volts; max peak current per plate ◈ = 1,400 ma										5V3-A
Full-Wave Rectifier	Max d-c output current = 175 ma; max peak inverse voltage = 1400 volts; rms supply voltage per plate = 375 volts; max peak current per plate = 525 ma										5V4-G 5V4-GA

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads: Input	Output	Grid-plate
5V6-GT¶	Beam Power Amplifier	7AC	9–11 or 9–41	4.7	0.6	12 — 9.0	315 — 315	285 — —	Single Tube 2 Tubes, Push-Pull Triode Connection (G2 & P tied)		
5W4 5W4-GT	Full-Wave High-Vacuum Rectifier	5T	8–6 9–13	5.0	1.5	—	Tube Voltage Drop: ♠ 45 v at 100 ma d-c				
5X4-G	Full-Wave High-Vacuum Rectifier	5Q	16–3	5.0	3.0	—	Tube Voltage Drop: ♠ 58 v at 225 ma d-c				
5X4-GA	Full-Wave High-Vacuum Rectifier	5Q	12–16	5.0	3.0	—	Tube Voltage Drop: ♠ 47 v at 250 ma d-c				
5X8¶	Triode-Pentode Converter	9AK	6–2	4.7	0.6	2.3◈ 1.7◈	275◈ 275◈	275◈**‡** 0.45◈ —	Pentode Section Triode Section		
5X9	Triode-Pentode	10K	6–2	5.9	0.45	2.1 1.5	250 250	250 0.7 —	Pentode Section Triode Section		
5Y3-G	Full-Wave High-Vacuum Rectifier	5T	14–3	5.0	2.0	—	Tube Voltage Drop: ♠ 60 v at 125 ma d-c				
5Y3-GA	Full-Wave High-Vacuum Rectifier	5T	12–16 9–13	5.0	2.0	—	Tube Voltage Drop: ♠ 60 v at 125 ma d-c				
5Y3-GT	Full-Wave High-Vacuum Rectifier	5T	9–13 or 9–42	5.0	2.0	—	Tube Voltage Drop: ♠ 50 volts at 125 ma d-c				
5Y4-G	Full-Wave High-Vacuum Rectifier	5Q	14–3	5.0	2.0	—	Tube Voltage Drop: ♠ 60 v at 125 ma d-c				
5Y4-GA 5Y4-GT	Full-Wave High-Vacuum Rectifier	5Q	12–16 9–13 9–42	5.0	2.0	—	Tube Voltage Drop: ♠ 60 v at 125 ma d-c				
5Z3	Full-Wave High-Vacuum Rectifier	4C	16–1	5.0	3.0	—	Tube Voltage Drop: ♠ 58 v at 225 ma d-c				
5Z4 5Z4-GT	Full-Wave High-Vacuum Rectifier	5L 5L	8–6 9–11	5.0 5.0	2.0 2.0	— —	Tube Voltage Drop: ♠ 20 v at 125 ma				
6A3	Power Amplifier Triode	4D	16–1	6.3	1.0	—	325		Single tube 2 tubes, push-pull		
6A4/LA	Power Amplifier Pentode	5B	14–1	6.3	0.3	—	180	180	—	—	—
6A5-G	Power Amplifier Triode	6T	16–3	6.3	1.25	—	250	—	Single Tube 2 tubes, push-pull		
6A6	Twin Triode Power Amplifier	7B	14–1	6.3	0.8	1.0♠ —	300	—	Both Sections in Push-pull Both Sections in Parallel		
6A7	Pentagrid Converter	7C♦	12–6	6.3	0.3	1.0	300	100 0.3	Osc $I_{c1}=0.4$ ma $R_{g1}=50{,}000$ ohms		
6A8 6A8-G 6A8-GT	Pentagrid Converter	8A♦	8–4 12–8 9–18	6.3	0.3	1.0	300	100 0.3	Osc $I_{c1}=0.4$ ma $R_{g1}=50{,}000$ ohms		
6AB4	High-Frequency Triode	5CE	5–2	6.3	0.15	2.5	300	—	2.2	1.4	1.5
6AB5/6N5	Electron-Ray Indicator	6R	9–26	6.3	0.15	—	180**‡**	Max target voltage = 180 Min target voltage = 125			
6AB7/1853	Remote-Cutoff RF Pentode	8N	8–1	6.3	0.45	3.75	300	200 0.65	8.0	5.0	0.015♣
6AB9	Twin Tetrode	10N	T-X	6.3	0.365	2.0◈♠	250◈	180**‡**◈ 0.5◈	5.7	2.7	0.055♣
6AC5-GT	Triode Power Amplifier	6Q	9–11	6.3	0.4	10	250	—	2 tubes, Push-pull		
6AC6-GT	Dynamic-Coupled Power Amplifier	7W	9–11	6.3	1.1	8.5 1.3	180	—	—	—	—
6AC7	RF Pentode	8N	8–1	6.3	0.45	3.0	300	300**‡** 0.38	11	5	0.015♣

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. **‡** Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	315	225	13	34†	2.2†	80,000	3,750	—	8,500	5.5	5V6-GT¶
	250	250	12.5	45†	4.5†	50,000	4,100	—	5,000	4.5	
	180	180	8.5	29†	3.0†	50,000	3,700	—	5,500	2.0	
Class AB1 Amplifier	285	285	19	70†	4.0†	—	—	—	8,000‡	14	
	250	250	15	70†	5.0†	—	—	—	10,000‡	10	
Vertical Amplifier	250	—	12.5	49.5	—	1,960	5,000	9.8	—	—	
	Max positive pulse plate voltage ▣ =1200 v; max plate dissipation =9 watts; max d-c cathode current =35 ma										
Full-Wave Rectifier	Max d-c output current =100 ma; max peak inverse voltage =1400 volts; max rms supply voltage per plate =350 volts; max peak current per plate =300 ma										**5W4** 5W4-GT
Full-Wave Rectifier	Max d-c output current =225 ma; max peak inverse voltage =1550 volts; max rms supply voltage per plate =450 volts; max peak current per plate =675 ma										5X4-G
Full-Wave Rectifier	Max d-c output current =250 ma; max peak inverse voltage =1550 volts; rms supply voltage per plate =450 volts; max peak current per plate =900 ma										5X4-GA
Class A Amplifier	125	125	1.0	9.0	2.2	300,000	5,500	—	—	—	*5X8*¶
Class A Amplifier	125	—	1.0	12	—	6,000	6,500	40	—	—	
Class A Amplifier	160	135	1.7	13	5.0	—	14,000	—	—	—	*5X9*
Class A Amplifier	170	—	1.0	8.5	—	—	4,800	55	—	—	
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1400 volts; max rms supply voltage per plate =350 volts; max peak current per plate =375 ma										5Y3-G
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1400 volts; rms supply voltage per plate =350 volts; max peak current per plate =440 ma										5Y3-GA
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1400 volts; rms supply voltage per plate =350 volts; max peak current per plate =440 ma										5Y3-GT
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1400 volts; rms supply voltage per plate =350 volts; max peak current per plate =375 ma										5Y4-G
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1400 volts; rms supply voltage per plate =350 volts; max peak current per plate =400 ma										5Y4-GA 5Y4-GT
Full-Wave Rectifier	Max d-c output current =225 ma; max peak inverse voltage =1550 volts; max rms supply voltage per plate =450 volts; max peak current per plate =675 ma										5Z3
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1400 volts; max rms supply voltage per plate =350 volts; max peak current per plate =375 ma										**5Z4** 5Z4-GT
Class A Amplifier	250	—	45	60†	—	800	5,250	4.2	2,500	3.2	6A3
Class AB1 Amplifier	325	—	68	80†	—	—	—	—	3,000‡	15	
Class A Amplifier	180	180	12	22†	3.9†	45,400	2,200	—	8,000	1.4	6A4/LA
Class A Amplifier	250	—	45	60†	—	800	5,250	4.2	2,500	3.75	6A5-G
Class A Amplifier	325	—	68	80†	—	—	—	—	3,000	15	
Class B Amplifier	300	—	0	35†	—	—	—	—	8,000‡	10	6A6
Class A Amplifier	294	—	6.0	7.0	—	11,000	3,200	35	—	—	
Converter	250	100	3.0	3.5	2.7	360,000	550 #	E_{c2} (Osc Plate) =250 thru 20,000 ohms I_{c2} =4.0 ma			6A7
Converter	250	100	3.0	3.5	2.7	360,000	550 #	E_{c2} (Osc Plate) =250 thru 20,000 ohms I_{c2} =4.0 ma			**6A8** 6A8-G 6A8-GT
Class A Amplifier	250	—	R_k= 200	10	—	10,900	5,500	60	—	—	*6AB4*
	100	—	R_k= 270	3.7	—	15,000	4,000	60	—	—	
Tuning Indicator	Plate voltage =135 thru 0.25 meg; target voltage =135 (E_c = −10, shadow = 0°) (E_c =0 volt, shadow =90°, plate current =0.5 ma, target current =2 ma)										6AB5/6N5
Class A Amplifier	300	200	3.0	12.5	3.2	700,000	5,000	—	—	—	**6AB7/1853**
Class A Amplifier ♣	125	80	1.0	8.0	2.0	110,000	10,000	—	—	—	*6AB9*
Class B Amplifier	250	—	0	5.0†	—	Input signal =.950 watt			10,000‡	8.0	6AC5-GT
Class A Amplifier	180	180	0	45.0	7.0	18,000 Input Plate	3,000	—	3,500	3.6	6AC6-GT
Class A Amplifier	300	150	R_k = 160	10	2.5	1,000,000	9,000	—	—	—	**6AC7**

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
♣Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Out-put	Grid-plate
6AC9¶■	Duplex-Diode Pentode	12GN	9–57	6.3	0.6	2.5◈	330◈	330‡◈ 0.55◈	Pentode Section		
							Tube Voltage Drop: 10 volts at 50 ma d-c♣				
6AC10¶■	Triple Triode	12FE	9–58	6.3	0.6	2.0◈ ♠	330◈	—	2.4_1▲ 2.6_2▲ 2.6_3▲	0.22_1▲ 0.30_2▲ 0.44_3▲	1.3_1▲ 1.2_2▲ 1.2_3▲
6AD4●	High-Mu Triode	8DK	3–1	6.3	0.15	0.3	150	—	1.9	2.2	0.7
6AD6-G	Twin Electron-Ray Indicator	7AG	9–3	6.3	0.15	—	Max target voltage = 150 Min target voltage = 100				
6AD7-G	Triode-Power Amplifier Pentode	8AY	14–3	6.3	0.85	1.0	285	—	Triode section		
						8.5	375	285 2.7	Pentode section		
6AD10■	Dissimilar Double Pentode	12EZ	9–59	6.3	1.05	10◈	275◈	275◈ 2.0◈	Section 1 (Pins 8, 9, 10, 11)		
						1.7◈	300◈	300‡◈ 1.0◈	Section 2 (Pins 2, 3, 5, 6, 7)		
6AD10-A ■	Dissimilar Double Pentode	12EZ	9–59	6.3	1.05	12◈	300◈	300◈ 2.5◈	Section 1 (Pins 8, 9, 10, 11)		
						1.7◈	300◈	300‡◈ 1.0◈	Section 2 (Pins 2, 3, 5, 6, 7)		
6AE5-GT	Low-Mu Triode	6Q	9–11	6.3	0.3	2.5	300	—	—	—	—
6AE6-G	Single-Grid Twin-Plate Control Tube	7AH	12–7	6.3	0.15	—	250	Remote-cut-off plate (Pin 3) Sharp-cut-off plate (Pin 4)			
6AE7-GT	Twin-Input Triode	7AX	9–11	6.3	0.5	5.0	300	—	—	—	—
6AF3	Half-Wave High-Vacuum Rectifier	9CB	6–8	6.3	1.2	6.0◈	Tube Voltage Drop: 30 volts at 340 ma d-c				
6AF4 *6AF4-A*	UHF Triode Oscillator	7DK	5–2 5–1	6.3	0.225	2.5◈	150◈	—	2.2▲	1.4▲	1.9▲
6AF5-G	Low-Mu Triode	6Q	12–7	6.3	0.3	—	180	—	—	—	—
6AF6-G	Twin Electron-Ray Indicator	7AG	9–1 9–36	6.3	0.15	—	—	Max target voltage = 250 Min target voltage = 125			
6AF10■	Dissimilar Double Pentode	12GX	9–58	6.3	1.2	3.0◈	300◈	300‡◈ 0.8◈	Section 1 (Pins 6, 8, 9, 10, 11)		
						5.0◈	300◈	300‡◈ 1.0◈	Section 2 (Pins 2, 3, 4, 5, 6)		
6AF11■	Dissimilar-Double-Triode Pentode	12DP	9–58	6.3	1.05	5.0◈	330◈	330‡◈ 1.25◈	Pentode Section		
						1.1◈	330◈	—	Triode Section 1 (Pins 5, 6, 8)		
						2.0◈	330◈	—	Triode Section 2 (Pins 3, 4, 7)		
6AG5	Sharp-Cutoff RF Pentode	7BD	5–2	6.3	0.3	2.0	300	300‡ 0.5	Pentode Connection		
						2.5	300	—	Triode Connection (G_2 & P tied)		
6AG7	Power Amplifier Pentode	8Y	8–6	6.3	0.65	9.0	300	300 1.5	13	7.5	0.06 ♣
6AG9■	Triode-Pentode	12HE	9–59	6.3	0.82	10◈	330◈	200◈ 1.5◈	Pentode Section		
						1.1◈	330◈	—	Triode Section		
6AG10■	Gated Twin Hexode	12GT	9–60	6.3	0.75	2.0♠ ◈	330◈	25◈g4 1.0♠ ◈g4 300 ◈g3 2.0 ◈g3 50 ◈g2 0.25 ◈g2	—	—	—
6AG11■	Duplex-Diode Twin Triode	12DA	9–56	6.3	0.75	2.0◈ ♠	330◈	—	Triode Sections		
									Diode Sections		
6AH4-GT	Low-Mu Triode	8EL	9–41	6.3	0.75	7.5	500	—	7.0▲	1.7▲	4.4▲

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ‡ Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ⊞Absolute maximum rating. # Conversion transconductance

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	125	125	1.0	12	4.5	150,000	10,000	—	—	—	6AC9¶■
	Max d-c output current ◈ ♠ = 5.0 ma										
Class A Amplifier ♠	200	—	R_k = 150	9.0	—	10,700	5,800	62	—	—	6AC10¶■
Class A Amplifier	100	—	R_k = 820	1.4	—	35,000	2,000	70	—	—	6AD4 ◉
Tuning Indicator ♠	Target voltage = 150 (Ray control = +75 volts, shadow = 0°) (Ray control = +8 volts, shadow = 90°)										6AD6-G
Class A Amplifier	250	—	25	3.7	—	19,000	325	6.0	—	—	6AD7-G
Class A Amplifier	250	250	16.5	34†	6.5†	80,000	2,500	—	7,000	3.2	
Class A Amplifier	250	250	8.0	35†	2.5†	100,000	6,500	—	5,000	4.2	6AD10■
Class A Amplifier	150	100	R_k = 180	2.8	3.4	110,000	2,500	(E_{c3} = 0 volts)			
Class A Amplifier	250	250	8.0	35	2.5	100,000	6,500	—	5,000	4.2	6AD10-A ■
Class A Amplifier	150	100	R_k = 180	2.8	3.4	110,000	2,500	E_{c3} = 0 volts			
Class A Amplifier	95	—	15	7.0	—	3,500	1,200	4.2	—	—	6AE5-GT
Class A Amplifier	250	—	1.5	6.5	—	25,000	1,000	25	—	—	6AE6-G
	250	—	1.5	4.5	—	35,000	950	33	—	—	
Class A Amplifier ♠	250	—	13.5	5	—	9,300	1,500	14	—	—	6AE7-GT
TV Damper	Max d-c output current ◈ = 185 ma; max peak inverse voltage ◈ = 4,500 volts; max peak current ◈ = 750 ma										*6AF3*
Class A Amplifier	80	—	R_k = 150	17.5	—	2,100	6,500	13.5	—	—	*6AF4* *6AF4-A*
Class A Amplifier	180	—	18	7.0	—	4,900	1,500	7.4	—	—	6AF5-G
Tuning Indicator ♠	Target voltage = 250 (Ray control = +155 volts, shadow = 0°) (Ray control = 0 v, shadow = 100°, target current = 3.75 ma)										6AF6-G
Class A Amplifier	200	150	2.0	10	2.5	—	10,000	—	—	—	6AF10■
Class A Amplifier	200	125	R_k = 68	22	4.0	75,000	23,000	—	—	—	
Class A Amplifier	200	150	R_k = 100	24	4.8	68,000	11,000	—	—	—	6AF11■
Class A Amp	200	—	2.0	7.0	—	12,400	5,500	68	—	—	
Class A Amplifier	200	—	R_k = 220	9.2	—	9,400	4,400	41	—	—	
Class A Amplifier	250	150	R_k = 180	6.5	2.0	800,000	5,000	—	—	—	*6AG5*
Class A Amplifier	250	—	R_k = 820	5.5	—	10,000	3,800	42	—	—	
Class A Amplifier	300	150	3.0	30†	7.0†	130,000	11,000	—	10,000	3.0	**6AG7**
Class A Amplifier	250	150	R_k = 56	28	5.6	40,000	30,000	—	—	—	6AG9■
	55	125	0	56	21	—	—	—	—	—	
Class A Amplifier	150	—	R_k = 350	6.2	—	8,500	4,600	39	—	—	
Color Demodulator Avg. Char.	Sections in parallel unless otherwise indicated										6AG10■
	40	10g4 100g3 25g2	R_k = 120	5.0 ♠	0.4g4 2.2g3 0.5g2	—	10,000	—	—	—	
	250	−26g4 100g3 25g2	R_k = 120	0.1	—	—	—	—	—	—	
	100	10g4 100g3 25g2	0	37	2.5g4 6.0g3 1.5g2	—	—	—	—	—	
Class A Amplifier ♠ Detector ♠	125	—	1.0	7.5		8,500	7,800	66	—	—	6AG11■
	Max d-c output current ◈ = 5.0 ma										
Vertical Amplifier	250	—	23	30	—	1,780	4,500	8.0	—	—	6AH4-GT
	Max positive pulse plate voltage ▣ = 2000 v; max d-c cathode current = 60 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✤Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Output	Grid-plate
6AH6	Sharp-Cutoff RF Pentode	7BK	5–2	6.3	0.45	3.2	300	300⁑ 0.4	Pentode Connection Triode Connection (G_2, G_3 & P tied)		
6AH7-GT	Medium-Mu Twin-Triode	8BE	9–7	6.3	0.3	1.5♦	180	—	—	—	—
6AH9■	Triode-Pentode	12HJ	9–58	6.3	0.9	10◈ 2.0◈	400◈ 330◈	330⁑◈ 1.0◈ —	Pentode Section Triode Section		
6AJ4	UHF Medium-Mu Triode	9BX	6–1	6.3	0.225	2.0	150	—	—	—	—
6AJ5	Sharp-Cutoff RF Pentode	7BD	5–1	6.3	0.175	1.7	180	180⁑ 0.5	4.0	2.8	0.02♣
6AJ7	RF Pentode	8N	8–1	6.3	0.45	3.0	300	300⁑ 0.38	11	5	0.015♣
6AK4●	Medium-Mu Triode	8DK	3–1	6.3	0.15	3.0	250	—	2.2	2.2	1.3
6AK5	Sharp-Cutoff RF Pentode	7BD	5–1	6.3	0.175	1.7	180	180⁑ 0.5	4.0	2.8	0.02♣
6AK6	Power Amplifier Pentode	7BK	5–2	6.3	0.15	2.75	300	250 0.75	3.6▲	4.2▲	0.12▲
6AK7	Power Amplifier Pentode	8Y	8–6	6.3	0.65	9.0	300	300 1.5	13	7.5	0.06♣
6AK9■	Dissimilar-Double-Triode Pentode	12GZ	12–56	6.3	1.6	10◈ 1.25◈ 1.0◈	350◈ 330◈ 330◈	250◈ 2.0◈ — —	Pentode Section Triode Section 1 (Pins 7, 10, 11) Triode Section 2 (Pins 2, 3, 7)		
6AK10■	Triple Triode	12FE	9–59	6.3	0.9	2.0♦	330♦	—	4.2_1▲ 4.2_2▲ 4.2_3▲	0.3_1▲ 0.4_2▲ 0.54_3▲	3.2_1▲ 3.0_2▲ 3.0_3▲
6AL3	Half-Wave High-Vacuum Rectifier	9CB	T-X	6.3	1.55	5.0	Tube Voltage Drop: 29 volts at 440 ma d-c				
6AL5	Twin Diode	6BT	5–1	6.3	0.3	—	Tube Voltage Drop:♦ 10 v at 60 ma d-c				
6AL6-G	Beam Power Amplifier	6AM	T-X	6.3	0.9	18.5	350	300 2.7	—	—	—
6AL7-GT	Electron-Ray Indicator	8CH	9–7 or 9–39	6.3	0.15	—	—	Max target voltage = 365 Min target voltage = 220			
6AL9■	Triode-Pentode	12HE	9–59	6.3	0.82	10◈ 1.5◈	330◈ 330◈	200◈ 1.5◈ —	Pentode Section Triode Section		
6AL11■	Dissimilar Double Pentode	12BU	9–59	6.3	0.9	10◈ 1.7◈	275◈ 330◈	275◈ 2.0◈ 330⁑◈ 1.1◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 4, 6, 7)		
6AM4	UHF High-Mu Triode	9BX	6–1	6.3	0.225	2.0	200	—	—	—	—
6AM8 *6AM8-A*¶	Diode Sharp-Cutoff RF Pentode	9CY	6–2	6.3	0.45	3.2◈ —	330◈	330◈⁑ 0.55◈	6.5 Diode Section	2.6	0.015♣
6AN4	UHF High-Mu Triode	7DK	5–1	6.3	0.225	4.0	300	—	—	—	—
6AN5	Beam Power Amplifier	7BD	5–2	6.3	0.45	4.2	120	120 1.4	9.0	4.8	0.075♣
6AN6	Quadruple Diode	7BJ	5–2	6.3	0.2	—	Tube Voltage Drop:♦ 9.0 v at 6.6 ma				
6AN8 *6AN8-A*¶	Triode-Pentode	9DA	6–2	6.3	0.45	2.3◈ 2.8◈	330◈ 330◈	330◈⁑ 0.55◈ —	Pentode Section Triode Section		
6AQ5 *6AQ5-A*¶	Beam Power Amplifier	7BZ	5–3	6.3	0.45	12◈ 10◈	275◈ 275◈	275◈ 2.0◈ —	Pentode Connection Triode Connection (G_2 & P tied)		

■Compactron. † Zero signal. ♦Per section.
‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	300	150	R_k = 160	10	2.5	500,000	9,000	—	—	—	*6AH6*
Class A Amplifier	150	—	R_k = 160	12.5	—	3,600	11,000	40	—	—	
Class A Amplifier ♠	180	—	6.5	7.6	—	8,400	1,900	16	—	—	6AH7-GT
Avg. Char.	250	150	R_k = 122	25	6.0	55,000	21,000	—	—	—	6AH9■
	50	125	0	76	32	—	—	—	—	—	
Avg. Char.	250	—	9.0	8.0	—	7,300	2,750	20	—	—	
Class A Amplifier	125	—	R_k = 68	16	—	4,200	10,000	42	—	—	*6AJ4*
Class A Amplifier	28	28	1.0	2.7	1.0	100,000	2,500	—	—	—	*6AJ5*
Class A Amplifier	300	150	R_k = 160	10	2.5	1,000,000	9,000	—	—	—	**6AJ7**
Class A Amplifier	200	—	R_k = 680	9.5	—	5,300	3,800	20	—	—	6AK4 ●
Class A Amplifier	180	120	R_k = 180	7.7	2.4	500,000	5,100	—	—	—	*6AK5*
	120	120	R_k = 180	7.5	2.5	300,000	5,000	—	—	—	
Class A Amplifier	180	180	9.0	15†	2.5†	200,000	2,300	—	10,000	1.1	*6AK6*
Class A Amplifier	300	150	3.0	30†	7.0†	130,000	11,000	—	10,000	3.0	**6AK7**
Avg. Char.	150	150	14	49	3.5	16,400	6,200	—	—	—	6AK9■
	60	125	0	140	18	—	—	—	—	—	
Avg. Char.	150	—	2.0	5.4	—	11,000	3,900	43	—	—	
Avg. Char.	150	—	5.0	5.5	—	8,500	2,350	20	—	—	
Color Difference Amplifier ♠	200	—	R_k = 230	10	—	7,500	7,000	53	—	—	6AK10■
TV Damper	Max d-c output current = 220 ma; max peak inverse voltage ◙ = 7,500 volts; max peak current = 550 ma										*6AL3*
Half-Wave Rectifier	Max d-c output current per plate ◈ = 9 ma; max peak inverse voltage ◈ = 330 volts; max rms supply voltage per plate ◈ = 117 volts; max peak current per plate ◈ = 54 ma										*6AL5*
Class A Amplifier	250	250	14	72†	5.0†	22,500	6,000	—	2,500	6.5	6AL6-G
FM/AM Tuning Indicator	Target voltage = 315 volts; cathode resistor = 3,300 ohms; grid voltage = 0 volts; pin 6 electrode controls top left quarter of fluorescent area, pin 4 electrode controls top right quarter of fluorescent area, and pin 5 electrode controls bottom half of fluorescent area when the tube is mounted horizontally with a plane passing through pins 4 and 8 vertical and with pin 4 on top.										6AL7-GT
Video Amplifier	250	150	R_k = 56	28	5.6	40,000	30,000	—	—	—	6AL9■
	55	125	0	56	21	—	—	—	—	—	
General Purpose Amplifier	200	—	R_k = 270	7.6	—	9,200	6,300	59	—	—	
Class A Amplifier	250	250	8.0	35†	2.5†	100,000	6,500	—	5,000	4.2	6AL11■
Class A Amplifier	150	100	R_k = 560	1.3	2.1	150,000	1,000	E_{c3} = 0 volts			
Class A Amplifier	200	—	R_k = 100	10	—	8,700	9,800	85	—	—	*6AM4*
Class A Amplifier	125	125	R_k = 56	12.5	3.2	300,000	7,800	—	—	—	*6AM8*
Video Det.	Max d-c output current = 5 ma; voltage drop: 10 v at 50 ma d-c										*6AM8-A* ¶
Class A Amplifier	200	—	R_k = 100	13	—	7,000	10,000	70	—	—	*6AN4*
Class A Amplifier	120	120	R_k = 120	35	12	12,500	8,000	—	2,500	1.3	*6AN5*
Half-Wave Rectifier	Max d-c output current per plate = 8.0 ma; max peak inverse voltage = 210; rms supply voltage per plate = 75; max peak current per plate = 45 ma										*6AN6*
Class A Amplifier	125	125	R_k = 56	12	3.8	170,000	7,800	—	—	—	*6AN8*
Class A Amplifier	150	—	3.0	15	—	4,700	4,500	21	—	—	*6AN8-A* ¶
Class A Amplifier	180	180	8.5	29†	3.0†	58,000	3,700	—	5,500	2.0	*6AQ5*
	250	250	12.5	45†	4.5†	52,000	4,100	—	5,000	4.5	
Vertical Amplifier	250	—	12.5	49.5	—	1,970	4,800	9.5	—	—	*6AQ5-A* ¶
	Max positive pulse plate voltage ◈ = 1100 v; max d-c cathode current ◈ = 40 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Output	Grid-plate
6AQ6	Duplex-Diode High-Mu Triode	7BT	5-2	6.3	0.15	—	300	—	1.7	1.5	1.8
6AQ7-GT	Duplex-Diode High-Mu Triode	8CK	9-11 9-41	6.3	0.3	1.0	250	—	—	—	—
6AQ8	Twin Triode	9AJ	6-2	6.3	0.435	2.5♠ 4.5⊕	300	—	3.0▲	1.2▲	1.5▲
6AR5	Power Amplifier Pentode	6CC	5-3	6.3	0.4	8.5	250	250 2.5	—	—	—
6AR6	Beam Power Amplifier	6BQ	T-X	6.3	1.2	21▣	630▣	315▣ 3.5▣	11.0▲	7.0▲	0.8▲ ♣
6AR8	Double Plate Sheet-Beam Tube	9DP	6-3	6.3	0.3	2.0♠	300	300	—	—	—
6AR11■	Twin Pentode	12DM	9-58	6.3	0.8	3.1◈ ♠	330◈	330§◈ ♠ 0.65◈ ♠	10	2.8₁ 3.0₂	0.026
6AS5	Beam Power Amplifier	7CV	5-3	6.3	0.8	5.5	150	117 1.0	12▲	9.0▲	0.6▲
6AS6	Dual-Control RF Pentode	7CM	5-1	6.3	0.175	1.7	180	140 0.75	4.0	3.0	0.02♣
6AS7-G	Low-Mu Twin Triode	8BD	16-3	6.3	2.5	13♠	250	—	—	—	—
6AS7-GA	Low-Mu Twin Triode	8BD	12-16	6.3	2.5	13♠	250	—	—	—	—
6AS7-GYB	Low-Mu Twin Triode	8BD	12-16	6.3	2.5	13♠	250	—	—	—	—
6AS8	Diode Sharp-Cutoff RF Pentode	9DS	6-2	6.3	0.45	2.5	300	300§ 0.5	Pentode Section		
									Diode Section		
6AS11■	Dissimilar-Double-Triode Pentode	12DP	9-58	6.3	1.05	5.0◈	330◈	330§◈ 1.1◈	Pentode Section		
						1.5◈	330◈	—	Triode Section 1 (Pins 5, 6, 8)		
						2.0◈	330◈	—	Triode Section 2 (Pins 3, 4, 7)		
6AT6	Duplex-Diode High-Mu Triode	7BT	5-2	6.3	0.3	0.5	300	—	2.2▲	0.8▲	2.0▲
6AT8	Triode-Pentode Converter	9DW	6-2	6.3	0.45	2.3◈	275◈	275◈§ 0.45◈	Pentode Section		
6AT8-A¶						1.7◈	275◈	—	Triode Section		
6AU4-GT	Half-Wave High-Vacuum Rectifier	4CG	9-44	6.3	1.8	6.0	Tube Voltage Drop: 25 v at 350 ma d-c				
6AU4-GTA	Half-Wave High-Vacuum Rectifier	4CG	9-44	6.3	1.8	6.5	Tube Voltage Drop: 25 v at 350 ma d-c				
6AU5-GT	Beam Power Amplifier	6CK	9-11 or 9-41	6.3	1.25	10	550§	200	11.3▲	7.0▲	0.5▲
6AU6 *6AU6-A*¶	Sharp-Cutoff RF Pentode	7BK	5-2	6.3	0.3	3.5◈	300◈	330◈§ 0.75◈	Pentode Connection		
						3.5◈	275◈	—	Triode Connection (G_2, G_3, & P tied)		

■Compactron.
† Zero signal.
♠Per section.
‡ Plate-to-plate.
♣Maximum.
§ Supply voltage.
●Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	*6AQ6*
	100	—	1.0	0.8	—	61,000	1,150	70	—	—	
Class A Amplifier	250	—	2.0	2.3	—	44,000	1,600	70	—	—	6AQ7-GT
	100	—	1.0	1.1	—	64,000	1,250	79	—	—	
Class A Amplifier ♠	250	—	2.3	10	—	9,700	5,900	57	—	—	*6AQ8*
Class A Amplifier	250	250	18	32†	5.5†	68,000	2,300	—	7,600	3.4	*6AR5*
	250	250	16.5	34†	5.7†	65,000	2,400	—	7,000	3.2	
Class A Amplifier	300	300	36.0	58	4.0	22,000	4,300	—	—	—	6AR6
Color TV Synchronous Detector	250	250	R_k = 300	10	0.4	—	4,000	—	—	—	*6AR8*
	[With plates tied together and deflectors (pins 1 and 2) grounded] Total voltage change on either deflector with an equal and opposite change on the other deflector required to switch the plate current from one plate to the other =20 volts maximum										
Class A Amplifier	125	125	R_k = 56	11	3.5	200,000	10,500	—	—	—	6AR11■
Class A Amplifier	150	110	8.5	35†	2.0†	—	5,600	—	4,500	2.2	*6AS5*
Class A Amplifier	120	120	2.0	5.2	3.5	110,000	3,200	E_{c3} = 0 volts			*6AS6*
	120	120	2.0	3.6	4.8	—	1,850	E_{c3} = −3 volts			
DC Amplifier ♠	135	—	R_k = 250	125	—	280	7,000	2.0	—	—	6AS7-G
DC Amplifier ♠	135	—	R_k = 250	125	—	280	7,000	2.0	—	—	6AS7-GA
DC Amplifier ♠	135	—	R_k = 250	125	—	280	7,000	2.0	—	—	6AS7-GYB
Class A Amplifier	200	150	R_k = 180	9.5	3.0	300,000	6,200	—	—	—	*6AS8*
Detector	Max d-c output current =5 ma; max peak inverse voltage =330 volts; max peak current =50 ma										
Class A Amplifier	200	125	R_k = 68	24	5.2	70,000	10,500	—	—	—	6AS11■
Class A Amp	200	—	2.0	7.0	—	12,400	5,500	68	—	—	
Class A Amplifier	200	—	R_k = 220	9.2	—	9,400	4,400	41	—	—	
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	*6AT6*
	100	—	1.0	0.8	—	54,000	1,300	70	—	—	
Class A Amplifier	125	125	1.0	9.0	2.2	300,000	5,500	—	—	—	*6AT8*
Class A Amplifier	125	—	1.0	12	—	6,000	6,500	40	—	—	*6AT8-A*¶
TV Damper	Max d-c output current =175 ma; max peak inverse voltage ▣ =4,500 volts; max peak current =1050 ma										6AU4-GT
TV Damper	Max d-c output current ◈ =210 ma; max peak inverse voltage ◈ =4,500 volts; max peak current ◈ =1,300 ma										6AU4-GTA
Horizontal Amplifier	115	175	20	60	6.8	6,000	5,600	—	—	—	6AU5-GT
	60	175	0	210	25	—	—	—	—	—	
	Max positive pulse plate voltage ▣ = 5,500 v; max screen dissipation =2.5 watts; max d-c cathode current =110 ma										
Class A Amplifier	250	150	R_k = 68	10.6	4.3	1,000,000	5,200	—	—	—	*6AU6* *6AU6-A*¶
	100	100	R_k = 150	5.0	2.1	500,000	3,900	—	—	—	
Class A Amplifier	250	—	R_k = 330	12.2	—	—	4,800	36	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✠Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Out-put	Grid-plate
6AU7¶	Medium-Mu Twin Triode	9A	6–2	6.3 3.15	0.3 0.6	2.75♠	300	—	1.8	2.0	1.5
6AU8¶	Triode-Pentode	9DX	6–3	6.3	0.6	3.0 2.5	300 300	300⁑ 1.0 —	Pentode Section Triode Section		
6AU8-A¶	Triode-Pentode	9DX	6–3	6.3	0.6	3.3◈ 2.8◈	330◈ 330◈	330⁑◈ 1.0◈ —	Pentode Section Triode Section		
6AV5-GA	Beam Power Amplifier	6CK	T-X	6.3	1.2	11	550⁑	175 2.5	14▲	7.0▲	0.5▲
6AV5-GT	Beam Power Amplifier	6CK	9–11 or 9–41	6.3	1.2	11	550⁑	175 2.5	14▲	7.0▲	0.7▲
6AV6	Duplex-Diode High-Mu Triode	7BT	5–2	6.3	0.3	0.5	300	—	2.2	1.2	2.0
6AV11■	Triple Triode	12BY	9–56	6.3	0.6	2.75◈♠ 6.0◈⊕	330◈♠	—	1.9▲	1.8$_1$▲ 0.7$_2$▲ 2.0$_3$▲	1.2▲
6AW7-GT	Duplex-Diode, High-Mu Triode	8CQ	9–16	6.3	0.3	—	300	—	—	—	—
6AW8¶	Triode-Pentode	9DX	6–3	6.3	0.6	3.25 1.0	300 300	300⁑ 1.0 —	Pentode Section Triode Section		
6AW8-A¶	Triode-Pentode	9DX	6–3	6.3	0.6	3.75◈ 1.1◈	330◈ 330◈	330◈⁑ 1.1◈ —	Pentode Section Triode Section		
6AX3■	Half-Wave High-Vacuum Rectifier	12BL	9–59	6.3	1.2	5.3◈	Tube Voltage Drop: 32 volts at 250 ma d-c				
6AX4-GT	Half-Wave High-Vacuum Rectifier	4CG	9–11 9–41	6.3	1.2	5.0◈	Tube Voltage Drop: 32 v at 250 ma d-c				
6AX4-GTA	Half-Wave High-Vacuum Rectifier	4CG	9–11	6.3	1.2	5.3◈	Tube Voltage Drop: 32 volts at 250 ma d-c				
6AX4-GTB	Half-Wave High-Vacuum Rectifier	4CG	9–11	6.3	1.2	5.3◈	Tube Voltage Drop: 32 volts at 250 ma d-c				
6AX5-GT	Full-Wave High-Vacuum Rectifier	6S	9–41	6.3	1.2	—	Tube Voltage Drop:♠ 50 v at 125 ma d-c				
6AX6-G	Full-Wave High-Vacuum Rectifier	7Q	14–3	6.3	2.5	—	Tube Voltage Drop:♠ 21 v at 250 ma d-c				
6AX7¶	High-Mu Twin Triode	9A	6–2	{6.3 {3.15	0.3} 0.6}	1.0♠	300	—	1.8	1.9	1.7
6AX8	Triode-Pentode	9AE	6–2	6.3	0.45	2.8 2.7	300 300	300⁑ 0.5 —	Pentode Section Triode Section		
6AY3	Half-Wave High-Vacuum Rectifier	9HP	9–86	6.3	1.2	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier ♠	250	—	8.5	10.5	—	7,700	2,200	17	—	—	*6AU7¶*
	100	—	0	11.8	—	6,500	3,100	20	—	—	
Vertical Amplifier	Max positive pulse plate voltage ▣ =1,200 volts; max d-c cathode current =20 ma										
Class A Amplifier	200	125	R_k = 82	15	3.4	150,000	7,000	—	—	—	*6AU8¶*
Class A Amplifier	150	—	R_k = 150	9.0	—	8,200	4,900	40	—	—	
Class A Amplifier	200	125	R_k = 82	17	3.4	100,000	8,000	—	—	—	*6AU8-A¶*
	40	125	0	28	10	—	—	—	—	—	
Class A Amplifier	150	—	R_k = 150	9.5	—	8,100	5,300	43	—	—	
Horizontal Amplifier	250	150	22.5	57	2.1	14,500	5,900	—	—	—	6AV5-GA
	60	150	0	260	26	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =5,500 volts; max screen dissipation =2.5 watts; max d-c cathode current =110 ma										
Horizontal Amplifier	250	150	22.5	55	2.1	20,000	5,500	—	—	—	6AV5-GT
	60	150	0	225	25	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =5,500 v; max screen dissipation =2.5 watts; max d-c cathode current =110 ma										
Class A Amplifier	250	—	2.0	1.2	—	62,500	1,600	100	—	—	*6AV6*
	100	—	1.0	0.5	—	80,000	1,250	100	—	—	
Class A Amplifier ♠	250	—	8.5	10.5	—	7,700	2,200	17	—	—	6AV11 ■
Class A Amplifier	100	—	0	1.4	—	—	1,200	80	—	—	6AW7-GT
Class A Amplifier	200	150	R_k = 180	13	3.5	400,000	9,000	—	—	—	*6AW8¶*
Class A Amplifier	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Class A Amplifier	150	150	R_k = 150	15	3.5	200,000	9,500	—	—	—	*6AW8-A¶*
	65	150	0	46	15	—	—	—	—	—	
Class A Amplifier	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
TV Damper	Max d-c output current ◈ =165 ma; max peak inverse voltage ◈ =5,000 volts; max peak current ◈ =1,000 ma										6AX3 ■
TV Damper	Max d-c output current ◈ =137 ma; max peak inverse voltage ◈ =4,400 volts; max peak current ◈ =825 ma.										6AX4-GT
TV Damper	Max d-c output current ◈ =165 ma; max peak inverse voltage ◈ =4,400 volts; max peak current ◈ =1,000 ma										6AX4-GTA
TV Damper	Max d-c output current ◈ =165 ma; max peak inverse voltage ◈ =5,000 volts; max peak current ◈ =1,000 ma										6AX4-GTB
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1250 volts; rms supply voltage per plate =350 volts; max peak current per plate =375 ma										6AX5-GT
Full-Wave Rectifier	Max d-c output current =250 ma; max peak inverse voltage =1250 volts; rms supply voltage per plate =350 volts; max peak current per plate =600 ma										6AX6-G
TV Damper	Max d-c output current per plate =125 ma; max peak inverse voltage =2000 volts; max peak current per plate =600 ma										
Class A Amplifier ♠	100	—	1.0	0.5	—	80,000	1,250	100	—	—	*6AX7¶*
	250	—	2.0	1.2	—	62,500	1,600	100	—	—	
Class A Amplifier	250	110	R_k = 120	10	3.5	400,000	4,800	—	—	—	*6AX8*
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	
TV Damper	Max d-c output current ◈ =175 ma; max peak inverse voltage ◈ =5000 volts; max peak current ◈ =1,100 ma										6AY3

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
6AY3-A	Half-Wave High-Vacuum Rectifier	9HP	9–85	6.3	1.2	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
6AY3-B	Half-Wave High-Vacuum Rectifier	9HP	T-X	6.3	1.2	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
6AY11■	Duplex-Diode Twin Triode	12DA	9–56	6.3	0.69	1.0◈ ♠	330◈	—	Triode Sections Diode Sections		
6AZ5◉	Twin Diode	8DF	3–1	6.3	0.15	—	Tube Voltage Drop:♠ 10 v at 15 ma d-c				
6AZ6◉	Twin Diode	8EH	3–11	6.3	0.15	—	Tube Voltage Drop:♠ 3.5 v at 8 ma d-c				
6AZ8	Triode-Pentode	9ED	6–2	6.3	0.45	2.0 2.6	300 300	300⁑ 0.5 —	Pentode Section Triode Section		
6B4-G	Power Amplifier Triode	5S	16–3	6.3	1.0	15	325	—	Single tube 2 tubes, Push-pull		
6B5	Direct-Coupled Power Amplifier Triode	6AS	14–1	6.3	0.8	13.5 2.5	300	300	—	—	—
6B6-G	Duplex Diode High-Mu Triode	7V	12–8	6.3	0.3	—	250	—	—	—	—
6B7	Duplex-Diode Remote-Cutoff Pentode	7D	12–6	6.3	0.3	2.25	300	125 0.3	3.5▲	9.5▲	.007 ♣
6B8 6B8-G 6B8-GT	Duplex-Diode Remote-Cutoff Pentode	8E	8–4 12–8 9–20	6.3	0.3	3.0 2.25 3.0	300	125 0.3	6.0 3.6 4.5	7.5 9.5 10.0	.005♣ .01♣ .005♣
6B10¶■	Duplex-Diode Medium-Mu Twin Triode	12BF	9–56	6.3	0.6	2.5◈ ♠	330◈	—	1.7_1▲ 1.8_2▲ Diode Sections	1.6_1▲ 0.6_2▲	1.5▲
6BA3	Half-Wave High-Vacuum Rectifier	9HP	T-X	6.3	1.2	5.3◈	Tube Voltage Drop: 32 volts at 250 ma d-c				
6BA4	High-Mu Planar Triode (Planar)	6BA4	T-X	6.3	0.4	2.0▣	200	—	—	—	—
6BA5◉	Sharp-Cutoff Pentode	8DY	3–1	6.3	0.15	0.7	150	140 0.3	3.4	3.6	0.065
6BA6	Remote-Cutoff RF Pentode	7BK	5–2	6.3	0.3	3.4◈	330	330◈⁑ 0.7◈	5.5	5.5	0.0035 ♣
6BA7	Pentagrid Converter	8CT ♥	6–3	6.3	0.3	2.0	300	100 1.5	Osc I_{c1} = 0.35 ma R_{g1} = 20,000 ohms		
6BA8¶	Triode-Pentode	9DX	6–3	6.3	0.6	3.25 2.0	300 300	300⁑ 1.0 —	Pentode Section Triode Section		
6BA8-A¶	Triode-Pentode	9DX	6–3	6.3	0.6	3.25 2.0	300 300	300⁑ 1.0 —	Pentode Section Triode Section		
6BA11¶■	Triode-Twin Pentode	12ER	9–58	6.3	0.6	1.1♠ ◈ 1.5◈	300◈ 300◈	150◈ 0.75◈ —	Pentode Sections Triode Section		

■ Compactron.
† Zero signal.
♠ Per section.
‡ Plate-to-plate.
♣ Maximum.
⁑ Supply voltage.
◉ Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
▣ Absolute maximum rating.
\# Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
TV Damper	Max d-c output current ◆ = 175 ma; max peak inverse voltage ◆ = 5,000 volts; max peak current ◆ = 1,100 ma										6AY3-A
TV Damper	Max d-c output current ◆ = 175 ma; max peak inverse voltage ◆ = 5,000 volts; max peak current ◆ = 1,100 ma										6AY3-B
Class A Amplifier ♠	250	—	2.0	1.2	—	52,700	1,900	100	—	—	6AY11■
Detector ♠	Max d-c output current ◆ = 5.0 ma										
Half-Wave Rectifier	Max d-c output current per plate = 4 ma; max peak inverse voltage = 420 volts; max rms supply voltage per plate = 150 volts; max peak current per plate = 24 ma										6AZ5●
Full-Wave Rectifier	Max d-c output current = 20 ma; max peak inverse voltage = 450 volts; max rms supply voltage per plate = 200 volts; max peak current per plate = 50 ma										6AZ6●
Class A Amplifier	200	150	R_k = 180	9.5	3.0	300,000	6,000	—	—	—	*6AZ8*
Class A Amplifier	200	—	6.0	13	—	5,750	3,300	19	—	—	
Class A Amplifier	250	—	45	60†	—	800	5,250	4.2	2,500	3.2	6B4-G
Class AB_1 Amplifier	325	—	68	80†	—	—	—	—	3,000 ‡	15.0	
Class A Amplifier	300	300	0	45	8.0	24,000	2,400	—	7,000	4.0	6B5
				Input	Plate						
Class A Amplifier	250	—	2.0	0.9	—	91,000	1,100	100	—	—	6B6-G
Class A Amplifier	250	125	3.0	9.0	2.3	600,000	1,125	—	—	—	6B7
Class A Amplifier	250	125	3.0	10	2.3	600,000	1,325	—	—	—	**6B8** 6B8-G 6B8-GT
Class A Amplifier	250	—	9.5	7.0	—	9,750	1,850	18	—	—	6B10¶■
Horizontal Phase Det.	Max d-c output current ◆♠ = 5.0 ma; voltage drop: ♠ 5 volts at 20 ma d-c										
TV Damper	Max d-c output current ◆ = 165 ma; max peak inverse voltage ◆ = 5,000 volts; max peak current ◆ = 1,000 ma										6BA3
Class A Amplifier	150	—	R_k = 100	10	—	8,700	8,000	70	—	—	6BA4
Class A Amplifier	100	100	R_k = 270	5.5	2.0	175,000	2,150	—	—	—	6BA5●
Class A Amplifier	250	100	R_k = 68	11	4.2	1,000,000	4,400	—	—	—	*6BA6*
	100	100	R_k = 68	10.8	4.4	250,000	4,300	—	—	—	
Converter	250	100	1.0	3.8	10.0	1,000,000	950 #	—	—	—	*6BA7*
Class A Amplifier	200	150	R_k = 180	13	3.5	400,000	9,000	—	—	—	*6BA8*¶
Class A Amplifier	200	—	8.0	8.0	—	6,700	2,700	18	—	—	
Class A Amplifier	200	150	R_k = 180	13	3.5	400,000	9,000	—	—	—	*6BA8-A*¶
	65	150	0	42	12.5	—	—	—	—	—	
Class A Amplifier	200	—	8.0	8.0	—	6,700	2,700	18	—	—	
Sync Separator and AGC Keyer	100	67.5	I_{c1} = 0.1 ma	2.5	4.4	(Both sections operating) E_{c3} = 0 volts					6BA11¶■
	100	67.5	0	—	—	—	1,700	—	E_{c3} = 0 volts		
	(Plate and grid number 3 of opposite section grounded)										
Class A Amplifier	250	—	11	5.0	—	—	1,800	18	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
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♥G2 and G4 are screen. G3 is signal-input grid.
$_1$, $_2$, $_3$, etc. indicate tube sections.
♣Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✱ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
6BC4	UHF Triode		9DR	6–1	6.3	0.225	2.5	250	—	2.9▲	0.26▲	1.6
6BC5	Sharp-Cutoff RF Pentode		7BD	5–2	6.3	0.3	2.3◈	330◈	330◈§ 0.55◈	Pentode Connection		
							2.9◈	330◈	—	Triode Connection (G_2 & P tied)		
6BC7	Triple Diode		9AX	6–2	6.3	0.45	—	Avg Diode Current: (Diode 1 or 3 35 ma @ +5 v d-c)				
6BC8	High-Frequency Twin Triode		9AJ	6–2	6.3	0.4	2.2◈ ♠	250◈	—	2.6_1 5.5_2	1.3_1 2.4_2	1.2
6BD4 ●	Sharp-Cutoff Beam Triode	Ⓐ	8FU	T-X	6.3	0.6	20	20,000	—	3.8▲	0.04♣ ▲	1.0▲
6BD4-A ●	Sharp-Cutoff Beam Triode	Ⓐ	8FU	T-X	6.3	0.6	25	27,000	—	3.8▲	0.04♣ ▲	1.0▲
6BD5-GT	Beam Power Amplifier		6CK	T-X	6.3	0.9	10	325	325 3.0	—	—	—
6BD6	Remote-Cutoff RF Pentode		7BK	5–2	6.3	0.3	3.0	300	125 0.65	4.3	5.0	0.005 ♣
6BD11 ■	Dissimilar Double Triode Pentode		12DP	9–58	6.3	1.05	4.0◈	330◈	330§◈ 1.1◈	Pentode Section		
							1.5◈	330◈	—	Triode Section 1 (Pins 5, 6, 8)		
							2.0◈	330◈	—	Triode Section 2 (Pins 3, 4, 7)		
6BE3 ■	Half-Wave High-Vacuum Rectifier		12GA	9–60	6.3	1.2	6.5◈	Tube Voltage Drop. 25 volts at 350 ma d-c				
6BE3-A ■	Half-Wave High-Vacuum Rectifier		12GA	9–60	6.3	1.2	6.5◈	Tube Voltage Drop: 22.5 volts at 350 ma d-c				
6BE6	Pentagrid Converter		7CH ♥	5–2	6.3	0.3	1.1◈	330◈	110◈ 1.1◈	Osc I_{c1} = 0.5 ma R_{g1} = 20,000 ohms		
6BE8	Triode-Pentode		9EG	6–2	6.3	0.45	2.8	300	300§ 0.5	Pentode Section		
							2.5	300	—	Triode Section		
6BE8-A ¶	Triode-Pentode		9EG	6–2	6.3	0.45	2.8	300	300§ 0.5	Pentode Section		
							2.5	300	—	Triode Section		
6BF5	Beam Power Amplifier		7BZ	5–3	6.3	1.2	5.5	250	117 1.25	Pentode Connection		
							5.0	250	—	Triode Connection (G_2 & P tied)		
6BF6	Duplex-Diode Medium-Mu Triode		7BT	5–2	6.3	0.3	2.5	300	—	1.8	0.7	1.9
6BF7 ◉	Medium-Mu Twin Triode		8DG	3–2	6.3	0.3	1.0♠	110	—	2.0	1.6_1 2.0_2	1.5
6BF7-A ◉	Medium-Mu Twin Triode		8DG	3–2	6.3	0.3	1.1♠ ⊞	120⊞	—	2.0	1.6_1 2.0_2	1.5
6BF8	Sextuple Diode		9NX	6–2	6.3	0.45	—	—	Tube Voltage Drop:♠ 1.4 volts at 5.0 ma d-c			
6BF11 ■	Dissimilar Double Pentode		12EZ	9–59	6.3	1.2	6.5◈	165◈	150◈ 1.8◈	Section 1 (Pins 8, 9, 10, 11)		
							1.7◈	330◈	330§◈ 1.1◈	Section 2 (Pins 2, 3, 5, 6, 7)		

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
[▲]—X-Radiation Rated, and Ⓐ—No X-Radiation Rating.

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. § Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ⊞Absolute maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	150	—	R_k = 100	14.5	—	4,800	10,000	48	—	—	*6BC4*
Class A Amplifier	250	150	R_k = 180	7.5	2.1	800,000	5,700	—	—	—	*6BC5*
	125	125	R_k = 100	8.0	2.4	500,000	6,100	—	—	—	
	100	100	R_k = 180	4.7	1.4	600,000	4,900	—	—	—	
Class A Amplifier	250	—	R_k = 820	6.0	—	9,000	4,400	40	—	—	
	180	—	R_k = 330	8.0	—	6,000	6,000	42	—	—	
Half-Wave Rectifier	Max d-c output current per plate = 12 ma										*6BC7*
Class A Amplifier ♦	150	—	R_k = 220	10	—	5,300	6,200	35	—	—	*6BC8*
HV Shunt Regulator	Max unregulated d-c supply voltage = 40,000 volts; max d-c plate current = 1.5 ma.										6BD4 ●
HV Shunt Regulator	Max unregulated d-c supply voltage = 55,000 volts; max d-c plate current = 1.5 ma.										6BD4-A ●
Horizontal Amplifier	Max positive pulse plate voltage = 4,000 volts; max screen dissipation = 3.0 watts; max d-c cathode current = 100 ma.										6BD5-GT
Class A Amplifier	250	100	3.0	9	3	800,000	2,000	—	—	—	*6BD6*
	100	100	1.0	13	5	150,000	2,550	—	—	—	
Class A Amplifier	135	135	R_k = 100	17	4.0	45,000	10,400	—	—	—	6BD11 ■
Class A Amplifier	200	—	2.0	7.0	—	12,400	5,500	68	—	—	
Class A Amplifier	200	—	R_k = 220	9.2	—	9,400	4,400	41	—	—	
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,200 ma										6BE3 ■
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,200 ma.										6BE3-A ■
Converter	250	100	1.5	2.9	6.8	1,000,000	475 #	—	—	—	*6BE6*
	100	100	1.5	2.6	7.0	400,000	455 #	—	—	—	
Class A Amplifier	250	110	R_k = 68	10	3.5	400,000	5,200	—	—	—	*6BE8*
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	
Class A Amplifier	250	110	R_k = 68	10	3.5	400,000	5,200	—	—	—	*6BE8-A* ¶
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	
Class A Amplifier	110	110	7.5	36†	4†	12,000	7,500	—	2,500	1.9	*6BF5*
Vertical Amplifier	225	—	30	10	—	2,500	2,700	6.7	—	—	
	Max positive pulse plate voltage ◙ = 900 volts; max d-c cathode current = 40 ma										
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	10,000	0.3	*6BF6*
Class A Amplifier ♦	100	—	R_k = 100	8.0	—	7,000	4,800	35	—	—	6BF7 ◉
Class A Amplifier ♦	100	—	R_k = 100	8.0	—	7,300	4,800	35	—	—	6BF7-A ◉
Detector ♦	Max d-c output current ◈ = 2.2 ma; max peak inverse voltage ◈ = 165 volts; max peak current ◈ = 11 ma										*6BF8*
Class A Amplifier	145	110	6.0	36†	3.0†	30,000	8,600	—	3,000	2.4	6BF11 ■
Class A Amplifier	150	100	R_k = 560	1.3	2.0	150,000	1,000	E_{c3} = 0 volts		—	

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	♣ Max. Screen Volts and Watts	Capacitance in Picofarads		
										Input	Output	Grid-Plate
6BG6-G 6BG6-GA	Beam Power Amplifier		5BT	16–5 12–21	6.3	0.9	20	700⁑	350 3.2	12▲	6.5▲	0.34▲
6BG7 ◉	Medium-Mu Twin Triode		8DG	3–5	6.3	0.3	1.0♠	110	—	2.0	1.6_1 2.0_2	1.5
6BH3	Half-Wave High-Vacuum Rectifier		9HP	9–86	6.3	1.6	6.5◈	Tube Voltage Drop: 33 volts at 360 ma d-c				
6BH3-A	Half-Wave High-Vacuum Rectifier		9HP	T-X	6.3	1.6	6.5◈	Tube Voltage Drop: 33 volts at 360 ma d-c				
6BH6	Sharp-Cutoff RF Pentode		7CM	5–2	6.3	0.15	3.0	300	300⁑ 0.5	5.4	4.4	0.0035 ♣
6BH8¶	Triode-Pentode		9DX	6–3	6.3	0.6	3.0 2.5	300 300	300⁑ 0.6 —	Pentode Section Triode Section		
6BH11■	Twin-Triode Pentode		12FP	9–58	6.3	0.8	2.5◈ 2.5◈ ♠	350◈ 330◈	330⁑◈ 0.55◈ —	Pentode Section Triode Sections		
6BJ3■	Half-Wave High-Vacuum Rectifier		12BL	9–59	6.3	1.2	4.0◈	Tube Voltage Drop: 21 volts at 250 ma d-c				
6BJ6	Remote-Cutoff RF Pentode		7CM	5–2	6.3	0.15	3.0	300	300⁑ 0.6	4.5	5.5	0.0035 ♣
6BJ6-A	Remote-Cutoff RF Pentode		7CM	5–2	6.3	0.15	3.0	300	300⁑ 0.6	4.5	5.5	0.0035 ♣
6BJ7	Triple Diode		9AX	6–2	6.3	0.45	—	Tube Voltage Drop:♠ 2.7 v at 10 ma d-c				
6BJ8¶	Duplex-Diode Triode		9ER	6–3	6.3	0.6	4.0◈	330◈	—	2.8▲ Diode Sections	0.31▲	2.6▲
6BK4 ●	Sharp-Cutoff Beam Triode	(▲)	8GC	12–21 or 12–36	6.3	0.2	25	25,000	—	2.6▲	1.0▲	0.03▲
6BK4-A ●	Sharp-Cutoff Beam Triode	(▲)	8GC	12–36	6.3	0.2	30◈	27,000 ◈	—	2.6▲	1.0▲	0.03▲
6BK4-B ●	Sharp-Cutoff Beam Triode	(▲)	8GC	12–36	6.3	0.2	40◈	27,000 ◈	—	2.6▲	1.0▲	0.03▲
6BK4-C ●	Sharp-Cutoff Beam Triode	1.5 mR/hr [▲]	8GC	12–36	6.3	0.2	40◈	27,000 ◈	—	2.6▲	1.0▲	0.03▲
6BK5	Beam Power Amplifier		9BQ	6–3	6.3	1.2	9.0	250	250 2.5	13▲	5.0▲	0.6▲
6BK6	Duplex-Diode High-Mu Triode		7BT	5–3	6.3	0.3	—	300	—	—	—	—
6BK7	High-Frequency Twin Triode		9AJ	6–2	6.3	0.45	2.7♠	300	—	3.0▲	1.1_1▲ 1.0_2▲	1.9▲
6BK7-A *6BK7-B*¶	High-Frequency Twin Triode		9AJ	6–2	6.3	0.45	2.7♠	300	—	3.0▲	1.0_1▲ 0.9_2▲	1.8▲
6BK11¶■	Three Section Triode		12BY	9–56	6.3	0.6	0.4◈ 0.4◈	330◈ 330◈	— —	Section 1 (Pins 4, 9, 10) Sections 2 and 3 (Pins 5, 6, 7 and 2, 3, 11)		
6BL4	Half-Wave High-Vacuum Rectifier		8GB	12–26	6.3	3.0	8.0	Tube Voltage Drop: 20 v at 400 ma d-c				
6BL7-GT	Medium-Mu Twin Triode		8BD	9–41	6.3	1.5	10♠ 12⊕	500	—	4.2_1▲ 4.6_2▲	0.9▲	6.0▲

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
[▲] —X-Radiation Rated, and (▲)— No X-Radiation Rating.

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ⊞Absolute maximum rating.
♠Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	250	250	15	75	4.0	25,000	6,000	—	—	—	6BG6-G
	60	250	0	180	18	—	—	—	—	—	6BG6-GA
	Max positive pulse plate voltage ▣ =6600 volts; max screen dissipation = 3.2 watts; max d-c cathode current =110 ma										
Class A Amplifier ♠	100	—	R_k = 100	8.0	—	7,000	4,800	35	—	—	6BG7 ◉
TV Damper	Max d-c output current ◈ =180 ma; max peak inverse voltage ◈ =5500 volts; max peak current ◈ =1100 ma										6BH3
TV Damper	Max d-c output current ◈ = 180 ma; max peak inverse voltage ◈ = 5,500 volts; max peak current ◈ = 1,100 ma										6BH3-A
Class A Amplifier	100	100	1.0	3.6	1.4	700,000	3,400	—	—	—	*6BH6*
	250	150	1.0	7.4	2.9	1,400,000	4,600	—	—	—	
Class A Amplifier	200	125	R_k = 82	15	3.4	150,000	7,000	—	—	—	*6BH8*¶
Class A Amplifier	150	—	5.0	9.5	—	5,150	3,300	17	—	—	
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	6BH11 ■
Class A Amplifier	120	—	1.0	13.5	—	5,400	8,500	46	—	—	
TV Damper	Max d-c output current ◈ =140 ma; max peak inverse voltage ◈ = 3,300; max peak current ◈ =840 ma										6BJ3 ■
Class A Amplifier	250	100	1.0	9.2	3.3	1,300,000	3,600	—	—	—	*6BJ6*
	100	100	1.0	9.0	3.5	250,000	3,650	—	—	—	
Class A Amplifier	250	100	1.0	9.2	3.3	1,300,000	3,600	—	—	—	*6BJ6-A*
	100	100	1.0	9.0	3.5	250,000	3,650	—	—	—	
DC Restorer Service	Max d-c output current per plate =1.0 ma; max peak inverse voltage =330 volts; max peak current per plate =10 ma										*6BJ7*
Class A Amplifier	250	—	9.0	8.0	—	7,150	2,800	20	—	—	*6BJ8*¶
	90	—	0	13.5	—	4,700	4,700	22	—	—	
Vertical Amplifier	Max positive pulse plate voltage ◈ =1,200 volts; max d-c cathode current ◈ =22 ma										
Horizontal Phase Det.	Max d-c output current ♠ ◈ =9.0 ma; voltage drop ♠: 2.6 volts at 9.0 ma d-c										
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current =1.5 ma; amplification factor = 2,000.										6BK4 ●
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current = ◈ 1.6 ma.										6BK4-A ●
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current = ◈ 1.6 ma.										6BK4-B ●
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current = ◈ 1.5 ma.										6BK4-C ●
Class A Amplifier	250	250	5.0	35†	3.5†	100,000	8,500	—	6,500	3.5	*6BK5*
Class A Amplifier	250	—	2.0	1.2	—	62,500	1,600	100	—	—	*6BK6*
	100	—	1.0	0.5	—	80,000	1,250	100	—	—	
Class A Amplifier ♠	150	—	R_k = 56	18	—	4,700	8,500	40	—	—	*6BK7*
	100	—	R_k = 120	9.0	—	6,100	6,100	37	—	—	
Class A Amplifier ♠	150	—	R_k = 56	18	—	4,600	9,300	43	—	—	*6BK7-A* *6BK7-B*¶
Class A Amplifier	250	—	2.5	1.6	—	45,000	1,550	70	—	—	6BK11¶ ■
Class A Amplifier	250	—	2.0	1.2	—	62,500	1,600	100	—	—	
TV Damper	Max d-c output current =200 ma; max peak inverse voltage ▣ =4500 volts; max peak current =1200										6BL4
Vertical Amplifier ♠	250	—	9.0	40	—	2,150	7,000	15	—	—	6BL7-GT
	250	—	17	4.0	—	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =2,000; max d-c cathode current =60 ma										

Metal tubes are shown in bold-face type, ***miniature tubes in italics.***
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
6BL7-GTA	Medium-mu Twin Triode	8BD	9–41	6.3	1.5	10♠ 12⊕	500	—	4.2_1▲ 4.6_2▲	0.9▲	6.0▲
6BL8	Triode-Pentode	9AE	6–2	6.3	0.45	1.7 1.5	250 250	200 0.75 —	Pentode Section Triode Section		
6BM8	Triode-Pentode	9EX	6–4	6.3	0.78	5.0 1.0	600 300	300 1.8 —	Pentode Section Triode Section		
6BN4	High-Frequency Triode	7EG	5–2	6.3	0.2	2.2◈	275◈	—	3.2	1.4	1.2
6BN4-A	High-Frequency Triode	7EG	5–2	6.3	0.2	2.2	275	—	3.2	1.4	1.2
6BN6	Gated-Beam Discriminator	7DF	5–3	6.3	0.3	—	330◈	110◈	E_c1 = 1.25 volts RMS		
6BN7	Double Triode	9BT	6–3	6.3	0.75	7.5 1.5	400 400	— —	Section 1 (Pins 6, 7, 9) Section 2 (Pins 1, 2, 3)		
6BN8¶	Duplex-Diode High-mu Triode	9ER	6–3	6.3	0.6	1.7◈	330◈	—	3.6▲ Diode Sections	0.25▲	2.5▲
6BN11■	Twin Pentode	12GF	9–58	6.3	0.8	3.1◈ ♠	330◈	330⁑◈ 0.65◈	12	2.8	0.04_1 0.03_2
6BQ5	Beam Power Amplifier	9CV	6–4	6.3	0.76	12	300	300 2.0	—	—	—
6BQ6-G 6BQ6-GTA	Beam Power Amplifier	6AM	12–8 9–49, 9–50	6.3	1.2	11	600⁑	175 2.5	—	—	—
6BQ6-GA 6BQ6-GTB	Beam Power Amplifier	6AM	T-X 9–49, 9–50	6.3	1.2	11	600⁑	200 2.5	15▲	7.0▲	0.6▲
6BQ6-GT	Beam Power Amplifier	6AM	9–49, 9–50	6.3	1.2	11	550⁑	175 2.5	15▲	7.5▲	0.o▲
6BQ7	High-Frequency Twin Triode	9AJ	6–2	6.3	0.4	2.0♠	250	—	2.85_1	1.35_1	1.15
6BQ7-A	High-Frequency Twin Triode	9AJ	6–2	6.3	0.4	2.0♠	250	—	2.6_1	1.2_1	1.2
6BR3	Half-Wave High-Vacuum Rectifier	9CB	T-X	6.3	1.2	6.5◈	Tube Voltage Drop: 19 volts at 250 ma d-c				
6BR8	Triode-Pentode	9FA	6–2	6.3	0.45	2.8 2.7	300 300	300⁑ 0.5 —	Pentode Section Triode Section		
6BR8-A¶	Triode-Pentode	9FA	6–2	6.3	0.45	3.0◈ 2.5◈	330◈ 330◈	330◈⁑ 0.55◈ —	Pentode Section Triode Section		
6BS3	Half-Wave High-Vacuum Rectifier	9HP	9–86	6.3	1.2	6.0◈	Tube Voltage Drop: 12 volts at 140 ma d-c				

■Compactron.
† Zero signal.
♠Per section.
‡ Plate-to-plate.
♣Maximum.
⁑ Supply voltage.
◉Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
⊡Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Vertical Amplifier ♣	250	—	9.0	40	—	2,150	7,000	15	—	—	6BL7-GTA
	250	—	17	4.0	—	—	—	—	—	—	
	150	—	0	65	—	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =2,000; max d-c cathode current =60 ma										
Class A Amplifier	170	170	2.0	10	2.8	400,000	6,200	—	—	—	*6BL8*
Class A Amplifier	100	—	2.0	14	—	4,000	5,000	20	—	—	
Class A Amplifier	200	200	16	35	7.0	20,000	6,400	—	5,600	3.5	*6BM8*
	100	100	6.0	26	5.0	15,000	6,800	—	3,900	1.05	
Class A Amplifier	100	—	0	3.5	—	—	2,500	70	—	—	
Class A Amplifier	150	—	R_k = 220	9.0	—	6,300	6,800	43	—	—	*6BN4*
Class A Amplifier	150	—	R_k = 220	9.0	—	5,400	7,700	43	—	—	*6BN4-A*
FM Limiter-Discriminator	285‡	100	R_k = 200 to 400	0.49	9.8	—	—	—	330000	—	*6BN6*
Vertical Amplifier	250	—	15.0	24	—	2,200	5,500	12	—	—	*6BN7*
	Max positive pulse plate voltage =1,500 volts										
Class A Amplifier	120	—	1.0	5	—	14,000	2,000	28	—	—	
Class A Amplifier	250	—	3.0	1.6	—	28,000	2,500	70	—	—	*6BN8*¶
	100	—	1.0	1.5	—	21,000	3,500	75	—	—	
Horizontal Phase Det.	Max d-c output current ♣ ◈ =9.0 ma; voltage drop: ♣2.6 volts at 9.0 ma d-c										
Class A Amplifier ♣	125	125	R_k = 56	11	3.8	200,000	13,000	(g3 connected to k at socket)			6BN11■
Class A Amplifier	250	250	R_k = 135	48†	5.5†	38,000	11,300	—	5,200	6.0	*6BQ5*
Horizontal Amplifier	250	150	22.5	55	2.1	20,000	5,500	—	—	—	6BQ6-G 6BQ6-GTA
	60	150	0	225	25	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =6000 volts; max screen dissipation = 2.5 watts; max d-c cathode current =110 ma										
Horizontal Amplifier	250	150	22.5	57	2.1	14,500	5,900	—	—	—	6BQ6-GA 6BQ6-GTB
	60	150	0	260	26	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =6,000 volts; max screen dissipation =2.5 watts; max d-c cathode current =110 ma										
Horizontal Amplifier	250	150	22.5	55	2.1	20,000	5,550	—	—	—	6BQ6-GT
	60	150	0	225	25	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =5500 volts; max screen dissipation =2.5 watts; max d-c cathode current =110 ma										
Class A Amplifier ♣	150	—	R_k = 220	9	—	5,800	6,000	35	—	—	*6BQ7*
Class A Amplifier ♣	150	—	R_k = 220	9.0	—	5,900	6,400	38	—	—	*6BQ7-A*
TV Damper	Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ =5,500; max peak current ◈ =1,200 ma.										6BR3
Class A Amplifier	250	110	R_k = 68	10	3.5	400,000	5,200	—	—	—	*6BR8*
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	
Class A Amplifier	125	110	1.0	9.5	3.5	200,000	5,000	—	—	—	*6BR8-A*¶
Class A Amplifier	125	—	1.0	13.5	—	5,300	7,500	40	—	—	
TV Damper	Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ =5,000; max peak current ◈ =1,100 ma.										6BS3

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦ G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✤Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✠ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
6BS3-A	Half-Wave High-Vacuum Rectifier		9HP	T-X	6.3	1.2	6.0◈	Tube Voltage Drop: 12 volts at 140 ma d-c				
6BS8	Medium-mu Twin Triode		9AJ	6-2	6.3	0.4	2.0♠	150	—	2.6$_1$	1.2$_1$	1.15
6BT6	Duplex-Diode High-Mu Triode		7BT	5-3	6.3	0.3	—	300	—	—	—	—
6BT8	Duplex-Diode Pentode		9FE	6-2	6.3	0.45	2.0	300	300⁑ 0.5	7.0▲ Diode Sections	2.3▲	0.04♣ ▲
6BU4 ●	Sharp-Cutoff Beam Triode	Ⓐ	8GC	T-X	6.3	0.45	25	25,000	—	—	—	—
6BU5 ●	Sharp-Cutoff Beam Pentode	Ⓐ	6BU5	T-X	6.3	0.15	20	20,000	100 0.1	3.0▲	0.9▲	0.024 ▲
6BU6	Duplex-Diode Medium-Mu Triode		7BT	5-3	6.3	0.3	—	300	—	—	—	—
6BU8	Twin Pentode		9FG	6-3	6.3	0.3	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
6BU8-A†	Twin Pentode		9FG	6-3	6.3	0.3	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
6BV8¶	Duplex-Diode Triode		9FJ	6-2	6.3	0.6	2.7◈	330◈	—	3.6 Diode Sections	0.4	2.0
6BV11■	Twin Pentode		12HB	9-59	6.3	0.9	1.7 ◈♠	300◈	300⁑◈ 0.1◈♠	—	—	—
6BW3■	Half-Wave High-Vacuum Rectifier		12FX	9-60	6.3	1.6	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
6BW4	Full-Wave High-Vacuum Rectifier		9DJ	6-3	6.3	0.9	—	Tube Voltage Drop:♠ 40 v at 100 ma d-c				
6BW6	Beam Power Amplifier		9AM	6-3	6.3	0.45	12	315	285 2.0	—	—	—
6BW8	Duplex-Diode Pentode		9HK	6-2	6.3	0.45	3.0◈	330◈	330◈⁑ 0.55◈	4.8▲ Diode Sections	2.6▲	0.02▲ ♣
6BW11■	Dissimilar Double Pentode		12HD	9-58	6.3	0.8	4.0◈ 3.1◈	330◈ 330◈	330⁑◈ 0.8◈ 330⁑◈ 0.65◈	Section 1 (Pins 7, 8, 9, 10, 11) Section 2 (Pins 2, 3, 4, 5, 6)		
6BX7-GT	Medium-Mu Twin Triode		8BD	9-41	6.3	1.5	10♠ 12⊕	500	—	4.4$_1$▲ 4.8$_2$▲	1.1$_1$▲ 1.2$_2$▲	4.2$_1$▲ 4.0$_2$▲
6BX8	High-Frequency Twin Triode		9AJ	6-2	6.3	0.4	2.0◈ ♠	150◈	—	2.4$_2$	1.25$_2$	1.4
6BY4	High-mu Triode (Planar)		6BY4	T-X	6.3	0.2	1.1◈	300◈	—	—	—	—
6BY5-G	Full-Wave High-Vacuum Rectifier		6CN	14-3	6.3	1.6	—	Tube Voltage Drop:♠ 32 volts at 175 ma d-c				
6BY5-GA	Full-Wave High-Vacuum Rectifier		6CN	12-14	6.3	1.6	—	Tube Voltage Drop:♠ 32 volts at 175 ma d-c				

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
[▲]—X-Radiation Rated, and Ⓐ—No X-Radiation Rating.

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4

Service	Plate Volts	Screen Volts	eg rid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 5,000; max peak current ◈ = 1,100 ma										6BS3-A
Class A Amplifier ♠	150	—	R_k = 220	10	—	5,000	7,200	36	—	—	*6BS8*
Class A Amplifier	250 100	— —	3.0 1.0	1.0 0.8	— —	58,000 54,000	1,200 1,300	70 70	— —	— —	*6BT6*
Class A Amplifier Horizontal Phase Det.	200	150	R_k = 180	9.5	2.8	300,000	6,200	—	—	—	*6BT8*
	Max d-c output current ♠ = 1.0 ma; voltage drop ♠: 10 volts at 8.0 ma d-c										
HV Shunt Regulator	Max unregulated d-c supply voltage = 55,000 volts; max d-c cathode current = 10 ma.										6BU4 ●
HV Shunt Regulator	20000	70	2.4	1.0	0.4	—	—	—	E_{c3} = 0 volts		6BU5 ●
	Max screen dissipation = 0.1 watt; d-c cathode current = 2.5 ma.										
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	10,000	0.30	*6BU6*
Sync Separator and AGC Keyer	100 100	67.5 67.5	I_{c1} = 0.1 ma 0	2.2 —	5.0 —	— —	— 1,500	— —	E_{c3} = 0 volts E_{c3} = 0 volts		*6BU8*
	(Characteristics given are for each section separately with plate and grid number 3 of opposite section grounded)										
Sync Separator and AGC Keyer	100 100	67.5 67.5	I_{c1} = 0.1 ma 0	2.2 —	3.3 —	— —	— 1,500	— —	E_{c3} = 0 volts E_{c3} = 0 volts		*6BU8-A*
	(Characteristics given are for each section separately with plate and grid number 3 of opposite section grounded)										
Class A Amplifier	200 75	— —	R_k = 330 0	11 14	— —	5,900 —	5,600 —	33 —	— —	— —	*6BV8*¶
Synchronous Detector	Max d-c output current ♠ = 10 ma; voltage drop ♠: 5.0 volts at 23 ma d-c										
Avg. Char. ♠	150	100	R_k = 180	3.6	2.0	200,000	3,700	(E_{c3} = 0 volts)			6BV11 ■
TV Damper	Max d-c output current ◈ = 175 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,100 ma.										6BW3 ■
Full-Wave Rectifier	Max d-c output current = 100 ma; max peak inverse voltage = 1,275 volts; rms supply voltage per plate = 325 volts; max peak current per plate = 350 ma										*6BW4*
Class A Amplifier	315 250 180	225 250 180	13.0 12.5 8.5	34† 45† 29†	2.2† 4.5† 3†	77,000 52,000 58,000	3,750 4,100 3,700	— — —	8,500 5,000 5,500	5.5 4.5 2.0	*6BW6*
Class A Amplifier Horizontal Phase Det.	250	110	R_k = 68	10	3.5	250,000	5,200	—	—	—	*6BW8*
	Max d-c output current ◈♠ = 5.0 ma; voltage drop ♠: 5 volts at 20 ma d-c										
Avg. Char. Avg. Char.	125 125	125 125	R_k = 56 R_k = 56	22 11	4.8 3.8	120,000 200,000	8,500 13,000	— —	— —	— —	6BW11 ■
Vertical Amplifier ♠	250 100	— —	R_k = 390 0	42 80	— —	1,300 —	7,600 —	10 —	— —	— —	6BX7-GT
	Max positive pulse plate voltage ▣ = 2000; max d-c cathode current = 60 ma										
Class A Amplifier ♠	65	—	1.0	9.0	—	3,750	6,700	25	—	—	*6BX8*
Class A Amplifier	200	—	R_k = 200	5.0	—	16,700	6,000	100	—	—	*6BY4*
Full-Wave Rectifier	Max d-c output current = 175 ma; max peak inverse voltage = 1400 volts; rms supply voltage per plate = 375 volts; max peak current per plate = 525 ma;										6BY5-G
TV Damper	Max d-c output current = 175 ma; max peak inverse voltage = 3000 volts; max peak current per plate = 525 ma										
Full-Wave Rectifier	Max d-c output current = 175 ma; max peak inverse voltage ▣ = 1400 volts; max peak current per plate = 525 ma										6BY5-GA
TV Damper	Max d-c output current = 175 ma; max peak inverse voltage ▣ = 3000 volts; max peak current per plate = 525 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
6BY6	Dual-Control Heptode	7CH ♥	5–2	6.3	0.3	2.3 ◈	330 ◈	330 ◈⁑ 1.1 ◈	—	—	—
6BY8¶	Diode-Pentode	9FN	6–3	6.3	0.6	3.0	300	300⁑ 0.65	5.5	5.0	0.0035 ♣
									Diode Section		
6BY11 ■	Dissimilar Double Pentode	12EZ	9–59	6.3	1.2	10◈ 1.7◈	200◈ 300◈	150◈ 1.8◈ 300⁑◈ 1.0◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 5, 6, 7)		
6BZ3 ■	Half-Wave, High-Vacuum Rectifier	12FX	9–60	6.3	1.2	6.5 ◈	Tube Voltage Drop: 21 volts at 350 ma d-c				
6BZ6	Semi-Remote-Cutoff RF Pentode	7CM	5–2	6.3	0.3	2.3 ◈	330 ◈	330 ◈⁑ 0.55 ◈	7.0	3.0	0.015 ♣
6BZ7	High-Frequency Twin Triode	9AJ	6–2	6.3	0.4	2.0 ♠	250	—	2.6_1	1.2_1	1.2
6BZ8	High-Frequency Twin Triode	9AJ	6–2	6.3	0.4	2.2 ♠	250	—	—	—	—
6C4	Medium-Mu Triode	6BG	5–2	6.3	0.15	3.5 5.0	300 300	— —	1.8 ▲	1.3 ▲	1.6 ▲
6C5 6C5-GT	Medium-Mu Triode	6Q	8–1 9–12	6.3	0.3	2.5	300	—	3.0 4.4	11.0 12.0	2.0 2.2
6C6	Sharp-Cutoff Pentode	6F	12–2	6.3	0.3	0.75	300	125 0.75	5.0 ▲	6.5 ▲	0.007 ♣
6C7	Duplex-Diode Medium-Mu Triode	7G	12–2	6.3	0.3	—	250	—	—	—	—
6C8-G	Medium-Mu Twin Triode	8G	12–8	6.3	0.3	1.0 ♠	250	—	—	—	—
6C9	Twin Tetrode	10F	6–13	6.3	0.4	1.5 ◈ ♠ 2.5 ◈ ⊕	250 ◈	180 ◈⁑ 0.5 ◈	4.4_1 4.2_2	2.2	$.055_1$ $.06_2$
6C10¶ ■	Triple-Triode	12BQ	9–56	6.3	0.6	1.0 ◈ ♠	330 ◈	—	1.8 ▲	0.24_1 ▲ 0.34_2 ▲ 0.48_3 ▲	1.4 ▲
6CA4	Full-Wave High-Vacuum Rectifier	9M	6–4	6.3	1.0	—	—	—	—	—	—
6CA5	Beam Power Amplifier	7CV	5–3	6.3	1.2	5.0	130	130 1.4	15 ▲	9 ▲	0.5 ▲
6CA7	Power Amplifier Pentode	8EP	T-X	6.3	1.5	25	800	425 8.0	—	—	—
6CA11 ■	Dissimilar-Double-Triode Pentode	12HN	9–58	6.3	1.02	5.0◈ 1.5◈ 1.5◈	330◈ 330◈ 330◈	330⁑◈ 1.0◈ — —	Pentode Section Triode Section 1 (Pins 4, 5, 6) Triode Section 2 (Pins 2, 3, 7)		
6CB5	Beam Power Amplifier	8GD	T-X	6.3	2.5	23	700⁑	200 3.6	24 ▲	10 ▲	0.8 ▲
6CB5-A	Beam Power Amplifier	8GD	12–36	6.3	2.5	26 ◈	880 ◈⁑	220 ◈ 4.0 ◈	22 ▲	10 ▲	0.4 ▲
6CB6 *6CB6-A*¶	Sharp-Cutoff RF Pentode	7CM	5–2	6.3	0.3	2.3 ◈	330 ◈	330 ◈⁑ 0.55 ◈	6.5	3.0	0.015 ♣
6CD3 ■	Half-Wave High-Vacuum Rectifier	12FX	9–62	6.3	2.5	12 ◈	Tube Voltage Drop: 18 volts at 350 ma d-c				
6CD6-G	Beam Power Amplifier	5BT	16–5	6.3	2.5	15	700⁑	175 3.0	24 ▲	9.5 ▲	0.8 ▲

■ Compactron.
† Zero signal.
♠ Per section.
‡ Plate-to-plate.
♣ Maximum.
⁑ Supply voltage.
◉ Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
▣ Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Gated Amplifier	250	100	2.5	6.5	9	—	1,900	E_{c3} = −2.5 volts			*6BY6*
	10	25	0	1.4	3.5	—	—	E_{c3} = 0 volts			
Class A Amplifier	250	150	R_k = 68	10.6	4.3	1,000,000	5,200	G_3 tied to K			*6BY8*¶
Video Detector	100	100	R_k = 150	5.0	2.1	500,000	3,900	G_3 tied to K			
	Max d-c output current =45 ma; voltage drop: 10 volts at 60 ma d-c										
Class A Amplifier	170	140	R_k = 82	74†	3.9†	33,000	4,900	—	2,500	4.0	6BY11■
Avg. Char.	150	100	R_k = 180	2.8	3.4	110,000	2,500	(Ec3 =0 volts)			
TV Damper	Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ =4,500 volts; max peak current ◈ =1,200 ma										6BZ3■
Class A Amplifier	125	125	R_k = 56	14	3.6	260,000	8,000	—	—	—	*6BZ6*
	125	125	4.5	—	—	—	700	—	—	—	
Class A Amplifier ♠	150	—	R_k = 220	10	—	5,300	6,800	36	—	—	*6BZ7*
Class A Amplifier ♠	125	—	R_k = 100	10	—	5,600	8,000	45	—	—	*6BZ8*
Class A Amplifier	250	—	8.5	10.5	—	7,700	2,200	17	—	—	*6C4*
	100	—	0	11.8	—	6,250	3,100	19.5	—	—	
Class C Amplifier	300	—	27	25	—	Input signal =0.35 watt				5.5	
Class A Amplifier	250	—	8.0	8.0	—	10,000	2,000	20	—	—	**6C5** 6C5-GT
Class A Amplifier	250	100	3.0	2.0	0.5	1,000,000	1,225	—	—	—	6C6
Class A Amplifier	250	—	9.0	5.5	—	16,000	1,250	20	—	—	6C7
Class A Amplifier ♠	250	—	4.5	3.2	—	22,500	1,600	36	—	—	6C8-G
Class A Amplifier ♠	125	80	1.0	10	1.5	100,000	8,000	—	—	—	*6C9*
Class A Amplifier ♠	250	—	2.0	1.2	—	62,500	1,600	100	—	—	6C10¶■
	100	—	1.0	0.5	—	80,000	1,250	100	—	—	
Full-Wave Rectifier	Max d-c output current =150 ma; max peak inverse voltage =1,000 volts; max peak current per plate =450 ma										*6CA4*
Class A Amplifier	125	125	4.5	37†	4.0†	15,000	9,200	—	4,500	1.5	*6CA5*
	110	110	4.0	32†	3.5†	16,000	8,100	—	3,500	1.1	
Class A Amplifier	250	250	13.5	100†	15†	15,000	11,000	—	2,000	11	6CA7
Avg. Char.	200	120	R_k = 65	27.5	4.9	490,000	21,200	—	—	—	6CA11■
Avg. Char.	200	—	R_k = 270	7.1	—	10,000	6,300	63	—	—	
Avg. Char.	200	—	R_k = 270	7.1	—	12,400	5,500	69	—	—	
Horizontal Amplifier	175	175	30	90	6.0	5,000	8,800	—	—	—	6CB5
	Max positive pulse plate voltage ▣ =6,800 volts; max screen dissipation =3.6 watts; max d-c plate current =200 ma										
Horizontal Amplifier	175	175	30	90	6.0	5,000	8,800	—	—	—	6CB5-A
	75	150	0	460	42	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,800 volts; max screen dissipation ◈ =4.0 watts; max d-c cathode current ◈ =240 ma										
Class A Amplifier	125	125	R_k = 56	13	3.7	280,000	8,000	—	—	—	*6CB6*
	125	125	3.0	2.8	—	—	—	—	—	—	*6CB6-A*¶
TV Damper	Max d-c output current ◈ =350 ma; max peak inverse voltage ◈ =6,000 volts; max peak current ◈ =1,500 ma										6CD3■
Horizontal Amplifier	175	175	30	75	5.5	7,200	7,700	—	—	—	6CD6-G
	60	100	0	230	21	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =6600 volts; max screen dissipation = 3.0 watts; max d-c cathode current =200 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ⊞	Capacitance in Picofarads Input	Output	Grid-plate
6CD6-GA	Beam Power Amplifier	5BT	12–21	6.3	2.5	20	700§	175 3.0	22▲	8.5▲	1.1▲
6CE3■	Half-Wave, High-Vacuum Rectifier	12GK	9–62	6.3	2.5	—	Tube Voltage Drop: 20 volts at 680 ma d-c				
6CE5¶	Sharp-Cutoff RF Pentode	7BD	5–2	6.3	0.3	2.0	300	150 0.5	6.5▲	1.9▲	0.03♣ ▲
6CF6	Sharp-Cutoff RF Pentode	7CM	5–2	6.3	0.3	2.3◈	330◈	330◈§ 0.55◈	6.5	3.0	0.015 ♣
6CG3■	Half-Wave, High-Vacuum Rectifier	12HF	9–62	6.3	1.8	6.5◈	Tube Voltage Drop: 25 volts at 700 ma d-c				
6CG6	Remote-Cutoff Pentode	7BK	5–2	6.3	0.3	4.0	300	150 0.75	5.0	5.0	0.008 ♣
6CG7¶	Medium-mu Twin Triode	9AJ	6–3	6.3	0.6	4.0◈♠ 5.7◈⊕	330◈	—	2.3▲	2.2▲	4.0▲
6CG8 *6CG8-A*¶	Triode-Pentode	9GF	6–2	6.3	0.45	2.3◈ 1.7◈	275◈ 275◈	275◈§ 0.45◈ —	Pentode Section Triode Section		
6CH3	Half-Wave, High-Vacuum Rectifier	9HP	9–86	6.3	2.5	11◈	Tube Voltage Drop: 20 volts at 680 ma d-c				
6CH7	High-Frequency Twin Triode	9FC	6–2	6.3	0.4	2.0♠	250	—	2.4₁	0.8₁	1.1₁
6CH8	Triode Pentode	9FT	6–2	6.3	0.45	2.0 2.6	300 300	300§ 0.5 —	Pentode Section Triode Section		
6CJ3	Half-Wave High-Vacuum Rectifier	9SD	9–111 or 9–87	6.3	1.8	6.5	Tube Voltage Drop: 25 volts at 700 ma d-c				
6CK3	Half-Wave, High-Vacuum Rectifier	9HP	T-X or 9–86	6.3	1.2	6.5◈	Tube Voltage Drop: 16 volts at 350 ma d-c				
6CK4	Low-mu Triode	8JB	9–43	6.3	1.25	12◈	550◈	—	8.0▲	1.8▲	6.5▲
6CL3	Half-Wave, High-Vacuum Rectifier	9HP	T-X or 9–86	6.3	1.2	8.5◈	Tube Voltage Drop: 16 volts at 350 ma d-c				
6CL5	Beam Power Amplifier	8GD	12–21	6.3	2.5	25	700§	200 4.0	20▲	11.5▲	0.7▲
6CL6	Power Amplifier Pentode	9BV	6–3	6.3	0.65	7.5	300	150 1.7	11▲	5.5▲	0.12 ♣▲
6CL8¶	Triode-Tetrode	9FX	6–2	6.3	0.45	3.0◈ 2.5◈	330◈ 330◈	330◈§ 0.55◈ —	Tetrode Section Triode Section		
6CL8-A¶	Triode-Tetrode	9FX	6–2	6.3	0.45	3.0◈ 2.5◈	330◈ 330◈	330◈§ 0.55◈ —	Tetrode Section Triode Section		
6CM3	Half-Wave, High-Vacuum Rectifier	9HP	T-X	6.3	2.4	12◈	Tube Voltage Drop: 10 volts at 350 ma d-c				
6CM6	Beam Power Amplifier	9CK	6–3	6.3	0.45	12 9.0 8.0	315 315 315	285 2.0 — 285 2.0	Pentode Connection Triode (G_2 & P tied) or Pentode Connection		

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ⊞Absolute maximum rating.
♠Per section. § Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	175	175	30	75	5.5	7,200	7,700	—	—	—	**6CD6-GA**
	60	100	0	230	21	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =7,000 volts; max screen dissipation =3.0 watts; max d-c cathode current =200 ma										
TV Damper	Max d-c output current ◈ =350 ma; max peak inverse voltage ◈ =6,000 volts; max peak current ◈ =1,500 ma										6CE3 ■
Class A Amplifier	125	125	1.0	11	2.8	300,000	7,600	—	—	—	*6CE5*¶
Class A Amplifier	125	125	R_k = 56	12.5	3.7	300,000	7,800	—	—	—	*6CF6*
	125	125	3.0	2.2	—	—	—	—	—	—	
TV Damper	Max d-c output current ◈ =350 ma; max peak inverse voltage ◈ =5,000 volts; max peak current ◈ =2,100 ma										6CG3 ■
Class A Amplifier	250	150	8.0	9.0	2.3	720,000	2,000	—	—	—	*6CG6*
Class A Amplifier ♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	*6CG7*¶
	250	—	12.5	1.3	—	—	—	—	—	—	
	90	—	0	10	—	6,700	3,000	20	—	—	
Class A Amplifier	125	125	1.0	9.0	2.2	300,000	5,500	—	—	—	*6CG8* *6CG8-A*¶
Class A Amplifier	125	—	1.0	12	—	6,000	6,500	40	—	—	
TV Damper	Max d-c output current ◈ =350 ma; max peak inverse voltage ◈ = 6,000 volts; max peak current ◈ =1,500 ma										6CH3
Class A Amplifier ♠	150	—	R_k = 220	10	—	5,300	6,800	36	—	—	*6CH7*
Class A Amplifier	200	150	R_k = 180	9.5	2.8	300,000	6,200	—	—	—	*6CH8*
Class A Amplifier	200	—	6.0	13	—	5,750	3,300	19	—	—	
TV Damper	Max d-c output current ◈ = 350 ma; max peak inverse voltage ◈ = 5,500 volts; max peak current ◈ = 2,100 ma.										6CJ3
TV Damper	Max d-c output current ◈ =250 ma; max peak inverse voltage ◈ =5,200 volts; max peak current ◈ =1,200 ma										6CK3
Vertical Amplifier	250	—	28.0	40	—	1,200	5,500	6.6	—	—	6CK4
	100	—	0	125	—	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =2,000 volts; max d-c cathode current = 100 ma										
TV Damper	Max d-c output current ◈ =250 ma; max peak inverse voltage ◈ =5,500 volts; max peak current ◈ =1,300 ma										6CL3
Horizontal Amplifier	175	175	40	90	7.0	6,000	6,500	—	—	—	6CL5
	80	100	0	280	20	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =7,000 volts; max screen dissipation = 4.0 watts; max d-c cathode current =240 ma										
Class A Amplifier	250	150	3.0	30†	7.0†	150,000	11,000	—	7,500	2.8	*6CL6*
Class A Amplifier	125	125	1.0	12	4.0	120,000	6,000	—	—	—	*6CL8*¶
Class A Amplifier	125	—	1.0	14	—	5,000	8,000	40	—	—	
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,500	—	—	—	*6CL8-A*¶
	100	100	0	—	—	—	8,200	—	—	—	
Class A Amplifier	125	—	1.0	14	—	5,000	8,000	40	—	—	
TV Damper	Max d-c output current ◈ =400 ma; max peak inverse voltage ◈ =5,500 volts; max peak current ◈ =1,700 ma										6CM3
Class A Amplifier	250	250	12.5	45†	4.5†	50,000	4,100	—	5,000	4.5	*6CM6*
Vertical Amplifier	Max positive pulse plate voltage ▣ =2000 volts; max screen dissipation (pentode connection only) =1.75 watts; max d-c cathode current =40 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Out-put	Grid-plate
6CM7¶	Double Triode	9ES	6–3	6.3	0.6	1.45◈	550◈	—	Section 1 (Pins 3, 6, 7)		
						6.0◈	550◈	—	Section 2 (Pins 1, 8, 9)		
6CM8¶	Triode-Pentode	9FZ	6–2	6.3	0.45	2.0	300	300⁑	Pentode Section		
						1.0	300	0.5	Triode Section		
6CN7¶	Duplex-Diode Triode	9EN	6–2	6.3 3.15	0.3 0.6	1.1◈	330◈	—	1.5▲	0.5▲	1.8▲
									Diode Sections		
6CQ4	Half-Wave High-Vacuum Rectifier	4CG	9–44	6.3	1.6	6.5◈	—	—	Tube Voltage Drop: 25 volts at 250 ma d-c		
6CQ8¶	Triode-Tetrode	9GE	6–2	6.3	0.45	3.2◈	330◈	330◈⁑ 0.7◈	Tetrode Section		
						3.1◈	330◈	—	Triode Section		
6CR6	Diode Remote-Cutoff Pentode	7EA	5–2	6.3	0.3	2.5	300	150 0.3	—	—	—
6CR8¶	Triode-Pentode	9GJ	6–2	6.3	0.45	2.3◈	330◈	330◈⁑ 0.55◈	Pentode Section		
						2.75◈	330◈	—	Triode Section		
6CS5	Beam Power Amplifier	9GR	6–3	6.3	1.2	10	300	300⁑ 1.25	15▲	9.0▲	0.5▲
6CS6	Dual-Control Heptode	7CH ♥	5–2	6.3	0.3	1.0	300	100 1.0	5.5	7.5	0.07 ♣
6CS7¶	Double Triode	9EF	6–3	6.3	0.6	1.25	500	—	Section 1 (Pins 6, 7, 8)		
						6.5	500	—	Section 2 (Pins 1, 3, 9)		
6CS8¶	Triode-Pentode	9FZ	6–2	6.3	0.45	2.3◈	330◈	330◈⁑ 0.55◈	Pentode Section		
						2.75◈	330◈	—	Triode Section		
6CT3	Half-Wave, High-Vacuum Rectifier	9RX	T-X	6.3	1.2	4.75◈	Tube Voltage Drop: 16 volts at 350 ma d-c				
6CU5	Beam Power Amplifier	7CV	5–3	6.3	1.2	7.0◈	150◈	130◈ 1.4◈	13▲	8.5▲	0.6▲
6CU6	Beam Power Amplifier	6AM	T-X	6.3	1.2	11	600⁑	200 2.5	15▲	7.0▲	0.6▲
6CU8¶	Triode-Pentode	9GM	6–2	6.3	0.45	2.3◈	330◈	330◈ 0.55◈	Pentode Section		
						2.8◈	330◈	—	Triode Section		
6CW4	High-Mu Triode (Nuvistor)	12AQ	4–4	6.3	0.135	1.5◈	135◈	—	4.3▲	1.8▲	0.92▲
6CW5	Power Amplifier Pentode	9CV	6–4	6.3	0.76	14◈	275◈	220◈ 2.1◈	Single Tube		
									Two Tubes, Push-Pull		
6CX7	Medium-mu Twin Triode	9FC	6–2	6.3	0.4	2.0♠	250	—	2.4_1	1.3_1	1.2_1
6CX8	Triode-Pentode	9DX	6–3	6.3	0.75	5.0◈	330◈	330◈⁑ 1.1◈	Pentode Section		
						2.0◈	330◈	—	Triode Section		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Vertical Oscillator	200	—	7.0	5.0	—	10,500	2,000	21	—	—	*6CM7¶*
	Max d-c cathode current ◈ =17 ma										
Vertical Amplifier	250	—	8.0	20	—	4,100	4,400	18	—	—	
	Max positive pulse plate voltage ◈ =2,200 volts; max d-c cathode current ◈ =22 ma										
Class A Amplifier	200	150	R_k = 180	9.5	2.8	600,000	6,200	—	—	—	*6CM8¶*
Class A Amplifier	250	—	2.0	1.8	—	50,000	2,000	100	—	—	
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	*6CN7¶*
	100	—	1.0	0.8	—	54,000	1,300	70	—	—	
Horizontal Phase Det.	Max d-c output current ◈♣ =5.5 ma; voltage drop ♣: 5 volts at 20 ma d-c										
TV Damper	Max d-c output current ◈ =190 ma; max peak inverse voltage ◈ =5,500 volts max peak current ◈ =1,200 ma										6CQ4
Class A Amplifier	125	125	1.0	12	4.2	140,000	5,800	—	—	—	*6CQ8¶*
Class A Amplifier	125	—	R_k = 56	15	—	5,000	8,000	40	—	—	
Class A Amplifier	250	100	2.0	9.6	2.6	800,000	2,200	—	—	—	*6CR6*
Class A Amplifier	125	125	R_k = 56	13	3.0	300,000	7,700	—	—	—	*6CR8¶*
Class A Amplifier	125	—	2.0	12	—	5,500	4,000	22	—	—	
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	*6CS5*
	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
Gated Amplifier	100	30	1.0	1.0	1.3	1,000,000	1,100	E_{c3} = 0 volts			*6CS6*
	100	30	0	0.8	5.5	700,000	—	E_{c3} = −1.0 volts			
	10	30	0	2.0	4.5	—	—	E_{c3} = 0 volts			
Vertical Oscillator	250	—	8.5	10.5	—	7,700	2,200	17	—	—	*6CS7¶*
	Max d-c cathode current =20 ma										
Vertical Amplifier	250	—	10.5	19	—	3,450	4,500	15.5	—	—	
	Max positive pulse plate voltage ▣ =2,200; max d-c cathode current =30 ma										
Class A Amplifier	125	125	R_k = 56	13	3.0	300,000	7,700	—	—	—	*6CS8¶*
Class A Amplifier	125	—	2.0	12	—	5,500	4,000	22	—	—	
TV Damper	Max d-c output current◈ =250 ma; max peak inverse voltage◈ =5,000 volts; max peak current◈ =1,200 ma										*6CT3*
Class A Amplifier	120	110	8.0	49†	4.0†	10,000	7,500	—	2,500	2.3	*6CU5*
Horizontal Amplifier	250	150	22.5	57	2.1	14,500	5,900	—	—	—	6CU6
	60	150	0	260	26	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =6000 volts; max screen dissipation =2.5 watts; max d-c cathode current =110 ma										
Class A Amplifier	125	125	R_k = 56	12	3.8	170,000	7,800	—	—	—	*6CU8¶*
Class A Amplifier	125	—	1.0	17	—	4,100	5,800	24	—	—	
Class A Amplifier	110	—	R_k = 130	7.6	—	6,300	9,800	62	—	—	6CW4
Class A Amplifier	170	170	12.5	70†	3.5†	26,000	11,000	—	2,400	5.6	*6CW5*
Class AB_1 Amplifier	250	200	18.5	91†	4.0†	—	—	—	3,000‡	25	
Class A Amplifier ♣	150	—	R_k = 220	9.0	—	6,100	6,400	39	—	—	*6CX7*
Class A Amplifier	200	125	R_k = 68	24	5.2	70,000	10,000	—	—	—	*6CX8*
	40	125	0	40	15.5	—	—	—	—	—	
Class A Amplifier	150	—	R_k = 150	9.2	—	8,700	4,600	40	—	—	

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♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

♣ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Output	Grid-plate
6CY5	Sharp-Cutoff RF Tetrode	7EW	5–2	6.3	0.2	2.0◈	180◈	180◈⁑ 0.5◈	4.5	3.0	0.03
6CY7	Double Triode	9LG	6–3	6.3	0.75	1.0◈	350◈	—	Section 1 (Pins 6, 7, 8)		
						5.5◈	350◈	—	Section 2 (Pins 1, 3, 9)		
6CZ5¶	Beam Power Amplifier	9HN	6–4	6.3	0.45	10◈	350◈	315◈ 2.2◈	9.0▲	6.0▲	0.04▲♣
6D4	Thyratron	5AY	5–2	6.3	0.25	—	—	Tube Voltage Drop: 16 v at 25 ma d-c			
6D6	Remote-Cutoff RF Pentode	6F	12–2	6.3	0.3	2.25	300	300⁑ 0.25	4.7▲	6.5▲	0.007♣
6D7	Sharp-Cutoff Pentode	7H	12–2	6.3	0.3	—	300	125	5.2▲	6.8▲	0.01▲♣
6D8-G	Pentagrid Converter	8A♦	12–8	6.3	0.15	1.0	300	100 0.3	Osc I_{c1} = 0.4 ma R_{g1} = 50,000 ohms		
6D10■	Triple-Triode	12BY	9–56	6.3	0.45	2.0◈♦	330◈	—	2.8▲	1.4▲	1.5▲
6DA4	Half-Wave High-Vacuum Rectifier	4CG	9–11 or 9–41	6.3	1.2	5.5◈	—	—	—	—	—
6DA4-A	Half-Wave High-Vacuum Rectifier	4CG	9–41	6.3	1.2	8.0◈	—	—	Tube Voltage Drop: 30 volts at 340 ma d-c		
6DA5	Electron-Ray Indicator	9DB	6–3	6.3	0.3	0.2	300	—	Max Target Voltage = 300 Min Target Voltage = 165		
6DA7	Double Triode	9EF	6–3	6.3	1.0	2.0	300	—	Section 1 (Pins 6, 7, 8)		
						6.0	500	—	Section 2 (Pins 1, 3, 9)		
6DB5	Beam Power Amplifier	9GR	T-X	6.3	1.2	10	300	150 1.25	13▲	8.0▲	0.2▲
6DB6	Dual-Control Pentode	7CM	5–2	6.3	0.3	3.0	300	300⁑ 1.0	6.0▲	5.0▲	0.0035♣▲
6DC6	Semi-Remote-Cutoff Pentode	7CM	5–2	6.3	0.3	2.0	300	300⁑ 0.5	6.5▲	2.0▲	0.02♣▲
6DC8	Duplex-Diode-Pentode	9HE	6–3	6.3	0.3	2.25	300	125 0.45	5.0▲	5.2▲	0.0025▲♣
									Diode Sections		
6DE4	Half-Wave High-Vacuum Rectifier	4CG	9–44	6.3	1.6	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
6DE6	Sharp-Cutoff RF Pentode	7CM	5–2	6.3	0.3	2.3◈	330◈	330◈⁑ 0.55◈	6.5	3.0	0.015♣
6DE7	Double Triode	9HF	6–3	6.3	0.90	1.5◈	330◈	—	Section 1 (Pins 6, 7, 8)		
						7.0◈	275◈	—	Section 2 (Pins 1, 2, 3, 9)		

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ⊞Absolute maximum rating.
♦Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	125	80	1.0	10	1.5	100,000	8,000	—	—	—	*6CY5*
Vertical Oscillator	250	—	3.0	1.2	—	52,000	1,300	68	—	—	*6CY7*
	Max peak negative grid voltage ◈ =400										
Vertical Amplifier	150	—	R_k=620	30	—	920	5,400	5.0	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1800; max d-c cathode current ◈ = 35 ma										
Vertical Amplifier	250	250	14	46	4.6	73,000	4,800	—	—	—	*6CZ5*¶
	75	250	0	130	16	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,200; max d-c cathode current ◈ =45 ma										
Relay Control	Max d-c cathode current =25 ma; max voltage between elements =450 volts; max peak cathode current =100 ma										*6D4*
Class A Amplifier	250	100	3.0	8.2	2.0	800,000	1,600	—	—	—	6D6
Class A Amplifier	250	100	3.0	2.0	0.5	1,000,000	1,225	—	—	—	6D7
Converter	250	100	3.0	3.5	2.6	400,000	550 #	E_{c2} (Osc Plate) =250 thru 20,000 ohms I_{c2}=4.3 ma			6D8-G
Class A Amplifier ♠	125	—	1.0	4.2	—	13,600	4,200	57	—	—	6D10■
TV Damper	Max d-c output current ◈ =155 ma; max peak inverse voltage ◈ = 4,400 volts; max peak current ◈ =900 ma										6DA4
TV Damper	Max d-c output current ◈ =185 ma; max peak inverse voltage ◈ =5,000 volts max peak current ◈ =900 ma										6DA4-A
Tuning Indicator	Plate voltage =250 thru 0.5 meg; Target voltage =250; (E_c = −4 volts, shadow angle =5°) (E_c = −1 volt, shadow angle =65°, Plate current =0.37 ma, Target current =2.0 ma)										*6DA5*
Vertical Oscillator	250	—	8.0	9.0	—	7,700	2,600	20	—	—	*6DA7*
Vertical Amplifier	150	—	17.5	40	—	1,100	5,700	6.3	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage =1,800 volts; max d-c cathode current = 40 ma										
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	*6DB5*
Vertical Amplifier	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
	Max positive pulse plate voltage ◙ =2,000 volts; max d-c cathode current =55 ma										
Class A Amplifier	150	150	1.0	5.8	6.6	50,000	2,050	E_{c3} = −3.0 volts			*6DB6*
Class A Amplifier	200	150	R_k = 180	9.0	3.0	500,000	5,500	—	—	—	*6DC6*
Class A Amplifier	250	100	E_{c3} = 0 E_{c1} = 2.0	19.0	2.7	1,000,000	3,800	—	—	—	*6DC8*
AM Det.	Max d-c output current ♠ =0.8 ma										
TV Damper	Max d-c output current ◈ =180 ma; max peak inverse voltage ◈ =5,500 volts; max peak current ◈ =1,100 ma										6DE4
Class A Amplifier	125	125	R_k = 56	15.5	4.2	250,000	8,000	—	—	—	*6DE6*
	125	125	5.5	—	—	—	700	—	—	—	
Vertical Oscillator	250	—	11	5.5	—	8,750	2,000	17.5	—	—	*6DE7*
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	17.5	35	—	925	6,500	6.0	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,500 volts; max d-c cathode current ◈ =50 ma										

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
6DG6-GT	Beam Power Amplifier	7S	9–11 or 9–41	6.3	1.2	10	200	125 1.25	—	—	—
6DJ8	Twin Triode	9DE	6–2	6.3	0.365	1.8	130	—	—	—	—
6DK3	Half-Wave High-Vacuum Rectifier	9SG	9–117	6.3	1.8	9.0◈	Tube Voltage Drop: 16 volts at 400 ma d-c 25 volts at 800 ma d-c				
6DK6	Sharp-Cutoff Pentode	7CM	5–2	6.3	0.3	2.3◈	330◈	330◈**‡** 0.55◈	6.3▲	1.9▲	0.025 ♣▲
6DL3	Half-Wave High-Vacuum Rectifier	9GD	9–135	6.3	2.3	11◈	Tube Voltage Drop: 25 volts at 800 ma d-c				
6DL4	Triode	9NY	T-X	6.3	0.165	2.0	230	—	3.8	0.055	1.7
6DM4	Half-Wave High-Vacuum Rectifier	4CG	9–44	6.3	1.2	6.5◈	Tube Voltage Drop: 35 volts at 400 ma d-c				
6DM4A	Half-Wave High-Vacuum Rectifier	4CG	9–44	6.3	1.2	6.5◈	Tube Voltage Drop: 35 volts at 400 ma d-c				
6DN3	Half-Wave High-Vacuum Rectifier	9HP	9–111	6.3	2.4	9.0◈	Tube Voltage Drop: 14 volts at 350 ma d-c				
6DN6	Beam Power Amplifier	5BT	12–21	6.3	2.5	15	700**‡**	175 3.0	22▲	11.5▲	0.8▲
6DN7	Double Triode	8BD	9–5	6.3	0.9	1.0◈ 10◈	350◈ 550◈	— —	Section 1 (Pins 4, 5, 6) Section 2 (Pins 1, 2, 3)		
6DQ3 ■	Half-Wave High-Vacuum Rectifier	12HF	9–62	6.3	1.8	9.0◈	Tube Voltage Drop: 16 volts at 400 ma d-c 25 volts at 800 ma d-c				
6DQ3-A ■	Half-Wave High-Vacuum Rectifier	12HF	9–62	6.3	1.8	10◈	Tube Voltage Drop: 17 volts at 450 ma d-c 27 volts at 900 ma d-c				
6DQ4	Half-Wave High-Vacuum Rectifier	4CG	9–43	6.3	1.2	6.0◈	Tube Voltage Drop: 32 volts at 250 ma d-c				
6DQ5	Beam Power Amplifier	8JC	12–21	6.3	2.5	24◈	990◈**‡**	190◈ 3.2◈	23▲	11▲	0.5▲
6DQ6	Beam Power Amplifier	6AM	T-X	6.3	1.2	15	550**‡**	175 2.5	15▲	7.0▲	0.55▲
6DQ6-A	Beam Power Amplifier	6AM	12–51	6.3	1.2	18◈	770◈**‡**	220◈ 3.6◈	15▲	7.0▲	0.5▲
6DQ6-B	Beam Power Amplifier	6AM	12–51	6.3	1.2	18◈	770◈**‡**	220◈ 3.6◈	15▲	7.0▲	0.5▲
6DR4	High-Mu Triode	6BG	5–2	6.3	0.15	1.2◈	330◈	—	1.6▲	0.46▲	1.7▲
6DR7	Double Triode	9HF	6–3	6.3	0.9	1.0◈ 7.0◈	330◈ 275◈	—	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3, 9)		
6DS4	High-Mu Triode (Nuvistor)	12AQ	4–4	6.3	0.135	1.5◈	135◈	—	4.3▲	1.8▲	0.92▲
6DS5	Beam Power Amplifier	7BZ	5–3	6.3	0.8	9.0◈	275◈	275◈ 2.2◈	9.5▲	6.3▲	0.19▲
6DT3 ■	Half-Wave High-Vacuum Rectifier	12HF	9–62	6.3	2.4	9.0◈	Tube Voltage Drop: 14 volts at 350 ma d-c				
6DT4	Half-Wave High-Vacuum Rectifier	4CG	9–33	6.3	1.2	7.5◈	Tube Voltage Drop: 28 volts at 350 ma d-c				
6DT5	Beam Power Pentode	9HN	6–3	6.3	1.2	9.0◈	315◈	285◈ 2.0◈	12.5▲	4.9▲	0.57▲

■ Compactron.
† Zero signal.
♦ Per section.
‡ Plate-to-plate.
♣ Maximum.
‡ Supply voltage.
● Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
⊞ Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	6DG6-GT
	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
Class A Amplifier ♦	90	—	1.3	15	—	—	12,500	33	—	—	*6DJ8*
TV Damper	Max d-c output current ◈ = 400 ma; max peak inverse voltage ◈ = 6,500 volts; max peak current ◈ = 1,200 ma.										6DK3
Class A Amplifier	125	125	R_k = 56	12	3.8	350,000	9,800	—	—	—	*6DK6*
TV Damper	Max d-c output current ◈ = 400 ma; max peak inverse voltage ◈ = 6,500 volts; max peak current ◈ = 1,800 ma.										6DL3
Class A Amplifier	160	—	R_k = 100	12.5	—	—	13,500	65	—	—	*6DL4*
TV Damper	Max d-c output current ◈ = 175 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,100 ma										6DM4
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,200 ma										6DM4A
TV Damper	Max d-c output current ◈ = 350 ma; max peak inverse voltage ◈ = 5,500 volts; max peak current ◈ = 2,100 ma.										6DN3
Horizontal Amplifier	125	125	18	70	6.3	4,000	9,000	—	—	—	6DN6
	50	100	0	240	30	—	—	—	—	—	
	Max positive pulse plate voltage ▣ = 6,600 volts; max screen dissipation = 3.0 watts; max d-c cathode current = 200 ma										
Vertical Oscillator	250	—	8.0	8.0	—	9,000	2,500	22.5	—	—	6DN7
	Max peak negative grid voltage ◈ = 400 volts										
Vertical Amplifier	250	—	9.5	41	—	2,000	7,700	15.4	—	—	
	150	—	0	68	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,500; max d-c cathode current ◈ = 50 ma										
TV Damper	Max d-c output current ◈ = 400 ma; max peak inverse voltage ◈ = 6,500 max peak current ◈ = 1,200 ma.										6DQ3 ■
TV Damper	Max d-c output current ◈ = 450 ma; max peak inverse voltage ◈ = 6,500 volts; max peak current ◈ = 1,200 ma.										6DQ3-A ■
TV Damper	Max d-c output current ◈ = 175 ma; max peak inverse voltage ◈ = 5,500 volts; max peak current ◈ = 1,000 ma										6DQ4
Horizontal Amplifier	175	125	25	110	5.0	5,500	10,500	—	—	—	6DQ5
	70	125	0	550	42	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 315 ma										
Horizontal Amplifier	250	150	22.5	75	2.4	20,000	6,000	—	—	—	6DQ6
	60	150	0	300	27	—	—	—	—	—	
	Max positive pulse plate voltage ▣ = 6,000 volts; max screen dissipation = 2.5 watts; max d-c cathode current = 120 ma										
Horizontal Amplifier	250	150	22.5	55	1.5	20,000	6,600	—	—	—	6DQ6-A
	60	150	0	315	25	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,000 volts; max screen dissipation ◈ = 3.6 watts; max d-c cathode current ◈ = 155 ma										
Horizontal Amplifier	250	150	22.5	65	1.8	18,000	7,300	—	—	—	6DQ6-B
	60	150	0	345	27	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500 volts; max d-c cathode current ◈ = 175 ma										
Class A Amplifier	250	—	2.0	1.2	—	62,500	1,600	100	—	—	*6DR4*
	100	—	1.0	0.5	—	80,000	1,250	100	—	—	
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	*6DR7*
	Max d-c cathode current ◈ = 20 ma										
Vertical Amplifier	150	—	17.5	35	—	925	6,500	6.0	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage ▣ = 1,500; max d-c cathode current ◈ = 50 ma										
Class A Amplifier	110	—	R_k = 130	6.5	—	7,000	9,000	63	—	—	6DS4
Class A Amplifier	250	200	8.5	29†	3.0†	28,000	5,800	—	8,000	3.8	*6DS5*
	200	200	7.5	35†	3.0†	28,000	6,000	—	6,000	3.0	
TV Damper	Max d-c output current ◈ = 350 ma; max peak inverse voltage ◈ = 6,500 volts; max peak current ◈ = 2,100 ma.										6DT3 ■
TV Damper	Max d-c output current ◈ = 235 ma; max peak inverse voltage ◈ = 5,500 volts; max peak current ◈ = 1,450 ma										6DT4
Vertical Amplifier	250	250	16.5	44	1.5	—	6,200	—	—	—	*6DT5*
	80	250	0	195	19	—	—	—	—	—	
	Max positive pulse plate voltage ▣ = 2,200; max d-c cathode current ◈ = 55 ma										

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1, 2, 3, etc. indicate tube sections.

✱ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	⁕ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
6DT6	Sharp-Cutoff Pentode		7EN	5–2	6.3	0.3	1.7◈	330◈	330◈❢ 1.1◈	— I_{c1} =0.6 ma	—	—
6DT6-A	Sharp-Cutoff Pentode		7EN	5–2	6.3	0.3	1.7◈	330◈	330◈❢ 1.1◈	—	—	—
6DT8	High-Mu Twin Triode		9DE	6–2	6.3	0.3	2.5♠	300	—	2.7	1.6	1.6
6DV4	Medium-Mu Triode (Nuvistor)		12EA	4–4	6.3	0.135	1.0◈	125◈	—	4.4▲	1.9▲	1.8▲
6DW4	Half-Wave High-Vacuum Rectifier		9HP	9–86	6.3	1.2	8.5◈	Tube Voltage Drop: 25 volts at 350 ma d-c				
6DW4-A	Half-Wave High-Vacuum Rectifier		9HP	T-X	6.3	1.2	8.5◈	Tube Voltage Drop: 25 volts at 350 ma d-c				
6DW4-B	Half-Wave High-Vacuum Rectifier		9HP	T-X	6.3	1.2	8.5◈	Tube Voltage Drop: 25 volts at 350 ma d-c				
6DW5	Beam Power Amplifier		9CK	6–4	6.3	1.2	11◈	330◈	220◈ 2.5◈	14▲	9.0▲	0.5▲
6DX4	UHF Triode Oscillator		7DK	5–1	6.3	0.2	2.2◈	150◈	—	3.9	1.5	1.6
6DX8	Triode-Pentode		9HX	6–3	6.3	0.72	4.0 1.0	300 300	300 1.7 —	Pentode Section Triode Section		
6DY4	UHF Triode Oscillator		7DK	5–2	6.3	0.125	1.5◈	135◈	—	3.5	1.15	2.0
6DY4-A	UHF Triode Oscillator		7DK	5–1	6.3	0.125	1.5◈	135◈	—	3.5	1.15	2.0
6DY7	Twin Pentode		8JP	12–14	6.3	1.2	15◈♠	400◈	300◈ 4.0◈ ⊕	— Two Sections, Push-Pull	—	—
6DZ4	UHF Triode Oscillator		7DK	5–1	6.3	0.225	2.3◈	135◈	—	2.2	1.3	1.8
6DZ7	Twin Pentode		8JP	12–14	6.3	1.52	13.2◈ ♠	440◈	300◈ 4.0◈ ⊕	— Two Sections, Push-Pull	—	—
6DZ8	Triode-Pentode		9JE	T-X	6.3	0.9	6.5 0.75	150 150	135 1.5 —	Pentode Section Triode Section		
6E5	Electron-Ray Indicator		6R	9–26	6.3	0.3	—	250❢	Max target voltage =250 Min target voltage =125			
6E6	Twin-Triode Power Amplifier		7B	14–1	6.3	0.6	—	250	—	Both Sections in Push-pull		
6E7	Remote-Cutoff RF Pentode		7H	12–2	6.3	0.3	—	300	100	5.2▲	6.8▲	0.01▲
6EA4 ●	Beam Triode	Ⓐ	12FA	12–90	6.3	0.2	30◈	27,000 ◈	—	1.9▲	0.63▲	0.036 ▲
6EA5	Sharp-Cutoff RF Tetrode		7EW	5–2	6.3	0.2	3.25◈	250◈	150◈ 0.5◈	4.5	3.0	0.05♣
6EA7	Double Triode		8BD	9–5	6.3	1.05	1.0◈ 10◈	350◈ 550◈	— —	Section 1 (Pins 4, 5, 6) Section 2 (Pins 1, 2, 3)		

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
[▲] —X-Radiation Rated, and Ⓐ— No X-Radiation Rating.

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ⊞Absolute maximum rating.
♠Per section. ❢ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	150	100	R_k = 560	1.1	2.1	150,000	800	E_{c3} = 0 volts			*6DT6*
FM Limiter Discriminator	250‡	100	R_k = 560	0.22	5.5	E_{c3} = −6.0 volts		—	270,000	—	
Class A Amplifier	150	100	R_k = 560	1.55	1.8	150,000	1,350	E_{c3} = 0 volts		—	*6DT6-A*
Class A Amplifier ♠	250	—	R_k = 200	10	—	10,900	5,500	60	—	—	*6DT8*
	100	—	R_k = 270	3.7	—	15,000	4,000	60	—	—	
Class A Amplifier	75	—	R_k = 100	10.5	—	3,100	11,500	35	—	—	6DV4
TV Damper	Max d-c output current ◈ =250 ma; max peak inverse voltage ◈ =4,500 volts; max peak current ◈ =1,300 ma										6DW4
TV Damper	Max d-c output current ◈ =250 ma; max peak inverse voltage ◈ =5,500 volts; max peak current ◈ =1,300 ma										6DW4-A
TV Damper	Max d-c output current ◈ =250 ma; max peak inverse voltage ◈ =5,500 volts; max peak current ◈ =1,300 ma										6DW4-B
Vertical Amplifier	200	150	22.5	55	2.0	15,000	5,500	—	—	—	*6DW5*
	60	150	0	260	20	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =2,200; max d-c cathode current ◈ =65 ma										
Class A Amplifier	85	—	R_k = 150	10	—	2,700	11,000	30	—	—	*6DX4*
Class A Amplifier	220	220	3.4	18	3.0	150,000	10,000	—	—	—	*6DX8*
Class A Amp	200	—	1.7	3.0	—	—	4,000	65	—	—	
Class A Amplifier	90	—	R_k = 180	10.4	—	—	11,000	28	—	—	*6DY4*
Class A Amplifier	90	—	R_k = 180	10.4	—	—	11,000	28	—	—	*6DY4-A*
Characteristics ♠	250	250	12.5	50	3.0	28,000	6,000	—	—	—	6DY7
Class AB_1 Amplifier	400	250	20	58†	1.7†	—	—	—	14,000‡	20	
	250	250	16	77†	3.5†	—	—	—	9,000‡	11	
Class A Amplifier	80	—	—	15	—	2,000	6,700	14	—	—	*6DZ4*
	With 2,700 ohm resistor in plate circuit										
Characteristics ♠	250	250	7.3	48	5.5	38,000	11,300	—	—	—	6DZ7
Class AB_1 Amplifier	400	250	11	40†	4.0†	—	—	—	9,000‡	18	
	300	250	R_k = 120	66†	7.0†	—	—	—	9,000‡	12	
Class A Amplifier	145	120	R_k = 180	45†	6.0†	—	7,500	—	2,500	2.0	*6DZ8*
Class A Amplifier	120	—	R_k = 1500	0.8	—	—	1,400	100	—	—	
Tuning Indicator	Plate voltage =250 thru 1 meg. Target voltage =250 (E_c = −8 v, Shadow =0°) (E_c =0 v, Shadow =90°. Plate current =0.24 ma, Target current =4 ma)										6E5
Class A Amplifier	250	—	27.5	18†♠	—	3,500 ♠	1,700 ♠	6.0 ♠	14,000 ‡	1.6	6E6
Class A Amplifier	250	100	3.0	8.2	2.0	800,000	1,600	—	—	—	6E7
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ◈ = 1.6 ma.										6EA4 ●
Class A Amplifier	250	140	1.0	10	0.95	150,000	8,000	—	—	—	*6EA5*
Vertical Oscillator	250	—	3.0	2.0	—	30,000	2,200	66	—	—	6EA7
	Max peak negative grid voltage ◈ =400 volts										
Vertical Amplifier	60	—	0	100	—	—	—	—	—	—	
	175	—	25	40	—	920	6,000	5.5	—	—	
	Max positive pulse plate voltage ◈ =1,500 volts; max d-c cathode current ◈ =50 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✠ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
6EA8¶	Triode-Pentode		9AE	6–2	6.3	0.45	3.1◈ 2.5◈	330◈ 330◈	330◈⁑ 0.55◈ —	Pentode Section Triode Section		
6EB5	Twin Diode		6BT	5–2	6.3	0.3	—	—	Tube Voltage Drop:♠ 10 volts at 11 ma d-c			
6EB8	Triode-Pentode		9DX	6–3	6.3	0.75	5.0◈ 1.0◈	330◈ 330◈	330◈⁑ 1.1◈ —	Pentode Section Triode Section		
6EF4 ■ ●	Beam Triode	(▲)	12HC	12–90	6.3	0.2	40◈	27,000◈	—	2.0▲	0.8▲	0.03▲
6EF6	Beam Power Amplifier		7S	9–13 or 9–42	6.3	0.9	10	250	250 2.0	11.5▲	9.0▲	0.8▲
6EH4 ■ ●	Beam Triode	0.5 mR/hr [▲]	12FA	12–90	6.3	0.2	30◈	27,000◈	—	1.9▲	0.63▲	0.036▲
6EH4-A ■ ●	Beam Triode	0.5 mR/hr [▲]	12FA	12–135	6.3	0.2	40▣	27,000▣	—	1.9▲	0.63▲	0.036▲
6EH5	Power Amplifier Pentode		7CV	5–3	6.3	1.2	5.5◈	150◈	130◈ 2.0◈	17▲	9.0▲	0.65▲
6EH7	Remote-Cutoff Pentode		9AQ	T-X	6.3	0.3	2.5	250	250 0.65	9.5	3.0	0.005♣
6EH8¶	Triode-Pentode		9JG	6–2	6.3	0.45	2.8◈ 2.5◈	300◈ 300◈	300◈⁑ 0.5◈	Pentode Section Triode Section		
6EJ4 ■ ●	Beam Triode	0.5 mR/hr [▲]	12HC	12–90	6.3	0.2	40◈	27,000◈	—	2.0▲	0.8▲	0.03▲
6EJ4-A ■ ●	Beam Triode	0.5 mR/hr [▲]	12HC	12–135	6.3	0.2	40▣	27,000▣	—	2.0▲	0.8▲	0.03▲
6EJ7	Sharp-Cutoff Pentode		9AQ	T-X	6.3	0.3	2.5	250	250 0.9	10	3.0	0.005♣
6EL4 ●	Beam Triode	1.5 mR/hr [▲]	8MW	12–36	6.3	0.2	40▣	27,000▣	—	2.6▲	1.0▲	1.0▲
6EL4-A ●	Beam Triode	0.5 mR/hr [▲]	8MW	12–21	6.3	0.2	40▣	27,000▣	—	2.6▲	1.0▲	1.0▲
6EM5	Beam Power Amplifier		9HN	6–4	6.3	0.8	10	315	285 1.5	10▲	5.1▲	0.7▲♣
6EM7	Double Triode		8BD	9–37	6.3	0.925	1.5◈ 10◈	330◈ 330◈	— —	Section 1 (Pins 4, 5, 6) Section 2 (Pins 1, 2, 3)		
6EN4 ●	Beam Triode	0.5 mR/hr [▲]	8NJ	12–21	6.3	0.2	40◈	30,000▣	—	2.6▲	1.0▲	1.0▲
6EQ7	Diode-Pentode		9LQ	6–3	6.3	0.3	3.0◈	300◈	300◈⁑ 0.6◈	5.5▲	5.0▲	0.002▲♠
6ER5	High-Frequency Triode		7FP	5–2	6.3	0.18	2.2	250	—	4.4	4.0	0.36
6ES5	High-Frequency Triode		7FP	5–2	6.3	0.2	2.2◈	250◈	—	3.2	4.0	0.5
6ES8	Twin Triode		9DE	6–2	6.3	0.365	1.8♠	130	—	—	—	—
6ET7	Duplex-Diode Pentode		9LT	6–3	6.3	0.75	5.0◈	330◈	330◈⁑ 1.1◈	10▲	4.2▲	0.1▲♣
										Diode Sections		

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
[▲] —X-Radiation Rated, and (▲)— No X-Radiation Rating.
■Compactron. † Zero signal. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
♠Per section. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
● See X-Radiation Warning, page 4. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,400	—	—	—	*6EA8*¶
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	
Voltage Doubler	Max d-c output current per plate ◈ =5.5 ma; max peak inverse voltage ◈ = 550 volts; max peak current per plate ◈ =40 ma										*6EB5*
Class A Amplifier	200	125	R_k = 68	25	7.0	75,000	12,500	—	—	—	*6EB8*
Class A Amplifier	250	—	2.0	2.0	—	37,000	2,700	100	—	—	
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ◈ = 1.6 ma.										6EF4 ■ ●
Vertical Amplifier	250	250	18	50	2.0	—	5,000	—	—	—	6EF6
	75	250	0	170	17	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =2,000; max d-c cathode current =60 ma										
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ◈ = 1.6 ma.										6EH4 ■ ●
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ▣ = 1.5 ma.										6EH4-A ■ ●
Class A Amplifier	110	115	R_k = 62	42†	11.5†	11,000	14,600	—	8,000	1.4	*6EH5*
Class A Amplifier	200	90	2.0	12	4.5	500,000	12,500	—	—	—	*6EH7*
Class A Amplifier	125	125	1.0	12	4.0	170,000	6,000	—	—	—	*6EH8*¶
	100	70	0	—	—	—	6,500	—	—	—	
Class A Amplifier	125	—	1.0	13.5	—	—	7,500	40	—	—	
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ◈ = 1.6 ma.										6EJ4 ■ ●
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ▣ = 1.5 ma.										6EJ4-A ■ ●
Class A Amplifier	200	200	2.5	10	4.1	350,000	15,000	—	—	—	*6EJ7*
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ▣ = 1.6 ma.										6EL4 ●
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ▣ = 1.5 ma.										6EL4-A ●
Vertical Amplifier	250	250	18	40	3.0	50,000	5,100	—	—	—	*6EM5*
	60	250	0	180	30	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =2,200; max d-c cathode current =60 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	6EM7
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20	50	—	750	7,200	5.4	—	—	
	Max positive pulse plate voltage ▣ =1,500 volts, max d-c cathode current ◈ =50 ma										
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ▣ = 1.6 ma.										6EN4 ●
Class A Amplifier	100	100	E_{cc1} = 0	9.0	3.5	250,000	3,800	R_{g1} =2.2 Meg. E_{c3} =0 volts		—	*6EQ7*
Class A Amplifier	200	—	1.2	10	—	—	10,500	80	—	—	*6ER5*
Class A Amplifier	200	—	1.0	10	—	8,000	9,000	75	—	—	*6ES5*
Class A Amplifier ♠	90	—	1.2	15	—	—	12,500	—	—	—	*6ES8*
Class A Amplifier	200	150	R_k = 100	25	5.5	60,000	11,500	—	—	—	*6ET7*
	60	150	0	55	18	—	—	—	—	—	
	Average Diode current at 10 volts =1.5 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads: Input	Output	Grid-plate
6EU7	High-Mu Twin Triode	9LS	6–2	6.3	0.3	1.2◈	330◈	—	1.6▲	0.2▲	1.5▲
6EU8¶	Triode-Pentode	9JF	6–2	6.3	0.45	3.1◈ 3.0◈	330◈ 330◈	330◈§ 0.55◈ —	Pentode Section Triode Section		
6EV5	Sharp-Cutoff RF Tetrode	7EW	5–2	6.3	0.2	3.25◈	275◈	180◈§ 0.2◈	4.5	2.9	0.035 ♣
6EV7	High-Mu Twin Triode	9LP	6–3	6.3	0.6	2.5◈	300◈	—	3.0▲	0.33_1▲ 0.23_2▲	3.4▲
6EW6	Sharp-Cutoff RF Pentode	7CM	5–2	6.3	0.4	3.1◈	330◈	330◈§ 0.65◈	10	3.4	0.03♣
6EW7	Double Triode	9HF	9–70	6.3	0.9	1.5◈ 10◈	330◈ 330◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3, 9)		
6EX6	Beam-Power Amplifier	5BT	12–21	6.3	2.25	22◈	770◈§	195◈ 3.5◈	22▲	8.5▲	1.1▲
6EY6	Beam-Pentode	7AC	9–15	6.3	0.68	11◈	350◈	300◈ 2.75◈	8.5▲	7.0▲	0.7▲
6EZ5	Beam-Pentode	7AC	9–15	6.3	0.8	12◈	350◈	300◈ 2.75◈	9.0▲	7.0▲	0.6▲
6EZ8	Triple-Triode	9KA	6–2	6.3	0.45	2.0◈ ♠ 5.0◈ ⊕	330◈	—	2.6	1.4_1 1.2_2 1.2_3	1.5
6F4	High-Frequency Triode (Acorn)	7BR	4–2	6.3	0.225	2.0	150	—	1.9▲	0.6▲	1.8▲
6F5 6F5-G 6F5-GT	High-Mu Triode	5M	8–4 12–8 9–17 or 9–47	6.3	0.3	—	300	—	—	—	—
6F6 6F6-G 6F6-GT	Power Amplifier Pentode	7S	8–6 14–3 9–15	6.3	0.7	11	375	285 3.75	Single Tube 2 Tubes, Push-pull		
6F7	Triode-Remote-Cutoff Pentode	7E	12–6	6.3	0.3	1.7 0.4	250 100	100 0.2 —	Pentode section Triode section		
6F8-G	Medium-Mu Twin Triode	8G	12–8	6.3	0.6	2.5♠	300	—	—	—	—
6FA7	Diode Twin-Plate Tetrode	9MR	6–3	6.3	0.3	1.5◈ ♠	330◈	330◈§ 0.65◈	—	—	—
6FD6	RF Pentode	7BK	5–2	6.3	0.33	—	30◈	30◈	5.5	4.8	0.006 ♣
6FD7	Double Triode	9HF	9–77	6.3	0.925	1.5◈ 10.0◈	330◈ 330◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3, 9)		
6FE5	Beam-Power Amplifier	8KB	9–33	6.3	1.2	14.5◈	175◈	175◈ 2.4◈	15▲ Single Tube 2-Tubes, Push-Pull	9.0▲	0.44▲
6FG5	"Shadow-Grid" Beam Pentode	7GA	5–2	6.3	0.2	2.75◈	275◈	275◈ 0.15◈	4.2▲	2.8▲	0.02▲ ♣
6FG6	Electron-Ray Indicator	9GA	T-X	6.3	0.27	0.5	—	—	Max Target Voltage =300 volts Min Target Voltage =150 volts		
6FG7¶	Triode-Pentode	9GF	6–2	6.3	0.45	3.0◈ 2.5◈	330◈ 330◈	330◈§ 0.55◈ —	Pentode Section Triode Section		
6FH5	High-Frequency Triode	7FP	5–2	6.3	0.2	2.2◈	150◈	—	3.2	4.0	0.52

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ✱Absolute maximum rating.
♠Per section. § Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250 100	— —	2.0 1.0	1.2 0.5	— —	62,500 80,000	1,600 1,250	100 100	— —	— —	*6EU7*
Class A Amplifier	125	125	1.0	12	4.0	80,000	6,400	—	—	—	*6EU8*¶
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	
Class A Amplifier	250	80	1.0	11.5	0.9	150,000	8,800	—	—	—	*6EV5*
Relay Control	250	—	2.0	9.2	—	11,500	5,200	60	—	—	*6EV7*
Class A Amplifier	125	125	R_k = 56	11	3.2	200,000	14,000	—	—	—	*6EW6*
Vertical Oscillator	250	—	11	5.5	—	8,750	2,000	17.5	—	—	6EW7
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	17.5	45	—	800	7,500	6.0	—	—	
	Max positive pulse plate voltage ◈ =1,500 volts; max d-c cathode current ◈ =50 ma										
Horizontal Amplifier	175 60 60	175 150 125	30 0 0	67 460 360	3.3 45 30	8,500 — —	7,700 — —	— — —	— — —	— — —	6EX6
	Max positive pulse plate voltage ▣ =7,000; max d-c cathode current ◈ =220 ma										
Vertical Amplifier	250 50	250 250	17.5 0	44 153	3.0 21	60,000 —	4,400 —	— —	— —	— —	6EY6
	Max positive pulse plate voltage ◈ =2,500; max d-c cathode current ◈ =60 ma										
Vertical Amplifier	250 60	250 250	20 0	43 180	3.5 26	50,000 —	4,100 —	— —	— —	— —	6EZ5
	Max positive pulse plate voltage ◈ =2,500; max d-c cathode current ◈ =75 ma										
Class A Amplifier	125	—	1.0	4.2	—	13,600	4,200	57	—	—	*6EZ8*
Class A Amplifier	80	—	R_k = 105	13	—	2,900	5,800	17	—	—	6F4
Class A Amplifier	250 100	— —	2.0 1.0	0.9 0.4	— —	66,000 85,000	1,500 1,150	100 100	— —	— —	**6F5** 6F5-G 6F5-GT
Class A Amplifier	285 250	285 250	20 16.5	38† 34†	7.0† 6.5†	78,000 80,000	2,550 2,500	— —	7,000 7,000	4.8 3.2	**6F6** 6F6-G
Class A Amplifier	315	285	24	62†	12†	—	—	—	10,000 ‡	11	6F6-GT
Class A Amplifier	250	100	3.0	6.5	1.5	850,000	1,100	—	—	—	6F7
Class A Amplifier	100	—	3.0	3.5	—	16,000	500	8.0	—	—	
Class A Amplifier ♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	6F8-G
Class A Amplifier	100	100	E_{cc1} = 0	2.2	3.0	130,000	1,900	R_{g1} =2.2 Meg		—	*6FA7*
	For operation with other plate grounded										
Class A Amplifier	12.6	12.6	E_{cc1} = 0	1.4	0.5	500,000	1,450	R_{g1} =2.2 Meg		—	*6FD6*
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	6FD7
	Max d-c cathode current ◈ =20 ma										
Vertical Amplifier	150	—	17.5	40	—	800	7,500	6.0	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Class A Amplifier	130	130	R_k = 120	88†	5.0†	8,000	9,500	—	1,000	3.5	6FE5
Class A Amplifier	130	130	R_k = 75	150†	7.2†	—	—	—	1,600‡	7.0	
Class A Amplifier	250	250	0.2	9.0	0.42	250,000	9,500	—	—	—	*6FG5*
Tuning Indicator	Plate voltage =250 thru 0.47 Meg; Target voltage =250; (E_c =0; Pattern length, dark portion =0.8"; Target current =1.1 ma; Plate current =0.45 ma) (E_c = −22 volts; Pattern length, dark portion =0.0"; Target current = 1.6 ma; Plate current =0.06 ma)										*6FG6*
Class A Amplifier	125 100	125 100	1.0 0	11 —	4.0 —	180,000 —	6,000 7,400	— —	— —	— —	*6FG7*¶
Class A Amplifier	125	—	1.0	13	—	5,700	7,500	43	—	—	
Class A Amplifier	135	—	1.0	11	—	5,600	9,000	50	—	—	*6FH5*

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Output	Grid-plate
6FH6	Beam Power Amplifier	6AM	12–19	6.3	1.2	17◈	770◈‡	220◈ 3.6◈	33▲	8.0▲	0.4▲
6FH8	Triode-Three Plate Tetrode	9KP	6–2	6.3	0.45	2.3◈ (Main Plate) 0.3◈ ♠ (Other Plates) 1.7◈	275◈ (Main Plate) 200◈ (Other Plates) 275◈	275◈‡ 0.45◈ —	Tetrode Section (Plates 2, 3 tied to cathode) Triode Section		
6FJ7■	Double Triode	12BM	9–58	6.3	0.9	1.0◈ 10◈	350◈ 550◈	— —	Section 1 (Pins 9, 10, 11) Section 2 (Pins 3, 5, 7)		
6FM7■	Dissimilar Double Triode	12EJ	9–58	6.3	1.05	1.0◈ 10◈	350◈ 550◈	— —	Section 1 (Pins 9, 10, 11) Section 2 (Pins 3, 5, 7, 8)		
6FM8	Duplex-Diode Triode	9KR	6–2	6.3	0.45	1.1◈	330◈	—	1.5▲ Diode Sections	0.16▲	1.8▲
6FQ5	High-Frequency Triode	7FP	5–2	6.3	0.18	2.5◈	200◈	—	4.8	4.0	0.4
6FQ5-A	High-Frequency Triode	7FP	5–2	6.3	0.18	2.5◈	200◈	—	5.0	3.5	0.52
6FQ7¶	Medium-Mu Twin Triode	9LP	6–3	6.3	0.6	4.0◈ ♠ 5.7◈ ⊕	330◈	—	2.4▲	0.34$_1$▲ 0.26$_2$▲	3.6$_1$▲ 3.8$_2$▲
6FR7	Double-Triode	9HF	9–70	6.3	0.925	1.5◈ 10◈	330◈ 330◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3, 9)		
6FS5	"Shadow Grid" Beam Pentode	7GA	5–2	6.3	0.2	3.25◈	300◈	150◈ 0.15◈	4.8	2.8	0.016
6FV6	Sharp-Cutoff RF Tetrode	7FQ	5–2	6.3	0.2	2.0◈	275◈	180◈‡ 0.5◈	4.5	3.0	0.03♣
6FV8¶	Triode-Pentode	9FA	6–2	6.3	0.45	2.3◈ 2.0◈	330◈ 330◈	330◈‡ 0.55◈ —	Pentode Section Triode Section		
6FV8-A¶	Triode-Pentode	9FA	6–2	6.3	0.45	2.3◈ 2.0◈	330◈ 330◈	330◈‡ 0.55◈ —	Pentode Section Triode Section		
6FW5	Beam-Power Amplifier	6CK	12–14	6.3	1.2	18◈	770◈‡	220◈ 3.6◈	17▲	7.0▲	0.5▲
6FW7◉	Double Triode	8LM	T-X	6.3	0.3	— —	150◈ 150◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3)		
6FW8	High-Frequency Twin Triode	9AJ	6–2	6.3	0.4	2.2◈	250◈ ♠	—	3.4$_1$	2.4$_1$	1.9
6FX7◉	Twin Triode	8LK	T-X	6.3	0.3	1.7◈ ♠ 3.2 Total	100◈	—	—	—	—

■Compactron. † Zero signal. ♠Per section.
↕ Plate-to-plate. ♣Maximum. ‡ Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

◉ See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	250	150	22.5	75	1.7	12,000	6,000	—	—	—	6FH6
	60	150	0	300	15	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,000; max d-c cathode current ◈ =155 ma										
Class A Amplifier	100	50	1.0	1.6 (Main Plate) 0.04 ♠ (Other Plates)	0.3	—	2,500 (Main Plate) 70 ♠ (Other Plates)	—	—	—	*6FH8*
Class A Amplifier	100	—	1.0	7.9	—	7,400	5,400	40	—	—	
Vertical Oscillator	250	—	8.0	8.0	—	9,000	2,500	22.5	—	—	6FJ7 ■
	Max peak negative grid voltage ◈ =400 volts										
Vertical Amplifier	250	—	9.5	41	—	2,000	7,700	15.4	—	—	
	150	—	0	68	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,500; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	3.0	2.0	—	30,000	2,200	66	—	—	6FM7 ■
	Max peak negative grid voltage ◈ =400 volts										
Vertical Amplifier	175	—	25	40	—	920	6,000	5.5	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	*6FM8*
FM Detector	Max d-c output current ◈ ♠ =5.0 ma; voltage drop: ♠5.0 volts at 20 ma d-c										
Class A Amplifier	135	—	1.2	11.5	—	5,500	11,000	60	—	—	*6FQ5*
Class A Amplifier	135	—	1.2	8.9	—	6,300	12,000	74	—	—	*6FQ5-A*
Class A Amplifier ♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	*6FQ7*¶
	90	—	0	10	—	6,700	3,000	20	—	—	
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	68	—	—	6FR7
	Max peak negative grid voltage ◈ =400; max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20.0	50	—	750	7,200	5.4	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Class A Amplifier	275	135	0.2	9.0	0.17	240,000	10,000	—	—	—	*6FS5*
Class A Amplifier	125	80	1.0	10	1.5	100,000	8,000	—	—	—	*6FV6*
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,500	—	—	—	*6FV8*¶
Class A Amplifier	125	—	1.0	14	—	5,000	8,000	40	—	—	
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,500	—	—	—	*6FV8-A*¶
Class A Amplifier	125	—	1.0	12	—	5,600	8,000	45	—	—	
Horizontal Amplifier	250	150	22.5	65	1.8	18,000	7,300	—	—	—	6FW5
	60	150	—	345	27	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ =175 ma										
Class A Amplifier	90	—	1.0	7.0	—	6,000	6,000	36	—	—	6FW7 ◉
Class A Amplifier	90	—	1.0	9.0	—	3,800	9,500	36	—	—	
Class A Amplifier ♠	100	—	1.2	15	—	2,500	13,000	33	—	—	*6FW8*
Class A Amplifier	90	—	1.0	9.0	—	3,800	9,500	36	—	—	6FX7 ◉

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♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Out-put	Grid-plate
6FY5	High-Mu Triode	7FP	5–2	6.3	0.2	2.2▣	200▣	—	4.75	4.3	0.48
6FY7■	Dissimilar Double Triode	12EO	9–60	6.3	1.05	1.0◈ 7.0◈	330◈ 275◈	— —	Section 1 (Pins 9, 10, 11) Section 2 (Pins 3, 5, 7)		
6FY8	Triode-Pentode	9EX	6–4	6.3	1.2	8.0◈ 1.0◈	150◈ 150◈	150◈ 2.0◈ —	Pentode Section Triode Section		
6G6-G 6G6-GT	Power Amplifier Pentode	7S	12–7 9–11 or 9–41	6.3	0.15	2.75	300 300	300 0.75 —	Pentode connection Triode connection (G_2 & P tied)		
6G11■	Dissimilar Double Pentode	12BU	9–58	6.3	1.2	6.5◈ 1.7◈	150◈ 330◈	135◈ 1.8◈ 330§◈ 1.1◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 4, 6, 7)		
6GA7■	Diode-Pentode	12EB	12–58	6.3	2.26	15◈ 5.0◈	770§◈ Tube Voltage Drop: 32 volts at 250 ma d-c	220◈ 3.6◈	Pentode Section Diode Section		
6GB5	Beam Power Amplifier	9NH	T-X	6.3	1.38	17◈	275◈	275◈ 6.0◈	—	—	—
6GC5	Beam-Power Amplifier	9EU	9–71	6.3	1.2	12◈	220◈	140◈ 1.4◈	18▲	7.0▲	0.9▲
6GC6	Beam Power Amplifier	8JX	12–51	6.3	1.2	17.5◈	770◈§	220◈ 4.5◈	15▲	7.0▲	0.55▲
6GD7	Triode-Pentode	9GF	6–2	6.3	0.38	2.2◈ 2.2◈	250◈ 125◈	250§◈ 0.55◈ —	Pentode Section Triode Section		
6GE5■	Beam Power Amplifier	12BJ	12–56	6.3	1.2	17.5◈	770§◈	220◈ 3.5◈	16▲	7.0▲	0.34▲
6GE8	Triode-Pentode	9LC	6–3	6.3	0.9	1.0◈ 7.0◈	330◈ 275◈	275◈ 0.5◈ —	Pentode Section Triode Section		
6GF5■	Beam Power Amplifier	12BJ	9–60	6.3	1.2	9.0◈	770§◈	220◈ 2.5◈	16▲	7.5▲	0.2▲
6GF7	Dissimilar Double Triode	9QD	T-X	6.3	0.985	1.5◈ 11◈	330◈ 330◈	— —	Section 1 (Pins 1, 8, 9) Section 2 (Pins 2, 3, 6)		
6GF7-A	Dissimilar Double Triode	9QD	9–107	6.3	0.985	1.5◈ 11◈	330◈ 330◈	— —	Section 1 (Pins 1, 8, 9) Section 2 (Pins 2, 3, 6)		
6GH8¶	Triode-Pentode	9AE	6–2	6.3	0.45	2.5◈ 2.5◈	350◈ 330◈	330◈§ 0.55◈ —	Pentode Section Triode Section		

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‡ Plate-to-plate. ♣Maximum. § Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	135	—	1.0	11	—	—	13,000	70	—	—	*6FY5*
Vertical Oscillator	250	—	3.0	1.4	—	40,500	1,600	65	—	—	6FY7■
	Max d-c cathode current ◈ =20 ma										
Vertical Amplifier	150	—	17.5	35	—	920	6,500	6.0	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,000; max d-c cathode current ◈ =50 ma										
Class A Amplifier	125	125	13.5	50†	10†	—	7,500	—	2,000	2.7	*6FY8*
Class A Amplifier	125	—	1.5	2.5	—	—	2,000	—	—	—	
Class A Amplifier	180	180	9.0	15†	2.5†	175,000	2,300	—	10,000	1.1	6G6-G 6G6-GT
Class A Amplifier	180	—	12	11†	—	4,750	2,000	9.5	12,000	0.25	
Class A Amplifier	120	110	8.0	49†	4.0†	10,000	7,500	—	2,500	2.3	6G11■
Class A Amplifier	150	100	R_k = 560	1.3	2.0	150,000	1,000	E_{c3} = 0 Volts			
Horizontal Amplifier	250	150	22.5	75	2.4	20,000	6,600	—	—	—	6GA7■
	60	150	0	345	27	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ =150 ma										
TV Damper	Max d-c output current ◈ =140 ma; max peak inverse voltage ◈ =5,500 volts; max peak current ◈ =325 ma										
Horizontal Amplifier	75	200	10	440	37	(Instantaneous Values)					6GB5
	Max pos. pulse plate volt. ◈ =7,700; Max d-c cath. current ◈ =275 ma										
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	6GC5
	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
Horizontal Amplifier	250	150	22.5	75	2.4	20,000	6,600	—	—	—	6GC6
	60	150	0	345	30	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,500 volts; max d-c cathode current ◈ =175 ma										
Class A Amplifier	170	150	R_k = 82	10	3.3	350,000	12,000	—	—	—	*6GD7*
Class A Amp	125	—	1.0	15	—	4,700	10,000	47	—	—	
Horizontal Amplifier	250	150	22.5	65	1.8	18,000	7,300	—	—	—	6GE5■
	60	150	0	345	27	—	—	—	—	—	
	Max pos. pulse plate voltage ◈ =6,500; max d-c cathode current ◈ =175 ma										
Class A Amp	150	150	2.0	5.5	1.7	340,000	3,200	—	—	—	*6GE8*
Series Regulator	150	—	21	35	—	1,080	5,000	5.4	—	—	
Horizontal Amplifier	250	150	26.5	34	1.6	260,000	4,700	—	—	—	6GF5■
	60	150	0	345	27	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =5,000; max d-c cathode current ◈ =160 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	6GF7
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20	50	—	750	7,200	5.4	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	6GF7-A
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20	50	—	750	7,200	5.4	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ = 50 ma										
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	*6GH8*¶
Class A Amp	125	—	1.0	13.5	—	5,400	8,500	46	—	—	

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✽Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Output	Grid-plate
6GH8-A¶	Triode-Pentode	9AE	6–2	6.3	0.45	2.5◈	350◈	330⁑◈ 0.55◈	Pentode Section		
						2.5◈	330◈	—	Triode Section		
6GJ5	Beam Power Amplifier	9QK	T-X	6.3	1.2	17.5◈	770⁑◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
6GJ5-A	Beam Power Amplifier	9QK	T-X	6.3	1.2	17.5◈	770⁑◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
6GJ7	Triode-Pentode	9QA	T-X	6.3	0.41	2.4◈	275◈	275◈ 0.55◈	Pentode Section		
						1.8◈	140◈	—	Triode Section		
6GJ8¶	Triode-Pentode	9AE	6–2	6.3	0.6	2.5◈	330◈	330◈⁑ 0.55◈	Pentode Section		
						2.5◈	330◈	—	Triode Section		
6GK5	High-Frequency Triode	7FP	5–2	6.3	0.18	2.5◈	200◈	—	5.0	3.5	0.52
6GK6	Beam-Power Amplifier	9GK	6–4	6.3	0.76	13.2◈	330◈	330◈ 2.0◈	Single Tube		
									2 Tubes, Push-Pull		
									2 Tubes, Push-Pull		
6GK7	RF Pentode	9AQ	T-X	6.3	0.3	2.8◈	330◈	330⁑◈ 1.1◈	8.5▲	3.3▲	0.005 ♣▲
6GL7	Dissimilar Double Triode	8BD	9–5	6.3	1.05	1.0◈	350◈	—	Section 1 (Pins 4, 5, 6)		
						10◈	550◈	—	Section 2 (Pins 1, 2, 3)		
6GM5	Beam Power Amplifier	9MQ	9–71	6.3	0.8	19◈	550◈	440◈ 3.3◈	Single Tube		
									2 Tubes, Push-Pull		
6GM6	Semi-Remote-Cutoff Pentode	7CM	5–2	6.3	0.4	3.1◈	330◈	330◈⁑ 0.65◈	10.0▲	2.4▲	0.036▲ ♣
6GM8	Twin Triode	9DE	6–2	6.3	0.33	0.6	30	—	3.0▲	1.8▲	1.3▲
6GN8	Triode-Pentode	9DX	6–3	6.3	0.75	5.0◈	330◈	330◈⁑ 1.1◈	Pentode Section		
						1.0◈	330◈	—	Triode Section		
6GQ7	Triple Diode	9QM	6–2	6.3	0.45	—	Tube Voltage Drop: ♠ 10 volts at 60 ma d-c				
6GS8	Twin Pentode	9LW	6–3	6.3	0.3	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
6GT5	Beam Power Amplifier	9NZ	12–64	6.3	1.2	17.5◈	770◈⁑	220◈ 3.5◈	15▲	6.5▲	0.26▲
6GT5-A	Beam Power Amplifier	9NZ	12–95	6.3	1.2	17.5◈	770⁑◈	220◈ 3.5◈	15▲	6.5▲	0.26▲

■ Compactron.
† Zero signal.
♠ Per section.
‡ Plate-to-plate.
♣ Maximum.
⁑ Supply voltage.
● Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
⊞ Absolute maximum rating.
Conversion transconductance

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	*6GH8-A*¶
Class A Amplifier	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	—	—	—	6GJ5
	60	150	0	390	32	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ =175 ma										
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	—	—	—	6GJ5-A
	60	150	0	390	32	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Class A Amplifier	170	120	1.2	10	3.0	350,000	11,000	—	—	—	*6GJ7*
Class A Amplifier	100	—	3.0	15	—	—	9,000	20	—	—	
Class A Amplifier	125	125	1.0	12	4.5	150,000	7,500	—	—	—	*6GJ8*¶
Class A Amp	125	—	1.0	13.5	—	5,000	8,500	40	—	—	
Class A Amp	135	—	1.0	11.5	—	5,400	15,000	78	—	—	*6GK5*
Class A Amplifier	250	250	7.3	48†	5.5†	38,000	11,300	—	5,200	5.7	*6GK6*
Class AB Amplifier	300	300	R_k = 130	72†	8.0†	—	—	—	8,000‡	17	
	250	250	R_k = 130	62†	7.0†	—	—	—	8,000‡	11	
Class B Amplifier	300	300	14.7	15†	1.6†	—	—	—	8,000‡	17	
	250	250	11.6	20†	2.2†	—	—	—	8,000‡	11	
Class A Amplifier	135	135	R_k = 82	7.0	3.5	275,000	9,500	E_{c3} = 15 volts			*6GK7*
Vertical Oscillator	250	—	3.0	2.0	—	30,000	2,200	66	—	—	6GL7
	Max peak negative grid voltage ◈ =400 volts										
Vertical Amplifier	175	—	25	46	—	780	6,400	5.0	—	—	
	60	—	0	100	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Class A Amp	300	300	10	60†	8.0†	29,000	10,200	—	3,000	11	6GM5
Class AB_1 Amp.	450	400	21	66†	9.4†	—	—	—	6,600‡	45	
Class A Amplifier	125	125	R_k = 56	14	3.4	200,000	13,000	—	—	—	*6GM6*
Class A Amp	6.3	—	0.4	0.9	—	5,400	2,600	14	—	—	*6GM8*
Class A Amplifier	200	150	R_k = 100	25	5.5	60,000	11,500	—	—	—	*6GN8*
Class A Amplifier	250	—	2.0	2.0	—	37,000	2,700	100	—	—	
Half-Wave Rectifier	Max d-c output current per plate ◈ =9 ma; max peak inverse voltage ◈ =330 volts; max RMS supply voltage per plate ◈ =117 volts; max peak current per plate ◈ =54 ma										*6GQ7*
Sync Separator and AGC Keyer	100	67.5	I_{c1} = 0.1 ma	2.0	3.6	(Both Sections operating)		—	E_{c3} =0 volts		*6GS8*
	100	67.5	0	—	—	—	1,200	—	E_{c3} =0 volts		
	(Plate and grid number 3 of opposite section grounded)										
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	—	—	—	6GT5
	60	150	0	390	32	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ =175 ma										
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	—	—	—	6GT5-A
	60	150	0	390	32	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										

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♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Output	Grid-plate
6GU5	"Shadow-Grid" Beam Pentode	7GA	5–2	6.3	0.22	3.0◈	300◈	150◈ 0.15◈	7 0▲	3.2▲	0.018 ▲
6GU7¶	Medium-Mu Twin Triode	9LP	6–3	6.3	0.6	3.0◈ ♠	330◈	—	3.4_1 3.6_2 ▲	0.44_1 ▲ 0.34_2 ▲	3.0▲
6GV5■	Beam Power Amplifier	12DR	12–79	6.3	1.2	17.5◈	770❢◈	220◈ 3.5◈	16▲	7.0▲	0.6▲
6GV7	Triode-Pentode	9KN	T-X	6.3	0.35	2.0	250	230 0.5	Pentode Section		
						2.0	250	—	Triode Section		
6GV8	Triode-Pentode	9LY	6–4	6.3	0.9	7.0▣	250▣	250▣ 2.0▣	Pentode Section		
						0.5▣	250▣	—	Triode Section		
6GW5	High-Mu Triode	7GK	5–2	6.3	0.19	2.5◈	200◈	—	5.5	4.0	0.6
6GW6	Beam-Power Amplifier	6AM	12–51	6.3	1.2	17.5◈	770◈	220◈ 3.5◈	17▲	7.0▲	0.5▲
6GW8	Triode-Pentode	9LZ	6–4	6.3	0.7	9.0	300	300 1.5	Pentode Section		
						0.5	300	—	Triode Section		
6GX6¶	Dual-Control Pentode	7EN	5–2	6.3	0.45	1.7◈	300◈	300◈❢ 1.0◈	—	—	—
6GX7	Triode-Pentode	9QA	6–2	6.3	0.4	2.2◈	275◈	275❢◈ 0.45◈	Pentode Section		
						1.5◈	275◈	—	Triode Section		
6GY5■	Beam Power Amplifier	12DR	12–79	6.3	1.5	18◈	770❢◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
6GY6¶	Dual-Control Pentode	7EN	5–2	6.3	0.45	1.7◈	300◈	300◈❢ 1.0◈	—	—	—
6GY8	Triple-Triode	9MB	6–2	6.3	0.45	2.0◈ 5.0◈ ⊕	330◈	—	Section 1 (Pins 4, 6, 7) Section 2 (Pins 3, 8, 9) Section 3 (Pins 1, 2, 4)		
6GZ5	Power Amplifier Pentode	7CV	5–2	6.3	0.38	4.8◈	300◈	300◈ 1.1◈	8.5▲	3.8▲	0.24▲
6H4-GT	Diode	5AF	9–11	6.3	0.15	—	—	—	—	—	—
6H6 6H6-GT	Twin Diode	7Q	8–5 9–11	6.3	0.3	—	Tube Voltage Drop: ♠ 11 v at 16 ma d-c				
6HA5	High-Mu Triode	7GM	5–1	6.3	0.18	2.6◈	220◈	—	4.3	2.9	0.36
6HA6	Pentode	9NW	6–4	6.3	0.71	8.0◈	300◈	250◈ 1.5◈	13▲	8.0▲	0.18▲
6HB5■	Beam Power Amplifier	12BJ	12–58	6.3	1.5	18◈	770❢◈	220◈ 3.5◈	22▲	9.0▲	0.4▲
6HB6	Power Amplifier Pentode	9NW	6–4	6.3	0.76	10◈	350◈	300◈ 2.0◈	13▲	8.0▲	0.18▲

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ❢ Supply voltage. ◈Design maximum rating. ✠Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	275	135	0.4	10	0.17	165,000	15,500	—	—	—	*6GU5*
Class A Amplifier ♠	250	—	10.5	11.5	—	5,500	3,100	17	—	—	*6GU7*¶
Horizontal Amplifier	250	150	22.5	65	1.8	18,000	7,300	—	—	—	6GV5■
	60	150	0	345	27	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ =175 ma										
Class A Amplifier	125	125	1.5	10	3.1	—	11,000	—	—	—	*6GV7*
Class A Amplifier	100	—	3.0	14	—	—	5,500	17	—	—	
Class A Amplifier	170	170	15	41	2.7	25,000	7,500	—	—	—	*6GV8*
Class A Amp	100	—	0.8	5.0	—	7,600	6,500	50	—	—	
Class A Amp	135	—	1.0	12.5	—	5,800	15,000	70	—	—	*6GW5*
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	—	—	—	6GW6
	60	150	0	390	32	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Class A Amplifier	250	250	7.0	36†	5.5†	45,000	10,000	—	7,000	4.2	*6GW8*
Class A Amp	250	—	1.7	1.2	—	62,500	1,600	100	—	—	
Class A Amplifier	150	100	R_k = 180	3.7	3.0	140,000	3,700	E_{c3} =0 volts			*6GX6*¶
Class A Amplifier	125	125	1.0	8.0	2.5	200,000	11,000	—	—	—	*6GX7*
Class A Amplifier	125	—	1.0	13	—	4,700	8,500	40	—	—	
Horizontal Amplifier	130	130	20	50	1.75	11,000	9,100	—	—	—	6GY5■
	60	130	0	410	24	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 230 ma										
Class A Amplifier	150	100	R_k = 180	3.7	3.0	140,000	3,700	E_{c3} =0 volts			*6GY6*¶
	Max peak positive pulse plate voltage ◈ =600 volts										
Class A Amplifier1	125	—	R_k = 220	4.5	—	14,000	4,500	63	—	—	*6GY8*
Class A Amplifier (Sections 2 and 3)	125	—	1.0	4.5	—	14,000	4,500	63	—	—	
Class A Amplifier	250	250	R_k = 270	16†	2.7†	150,000	8,400	—	15,000	1.1	*6GZ5*
Half-Wave Rectifier	Max d-c output current =4 ma; max rms supply voltage =100 volts; max peak current =18 ma										6H4-GT
Half-Wave Rectifier	Max d-c output current per plate =8 ma; max peak inverse voltage =420 volts; max rms supply voltage per plate =150 volts; max peak current per plate =48 ma										**6H6** 6H6-GT
Class A Amplifier	135	—	1.0	11.5	—	—	14,500	72	—	—	*6HA5*
Class A Amplifier	150	100	R_k = 33	28	3.5	20,000	20,000	—	—	—	*6HA6*
	60	100	0	45	9.0	—	—	—	—	—	
Horizontal Amplifier	130	130	20	50	1.75	11,000	9,100	—	—	—	6HB5■
	60	130	0	410	24	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,000; max d-c cathode current ◈ =230 ma										
Class A Amplifier	250	250	R_k = 100	40	6.2	24,000	20,000	—	—	—	*6HB6*

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♥G2 and G4 are screen. G3 is signal-input grid.
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■Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Out-put	Grid-plate
6HB7¶	Triode-Pentode	9QA	6–2	6.3	0.45	3.1◈	330◈	330⁑◈ 0.55◈	Pentode Section		
						2.5◈	330◈	—	Triode Section		
6HC8	Triode-Pentode	9EX	9–70	6.3	1.2	11◈	350◈	315◈ 1.5◈	Pentode Section		
						1.0◈	330◈	—	Triode Section		
6HD5■	Beam Power Amplifier	12ES	12–59	6.3	2.25	24◈	770⁑◈	220◈ 6.0◈	—	—	—
6HD7¶	Triode-Pentode	9QA	6–2	6.3	0.45	2.2◈	275◈	275⁑◈ 0.45◈	Pentode Section		
						1.5◈	275◈	—	Triode Section		
6HE5■	Beam Power Amplifier	12EY	9–60	6.3	0.8	12◈	350◈	300◈ 2.75◈	9.5▲	7.0▲	0.50▲
6HE7■	Diode-Pentode	12FS	12–57	6.3	2.7	10◈	500⁑◈	150◈ 3.5◈	Pentode Section		
									Diode Section		
							Tube Voltage Drop: 21 volts at 350 ma d-c				
6HF5■	Beam Power Amplifier	12FB	12–89	6.3	2.25	28◈	990⁑◈	190◈ 5.5◈	24▲	10▲	0.56▲
6HF8	Triode-Pentode	9DX	6–3	6.3	0.75	5.0◈	330◈	330◈⁑ 1.1◈	Pentode Section		
						1.0◈	330◈	—	Triode Section		
6HG5	Beam Power Amplifier	7BZ	5–3	6.3	0.45	12◈	275◈	275◈ 2.0◈	8.0▲	8.5▲	0.4▲
6HG8	Triode-Pentode	9MP	6–2	6.3	0.34	2.0	250	150 0.5	Pentode Section		
						1.5	125	—	Triode Section		
6HJ5■	Beam Power Amplifier	12FL	12–59	6.3	2.25	24◈	770⁑◈	220◈ 6.0◈	—	—	—
6HJ7¶	Triode-Pentode	9QA	6–2	6.3	0.45	2.2◈	275◈	275⁑◈ 0.45◈	Pentode Section		
						1.5◈	275◈	—	Triode Section		
6HJ8¶	Diode-Pentode	9CY	6–2	6.3	0.45	3.2◈	330◈	330◈⁑ 0.55◈	7.0	3.2	0.015♣
									Diode Section		
6HK5	High-Frequency Triode	7GM	5–2	6.3	0.19	2.3◈	200◈	—	4.4	2.6	0.29
6HL5	Beam Power Amplifier	9QW	6–4	6.3	0.95	12◈	330◈	250◈ 2.5◈	—	—	—
6HL8¶	Triode-Pentode	9AE	6–2	6.3	0.6	2.5◈	330◈	330⁑◈ 0.55◈	Pentode Section		
						2.5◈	330◈	—	Triode Section		

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
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♠Per section. ⁑Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milliamperes	Screen Milliamperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,400	—	—	—	*6HB7*¶
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	
Vertical Amplifier	250	250	18	38	3.0	55,000	5,100	—	—	—	6HC8
	60	250	0	180	30	—	—	—	—	—	
Max positive pulse plate voltage ◈ =2,200 volts; max d-c cathode current ◈ =65 ma											
Vertical Oscillator	250	—	3	1.4	—	34,000	2,000	68	—	—	
Max. d-c cathode current ◈ =20 ma; max peak negative pulse grid voltage ◈ =400 volts											
Horizontal Amplifier	135	135	22	65	4.0	5,000	10,000	—	—	—	6HD5■
	60	135	0	540	48	—	—	—	—	—	
Max positive pulse plate voltage ◈ =7,000; max d-c cathode current ◈ =280 ma											
Class A Amplifier	125	125	1.0	12	3.5	—	7,000	—	—	—	*6HD7*¶
Class A Amplifier	100	—	R_g = 0.1 meg	14	—	4,880	8,200	40	—	—	
Vertical Amplifier	250	250	20	43	3.5	50,000	4,100	—	—	—	6HE5■
	60	250	0	180	20	—	—	—	—	—	
Max positive pulse plate voltage ◈ =2,500; max d-c cathode current ◈ =75 ma											
Horizontal Amplifier	130	130	22	60	2.8	6,200	8,800	—	—	—	6HE7■
	50	130	0	450	40	—	—	—	—	—	
Max positive pulse plate voltage ◈ =5,000; max d-c cathode current ◈ = 230 ma											
TV Damper: Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ =4,200; max peak current ◈ =1,200 ma											
Horizontal Amplifier	175	125	25	125	4.5	5,600	11,300	—	—	—	6HF5■
	70	120	0	570	34	—	—	—	—	—	
Max positive pulse plate voltage ◈ =7,500; max d-c cathode current ◈ = 315 ma											
Class A Amplifier	200	125	R_k = 68	25	7.0	75,000	12,500	—	—	—	*6HF8*
	45	125	0	40	15	—	—	—	—	—	
Class A Amp	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Class A Amplifier	250	250	12.5	45†	4.5†	52,000	4,100	—	5,000	4.5	*6HG5*
Class A Amplifier	170	150	1.2	10	3.3	350,000	12,000	—	—	—	*6HG8*
Class A Amp	100	—	3.0	14	—	3,100	5,500	17	—	—	
Horizontal Amplifier	135	135	22	80	5.5	5,000	10,000	(b.p. connected to k at socket)			6HJ5■
	60	135	0	540	48	—	—				
Max positive pulse plate voltage ◈ =7,000; max d-c cathode current ◈ = 280 ma											
Class A Amplifier	125	125	1.0	9.5	2.3	—	12,300	—	—	—	*6HJ7*¶
Class A Amplifier	100	—	R_g = 0.1 meg	14	—	4,880	8,200	40	—	—	
Class A Amplifier	125	125	R_k = 56	11.5	3.6	200,000	9,300	—	—	—	*6HJ8*¶
Video Detector: Max d-c output current ◈ =5.0 ma; voltage drop: 10 volts at 50 ma											
Class A Amplifier	135	—	1.0	12.5	—	5,000	15,000	75	—	—	*6HK5*
Class A Amplifier	130	130	R_k = 56	70†	5.0†	7,500	17,000	—	2,000	3.0	*6HL5*
Class A Amplifier	125	125	1.0	12	4.5	150,000	10,000	—	—	—	*6HL8*¶
Class A Amp	125	—	1.0	12.5	—	5,000	7,000	40	—	—	

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Out-put	Grid-plate
6HM5	High-Mu Triode	7GM	5–2	6.3	0.185	2.6◈	200◈	—	4.5	3.0	0.34♣
6HM6	Sharp-Cutoff RF Pentode	9PM	6–2	6.3	0.3	2.5◈	250◈	250⁑◈ 0.6◈	8.7	3.0	0.024
6HQ5	Triode	7GM	5–2	6.3	0.2	2.5◈	200◈	—	5.0	3.5	0.52
6HQ6	Semi-Remote-Cutoff RF Pentode	7CM	5–2	6.3	0.3	2.4◈	330◈	330⁑◈ 0.65◈	7.8	3.0	0.016
6HR5¶	Beam Pentode	7BZ	5–3	6.3	0.45	8.0◈	260◈	270◈ 2.0◈	8.3▲	8.2▲	0.35▲
6HR6¶	Semi-Remote-Cutoff RF Pentode	7BK	5–2	6.3	0.45	3.0◈	300◈	300⁑◈ 1.0◈	8.8▲	5.2▲	0.006 ▲♣
6HS5■	Beam Triode	12GY	12–60	6.3	1.5	30◈	5500◈ Peak	—	24▲	6.5▲	1.6▲
6HS6¶	Sharp-Cutoff RF Pentode	7BK	5–2	6.3	0.45	3.0◈	300◈	300⁑◈ 1.0◈	8.8▲	5.2▲	0.006 ▲♣
6HS8	Twin Pentode	9FG	6–3	6.3	0.3	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
6HT6	Semi-Remote-Cutoff RF Pentode	9PM	6–2	6.3	0.3	2.5◈	250◈	250⁑◈ 0.6◈	8.7	3.0	0.024
6HU6	Electron-Ray Indicator	9GA	T-X	6.3	0.3	0.6	—	—	Max Target Voltage =300 Volts Min Target Voltage =170 Volts		
6HV5■	Beam Triode	12GY	T-X	6.3	1.8	30◈	5,500 peak◈	—	19▲	7.0▲	1.5▲
6HV5-A■	Beam Triode	12GY	T-X	6.3	1.8	35◈	5,500 peak◈	—	22▲	11▲	1.8▲
6HW8	Double-Plate Sheet-Beam Tube	9NQ	6–3	6.3	0.3	2.0◈ ♠	330◈ ♠	330◈	—	—	—
6HZ5■	Beam Triode	12GY	12–62	6.3	2.4	30◈	6,000 ◈	—	22▲	10▲	2.2▲
6HZ6¶	Dual-Control Pentode	7EN	5–2	6.3	0.45	1.7◈	300◈	300⁑◈ 1.0◈	—	—	—
6HZ8	Triode-Pentode	9DX	9–77	6.3	1.125	8.0◈ 1.0◈	330◈ 300◈	330◈⁑ 2.0◈ —	Pentode Section Triode Section		
6J4	High-Frequency Triode	7BQ	5–2	6.3	0.4	2.25	150	—	—	—	—
6J5 6J5-GT	Medium-Mu Triode	6Q	8–1 9–12	6.3	0.3	2.5	300	—	3.4 4.2	3.6 5.0	3.4 3.8
6J6 *6J6-A*¶	Medium-Mu Twin Triode	7BF	5–2	6.3	0.45	1.5♠	300	— —	2.6 Both Sections in Push-pull	1.6_1 1.0_2	1.5
6J7 6J7-G 6J7-GT	Sharp-Cutoff Pentode	7R	8–4 12–8 9–18	6.3	0.3	0.75 1.75	300 250	300⁑ 0.1 —	Pentode connection Triode connection (G_2, G_3 & P tied)		
6J8-G	Triode-Heptode Converter	8H	12–8	6.3	0.3	0.4 0.75	300 150	100 0.3 —	Osc I_{c1} =0.4 ma R_{g1} =50,000 ohms Triode Section		
6J9¶	Triple Triode	10G	6–13	6.3	0.45	2.0◈ ♠ 5.0◈ Total	330◈	—	—	—	—

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Fac-tor	Load for Rated Out-put, Ohms	Power Out-put, Watts	Tube Type
Class A Amplifier	135	—	1.0	12.5	—	—	14,500	78	—	—	*6HM5*
Class A Amplifier	125	125	R_k = 56	13	3.2	156,000	15,000	—	—	—	*6HM6*
Class A Amplifier	135	—	1.0	11.5	—	5,400	15,000	78	—	—	*6HQ5*
Class A Amplifier	125	125	R_k = 56	15	3.8	220,000	10,500	—	—	—	*6HQ6*
Class A Amplifier	260	270	19	30	2.3	—	3,600	—	—	—	*6HR5*¶
Class A Amplifier	200	115	R_k = 68	13.2	4.3	500,000	8,500	—	—	—	*6HR6*¶
Avg. Char.	3500	—	4.4	300 Peak	—	4,600	65,000	300	(b.p. connected to k at socket)		6HS5 ■
Class A Amplifier	150	75	R_k = 68	8.8	2.8	500,000	9,500	—	—	—	*6HS6*¶
Sync Separator and AGC Keyer	100	67.5	I_{c1} = 0.1 ma	2.0	4.4	(Both Sections Operating)			E_{c3} = 0 volts		*6HS8*
	100	67.5	0	—	—	—	1,100	—	E_{c3} = 0 volts		
	(Plate and grid number 3 of opposite section grounded)										
Class A Amplifier	125	125	R_k = 56	15	4.0	143,000	14,000	—	—	—	*6HT6*
Level Indicator	Plate voltage = 250 thru 0.1 Meg; Target voltage = 250; (E_c = 0; Pattern length, dark portion = 0.83″; Target current = 1.0 ma; Plate current = 20 ma) E_c = −10 volts; Pattern length, dark portion = 0.0″; Target current = 1.8 ma; Plate current = 0.5 ma										*6HU6*
Pulse Regulator	3,500	—	4.4	300 peak	—	4,600	65,000	300	(b.p. connected to k at socket)		6HV5 ■
Pulse Regulator	3,500	—	4.4	300 peak	—	4,600	65,000	300	(b.p. connected to k at socket)		6HV5-A ■
Synchronous Detector	250	250	R_k = 270	13	1.4	—	4,000	—	—	—	*6HW8*
	(With plates tied together and deflectors grounded) Total voltage on either deflector with an equal and opposite change on the other deflector required to switch the plate current from one plate to the other = 40 volts maximum										
Pulse Regulator	500	—	−1.25	5.4	—	—	11,500	235	(b.p. connected to k at socket)		6HZ5 ■
Class A Amplifier	150	100	R_k = 180	3.2	3.2	110,000	3,400	E_{c3} = 0 volts			*6HZ6*¶
Class A Amplifier	250	170	R_k = 100	29	6.0	140,000	12,600	—	—	—	6HZ8
Class A Amp	200	—	2.0	3.5	—	17,500	4,000	70	—	—	
Class A Amplifier	150	—	R_k = 100	15	—	4,500	12,000	55	—	—	*6J4*
Class A Amplifier	250	—	8.0	9.0	—	7,700	2,600	20	—	—	**6J5**
	90		0	10		6,700	3,000	20	—	—	6J5-GT
Class A Amplifier ♠	100	—	R_k = 50 ⊕	8.5	—	7,100	5,300	38	—	—	*6J6*
Class C Amplifier	150	—	10	30	—	Input Signal = 0.35 watt I_{c1} = 16 ma d-c				3.5	*6J6-A*¶
Class A Amplifier	250	100	3.0	2.0	0.5	1,000,000	1,225	—	—	—	**6J7**
	100	100	3.0	2.0	0.5	1,000,000	1,185	—	—	—	6J7-G
Class A Amp	250	—	8.0	6.5	—	10,500	1,900	20	—	—	6J7-GT
Converter	250	100	3.0	1.3	3.5	2,500,000	290 #	E_b (Triode Osc) = 250 thru 20,000 ohms I_b (Triode) = 5.8 ma			6J8-G
Class A Amplifier	125	—	1.0	6.0	—	11,000	5,200	57	—	—	*6J9*¶

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦ G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✠Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Output	Grid-plate
6J10■	Pentode-Gated-Beam Discriminator	12BT	9–58	6.3	0.95	10◈ —	275◈ 330◈	275◈ 2.0◈ 110◈	Pentode Section (Pins 2, 3, 9, 11) Gated-Beam Discriminator (Pins 4, 5, 6, 7, 8)		
6J11■	Twin Pentode	12BW	9–58	6.3	0.8	3.1◈♦	330◈♦	330§◈♦ 0.65◈♦	11	2.8_1 3.2_2	0.04♣
6JA5■	Beam Power Amplifier	12EY	12–57	6.3	1.0	19◈	400◈	300◈ 275◈	14▲	7.5▲	0.66▲
6JA8	Triode-Pentode	9DX	6–3	6.3	0.75	5.0◈ 1.0◈	330◈ 300◈	330§◈ 1.5◈ —	Pentode Section Triode Section		
6JB5■	Beam Power Amplifier	12EY	12–57	6.3	0.8	15◈	350◈	300◈ 2.75◈	9.5▲	6.5▲	0.49▲
6JB6	Beam Power Amplifier	9QL	12–70	6.3	1.2	17.5◈	770§◈	220◈ 3.5◈	15▲	6.0▲	0.2▲
6JB6-A	Beam Power Amplifier	9QL	T-X	6.3	1.2	17.5◈	770§◈	220◈ 3.5◈	15▲	6.0▲	0.2▲
6JC5■	Beam Power Amplifier	12EY	12–57	6.3	0.8	19◈	350◈	300◈ 2.75◈	9.5▲	7.0▲	0.54▲
6JC6	Sharp-Cutoff Pentode	9PM	6–2	6.3	0.3	2.5◈	330◈	330§◈ 0.6◈	8.2▲	3.0▲	0.019♣▲
6JC6-A	Sharp-Cutoff Pentode	9PM	6–2	6.3	0.3	3.1◈	330◈	330§◈ 0.7◈	8.5▲	3.0▲	0.019♣▲
6JC8¶	Triode-Pentode	9PA	6–2	6.3	0.45	2.3◈ 1.7◈	275◈ 275◈	275◈§ 0.45◈ —	Pentode Section Triode Section		
6JD5■	Beam Triode	12GY	T-X	6.3	2.4	35◈	5,500◈peak	—	23▲	12▲	1.7▲
6JD6	Sharp-Cutoff Pentode	9PM	6–2	6.3	0.3	2.5◈	330◈	330§◈ 0.6◈	8.2▲	3.0▲	0.019♣▲
6JE6	Beam Power Amplifier	9QL	T-X	6.3	2.5	24◈	990§◈	190◈ 3.2◈	21▲	11▲	0.44▲
6JE6-A	Beam Power Amplifier	9QL	12–116	6.3	2.5	30◈	990§◈	220◈ 5.0◈	22▲	11▲	0.56▲
6JE6-B	Beam Power Amplifier	9QL	12–116	6.3	2.5	30◈	990§◈	220◈ 5.0◈	22▲	11▲	0.56▲
6JE6-C	Beam Power Amplifier	9QL	12–116	6.3	2.5	30◈	990§◈	220◈ 5.0◈	22▲	11▲	0.56▲
6JE8	Triode-Pentode	9DX	6–3	6.3	0.78	5.0◈ 1.0◈	330◈ 300◈	330◈§ 2.0◈ —	Pentode Section Triode Section		
6JF6	Beam Power Amplifier	9QL	T-X or 12–70	6.3	1.6	17◈	770§◈	220◈ 3.5◈	22▲	9.0▲	1.2▲
6JG5	Sharp-Cutoff Pentode	9SF	6–3	6.3	0.525	5.0◈	330◈	330§◈ 1.1◈	11▲	4.5▲	0.10▲
6JG6	Beam Power Amplifier	9QU	12–64	6.3	1.6	17◈	770§◈	220◈ 3.5◈	22▲	9.0▲	0.7▲

■Compactron.
† Zero signal.
♦Per section.
‡ Plate-to-plate.
♣Maximum.
§ Supply voltage.
◉Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250	250	8.0	35†	2.5†	100,000	6,500	—	5,000	4.2	6J10■
FM Limiter-Discriminator	285‡	100	R_k = 200 to 400	0.49	9.8	—	—	—	330,-000	—	
Ecl = 1.25 Volts RMS											
Class A Amplifier ♠	125	125	R_k = 56	11	3.8	200,000	13,000	—	—	—	6J11■
Vertical-Deflection Amplifier	135	125	10	95	4.2	12,000	10,300	—	—	—	6JA5■
	45	125	0	210	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,500 volts; max d-c cathode current ◈ = 110 ma.										
Class A Amplifier	200	135	1.5	18	4.0	70,000	14,000	—	—	—	*6JA8*
	30	135	0	32	14	—	—	—	—	—	
Class A Amp	200	—	2.0	3.5	—	19,000	3,700	70	—	—	
Vertical Amplifier	250	250	20	43	3.5	50,000	4,100	—	—	—	6JB5■
	60	250	0	180	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,500 volts; max d-c cathode current ◈ = 75 ma.										
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	(g_3 connected to k at socket)			6JB6
	60	150	0	390	32	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	(g_3 connected to k at socket)			6JB6-A
	60	150	0	390	32	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Vertical Amplifier	250	250	20	43	3.5	50,000	4,100	—	—	—	6JC5■
	60	250	0	180	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,500 volts; max d-c cathode current ◈ = 75 ma.										
Class A Amplifier	125	125	R_k = 56	13	3.2	180,000	15,000	—	—	—	*6JC6*
Class A Amplifier	125	125	R_k = 56	14	3.4	180,000	16,000	(g_3 connected to k at socket)			*6JC6-A*
Class A Amp	125	125	1.0	9.0	2.2	300,000	5,500	—	—	—	*6JC8*¶
Class A Amp	125	—	1.0	12	—	6,000	6,500	40	—	—	
Pulse Regulator	3,500	—	4.4	300 peak	—	4,600	55,000	300	(b.p. connected to k at socket)		6JD5■
Class A Amplifier	125	125	R_k = 56	15	4.0	160,000	14,000	—	—	—	*6JD6*
Horizontal Amplifier	175	125	25	115	5.0	5,500	10,500	(g_3 connected to k at socket)			6JE6
	70	125	0	580	40	—	—				
	Max positive pulse plate voltage ◈ = 7,000; max d-c cathode current ◈ = 315 ma										
Horizontal Amplifier	175	125	25	130	2.8	5,800	9,600	(E_{c3} = 30 volts)			6JE6-A
	55	125	0	580	40	—	—				
	Max positive pulse plate voltage ◈ = 7,500; max d-c cathode current ◈ = 350 ma										
Horizontal Amplifier	175	125	25	130	2.8	5,500	10,500	(b.p. connected to k at socket)			6JE6-B
	70	125	0	600	36	—	—				
	Max positive pulse plate voltage◈ = 7,500 volts; max d-c cathode current◈ = 350 ma										
Horizontal Amplifier	175	125	25	130	2.8	5,500	10,500	(b.p. connected to k at socket)			6JE6-C
	60	125	0	600	30	—	—				
	Max positive pulse plate voltage ◈ = 7,500 volts; max d-c cathode current◈ = 350 ma										
Class A Amplifier	250	170	R_k = 82	22	4.0	140,000	12,000	—	—	—	*6JE8*
Class A Amp	200	—	2.0	4.5	—	16,600	4,200	70	—	—	
Horizontal Amplifier	130	125	20	80	2.5	12,000	10,000	(Ec3 = +25 volts)			6JF6
	55	125	0	525	32	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 275 ma										
Class A Amplifier	200	150	R_k = 100	25	5.5	60,000	11,500	—	—	—	*6JG5*
	60	150	0	55	18	—	—	—	—	—	
Horizontal Amplifier	130	125	20	80	2.5	12,000	10,000	(g_3 connected to k at socket)			6JG6
	50	125	0	525	32	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 275 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
❋ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Output	Grid-plate
6JG6-A	Beam Power Amplifier	9QU	12–96	6.3	1.6	17◈	770⁑◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
6JH5■	Beam Triode	12JE	T-X	6.3	2.4	35◈	5,500 ◈peak	—	23▲	12▲	1.7▲
6JH6	Semi-Remote-Cutoff Pentode	7CM	5–2	6.3	0.3	2.3◈	300◈	300⁑◈ 0.55◈	7.0	3.0	0.015 ♣
6JH8	Double Plate Sheet-Beam Tube	9DP	6–3	6.3	0.3	3.0♠ ◈	330◈	330◈ 1.0◈	—	—	—
6JK5■	Beam Triode	12JE	T-X	6.3	1.8	35◈	5,500 ◈peak	—	22▲	11▲	1.8▲
6JK6	Sharp-Cutoff RF Pentode	7CM	5–2	6.3	0.35	2.5◈	275◈	275⁑◈ 0.6◈	9.5▲	2.7▲	0.02♣ ▲
6JK8	Double Triode	9AJ	6–2	6.3	0.4	1.0◈	165◈	—	Section 1 (Pins 6, 7, 8)		
						2.0◈	200◈	—	Section 2 (Pins 1, 2, 3)		
6JL6	Semi-Remote-Cut-off RF Pentode	7CM	5–2	6.3	0.35	2.5◈	275◈	275⁑◈ 0.6◈	9.3▲	2.7▲	0.02♣ ▲
6JL8	Triode-Pentode	9DX	6–3	6.3	0.75	5.0◈	330◈	175◈ 1.1◈	Pentode Section		
						2.0◈	330◈	—	Triode Section		
6JM6■	Beam Power Amplifier	12FJ	12–79	6.3	1.2	17.5◈	770⁑◈	220◈ 3.5◈	16▲	7.0▲	0.6▲
6JM6-A■	Beam Power Amplifier	12FJ	12–79	6.3	1.2	17.5◈	770⁑◈	220◈ 3.5◈	16▲	7.0▲	0.6▲
6JN6■	Beam Power Amplifier	12FK	12–56	6.3	1.2	17.5◈	770⁑◈	220◈ 3.5◈	16▲	7.0▲	0.34▲
6JN6-A■	Beam Power Amplifier	12FK	12–56	6.3	1.2	17.5◈	770⁑◈	220◈ 3.5◈	16▲	7.0▲	0.34▲
6JN8¶	Triode-Pentode	9FA	6–2	6.3	0.45	2.5◈	300◈	300⁑◈ 0.55◈	Pentode Section		
						2.5◈	300◈	—	Triode Section		
6JQ6	Beam Pentode with Integral Diode	9RA	6–4	6.3	1.2	10◈	425◈	330◈ 2.0◈	13▲	6.0▲	0.32▲
6JR6	Beam Power Amplifier	9QU	12–96	6.3	1.6	17◈	770⁑◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
6JS6■	Beam Pentode	12FY	12–89	6.3	2.25	28◈	990⁑◈	190◈ 5.5◈	24▲	10▲	0.7▲
6JS6-A■	Beam Power Amplifier	12FY	12–89	6.3	2.25	28◈	990⁑◈	190◈ 5.5◈	24▲	10▲	0.7▲
6JS6-B■	Beam Power Amplifier	12FY	12–89	6.3	2.25	28◈	990⁑◈	190◈ 5.5◈	24▲	10▲	0.7▲

■Compactron. **† Zero signal.** **♠Per section.**
‡ Plate-to-plate. **♣Maximum.** **⁑ Supply voltage.**
●Subminiature type. **▲Without external shield.** **◈Design maximum rating.**
⊕Total for all similar sections. **⊠Absolute maximum rating.** **# Conversion transconductance.**

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	130	125	20	80	2.5	12,000	10,000	(Ec3 = +25 volts)			6JG6-A
	55	125	0	525	32	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 275 ma										
Pulse Regulator	3,500	—	4.4	300 peak	—	4,600	55,000	300	(b.p. connected to k at socket)		6JH5 ■
Class A Amplifier	125	125	R_k = 56	14	3.6	260,000	8,000	—	—	—	*6JH6*
Color TV Synchronous Detector	250	250	R_k = 220	14	1.5	—	4,400	—	—	—	*6JH8*
	(With plates tied together and deflectors (pins 1 and 2) grounded.) Total voltage change on either deflector with an equal and opposite change on the other deflector required to switch the plate current from one plate to the other = 20 volts maximum										
Pulse Regulator	3,500	—	4.4	300 peak	—	4,600	65,000	300	(b.p. connected to k at socket)		6JK5 ■
Class A Amplifier	125	125	R_k = 68	11.5	3.9	150,000	18,000	—	—	—	*6JK6*
Class A Amplifier	100	—	1.0	5.3	—	8,000	6,800	55	—	—	*6JK8*
Class A Amplifier	135	—	1.2	10	—	5,400	13,000	70	—	—	
Class A Amplifier	125	60	R_k = 68	12.5	4.0	120,000	15,500	—	—	—	*6JL6*
Class A Amplifier	300	150	3.5	25†	5.0†	60,000	11,500	—	5,000	1.8	*6JL8*
Class A Amplifier	150	—	R_k = 150	10	—	7,500	4,700	35	—	—	
Horizontal Amplifier	250	150	22.5	65	1.8	18,000	7,300	(b.p. connected to k at socket)			6JM6 ■
	60	150	0	345	27	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 275 ma										
Horizontal Amplifier	250	150	22.5	70	2.4	15,000	7,300	(b.p. connected to k at socket)			6JM6-A ■
	55	150	0	345	30	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250	150	22.5	65	1.8	18,000	7,300	(b.p. connected to k at socket)			6JN6 ■
	60	150	0	345	27	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250	150	22.5	70	2.4	15,000	7,300	(b.p. connected to k at socket			6JN6-A ■
	55	150	0	345	30	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	*6JN8*¶
Class A Amp	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Vertical Amplifier	140	140	18	35	2.5	10,500	4,200	—	—	—	*6JQ6*
	40	120	0	150	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,000 volts; max d-c cathode current ◈ = 70 ma. Instantaneous diode-plate-to-cathode voltage drop for instantaneous diode-plate current of 2.0 ma = 5.0 volts										
Horizontal Amplifier	130	125	20	45	1.5	18,000	7,000	—	—	—	6JR6
	50	125	0	470	32	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500 volts; max d-c cathode current ◈ = 275 ma.										
Horizontal Amplifier	175	125	25	125	4.5	5,600	11,300	(b.p. connected to k at socket)			6JS6 ■
	70	120	0	570	34	—	—				
	Max positive pulse plate voltage ◈ = 7,500; max d-c cathode current ◈ = 315 ma										
Horizontal Amplifier	175	125	25	125	4.5	5,600	11,300	(b.p. connected to k at socket)			6JS6-A ■
	62	125	0	570	34	—	—				
	Max positive pulse plate voltage ▣ = 7,500; max d-c cathode current ◈ = 315 ma										
Horizontal Amplifier	175	125	25	125	4.5	5,600	11,300	(b.p. connected to k at socket)			6JS6-B ■
	62	125	0	570	34	—	—				
	Max positive pulse plate voltage ⊡ = 7,500 volts; max d-c cathode current ◈ = 315 ma.; primary beam-plate emission = 100 microamperes										

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads: Input	Output	Grid-plate
6JS6-C ■	Beam Power Amplifier	12FY	12–89	6.3	2.25	30◈	990◈	220‡◈ 5.5◈	24▲	10▲	0.7▲
6JT6	Beam Pentode	9QU	T-X	6.3	1.2	17.5◈	770‡◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
6JT6-A	Beam Power Amplifier	9QU	12–95	6.3	1.2	17.5◈	770‡◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
6JT8	Triode-Pentode	9DX	9–69	6.3	0.725	4.0◈ 1.0◈	330◈ 330◈	330‡◈ 1.1◈ —	Pentode Section Triode Section		
6JU6	Beam Power Amplifier	9QL	T-X	6.3	1.6	17◈	770‡◈	220◈ 3.5◈	22▲	9.0▲	1.2▲
6JU8	Quadruple Diode	9PQ	6–3	6.3	0.6	—	—	Tube Voltage Drop: ♠ 10 volts at 60 ma d-c			
6JU8-A	Quadruple Diode	9PQ	6–2	6.3	0.6	—	Tube Voltage Drop: ♠ 10 volts at 60 ma d-c				
6JV8¶	Triode-Pentode	9DX	6–3	6.3	0.6	4.0◈ 1.1◈	330◈ 330◈	330◈ 1.7◈ —	Pentode Section Triode Section		
6JW6¶	Pentode	9PU	6–3	6.3	0.6	11.5◈	400◈	330‡◈ 1.0◈	16▲	5.0▲	0.13▲
6JW8	Triode-Pentode	9DC	6–2	6.3	0.43	1.2 1.4	250 250	250 0.8 —	Pentode Section Triode Section		
6JZ6■	Beam Power Amplifier	12GD	12–79	6.3	1.5	18◈	770‡◈	220◈ 3.5◈	24▲	8.5▲	0.34▲
6JZ8■	Triode-Pentode	12DZ	9–58	6.3	1.2	7.0◈ 1.0◈	250◈ 250◈	200◈ 1.8◈ —	Pentode Section Triode Section		
6K4◉	Medium-Mu Triode	6K4	3–2	6.3	0.15	3.0	250	—	2.4▲	0.8▲	2.4▲
6K5-G 6K5-GT	High-Mu Triode	5U	12–8 9–17	6.3	0.3	—	250	—	— 2.4▲	— 3.6▲	— 2.0▲
6K6-GT	Power Amplifier Pentode	7S	9–11 or 9–41	6.3	0.4	8.5 7.0	315 315	285 2.8 —	Single Tube 2 Tubes, Push-Pull Triode Connection (G_2 & P tied)		
6K7 6K7-G 6K7-GT	Remote-Cutoff RF Pentode	7R	8–4 12–8 9–18	6.3	0.3	2.75	300	300‡ 0.35	7.0 5.0 4.6	12.0 12.0 12.0	0.005♣ 0.007♣ 0.005♣
6K8 6K8-G 6K8-GT	Triode-Hexode Converter	8K♥	8–2 12–8 9–24	6.3	0.3	0.75♠	300	150 0.7	Osc I_{c1} = 0.15 ma R_{g1} = 50,000 ohms		
6K11¶■	Three-Section Triode	12BY	9–56	6.3	0.6	2.75◈ 0.3◈	330◈ 330◈	— —	Section 1 (Pins 4, 9, 10) Section 2 and 3 (Pins 5, 6, 7, and 2, 3, 11)		
6KA8¶	Triode-Pentode	9PV	6–3	6.3	0.6	2.0◈ 1.1◈	300◈ 300◈	300‡◈ 1.1◈	Pentode Section Triode Section		

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ‡Supply voltage. ◈Design maximum rating. #Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	175	125	25	130	2.8	5,500	11,500	—	(b.p. connected to k at socket)		6JS6-C ■
	60	125	0	600	32	—	—	—			
	Max positive pulse plate voltage ◈ = 7,500 volts; max d-c cathode current ◈ = 350 ma.										
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	(g3 connected to k at socket)			6JT6
	60	150	0	390	32	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	(g3 connected to k at socket)			6JT6-A
	60	150	0	390	32	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Class A Amplifier	200	100	R_k = 82	17	3.5	50,000	20,000	—	—	—	6JT8
	35	100	0	50	17	—	—	—	—	—	
Class A Amp	250	—	2.0	1.5	—	37,000	2,700	100	—	—	
Horizontal Amplifier	130	125	20	45	1.5	18,000	7,000	(b.p. connected to k at socket)			6JU6
	50	125	0	470	32	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ =275 ma										
Detector	Max d-c output current per plate ◈ =9.0 ma; max peak inverse voltage ◈ =300 volts; max peak current per plate ◈ =54 ma										*6JU8*
Detector	Max d-c output current per plate ◈ =9.0 ma; max peak inverse voltage ◈ = 300 volts; max peak current per plate ◈ =54 ma										*6JU8-A*
Class A Amplifier	125	125	1.0	22	4.0	100,000	11,500	—	—	—	*6JV8*¶
	40	125	0	28	9.0	—	—	—	—	—	
Class A Amplifier	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Class A Amplifier	250	150	R_k = 56	28	6.5	50,000	36,000	—	—	—	*6JW6*¶
Class A Amplifier	100	100	1.0	6.0	1.7	—	5,500	—	—	—	*6JW8*
Class A Amplifier	200	—	2.0	3.5	—	—	3,500	70	—	—	
Horizontal Amplifier	130	130	20	46	1.8	9,900	9,000	—	—	—	6JZ6■
	50	130	0	450	29	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 230 ma										
Vertical Amplifier	120	110	8.0	46	3.5	11,700	7,100	—	—	—	6JZ8■
	45	110	0	122	16.5	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,000; max d-c cathode current ◈ =70 ma										
Vertical Oscillator	150	—	5.0	5.5	—	8,500	2,350	20	—	—	
	Max d-c cathode current ◈ =20 ma										
Class A Amplifier	200	—	R_k = 680	11.5	—	4,650	3,450	16	—	—	6K4◉
Class A Amplifier	250	—	3.0	1.1	—	50,000	1,400	70	—	—	6K5-G 6K5-GT
Class A Amplifier	315	250	21	25.5†	4.0†	110,000	2,100	—	9,000	4.5	6K6-GT
	250	250	18	32†	5.5†	90,000	2,300	—	7,600	3.4	
	100	100	7.0	9.0†	1.6†	104,000	1,500	—	12,000	0.35	
Class A Amplifier	285	285	R_k = 400	55†	9.0†	—	—	—	12,000 ‡	9.8	
	285	285	25.5	55†	9.0†	—	—	—	12,000 ‡	10.5	
Vertical Amplifier	250	—	18	37.5	—	2,500	2,700	6.8	—	—	
	Max positive pulse plate voltage ▣ =1200 volts; max d-c cathode current=25 ma										
Class A Amplifier	250	125	3.0	10.5	2.6	600,000	1,650	—	—	—	**6K7** 6K7-G 6K7-GT
	250	100	3.0	7.0	1.7	800,000	1,450	—	—	—	
	100	100	1.0	9.5	2.7	150,000	1,650	—	—	—	
Converter	250	100	3.0	2.5	6.0	600,000	350 #	E_b (Triode Osc) = 100 I_b (Triode) =3.8 ma			**6K8** 6K8-G 6K8-GT
Class A Amp	250	—	8.5	10.5	—	7,700	2,200	17	—	—	6K11¶■
Class A Amplifier ♠	250	—	2.0	1.2	—	62,500	1,600	100	—	—	
Class A Amplifier	150	100	R_k = 180	4.0	2.8	100,000	4,400	—	—	—	*6KA8*¶
Class A Amp	200	—	2.0	4.0	—	17,500	4,000	70	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

♣Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads: Input	Output	Grid-plate
6KD6■	Beam Power Amplifier	12GW	12-118	6.3	2.85	33▣	990ǂ◈	200◈ 5.0◈	40▲	16▲	0.8▲
6KD8	Triode-Pentode	9AE	6-2	6.3	0.4	3.0◈ 2.5◈	330◈ 330◈	330ǂ◈ 0.55◈ —	Pentode Section Triode Section		
6KE6■	Beam Power Amplifier	12GM	12-79	6.3	1.5	18◈	770ǂ◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
6KE8	Triode-Pentode	9DC	6-2	6.3	0.4	2.0◈ 2.0◈	280◈ 280◈	280ǂ◈ 0.5◈ —	Pentode Section Triode Section		
6KF8	Twin Pentode	9FG	6-3	6.3	0.3	1.1◈ ♠	300◈	150◈ 0.75◈	—	—	—
6KG6	Beam Power Amplifier	9RJ	T-X	6.3	2.0	34◈	700ǂ◈	250◈ 7.0◈	—	—	—
6KL8	Diode-Pentode	9LQ	6-3	6.3	0.3	3.0◈	300◈	300ǂ◈ 0.6◈	Pentode Section Diode Section		
6KM6	Beam Power Amplifier	9QL	T-X or 12-70	6.3	1.6	20◈	770ǂ◈	220◈ 3.5◈	22▲	9.0▲	1.2▲
6KM8	Diode Triple-Plate Tetrode	9QG	6-3	6.3	0.3	1.0◈ ♠	330◈	330ǂ◈ 0.65◈	—	—	—
6KN6■	Beam Power Amplifier	12GU	12-82	6.3	3.0	30◈	770ǂ◈	220◈ 5.0◈	44▲	18▲	1.0▲
6KN8	Twin Triode	9AJ	6-2	6.3	0.4	2.2▣ ♠	220▣	—	—	—	—
6KR8	Triode-Pentode	9DX	6-3	6.3	0.75	5.0◈ 2.0◈	330◈ 330◈	330ǂ◈ 1.1◈ —	Pentode Section Triode Section		
6KR8-A	Triode-Pentode	9DX	6-3	6.3	0.75	5.0◈ 2.0◈	330◈ 330◈	330◈ 1.5◈ —	Pentode Section Triode Section		
6KS6	Gated-Beam Discriminator	7DF	5-3	6.3	0.3	—	330ǂ◈	330ǂ◈	—	—	—
6KS8¶	Triode-Pentode	9DX	6-3	6.3	0.6	3.75◈ 1.1◈	330◈ 330◈	330ǂ◈ 1.1◈ —	Pentode Section Triode Section		
6KT6	Semi-Remote-Cutoff Pentode	9PM	6-2	6.3	0.3	3.1◈	330◈	330ǂ◈ 0.6◈	9.5▲	3.0▲	0.019 ♣▲
6KT8	Triode-Pentode	9QP	6-2	6.3	0.6	2.5◈ 1.0◈	330◈ 330◈	330ǂ◈ 0.55◈ —	Pentode Section Triode Section		
6KU8	Duplex-Diode Pentode	9LT	9-69	6.3	0.725	4.0◈	330◈	330ǂ◈ 1.1◈	12▲ Diode Sections	3.0▲	0.1♣ ▲
6KV6	Beam Power Pentode	9QU	12-97	6.3	1.6	20◈	770ǂ◈	220◈ 2.0◈	22▲	9.0▲	0.6▲
6KV6-A	Beam Power Pentode	9QU	12-97	6.3	1.6	28◈	900◈	220◈ 2.0◈	22▲	9.0▲	0.6▲

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ǂ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	150	110	22.5	100	2.0	6,000	14,000	(b.p. connected to k at socket)			**6KD6**■
	45	160	0	1,100	110	—	—				
	Max positive pulse plate voltage ◈ = 7,000; max d-c cathode current ◈ = 400 ma										
Class A Amplifier	125	110	1.0	9.5	3.5	200,000	5,000	—	—	—	*6KD8*
Class A Amp	125	—	1.0	13.5	—	—	7,500	40	—	—	
Horizontal Amplifier	130	130	20	50	1.75	11,000	9,100	—	—	—	**6KE6**■
	60	130	0	410	24	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 230 ma										
Class A Amplifier	125	125	R_k = 33	10	2.8	125,000	12,000	—	—	—	*6KE8*
Class A Amplifier	125	—	R_k = 68	13	—	5,000	8,000	40	—	—	
Sync Separator and AGC Keyer	100	67.5	I_{c1} = 0.1 ma	2.8	—	—	270	—	E_{c3} = 0 volts		*6KF8*
	100	67.5	0	—	—	—	1,750	—	E_{c3} = 0 volts		
	(Characteristics given are for each section separately with plate and grid number 3 of opposite section grounded)										
Horizontal Amplifier	160	160	0	1,400	45	—	—	(E_{c3} = 0 volts)			6KG6
	45	160	0	1,000	—	—	—				
	Max positive pulse plate voltage ◈ = 7,000; max d-c cathode current ◈ = 500 ma										
Class A Amplifier Detector	100	100	E_{cc1} = 0	5.5	2.2	550,000	4,300	R_{g1} = 2.2 Megohms			*6KL8*
	Max d-c output current ◈ = 1.0 ma										
Horizontal Amplifier	140	140	24.5	80	2.4	6,000	9,500	(E_{c3} = 30 volts)			6KM6
	60	140	0	560	31	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 275 ma										
Class A Amplifier	100	100	E_{cc1} = 0	4.2	1.7	30,000	3,400	R_{g1} = 2.2 megohms			*6KM8*
	(With plates tied together)										
Horizontal Amplifier	130	130	20	100	4.0	4,000	16,000	(b.p. connected to k at socket)			6KN6■
	60	125	0	800	50	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 400 ma										
Class A Amplifier ♦	110	—	1.0	16	—	2,800	16,000	45	—	—	*6KN8*
Class A Amplifier	200	100	R_k = 82	19.5	3.0	60,000	20,000	—	—	—	*6KR8*
Class A Amplifier	125	—	R_k = 68	15	—	4,400	10,400	46	—	—	
Avg. Char.	200	100	R_k = 82	19.5	3.0	60,000	20,000	—	—	—	*6KR8-A*
	35	100	0	54	13.5	—	—	—	—	—	
Avg. Char.	125	—	R_k = 68	15	—	4,400	10,400	46	—	—	
FM Limiter-Discriminator	135	280‡	—	5.0	(R_{g2} = 33,000 ohms) (E_{c3} = +4.0 volts)						*6KS6*
Class A Amplifier	150	150	R_k = 150	20	4.5	150,000	9,500	—	—	—	*6KS8*¶
	65	150	0	60	20	—	—	—	—	—	
Class A Amp	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Class A Amplifier	125	125	R_k = 56	17	4.2	160,000	18,000	—	(E_{c3} = 0 volts)		*6KT6*
Class A Amplifier	125	125	1.0	12	4.5	150,000	10,000	—	—	—	*6KT8*
Class A Amplifier	250	—	2.0	1.8	—	31,500	3,200	100	—	—	
Class A Amplifier	200	100	R_k = 82	17	3.5	50,000	20,000	—	—	—	6KU8
	50	100	0	55	18	—	—	—	—	—	
	Average diode current at 10 volts = 2.0 ma										
HV Pulse Shunt Regulator	140	140	24.5	40	2.4	10,000	6,000	(E_{c3} = 0 volts)			6KV6
	100	140	0	440	30	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 275 ma										
Pulse Regulator	140	140	24.5	40	2.4	10,000	6,000	(E_{c3} = 0 volts)			6KV6-A
	100	140	0	440	30	—	—				
	Max positive pulse plate voltage ◈ = 6,500 volts; max d-c cathode current ◈ = 275 ma.										

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
‡Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✱ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
6KV8	Triode-Pentode		9DX	6–3	6.3	0.775	5.0◈ 1.0◈	300◈ 300◈	300⁑◈ 1.0◈ —	Pentode Section Triode Section		
6KY6	Sharp-Cutoff Pentode		9GK	6–3	6.3	0.52	9.0◈	330◈	330⁑◈ 1.0◈	14▲	6.0▲	0.16▲
6KY8	Triode-Pentode		9QT	T-X	6.3	1.1	12◈ 1.5◈	300◈ 330◈	150◈ 1.9◈ —	Pentode Section Triode Section		
6KY8-A	Triode-Pentode		9QT	9–107	6.3	1.1	12◈ 1.5◈	300◈ 330◈	150◈ 1.9◈ —	Pentode Section Triode Section		
6KZ8¶	Triode-Pentode		9FZ	6–2	6.3	0.45	2.5◈ 2.5◈	330◈ 330◈	330⁑◈ 0.55◈ —	Pentode Section Triode Section		
6L4	Medium-Mu Triode (Acorn)		7BR	4-2	6.3	0.225	1.7	500	—	0.5▲	1.8▲	1.6▲
6L5-G	Medium-Mu Triode		6Q	12–7	6.3	0.15	—	250	—	3.0	5.0	2.7
6L6 6L6-G 6L6-GA 6L6-GB	Beam Power Amplifier		7AC	10–1 16–3 14–3 12–15	6.3	0.9	19 19	360 275	270 2.5 —	Single Tube Single Tube 2 Tubes, Push-pull 2 Tubes, Push-pull 2 Tubes, Push-pull Triode Connection (G_2 & P tied)		
6L6-GC	Beam-Power Amplifier		7AC	12–15	6.3	0.9	30◈ 30◈	500◈ 450◈	450◈ 5.0◈ —	Two Tubes, Push-Pull Triode Connection (G_2 & P tied)		
6L7 6L7-G	Pentagrid Mixer		7T	8–4 12–8	6.3	0.3	1.5 1.0	300 300	100 1.0 150 1.0	— E_{c3} (Injection) =18 v peak	—	—
6LB6■	Beam-Power Amplifier		12GJ	12–90	6.3	2.25	30▣	990⁑◈	200◈ 5.0◈	33▲	18▲	0.44▲
6LB8	Triode-Pentode		9DX	9–69	6.3	0.725	4.0◈ 2.0◈	330◈ 330◈	330⁑◈ 1.1◈ —	Pentode Section Triode Section		
6LC6 ●	Beam Triode	Ⓐ	8ML	12–36	6.3	0.2	40◈	27,000◈	—	2.6▲	1.0▲	1.0▲
6LC8¶	Triode-Pentode		9QY	6–3	6.3	0.6	2.0◈ 1.1◈	300◈ 300◈	300⁑◈ 1.1◈ —	Pentode Section Triode Section		
6LE8	Twin Pentode		9QZ	6–4	6.3	0.76	2.0◈♠	300◈	150◈ 2.0◈	—	—	—
6LF6■	Beam Power Amplifier		12GW	T-X	6.3	2.0	40◈	990⁑◈	275◈ 9.0◈	37▲	18.5▲	2.5▲
6LF8¶	Triode-Pentode		9DX	6–3	6.3	0.6	3.75◈ 1.1◈	330◈ 330◈	330⁑◈ 1.1◈ —	Pentode Section Triode Section		

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—
[▲] —X-Radiation Rated, and Ⓐ— No X-Radiation Rating.

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	200	125	R_k = 68	20	3.5	75,000	23,000	—	—	—	*6KV8*
	125	125	R_k = 82	16.5	3.1	55,000	21,000	—	—	—	
Class A Amplifier	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Class A Amplifier	200	135	R_k = 47	30	5.2	40,000	30,000	(g3 connected to k at socket)			*6KY6*
Vertical Amplifier	135	120	10	39	3.0	18,000	8,400	—	—	—	6KY8
	50	120	0	170	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,000; max d-c cathode current ◈ = 70 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	135	120	10	39	3.0	18,000	8,400	—	—	—	6KY8-A
	50	120	0	170	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,000; max d-c cathode current ◈ =70 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	
	Max d-c cathode current ◈ =22 ma										
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	*6KZ8*¶
Class A Amplifier	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Class A Amplifier	80	—	R_k = 150	9.5	—	4,400	6400	28	—	—	6L4
Class A Amp	250	—	9.0	8.0	—	9,000	1,900	17	—	—	6L5-G
Class A Amplifier	250	250	14	72†	5.0†	22,500	6,000	—	2,500	6.5	**6L6** 6L6-G 6L6-GA 6L6-GB
Class A Amplifier	350	250	18	54†	2.5†	33,000	5,200	—	4,200	10.8	
Class A Amplifier	270	270	17.5	134†	11†	23,500	5,700	—	5,000‡	17.5	
Class AB_1 Amplifier	360	270	22.5	88†	5.0†	—	—	—	3,800‡	18	
Class AB_2 Amplifier	360	270	22.5	88†	5.0†	—	—	—	3,800‡	47	
Class A Amplifier	250	—	20	40†	—	1,700	4,700	8.0	5,000‡	1.4	
Class AB_1 Amplifier	450	400	37	116†	5.6†	—	—	—	5,600‡	55	6L6-GC
	(Characteristics given above for 6L6, 6L6G, 6L6GA, and 6L6GB apply also.)										
Class A Amplifier	250	100	3.0	5.3	6.5	600,000	1,100 E_{c3} = −3.0 volts				**6L7** 6L7-G
Mixer	250	150	6.0	3.3	9.2	1,000,000	350 # E_{c3} = −15 volts				
Horizontal Amplifier	150	110	20	105	2.0	6,600	13,400	(b.p. connected to k at socket)			6LB6■
	45	160	0	900	110	—	—				
	Max positive pulse plate voltage ◈ =7,000; max d-c cathode current ◈ =315 ma										
Class A Amplifier	200	100	Rk = 82	17	3.5	50,000	20,000	—	—	—	6LB8
	50	100	0	55	18	—	—	—	—	—	
Class A Amplifier	125	—	Rk = 68	13	—	6,000	5,000	30	—	—	
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ◈ = 1.6 ma.										6LC6 ●
Class A Amplifier	150	100	Rk = 180	4.0	2.8	100,000	4,400	—	—	—	*6LC8*¶
Class A Amplifier	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Color Demodulator	100	100	2.5	8.0	15	50,000	5,800	—	Ec3 =0 volts		*6LE8*
Horizontal Amplifier	160	160	30	175	2.5	—	—	(Ec3 =0 volts)			6LF6■
	75	160	0	1350	90	—	—	—	—	—	
	Max positive pulse plate voltage◈ =8,000 volts										
Class A Amplifier	100	150	2.5	20	5.0	200,000	11,000	—	—	—	*6LF8*¶
	75	150	0	50	12	—	—	—	—	—	
Class A Amplifier	200	—	2.0	4.0	—	17,500	4,000	70	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✱ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
6LG6■	Beam Power Amplifier		12HL	12-89	6.3	2.0	28◈	990⁑◈	200◈ 5.0◈	25▲	13▲	0.8▲
6LH6 ●	Beam Triode	0.5 mR/hr [▲]	8ML	12-36	6.3	0.2	40◈	27,000 ◈	—	2.6▲	1.0▲	1.0▲
6LH6-A ●	Beam Triode	0.5 mR/hr [▲]	8ML	12-36	6.3	0.2	40▣	27,000 ▣	—	2.6▲	1.0▲	1.0▲
6LJ6 ●	Beam Triode	(▲)	8MQ	12-36	6.3	0.2	40◈	27,000 ◈	—	2.6▲	1.0▲	1.0▲
6LJ6-A ●	Beam Triode	0.5 mR/hr [▲]	8MQ	12-21	6.3	0.2	40▣	27,000 ▣	—	2.6▲	1.0▲	1.0▲
6LJ8	Triode-Pentode		9GF	6-2	6.3	0.4	2.0◈ 2.0◈	280◈ 280◈	280⁑◈ 0.5◈ —	Pentode Section Triode Section		
6LM8	Triode-Pentode		9AE	6-2	6.3	0.45	2.5◈ 2.5◈	350◈ 330◈	330⁑◈ 0.55◈ —	Pentode Section Triode Section		
6LM8-A¶	Triode-Pentode		9AE	6-2	6.3	0.45	3.75◈ 2.5◈	350◈ 330◈	330⁑◈ 1.1◈ —	Pentode Section Triode Section		
6LN8¶	Triode-Pentode		9AE	6-2	6.0	0.45	1.7 1.5	250 250	200 0.75 —	Pentode Section Triode Section		
6LQ6	Beam Power Amplifier		9QL	12-117	6.3	2.5	30◈	990⁑◈	220◈ 5.0◈	22▲	11▲	0.56▲
6LQ8	Triode-Pentode		9DX	6-3	6.3	0.775	5.0◈ 2.0◈	300◈ 300◈	300⁑◈ 1.0◈ —	Pentode Section Triode Section		
6LR6■	Beam Power Amplifier		12FY	12-90	6.3	2.5	30◈	990⁑◈	220◈ 5.0◈	33▲	12▲	0.47▲
6LR8	Triode-Pentode		9QT	12-65	6.3	1.5	14◈ 2.5◈	400◈ 400◈	300◈ 2.75◈ —	Pentode Section Triode Section		
6LT8¶	Duplex-Diode Pentode		9RL	6-2	6.3	0.6	3.1◈	330◈	330⁑◈ 0.65◈	Pentode Section Diode Sections		
6LU6	Semi-Remote-Cutoff RF Pentode		7CM	5-2	6.3	0.4	4.0◈	300◈	300⁑◈ 1.5◈	7.3▲	2.2▲	0.058 ▲
6LU8■	Triode-Pentode		12DZ	12-57	6.3	1.5	14◈ 2.5◈	400◈ 400◈	300◈ 2.75◈ —	Pentode Section Triode Section		
6LV6■	Beam Power Amplifier		12GW	T-X	6.3	2.0	40◈	990⁑◈	275◈ 9.0◈	37▲	18.5▲	2.5▲
6LW6	Beam Power Amplifier		8NC	14-7	6.3	2.65	40◈	990⁑◈	280◈ 7.0◈	40▲	14.5▲	1.0▲
6LX6■	Beam Power Amplifier		12JA	12-136	6.3	2.55	33◈	990⁑◈	250◈ 5.0◈	40▲	17▲	1.0▲
6LX8¶	Triode-Pentode		9DC	6-2	6.0	0.45	1.2 1.4	250 250	250 0.8 —	Pentode Section Triode Section		

§See pages 20 and 21 for X-Radiation Rated Recommended Replacement Chart and Symbol Definitions—[▲]—X-Radiation Rated, and (▲)—No X-Radiation Rating.

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	175 60	125 125	23 0	90 600	1.7 42	7,500 —	11,500 —	— —	— —	— —	6LG6■
	Max positive pulse plate voltage ▣ =7,500 volts; max d-c cathode current◈ =315 ma.										
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; d-c plate current ◈ = 1.6 ma.										6LH6 ●
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; d-c plate current = ▣ 1.6 ma.										6LH6-A ●
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; d-c plate current ◈ = 1.6 ma.										6LJ6 ●
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ▣ = 1.5 ma.										6LJ6-A ●
Class A Amplifier	125	125	R_k = 33	12	3.5	125,000	13,000	—	—	—	*6LJ8*
Class A Amplifier	125	—	R_k = 68	13	—	5,000	8,000	40	—	—	
Class A Amplifier	125	125	2.0	12	4.0	150,000	6,000	—	—	—	*6LM8*
Class A Amplifier	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Class A Amplifier	**125**	**125**	**2.0**	**12**	**4.0**	**150,000**	**6,000**	—	—	—	*6LM8-A*¶
Class A Amplifier	**125**	—	**1.0**	**13.5**	—	**5,400**	**8,500**	**46**	—	—	
Class A Amplifier	170	170	2.0	10	2.8	400,000	6,200	—	—	—	*6LN8*¶
Class A Amplifier	100	—	2.0	14	—	4,000	5,000	20	—	—	
Horizontal Amplifier	175 60	145 145	35 0	95 710	2.4 55	7,000 —	7,500 —	(Ec3 =30 volts) —	 —	 —	6LQ6
	Max positive pulse plate voltage◈ =7,500; max d-c cathode current◈ = 350 ma.										
Class A Amplifier	125	125	R_k = 82	16.5	3.1	55,000	21,000	—	—	—	*6LQ8*
Class A Amplifier	125	—	R_k = 68	15	—	4,400	10,400	46	—	—	
Horizontal Amplifier	175 60	110 110	20 0	140 700	2.4 35	5,300 —	16,000 —	(b.p. connected to k at socket)			6LR6■
	Max positive pulse plate voltage ▣ =7,500; max d-c cathode current◈ =375 ma.										
Class A Amplifier	135	120	10	56	3.0	12,000	9,300	—	—	—	6LR8
Class A Amplifier	250	—	4.0	2.3	—	16,000	3,600	58	—	—	
Class A Amplifier	125	125	R_k = 56	10	3.4	200,000	13,000	—	—	—	*6LT8*¶
	Max d-c output current◈♦ = 5.0 ma; voltage drop: 5.0 volts at 20 ma d-c♦										
Class A Amplifier	250	250	R_k = 820	9.0	2.3	280,000	3,900	—	—	—	*6LU6*
Class A Amplifier	135	120	10	56	3.0	12,000	9,300	—	—	—	6LU8■
Class A Amplifier	250	—	4.0	2.3	—	16,000	3,600	58	—	—	
Horizontal Amplifier	160 75	160 160	30 0	175 1350	2.5 90	— —	— —	(E_{c3} = 0 volts) —	 —	 —	6LV6 ■
	Max positive pulse plate voltage ◈ = 8,000 volts.										
Horizontal Amplifier	250 60	250 110	56 0	125 650	4.2 37	6,700 —	12,000 —	— —	— —	— —	6LW6
	Max positive pulse plate voltage ◈ = 7,500 volts; d-c cathode current ◈ = 400 ma.										
Horizontal Amplifier	175 60	110 110	21 0	125 750	3.3 4.2	6,000 —	14,000 —	— —	— —	— —	6LX6 ■
	Max positive pulse plate voltage ◈ = 7,000 volts; max d-c cathode current ◈ = 400 ma.										
Class A Amplifier	100	100	1.0	6.0	1.7	—	5,500	—	—	—	*6LX8*¶
Class A Amplifier	200	—	2.0	3.5	—	—	3,500	70	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
♣Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	§ X-Radiation Rating	Base Connections	Outline Dwg.	Filament Volts	Filament Amps	Max. Plate Watts	Max. Plate Volts	✠ Max. Screen Volts and Watts	Capacitance in Picofarads Input	Output	Grid-Plate
6LY8	Triode-Pentode		9DX	6–3	6.3	0.75	5.0◈ 1.0◈	330◈ 330◈	330❢◈ 1.1◈ —	Pentode Section Triode Section		
6LZ6	Beam Power Amplifier		9QL	12–117	6.3	2.3	30◈	990❢◈	220◈ 5.0◈	22▲	11▲	0.6▲
6M3	Half-Wave High-Vacuum Rectifier		8GV	T-X	6.3	3.0	8.0	Tube Voltage Drop: 22 v at 640 ma d-c				
6M11■	Twin-Triode Pentode		12CA	9–58	6.3	0.75	3.1◈ 2.25◈♠	330◈ 330◈	330❢◈ 0.65◈ —	Pentode Section Triode Sections		
6MA6 ●	Beam Triode	0.5 mR/hr [▲]	8NP	12–21	6.3	0.2	40▣	30,000▣	—	2.4▲	0.88▲	0.03▲
6MB6■	Beam Power Amplifier		12FY	T-X	6.3	2.25	35◈	990❢◈	225◈ 7.0◈	35▲	17▲	0.5▲
6MB8	Triode-Pentode		9FA	6–2	6.3	0.4	2.0◈ 2.0◈	280◈ 280◈	280❢◈ 0.5◈	Pentode Section Triode Section		
6MC6	Beam Power Amplifier		9QL	T-X	6.3	2.85	33◈	990❢◈	250◈ 5.0◈	40▲	16▲	1.0▲
6MD8	Triple Triode		9RQ	T-X	6.3	0.9	3.0◈♠	330◈	—	—	—	—
6ME6	Beam Power Amplifier		9QL	12–117	6.3	2.3	30◈	990❢◈	220◈ 5.0◈	22▲	11▲	0.6▲
6ME8	Double Plate Sheet Beam Tube		9RU	6–3	6.3	0.3	2.0◈♠	400◈	400◈ 2.0◈	—	—	—
6MF8■	Triode-Pentode		12DZ	12–57	6.3	1.4	12◈ 2.5◈	400◈ 400◈	300◈ 2.75◈ —	Pentode Section Triode Section		
6MG8	Triode-Pentode		9DC	6–2	6.3	0.45	2.0◈ 2.5◈	330◈ 330◈	300❢◈ 0.5◈ —	Pentode Section Triode Section		
6MJ8■	Triple Triode		12HG	9–60	6.3	0.9	3.0◈♠	330◈	—	2.9_1▲ 2.9_2▲ 3.0_3▲	0.36_1▲ 0.6_2▲ 0.7_3▲	2.8_1▲ 2.8_2▲ 2.8_3▲
6MK8	Twin Pentode		9FG	6–3	6.3	0.3	1.1◈♠	300◈	150◈ 0.75◈	—	—	—
6MK8-A	Twin Pentode		9FG	6–3	6.3	0.3	1.1◈♠	300◈	150◈ 0.75◈	—	—	—
6ML8	Triple Triode		9RQ	6–2	6.3	0.675	2.0◈ 5.0◈⊕	330◈	—	—	—	—
6MN8■	Triple Triode		12HU	9–60	6.3	0.9	3.0◈♠	330◈	—	4.6▲	0.33_1▲ 0.57_2▲ 0.65_3▲	2.6▲
6MQ8	Triode-Pentode		9AE	6.2	6.3	0.535	2.5◈ 2.7◈	330◈ 330◈	330❢◈ 0.55◈ —	Pentode Section Triode Section		
6MU8¶	Triode-Pentode		9AE	6–3	6.3	0.6	3.75◈ 2.5◈	330◈ 330◈	330❢◈ 1.1◈ —	Pentode Section Triode Section		

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‡ Plate-to-plate. ♣Maximum. ❢ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	200	100	R_k = 82	19.5	3.0	60,000	20,000	—	—	—	*6LY8*
	35	100	0	54	13.5	—	—	—	—	—	
Class A Amplifier	250	—	2.0	1.0	—	59,000	1,700	100	—	—	
Horizontal Amplifier	175	125	25	140	2.0	6,000	11,000	—	—	—	6LZ6
	55	125	0	800	56	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 7,500 volts; d-c cathode current ◈ = 350 ma.										
TV Damper	Max d-c output current = 320 ma; max peak inverse voltage ▣ = 6,000 volts; max peak current = 1,100 ma										6M3
Class A Amplifier	125	125	R_k = 56	11	3.4	200,000	13,000	—	—	—	6M11■
Class A Amp ♠	125	—	R_k = 120	8.0	—	7,250	8,000	58	—	—	
HV Shunt Regulator	Unregulated d-c supply voltage = 36,000 volts; max d-c plate current ▣ = 1.5 ma.										6MA6 ●
Horizontal Amplifier	150	110	20	110	2.0	5,000	14,000	—	—	—	6MB6■
	60	110	0	660	42	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 8,000 volts; max d-c cathode current ◈ = 400 ma.										
Class A Amplifier	125	125	R_k = 33	10	2.8	125,000	12,000	—	—	—	*6MB8*
Class A Amplifier	125	—	R_k = 68	13	—	5,000	8,000	40	—	—	
Horizontal Amplifier	175	110	21	125	3.3	6,000	14,000	—	—	—	6MC6
	60	110	0	750	42	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 8,000 volts; max d-c cathode current ◈ = 400 ma										
Class A Amplifier ♠	250	—	10.5	11.5	—	5,500	3,100	17	—	—	6MD8
Horizontal Amplifier	175	125	25	130	2.8	5,800	9,600	—	—	—	6ME6
	55	125	0	580	40	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 8,000 volts; max d-c cathode current ◈ = 350 ma.										
Color TV Synchronous Detector	250	350	R_k = 390	14.5	0.7	—	4,400	—	—	—	*6ME8*
	(With plates tied together and deflectors (pins 1 and 2) grounded.) Total voltage change on either deflector with an equal and opposite change on the other deflector required to switch the plate current from one plate to the other = 75 volts maximum.										
Class A Amplifier	250	250	20	50	3.5	5,000	4,100	—	—	—	6MF8■
Class A Amplifier	250	—	4.0	2.6	—	14,000	4,100	58	—	—	
Class A Amplifier	170	170	2.0	10	2.8	400,000	6,200	—	—	—	*6MG8*
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	
Class A Amplifier ♠	250	—	10.5	10	—	5,600	3,000	17	—	—	6MJ8■
Avg. Char. ♠	100	67.5	—	2.0	4.4	(Both sections operating)					*6MK8*
	(Grid current adjusted for 100 microamperes d-c)										
Color Demodulator ♠	100	67.5	—	2.0	4.4	(Both Sections Operating)					*6MK8-A*
	(Grid current adjusted for 100 microamperes d-c)										
Class A Amplifier ♠	125	—	1.0	11	—	6,400	6,700	43	—	—	*6ML8*
Class A Amplifier ♠	125	—	1.0	11	—	5,500	9,000	50	—	—	6MN8■
Class A Amplifier	125	125	R_k = 62	12	4.5	150,000	10,000	—	—	—	*6MQ8*
Class A Amplifier	150	—	R_k = 56	18	—	5,000	5,000	40	—	—	
Class A Amplifier	150	150	R_k = 150	19	4.2	165,000	9,000	—	—	—	*6MU8*¶
Class A Amplifier	125	—	1.0	115	—	5,800	6,000	35	—	—	

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Out-put	Grid-plate
6MV8¶	Triode-Pentode	9DX	6–2	6.3	0.6	2.5◈ 1.0◈	330◈ 330◈	330‡◈ 0.55◈ —	Pentode Section Triode Section		
6MY8■	Triode-Pentode	12DZ	12–57	6.3	1.45	16◈ 2.5◈	400◈ 400◈	300◈ 2.75◈ —	Pentode Section Triode Section		
6N4	Medium-Mu Triode	7CA	5–1	6.3	0.2	3.0	180	—	3.0	1.6	1.1
6N5	Electron Ray Indicator same as 6AB5										
6N6-G	Direct-Coupled Power Amplifier Triode	7AU	14–3	6.3	0.8	13.5 2.5‖	300	300‖	—	—	—
6N7 6N7-G 6N7-GT	Twin-Triode Power Amplifier	8B	8–6 14–3 9–11	6.3	0.8	1.0♠	300	— —	Both Sections in Push-pull Both Sections in Parallel		
6P5-GT	Medium-Mu Triode	6Q	9–11	6.3	0.3	1.25	250	—	3.4	5.5	6.2
6P7-G	Triode-Pentode	7U	12–8	6.3	0.3	1.7 0.4	250 100	100 —	Pentode Section Triode Section		
6Q7 6Q7-G 6Q7-GT	Duplex-Diode High-Mu Triode	7V	8–4 12–8 9–18	6.3	0.3	—	300	—	—	—	—
6Q11¶■	Three-Section Triode	12BY	9–56	6.3	0.6	3.0◈ 1.2◈	330◈ 330◈	— —	Section 1 (Pins 3, 9, 10) Sections 2 and 3 (Pins 5, 6, 7, and 2, 3, 11)		
6R3	Half-Wave, High-Vacuum Rectifier	9CB	6–8	6.3	0.81	—	Tube Voltage Drop: 16.3 Volts at 150 ma d-c				
6R7 6R7-G 6R7-GT	Duplex-Diode Medium-Mu Triode	7V	8–4 12–8 9–17	6.3	0.3	2.5	250	—	4.8	3.8	2.4
6R8	Triple-Diode, Low-Mu Triode	9E	6–2	6.3	0.45	2.5	250	—	—	—	—
6S4	Medium-Mu Triode	9AC	6–3	6.3	0.6	8.5◈	550◈	—	4.2▲	0.6▲	2.4▲
6S4-A¶	Medium-Mu Triode	9AC	6–3	6.3	0.6	8.5◈	550◈	—	4.2▲	0.6▲	2.4▲
6S7 6S7-G	Remote-Cutoff RF Pentode	7R	8–2 12–8	6.3	0.15	2.25	300	300‡ 0.25	6.5 4.4	10.5 8.0	0.005♣ 0.008♣
6S8-GT	Triple-Diode High-Mu Triode	8CB	9–23, 9–48	6.3	0.3	0.5	300	—	—	—	—
6SA7 6SA7-GT	Pentagrid Converter	8R♥ 8AD♥	8–1 9–11, 9–41	6.3	0.3	1.0	300	100 1.0	Osc I_{c1} = 0.5 ma R_{g1} = 20,000 ohms		
6SB7-Y	Pentagrid Converter	8R♥	8–1	6.3	0.3	2.0	300	100 1.5	Osc I_{c1} = 0.35 ma R_{g1} = 20,000 ohms		
6SC7 6SC7-GT	High-Mu Twin-Triode	8S	8–1 9–11	6.3	0.3	—	250	—	—	—	—
6SD7-GT	Semi-Remote-Cutoff Pentode	8N	9–12	6.3	0.3	4.0	300	125 0.4	9.0	7.5	0.0035♣
6SE7-GT	Sharp-Cutoff Pentode	8N	9–12	6.3	0.3	4.0	300	125 0.4	8.0	7.5	0.005♣
6SF5 6SF5-GT	High-Mu Triode	6AB	8–1 9–11	6.3	0.3	—	300	—	—	—	—
6SF7	Diode Remote-Cutoff Pentode	7AZ	8–1	6.3	0.3	3.5	300	300‡ 0.5	5.5	6.0	0.004♣
6SG7 6SG7-GT	Semi-Remote-Cutoff RF Pentode	8BK	8–1 9–12	6.3	0.3	3.0	300	300‡ 0.6	8.5 8.5	7.0 7.0	0.003♣ 0.0035♣
6SH7 6SH7-GT	Sharp-Cutoff RF Pentode	8BK	8–1 9–12	6.3	0.3	3.0	300	300‡ 0.7	8.5	7.0	0.0035♣

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ‡ Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ⊞Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	125	125	1.0	13	4.0	150,000	9,000	—	—	—	*6MV8*¶
Class A Amplifier	250	—	2.0	2.5	—	25,000	4,000	100	—	—	
Class A Amplifier	135	120	10	56	3.0	12,000	9,300	—	—	—	6MY8 ■
	45	125	0	200	20	—	—	—	—	—	
Class A Amplifier	250	—	4.0	2.3	—	16,000	3,600	58	—	—	
Class A Amplifier	180	—	3.5	12	—	5,400	6,000	32	—	—	*6N4*
Class A Amplifier	300 Input	300‖ Plate	0	45	8.0	24,000	2,400	—	7,000	4.0	6N6-G
Class B Amplifier	300	—	0	35†	—	—	—	—	8,000‡	10	**6N7** 6N7-G 6N7-GT
Class A Amplifier	294	—	6.0	7.0	—	11,000	3,200	35	—	—	
Class A Amplifier	250	—	13.5	5.0	—	9,500	1,450	13.8	—	—	6P5-GT
Class A Amp	250	100	3.0	6.5	1.5	850,000	1,100	—	—	—	6P7-G
Class A Amp	100	—	3.0	3.5	—	16,000	500	8.0	—	—	
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	**6Q7** 6Q7-G 6Q7-GT
	100	—	1.0	0.8	—	58,000	1,200	70	—	—	
Class A Amplifier	150	—	0	22	—	7,000	2,500	18	—	—	6Q11¶■
Class A Amplifier ♠	100	—	1.0	0.5	—	80,000	1,250	100	—	—	
	250	—	2.0	1.2	—	62,500	1,600	100	—	—	
TV Damper	Max d-c output current = 150 ma; max peak inverse voltage = 4,500 volts; max peak current = 450 ma										*6R3*
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	—	—	**6R7** 6R7-G 6R7-GT
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	10,000	0.30	*6R8*
Vertical Amplifier	250	—	8.0	26	—	3,600	4,500	16	—	—	*6S4*
	Max positive pulse plate voltage ◙ = 2,200 volts; max d-c cathode current ◈ = 30 ma										
Vertical Amplifier	250	—	8.0	24	—	3,700	4,500	16.5	—	—	*6S4-A*¶
	Max positive pulse plate voltage ◙ = 2,200 volts; max d-c cathode current ◈ = 30 ma										
Class A Amplifier	250	100	3.0	8.5	2.0	1,000,000	1,750	—	—	—	**6S7** 6S7-G
Class A Amplifier	250	—	2.0	0.9	—	91,000	1,100	100	—	—	6S8-GT
Converter	250	100	2.0	3.5	8.5	1,000,000	450#	—	—	—	**6SA7**
	100	100	2.0	3.3	8.5	500,000	425#	—	—	—	6SA7-GT
Converter	250	100	1.0	3.8	10	1,000,000	950#	—	—	—	**6SB7-Y**
Class A Amplifier ♠	250	—	2.0	2.0	—	53,000	1,325	70	—	—	**6SC7** 6SC7-GT
Class A Amplifier	250	125	2.0	9.5	3.0	700,000	4,250	—	—	—	6SD7-GT
Class A Amplifier	250	100	1.5	4.5	1.5	1,000,000	3,400	—	—	—	6SE7-GT
Class A Amplifier	250	—	2.0	0.9	—	66,000	1,500	100	—	—	**6SF5** 6SF5-GT
	100	—	1.0	0.4	—	85,000	1,150	100	—	—	
Class A Amplifier	250	100	1.0	12.4	3.3	700,000	2,050	—	—	—	**6SF7**
Class A Amplifier	250	150	2.5	9.2	3.4	1,000,000	4,000	—	—	—	**6SG7** 6SG7-GT
	250	125	1.0	11.8	4.4	900,000	4,700	—	—	—	
	100	100	1.0	8.2	3.2	250,000	4,100	—	—	—	
Class A Amplifier	250	150	1.0	10.8	4.1	900,000	4,900	—	—	—	**6SH7** 6SH7-GT

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✤Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads		
									Input	Out-put	Grid-plate
6SJ7 6SJ7-GT	Sharp-Cutoff Pentode	8N	8–1 9–12	6.3	0.3	2.5 2.5	300 250	300**‡** 0.7 —	Pentode Connection Triode Connection (G_2, G_3 & P tied)		
6SK7 6SK7-GT	Remote-Cutoff RF Pentode	8N	8–1 9–11	6.3	0.3	4.0	300	300**‡** 0.4	6.0 6.5	7.0 7.5	0.003 ♣ 0.005 ♣
6SL7-GT	High-Mu Twin-Triode	8BD	9–11, 9–41	6.3	0.3	1.0♠	300	—	—	—	—
6SN7-GT	Medium-Mu Twin Triode	8BD	9–11, 9–14	6.3	0.6	3.5♠ 5.0⊕	300	—	2.8_1▲ 3.0_2▲	0.8_1▲ 1.2_2▲	3.8_1▲ 4.0_2▲
6SN7-GTA 6SN7-GTB¶	Medium-Mu Twin Triode	8BD	9–11 or 9–41	6.3	0.6	5.0♠ 7.5⊕	450	—	2.2_1▲ 2.6_2▲	0.7▲	4.0_1▲ 3.8_2▲
6SQ7 6SQ7-GT	Duplex-Diode, High-Mu Triode	8Q	8–1 9–12	6.3	0.3	0.5	300	—	3.2 4.2▲	3.0 3.4▲	1.6 1.8▲
6SR7 6SR7-GT	Duplex-Diode Medium-Mu Triode	8Q	8–1 9–11	6.3	0.3	2.5	250	—	3.6 —	2.8 —	2.4 —
6SS7	Remote-Cutoff RF Pentode	8N	8–1	6.3	0.15	2.25	300	100 0.35	5.5	7.0	0.004 ♣
6ST7	Duplex-Diode Medium-Mu Triode	8Q	8–1	6.3	0.15	2.5	250	—	2.8	3.0	1.5
6SU7-GTY	High-Mu Twin-Triode	8BD	9–11	6.3	0.3	1.0♠	250	—	—	—	—
6SV7	Diode Sharp-Cutoff RF Pentode	7AZ	8–1	6.3	0.3	2.3	300	300**‡** 0.6	6.5	6.0	0.004 ♣
6SZ7	Duplex-Diode High-Mu Triode	8Q	8–1	6.3	0.15	—	300	—	2.6	2.8	1.1
6T4	UHF Triode Oscillator	7DK	5–1	6.3	0.225	3.5	200	—	2.6▲	0.4▲	1.7▲
6T5	Electron-Ray Indicator	6R	9–26	6.3	0.3	—	250**‡**	—	—	—	—
6T7-G	Duplex-Diode High-Mu Triode	7V	12–8	6.3	0.15	—	250	—	1.8	3.1	1.7
6T8 *6T8-A*¶	Triple-Diode High-Mu Triode	9E	6–2	6.3	0.45	1.1◈	330◈	—	1.7	2.4	1.7
6T9■	Triode-Pentode	12FM	9–58	6.3	0.93	12◈ 1.5◈	275◈ 300◈	275◈ 2.0◈ —	Pentode Section Triode Section		
6T10■	Dissimilar Double Pentode	12EZ	9–59	6.3	0.95	10◈ 1.7◈	275◈ 330◈	275◈ 2.0◈ 330**‡**◈ 1.1◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 5, 6, 7)		
6U4-GT	Half-Wave High-Vacuum Rectifier	4CG	9–13	6.3	1.2	—	Tube Voltage Drop: 21 v at 250 ma d-c				
6U5	Electron-Ray Indicator	6R	9–26	6.3	0.3	—	285**‡**	Max target voltage = 285 Min target voltage = 125			
6U6-GT	Beam Power Amplifier	7AC	9–11	6.3	0.75	11	200	135 2.0	—	—	—
6U7-G	Remote-Cutoff RF Pentode	7R	12–4	6.3	0.3	2.25	300	100 0.25	5.0	9.0	0.007 ♣

■Compactron.
† Zero signal.
♠Per section.
‡ Plate-to-plate.
♣Maximum.
‡ Supply voltage.
◉Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250	100	3.0	3.0	0.8	1,000,000	1,650	—	—	—	**6SJ7**
	100	100	3.0	2.9	0.9	700,000	1,575	—	—	—	6SJ7-GT
Class A Amplifier	250	—	8.5	9.2	—	7,600	2,500	19	—	—	
	180	—	6.0	6.0	—	8,200	2,300	19	—	—	
Class A Amplifier	250	100	3.0	9.2	2.6	800,000	2,000	—	—	—	**6SK7**
	100	100	1.0	13	4.0	120,000	2,350	—	—	—	6SK7-GT
Class A Amplifier ♠	250	—	2.0	2.3	—	44,000	1,600	70	—	—	6SL7-GT
Class A Amplifier ♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	6SN7-GT
	90	—	0	10	—	6,700	3,000	20	—	—	
Class A Amplifier ♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	6SN7-GTA
	90	—	0	10	—	6,700	3,000	20	—	—	6SN7-GTB¶
Vertical Amplifier ♠	Max positive pulse plate voltage ▣ =1500 volts; max plate dissipation ⊕ = 7.5 watts; max d-c cathode current =20 ma										
Class A Amplifier	250	—	2.0	1.1	—	85,000	1,175	100	—	—	**6SQ7**
	100	—	1.0	0.5	—	110,000	925	100	—	—	6SQ7-GT
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	—	—	**6SR7**
											6SR7-GT
Class A Amplifier	250	100	3.0	9.0	2.0	1,000,000	1,850	—	—	—	**6SS7**
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	—	—	**6ST7**
Class A Amplifier ♠	250	—	2.0	2.3	—	44,000	1,600	70	—	—	6SU7-GTY
Class A Amplifier	250	150	1.0	7.5	2.8	1,500,000	3,600	—	—	—	**6SV7**
	100	100	1.0	3.7	1.4	700,000	2,600	—	—	—	
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	**6SZ7**
Class A Amplifier	80	—	R_k = 150	18	—	1,860	7,000	13	—	—	*6T4*
Tuning Indicator	Plate voltage =250 thru 1 meg, target voltage =250 (E_c = −22 volts for max illumination) (E_c =0 volts for min illumination)										6T5
Class A Amplifier	250	—	3.0	1.2	—	62,000	1,050	65	—	—	6T7-G
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	*6T8*
	100	—	1.0	0.8	—	54,000	1,300	70	—	—	*6T8-A*¶
Class A Amplifier	250	250	8.0	35†	2.5†	100,000	6,500	—	5,000	4.2	6T9■
Class A Amplifier	250	—	2.0	1.5	—	45,000	2,100	95	—	—	
Class A Amplifier	250	250	8.0	35†	2.5†	100,000	6,500	—	5,000	4.2	6T10■
Class A Amplifier	150	100	R_k = 560	1.3	2.1	150,000	1,000	E_{c3} =0 volts			
Half-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1250 volts; rms supply voltage =350 volts; max peak current =600 ma										6U4-GT
TV Damper	Max d-c output current =125 ma; max peak inverse voltage ▣ =3850 volts; max peak current =600 ma										
Tuning Indicator	Plate voltage =250 thru 1 meg, target voltage =250 (E_c = −22 volts, shadow =0°) (E_c =0 volt, shadow =90°, plate current =0.24 ma, target current = 4 ma)										6U5
Class A Amplifier	200	135	14.0	55†	3.0†	20,000	6,200	—	3,000	5.5	6U6-GT
Class A Amplifier	250	100	3.0	8.2	2.0	800,000	1,600	—	—	—	6U7-G

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Out-put	Grid-plate
6U8 *6U8-A*¶	Triode-Pentode	9AE	6–2	6.3	0.45	3.0◈	330◈	330◈⁑ 0.55◈	Pentode Section		
						2.5◈	330◈	—	Triode Section		
6U9	Triode-Pentode	10K	6–2	6.3	0.41	2.1	250	250 0.7	Pentode Section		
						1.5	250	—	Triode Section		
6U10¶■	Three-Section Triode	12FE	9–56	6.3	0.6	2.0◈	330◈	—	Sections 1 and 3 (Pins 4, 9, 10, and 2, 3, 11)		
						1.0◈	330◈	—	(Section 2 (Pins 5, 6, 7)		
6V3 *6V3-A*	High-Wave, High-Vacuum Rectifier	9BD	6–7 T-X	6.3	1.75	— 2.7	Tube Voltage Drop: 19 v at 250 ma d-c				
6V4	Full-Wave, High-Vacuum Rectifier	9M	6–3	6.3	0.6	—	Tube Voltage Drop:♠ 25 volts at 90 ma d-c				
6V5-GT	Beam Power Amplifier	6AO	9–11	6.3	0.45	12	315	285 2.0	—	—	—
6V6	Beam Power Amplifier	7AC	8–6	6.3	0.45	14◈	350◈	315◈ 2.2◈	Single Tube		
									2 Tubes, Push-pull		
6V6-GT 6V6-GTA¶	Beam Power Amplifier	7AC	9–11 or 9–41	6.3	0.45	14◈	350◈	315◈ 2.2◈	Single Tube		
							—	—	2 Tubes, Push-Pull		
						10	315◈	—	Triode Connection (G_2 & P tied)		
6V7-G	Duplex-Diode Medium-Mu Triode	7V	12–8	6.3	0.3	—	250	—	2.0	3.5	1.7
6V8	Triple-Diode, High-Mu Triode	9AH	6–2	6.3	0.45	1.0	300	—	—	—	—
6W4-GT	Half-Wave High-Vacuum Rectifier	4CG	9–11, 9–41	6.3	1.2	3.5	Tube Voltage Drop: 21 v at 250 ma d-c				
6W4-GTA	Half-Wave High-Vacuum Rectifier	4CG	9–11	6.3	1.2	4.0◈	Tube Voltage Drop: 21 volts at 250 ma d-c				
6W5-G	Full-Wave High-Vacuum Rectifier	6S	12–7	6.3	0.9	—	Tube Voltage Drop:♠ 24 v at 90 ma d-c				
6W6-GT	Beam Power Amplifier	7AC	9–11 or 9–41	6.3	1.2	12◈	330◈	165◈ 1.35◈	Pentode Connection		
						8.5◈	330◈	—	Triode Connection (G_2 & P tied)·		
6W7-G	Sharp-Cutoff Pentode	7R	12–8	6.3	0.15	0.5	300	300 0.1	5.0	8.5	0.007 ♣
6X4	Full-Wave High-Vacuum Rectifier	5BS	5–3	6.3	0.6	—	Tube Voltage Drop:♠ 22 v at 70 ma d-c				
6X5 6X5-GT	Full-Wave High-Vacuum Rectifier	6S	8–6 9–11	6.3	0.6	—	Tube Voltage Drop:♠ 22 v at 70 ma d-c				
6X8 *6X8-A*¶	Triode-Pentode Converter	9AK	6–2	6.3	0.45	2.3◈	275◈	275◈⁑ 0.45◈	Pentode Section		
						1.7◈	275◈	—	Triode Section		
6X9	Triode-Pentode	10K	6–2	6.3	0.41	2.1	250	250 0.7	Pentode Section		
						1.5	250	—	Triode Section		

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	125	110	1.0	9.5	3.5	200,000	5,000	—	—	—	*6U8* *6U8-A*¶
Class A Amplifier	125	—	1.0	13.5	—	—	7,500	40	—	—	
Class A Amplifier	160	110	1.4	13	5.0	—	12,000	(E_{c3} = 0 volts)			*6U9*
Class A Amplifier	100	—	2.0	14	—	—	5,000	17	—	—	
Class A Amplifier	200	—	6.0	9.6	—	7,700	2,300	17.5	—	—	6U10¶■
Class A Amplifier	200	—	1.5	1.2	—	61,000	1,600	98	—	—	
TV Damper	Max d-c output current = 135 ma; max peak inverse voltage ▣ = 6000 volts; max peak current = 800 ma										*6V3* *6V3-A*
Full-Wave Rectifier	Max d-c output current = 90 ma; max RMS supply voltage per plate = 350 volts										*6V4*
Class A Amplifier	315	225	13	34†	2.2†	77,000	3,750	—	8,500	5.5	6V5-GT
	250	250	12.5	45†	4.5†	52,000	4,100	—	5,000	4.5	
Class A Amplifier	315	225	13	34†	2.2†	80,000	3,750	—	8,500	5.5	**6V6**
	250	250	12.5	45†	4.5†	50,000	4,100	—	5,000	4.5	
	180	180	8.5	29†	3†	50,000	3,700	—	5,500	2.0	
Class AB_1 Amplifier	285	285	19	70†	4†	70,000	3,600	—	8000‡	14	
	250	250	15	70†	5†	60,000	3,750	—	10000‡	10	
Class A Amplifier	315	225	13	34†	2.2†	80,000	3,750	—	8,500	5.5	6V6-GT 6V6-GTA¶
	250	250	12.5	45†	4.5†	50,000	4,100	—	5,000	4.5	
	180	180	8.5	29†	3.0†	50,000	3,700	—	5,500	2.0	
Class AB_1 Amplifier	285	285	19	70†	4.0†	—	—	—	8,000‡	14	
	250	250	15	70†	5.0†	—	—	—	10000‡	10	
Vertical Amplifier	250	—	12.5	49.5	—	1,960	5,000	9.8	—	—	
	Max positive pulse plate voltage ◈ = 1200 volts; max d-c cathode current ◈ = 40 ma										
Class A Amplifier	250	—	20	8.0	—	7,500	1,100	8.3	20,000	0.350	6V7-G
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	*6V8*
	100	—	1.0	0.8	—	54,000	1,300	70	—	—	
TV Damper	Max d-c output current = 125 ma; max peak inverse voltage ▣ = 3850 volts; max peak current = 750 ma										6W4-GT
TV Damper	Max d-c output current ◈ = 140 ma; max peak inverse voltage ◈ = 3,950 volts max peak current ◈ = 840 ma										6W4-GTA
Full-Wave Rectifier	Max d-c output current = 90 ma; max peak inverse voltage = 1250 volts; max rms supply voltage per plate = 325 volts; max peak current per plate = 270 ma										6W5-G
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	6W6-GT
	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
Vertical Amplifier	225	—	30	22	—	1,600	3,800	6.2	—	—	
	Max positive pulse plate voltage ◈ = 1200; max d-c cathode current ◈ = 65 ma										
Class A Amplifier	250	100	3.0	2.0	0.5	1,500,000	1,225	—	—	—	6W7-G
Full-Wave Rectifier	Max d-c output current ◈ = 90 ma; max peak inverse voltage ◈ = 1250 volts; rms supply voltage per plate ◈ = 360 volts; max peak current per plate ◈ = 245 ma										*6X4*
Full-Wave Rectifier	Max d-c output current ◈ = 80 ma; max peak inverse voltage ◈ = 1250 volts; rms supply voltage per plate ◈ = 360 volts; max peak current per plate ◈ = 245 ma										**6X5** 6X5-GT
Class A Amplifier	125	125	1.0	9.0	2.2	300,000	5,500	—	—	—	*6X8*
Class A Amplifier	125	—	1.0	12	—	6,000	6,500	40	—	—	*6X8-A*¶
Class A Amplifier	160	135	1.7	13	5.0	—	14,000	—	—	—	*6X9*
Class A Amplifier	170	—	1.0	8.5	—	—	4,800	55	—	—	

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♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
6Y3-G	Half-Wave High-Voltage Rectifier	4AC	12–8	6.3	0.7	—	—	—	—	—	—
6Y6-G 6Y6-GA 6Y6-GT	Beam Power Amplifier	7AC	14–3 12–14 9–11	6.3	1.25	12.5	200	200‡ 1.75	— 12.0▲ —	— 7.5▲ —	— 0.7▲ —
6Y7-G	Twin-Triode Power Amplifier	8B	12–7	6.3	0.6	11.5⊕	250	—	Both Sections in Push-pull		
6Y9	Dissimilar Double Pentode	10L	6–3	6.3	0.8	5.0 1.5	250 250	250 2.5 250 0.5	Section 1 (Pins 7, 8, 9, 10) Section 2 (Pins 1, 2, 3, 4)		
6Y10■	Dissimilar Double Pentode	12EZ	9–58	6.3	0.83	4.8◈ 1.7◈	300◈ 300◈	300‡◈ 1.1◈ 300‡◈ 1.0◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 5, 6, 7)		
6Z5	Full-Wave High-Vacuum Rectifier	6K	12–5	6.3 12.6	0.8 0.4	—	—	—	—	—	—
6Z7-G	Twin-Triode Power Amplifier	8B	12–7	6.3	0.3	4.0♠	180	—	Both Sections in Push-pull		
6Z10■	Pentode—Gated-Beam Discriminator	12BT	9–58	6.3	0.95	10◈ --	275◈ 330‡◈	275◈ 2.0◈ 330‡◈	Pentode Section (Pins 2, 3, 9, 11) Gated-Beam Discriminator (Pins 4, 5, 6, 7, 8)		
6ZY5-G	Full-Wave High-Vacuum Rectifier	6S	12–7	6.3	0.3	—	Tube Voltage Drop: ♠ 18 v at 40 ma d-c				
7A4	Medium-Mu Triode	5AC	9–30	6.3	0.3	2.5	300	—	3.4	3.0	4.0
7A5	Beam Power Amplifier	6AA	9–31	6.3	0.75	5.5	125	125 1.2	—	—	—
7A6	Twin Diode	7AJ	9–30	6.3	0.15	—	Tube Voltage Drop: ♠ 11 v at 16 ma d-c				
7A7	Remote-Cutoff RF Pentode	8V	9–30	6.3	0.3	4.0	250	100 0.4	6.0	7.0	0.005 ♣
7A8	Octode Converter	8U♦	9–30	6.3	0.15	1.0	300	100 0.3	Osc I_{c1} = 0.4 ma R_{g1} = 50,000 ohms		
7AB7	Sharp-Cutoff RF Pentode	8BO	9–32	6.3	0.15	1.2	300	300‡ 0.15	3.5	4.0	0.06 ♣
7AD7	Power Amplifier Pentode	8V	9–31	6.3	0.6	10	300	300‡ 1.2	11.5	7.5	0.03 ♣
7AF7	Medium-Mu Twin Triode	8AC	9–30	6.3	0.3	2.5♠	300	—	2.2	1.6	2.3 ♣
7AG7	Sharp-Cutoff RF Pentode	8V	9–30	6.3	0.15	2.0	300	300 0.75	7.0	6.0	0.005 ♣
7AH7	Remote-Cutoff RF Pentode	8V	9–30	6.3	0.15	2.0	300	300‡ 0.7	7.0	6.5	0.0 05 ♣
7AJ7	Sharp-Cutoff RF Pentode	8V	9–30	6.3	0.3	1.0	300	100 0.1	6.0	6.5	0.007 ♣
7AK7	Sharp-Cutoff Dual-Control Pentode	8V	9–31	6.3	0.8	8.5	200	100 2.5	12.0	9.5	0.7
7AU7¶	Medium-Mu Twin Triode	9A	6–2	7.0 3.5	0.3 0.6	2.75◈ ♠	330◈	—	1.8	2.0	1.5
7B4	High-Mu Triode	5AC	9–30	6.3	0.3	—	300	—	3.6	3.4	1.6

■Compactron.
† Zero signal.
♠Per section.

‡ Plate-to-plate.
♣Maximum.
‡ Supply voltage.

●Subminiature type.
▲Without external shield.
◈Design maximum rating.

⊕Total for all similar sections.
⊠Absolute maximum rating.
#Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Half-Wave Rectifier	Max d-c output current =7.5 ma; max peak inverse voltage =14,000 volts; max rms supply voltage =5,000 volts; max peak current =100 ma										6Y3-G
Class A Amplifier	200	135	14	61†	2.2†	18,300	7,100	—	2,600	6.0	6Y6-G 6Y6-GA 6Y6-GT
Class B Amplifier	250	—	0	5.3† ♠	—	—	—	—	14,000‡	8.0	6Y7-G
Class A Amplifier	170	170	2.6	30	6.5	40,000	21,000	—	—	—	*6Y9*
Class A Amplifier	150	150	2.3	10	3.0	160,000	8,500	—	—	—	
Class A Amplifier	250	250	R_k = 270	16†	2.7†	150,000	8,400	—	15,000	1.1	6Y10■
Class A Amplifier	150	100	R_k = 180	3.7	3.0	140,000	3,700	—	—	—	
Full-Wave Rectifier	Max d-c output current =60 ma; max peak inverse voltage =1500 volts										6Z5
Class B Amplifier	180	—	0	4.2† ♠	—	Input signal =0.320 watts			12,000‡	4.2	6Z7-G
Class A Amplifier	250	250	8.0	35†	3.0†	100,000	6,500	—	5,000	4.2	6Z10■
FM Limiter-Discriminator	135	280‡	—	5.0	(R_{g2} = 33,000 ohms) (E_{c3} = +4.0 volts)						
Full-Wave Rectifier	Max d-c output current =40 ma; max peak inverse voltage =1250 volts; max rms supply voltage per plate =325 volts; max peak current per plate =120 ma										6ZY5-G
Class A Amplifier	250 90	— —	8.0 0	9.0 10	— —	7,700 6,700	2,600 3,000	20 20	— —	— —	7A4
Class A Amplifier	110	110	7.5	40†	3.0†	16,000	5,800	—	2,500	1.5	7A5
Half-Wave Rectifier	Max d-c output current per plate =8 ma; max rms supply voltage per plate = 150 volts; max peak current per plate =45 ma										7A6
Class A Amplifier	250	100	3.0	9.2	2.6	800,000	2,000	—	—	—	7A7
Converter	250	100	3.0	3.0	3.2	700,000	550 #	E_{c2} (Osc Plate) =250 thru 20,000 ohms I_{c2} =4.2 ma			7A8
Class A Amplifier	250	100	2.0	4.0	1.3	500,000	1,800	—	—	—	7AB7
Class A Amplifier	300	150	R_k = 68	28	7.0	300,000	9,500	—	—	—	7AD7
Class A Amplifier ♠	250	—	10	9.0	—	7,600	2,100	16	—	—	7AF7
Class A Amplifier	250	250	R_k = 250	6.0	2.0	1,000,000	4,200	—	—	—	7AG7
Class A Amplifier	250	250	R_k = 250	6.8	1.9	1,000,000	3,300	—	—	—	7AH7
Class A Amplifier	100 250	100 100	1.0 3.0	5.7 2.2	1.8 0.7	400,000 1,000,000	2,275 1,575	— —	— —	— —	7AJ7
Class A Amplifier	150 150 150	90 90 90	0 11 0	40 2.5♣ 2.0♣	21 0.45 60♣	11,500 — —	6,000 — —	E_{c3} =0 volts E_{c3} =0 volts E_{c3} =9.5 volts			7AK7
Class A Amplifier ♠	250 100	— —	8.5 0	10.5 11.8	— —	7,700 6,500	2,200 3,100	17 20	— —	— —	*7AU7*¶
Vertical Amplifier ♠	Max positive pulse plate voltage ◈ =1,200; max d-c cathode current ◈ =22 ma										
Class A Amplifier	250	—	2.0	0.9	—	66,000	1,500	100	—	—	7B4

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♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

‡Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Out-put	Grid-plate
7B5	Power Amplifier Pentode	6AE	9–31	6.3	0.4	8.5	315	285 2.8	—	—	—
7B6	Duplex-Diode High-Mu Triode	8W	9–30	6.3	0.3	0.5	300	—	—	—	—
7B7	Remote-Cutoff RF Pentode	8V	9–30	6.3	0.15	2.25	300	100 0.25	5.0	6.0	0.004 ♣
7B8	Pentagrid Converter	8X♦	9–30	6.3	0.3	1.0	300	100 0.3	Osc I_{c1} = 0.4 ma R_{g1} = 50,000 ohms		
7C4	High-Frequency Diode	4AH	9–30	6.3	0.15	—	—	Tube Voltage Drop: 11 v at 10 ma d-c			
7C5	Beam Power Amplifier	6AA	9–31	6.3	0.45	12	315	285 2.0	—	—	—
7C6	Duplex-Diode High-Mu Triode	8W	9–30	6.3	0.15	0.6	300	—	—	—	—
7C7	Sharp-Cutoff Pentode	8V	9–30	6.3	0.15	1.0	300	100 0.1	5.5	6.5	0.007 ♣
7E5	High-Frequency Triode	8BN	9–30	6.3	0.15	4.0	250	—	3.6	2.8	1.5
7E6	Duplex-Diode Medium-Mu Triode	8W	9–30	6.3	0.3	2.5	250	—	—	—	—
7E7	Duplex-Diode Remote-Cutoff Pentode	8AE	9–30	6.3	0.3	2.0	250	100 0.3	4.6	4.6	0.005 ♣
7EY6¶	Beam Pentode	7AC	9–15	7.2	0.6	11◈	350◈	300◈ 2.75◈	8.5▲	7.0▲	0.7▲
7F7	High-Mu Twin Triode	8AC	9–30	6.3	0.3	1.0♠	250	—	—	—	—
7F8	High-Frequency Twin Triode	8BW	9–32	6.3	0.3	3.5♠ 3.5⊕	300	—	2.8	1.4	1.6
7G7	Sharp-Cutoff Pentode	8V	9–30	6.3	0.45	1.5	250	100 0.2	9.0	7.0	0.007 ♣
7G8	Sharp-Cutoff Twin Tetrode	8BV	9–32	6.3	0.3	1.5♠	300	300‡ 0.1	3.4	2.6	0.15 ♣
7GS7	Triode-Pentode	9GF	6–2	7.6	0.3	2.0	250	150 0.5	Pentode Section		
						1.5	125	—	Triode Section		
7GV7	Triode-Pentode	9KN	T-X	7.4	0.3	2.0	250	230 0.5	Pentode Section		
						2.0	250	—	Triode Section		
7H7	Semi-Remote-Cutoff RF Pentode	8V	9–30	6.3	0.3	2.5	300	300‡ 0.5	8.0	7.0	0.004 ♣
7HG8	Triode-Pentode	9MP	6–2	7.2	0.3	2.0	250	150 0.5	Pentode Section		
						1.5	125	—	Triode Section		
7J7	Triode Heptode Converter	8BL	9–30	6.3	0.3	0.5 1.25	300 150	100 0.4 —	Osc I_{c1} = 0.4 ma R_{g1} = 50,000 ohms Triode Section		
7K7	Duplex-Diode High-Mu Triode	8BF	9–30	6.3	0.3	—	250	—	—	—	—
7KY6¶	Sharp-Cutoff Pentode	9GK	6–3	7.3	0.45	9.0◈	330◈	330‡◈ 1.0◈	14▲	6.0▲	0.16♣ ▲
7KZ6¶	Sharp-Cutoff Pentode	9GK	6–3	7.3	0.45	9.0◈	330◈	330‡◈ 1.0◈	13▲	6.0▲	0.16♣ ▲
7L7	Sharp-Cutoff Pentode	8V	9–30	6.3	0.3	4.0	300	125 0.4	8.0	6.5	0.01 ♣
7N7	Medium-Mu Twin Triode	8AC	9–31	6.3	0.6	2.5♠	300	—	—	—	—

■Compactron. † Zero signal. ♠Per section.
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⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

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Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	315	250	21	25.5†	4.0†	75,000	2,100	—	9,000	4.5	**7B5**
	250	250	18	32†	5.5†	68,000	2,300	—	7,600	3.4	
Class A Amplifier	250	—	2.0	0.9	—	91,000	1,100	100	—	—	7B6
	100	—	1.0	0.4	—	110,000	900	100	—	—	
Class A Amplifier	250	100	3.0	8.5	1.7	750,000	1,750	—	—	—	7B7
	100	100	3.0	8.2	1.8	300,000	1,675	—	—	—	
Converter	250	100	3.0	3.5	2.7	360,000	550 #	E_{c2} (Osc Plate) = 250 thru 20,000 ohms I_{c2} = 4.0 ma			7B8
Half-Wave Rectifier	Max d-c output current = 5.0 ma; max rms supply voltage = 117 volts										7C4
Class A Amplifier	315	225	13.0	34†	2.2†	77,000	3,750	—	8,500	5.5	7C5
	250	250	12.5	45†	4.5†	52,000	4,100	—	5,000	4.5	
Class A Amplifier	250	—	1.0	1.3	—	100,000	1,000	100	—	—	7C6
	100	—	0	1.0	—	100,000	850	85	—	—	
Class A Amplifier	250	100	3.0	2.0	0.5	2,000,000	1,300	—	—	—	7C7
Class A Amplifier	180	—	3.0	5.5	—	12,000	3,000	36	—	—	7E5
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	—	—	7E6
Class A Amplifier	250	100	3.0	7.5	1.6	700,000	1,300	—	—	—	7E7
Vertical Amplifier	250	250	17.5	44	3.0	60,000	4,400	—	—	—	7EY6¶
	50	250	0	153	21	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,500; max d-c cathode current ◈ = 60 ma										
Class A Amplifier ♠	250	—	2.0	2.3	—	44,000	1,600	70	—	—	7F7
Class A Amplifier ♠	250	—	R_k = 500	6.0	—	—	3,300	48	—	—	7F8
Class A Amplifier	250	100	2.0	6.0	2.0	800,000	4,500	—	—	—	7G7
Class A Amplifier ♠	250	100	2.5	4.5	0.8	225,000	2,100	—	—	—	7G8
Class A Amplifier	170	150	1.2	10	3.3	350,000	12,000	—	—	—	*7GS7*
Class A Amplifier	100	—	3.0	14	—	—	5,500	17	—	—	
Class A Amplifier	125	125	1.5	10	3.1	—	11,000	—	—	—	*7GV7*
Class A Amplifier	100	—	3.0	14	—	—	5,500	17	—	—	
Class A Amplifier	250	150	R_k = 180	10	3.2	800,000	4,000	—	—	—	7H7
	100	100	1.5	7.5	2.6	350,000	4,000	—	—	—	
Class A Amplifier	170	150	1.2	10	3.3	350,000	12,000	—	—	—	*7HG8*
Class A Amplifier	100	—	3.0	14	—	3,100	5,500	17	—	—	
Converter	250	100	3.0	1.4	2.8	1,500,000	290 #	E_b (Triode Osc) = 250 thru 20,000 ohms I_b (Triode) = 5.0 ma			7J7
Class A Amplifier	250	—	2.0	2.3	—	44,000	1,600	70	—	—	7K7
Class A Amplifier	200	135	R_k = 47	30	5.2	40,000	30,000	(g3 connected to k at socket)			*7KY6*¶
Class A Amplifier	250	115	R_k = 75	25	3.6	45,000	24,000	(g3 connected to k at socket)			*7KZ6*¶
Class A Amplifier	250	100	1.5	4.5	1.5	1,000,000	3,100	—	—	—	7L7
Class A Amplifier ♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	7N7

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¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads: Input	Out-put	Grid-plate
7Q7	Pentagrid Converter	8AL ♥	9–30	6.3	0.3	1.0	300	100 1.0	Osc I_{c1} = 0.5 ma R_{g1} = 20,000 ohms		
7R7	Duplex-Diode Remote-Cutoff Pentode	8AE	9–30	6.3	0.3	2.0	250	250§ 0.25	5.6	5.3	0.004 ♣
7S7	Triode-Heptode Converter	8BL	9–30	6.3	0.3	0.6	300	100 0.4	Osc I_{c1} = 0.4 ma R_{g1} = 50,000 ohms		
7T7	Sharp-Cutoff RF Pentode	8V	9–30	6.3	0.3	3.0	300	300§ 0.7	7.5	5.5	0.005
7V7	Sharp-Cutoff RF Pentode	8V	9–30	6.3	0.45	4.0	300	300§ 0.8	—	—	—
7W7	Sharp-Cutoff RF Pentode	8BJ	9–30	6.3	0.45	4.0	300	300§ 0.8	—	—	—
7X6	High-Vacuum Rectifier-Doubler	7AJ	9–31	6.3	1.2	—	Tube Voltage Drop: ♠ 22 v at 150 ma d-c				
7X7/-XXFM	Duplex-Diode High-Mu Triode	8BZ	9–31	6.3	0.3	—	300	—	—	—	—
7Y4	Full-Wave High-Vacuum Rectifier	5AB	9–30	6.3	0.5	—	Tube Voltage Drop: ♠ 22 v at 70 ma d-c				
7Z4	Full-Wave High-Vacuum Rectifier	5AB	9–31	6.3	0.9	—	Tube Voltage Drop: ♠ 40 v at 100 ma				
8A8	Triode-Pentode	9DC	6–2	8.4	0.3	1.7 1.5	250 250	200 0.75 —	Pentode Section Triode Section		
8AC9¶■	Duplex-Diode Pentode	12GN	9–57	8.4	0.45	2.5◈	330◈ Tube Voltage Drop: 10 volts at 50 ma d-c ♠	330§◈ 0.55◈	Pentode Section		
8AC10¶■	Triple Triode	12FE	9–58	8.4	0.45	2.0◈ ♠	330◈	—	2.4_1▲ 2.6_2▲ 2.6_3▲	0.22_1▲ 0.30_2▲ 0.44_3▲	1.3_1▲ 1.2_2▲ 1.2_3▲
8AC10-A¶■	Triple Triode	12FE	9–56	8.4	0.45	2.0◈	330◈	—	2.4_1▲ 2.6_2▲ 2.6_3▲	0.22_1▲ 0.30_2▲ 0.44_3▲	1.3_1▲ 1.2_2▲ 1.2_3▲
8AL9¶■	Triode-Pentode	12HE	9–59	8.6	0.6	10◈ 1.5◈	330◈ 330◈	200◈ —	Pentode Section Triode Section		
8AR1[illegible]¶■	Twin Pentode	12DM	9–58	8.4	0.6	3.1◈ ♠	330◈	330§◈ 0.65◈ ♠	10	2.8_1 3.0_2	0.026
8AU8¶	Triode-Pentode	9DX	6–3	8.4	0.45	3.0 2.5	300 300	300§ 1.0 —	Pentode Section Triode Section		
8AU8-A¶	Triode-Pentode	9DX	6–3	8.4	0.45	3.0 2.5	300 300	300§ 1.0 —	Pentode Section Triode Section		
8AW8-A¶	Triode-Pentode	9DX	6–3	8.4	0.45	3.75◈ 1.1◈	330◈ 330◈	330◈§ 1.1◈ —	Pentode Section Triode Section		
8B10¶■	Duplex-Diode Medium-Mu Twin Triode	12BF	9–56	8.5	0.45	2.5◈ ♠	330◈	—	1.7_1▲ 1.8_2▲ Diode Sections	1.6_1▲ 0.6_2▲	1.5▲
8BA8-A¶	Triode-Pentode	9DX	6–3	8.4	0.45	3.25 2.0	300 300	300§ 1.0 —	Pentode Section Triode Section		
8BA11¶■	Triode-Twin Pentode	12ER	9–58	8.4	0.45	1.1◈ ♠ 1.5◈	300◈ 300◈	150◈ 0.75◈	Pentode Sections Triode Section		

■ Compactron.
† Zero signal.
♠ Per section.
‡ Plate-to-plate.
♣ Maximum.
§ Supply voltage.
◉ Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
▣ Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Converter	250	100	2.0	3.5	8.5	1,000,000	550 #	—	—	—	**7Q7**
Class A Amplifier	250 100	100 100	1.0 1.0	5.7 5.5	2.1 2.2	1,000,000 350,000	3,200 3,000	— —	— —	— —	**7R7**
Converter	250	100	2.0	1.8	3.0	1,250,000	525 #	E_b (Triode Osc) = 250 thru 20,000 ohms I_b (Triode) = 5.0 ma			**7S7**
Class A Amplifier	250	150	1.0	10.8	4.1	900,000	4,900	—	—	—	**7T7**
Class A Amplifier	300	150	R_k = 160	10	3.9	300,000	5,800	—	—	—	**7V7**
Class A Amplifier	300	150	R_k = 160	10	3.9	300,000	5,800	—	—	—	**7W7**
Rectifier or Doubler	Max d-c output current per plate = 75 ma; max peak inverse voltage = 700; rms supply voltage per plate = 235; max peak current per plate = 450 ma										**7X6**
Class A Amplifier	250	—	1.0	1.9	—	67,000	1,500	100	—	—	**7X7/-XXFM**
Full-Wave Rectifier	Max d-c output current = 70 ma; max peak inverse voltage = 1250 volts; max rms supply voltage per plate = 325 volts; max peak current per plate = 210 ma										**7Y4**
Full-Wave Rectifier	Max d-c output current = 100 ma; max peak inverse voltage = 1,250 volts; max rms supply voltage per plate = 325 volts; max peak current per plate = 300 ma										**7Z4**
Class A Amplifier Class A Amplifier	170 100	170 —	2.0 2.0	10 14	2.8 —	400,000 —	6,200 5,000	— 20	— —	— —	*8A8*
Class A Amplifier	125 Max d-c output current ◈♠ = 5.0 ma	125	1.0	12	4.5	150,000	10,000	—	—	—	8AC9¶■
Class A Amplifier ♠	200	—	R_k = 150	9.0	—	10,700	5,800	62	—	—	8AC10¶ ■
Class A Amplifier ♠	200	—	R_k = 150	9.0	—	10,700	5,800	62	—	—	8AC10-A¶ ■
Video Amplifier General Purpose Amplifier	250 55 200	150 125 —	R_k = 56 0 R_k = 270	28 56 7.6	5.6 21 —	40,000 — 9,200	30,000 — 6,300	— — 59	— — —	— — —	8AL9¶ ■
Class A Amplifier ♠	125	125	R_k = 56	11	3.5	200,000	10,500	—	—	—	8AR11¶■
Class A Amplifier Class A Amplifier	200 150	125 —	R_k = 82 R_k = 150	15 9.0	3.4 —	150,000 8,200	7,000 4,900	— 40	— —	— —	*8AU8*¶
Class A Amplifier Class A Amplifier	200 40 150	125 125 —	R_k = 82 0 R_k = 150	17 28 9.5	3.4 10 —	100,000 — 8,100	8,000 — 5,300	— — 43	— — —	— — —	*8AU8-A*¶
Class A Amplifier Class A Amplifier	150 65 200	150 150 —	R_k = 150 0 2.0	15 46 4.0	3.5 15 —	200,000 — 17,500	9,500 — 4,000	— — 70	— — —	— — —	*8AW8-A*¶
Class A Amplifier Horizontal Phase Det.	250 Max d-c output current ◈♠ = 5.0 ma; voltage drop: ◈♠ 5 volts at 20 ma d-c	—	9.5	7.0	—	9,750	1,850	18	—	—	8B10¶■
Class A Amplifier Class A Amplifier	200 65 200	150 150 —	R_k = 180 0 8.0	13 42 8.0	3.5 12.5 —	400,000 — 6,700	9,000 — 2,700	— — 18	— — —	— — —	*8BA8-A*¶
Sync Separator and AGC Keyer Class A Amplifier	100 100 250	67.5 67.5 —	I_{c1} = 0.1 ma 0 11	2.5 — 5.0	4.4 — —	(Both Sections Operating) — —	 1,700 1,800	(E_{c3} = 0 volts) (E_{c3} = 0 volts) 18	 —	 —	8BA11¶■

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
♣Maximum screen dissipation appears immediately below the screen voltage
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads		
									Input	Out-put	Grid-plate
8BH8¶	Triode-Pentode	9DX	6–3	8.4	0.45	3.0	300	300§ 0.6	Pentode Section		
						2.5	300	—	Triode Section		
8BM11¶■	Dissimilar Double Pentode	12FU	9–58	8.4	0.45	2.2◈	160◈	160◈ 0.55◈	Section 1 (Pins 7, 8, 9, 10, 11)		
						2.2◈	160◈	160◈ 0.55◈	Section 2 (Pins 2, 3, 4, 5, 6)		
8BN8¶	Duplex-Diode High-mu Triode	9ER	6–3	8.4	0.45	1.5	300	—	3.6▲	0.32▲	2.5▲
									Diode Sections		
8BN11¶ ■	Twin Pentode	12GF	9–58	8.4	0.6	3.1◈ ♠	330◈	330‡◈ 0.65◈	12	2.8	0.04_1 0.03_2
8BQ5¶	Beam Power Amplifier	9CV	6–4	8.0	0.6	12	300	300 2.0	—	—	—
8BQ11¶■	Dissimilar Double Pentode	12DM	9–58	8.4	0.6	3.1◈	330◈	330§◈ 0.65◈	Section 1 (Pins 7, 8, 9, 10, 11)		
						3.1◈	330◈	330§◈ 0.65◈	Section 2 (Pins 2, 3, 4, 5, 6)		
8BU11¶■	Twin-Triode Pentode	12FP	9–59	7.8	0.6	2.5◈	330◈	330§◈ 0.55◈	Pentode Section		
						1.8◈ ♠	330◈	—	Triode Sections		
8CB11¶■	Twin Pentode	12DM	9–58	8.4	0.6	3.1◈	330◈	330◈ 0.65◈	12_1▲ 12_2▲	2.6_1▲ 2.8_2▲	0.028_1▲ 0.02_2▲
8CG7¶	Medium-mu Twin Triode	9AJ	6–3	8.4	0.45	3.5♠ 5.0⊕	300	—	2.3▲	2.2▲	4.0▲
8CM7¶	Medium-mu Double Triode	9ES	6–3	3.4	0.45	1.25	500	—	Section 1 (Pins 3, 6, 7)		
						5.0	500	—	Section 2 (Pins 1, 8, 9)		
8CN7¶	Duplex-Diode Triode	9EN	6–2	{8.4 4.2	0.225 0.45}	1.0	300	—	1.5▲	0.5▲	1.8▲
									Diode Sections		
8CS7¶	Double Triode	9EF	6–3	8.4	0.45	1.25	500	—	Section 1 (Pins 6, 7, 8)		
						6.5	500	—	Section 2 (Pins 1, 3, 9)		
8CW5 *8CW5-A*¶	Power Amplifier Pentode	9CV	6–4	8.0	0.6	14◈	275◈	220◈ 2.1◈	Single Tube		
									Two Tubes, Push-Pull		
8CX8¶	Triode-Pentode	9DX	6–3	8.0	0.6	5.0◈	330◈	330◈§ 1.1◈	Pentode Section		
						2.0◈	330◈	—	Triode Section		
8CY7¶	Double Triode	9LG	6–3	7.9	0.6	1.0◈	350◈	—	Section 1 (Pins 6, 7, 8)		
						5.5◈	350◈	—	Section 2 (Pins 1, 3, 9)		
8EB8¶	Triode-Pentode	9DX	6–3	8.0	0.6	5.0◈	330◈	330◈§ 1.1◈	Pentode Section		
						1.0◈	330◈	—	Triode Section		
8EM5¶	Beam Power Amplifier	9HN	6–4	8.4	0.6	10	315	285 1.5	10▲	5.1▲	0.7▲ ♣

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. § Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	200	125	R_k = 82	15	3.4	150,000	7,000	—	—	—	*8BH8*¶
Class A Amplifier	150	—	5.0	9.5	—	5,150	3,300	17	—	—	
Class A Amplifier	125	125	R_k = 56	14	3.6	220,000	8,800	—	—	—	8BM11¶■
Class A Amplifier	125	125	R_k = 120	9.0	2.5	300,000	8,500	—	—	—	
Class A Amplifier	250	—	3.0	1.6	—	28,000	2,500	70	—	—	*8BN8*¶
	100	—	1.0	1.5	—	21,000	3,500	75	—	—	
Horizontal Phase Det.	Max d-c output current ♠ =9.0 ma; voltage drop ♠: 2.6 volts at 9.0 ma d-c										
Class A Amplifier ♠	125	125	R_k = 56	11	3.8	200,000	13,000	(g3 connected to k at socket)			8BN11¶ ■
Class A Amplifier	250	250	R_k = 135	48†	5.5†	40,000	11,300	—	4,500	5.7	*8BQ5*¶
Class A Amplifier	125	125	R_k = 56	11	3.5	200,000	10,500	—	—	—	8BQ11¶■
Class A Amplifier	125	125	R_k = 56	11	3.8	200,000	13,000	—	—	—	
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	8BU11¶■
Class A Amplifier ♠	125	—	R_k = 68	13.5	—	5,000	8,600	43	—	—	
IF, Band-pass Burst, Video Amplifier ♠	125	125	R_k = 56	11	3.8	200,000	13,000	—	—	—	8CB11¶■
Class A Amplifier ♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	*8CG7*¶
	250	—	12.5	1.3	—	—	—	—	—	—	
	90	—	0	10	—	6,700	3,000	20	—	—	
Vertical Oscillator	200	—	7.0	5.0	—	10,500	2,000	21	—	—	*8CM7*¶
	Max d-c cathode current =15 ma										
Vertical Amplifier	250	—	8.0	20	—	4,100	4,400	18	—	—	
	Max positive pulse plate voltage ▣ =2,200; max d-c cathode current =20 ma										
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	*8CN7*¶
	100	—	1.0	0.8	—	54,000	1,300	70	—	—	
Horizontal Phase Det.	Max d-c output current ♠ =5.0 ma; voltage drop ♠: 5 volts at 20 ma d-c										
Vertical Oscillator	250	—	8.5	10.5	—	7,700	2,200	17	—	—	*8CS7*¶
	Max d-c cathode current =20 ma										
Vertical Amplifier	250	—	10.5	19	—	3,450	4,500	15.5	—	—	
	Max positive pulse plate voltage ▣ =2,200; max d-c cathode current =30 ma										
Class A Amplifier	170	170	12.5	70†	3.5†	26,000	11,000	—	2,400	5.6	*8CW5* *8CW5-A* ¶
Class AB_1 Amplifier	250	200	18.5	91†	4.0†	—	—	—	3,000‡	25	
Class A Amplifier	200	125	R_k = 68	24	5.2	70,000	10,000	—	—	—	*8CX8*¶
	40	125	0	40	15.5	—	—	—	—	—	
Class A Amplifier	150	—	R_k = 150	9.2	—	8,700	4,600	40	—	—	
Vertical Oscillator	250	—	3	1.2	—	52,000	1,300	68	—	—	*8CY7*¶
	Max peak negative grid voltage ◈ =400										
Vertical Amplifier	150	—	R_k = 620	30	—	920	5,400	5.0	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,800; max d-c cathode current ◈ =35 ma										
Class A Amplifier	200	125	R_k = 68	25	7.0	75,000	12,500	—	—	—	*8EB8*¶
Class A Amplifier	250	—	2.0	2.0	—	37,000	2,700	100	—	—	
Vertical Amplifier	250	250	18	35	3.0	—	5,100	—	—	—	*8EM5*¶
	60	250	0	180	30	—	—	—	—	—	
	Max positive pulse plate voltage ▣ = 2,200 volts; max d-c cathode current = 60 ma										

Metal tubes are shown in bold-face type, ***miniature tubes in italics***.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tion	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Out-put	Grid-plate
8ET7¶	Duplex-Diode Pentode	9LT	6–3	8.0	0.6	5.0◈	330◈	330◈⁑ 1.1◈	10▲ Diode Sections	4.2▲	0.1▲ ♣
8FQ7¶	Medium-Mu Twin Triode	9LP	6–3	8.4	0.45	4.0◈ ♠ 5.7◈ ⊕	330◈	—	2.4▲	0.34_1▲ 0.26_2▲	3.6_1▲ 3.8_2▲
8GJ7	Triode-Pentode	9QA	T-X	8.0	0.3	2.4◈ 1.8◈	275◈ 140◈	275◈ 0.55◈ —	Pentode Section Triode Section		
8GN8¶	Triode-Pentode	9DX	6–3	8.0	0.6	5.0◈ 1.0◈	330◈ 330◈	330◈⁑ 1.1◈ —	Pentode Section Triode Section		
8GU7¶	Medium-Mu Twin Triode	9LP	6–3	8.4	0.45	3.0◈ ♠	330◈	—	3.4_1▲ 3.6_2▲	0.44_1 ▲ 0.34_2 ▲	3.0▲
8GX7¶	Triode-Pentode	9QA	6–2	7.7	0.3	2.2◈ 1.5◈	275◈ 275◈	275⁑◈ 0.45◈ —	Pentode Section Triode Section		
8HA6	Pentode	9NW	6–4	8.0	0.6	8.0◈	300◈	250◈ 1.5◈	13▲	8.0▲	0.18▲
8HG8	Triode-Pentode	9MP	6–2	8.0	0.3	2.0 1.5	250 125	150 0.5 —	Pentode Section Triode Section		
8JE8¶	Triode-Pentode	9DX	6–3	8.2	0.6	5.0◈ 1.0◈	330◈ 300◈	330◈⁑ 2.0◈ —	Pentode Section Triode Section		
8JK8	Double Triode	9AJ	6–2	8.4	0.3	1.0◈ 2.0◈	165◈ 200◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3)		
8JL8	Triode-Pentode	9DX	6–3	8.0	0.6	5.0◈ 2.0◈	330◈ 330◈	175◈ 1.1◈ —	Pentode Section Triode Section		
8JT8¶	Triode-Pentode	9DX	9–69	7.7	0.6	4.0◈ 1.0◈	330◈ 330◈	330⁑◈ 1.1◈ —	Pentode Section Triode Section		
8JU8-A¶	Quadruple Diode	9PQ	6–2	8.4	0.45	—	Tube Voltage Drop:♠ 10 volts at 60 ma d-c				
8JV8¶	Triode-Pentode	9DX	6–3	8.5	0.45	4.0◈ 1.1◈	330◈ 330◈	330◈ 1.7◈ —	Pentode Section Triode Section		
8KA8¶	Triode-Pentode	9PV	6–3	8.4	0.45	2.0◈ 1.1◈	300◈ 300◈	300⁑◈ 1.1◈ —	Pentode Section Triode Section		
8KR8¶	Triode-Pentode	9DX	6–3	8.0	0.6	5.0◈ 2.0◈	330⁑◈ 330◈	330◈ 1.5◈ —	Pentode Section Triode Section		
8KS8¶	Triode-Pentode	9DX	6–3	8.4	0.45	3.75◈ 1.1◈	330◈ 330◈	330⁑◈ 1.1◈ —	Pentode Section Triode Section		
8LC8¶	Triode-Pentode	9QY	6–3	8.4	0.45	2.0◈ 1.1◈	300◈ 300◈	300⁑◈ 1.1◈ —	Pentode Section Triode Section		
8LE8¶	Twin Pentode	9QZ	6–4	8.0	0.6	2.0◈ ♠	300◈	150◈ 2.0◈	—	—	—
8LS6¶	Sharp-Cutoff Pentode	9GK	6–3	7.7	0.45	5.0◈	180◈	180◈ 1.2◈	7.2▲	4.2▲	0.075▲

■Compactron. † Zero signal. ♠Per section. ‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage. ●Subminiature type. ▲Without external shield. ◈Design maximum rating. ⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	200	150	R_k = 100	25	5.5	60,000	11,500	—	—	—	*8ET7*¶
	60	150	0	55	18	—	—	—	—	—	
	Average Diode current at 10 volts = 1.5 ma										
Class A Amplifier	250	—	8.0	9.0	—	7,700	2,600	20	—	—	*8FQ7*¶
	90	—	0	10	—	6,700	3,000	20	—	—	
Class A Amplifier	170	120	1.2	10	3.0	350,000	11,000	—	—	—	*8GJ7*
Class A Amplifier	100	—	3.0	15	—	——	9,000	20	—	—	
Class A Amplifier	200	150	R_k = 100	25	5.5	60,000	11,500	—	—	—	*8GN8*¶
Class A Amp	250	—	2.0	2.0	—	37,000	2,700	100	—	—	
Class A Amplifier ♠	250	—	10.5	11.5	—	5,500	3,100	17	—	—	*8GU7*¶
Class A Amplifier	125	125	1.0	8.0	2.5	200,000	11,000	—	—	—	*8GX7*¶
Class A Amplifier	125	—	1.0	13	—	4,700	8,500	40	—	—	
Class A Amplifier	150	100	R_k = 33	28	3.5	20,000	20,000	—	—	—	*8HA6*
	60	100	0	45	9.0	——	—	—	—	—	
Class A Amplifier	170	150	1.2	10	3.3	350,000	12,000	—	—	—	*8HG8*
Class A Amp	100	—	3.0	14	—	3,100	5,500	17	—	—	
Class A Amplifier	250	170	R_k = 82	22	4.0	140,000	12,000	—	—	—	*8JE8*¶
Class A Amp	200	—	2.0	4.5	—	16,600	4,200	70	—	—	
Class A Amplifier	100	—	1.0	5.3	—	8,000	6,800	55	—	—	8JK8
Class A Amplifier	135	—	1.2	10	—	5,400	13,000	70	—	—	
Class A Amplifier	300	150	3.5	25†	5.0†	60,000	11,500	—	5,000	1.8	*8JL8*
Class A Amplifier	150	—	R_k = 150	10	—	7,500	4,700	35	—	—	
Class A Amplifier	200	100	R_k = 82	17	3.5	50,000	20,000	—	—	—	8JT8¶
	35	100	0	50	17	—	—	—	—	—	
Class A Amp	250	—	2.0	1.5	—	37,000	2,700	100	—	—	
Detector	Max d-c output current per plate ◈ = 9.0 ma; max peak inverse voltage ◈ = 300 volts; max peak current per plate ◈ = 54 ma										*8JU8-A*¶
Class A Amplifier	125	125	1.0	22	4.0	100,000	11,500	—	—	—	*8JV8*¶
	40	125	0	28	9.0	—	—	—	—	—	
Class A Amplifier	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Class A Amplifier	150	100	R_k = 180	4.0	2.8	100,000	4,400	—	—	—	*8KA8*¶
Class A Amp	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Video Amplifier	200	100	R_k = 82	19.5	3.0	60,000	20,000	—	—	—	*8KR8*¶
	35	100	0	54	13.5	—	—	—	—	—	
General Purpose Amplifier	125	—	R_k = 68	15	—	4,400	10,400	46	—	—	
Class A Amplifier	150	150	R_k = 150	20	4.5	150,000	9,500	—	—	—	*8KS8*¶
	65	150	0	60	20	—	—	—	—	—	
Class A Amp	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Class A Amplifier	150	100	R_k = 180	4.0	2.8	100,000	4,400	—	—	—	*8LC8*¶
Class A Amplifier	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Color Demodulator	100	100	2.5	8.0	15	50,000	5,800	—	E_{c3} = 0 volts		*8LE8*¶
Video Amplifier	110	110	R_k = 65	14	3.2	54,000	11,000	(E_{c3} = 0 volts)			*8LS6*¶

Metal tubes are shown in bold-face type, ***miniature tubes in italics.***
♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
8LT8¶	Duplex-Diode Pentode	9RL	6–2	8.1	0.45	3.1◈	330◈	330⧧◈ 0.65◈	Pentode Section		
									Diode Sections		
8MU8¶	Triode-Pentode	9AE	6–3	8.4	0.45	3.75◈	330◈	330⧧◈ 1.1◈	Pentode Section		
						2.5◈	330◈		Triode Section		
8SN7-GTB¶	Medium-mu Twin Triode	8BD	9–11 or 9–41	8.4	0.45	5.0♠ 7.5⊕	450	—	2.2_1▲ 2.6_2▲	0.7▲	4.0_1▲ 3.8_2▲
8U9	Triode-Pentode	10K	6–2	8.0	0.3	2.1	250	250 0.7	Pentode Section		
						1.5	250	—	Triode Section		
8X9	Triode-Pentode	10K	6–2	8.0	0.3	2.1	250	250 0.7	Pentode Section		
						1.5	250	—	Triode Section		
9A8	Triode-Pentode	9DC	6–2	9.0	0.3	1.7	250	200 0.75	Pentode Section		
						1.5	250	—	Triode Section		
9AH9¶■	Triode-Pentode	12HJ	9–59	8.8	0.6	10◈	400◈	330⧧◈ 1.0◈	Pentode Section		
						2.0◈	330◈	—	Triode Section		
9AK10¶■	Triple Triode	12FE	9–59	9.5	0.6	2.0◈	330◈	—	4.2_1▲ 4.2_2▲ 4.2_3▲	0.3_1▲ 0.4_2▲ 0.54_3▲	3.2_1▲ 3.0_2▲ 3.0_3▲
9AU7¶	Medium-mu Twin Triode	9A	6–2	{9.4 / 4.7	0.225 / 0.45}	2.75◈ ♠	330◈	—	1.8	2.0	1.5
9BJ11¶■	Dissimilar Double Pentode	12FU	9–58	9.6	0.45	2.8◈	160◈	160◈ 1.25◈	Section 1 (Pins 7, 8, 9, 10, 11)		
						2.2◈	160◈	160◈ 0.55◈	Section 2 (Pins 2, 3, 4, 5, 6)		
9BR7¶	Duplex-Diode Triode	9CF	6–2	{9.4 / 4.7	0.3 / 0.6}	2.5	300	—	2.8	1.0	1.9
									Diode Sections		
9CG8-A¶	Triode-Pentode	9GF	6–2	9.5	0.3	2.3◈	275◈	275⧧◈ 0.45◈	Pentode Section		
						1.7◈	275◈	—	Triode Section		
9CL8¶	Triode-Tetrode	9FX	6–2	9.5	0.3	2.8	300	300⧧ 0.5	Tetrode Section		
						2.7	300	—	Triode Section		
9DZ8	Triode-Pentode	9JE	T-X	9.0	0.6	6.5	150	135 1.5	Pentode Section		
						0.75	150	—	Triode Section		
9EA8¶	Triode-Pentode	9AE	6–2	9.5	0.3	3.1◈	330◈	330⧧◈ 0.55◈	Pentode Section		
						2.5◈	330◈	—	Triode Section		
9EF6¶	Beam Power Amplifier	7S	9–13 or 9–42	9.4	0.6	10	250	250 2.0	11.5▲	9.0▲	0.8▲
9GH8-A¶	Triode-Pentode	9AE	6–2	9.45	0.3	2.5◈	350◈	330⧧◈ 0.55◈	Pentode Section		
						2.5◈	330◈	—	Triode Section		
9GV8	Triode-Pentode	9LY	6–4	9.5	0.6	7.0▣	250▣	250▣ 2.0▣	Pentode Section		
						0.5▣	250▣	—	Triode Section		

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ⧧ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	125	125	R_k = 56	10	3.4	200,000	13,000	—	—	—	*8LT8¶*
Max d-c output current ◈♠ = 5.0 ma; voltage drop: 5.0 volts at 20 ma d-c♠											
Class A Amplifier	150	150	R_k = 150	19	4.2	165,000	9,000	—	—	—	*8MU8¶*
Class A Amplifier	125	—	1.0	11.5	—	5,800	6,000	35	—	—	
Class A Amplifier♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	8SN7-GTB¶
Vertical Amplifier♠	90	—	0	10	—	6,700	3,000	20	—	—	
Max positive pulse plate voltage ◈ = 1,500 volts; max d-c cathode current ◈ = 22 ma											
Class A Amplifier	160	110	1.4	13	5.0	—	12,000	(E_{c3} = 0 volts)			*8U9*
Class A Amplifier	100	—	2.0	14	—	—	5,000	17	—	—	
Class A Amplifier	160	135	1.7	13	5.0	—	14,000	—	—	—	*8X9*
Class A Amplifier	170	—	1.0	8.5	—	—	4,800	55	—	—	
Class A Amplifier	170	170	2.0	10	2.8	400,000	6,200	—	—	—	*9A8*
Class A Amplifier	100	—	2.0	14	—	—	5,000	20	—	—	
Video Amplifier	250	150	R_k = 122	25	6.0	55,000	21,000	—	—	—	9AH9¶ ■
	50	125	0	76	32	—	—	—	—	—	
General Purpose Amplifier	250	—	R_k = 68	8.0	—	7,300	2,750	20	—	—	
Color Difference Amplifier♠	200	—	R_k = 230	10	—	7,500	7,000	53	—	—	9AK10¶ ■
Class A Amplifier♠	250	—	8.5	10.5	—	7,700	2,200	17	—	—	*9AU7¶*
Vertical Amplifier♠	100	—	0	11.8	—	6,500	3,100	20	—	—	
Max positive pulse plate voltage ◈ = 1,200 volts; max d-c cathode current ◈ = 22 ma											
Class A Amplifier	110	110	E_{cc1} = 0	5.8	6.8	40,000	7,500	R_{g1} = 0.1 meg, E_{cc1} = 0 volts			9BJ11¶ ■
Class A Amplifier	125	125	R_k = 120	8.5	2.5	400,000	9,600	—	—	—	
Class A Amplifier	250	—	R_k = 200	10	—	10,900	5,500	60	—	—	*9BR7¶*
	100	—	R_k = 270	3.7	—	15,000	4,000	60	—	—	
Horizontal Phase Det.	Max peak output current ♠ = 60 ma; voltage drop ♠: 5 volts at 17 ma										
Class A Amplifier	125	125	1.0	9.0	2.2	300,000	5,500	—	—	—	*9CG8-A¶*
Class A Amplifier	125	—	1.0	12	—	6,000	6,500	40	—	—	
Class A Amplifier	125	125	1.0	12	4.0	100,000	5,800	—	—	—	*9CL8¶*
Class A Amplifier	125	—	R_k = 56	15	—	5,000	8,000	40	—	—	
Class A Amplifier	145	120	R_k = 180	45†	6.0†	—	7,500	—	2,500	2.0	*9DZ8*
Class A Amplifier	120	—	R_k = 1500	0.8	—	—	1,400	100	—	—	
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,400	—	—	—	*9EA8¶*
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	
Vertical Amplifier	250	250	18	50	2.0	—	5,000	—	—	—	9EF6¶
	75	250	0	170	17	—	—	—	—	—	
Max positive pulse plate voltage ◙ = 2,000; max d-c cathode current = 60 ma											
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	*9GH8-A¶*
Class A Amplifier	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Class A Amplifier	170	170	15	41	2.7	25,000	7,500	—	—	—	*9GV8*
Class A Amp	100	—	0.8	5.0	—	7,600	6,500	50	—	—	

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♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Output	Grid-plate
9JW8¶	Triode-Pentode	9DC	6–2	9.0	0.3	1.2 1.4	250 250	250 0.8 —	Pentode Section Triode Section		
9KC6¶	Dual-Control Pentode	9RF	6–3	8.7	0.45	7.0◈	400◈	330⁑◈ 1.5◈	—	—	—
9KX6¶	Sharp-Cutoff Pentode	9GK	6–3	8.7	0.45	11.5◈	400◈	330⁑◈ 1.5◈	17.5▲	4.0▲	0.12▲
9KZ8¶	Triode-Pentode	9FZ	6–2	9.45	0.3	2.5◈ 2.5◈	330◈ 330◈	330⁑◈ 0.55◈ —	Pentode Section Triode Section		
9LA6¶	Sharp-Cutoff Pentode	9GK	6–3	8.7	0.45	10◈	400◈	330⁑◈ 1.0◈	15▲	6.0▲	0.15▲
9ML8¶	Triple Triode	9RQ	6–2	9.6	0.45	2.0◈ 5.0◈⊕	330◈ 330◈	—	—	—	—
9MN8¶ ■	Triple Triode	12HU	9–60	9.5	0.6	3.0◈	330◈	—	4.6▲	0.3_1▲ 0.57_2▲ 0.65_3▲	2.6▲
9U8-A¶	Triode-Pentode	9AE	6–2	9.45	0.3	3.0◈ 2.5◈	330◈ 330◈	330◈⁑ 0.55◈ —	Pentode Section Triode Section		
9X8¶	Triode-Pentode Converter	9AK	6–2	9.5	0.3	2.0 1.5	250 250	250⁑ 0.4 —	Pentode Section Triode Section		
10	Power Amplifier Triode	4D	T-X	7.5	1.25	12	425	—	4.0	3.0	7.0
10AL11¶ ■	Dissimilar Double Pentode	12BU	9–59	9.8	0.6	10◈ 1.7◈	275◈ 330◈	275◈ 2.0◈ 330⁑◈ 1.1◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 4, 6, 7)		
10BQ5¶	Beam Power Amplifier	9CV	6–4	10.6	0.45	12	300	300 2.0	—	—	—
10C8¶	Triode-Pentode	9DA	6–2	10.5	0.3	2.2◈ 2.0◈ 2.5◈ 1.0◈	300◈ 300◈ 300◈ 300◈	300◈⁑ 0.55◈ — Pentode Section—Triode Connection —	Pentode Section Triode Section Triode Section		
10CW5¶	Power Amplifier Pentode	9CV	6–4	10.6	0.45	12	250	200 1.75	Single Tube Two Tubes, Push-Pull		
10DA7¶	Double Triode	9EF	6–3	10.5	0.6	2.0 6.0	300 500	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 3, 9)		
10DE7¶	Double Triode	9HF	6–3	9.7	0.6	1.5◈ 7.0◈	330◈ 275◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3, 9)		
10DR7¶	Double Triode	9HF	6–3	9.7	0.6	1.0◈ 7.0◈	330◈ 275◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3, 9)		
10DX8	Triode-Pentode	9HX	6–3	10.2	0.45	4.0 1.0	300 300	300 1.7 —	Pentode Section Triode Section		
10EB8¶	Triode-Pentode	9DX	6–3	10.5	0.45	5.0◈ 1.0◈	330◈ 330◈	330◈⁑ 1.1◈ —	Pentode Section Triode Section		
10EG7¶	Double Triode	8BD	9–38	9.7	0.6	1.5◈ 10◈	330◈ 330◈	— —	Section 1 (Pins 4, 5, 6) Section 2 (Pins 1, 2, 3)		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	100	100	1.0	6.0	1.7	—	5,500	—	—	—	*9JW8*¶
Class A Amplifier	200	—	2.0	3.5	—	—	3,500	70	—	—	
Class A Amplifier	250	150	R_k = 56	18	9.0	55,000	24,000	E_{c3} = 0 volts			*9KC6*¶
	50	100	0	25	25	—	—	—	—	—	
Avg. Char.	250	150	R_k = 56	28	6.5	50,000	36,000	—	—	—	*9KX6*¶
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	*9KZ8*¶
Class A Amplifier	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Avg. Char.	250	150	R_k = 122	25	6.0	55,000	21,000	—	—	—	*9LA6*¶
Class A Amplifier ♠	125		1.0	11	—	6,400	6,700	43	—	—	*9ML8*¶
Class A Amplifier ♠	125	—	1.0	11	—	5,500	9,000	50	—	—	9MN8¶ ■
Class A Amplifier	125	110	1.0	9.5	3.5	200,000	5,000	—	—	—	*9U8-A*¶
Class A Amp	125	—	1.0	13.5	—	—	7,500	40	—	—	
Class A Amplifier	250	150	R_k = 200	7.7	1.6	750,000	4,600	—	—	—	*9X8*¶
Class A Amplifier	100	—	R_k = 100	8.5	—	6,900	5,800	40	—	—	
Class A Amplifier	425	—	40	18†	—	5,000	1,600	8.0	10,200	1.6	10
Class A Amplifier	250	250	8.0	35†	2.5†	100,000	6,500	—	5,000	4.2	10AL11¶ ■
Class A Amplifier	150	100	R_k = 560	1.3	2.1	150,000	1,000	E_{c3} = 0 volts		—	
Class A Amplifier	250	250	R_k = 135	48†	5.5†	38,000	11,300	—	5,200	6.0	*10BQ5*¶
Class A Amplifier	135	135	R_k = 100	11.5	3.2	190,000	8,000	—	—	—	*10C8*¶
Class A Amplifier	250	—	R_k = 390	7.3	—	12,000	4,400	53	—	—	
Vertical Amplifier	Max positive pulse plate voltage ◈ = 1,000; max d-c cathode current ◈ = 18 ma										
Vertical Oscillator	Max d-c cathode current ◈ = 12 ma										
Class A Amplifier	170	170	12.5	70†	5.0†	23,000	10,000	—	2,400	5.6	*10CW5*¶
Class AB_1 Amplifier	250	200	18.5	91†	4.0†	—	—	—	3,000‡	25	
Vertical Oscillator	250	—	8.0	9.0	—	7,700	2,600	20	—	—	*10DA7*¶
Vertical Amplifier	150	—	17.5	40	—	1,100	5,700	6.3	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage = 1,800 volts; max d-c cathode current = 40 ma										
Vertical Oscillator	250	—	11	5.5	—	8,750	2,000	17.5	—	—	*10DE7*¶
	Max d-c cathode current ◈ = 22 ma										
Vertical Amplifier	150	—	17.5	35	—	925	6,500	6.0	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 1,000; max d-c cathode current ◈ = 50 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	*10DR7*¶
	Max d-c cathode current ◈ = 20 ma										
Vertical Amplifier	150	—	17.5	35	—	925	6,500	6.0	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage ▣ = 1,500; d-c cathode current ◈ = 50 ma										
Class A Amplifier	220	220	3.4	18	3.0	150,000	10,000	—	—	—	*10DX8*
Class A Amp	200	—	1.7	3.0	—	—	4,000	65	—	—	
Class A Amplifier	200	125	R_k = 68	25	7.0	75,000	12,500	—	—	—	*10EB8*¶
Class A Amp	250	—	2.0	2.0	—	37,000	2,700	100	—	—	
Vertical Oscillator	250	—	11	5.5	—	8,750	2,000	17.5	—	—	10EG7¶
	Max d-c cathode current ◈ = 22 ma										
Vertical Amplifier	150	—	17.5	45	—	800	7,500	6.0	—	—	
	Max positive pulse plate voltage ◈ = 1,500; max d-c cathode current ◈ = 50 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦ G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✠Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads: Input	Output	Grid-plate
10EM7¶	Double Triode	8BD	9–38	9.7	0.6	1.5◈	330◈	—	Section 1 (Pins 4, 5, 6)		
						10◈	330◈	—	Section 2 (Pins 1, 2, 3)		
10EW7¶	Double Triode	9HF	9–70	9.7	0.6	1.5◈	330◈	—	Section 1 (Pins 6, 7, 8)		
						10◈	330◈	—	Section 2 (Pins 1, 2, 3, 9)		
10FD7¶	Double Triode	9HF	9–77	9.7	0.6	1.5◈	330◈	—	Section 1 (Pins 6, 7, 8)		
						10.0◈	330◈	—	Section 2 (Pins 1, 2, 3, 9)		
10FR7¶	Double Triode	9HF	9–70	9.7	0.6	1.5◈	330◈	—	Section 1 (Pins 6, 7, 8)		
						10◈	330◈	—	Section 2 (Pins 1, 2, 3, 9)		
10GF7¶	Dissimilar Double Triode	9QD	T-X	9.7	0.6	1.5 ◈	330◈	—	Section 1 (Pins 1, 8, 9)		
						11◈	330◈	—	Section 2 (Pins 2, 3, 6)		
10GF7-A¶	Dissimilar Double Triode	9QD	9–107	9.7	0.6	1.5◈	330◈	—	Section 1 (Pins 1, 8, 9)		
						11◈	330◈	—	Section 2 (Pins 2, 3, 6)		
10GK6¶	Beam Power Amplifier	9GK	6–4	10.6	0.45	13.2◈	330◈	330◈ 2.0◈	Single Tube		
									Two Tubes, Push-Pull		
									Two Tubes, Push-Pull		
10GN8¶	Triode-Pentode	9DX	6–3	10.5	0.45	5.0 ◈	330◈	330◈§ 1.1◈	Pentode Section		
						1.0 ◈	330◈	—	Triode Section		
10HA6	Pentode	9NW	6–4	10.4	0.45	8.0◈	300◈	250◈ 1.5◈	13▲	8.0▲	0.18▲
10HF8¶	Triode-Pentode	9DX	6–3	10.5	0.45	5.0◈	330◈	330◈§ 1.1◈	Pentode Section		
						1.0◈	330◈	—	Triode Section		
10JA5¶ ■	Beam Power Amplifier	12FY	12–57	10.5	0.6	19◈	400◈	300◈ 2.75◈	14▲	7.5▲	0.66▲c
10JA8¶	Triode-Pentode	9DX	6–3	10.5	0.45	5.0 ◈	330◈	330§◈ 1.5◈	Pentode Section		
						1.0 ◈	300◈	—	Triode Section		
10JT8¶	Triode-Pentode	9DX	9–69	10.2	0.45	4.0 ◈	330◈	330§◈ 1.1◈	Pentode Section		
						1.0 ◈	330◈	—	Triode Section		
10JY8¶	Triode-Pentode	9DX	6–3	10.5	0.45	5.0 ◈	330◈	330§◈ 1.1◈	Pentode Section		
						2.0 ◈	330◈	—	Triode Section		
10KR8¶	Triode-Pentode	9DX	6–3	10.5	0.45	5.0◈	330◈	330§◈ 1.1◈	Pentode Section		
						2.0◈	330◈	—	Triode Section		
10KU8¶	Duplex-Diode Pentode	9LT	9–69	10.2	0.45	4.0◈	330◈	330§◈ 1.1◈	12▲	3.0▲	0.1♣ ▲
									Diode Sections		
10LB8¶	Triode-Pentode	9DX	9–69	10.2	0.45	4.0◈	330◈	330§◈ 1.1◈	Pentode Section		
						2.0◈	330◈	—	Triode Section		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. § Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	**10EM7¶**
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20	50	—	750	7,200	5.4	—	—	
	Max positive pulse plate voltage ⊞ =1,500; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	11	5.5	—	8,750	2,000	17.5	—	—	**10EW7¶**
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	17.5	45	—	800	7,500	6.0	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	**10FD7¶**
	Max d-c cathode current ◈ =20 ma										
Vertical Amplifier	150	—	17.5	40	—	800	7,500	6.0	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	68	—	—	**10FR7¶**
	Max peak negative grid voltage ◈ =400; max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20.0	50	—	750§	7,200	5.4	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	**10GF7¶**
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20	50	—	750	7,200	5.4	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	**10GF7-A¶**
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20	50	—	750	7,200	5.4	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ = 50 ma										
Class A Amplifier	250	250	7.3	48†	5.5†	38,000	11,300	—	5,200	5.7	*10GK6¶*
Class AB Amplifier	300	300	R_k = 130	72†	8.0†	—	—	—	8,000‡	17	
	250	250	R_k = 130	62†	7.0†	—	—	—	8,000‡	11	
Class B Amplifier	300	300	14.6	15†	1.6†	—	—	—	8,000‡	17	
	250	250	11.6	20†	2.2†	—	—	—	8,000‡	11	
Class A Amplifier	200	150	R_k = 100	25	5.5	60,000	11,500	—	—	—	*10GN8¶*
Class A Amp	250	—	2.0	2.0	—	37,000	2,700	100	—	—	
Class A Amplifier	150	100	R_k = 33	28	3.5	20,000	20,000	—	—	—	*10HA6*
	60	100	0	45	9.0	—	—	—	—	—	
Class A Amplifier	200	125	R_k = 68	25	7.0	75,000	12,500	—	—	—	*10HF8¶*
	45	125	0	40	15	—	—	—	—	—	
Class A Amp	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Vertical-Deflection Amplifier	135	125	10	95	4.2	12,000	10,300	—	—	—	10JA5¶ ■
	45	125	0	210	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,500 volts; max d-c cathode current ◈ = 110 ma.										
Class A Amplifier	200	135	1.5	18	4.0	70,000	14,000	—	—	—	*10JA8¶*
	30	135	0	32	14	—	—	—	—	—	
Class A Amp	200	—	2.0	3.5	—	19,000	3,700	70	—	—	
Class A Amplifier	200	100	R_k = 82	17	3.5	50,000	20,000	—	—	—	10JT8¶
	35	100	0	50	17	—	—	—	—	—	
Class A Amp	250	—	2.0	1.5	—	37,000	2,700	100	—	—	
Class A Amplifier	200	150	R_k = 100	24	4.8	55,000	11,000	—	—	—	*10JY8¶*
Class A Amplifier	125	—	R_k = 68	15	—	4,400	10,400	46	—	—	
Class A Amplifier	200	100	R_k = 82	19.5	3.0	60,000	20,000	—	—	—	*10KR8¶*
Class A Amplifier	125	—	R_k = 68	15	—	4,400	10,400	46	—	—	
Class A Amplifier	200	100	R_k = 82	17	3.5	50,000	20,000	—	—	—	10KU8¶
	50	100	0	55	18	—	—	—	—	—	
	Average diode current at 10 volts =2.0 ma										
Class A Amplifier	200	100	R_k = 82	17	3.5	50,000	20,000	—	—	—	10LB8¶
	50	100	0	55	18	—	—	—	—	—	
Class A Amplifier	125	—	R_k = 68	13	—	6,000	5,000	30	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✻Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Output	Grid-plate
10LE8¶	Twin Pentode	9QZ	6–4	10	0.45	2.0◈ ♠	300◈	150◈ 2.0◈	—	—	—
10LW8¶	Triode-Pentode	9DX	6–3	10.5	0.45	4.0◈ 1.5◈	330◈ 330◈	330⁑◈ 1.5◈ —	Pentode Section Triode Section		
10LY8¶	Triode-Pentode	9DX	6–3	10.5	0.45	5.0◈	330◈ 330◈	330⁑◈ 1.1◈ —	Pentode Section Triode Section		
10LZ8¶	Triode-Pentode	9DX	6–3	10.5	0.45	4.5◈ 1.0◈	225◈ 300◈	160◈ 2.0◈ —	Pentode Section Triode Section		
10T10¶ ■	Dissimilar Double Triode-Pentode	12EZ	9–59	9.8	0.6	10◈ 1.7◈	275◈ 330◈	275◈ 2.0◈ 330⁑◈ 1.1◈	Section 1 (pins 8, 9, 10 and 11) Section 2 (pins 2, 3, 5, 6 and 7)		
10Z10¶ ■	Pentode-Gated Beam Discriminator	12BT	9–58	10	0.6	10◈ —	275◈ 330◈	275◈ 2.0◈ 330⁑◈	Pentode Section (Pins 2, 3, 9, 11) Gated-Beam Discriminator (Pins 4, 5, 6, 7, 8)		
11AR11¶ ■	Twin Pentode	12DM	9–58	11.2	0.45	3.1◈ ♠	330◈	330⁑◈ ♠ 0.65 ◈♠	10	2.8[1] 3.0[2]	0.026
11BM8	Triode-Pentode	9EX	6–4	10.7	0.45	5.0 1.0	250 250	250 1.8	Pentode Section Triode Section		
11BQ11¶ ■	Dissimilar Double Pentode	12DM	9–58	11.2	0.45	3.1◈ 3.1◈	330◈ 330◈	330⁑◈ 0.65◈ 330⁑◈ 0.65◈	Section 1 (Pins 7, 8, 9, 10, 11) Section 2, (Pins 2, 3, 4, 5, 6)		
11BT11¶ ■	Dissimilar-Double-Triode Pentode	12GS	9–58	10.7	0.6	3.5◈ 1.5◈ 2.0◈	165◈ 330◈ 330◈	165◈ 1.5◈ — —	Pentode Section Triode Section 1 (Pins 5, 6, 7) Triode Section 2 (Pins 3, 4, 9)		
11C5¶	Beam Power Amplifier	7CV	5–3	11.6	0.45	4.5	135	117 1.0	12▲	9.0▲	0.6▲
11CA11¶ ■	Dissimilar-Double-Triode Pentode	12HN	9–58	10.7	0.6	5.0◈ 1.5◈ 1.5◈	330◈ 330◈ 330◈	330⁑◈ 1.0◈ — —	Pentode Section Triode Section 1 (Pins 4, 5, 6) Triode Section 2 (Pins 2, 3, 7)		
11CF11¶ ■	Dissimilar-Double-Triode-Pentode	12HW	9–58	10.7	0.6	5.0◈ 2.0◈ 1.5◈	330◈ 330◈ 330◈	330⁑◈ 1.0◈ — —	Pentode Section Triode Section 1 Triode Section 2		
11CH11¶ ■	Dissimilar-Double-Triode-Pentode	12GS	9–58	10.7	0.6	6.0◈ 2.0◈ 1.0◈	330◈ 330◈ 330◈	330⁑◈ 1.0◈ — —	Pentode Section Triode Section 1 Triode Section 2		
11CY7¶	Double Triode	9LG	6–3	11.0	0.45	1.0◈ 5.5◈	350◈ 350◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 3, 9)		

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohm	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Color Demodulator	100	100	2.5	8.0	15	50,000	5,800	—	E_{c3} = 0 volts		*10LE8*¶
Class A Amplifier	200	100	R_k = 82	16.5	2.8	60,000	19,000	—	—	—	*10LW8*¶
	35	100	0	48	12.5	—	—	—	—	—	
Class A Amplifier	200	—	2.0	2.6	—	18,700	4,000	75	—	—	
Class A Amplifier	200	100	R_k = 82	19.5	3.0	60,000	20,000	—	—	—	*10LY8*¶
	35	100	0	54	13.5	—	—	—	—	—	
Class A Amplifier	250	—	2.0	1.0	—	59,000	1,700	100	—	—	
Class A Amplifier	200	140	2.0	12	2.5	150,000	9,500	—	—	—	*10LZ8*¶
	30	140	0	30	13.5	—	—	—	—	—	
Class A Amplifier	250	—	2.0	1.1	—	52,000	2,100	110	—	—	
Class A Amplifier	250	250	8.0	35+	2.5+	100,000	6,500	—	5,000	4.2	**10T10**¶ ■
Class A Amplifier	150	100	R_k = 560	1.3	2.1	150,000	1,000	(E_{c3} = 0 volts)			
Class A Amplifier	250	250	8.0	35+	3.0+	100,000	6,500	—	5,000	4.2	**10Z10**¶ ■
FM Limiter-Discriminator	135	280	—	5.0	(R_{g2} → 33,000 ohms)			(E_{c3} = +4.0 volts)			
Class A Amplifier	125	125	R_k = 56	11	3.5	200,000	10,500	—	—	—	11AR11¶ ■
Class A Amplifier	200	200	16	35	7.0	20,000	6,400	—	—	—	*11BM8*
Class A Amplifier	100	—	0	3.5	—	—	2,500	70	—	—	
Class A Amplifier	125	125	R_k = 56	11	3.5	200,000	10,500	—	—	—	11BQ11¶ ■
Class A Amplifier	125	125	R_k = 56	11	3.8	200,000	13,000	—	—	—	
Avg. Char.	150	100	R_k = 82	17.4	3.2	51,000	19,000	—	—	—	11BT11¶ ■
	35	100	0	54	13.5	—	—	—	—	—	
Class A Amplifier	200	—	R_k = 270	7.1	—	12,300	5,500	69	—	—	
Class A Amplifier	200	—	R_k = 470	7.2	—	7,600	5,300	40	—	—	
Class A Amplifier	110	110	7.5	40†	3.0†	—	5,800	—	2,500	1.5	*11C5*¶
Class A Amplifier	200	120	R_k = 65	27.5	4.9	490,000	21,200	—	—	—	11CA11¶ ■
Class A Amplifier	200	—	R_k = 270	7.1	—	10,000	6,300	63	—	—	
Class A Amplifier	200	—	R_k = 270	7.1	—	12,400	5,500	69	—	—	
Class A Amplifier	200	120	R_k = 65	27.5	4.9	490,000	21,200	—	—	—	11CF11¶ ■
Class A Amplifier	200	—	R_k = 270	7.1	—	12,400	5,500	69	—	—	
Class A Amplifier	200	—	R_k = 270	7.6	—	9,200	6,300	59	—	—	
Video Amplifier	200	120	R_k = 65	27.5	4.9	49,000	20,000	—	—	—	11CH11¶ ■
	50	120	0	71	18	—	—	—	—	—	
General Purpose Amplifier	200	—	R_k = 270	7.1	—	12,500	5,500	69	—	—	
General Purpose Amplifier	200	—	R_k = 470	7.2	—	7,600	5,300	40	—	—	
Vertical Oscillator	250	—	3.0	1.2	—	52,000	1,300	68	—	—	*11CY7*¶
Vertical Amplifier	150	—	R_k = 620	30	—	920	5,400	5.0	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 1,800; max d-c cathode current ◈ = 35 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✠Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
11DS5¶	Beam Power Amplifier	7BZ	5–3	11.2	0.45	9.0◈	275◈	275◈ 2.2◈	9.5▲	6.3▲	0.19▲
11FY7¶■	Dissimilar Double Triode	12EO	9–60	11	0.6	1.0◈	330◈	—	Section 1 (Pins 9, 10, 11)		
						7.0◈	275◈	—	Section 2 (Pins 3, 5, 7)		
11HM7	Sharp-Cutoff Pentode	9BF	6–3	11	0.3	7.0◈	330◈	330**‡**◈ 1.0◈	14▲	5.0▲	0.15▲
11JE8¶	Triode-Pentode	9DX	6–3	10.9	0.45	5.0◈	330◈	330◈**‡** 2.0◈	Pentode Section		
						1.0◈	300◈	—	Triode Section		
11KV8¶	Triode-Pentode	9DX	6–3	10.9	0.45	5.0◈	300◈	300**‡**◈ 1.0◈	Pentode Section		
						1.0◈	300◈	—	Triode Section		
11LQ8¶	Triode-Pentode	9DX	6–3	10.9	0.45	5.0◈	300◈	300**‡**◈ 1.0◈	Pentode Section		
						2.0◈	300◈	—	Triode Section		
11LT8	Duplex-Diode Pentode	9RL	6–2	11.4	0.315	3.1◈	330◈	330:◈ 0.65◈	Pentode Section		
									Diode Sections		
11LY6¶	Sharp-Cutoff Pentode	9GK	6–3	11.0	0.3	6.5◈	330◈	190◈ 1.2◈	9.5▲	3.8▲	0.07▲ ▲
11MS8¶	Triode-Pentode	9LY	6–4	11.6	0.45	6.0◈	250◈	200◈ 1.5◈	Pentode Section		
						0.5◈	250◈	—	Triode Section		
11Y9	Dissimilar Double Pentode	10L	6–3	11	0.45	5.0	250	250 2.5	Section 1 (Pins 7, 8, 9, 10)		
						1.5	250	250 0.5	Section 2 (Pins 1, 2, 3, 4)		
12A	Detector Amplifier Triode	4D	14–1	5.0 DC	0.25	—	180	—	4.0▲	2.0▲	8.5▲
12A4	Medium-Mu Triode	9AG	6–3	12.6 / 6.3	0.3 / 0.6	5.9	450	—	4.9 ▲	0.9 ▲	5.6 ▲
12A5	Power Amplifier Pentode	7F	12–5	12.6 / 6.3	0.3 / 0.6	8.25	180	180 2.5	—	—	—
12A6 12A6-GT	Beam Power Amplifier	7AC	8–6 9–9	12.6	0.15	7.5	250	250 1.5	—	—	—
12A7	Half-Wave Rectifier Power Amplifier Pentode	7K	12–6	12.6	0.3	—	135	135	—	—	—
12A8-G 12A8-GT	Pentagrid Converter	8A♦	12–8 9–18	12.6	0.15	1.0	300	100 0.3	Osc I_{c1} = 0.4 ma R_{g1} = 50,000 ohms		
12AB5	Beam Power Amplifier	9EU	6–3	12.6	0.2	12	315	285 2.0	8.0▲	8.5▲	0.7▲
12AC6	Remote-Cutoff RF Pentode	7BK	5–2	12.6	0.15	—	30	30	4.3	5.0	0.004
12AC10-A¶ ■	Triple Triode	12FE	9–56	12.6	0.3	2.0◈ ♣	330◈	—	2.4_1▲ 2.6_2▲ 2.6_3▲	0.22_1▲ 0.30_2▲ 0.44_3▲	1.3_1▲ 1.2_2▲ 1.2_3▲
12AD6	Pentagrid Converter	7CH ♥	5–2	12.6	0.15	—	16	16	Osc. I_{c1} = 0.060 ma R_{g1} = 33,000 ohms		
12AD7	High-mu Twin Triode	9A	6–2	12.6 / 6.3	0.225 / 0.45	1.0♦	300	—	1.6▲	0.5_1▲ 0.45_2 ▲	1.8▲
12AE6	Duplex-Diode Triode	7BT	5–2	12.6	0.15	—	30	—	1.8▲	1.1▲	2.0▲
									Diode Sections		
12AE6-A	Duplex-Diode Triode	7BT	5–2	12.6	0.15	—	30	—	1.8▲	1.1▲	2.0▲
									Diode Sections		

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♦Per section. **‡** Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250	200	8.5	29+	3.0+	28,000	5,800	—	8,000	3.8	*11DS5*¶
	200	200	7.5	35+	3.0+	28,000	6,000	—	6,000	3.0	
Vertical Oscillator	250	—	3.0	1.4	—	40,500	1,600	65	—	—	11FY7¶ ■
	Max d-c cathode current ◈ =20 ma										
Vertical Amplifier	150	—	17.5	35	—	920	6,500	6.0	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,000; max d-c cathode current ◈ =50 ma										
Class A Amplifier	200	135	R_k = 47	30	5.2	40,000	30,000	(E_{c3} = 0 volts)			*11HM7*
Class A Amplifier	250	170	R_k = 82	22	4.0	140,000	12,000	—	—	—	*11JE8*¶
Class A Amp	200	—	2.0	4.5	—	16,600	4,200	70	—	—	
Class A Amplifier	200	125	R_k = 68	22	4.0	75,000	23,000	—	—	—	*11KV8*¶
	125	125	R_k = 82	19	3.8	55,000	21,000	—	—	—	
Class A Amplifier	200	—	2.0	4.0	—	17,500	4,000	70	—	—	
Class A Amplifier	125	125	R_k = 82	16.5	3.1	55,000	21,000	—	—	—	*11LQ8*¶
Class A Amplifier	125	—	R_k = 68	15	—	4,400	10,400	46	—	—	
Class A Amplifier	125	125	R_k =	10	3.4	200,000	13,000	—	—	—	*11LT8*
	Max d-c output current◈ ♠ =5.0 ma; voltage drop =5.0 volts at 20 ma d-c ♠										
Class A Amplifier	250	180	R_k = 100	26	5.75	89,000	11,000	—	—	—	*11LY6*¶
Vertical Deflection Amplifier	120	110	10	50	3.0	13,000	8,500	—	—	—	*11MS8*¶
	Max positive pulse plate voltage ◈ = 2,000 volts; max d-c cathode current ◈ = 70 ma.										
Class A Amplifier	100	—	0.85	5.0	—	11,000	5,500	60	—	—	
	100	—	0	10	—	9,000	7,000	63	—	—	
Class A Amplifier	170	170	2.6	30	6.5	40,000	21,000	—	—	—	*11Y9*
Class A Amplifier	150	150	2.3	10	3.0	160,000	8,500	—	—	—	
Class A Amplifier	180	—	13.5	7.7†	—	4,700	1,800	8.5	10,650	0.285	12A
Vertical Amplifier	250	—	9.0	23	—	2,500	8,000	20	—	—	*12A4*
	Max positive pulse plate voltage ◙ =1,000; max d-c cathode current =30 ma										
Class A Amplifier	180	180	25	45†	8†	35,000	2,400	—	3,300	3.4	12A5
	100	100	15	17†	3†	50,000	1,700	—	4,500	0.8	
Class A Amplifier	250	250	12.5	30†	3.5†	70,000	3,000	—	7,500	3.4	**12A6** 12A6-GT
Class A Amp	135	135	13.5	9.0†	2.5†	102,000	975	—	13,500	0.55	12A7
Half-Wave Rectifier	Max d-c output current =30 ma; max rms supply voltage =125 v										
Converter	250	100	3.0	3.5	2.7	360,000	550 #	E_{c2}(Osc Plate) =250 thru 20,000 ohms I_{c2} =4.0 ma			12A8-G 12A8-GT
Class A Amplifier	250	250	12.5	45†	4.5†	50,000	4,100	—	5,000	4.5	*12AB5*
	250	200	R_k = 270	33.5†	1.6†	—	4,000	—	6,000	3.3	
Class A Amplifier	12.6	12.6	E_{cc1} =0	0.6	0.2	600,000	750	R_{g1} =2.2 meg		—	*12AC6*
Class A Amplifier ♠	200	—	R_k = 150	9.0	—	10,700	5,800	62	—	—	12AC10-A¶ ■
Converter	12.6	12.6	E_{cc3}=0	0.34	1.19	400,000	320#	R_{g3} = 2.2 meg		—	*12AD6*
Class A Amplifier ♠	250	—	2.0	1.25	—	62,500	1,600	100	—	—	*12AD7*
Class A Amplifier	12.6	—	0	0.75	—	15,000	1,000	15	—	—	*12AE6*
AM Detect.	Max d-c output current ♠ =1.0 ma; voltage drop ♠: 10 volts at 2.0 ma d-c										
Class A Amplifier	12.6	—	0	1.0	—	13,000	1,300	16.7	—	—	*12AE6-A*
AM Detect.	Max d-c output current ♠ =1.0 ma; voltage drop ♠: 10 volts at 2.0 ma d-c										

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Out-put	Grid-plate
12AE7	Double Triode	9A	6–2	12.6	0.45	1.0◆ 1.0◆	16◆ 16◆	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3)		
12AE10¶ ■	Dissimilar Double Pentode	12EZ	9–59	12.6	0.45	6.0◆ 1.7◆	165◆ 330◆	150◆ 1.25◆ 330⁑◆ 1.1◆	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 5, 6, 7)		
12AF3¶	Half-Wave High-Vacuum Rectifier	9CB	6–8	12.6	0.6	6.0◆	Tube Voltage Drop: 30 volts at 340 ma d-c				
12AF6	RF Pentode	7BK	5–2	12.6	0.15	—	16◆	16◆	5.5▲	4.8▲	0.006 ▲♣
12AG6	Heptode	7CH ♥	5–2	12.6	0.15	—	16	16	Osc. I_{c1} = 0.05 ma R_{g1} = 20,000 ohms		
12AH7-GT	Medium-Mu Twin Triode	8BE	9–7	12.6	0.15	1.5♠	180	—	—	—	—
12AJ6	Duplex-Diode-Triode	7BT	5–2	12.6	0.15	—	30	—	2.2▲	0.8▲	2.0▲
									Diode Sections		
12AL5	Twin Diode	6BT	5–1	12.6	0.15	—	Tube Voltage Drop:♠ 10 v at 60 ma d-c				
12AL8	Triode Space-Charge-Grid Tetrode	9GS	6–3	12.6	0.55	— —	30 30	— —	Tetrode Section Triode Section		
12AL11¶■	Dissimilar-Double Pentode	12BU	9–59	12.6	0.45	10◆ 1.7◆	275◆ 330◆	275◆ 2.0◆ 330⁑◆ 1.1◆	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 4, 6, 7)		
12AQ5	Beam Power Amplifier	7BZ	5–3	12.6	0.225	12	250	250 2.0	8.3▲	8.2▲	0.35▲
12AS5	Beam Power Amplifier	7CV	5–3	12.6	0.4	5.5	150	150⁑ 1.0	12▲	6.2▲	0.6▲
12AT6 *12AT6-A*¶	Duplex-Diode High-Mu Triode	7BT	5–2	12.6	0.15	0.5	300	—	2.2	1.2	2.0
12AT7	High-Frequency Twin Triode	9A	6–2	12.6 6.3	0.15 0.3	2.5♠	300	—	2.2	1.2_1 1.5_2	1.5
12AU6 *12AU6-A*¶	Sharp-Cutoff RF Pentode	7BK	5–2	12.6	0.15	3.5◆ 3.5◆	330◆ 275◆	330⁑◆ 0.75◆ —	Pentode Connection Triode Connection (G_2, G_3, & P tied)		
12AU7 *12AU7-A*	Medium-Mu Twin Triode	9A	6–2	12.6 6.3	0.15 0.3	2.75 ◆♠	330◆	—	1.8	2.0	1.5
12AU8	Triode-Pentode	9DX	6–3	12.6	0.3	3.0 2.5	300 300	300⁑ 1.0 —	Pentode Section Triode Section		
12AV5-GA¶	Beam Power Amplifier	6CK	T-X	12.6	0.6	11	550⁑	175 2.5	14▲	7.0▲	0.5▲
12AV6 *12AV6-A*¶	Duplex-Diode High-Mu Triode	7BT	5–2	12.6	0.15	0.55◆	330◆	—	2.2	1.2	2.0
12AV7	Twin Triode	9A	6–2	6.3 12.6	0.45 0.225	2.7♠	300	—	3.2	1.3_1 1.6_2	1.9
12AW6	Sharp-Cutoff RF Pentode	7CM	5–2	12.6	0.15	2.0 2.5	300 300	300⁑ 0.5 —	Pentode Connection Triode Connection (G_2 & P tied)		
12AX3¶■	Half-Wave High-Vacuum Rectifier	12BL	9–59	12.6	0.6	5.3◆	Tube Voltage Drop: 32 volts at 250 ma d-c				
12AX4-GT 12AX4-GTA¶	Half-Wave High-Vacuum Rectifier	4CG	9–11 9–41	12.6	0.6	4.8	Tube Voltage Drop: 32 v at 250 ma d-c				

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage.
●Subminiature type. ▲Without external shield. ◆Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	12.6	—	$E_{cc}=0$	1.9	—	3,150	4,000	13	R_g = 1.5 meg		*12AE7*
Class A Amplifier	12.6	—	$E_{cc}=0$	7.5	—	985	6,500	6.4	R_g = 1.0 meg		
Class A Amplifier	145	110	7.0	34†	6.5†	33,000	5,600	—	2,500	1.45	12AE10¶■
Avg. Char.	150	100	R_k = 560	1.3	2.0	150,000	1,000	(E_{c3} = 0 volts)			
TV Damper	Max d-c output current ◈ = 185 ma; max peak inverse voltage ◈ = 4,500 volts; max peak current ◈ = 750 ma										*12AF3*¶
Class A Amplifier	12.6	12.6	$E_{cc1}=0$	1.1	0.45	350,000	1,500	R_{g1} = 2.2 meg		—	*12AF6*
Converter	12.6	12.6	—	0.55	1.4	—	300♯	E_{cc3} = 0 volts; R_{g3} = 2.2 meg		— —	*12AG6*
Class A Amplifier ♠	180	—	6.5	7.6	—	8,400	1,900	16	—	—	12AH7-GT
Class A Amp	12.6	—	0	0.75	—	45,000	1,200	55	—	—	*12AJ6*
AM Detector	Max d-c output current ♠ = 1.0 ma; voltage drop ♠: 10 volts at 2.0 ma										
Half-Wave Rectifier	Max d-c output current per plate = 9 ma; max peak inverse voltage = 330; max rms supply voltage per plate = 117; max peak current per plate = 54 ma										*12AL5*
Class A Amplifier	12.6	—	$E_{cc2}=0$	40	—	480	15,000	—	—	—	*12AL8*
	E_{c1} = 12.6 volts; I_{c1} = 75 ma (Note: grid 1 is space-charge grid, grid 2 is control grid)										
Class A Amp	12.6	—	$E_{cc1}=0$	0.5	—	13,000	1,000	13	—	—	
Class A Amplifier	250	250	8.0	35†	2.5†	100,000	6,500	—	5,000	4.2	12AL11¶■
Class A Amplifier	150	100	R_k = 60	1.3	2.1	150,000	1,000	E_{c3} = 0 volts			
Class A Amplifier	180	180	8.5	29†	3.0†	58,000	3,700	—	5,500	2.0	*12AQ5*
	250	250	12.5	45†	4.5†	52,000	4,100	—	5,000	4.5	
Class A Amplifier	150	110	8.5	35†	2.0†	—	5,600	—	4,500	2.2	*12AS5*
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	*12AT6*
	100	—	1.0	0.8	—	54,000	1,300	70	—	—	*12AT6-A*¶
Class A Amplifier ♠	250	—	R_k = 200	10	—	10,900	5,500	60	—	—	*12AT7*
	100	—	R_k = 270	3.7	—	15,000	4,000	60	—	—	
Class A Amplifier	250	150	R_k = 68	10.6	4.3	1,000,000	5,200	—	—	—	*12AU6* *12AU6-A*¶
	100	100	R_k = 150	5.0	2.1	500,000	3,900	—	—	—	
Class A Amplifier	250	—	R_k = 330	12.2	—	—	4,800	36	—	—	
Class A Amplifier ♠	250	—	8.5	10.5	—	7,700	2,200	17	—	—	*12AU7*
	100	—	0	11.8	—	6,500	3,100	20	—	—	*12AU7-A*
Vertical Amplifier ♠	Max positive pulse plate voltage ◈ = 1,200; max d-c cathode current ◈ = 22 ma										
Class A Amplifier	200	125	R_k = 82	15	3.4	150,000	7,000	—	—	—	*12AU8*
Class A Amplifier	150	—	R_k = 150	9.0	—	8,200	4,900	40	—	—	
Horizontal Amplifier	250	150	22.5	57	2.1	14,500	5,900	—	—	—	12AV5-GA¶
	60	150	0	260	26	—	—	—	—	—	
	Max positive pulse plate voltage ▣ = 5,500 volts; max screen dissipation = 2.5 watts; max d-c cathode current = 110 ma										
Class A Amplifier	250	—	2.0	1.2	—	62,500	1,600	100	—	—	*12AV6*
	100	—	1.0	0.5	—	80,000	1,250	100	—	—	*12AV6-A*¶
Class A Amplifier ♠	150	—	R_k = 56	18	—	4,800	8,500	41	—	—	*12AV7*
	100	—	R_k = 120	9.0	—	6,100	6,100	37	—	—	
Class A Amplifier	250	150	R_k = 200	7.0	2.0	800,000	5,000	—	—	—	*12AW6*
Class A Amplifier	250	—	R_k = 825	5.5	—	11,000	3,800	42	—	—	
TV Damper	Max d-c output current ◈ = 165 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,000 ma										12AX3¶■
TV Damper	Max d-c output current = 125 ma; max peak inverse voltage ▣ = 4400 volts; max peak current = 750 ma										12AX4-GT 12AX4-GTA¶

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
♣Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
12AX4-GTB¶	Half-Wave High-Vacuum Rectifier	4CG	9–11	12.6	0.6	5.3◈	Tube Voltage Drop: 32 volts at 250 ma d-c				
12AX7	High-Mu Twin Triode	9A	6–2	12.6 6.3	0.15 0.3	1.2◈ ♠	330◈	—	1.8	1.9	1.7
12AX7-A	High-Mu Twin Triode	9A	6–2	12.6 6.3	0.15 0.3	1.2◈ ♠	330◈	—	1.6▲	0.46_1▲ 0.34_2▲	1.7▲
12AY3¶	Half-Wave High-Vacuum Rectifier	9HP	9–86	12.6	0.6	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
12AY3-A¶	Half-Wave High-Vacuum Rectifier	9HP	T-X	12.6	0.6	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
12AY7	Twin Triode	9A	6–2	6.3 12.6	0.3 0.15	1.5♠	300	—	1.3▲	0.6▲	1.3▲
12AZ7	Twin Triode	9A	6–2	12.6 6.3	0.225 0.45	2.5♠	330	—	2.8	1.4_1 1.6_2	1.9
12AZ7-A¶	Twin Triode	9A	6–2	12.6 6.3	0.225 0.45	2.5◈ ♠	300◈	—	2.8	1.4_1 1.6_2	1.9
12B4 12B4-A¶	Low-Mu Triode	9AG	6–3	12.6 6.3	0.3 0.6	5.5	550	—	5.0▲	1.5▲	4.8▲
12B7	Remote Cutoff Pentode same as 14A7										
12B8-GT	Triode Remote-Cutoff Pentode	8T	9–24	12.6	0.3	— —	90	90	Pentode Section Triode Section		
12BA6 12BA6-A¶	Remote-Cutoff RF Pentode	7BK	5–2	12.6	0.15	3.4◈	330◈	330◈⁑ 0.7◈	5.5	5.0	0.0035 ♣
12BA7	Pentagrid Converter	8CT ♥	6–3	12.6	0.15	2.0	300	100 1.5	Osc I_{c1} = 0.35 ma R_{g1} = 20,000 ohms		
12BD6	Remote-Cutoff RF Pentode	7BK	5–2	12.6	0.15	3.0	300	125 0.65	4.3▲	5.0▲	0.005 ♣▲
12BE3¶■	Half-Wave High-Vacuum Rectifier	12GA	9–60	12.6	0.6	6.5◈	Tube Voltage Drop: 25 volts at 350 ma d-c				
12BE3-A ¶■	Half-Wave High-Vacuum Rectifier	12GA	9–60	12.6	0.6	6.5◈	Tube Voltage Drop: 22.5 volts at 350 ma d-c				
12BE6 12BE6-A¶	Pentagrid Converter	7CH ♥	5–2	12.6	0.15	1.1◈	330◈	110◈ 1.1◈	Osc I_{c1} = 0.5 ma R_{g1} = 20,000 ohms		
12BF6	Duplex-Diode Medium-Mu Triode	7BT	5–2	12.6	0.15	2.5	300	—	1.8	0.7	1.9
12BF11¶ ■	Dissimilar Double Pentode	12EZ	9–59	12.6	0.6	6.5◈ 1.7◈	165◈ 330◈	150◈ 1.8◈ 330⁑◈ 1.1◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 5, 6, 7)		
12BH7 12BH7-A¶	Medium-Mu Twin Triode	9A	6–3	12.6 6.3	0.3 0.6	3.5♠	300 450	—	3.2▲	0.5_1▲ 0.42_2▲	2.6▲
12BK5¶	Beam Power Amplifier	9BQ	6–3	12.6	0.6	9.0	250	250 2.5	13▲	5.0▲	0.6▲
12BK6	Duplex-Diode, High-Mu Triode	7BT	5–3	12.6	0.15	—	300	—	—	—	—
12BL6	Sharp-Cutoff Pentode	7BK	5–2	12.6	0.15	—	30	30	5.5	4.8	0.006 ♣
12BN6 12BN6-A¶	Gated-Beam Discriminator	7DF	5–3	12.6	0.15	—	300◈⁑	110◈	E_{c1} = 1.25 volts rms		
12BQ6-GTA¶	Beam Power Amplifier	6AM	9–49 or 9–50	12.6	0.6	11	600⁑	175 2.5	—	—	—

■Compactron. † Zero signal. ♠Per section. ‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage. ●Subminiature type. ▲Without external shield. ◈Design maximum rating. ⊕Total for all similar sections. ⊞Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
TV Damper	Max d-c output current ◈ =165 ma; max peak inverse voltage ◈ =5,000 volts max peak current ◈ =1,000 ma										**12AX4-GTB¶**
Class A Amplifier ♠	100 250	— —	1.0 2.0	0.5 1.2	— —	80,000 62,500	1,250 1,600	100 100	— —	— —	*12AX7*
Class A Amplifier ♠	100 250	— —	1.0 2.0	0.5 1.2	— —	80,000 62,500	1,250 1,600	100 100	— —	— —	*12AX7-A*
TV Damper	Max d-c output current ◈ =175 ma; max peak inverse voltage ◈ =5,000 volts; max peak current ◈ =1100 ma										12AY3¶
TV Damper	Max d-c output current ◈ = 175 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,100 ma										12AY3-A¶
Class A Amplifier ♠	250	—	4.0	3.0	—	25,000	1,750	44	—	—	*12AY7*
Class A Amplifier	250 100	— —	R_k = 200 R_k = 270	10 3.7	— —	10,900 15,000	5,500 4,000	60 60	— —	— —	*12AZ7*
Class A Amplifier	250 100	— —	R_k = 200 R_k = 270	10 3.7	— —	10,900 15,000	5,500 4,000	60 60	— —	— —	*12AZ7-A¶*
Vertical Amplifier	150	—	17.5	34	—	1,030	6,300	6.5	—	—	*12B4* *12B4¶-A*
	Max positive pulse plate voltage ◙ =1000; max d-c cathode current =30 ma										
Class A Amp Class A Amp	90 90	90 —	3.0 0	7.0 2.8	2.0 —	200,000 37,000	1,800 2,400	— 96	— —	— —	12B8-GT
Class A Amplifier	250 100	100 100	R_k = 68 R_k = 68	11 10.8	4.2 4.4	1,000,000 250,000	4,400 4,300	— —	— —	— —	*12BA6* *12BA6-A¶*
Converter	250	100	1.0	3.8	10	1,000,000	950 #	—	—	—	*12BA7*
Class A Amplifier	250	100	3.0	9.0	3.5	700,000	2,000	—	—	—	*12BD6*
TV Damper	Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ =5,000 volts; max peak current ◈ =1,200 ma										12BE3¶■
TV Damper	Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ =5,000 volts; max peak current ◈ =1,200 ma										12BE3-A¶■
Converter	250 100	100 100	1.5 1.5	2.9 2.6	6.8 7.0	1,000,000 400,000	475 # 455 #	— —	— —	— —	*12BE6* *12BE6-A¶*
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	10,000	0.3	*12BF6*
Class A Amplifier	145	110	6.0	36†	3.0†	30,000	8,600	—	3,000	2.4	12BF11¶■
Class A Amplifier	150	100	R_k = 560	1.3	2.0	150,000	1,000	(E_{c3} = 0 volts)			
Class A Amplifier ♠	250	—	10.5	11.5	—	5,300	3,100	16.5	—	—	*12BH7*
Vertical Amplifier ♠	Max positive pulse plate voltage ◙ =1,500; max d-c cathode current =20 ma										*12BH7-A¶*
Class A Amplifier	250	250	5.0	35†	3.5†	100,000	8,500	—	6,500	3.5	*12BK5¶*
Class A Amplifier	250 100	— —	2.0 1.0	1.2 0.5	— —	62,500 80,000	1,600 1,250	100 100	— —	— —	*12BK6*
Class A Amplifier	12.6	12.6	E_{cc1}=0	1.35	0.5	500,000	1,350	R_{g1} =2.2 meg		—	*12BL6*
FM Limiter-Discriminator	285‡	100	R_k = 200 to 400	0.49	9.8	—	—	—	33,0000	—	*12BN6* *12BN6-A¶*
Horizontal Amplifier	250 60	150 150	22.5 0	55 225	2.1 25	20,000 —	5,500 —	— —	— —	— —	12BQ6-GTA¶
	Max positive pulse plate voltage ◙ =6,000 volts; max screen dissipation = 2.5 watts; max d-c cathode current =110 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
₁, ₂, ₃, etc. indicate tube sections.
♣Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
12BQ6-GA¶ 12BQ6-GTB¶	Beam Power Amplifier	6AM	T-X 9–49, 9–50	12.6	0.6	11	600§	200 2.5	15▲	7.0▲	0.6▲
12BR3¶	Half-Wave High-Vacuum Rectifier	9CB	T-X	12.6	0.6	6.5◈	Tube Voltage Drop: 19 volts at 250 ma d-c				
12BR7	Duplex-Diode Triode	9CF	6–2	12.6 6.3	0.225 0.45	2.5	300	—	2.8 Diode Sections	1.0	1.9
12BR7-A¶	Duplex-Diode Triode	9CF	6–2	12.6 6.3	0.225 0.45	2.5	300	—	2.8 Diode Sections	1.0	1.9
12BS3¶	Half-Wave High-Vacuum Rectifier	9HP	9–86	12.6	0.6	6.0◈	Tube Voltage Drop: 12 volts at 140 ma d-c				
12BS3-A¶	Half-Wave High-Vacuum Rectifier	9HP	T-X	12.6	0.6	6.0◈	Tube Voltage Drop: 12 volts at 140 ma d-c				
12BT3■	Half-Wave High-Vacuum Rectifier	12BL	9–59	12.6	0.45	5.3◈	Tube Voltge Drop: 21 volts at 250 ma d-c				
12BT6	Duplex-Diode High-Mu Triode	7BT	5–3	12.6	0.15	—	300	—	—	—	—
12BU6	Duplex-Diode Medium-Mu Triode	7BT	5–3	12.6	0.15	—	300	—	—	—	—
12BV7	Sharp-Cutoff Pentode	9BF	6–3	12.6 6.3	0.3 0.6	6.25	300	175 1.0	11▲	3.0▲	0.055 ▲
12BV11¶ ■	Twin Pentode	12HB	9–59	12.6	0.45	1.7◈ ♠	300◈	300§◈ 0.1◈ ♠	—	—	—
12BW4	Full-Wave High-Vacuum Rectifier	9DJ	6-3	12.6	0.45	—	Tube Voltage Drop:♠ 40 v at 100 ma d-c				
12BY3¶	Half-Wave, High-Vacuum Rectifier	9CB	6–8	12.6	0.45	4.0◈	Tube Voltage Drop: 21 volts at 250 ma d-c				
12BY7 *12BY7-A*¶	Sharp-Cutoff Pentode	9BF	6–3	12.6 6.3	0.3 0.6	6.5◈	330◈	190◈ 1.2◈	10.2▲	3.5▲	0.063 ▲♣
12BZ6	Semi-Remote-Cutoff RF Pentode	7CM	5–2	12.6	0.15	2.3◈	330◈	330◈§ 0.55◈	7.0	3.0	0.015 ♣
12BZ7	High-Mu Twin Triode	9A	6–3	12.6 6.3	0.3 0.6	1.5♠	300	—	6.5▲	0.7_1▲ 0.55_2▲	2.5▲
12C5¶	Beam Power Amplifier	7CV	5–3	12.6	0.6	6.0	135	117 1.25	13▲	8.5▲	0.6▲
12C8	Duplex-Diode Semi-Remote-Cutoff Pentode	8E	8–4	12.6	0.15	2.25	300	125 0.3	6.0	9.0	0.005 ♣
12CA5¶	Beam Power Amplifier	7CV	5–3	12.6	0.6	5.0	130	130 1.4	15▲	9▲	0.5▲
12CK3¶	Half-Wave, High-Vacuum Rectifier	9HP	T-X or 9–86	12.6	0.6	6.5◈	Tube Voltage Drop: 16 volts at 350 ma d-c				
12CL3¶	Half-Wave, High-Vacuum Rectifier	9HP	T-X or 9–86	12.6	0.6	8.5◈	Tube Voltage Drop: 16 volts at 350 ma d-c				
12CM6	Beam Power Amplifier	9CK	6–3	12.6	0.225	12 9.0 8.0	315 315 315	285 1.75 — 285 1.75	Pentode Connection Triode (G_2 & P tied) or Pentode Connection		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. § Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ⊞Absolute maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	250	150	22.5	57	2.1	14,500	5,900	—	—	—	12BQ6-GA¶ 12BQ6-GTB¶
	60	150	0	260	26	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =6,000 volts; max screen dissipation = 2.5 watts; max d-c cathode current =110 ma										
TV Damper	Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ =5,500; max peak current ◈ =1,200 ma										12BR3¶
Class A Amplifier	250	—	R_k = 200	10	—	10,900	5,500	60	—	—	*12BR7*
	100	—	R_k = 270	3.7	—	15,000	4,000	60	—	—	
Horizontal Phase Det.	Max peak output current ♠ =60 ma; voltage drop ♠: 5 volts at 17 ma d-c										
Class A Amplifier	250	—	R_k = 200	10	—	10,900	5,500	60	—	—	*12BR7-A*¶
	100	—	R_k = 270	3.7	—	15,000	4,000	60	—	—	
Horizontal Phase Det.	Max peak output current ♠ =60 ma; voltage drop ♠: 5 volts at 17 ma										
TV Damper	Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ =5,000; max peak current ◈ =1,100 ma										12BS3¶
TV Damper	Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ = 5,000; max peak current ◈ = 1,100 ma										12BS3-A¶
TV Damper	Max d-c output current ◈ =165 ma; max peak inverse voltage ◈ =3,300 volts; max peak current ◈ =1,000 ma										12BT3■
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	*12BT6*
	100	—	1.0	0.8	—	54,000	1,300	70	—	—	
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	10,000	0.30	*12BU6*
Class A Amplifier	250	150	R_k = 68	27	6.0	85,000	13,000	—	—	—	*12BV7*
Avg. Char. ♠	150	100	R_k = 180	3.6	2.0	200,000	3,700	(E_{c3} = 0 volts)			12BV11¶■
Full-Wave Rectifier	Max d-c output current =100 ma; max peak inverse voltage =1,275 volts; rms supply voltage per plate =325 volts; max peak current per plate =350 ma										*12BW4*
TV Damper	Max d-c output current ◈ = 140 ma; max peak inverse voltage ◈ = 4,500 volts; max peak current ◈ = 840 ma										*12BY3*¶
Class A Amplifier	250	180	R_k = 100	26	5.75	93,000	11,000	—	—	—	*12BY7* *12BY7-A*¶
Class A Amplifier	125	125	R_k = 56	14	3.6	260,000	8,000	—	—	—	*12BZ6*
	125	125	4.5	—	—	—	700	—	—	—	
Class A Amplifier ♠	250	—	2	2.5	—	31,800	3,200	100	—	—	*12BZ7*
Class A Amplifier	120	110	8.0	49†	4.0†	10,000	7,500	—	2,500	2.3	*12C5*¶
Class A Amplifier	250	125	3.0	10	2.3	600,000	1,325	—	—	—	**12C8**
Class A Amplifier	125	125	4.5	37†	4.0†	15,000	9,200	—	4,500	1.5	*12CA5*¶
	110	110	4.0	32†	3.5†	16,000	8,100	—	3,500	1.1	
TV Damper	Max d-c output current ◈ =250 ma; max peak inverse voltage ◈ =5,200 volts; max peak current ◈ = 1,200 ma										12CK3¶
TV Damper	Max d-c output current ◈ =250 ma; max peak inverse voltage ◈ = 5,500 volts; max peak current ◈ =1300 ma										12CL3¶
Class A Amplifier	250	250	12.5	45†	4.5†	50,000	4,100	—	5,000	4.5	*12CM6*
Vertical Amplifier	Max positive pulse plate voltage ▣ =2000 volts; max screen dissipation (pentode connection only) =1.75 watts; max d-c cathode current =40 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

♣ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✤	Capacitance in Picofarads Input	Output	Grid-plate
12CN5	RF Pentode	7CV	5–3	12.6	0.45	—	16	16	—	—	—
12CR6	Diode Remote-Cutoff Pentode	7EA	5–2	12.6	0.15	2.5	300	150 0.3	—	—	—
12CS5¶	Beam Power Amplifier	9GR	6–3	12.6	0.6	10	300	150 1.25	15▲	9.0▲	0.5▲
12CS6	Dual-Control Heptode	7CH ♥	5–2	12.6	0.15	1.0	300	100 1.0	—	—	—
12CT3¶	Half-Wave High-Voltage Rectifier	9RX	T-X	12.6	0.6	4.75◈	Tube Voltage Drop: 16 volts at 350 ma d-c				
12CT8¶	Triode-Pentode	9DA	6–2	12.6	0.3	2.75◈ 2.5◈	300◈ 300◈	300◈⁑ 0.9◈ —	Pentode Section Triode Section		
12CU5¶	Beam Power Amplifier	7CV	5–3	12.6	0.6	7.0◈	150◈	130◈ 1.4◈	13▲	8.5▲	0.6▲
12CU6	Beam Power Amplifier	6AM	T-X	12.6	0.6	11	600⁑	200 2.5	15▲	7.0▲	0.6▲
12CX6	Sharp-Cutoff RF Pentode	7BK	5–2	12.6	0.15	—	33◈ —	33◈	7.6▲	6.2▲	0.05▲ ♣
12CY6	Sharp-Cutoff RF Pentode	7BK	5–2	12.6	0.2	—	33◈	33◈ —	8.5▲	4.0▲	0.18▲ ♣
12D4¶	Half-Wave High-Vacuum Rectifier	4CG	9–11 9–41	12.6	0.6	5.5◈	—	—	—	—	♣
12D4-A¶	Half-Wave High-Vacuum Rectifier	4CG	9–41	12.6	0.6	8.0◈	—	Tube Voltage Drop: 30 volts at 340 ma d-c			
12DB5¶	Beam Power Amplifier	9GR	T-X	12.6	0.6	10	300	150 1.25	13▲	8.0▲	0.2▲
12DE8	Diode-Pentode	9HG	6–2	12.6	0.2	—	30 —	30	5.5▲ Diode Sections	5.7▲	0.006 ▲♣
12DF5	Full-Wave High-Vacuum Rectifier	9BS	6–3	12.6 6.3	0.45 0.9	—	Tube Voltage Drop:♠ 40 volts at 100 ma d-c				
12DF7	High-mu Twin Triode	9A	6–2	12.6 6.3	0.15 0.3	1.0♠	300	—	1.6▲	0.4_1▲ 0.3_2▲	1.4▲
12DJ8	Twin Triode	9DE	6–2	12.6	0.18	1.8	130	—	—	—	—
12DK5	RF Pentode	9GT	6–2	12.6	0.3	—	16◈ —	16◈	9.5	2.65	0.045
12DK6	Sharp-Cutoff Pentode	7CM	5–2	12.6	0.15	2.3◈	330◈	330⁑◈ 0.55◈	6.3▲	1.9▲	0.025 ▲♣
12DK7	Duplex-Diode-Tetrode	9HZ	6–3	12.6	0.5	0.5	30	30 —	— Diode Sections	—	—
12DL8	Duplex-Diode Space-Charge-Grid Tetrode	9HR	6–3	12.6	0.55	—	30	—	12▲ Diode Sections	1.3▲	14▲
12DM4¶	Half-Wave High-Vacuum Rectifier	4CG	9–44	12.6	0.6	6.5◈	Tube Voltage Drop: 35 volts at 400 ma d-c				
12DM4A¶	Half-Wave High-Vacuum Rectifier	4CG	9–44	12.6	0.6	6.5◈	Tube Voltage Drop: 35 volts at 400 ma d-c				

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	12.6	12.6	E_{cc1} = 0	4.5	0.35	40,000	3,800	R_{g1} = 2.2 meg		—	*12CN5*
Class A Amplifier	250	100	2.0	9.6	2.6	800,000	2,200	—	—	—	*12CR6*
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	*12CS5*¶
	110	110	75	49†	4.0†	13,000	8,000	—	2,000	2.1	
Gated Amplifier	100	30	1.0	1.0	1.3	1,000,000	1,100	E_{c3} = 0 volts			*12CS6*
	100	30	0	0.8	5.5	700,000	—	E_{c3} = −1.0 volts			
	10	30	0	2.0	4.5	—	—	E_{c3} = 0 volts			
TV Damper	Max d-c output current ◈ = 250 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,200 ma.										*12CT3*¶
Class A Amplifier	200	125	R_k = 82	15	3.4	150,000	7,000	—	—	—	*12CT8*¶
Class A Amplifier	150	—	R_k = 150	9.0	—	8,200	4,900	40	—	—	
Class A Amplifier	120	110	8.0	49†	4.0†	10,000	7,500	—	2,500	2.3	*12CU5*¶
Horizontal Amplifier	250	150	22.5	57	2.1	14,500	5,900	—	—	—	12CU6
	60	150	0	260	26	—	—	—	—	—	
	Max positive pulse plate voltage ▣ = 6,000 volts; max screen dissipation = 2.5 watts; max d-c cathode current = 110 ma										
Class A Amplifier	12.6	12.6	E_{cc1} = 0	3.0	1.4	40,000	3,100	R_{g1} = 2.2 meg		—	*12CX6*
Class A Amplifier	12.6	12.6	E_{cc1} = 0	1.6	0.4	140,000	3,250	R_{g1} = 2.2 meg		—	*12CY6*
TV Damper	Max d-c output current ◈ = 155 ma; max peak inverse voltage ◈ = 4,400 volts; max peak current ◈ = 900 ma										12D4¶
TV Damper	Max d-c output current ◈ = 185 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 900 ma										12D4-A¶
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	*12DB5*¶
	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
Vertical Amplifier	Max positive pulse plate voltage ▣ = 2,000; max d-c cathode current = 55 ma										
Class A Amplifier	12.6	12.6	E_{cc1} = 0	1.3	0.5	300,000	1,500	R_{g1} = 2.2 meg		—	*12DE8*
AM Detector	Max d-c output current ♠ = 5 ma; voltage drop ♠: 5 volts at 20 ma d-c										
Full-Wave Rectifier	Max d-c output current = 100 ma; max peak inverse voltage = 1,275 volts; max rms supply voltage per plate = 325 volts; max peak current per plate = 350 ma										*12DF5*
Class A Amplifier ♠	250	—	2.0	1.2	—	55,000	1,600	100	—	—	*12DF7*
	100	—	1.0	0.5	—	70,000	1,250	100	—	—	
Class A Amplifier ♠	90	—	1.3	15	—	—	12,500	33	—	—	*12DJ8*
Class A Amplifier	12.6	12.6	E_{cc1} = 0	2.0	0.65	100,000	3,300	R_{g1} = 2.2 meg		—	*12DK5*
Class A Amplifier	125	125	R_k = 56	12	3.8	350,000	9,800	—	—	—	*12DK6*
Class A Amplifier	12.6	12.6	E_{cc1} = 0	6.0	1.0	4,000	5,000	R_{g1} = 2.2 meg		—	*12DK7*
AM Detector	Max d-c output current ♠ = 10 ma; voltage drop ♠: 10 volts at 1 ma d-c										
Class A Amplifier	12.6	—	E_{cc2} = 0	40	—	480	15,000	—	—	—	*12DL8*
	E_{c1} = 12.6 volts; I_{c1} = 75 ma (Note: grid 1 is space-charge grid, grid 2 is control grid)										
AM Detector	Max d-c output current ♠ = 5.0 ma; voltage drop ♠: 10 volts at 3.0 ma d-c										
TV Damper	Max d-c output current ◈ = 175 ma; max peak inverse voltage ◈ = 5,000 volts max peak current ◈ = 1,100 ma										12DM4¶
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,200 ma										12DM4A¶

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
12DM5¶	Beam Power Amplifier	7CV	5–3	12.6	0.45	5.5	135	117 1.25	13▲	9.0▲	0.55▲
12DM7	High-Mu Twin Triode	9A	6–2	12.6 6.3	0.130 0.260	1.1◈ ♠	330◈	—	1.6▲	0.46_1▲ 0.34_2▲	1.7▲
12DQ4¶	Half-Wave High-Vacuum Rectifier	4CG	9–43	12.6	0.6	6.0◈	Tube Voltage Drop: 32 volts at 250 ma d-c				
12DQ6¶	Beam Power Amplifier	6AM	T-X	12.6	0.6	15	550⁑	175 2.5	15▲	7.0▲	0.55▲
12DQ6-A¶	Beam Power Amplifier	6AM	12–51	12.6	0.6	18◈	770◈⁑	220◈ 3.6◈	15▲	7.0▲	0.55▲
12DQ6-B¶	Beam-Power Amplifier	6AM	12–51	12.6	0.6	18◈	770◈	220◈ 3.6◈	15▲	7.0▲	0.5▲
12DQ7¶	Sharp-Cutoff Pentode	9BF	6–3	{12.6 {6.3	0.3} 0.6}	6.5◈	330◈	330◈⁑ 1.1◈	10.0▲	3.8▲	0.1▲ ♣
12DS7	Duplex-Diode Space-Charge-Grid Tetrode	9JU	6–3	12.6	0.4	—	16◈	—	— Diode Sections	—	—
12DS7-A	Duplex-Diode Space-Charge-Grid Tetrode	9JU	6–3	12.6	0.4	—	16◈	—	12.7▲ Diode Sections	2.2▲	13.8▲
12DT5¶	Beam Power Pentode	9HN	6–3	12.6	0.6	9.0◈	315◈	285◈ 2.0◈	12.5▲	4.9▲	0.57▲
12DT6	Sharp-Cutoff Pentode	7EN	5–2	12.6	0.15	1.7◈	330◈	330◈⁑ 1.1◈	— I_{c1} = 0.6 ma	—	—
12DT7	High-Mu Twin Triode	9A	6–2	12.6 6.3	0.15 0.3	1.0♠	300	—	1.6	0.46_1▲ 0.34_2▲	1.7▲
12DT8	High-Mu Twin Triode	9DE	6–2	12.6	0.15	2.5♠	300	—	2.7	1.6	1.6
12DU7	Duplex-Diode-Tetrode	9JX	6–2	12.6	0.250	—	16◈	16◈ —	11▲ Diode Sections	3.6▲	0.6▲
12DV7	Duplex-Diode-Triode	9JY	6–2	12.6	0.15	—	16◈	—	1.3▲ Diode Sections	0.38▲	1.6▲
12DV8	Duplex-Diode Space-Charge-Grid Tetrode	9HR	6–3	12.6	0.375	—	16◈	—	9.0▲ Diode Sections	1.0▲	12▲

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	110	110	7.5	49†	4.0†	14,000	7,500	—	2,500	1.9	*12DM5*¶
Class A Amplifier	100	—	1.0	0.5	—	80,000	1,250	100	—	—	*12DM7*
	250	—	2.0	1.2	—	62,500	1,600	100	—	—	
TV Damper	Max d-c output current◈ =175 ma; max peak inverse voltage◈ =5,500 volts; max peak current◈ =1,000 ma										12DQ4¶
Horizontal Amplifier	250	150	22.5	75	2.4	20,000	6,000	—	—	—	12DQ6¶
	60	150	0	300	27	—	—	—	—	—	
	Max positive pulse plate voltage▣ =6,000 volts; max screen dissipation = 2.5 watts; max d-c cathode current =120 ma										
Horizontal Amplifier	250	150	22.5	55	1.5	20,000	6,600	—	—	—	12DQ6-A¶
	60	150	0	315	25	—	—	—	—	—	
	Max positive pulse plate voltage◈ =6,000 volts; max screen dissipation◈ =3.6 watts; max d-c cathode current◈ =155 ma										
Horizontal Amplifier	250	150	22.5	65	1.8	18,000	7,300	—	—	—	12DQ6-B¶
	60	150	0	345	27	—	—	—	—	—	
	Max positive pulse plate voltage◈ =6,500; max d-c cathode current◈ =175 ma										
Class A Amplifier	200	125	R_k = 68	26	5.6	53,000	10,500	—	—	—	*12DQ7*¶
	40	125	0	45	16	—	—	—	—	—	
Class A Amplifier	12.6	—	E_{cc2} = 0	35	—	500	16,000	—	R_{g2} = 2.2 meg	—	*12DS7*
	E_{c1} =12.6 volts; I_{c1} =80 ma (Note: grid 1 is space-charge grid, grid 2 is control grid)										
AM Detector	Max d-c output current♠ ◈ =5.0 ma; voltage drop: ♠ ◈10 volts at 3 ma d-c										
Class A Amplifier	12.6	—	E_{cc2} =0	35	—	500	19,000	R_{g2} =2.2 meg			*12DS7-A*
	E_{c1} =12.6 volts; I_{c1} =75 ma (Note: grid 1 is space-charge grid, grid 2 is control grid)										
AM Detector	Max d-c output current♠ ◈ =5.0 ma; voltage drop:♠ ◈ 10 volts at 3 ma d-c										
Vertical Amplifier	250	250	16.5	44	1.5	—	6,200	—	—	—	*12DT5*¶
	80	250	0	195	19	—	—	—	—	—	
	Max positive pulse plate voltage▣ =2,200 volts; max d-c cathode current◈ =55 ma										
Class A Amplifier	150	100	R_k = 560	1.1	2.1	150,000	800	E_{c3} =0 volts		—	*12DT6*
FM Limiter Discriminator	250‡	100	R_k = 560	0.22	5.5	E_{c3} =—6.0 volts		—	270,000	—	
Class A Amplifier	250	—	2.0	1.2	—	62,500	1,600	100	—	—	*12DT7*
	100	—	1.0	0.5	—	80,000	1,250	100	—	—	
Class A Amplifier♠	250	—	R_k = 200	10	—	10,900	5,500	60	—	—	*12DT8*
	100	—	R_k = 270	3.7	—	15,000	4,000	60	—	—	
Class A Amplifier	12.6	12.6	E_{cc1} = 0	12	1.5	6,000	6,200	R_{g1} = 2.2 meg	2,700	0.025	*12DU7*
	Max d-c output current◈♠ =1 ma; voltage drop: ♠10 volts at 1.3 ma d-c										
Class A Amplifier	12.6	—	E_{cc1} = 0	0.04	—	19,000	750	14	R_{g1} =2.2 meg		*12DV7*
	Maximum d-c output current◈ ♠ =1 ma; voltage drop: ♠10 volts at 1.3 ma d-c										
Class A Amplifier	12.6	—	E_{cc2} = 0	9.0	—	900	8,500	—	—	—	*12DV8*
	E_{c1} =12.6 volts; R_k =18 ohms, I_{c1} =53 ma (Note: grid 1 is space-charge grid, grid 2 is control grid)										
Detector AVC	Max d-c output current◈ ♠ =5.0 ma; voltage drop:♠ 10 volts at 3.0 ma d-c										

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
12DW4-A ¶	Half-Wave, High-Vacuum Rectifier	9HP	T-X or 9–86	12.6	0.6	8.5◈	Tube Voltage Drop: 25 volts at 350 ma d-c				
12DW5¶	Beam Power Amplifier	9CK	6–4	12.6	0.6	11◈	330◈	220◈ 2.5◈	14▲	9.0▲	0.5▲
12DW7	Double Triode	9A	6–2	12.6 6.3	0.15 0.3	1.2◈ 3.3◈	330◈ 330◈	—	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3)		
12DW8	Diode Double Triode	9JC	6–2	12.6	0.45	0.5◈ 0.5◈	16◈ 16◈	— —	Section 1 (Pins 6, 7 8) Section 2 (Pins 1, 2, 3)		
12DY8	Triode-Tetrode	9JD	6–2	12.6	0.35	—	16◈ 16◈	16◈ — —	Tetrode Section Triode Section		
12DZ6	Remote-Cutoff RF Pentode	7BK	5–2	12.6	0.190	—	16◈	16◈ —	9.5▲	4.0▲	0.05▲♣
12DZ8	Triode-Pentode	9JE	T-X	12.0	0.45	6.5 0.75	150 150	135 1.5 —	Pentode Section Triode Section		
12E5-GT	Medium-Mu Triode	6Q	9–11	12.6	0.15	1.25	250	—	3.4	5.5	2.6
12EA6	Remote-Cutoff Pentode	7BK	5–2	12.6	0.190	—	16◈	16◈ —	11▲	4.0▲	0.04▲♣
12EC8	Triode-Pentode	9FA	6–2	12.6	0.225	—	16◈ 16◈	16◈ —	Pentode Section Triode Section		
12ED5¶	Beam Power Amplifier	7CV	5–3	12.6	0.45	6.25◈	150◈	150◈ 1.5◈	14▲	8.5▲	0.26▲
12EF6¶	Beam Power Amplifier	7S	9–13 or 9–42	12.6	0.45	10	250	250 2.0	11.5▲	9.0▲	0.8▲
12EG6	Dual-Control Heptode	7CH♥	5–2	12.6	0.15	—	30	30 —	—	—	—
12EH5¶	Power-Amplifier Pentode	7CV	5–3	12.6	0.6	5.5◈	150◈	130◈ 2.0◈	17▲	9▲	0.65▲
12EK6	Sharp-Cutoff RF Pentode	7BK	5–2	12.6	0.190	—	16◈	16◈ —	10▲	5.0▲	0.036▲♣
12EL6	Duplex-Diode High-Mu Triode	7FB	5–2	12.6	0.15	—	30	—	2.2▲ Diode Sections	1.0▲	1.8▲
12EM6	Diode-Tetrode	9HV	6–3	12.6	0.5	0.5	30	30 —	— Diode Section	—	—
12EN6¶	Beam Power Amplifier	7AC	9–11 or 9–41	12.6	0.6	7.0◈	300◈	150◈ 1.25◈	14▲	8.0▲	0.65▲
12EQ7	Diode-Pentode	9LQ	6–3	12.6	0.15	3.0◈	300◈	300◈ǂ 0.6◈	5.5▲ Diode Section	5.0▲	0.002▲♣
12EZ6	Sharp-Cutoff RF Pentode	7BK	5–2	12.6	0.175	—	30	30	7.8▲	5.5▲	0.008▲♣
12F5-GT	High-Mu Triode	5M	9–17	12.6	0.15	—	300	—	1.9	3.4	2.4
12F8	Duplex-Diode-Pentode	9FH	6–2	12.6	0.15	—	30	30	4.5▲ Diode Sections	3.0▲	0.06▲
12FA6	Pentagrid Converter	7CH♥	5–2	12.6	0.15	—	30	30 —	Osc. I_{c1} = 0.045 ma R_{g1} = 33,000 ohms		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ǂ Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
TV Damper	Max d-c output current ◈ =250 ma; max peak inverse voltage ◈ =5,500 volts; max peak current ◈ = 1,300 ma										12DW4-A¶
Vertical Amplifier	200	150	22.5	55	2.0	15,000	5,500	—	—	—	*12DW5¶*
	60	150	0	260	20	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =2,200; max d-c cathode current ◈ =65 ma										
Class A Amplifier	250	—	2.0	1.2	—	62,500	1,600	100	—	—	*12DW7*
	100	—	1.0	0.5	—	80,000	1,250	100	—	—	
Class A Amplifier	250	—	8.5	10.5	—	7,700	2,200	17	—	—	
	100	—	0	11.8	—	6,500	3,100	20	—	—	
Class A Amplifier	12.6	—	E_{cc} = 0	1.9	—	—	2,700	9.5	R_g =1.5 meg		*12DW8*
Class A Amplifier	12.6	—	E_{cc} = 0	7.5	—	—	6,500	6.4	R_g =1.0 meg		
	Average Diode current at 10 volts =20 ma										
Class A Amplifier	12.6	12.6	E_{cc1} = 0	14	2.0	5,000	6,000	R_{g1} =2.2 meg		—	*12DY8*
Class A Amp	12.6	—	0	1.2	—	10,000	2,000	20	—	—	
Class A Amplifier	12.6	12.6	E_{cc1} = 0	4.5	2.2	25,000	3,800	R_{g3} =10 megohms; R_{g1} =10 megohms			*12DZ6*
Class A Amplifier	145	120	R_k = 180	45†	6.0†	—	7,500	—	2,500	2.0	*12DZ8*
Class A Amplifier	120	—	R_k = 1500	0.8	—	—	1,400	100	—	—	
Class A Amp	250	—	13	5.0	—	9,500	1,450	13.8	—	—	12E5-GT
Class A Amplifier	12.6	12.6	E_{cc1} = 0	3.2	1.4	32,000	3,800	R_{g1} =10 megohms			*12EA6*
Class A Amplifier	12.6	12.6	0	0.66	0.28	750,000	2,000	—	—	—	*12EC8*
Class A Amp	12.6	—	0	2.4	—	6,000	4,700	25	—	—	
Class A Amplifier	125	125	4.5	37†	7.0†	14,000	8,500	—	4,500	1.5	*12ED5¶*
	110	110	4.0	32†	4.0†	14,000	8,100	—	4,500	1.1	
Vertical Amplifier	250	250	18	50	2.0	—	5,000	—	—	—	12EF6¶
	75	250	0	170	17	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =2,000; max d-c cathode current =60 ma										
Class A Amplifier	12.6	12.6	E_{cc1} = 0	0.4	2.4	150,000	800	—	—	—	*12EG6*
	R_{g1} =2.2 meg; grid 3 connected to grid 1 through 2.2 meg										
Class A Amplifier	110	115	R_k = 62	42†	11.5†	11,000	14,600	—	8,000	1.4	*12EH5¶*
Class A Amplifier	12.6	12.6	E_{cc1} = 0	4.0	1.7	50,000	4,200	R_{g1} =2.2 meg		—	*12EK6*
Class A Amp	12.6	—	0	0.75	—	45,000	1,200	55	—	—	*12EL6*
Detector	Max d-c output current ♠ =1.0 ma; voltage drop: ♠10 volts at 2 ma d-c										
Class A Amplifier	12.6	12.6	E_{cc1} = 0	6.0	1.0	4,000	5,000	R_{g1} =2.2 meg		—	*12EM6*
Detector	Max d-c output current =10 ma; voltage drop: 10 volts at 1 ma d-c										
Vertical Amplifier	200	110	9.5	50	2.2	28,000	8,000	—	—	—	12EN6¶
	50	110	0	135	18	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,200; max d-c cathode current ◈ =50 ma										
Class A Amplifier	100	100	E_{cc1} = 0	9.0	3.5	250,000	3,800	R_{g1} =2.2 meg		—	*12EQ7*
AM Det.	Max d-c output current ◈ =1 ma; voltage drop: 10 volts at 2.0 ma										
Class A Amplifier	12.6	12.6	E_{cc1} = 0	1.9	0.7	400,000	2,700	R_{g1} =2.2 meg		—	*12EZ6*
Class A Amp	250	—	2.0	0.9	—	66,000	1,500	100	—	—	12F5-GT
Class A Amp	12.6	12.6	0	1.0	0.38	330,000	1,000	—	—	—	*12F8*
AM Det.	Max d-c output current ♠ =1.0 ma; voltage drop ♠: 10 volts at 2.0 ma d-c										
Converter	12.6	12.6	E_{cc3} = 0	0.67	0.12	—	300#	—	—	—	*12FA6*

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
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♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Output	Grid-plate
12FK6	Duplex-Diode Triode	7BT	5–2	12.6	0.15	—	16	—	1.8▲	0.7▲	1.6▲
									Diode Sections		
12FM6	Duplex-Diode Triode	7BT	5–2	12.6	0.15	—	30	—	2.7▲	1.7▲	1.7▲
									Diode Sections		
12FQ7¶	Medium-Mu Twin Triode	9LP	6–3	12.6	0.3	4.0◈ ♠ 5.7◈ ⊕	330◈	—	2.4▲	0.34_1 ▲ 0.26_2 ▲	3.6_1 ▲ 3.8_2 ▲
12FQ8	Twin Double-Plate Triode	9KT	6–2	12.6	0.15	2.0	330◈	—	—	—	—
12FR8	Diode Triode-Pentode	9KU	6–10	12.6	0.32	— —	16 16	16 —	Pentode Section Triode Section Diode Section		
12FT6	Duplex-Diode Triode	7BT	5–2	12.6	0.15	—	30	—	1.8▲	1.1▲	2.0▲
									Diode Section		
12FV7	Medium-Mu Twin Triode	9A	6–3	12.6 6.3	0.45 0.9	2.5◈ ♠	330◈	—	0.6▲	5.5▲	6.0▲
12FX5¶	Power Amplifier Pentode	7CV	5–3	12.6	0.45	5.5◈	150◈	130◈ 2.0◈	17▲	9.0▲	0.65▲
12FX8	Triode-Heptode	9KV ♥	6–10	12.6	0.27	— —	16 16	16 —	Heptode Section Triode Section		
12FX8-A	Triode-Heptode	9KV ♥	6–10	12.6	0.27	—	16 16	16 —	Heptode Section Triode Section		
12FY8	Triode-Pentode	9EX	6–4	12.6	0.6	8.0◈ 1.0◈	150◈ 150◈	150◈ 2.0◈ —	Pentode Section Triode Section		
12G4	Medium-Mu Triode	6BG	5–3	12.6	0.15	2.5	300	—	2.6	3.2	3.4
12G8	Double Triode	9CZ	6–3	12.6	0.4	—	16 16	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3)		
12G11¶■	Dissimilar Double Pentode	12BU	9–58	12.6	0.6	6.5◈ 1.7◈	150◈ 330◈	135◈ 1.8◈ 330⁑◈ 1.1◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 4, 6, 7)		
12GA6	Heptode	7CH ♥	5–2	12.6	0.15	—	16◈	16◈	Osc. I_{c1} = 0.06 ma R_{g1} = 33,000 ohms		
12GC6¶	Beam-Power Amplifier	8JX	12–15	12.6	0.6	17.5◈	770◈⁑	220◈ 4.5◈	15▲	7.0▲	0.55▲
12GE5¶■	Beam Power Amplifier	12BJ	12–56	12.6	0.6	17.5◈	770⁑◈	220◈ 3.5◈	16▲	7.0▲	0.34▲
12GJ5¶	Beam Power Amplifier	9QK	T-X	12.6	0.6	17.5◈	770⁑◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
12GN7	Sharp-Cutoff Pentode	9BF	6–3	12.6 6.3	0.3 0.6	7.5◈	400◈	330⁑◈ 1.5◈	17.5▲	4.0▲	0.12▲
12GN7-A¶	Sharp-Cutoff Pentode	9BF	6–3	12.6 6.3	0.3 0.6	11.5◈	400◈	330⁑◈ 1.5◈	17.5▲	4.0▲	0.12▲

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	12.6	—	E_{cc} = 0	1.3	—	6,200	1,200	7.4	R_g = 2.2 meg		*12FK6*
AM Detector	Max d-c output current ♠ = 1 ma; voltage drop: ♠10 volts at 2 ma d-c										
Class A Amplifier	12.6	—	E_{cc} = 0	1.0	—	7,700	1,300	10	R_g = 2.2 meg		*12FM6*
Detector	Max d-c output current ♠ = 1 ma; voltage drop: ♠10 volts at 2 ma d-c										
Class A Amplifier ♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	*12FQ7*¶
	90	—	0	10	—	6,700	3,000	20	—	—	
Class A Amplifier	250	—	1.5	1.5	—	76,000	1,250	95	—	—	*12FQ8*
	(Values for each plate)										
Class A Amplifier	12.6	12.6	E_{cc1} = 0	1.9	0.7	400,000	2,700	—	R_{g1} = 2.2 meg		*12FR8*
Class A Amplifier	12.6	—	E_{cc} = 0	1.0	—	—	1,200	10	R_g = 2.2 meg		
AM Det.	Max d-c output current = 5.0 ma; voltage drop: 10 volts at 2.0 ma d-c										
Class A Amplifier	12.6	—	E_{cc} = 0	0.6	—	13,000	1,000	14	R_g = 2.2 meg		*12FT6*
AM Det.	Max d-c output current = 1.0 ma; voltage drop: 10 volts at 3.0 ma										
Class A Amplifier ♠	100	—	2.0	16	—	2,250	9,600	21.5	—	—	*12FV7*
Class A Amplifier	110	115	R_k = 62	36†	10†	17,500	13,500	—	3,000	1.3	*12FX5*¶
Converter	12.6	12.6	E_{cc3} = 0	0.29	1.25	500,000	—	—	R_{g3} = 2.2 meg		*12FX8*
Class A Amplifier	12.6	—	E_{cc} = 0	1.3	—	—	1,400	10	R_g = 2.2 meg		
Converter	12.6	12.6	E_{cc3} = 0	0.29	1.25	500,000	—	—	R_{g3} = 2.2 meg		*12FX8-A*
Class A Amplifier	12.6	—	E_{cc} = 0	1.3	—	—	1,400	10	R_g = 2.2 meg		
Class A Amplifier	125	125	13.5	50†	10†	—	7,500	—	2,000	2.7	*12FY8*
Class A Amp	125	—	1.5	2.5	—	—	2,000	—	—	—	
Class A Amplifier	90	—	0	10	—	6,700	3,000	20	—	—	*12G4*
	250	—	8.0	9.0	—	7,700	2,600	20	—	—	
Direct-Coupled Amplifier	12.6₁	—	0₁	3.0₁†	—	8,500	2,600	22	—	—	*12G8*
	12.6₂	—	—	7.2₂†	—	—	—	—	2,000	0.025	
	Characteristics given are with pin 7 connected directly to pin 3. Rp, Gm, and µ are measured with respect to the grid voltage of input section (section 1) and the plate current and plate voltage of output section (section 2).										
Class A Amplifier	120	110	8.0	49†	4.0†	10,000	7,500	—	2,500	2.3	12G11¶■
Class A Amplifier	150	100	R_k = 560	1.3	2.0	150,000	1,000	E_{c3} = 0 volts			
Converter	12.6	12.6	E_{cc1} = 0	0.3	0.8	1,000,000	140 #	E_{cc3} = 0 volts R_{g3} = 2.2 meg		—	*12GA6*
Horizontal Amplifier	250	150	22.5	75	2.4	20,000	6,600	—	—	—	12GC6¶
	60	150	0	345	30	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250	150	22.5	65	1.8	18,000	7,300	—	—	—	12GE5¶■
	60	150	0	345	27	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	—	—	—	12GJ5¶
	60	150	0	390	32	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Class A Amplifier	250	150	R_k = 56	28	6.5	50,000	36,000	—	—	—	*12GN7*
Class A Amplifier	250	150	R_k = 56	28	6.5	50,000	36,000	—	—	—	*12GN7-A*¶

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
12GT5¶	Beam Power Amplifier	9NZ	12–64	12.6	0.6	17.5 ◈	770◈§	220◈ 3.5◈	15▲	6.5▲	0.26▲
12GT5-A¶	Beam Power Amplifier	9NZ	12–95	12.6	0.6	17.5◈	770§◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
12GW6¶	Beam-Power Amplifier	6AM	12–51	12.6	0.6	17.5◈	770◈§	220◈ 3.5◈	17▲	7.0▲	0.5▲
12H4	Medium-Mu Triode	7DW	5–3	12.6 6.3	0.15 0.3	2.5	300	—	2.6	3.2	3.4
12H6	Twin Diode	7Q	8–5	12.6	0.15	—	Tube Voltage Drop:♦ 11 v at 16 ma d-c				
12HE7■	Diode-Pentode	12FS	12–57	12.6	1.35	10◈	500§◈	150◈ 3.5◈	Pentode Section		
						—	Tube Voltage Drop: 21 volts at 350 ma d-c		Diode Section		
12HG7	Sharp-Cutoff Pentode	9BF	9–70	{ 6.3 12.6	0.52 0.26 }	10◈	400◈	330§◈ 1.0◈	14▲	4.4▲	0.18♣▲
12HL5	Beam Power Amplifier	9QW	6–4	12.6	0.45	12◈	330◈	250◈ 2.5◈	—	—	—
12J5 12J5-GT	Medium-Mu Triode	6Q	8–1 9–11, 9–41	12.6	0.15	2.5	300	—	3.4 4.2	3.6 5.0	3.4 3.8
12J7-GT	Sharp-Cutoff Pentode	7R	9–18	12.6	0.15	0.75	300	300§ 0.1	Pentode Connected		
						1.75	250	—	Triode Connected (G_2, G_3 & P Tied)		
12J8	Duplex-Diode Tetrode	9GC	6–2	12.6	0.325	—	30	30	10.5▲	4.4▲	0.7▲
									Diode Sections		
12JB6¶	Beam Power Amplifier	9QL	12–70	12.6	0.6	17.5◈	770§◈	220◈ 3.5◈	15▲	6.0▲	0.2▲
12JB6-A¶	Beam Power Amplifier	9QL	T-X	12.6	0.6	17.5◈	770§◈	220◈ 3.5◈	15▲	6.0▲	0.2▲
12JF5¶ ■	Beam Power Amplifier	12JH	12–79	12.6	0.6	17.5◈	770§◈	220◈ 3.5◈	15.6▲	6.4▲	0.55▲
12JN6¶■	Beam Power Amplifier	12FK	12–56	12.6	0.6	17.5◈	770§◈	220◈ 3.5◈	16▲	7.0▲	0.34▲
12JN6-A¶ ■	Beam Power Amplifier	12FK	12–56	12.6	0.6	17.5◈	770§◈	220◈ 3.5◈	16▲	7.0▲	0.34▲
12JN8	Triode-Pentode	9FA	6–2	12.6	0.225	2.5◈	300◈	300§◈ 0.55◈	Pentode Section		
						2.5◈	300◈	—	Triode Section		
12JQ6¶	Beam Pentode with Integral Diode	9RA	6–4	12.6	0.6	10◈	425◈	330◈ 2.0◈	13▲	6.0▲	0.32▲
12JS6■	Beam Power Amplifier	12FY	12–89	12.6	1.125	28◈	◈ §066	190◈ 5.5◈	24▲	10▲	0.7▲

■Compactron.
† Zero signal.
♦Per section.
‡ Plate-to-plate.
♣Maximum.
§ Supply voltage.
◉Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	250 60	150 150	22.5 0	70 390	2.1 32	15,000 —	7,100 —	— —	— —	— —	12GT5¶
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current◈ =175 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	70 390	2.1 32	15,000 —	7,100 —	— —	— —	— —	12GT5-A¶
	Max positive pulse plate voltage ◈6,500; max d-c cathode current ◈= 175 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	70 390	2.1 32	15,000 —	7,100 —	— —	— —	— —	12GW6¶
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current◈ =175 ma										
Class A Amplifier	90 250	— —	0 8.0	10 9.0	— —	6,700 7,700	3,000 2,600	20 20	— —	— —	*12H4*
Half-Wave Rectifier	Max d-c output current per plate =8 ma; max peak inverse voltage =420; max rms supply voltage per plate =150; max peak current per plate =48 ma										**12H6**
Horizontal Amplifier	130 50	130 130	22 0	60 450	2.8 40	6,200 —	8,800 —	— —	— —	— —	12HE7■
	Max positive pulse plate voltage ◈ =5,000; max d-c cathode current ◈ = 230 ma										
TV Damper	Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ =4,200; max peak current ◈ = 1,200 ma										
Class A Amplifier	300	135	R_k = 47	31	4.8	60,000	32,000	(g3 connected to k at socket)			12HG7
Class A Amplifier	130	130	R_k = 56	70†	5.0†	7,500	17,000	—	2,000	3.0	*12HL5*
Class A Amplifier	90 250	— —	0 8.0	10 9.0	— —	6,700 7,700	3,000 2,600	20 20	— —	— —	**12J5** 12J5-GT
Class A Amplifier	250	100	3.0	2.0	0.5	1,000,000	1,225	—	—	—	12J7-GT
Class A Amplifier	250	—	8.0	6.5	—	10,500	1,900	20	—	—	
Class A Amplifier	12.6	12.6	E_{cc1} = 0	12†	1.5†	60,000	5,500	R_{g1} =2.2 meg			*12J8*
AM Det.	Max d-c output current ♦ =5.0 ma; voltage $drop_1$: 5.0 volts at 8.5 ma d-c; voltage $drop_2$: 5.0 volts at 12 ma d-c										
Horizontal Amplifier	250 60	150 150	22.5 0	70 390	2.1 32	15,000 —	7,100 —	(g3 connected to k at socket)			12JB6¶
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	70 390	2.1 32	15,000 —	7,100 —	(g3 connected to k at socket)			12JB6-A¶
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	65 345	1.8 27	18,000 —	7,300 —	— —	— —	— —	12JF5¶ ■
	Max positive pulse plate voltage ◈ = 6,500 volts; max d-c cathode current ◈ = 175 ma.										
Horizontal Amplifier	250 60	150 150	22.5 0	65 345	1.8 27	18,000 —	7,300 —	(b.p. connected to k at socket)			12JN6¶■
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250 55	150 150	22.5 0	70 345	2.4 30	15,000 —	7,300 —	(b.p. connected to k at socket)			12JN6-A¶■
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	12JN8
Class A Amplifier	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Vertical Amplifier	140 40	140 120	18 0	35 150	2.5 20	10,500 —	4,200 —	— —	— —	— —	*12JQ6*¶
	Max positive pulse plate voltage◈ =2,000; max d-c cathode current◈ =70 ma. Instantaneous diode-plate-to-cathode voltage drop for instantaneous diode-plate current of 2.0 ma =5.0 volts.										
Horizontal Amplifier	175 70	125 120	25 0	125 570	4.5 34	5,600 —	11,300 —	(b.p. connected to k at socket)			12JS6■
	Max positive pulse plate voltage ◈ =7,500; max d-c cathode current ◈= 315 ma										

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Out-put	Grid-plate
12JT6¶	Beam Power Amplifier	9QU	T-X	12.6	0.6	17.5◈	770⁑◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
12JT6-A¶	Beam Power Amplifier	9QU	12–95	12.6	0.6	17.5◈	770⁑◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
12K5	Space-Charge-Grid Tetrode	7FD	5–3	12.6	0.4	—	30	—	23.0▲	1.8▲	11.0▲
12K7-GT	Remote-Cutoff RF Pentode	7R	9–18	12.6	0.15	2.75	300	300⁑ 0.35	4.6	12.0	0.005 ♣
12K8 12K8-GT	Triode Hexode Converter	8K♥	8–2 9–24	12.6	0.15	0.75 ♠	300	300⁑ 0.7	Osc I_{c1} = 0.15 ma R_{g1} = 50,000 ohms		
12KL8¶	Diode-Pentode	9LQ	6–3	12.6	0.15	3.0◈	330◈	330⁑◈ 0.6◈	Pentode Section Diode Section		
12L6–GT¶	Beam Power Amplifier	7AC	9–11 or 9–41	12.6	0.6	10	200	125 1.25	15▲	10▲	0.8▲
12L8-GT	Twin-Pentode Power Amplifier	8BU	9–11	12.6	0.15	2.5♠	180	180 1.0	5.0▲	6.0▲	0.7▲
12MD8¶	Triple Triode	9RQ	T-X	12.6	0.45	3.0◈ ♠	330◈	—	—	—	—
12Q7-GT	Duplex-Diode High-Mu Triode	7V	9–18	12.6	0.15	—	300	—	2.2	5.0	1.6
12R5¶	Beam Power Amplifier	7CV	5–3	12.6	0.6	4.5	150	150 1.0	13▲	9.0▲	0.55▲
12S8-GT	Triple-Diode High-Mu Triode	8CB	9–23	12.6	0.15	0.5	300	—	1.2	5.0	2.0
12SA7 12SA7-GT	Pentagrid Converter	8R♥ 8AD♥	8–1 9–11, 9–41	12.6	0.15	1.0	300	100 1.0	Osc I_{c1} = 0.5 ma R_{g1} = 20,000 ohms		
12SC7	High-Mu Twin Triode	8S	8–1	12.6	0.15	—	250	—	—	—	—
12SF5 12SF5-GT	High-Mu Triode	6AB	8–1 9–11	12.6	0.15	—	300	— —	4.0 —	3.6 —	2.4 —
12SF7 12SF7-GT	Diode Remote-Cutoff Pentode	7AZ	8–1 9–18	12.6	0.15	3.5	300	300⁑ 0.5	5.5 5.5	6.0 6.0	0.004♣ 0.004♣
12SG7	Semi-Remote-Cutoff RF Pentode	8BK	8–1	12.6	0.15	3.0	300	300⁑ 0.6	8.5	7.0	0.003♣
12SH7	Sharp-Cutoff RF Pentode	8BK	8–1	12.6	0.15	3.0	300	300⁑ 0.7	8.5	7.0	0.0035 ♣
12SJ7 12SJ7-GT	Sharp-Cutoff Pentode	8N	8–1 9–12	12.6	0.15	2.5 2.5	300 250	300⁑ 0.7 —	Pentode Connection Triode Connection (G_2, G_3 & P tied)		
12SK7 12SK7-GT	Remote-Cutoff RF Pentode	8N	8–1 9–11	12.6	0.15	4.0	300	300⁑ 0.4	6.0 6.5	7.0 7.5	0.003♣ 0.005♣
12SL7-GT	High-Mu Twin Triode	8BD	9–11	12.6	0.15	1.0♠	300	—	—	—	—
12SN7-GT	Medium-Mu Twin Triode	8BD	9–11, 9–41	12.6	0.3	3.5♠ 5.0⊕	300	—	2.8_1▲ 3.0_2▲	0.8_1▲ 1.2_2▲	3.8_1▲ 4.0_2▲

■Compactron.
† Zero signal.
♠Per section.
‡ Plate-to-plate.
♣Maximum.
⁑Supply voltage.
◉Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
⊡Absolute maximum rating.
#Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	250 60	150 150	22.5 0	70 390	2.1 32	15,000 —	7,100 —	(g3 connected to k at socket)			12JT6¶
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	70 390	2.1 32	15,000 —	7,100 —	(g3 connected to k at socket)			12JT6-A¶
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Class A Amplifier	12.6	—	E_{cc2} =0	40	—	480	15,000	—	R_{g2} =2.2 meg		*12K5*
	E_{c1} =12.6 volts; I_{c1} =75 ma (Note: grid number 1 is space-charge grid, grid number 2 is control grid)										
Class A Amplifier	250	125	3.0	10.5	2.6	600,000	1,650	—	—	—	12K7-GT
Converter	250	100	3.0	2.5	6.0	600,000	350 #	E_b(Triode Osc) = 100 I_b (Triode) =3.8 ma			**12K8** 12K8-GT
Class A Amplifier Detector	100	100	E_{cc1} = 0	5.5	2.2	550,000	4,300	R_{g1} =2.2 megohms			*12KL8*¶
	Max d-c output current ◈ =1.0 ma										
Class A Amplifier	200 110	125 110	R_k = 180 7.5	46† 49†	2.2† 4.0†	28,000 13,000	8,000 8,000	— —	4,000 2,000	3.8 2.1	12L6-GT¶
Class A Amplifier♠	180	180	9.0	13†	2.8†	160,000	2,150	—	10,000	1.0	12L8-GT
Class A Amplifier ♠	250	—	10.5	11.5	—	5,500	3,100	17	—	—	12MD8¶
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	12Q7-GT
Vertical Amplifier	110 45	110 110	8.5 0	40 120	3.3 17	13,000 —	7,000 —	— —	— —	— —	*12R5*¶
	Max positive pulse plate voltage ■ =1,500 volts; max screen dissipation = 1.0 watt; max d-c cathode current =45 ma										
Class A Amplifier	250	—	2.0	0.9	—	91,000	1,100	100	—	—	12S8-GT
Converter	250 100	100 100	2.0 2.0	3.5 3.3	8.5 8.5	1,000,000 500,000	450 # 425 #	— —	— —	— —	**12SA7** 12SA7-GT
Class A Amplifier ♠	250	—	2.0	2.0	—	53,000	1,325	70	—	—	**12SC7**
Class A Amplifier	250	—	2.0	0.9	—	66,000	1,500	100	—	—	**12SF5** 12SF5-GT
Class A Amplifier	250 100	100 100	1.0 1.0	12.4 12	3.3 3.4	700,000 200,000	2,050 1,975	— —	— —	— —	**12SF7** 12SF7-GT
Class A Amplifier	250 250 100	150 125 100	2.5 1.0 1.0	9.2 11.8 8.2	3.4 4.4 3.2	1,000,000 900,000 250,000	4,000 4,700 4,100	— — —	— — —	— — —	**12SG7**
Class A Amplifier	250	150	1.0	10.8	4.1	900,000	4,900	—	—	—	**12SH7**
Class A Amplifier	250	100	3.0	3.0	0.8	1,000,000	1,650	—	—	—	**12SJ7**
Class A Amplifier	250	—	8.5	9.2	—	7,600	2,500	19	—	—	12SJ7-GT
Class A Amplifier	250 100	100 100	3.0 1.0	9.2 13	2.6 4.0	800,000 120,000	2,000 2,350	— —	— —	— —	**12SK7** 12SK7-GT
Class A Amplifier ♠	250	—	2.0	2.3	—	44,000	1,600	70	—	—	12SL7-GT
Class A Amplifier ♠	250 90	— —	8.0 0	9.0 10	— —	7,700 6,700	2,600 3,000	20 20	— —	— —	12SN7-GT

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
❋Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Output	Grid-plate
12SN7-GTA	Medium-Mu Twin Triode	8BD	9–11, 9–41	12.6	0.3	5.0♠ 7.5⊕	450	—	2.2_1▲ 2.6_2▲	0.7▲	4.0_1▲ 3.8_2▲
12SQ7 12SQ7-GT	Duplex-Diode High-Mu Triode	8Q	8–1 9–12	12.6	0.15	0.5	300	—	3.2 4.2▲	3.0 3.4▲	1.6 1.8▲
12SR7 12SR7-GT	Duplex-Diode Medium-Mu Triode	8Q	8–1 9–11	12.6	0.15	2.5	250	—	3.6 3.5	2.8 3.8	2.4 2.3
12SW7	Duplex-Diode Medium-Mu Triode	8Q	8–1	12.6	0.15	2.5	250	—	3.0	2.8	2.4
12SX7-GT	Medium-Mu Twin Triode	8BD	9–11	12.6	0.3	2.5♠	300	—	3.0_1 2.8_2	0.8_1 1.2_2	3.6
12SY7 12SY7-GT	Pentagrid Converter	8R♥ 8AD♥	8–1 9–12	12.6	0.15	—	300	100 1.0	Osc I_{c1} = 0.5 ma R_{g1} = 20,000 ohms Osc I_{c1} = 0.1 ma R_{g1} = 20,000 ohms		
12T10¶■	Dissimilar Double Pentode	12EZ	9–59	12.6	0.45	10◈ 1.7◈	275◈ 330◈	275◈ 2.0◈ 330ǂ◈ 1.1◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 5, 6, 7)		
12U7	Twin Triode	9A	6–2	12.6	0.15	—	30	—	1.8	2.0	1.5
12V6-GT	Beam Power Amplifier	7AC	9–11 or 9–41	12.6	0.225	12	315	285 2.0	Single Tube 2 Tubes, Push-Pull		
12W6-GT¶	Beam Power Amplifier	7AC	9–11 or 9–41	12.6	0.6	12◈ 8.5◈	330◈ 330◈	165◈ 1.35◈ —	Pentode Connection Triode Connection (G_2 & P tied)		
12X4	Full-Wave High-Vacuum Rectifier	5BS	5–3	12.6	0.3	—	Tube Voltage Drop:♠ 22 v at 70 ma d-c				
12Z3	Half-Wave High-Vacuum Rectifier	4G	12–5	12.6	0.3	—	Tube Voltage Drop: 17 v at 110 ma d-c				
13CW4	High-Mu Triode (Nuvistor)	12AQ	4–4	13.5	0.06	1.5◈	135◈	—	4.3▲	1.8▲	0.92▲
13DE7¶	Double Triode	9HF	6–3	13.0	0.45	1.5◈ 7.0◈	330◈ 275◈	— —	Section 1 (Pins 6, 7 8) Section 2 (Pins 1, 2, 3, 9)		
13DR7¶	Double Triode	9HF	6–3	13.0	0.45	1.0◈ 7.0◈	330◈ 275◈	— —	Section 1 (Pins 6, 7 8) Section 2 (Pins 1, 2, 3, 9)		
13EM7¶	Double Triode	8BD	9–37	13.0	0.45	1.5◈ 10◈	330◈ 330◈	— —	Section 1 (Pins 4, 5, 6) Section 2 (Pins 1, 2, 3)		
13FD7¶	Double Triode	9HF	9–77	13.0	0.45	1.5◈ 10◈	330◈ 330◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3, 9)		

■Compactron. ‡ Plate-to-plate. ⊛Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ǂ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier ♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	12SN7-GTA
	90	—	0	10	—	6,700	3,000	20	—	—	
Vertical Amplifier ♠	Max positive pulse plate voltage ▣ =1,500; max d-c cathode current =20 ma										
Class A Amplifier	250	—	2.0	1.1	—	85,000	1,175	100	—	—	**12SQ7**
	100	—	1.0	0.5	—	110,000	925	100	—	—	12SQ7-GT
Class A Amplifier	250	—	9.0	9.5†	—	8,500	1,900	16	10,000	0.3	**12SR7** 12SR7-GT
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	—	—	**12SW7**
	26.5	—	R_g = 2 meg	1.1	—	15,500	1,100	17	—	—	
Class A Amplifier ♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	12SX7-GT
	26.5	—	R_g = .05 meg	1.8	—	11,500	1,800	21	—	—	
Converter	250	100	2.0	3.5	8.5	1,000,000	450 #	—	—	—	**12SY7**
Converter	28	28	1.0	0.5	1.8	—	250 #	—	—	—	12SY7-GT
Class A Amplifier	250	250	8.0	35†	2.5†	100,000	6,500	—	5,000	4.2	12T10¶■
Class A Amplifier	150	100	R_k = 560	1.3	2.1	150,000	1,000	(E_{c3} = 0 volts)			
Class A Amplifier ♠	12.6	—	0	1.0	—	12,500	1,600	20	—	—	*12U7*
Class A Amplifier	315	225	13	34†	2.2†	80,000	3,750	—	8,500	5.5	12V6-GT
	250	250	12.5	45†	4.5†	50,000	4,100	—	5,000	4.5	
	180	180	8.5	29†	3.0†	50,000	3,700	—	5,500	2.0	
Class AB₁ Amplifier	285	285	19	70†	4.0†	70,000	3,600	—	8,000‡	14	
	250	250	15	70†	5.0†	60,000	3,750	—	10,000‡	10	
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	12W6-GT¶
	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
Vertical Amplifier	225	—	30	22	—	1,600	3,800	6.2	—	—	
	Max positive pulse plate voltage ◈ =1,200; max d-c cathode current ◈ =65 ma										
Full-Wave Rectifier	Max d-c output current =90 ma; max peak inverse voltage =1,250; rms supply voltage per plate =360; max peak current per plate =245 ma										*12X4*
Half-Wave Rectifier	Max d-c output current =55 ma; max peak inverse voltage =700 volts; max rms supply voltage =235 volts; max peak current =330 ma										12Z3
Class A Amplifier	110	—	R_k = 130	7.0	—	6,600	9,800	65	—	—	13CW4
Vertical Oscillator	250	—	11	5.5	—	8,750	2,000	17.5	—	—	*13DE7*¶
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	17.5	35	—	925	6,500	6.0	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =4,000; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	68	—	—	*13DR7*¶
	Max d-c cathode current ◈ =20 ma										
Vertical Amplifier	150	—	17.5	35	—	925	6,500	6.0	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =1,500; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	13EM7¶
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20	50	—	750	7,200	5.4	—	—	
	Max positive pulse plate voltage ▣ =1,500; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	13FD7¶
	Max d-c cathode current ◈ =20 ma										
Vertical Amplifier	150	—	17.5	40	—	800	7,500	6.0	—	—	
	Max positive pulse plate voltage ◈1,500; max d-c cathode current ◈ =50 ma										

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
13FM7¶■	Dissimilar Double Triode	12EJ	9–58	13	0.45	1.0◈ 10◈	350◈ 550◈	— —	Section 1 (Pins 9, 10, 11) Section 2 (Pins 3, 5, 7, 8)		
13FR7¶	Double Triode	9HF	9–70	13.0	0.45	1.5◈ 10◈	330◈ 330◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3, 9)		
13GB5	Beam Power Amplifier	9NH	T-X	13.3	0.6	17◈	275◈	275◈ 6.0◈	—	—	—
13GF7¶	Dissimilar Double Triode	9QD	T-X	13	0.45	1.5◈ 11◈	330◈ 330◈	— —	Section 1 (Pins 1, 8, 9) Section 2 (Pins 2, 3, 6)		
13GF7-A¶	Dissimilar Double Triode	9QD	9–107	13	0.45	1.5◈ 11◈	330◈ 330◈	— —	Section 1 (Pins 1, 8, 9) Section 2 (Pins 2, 3, 6)		
13J10¶■	Pentode Gated-Beam Discriminator	12BT	9–58	13.2	0.45	10◈ —	275◈ 330◈	275◈ 2.0◈ 110◈ —	Pentode Section (Pins 2, 3, 9, 11) Gated-Beam Discriminator (Pins 4, 5, 6, 7, 8)		
13JZ8¶■	Triode-Pentode	12DZ	9–58	12.7	0.6	7.0◈ 1.0◈	250◈ 250◈	200◈ 1.8◈ —	Pentode Section Triode Section		
13JZ8-A¶■	Triode-Pentode	12DZ	9–98	12.7	0.6	10◈ 1.0◈	250◈ 250◈	200◈ 1.8◈ —	Pentode Section Triode Section		
13V10¶■	Dissimilar Double Pentode	12EZ	9–59	13.2	0.45	6.5◈ 1.7◈	165◈ 330◈	150◈ 1.8◈ 330**‡**◈ 1.1◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 5, 6, 7)		
13Z10¶■	Pentode—Gated-Beam Discriminator	12BT	9–58	13.2	0.45	10◈ —	275◈ 330**‡**◈	275◈ 2.0◈ 330**‡**◈	Pentode Section (Pins 2. 3, 9, 11) Gated-Beam Discriminator (Pins 4, 5, 6, 7, 8)		
14A4	Medium-Mu Triode	5AC	9–30	12.6	0.15	2.5	300	—	3.4	3.0	4.0
14A5	Beam Power Amplifier	6AA	9–30	12.6	0.15	7.5	250	250 1.5	—	—	—
14A7/12B7	Remote-Cutoff Pentode	8V	9–30	12.6	0.15	4.0	300	125 0.4	6.0	7.0	0.005 ♣
14AF7/-XXD	Medium-Mu Twin Triode	8AC	9–30	12.6	0.15	2.5♠	300	—	2.2	1.6	2.3
14B6	Duplex-Diode High-Mu Triode	8W	9–30	12.6	0.15	0.5	300	—	—	—	—
14B8	Pentagrid Converter	8X♦	9–30	12.6	0.15	1.0	300	100 0.3	Osc $I_{c1} = 0.4$ ma $R_{g1} = 50{,}000$ ohms		
14BL11¶■	Dissimilar-Double-Triode Pentode	12GC	9–58	14.2	0.45	2.5◈ 1.5◈ 2.0◈	250◈ 330◈ 300◈	125◈ 1.25◈ — —	Pentode Section Triode Section 1 (Pins 5, 6, 7) Triode Section 2 (Pins 3, 4, 9)		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. **‡** Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ⊠Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Vertical Oscillator	250	—	3.0	2.0	—	30,000	2,200	66	—	—	13FM7¶■
	Max peak negative grid voltage ◈ =400 volts										
Vertical Amplifier	175	—	25	40	—	920	6,000	5.5	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	68	—	—	13FR7¶
	Max peak negative grid voltage ◈ =400; max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20	50	—	750	7,200	5.4	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current =50 ma										
Horizontal Amplifier	75	200	10	440	37	(Instantaneous Values)					13GB5
	Max positive pulse plate voltage ◈ =7,700; max d-c cathode current ◈ =275 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	13GF7¶
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20	50	—	750	7,200	5.4	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	13GF7-A¶
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	20	50	—	750	7,200	5.4	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ = 50 ma										
Class A Amplifier	250	250	8.0	35†	2.5†	100,000	6,500	—	5,000	4.2	13J10¶■
FM Limiter-Discriminator	285‡	100	R_k = 200 to 400	0.49	9.8	—	—	—	330000	—	
	E_{c1} =1.25 volts RMS										
Vertical Amplifier	120	110	8.0	46	3.5	11,700	7,100	—	—	—	13JZ8¶■
	45	110	0	122	16.5	—	—	—	—	—	
	Max positive pulse plate voltage◈ =2,000; max d-c cathode current◈ =70 ma										
Vertical Oscillator	150	—	5.0	5.5	—	8,500	2,350	20	—	—	
	Max d-c cathode current◈ =20 ma										
Vertical Amplifier	120	110	8.0	46	3.5	11,700	7,100	—	—	—	13JZ8-A¶■
	45	110	0	122	16.5	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,000 volts; max d-c cathode current ◈ = 70 ma.										
Vertical Oscillator	150	—	5.0	5.5	—	8,500	2,350	20	—	—	
	Max d-c cathode current ◈ = 20 ma.										
Class A Amplifier	145	125	6.0	34†	2.2†	58,000	6,400	—	3,000	1.5	13V10¶■
Class A Amplifier	150	100	R_k = 560	1.3	2.0	150,000	1,000	(E_{c3} = 0 volts)			
Class A Amplifier	250	250	8.0	35†	3.0†	100,000	6,500	—	5,000	4.2	13Z10¶■
FM Limiter-Discriminator	135	280‡	—	5.0	(R_{g2} =33,000 ohms) (E_{c3} = +4.0 volts)						
Class A Amplifier	250	—	8.0	9.0	—	7,700	2,600	20	—	—	14A4
	90	—	0	10	—	6,700	3,000	20	—	—	
Class A Amplifier	250	250	12.5	30†	3.5†	70,000	3,000	—	7,500	2.8	14A5
Class A Amplifier	250	100	3.0	9.2	2.6	800,000	2,000	—	—	—	14A7/12B7
Class A Amplifier ♠	250	—	10	9.0	—	7,600	2,100	16	—	—	14AF7/-XXD
Class A Amplifier	250	—	2.0	0.9	—	91,000	1,100	100	—	—	14B6
	100	—	1.0	0.4	—	110,000	900	100	—	—	
Converter	250	100	3.0	3.5	2.7	360,000	550 #	E_{c2} (Osc Plate) =250 thru 20,000 ohms I_{c2} =4.0 ma			14B8
Class A Amplifier	200	100	R_k = 82	16	3.0	70,000	19,000	—	—	—	14BL11¶■
	35	100	0	40	13	—	—	—	—	—	
Class A Amplifier	200	—	R_k = 270	7.1	—	12,500	5,500	69	—	—	
Class A Amplifier	200	—	R_k = 470	7.2	—	7,600	5,300	40	—	—	

Metal tubes are shown in bold-face type, ***miniature tubes in italics.***
♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
♣ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
14BR11¶ ■	Dissimilar-Double-Triode Pentode	12GL	9-59	14.2	0.45	4.0 ◈ 1.5 ◈ 2.0 ◈	330 ◈ 330 ◈ 330 ◈	330ǂ ◈ 1.1 ◈ — —	Pentode Section Triode Section 1 (Pins 7, 9, 10) Triode Section 2 (Pins 5, 6, 8)		
14C5	Beam Power Amplifier	6AA	9-31	12.6	0.225	12	315	285 2.0	—	—	—
14C7	Sharp-Cutoff Pentode	8V	9-30	12.6	0.15	1.0	300	100 0.1	6.0	6.5	0.007 ♣
14E6	Duplex-Diode High-Mu Triode	8W	9-30	12.6	0.15	2.5	250	—	—	—	—
14E7	Duplex-Diode Remote-Cutoff Pentode	8AE	9-30	12.6	0.15	2.0	250	100 0.3	4.6	5.3	0.005 ♣
14F7	High-Mu Twin Triode	8AC	9-30	12.6	0.15	1.0 ♠	250	—	—	—	—
14F8	High-Frequency Twin Triode	8BW	9-32	12.6	0.15	3.5 ♠ 3.5 ⊕	300	—	2.8	1.4	1.6
14GT8 *14GT8-A* ¶	Duplex-Diode Triode	9KR	6-2	14.0	0.15	1.1 ◈	330 ◈	—	1.6 ▲ Diode Section	0.24 ▲	1.8 ▲
14H7	Semi-Remote-Cutoff RF Pentode	8V	9-30	12.6	0.15	2.5	300	300ǂ 0.5	8.0	7.0	0.004 ♣
14J7	Triode-Heptode Converter	8BL	9-30	12.6	0.15	0.5 1.25	300 150	100 0.4 —	Osc I_{c1} = 0.4 ma R_{g1} = 50,000 ohms Triode Section		
14JG8	Duplex-Diode Triode	9KR	6-2	14.0	0.15	1.1 ◈	330 ◈	—	1.8 ▲ Diode Sections	0.22 ▲	1.7 ▲
14N7	Medium-Mu Twin Triode	8AC	9-31	12.6	0.3	2.5 ♠	300	—	—	—	—
14Q7	Pentagrid Converter	8AL ♥	9-30	12.6	0.15	1.0	300	100 1.0	Osc I_{c1} = 0.5 ma R_{g1} = 20,000 ohms		
14R7	Duplex-Diode Remote-Cutoff Pentode	8AE	9-30	12.6	0.15	2.0	250	250ǂ 0.25	5.6	5.3	0.004 ♣
14S7	Triode-Heptode Converter	8BL	9-30	12.6	0.15	0.6 1.0	300 175	100 0.4	Osc I_{c1} = 0.4 ma R_{g1} = 50,000 ohms Triode Section		
14W7	Sharp-Cutoff RF Pentode	8BJ	9-30	12.6	0.225	—	300	150 0.8	—	—	—
14X7	Duplex-Diode High-Mu Triode	8BZ	9-31	12.6	0.15	—	300	—	—	—	—
14Y4	Full-Wave High-Vacuum Rectifier	5AB	9-30	12.6	0.3	—	Tube Voltage Drop: ♣ 22 v at 70 ma d-c				
15	Sharp-Cutoff RF Pentode	5F	12-6	2.0 DC	0.22	—	135	67.5	2.35 ▲	7.80 ▲	0.01
15A8¶	Triode-Pentode	8GS	9-49	15.0	0.6	10 2.5 7.5	300 300	150 1.25 Pentode Section-Triode Connection G and P tied	Pentode Section Triode Section		
15AB9	Twin Tetrode	10N	T-X	15.0	0.15	2.0 ◈ ♠	250 ◈	180ǂ ◈ 0.5 ◈	5.7	2.7	0.055 ♣
15AF11¶ ■	Dissimilar-Double Triode Pentode	12DP	9-58	14.7	0.45	5.0 ◈ 1.1 ◈ 2.0 ◈	330 ◈ 330 ◈ 330 ◈	330ǂ ◈ 1.25 ◈ —	Pentode Section Triode Section 1 (Pins 5, 6, 8) Triode Section 2 (Pins 3, 4, 7)		

■ Compactron. ‡ Plate-to-plate. ⊛ Subminiature type. ⊕ Total for all similar sections.
† Zero signal. ♣ Maximum. ▲ Without external shield. ▣ Absolute maximum rating.
♠ Per section. ǂ Supply voltage. ◈ Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Avg. Char.	135	135	R_k = 100	17	4.0	45,000	10,400	—	—	—	14BR11¶■
	35	135	0	34	13	—	—	—	—	—	
Class A Amplifier	200	—	2.0	7.0	—	12,400	5,500	68	—	—	
Class A Amplifier	200	—	R_k = 220	9.2	—	9,400	4,400	41	—	—	
Class A Amplifier	315	225	13	34†	2.2†	77,000	3,750	—	8,500	5.5	14C5
Class A Amplifier	250	100	3.0	2.2	0.7	1,0000,00	1,575	—	—	—	14C7
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	—	—	14E6
Class A Amplifier	250	100	3.0	7.5	1.6	700,000	1,300	—	—	—	14E7
Class A Amplifier ♠	250	—	2.0	2.3	—	44,000	1,600	70	—	—	14F7
Class A Amplifier ♠	250	—	R_k = 500	6.0	—	—	3,300	48	—	—	14F8
Class A Amplifier	250	—	3.0	0.7	—	72,000	1,000	72	—	—	*14GT8*
FM Det.	Mac d-c output current ◈♠ =5.0 ma; voltage drop ♠: 5.0 volts at 18 ma										*14GT8-A*¶
Class A Amplifier	250	150	R_k = 180	10	3.2	800,000	4,000	—	—	—	14H7
	100	100	1.5	7.5	2.6	350,000	4,000	—	—	—	
Converter	250	100	3.0	1.4	2.8	1,500,000	290 #	E_b (Triode Osc) = 250 thru 20,000 ohms I_b (Triode) =5.0 ma			14J7
Class A Amplifier	250	—	2.0	2.0	—	41,000	2,200	90	—	—	*14JG8*
FM Detector	Max. d-c output current ♠ =5.0 ma; voltage drop ♠: 5 volts at 20 ma										
Class A Amplifier ♠	250	—	8.0	9.0	—	7,700	2,600	20	—	—	14N7
Converter	250	100	2.0	3.5	8.5	1,000,000	550 #	—	—	—	14Q7
Class A Amplifier	250	100	1.0	5.7	2.1	1,000,000	3,200	—	—	—	14R7
	100	100	1.0	5.5	2.2	350,000	3,000	—	—	—	
Converter	250	100	2.0	1.8	3.0	1,250,000	525 #	E_b (Triode Osc) = 250 thru 20,000 ohms I_b (Triode) =5.0 ma			14S7
Class A Amplifier	300	150	R_k = 160	10	3.9	300,000	5,800	—	—	—	14W7
Class A Amplifier	250	—	1.0	1.9	—	67,000	1,500	100	—	—	14X7
Full-Wave Rectifier	Max d-c output current =70 ma; max peak inverse voltage =1250 volts; max rms supply voltage per plate =325 volts; max peak current per plate =210 ma										14Y4
Class A Amplifier	135	67.5	1.5	1.85	0.3	800,000	750	—	—	—	15
Class A Amplifier	110	110	7.5	45	4.0	13,000	7,300	—	—	—	15A8¶
	250	—	8.0	9.0	—	7,700	2,600	20	—	—	
Vertical Amplifier	225	—	30	25	—	1,600	3,800	6.0	—	—	
	Max positive pulse plate voltage ▣ =1,200; max d-c cathode current =40 ma										
Class A Amplifier ♠	125	80	1.0	8.0	2.0	110,000	10,000	—	—	—	*15AB9*
Class A Amplifier	200	150	R_k = 100	24	4.8	68,000	11,000	—	—	—	15AF11¶■
Class A Amp	200	—	2.0	7.0	—	12,400	5,500	68	—	—	
Class A Amplifier	200	—	R_k = 220	9.2	—	9,400	4,400	41	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✠Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
15BD11¶ ■	Dissimilar-Double-Triode Pentode	12DP	9–58	14.7	0.45	4.0◈	330◈	330⁑◈ 1.1◈	Pentode Section		
						1.5◈	330◈	—	Triode Section 1 (Pins 5, 6, 8)		
						2.0◈	330◈	—	Triode Section 2 (Pins 3, 4, 7)		
15BD11-A ¶■	Dissimilar-Double-Triode Pentode	12DP	9–58	14.7	0.45	4.0◈	330◈	330⁑◈ 1.5◈	Pentode Section		
						1.5◈	330◈	—	Triode Section 1 (Pins 5, 6, 8)		
						2.0◈	330◈	—	Triode Section 2 (Pins 3, 4, 7)		
15CW5	Power Amplifier Pentode	9CV	6–4	15	0.3	14◈	275◈	220◈ 2.1◈	11.8▲	6.0▲	0.6♣ ▲
15DQ8	Triode-Pentode	9HX	6–3	15	0.3	4.0	250	250 1.7	Pentode Section		
						1.0	250	—	Triode Section		
15EA7¶	Double Triode	8BD	9–5	14.8	0.45	1.0◈	350◈	—	Section 1 (Pins 4, 5, 6)		
						10◈	550◈	—	Section 2 (Pins 1, 2, 3)		
15EW6	Sharp-Cutoff RF Pentode	7CM	5–2	15.0	0.15	3.1◈	330◈	330◈⁑ 0.65◈	10	3.4	0.03♣
15EW7¶	Dissimilar Double Triode	9HF	9–70	14.8	0.45	1.5◈	330◈	—	Section 1 (Pins 6, 7, 8)		
						10◈	330◈	—	Section 2 (Pins 1, 2, 3, 9)		
15FM7¶■	Dissimilar Double Triode	12EJ	9–58	14.8	0.45	1.0◈	350◈	—	Section 1 (Pins 9, 10, 11)		
						10◈	550◈	—	Section 2 (Pins 3, 5, 7, 8)		
15FY7¶■	Dissimilar Double Triode	12EO	9–60	14.7	0.45	1.0◈	330◈	—	Section 1 (Pins 9, 10, 11)		
						7.0◈	275◈	—	Section 2 (Pins 3, 5, 7)		
15HA6	Pentode	9NW	6–4	15	0.3	8.0◈	300◈	250◈ 1.5◈	13▲	8.0▲	0.18▲
15HB6¶	Power Amplifier Pentode	9NW	6–4	14.7	0.3	10◈	350◈	300◈ 2.0◈	13▲	8.0▲	0.18▲
15KY8¶	Triode-Pentode	9QT	T-X	15	0.45	12◈	300◈	150◈ 1.9◈	Pentode Section		
						1.5◈	330◈	—	Triode Section		
15KY8-A¶	Triode-Pentode	9QT	9–107	15	0.45	12◈	300◈	150◈ 1.9◈	Pentode Section		
						1.5◈	330◈	—	Triode Section		
15LE8¶	Twin Pentode	9QZ	6–4	15	0.3	2.0◈ ♠	300◈	150◈ 2.0◈	—	—	—

■Compactron.
† Zero signal.
♠Per section.
‡ Plate-to-plate.
♣Maximum.
⁑ Supply voltage.
◉Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	135	135	R_k = 100	17	4.0	45,000	10,400	—	—	—	15BD11¶■
Class A Amplifier	200	—	2.0	7.0	—	12,400	5,500	68	—	—	
Class A Amplifier	200	—	R_k = 220	9.2	—	9,400	4,400	41	—	—	
Class A Amplifier	135	135	R_k = 100	17	4.0	45,000	10,400	—	—	—	15BD11-A ¶■
Class A Amplifier	200	—	2.0	7.0	—	12,400	5,500	68	—	—	
Class A Amplifier	200	—	R_k = 220	9.2	—	9,400	4,400	41	—	—	
Class A Amplifier	170	170	12.5	70†	3.5†	26,000	11,000	—	2,400	5.6	*15CW5*
Class A Amplifier	200	200	2.9	18	3.0	130,000	10,400	—	—	—	*15DQ8*
Class A Amplifier	200	—	1.7	3.0	—	—	4,000	65	—	—	
Vertical Oscillator	250	—	3.0	2.0	—	30,000	2,200	66	—	—	15EA7¶
	Max peak negative grid voltage ◈ =400 volts										
Vertical Amplifier	60	—	0	100	—	—	—	—	—	—	
	175	—	25	40	—	920	6,000	5.5	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Class A Amplifier	125	125	R_k = 56	11	3.2	200,000	14,000	—	—	—	*15EW6*
Vertical Oscillator	250	—	11	5.5	—	8,750	2,000	17.5	—	—	15EW7¶
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	17.5	45	—	800	7,500	6.0	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ = 50 ma										
Vertical Oscillator	250	—	3.0	2.0	—	30,000	2,200	66	—	—	15FM7¶■
	Max peak negative grid voltage ◈ =400 volts										
Vertical Amplifier	175	—	25	40	—	920	6,000	5.5	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,500	1,600	65	—	—	15FY7¶■
	Max d-c cathode current ◈ =20 ma										
Vertical Amplifier	150	—	17.5	35	—	920	6,500	6.0	—	—	
	60	—	0	95	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,000; max d-c cathode current ◈ =50 ma										
Class A Amplifier	150	100	R_k = 33	28	3.5	20,000	20,000	—	—	—	*15HA6*
	60	100	0	45	9.0	—	—	—	—	—	
Class A Amplifier	250	250	R_k = 100	40	6.2	24,000	20,000	—	—	—	*15HB6*¶
Vertical Amplifier	135	120	10	39	3.0	18,000	8,400	—	—	—	15KY8¶
	50	120	0	170	20	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =2,000; max d-c cathode current ◈ = 70 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	135	120	10	39	3.0	18,000	8,400	—	—	—	15KY8-A¶
	50	120	0	170	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,000; max d-c cathode current ◈ = 70 ma										
Vertical Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	
	Max d-c cathode current ◈ =22 ma										
Color Demodul tor	100	100	2.5	8.0	15	50,000	5,800	—	E_{c3} =0 volts		*15LE8*¶

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
15MF8¶ ■	Triode-Pentode	12DZ	12–57	14.7	0.6	12◈ 2.5◈	400◈ 400◈	300◈ 2.75◈ —	Pentode Section Triode Section		
15MX8¶	Triode-Pentode	9QT	9-109	15.0	0.45	14◈ 1.5◈	300◈ 330◈	150◈ 1.9◈ —	Pentode Section Triode Section		
16A8	Triode-Pentode	9EX	6–4	16	0.3	5.0 1.0	250 250	250 1.8 —	Pentode Section Triode Section		
16AK9¶ ■	Dissimilar-Double-Triode Pentode	12GZ	12–56	16.4	0.6	10◈ 1.25◈ 1.0◈	350◈ 330◈ 330◈	250◈ 2.0◈ — —	Pentode Section Triode Section 1 (Pins 7, 10, 11) Triode Section 2 (Pins 2, 3, 7)		
16AQ3	Half-Wave High-Vacuum Rectifier	9CB	T-X	16.4	0.6	5.0	Tube Voltage Drop: 28.5 volts at 440 ma d-c				
16BQ11¶ ■	Dissimilar-Double Pentode	12DM	9–58	16.0	0.315	3.1◈ 3.1◈	330◈ 330◈	330⁑◈ 0.65◈ 330⁑◈ 0.65◈	Section 1 (pins 7, 8, 9, 10, 11) Section 2 (2, 3, 4, 5, 6)		
16BX11¶ ■	Dissimilar-Double Triode-Pentode	12CA	9–58	16.0	0.315	3.0◈ 2.0◈ 1.5◈	165◈ 330◈ 330◈	165◈ 1.0◈ — —	Pentode Section Triode Section 1 (pins 7, 8, 9) Triode Section 2 (pins 4, 5, 6)		
16GK6¶	Beam Power Amplifier	9GK	6–4	16.0	0.3	13.2◈	330◈	330◈ 2.0◈	Single Tube 2 Tubes, Push-Pull 2 Tubes, Push-Pull		
16GY5¶ ■	Beam Pentode	12DR	12–79	15.8	0.6	18◈	770⁑◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
16KA6¶ ■	Beam Pentode	12GH	12–79	15.8	0.6	18◈	770⁑◈	220◈ 3.5◈	23▲	8.5▲	0.6▲
16LU8¶ ■	Triode-Pentode	12DZ	12–57	15.8	0.6	14◈ 2.5◈	400◈ 400◈	300◈ 2.75◈ —	Pentode Section Triode Section		

■Compactron. † Zero signal. ♣Per section.
‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250	250	20	50	3.5	5,000	4,100	—	—	—	15MF8¶ ■
Class A Amplifier	250	—	4.0	2.6	—	14,000	4,100	58	—	—	
Vertical-Deflection Amplifier	135	120	10	39	3.0	18,000	8,400	—	—	—	15MX8¶
	50	120	0	170	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,500 volts; max d-c cathode current ◈ = 200 ma.										
Vertical-Deflection Oscillator	250	—	3.0	1.4	—	40,000	1,600	64	—	—	
Class A Amplifier	200	200	16	35	7.0	20,000	6,400	—	—	—	*16A8*
Class A Amplifier	100	—	0	3.5	—	—	2,500	70	—	—	
Avg. Char.	150	150	14	49	3.5	16,400	6,200	—	—	—	16AK9¶ ■
	60	125	0	140	18	—	—	—	—	—	
Avg. Char.	150	—	2.0	5.4	—	11,000	3,900	43	—	—	
Avg. Char.	150	—	5.0	5.5	—	8,500	2,350	20	—	—	
TV Damper	Max d-c output current = 220 ma; max peak inverse voltage = 6,000 volts; max peak current = 550 ma										**16AQ3**
Class A Amplifier	125	125	R_k = 56	11	3.5	200,000	10,500	—	—	—	16BQ11¶ ■
Class A Amplifier	125	125	R_k = 56	11	3.8	200,000	13,000	—	—	—	
Video Amplifier	125	125	R_k = 56	12	3.8	100,000	11,300	—	—	—	16BX11¶ ■
	35	125	0	20	9.2	—	—	—	—	—	
General-Purpose Amplifier	150	—	R_k = 150	11	—	6,800	6,200	—	—	—	
General-Purpose Amplifier	150	—	R_k = 220	7.6	—	8,400	6,800	—	—	—	
Class A Amplifier	250	250	7.3	48†	5.5†	38,000	11,300	—	5,200	5.7	*16GK6*¶
Class AB Amplifier	300	300	R_k = 130	72†	8.0†	—	—	—	8,000‡	17	
	250	250	R_k = 130	62†	7.0†	—	—	—	8,000‡	11	
Class B Amplifier	300	300	14.7	15†	1.6†	—	—	—	8,000‡	17	
	250	250	11.6	20†	2.2†	—	—	—	8,000‡	11	
Horizontal Amplifier	130	130	20	50	1.75	11,000	9,100	—	—	—	16GY5¶ ■
	60	130	0	410	24	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 7,000; max d-c cathode current ◈ = 230 ma										
Horizontal Amplifier	130	130	20	50	1.75	11,000	9,100	(b.p. connected to k at socket)			16KA6¶ ■
	60	130	0	410	24	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 230 ma										
Class A Amplifier	135	120	10	56	3.0	12,000	9,300	—	—	—	16LU8¶ ■
Class A Amplifier	250	—	4.0	2.3	—	16,000	3,600	58	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Output	Grid-plate
16LU8-A¶ ■	Triode-Pentode	12DZ	12–56	16.0	0.6	14◈ 2.5◈	400◈ 400◈	300◈ 2.75◈ —	Pentode Section Triode Section		
16MY8¶ ■	Triode-Pentode	12DZ	12–57	15.8	0.6	16◈ 2.5◈	400◈ 400◈	300◈ 2.75◈ —	Pentode Section Triode Section		
16Y9	Dissimilar Double Pentode	10L	6–3	16.5	0.3	5.0 1.5	250 250	250 2.5 250 0.5	Section 1 (Pins 7, 8, 9, 10) Section 2 (Pins 1, 2, 3, 4)		
C16J	Thyratron same as 5665										
17A8	Triode-Pentode	9DC	6–2	9.0	0.3	1.7 1.5	250 250	200 0.75 —	Pentode Section Triode Section		
17AB9	Twin Tetrode	10N	T-X	16.8	0.15	2.0◈ ♠	250◈	180‡◈ 0.5◈	5.7	2.7	0.055 ♣
17AB10¶ ■	Pentode—Gated-Beam Discriminator	12BT	9–58	16.8	0.45	6.5◈ —	165◈ 330‡◈	150◈ 1.8◈ 330‡◈	Pentode Section (Pins 2, 3, 9, 11) Gated-Beam Discriminator (Pins 4, 5, 6, 7, 8)		
17AV5-GA ¶	Beam Power Amplifier	6CK	T-X	16.8	0.45	11	550‡	175 2.5	14▲	7.0▲	0.5▲
17AX3¶■	Half-Wave High-Vacuum Rectifier	12BL	9–59	16.8	0.45	5.3◈	Tube Voltage Drop: 32 volts at 250 ma d-c				
17AX4-GT ¶	Half-Wave High-Vacuum Rectifier	4CG	9–11, 9–41	16.8	0.45	4.8	Tube Voltage Drop: 32 v at 250 ma d-c				
17AX4-GTA¶	Half-Wave High-Vacuum Rectifier	4CG	9–11	16.8	0.45	5.3◈	Tube Voltage Drop: 32 volts at 250 ma d-c				
17AY3¶	Half-Wave High-Vacuum Rectifier	9HP	9–86	16.8	0.45	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
17AY3-A¶	Half-Wave High-Vacuum Rectifier	9HP	T-X	16.8	0.45	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
17BE3¶■	Half-Wave High-Vacuum Rectifier	12GA	9–60	16.8	0.45	6.5◈	Tube Voltage Drop: 25 volts at 350 ma d-c				
17BE3-A¶ ■	Half-Wave High Vacuum Rectifier	12GA	9–60	16.8	0.45	6.5◈	Tube Voltage Drop: 22.5 volts at 350 ma d-c				
17BF11¶ ■	Dissimilar-Double Pentode	12EZ	9–59	16.8	0.45	6.5◈ 1.7◈	165◈ 330◈	150◈ 1.8◈ 330‡◈ 1.1◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 5, 6, 7)		
17BF11-A ¶■	Dissimilar Double Pentode	12EZ	T-X	16.8	0.45	6.5◈ 1.7◈	165◈ 330◈	150◈ 1.8◈ 330‡◈ 1.1◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 5, 6, 7)		
17BH3¶	Half-Wave High-Vacuum Rectifier	9HP	9–86	17	0.6	6.5◈	Tube Voltage Drop: 33 volts at 360 ma d-c				
17BH3-A¶	Half-Wave High-Vacuum Rectifier	9HP	T-X	17	0.6	6.5◈	Tube Voltage Drop: 33 volts at 360 ma d-c				
17BQ6-GTB¶	Beam Power Amplifier	6AM	9–49 or 9–50	16.8	0.45	11	600‡	200 2.5	15▲	7.0▲	0.6▲
17BR3¶	Half-Wave High-Vacuum Rectifier	9CB	T-X	16.8	0.45	6.5◈	Tube Voltage Drop: 19 volts at 250 ma d-c				
17BS3¶	Half-Wave High-Vacuum Rectifier	9HP	9–86	16.8	0.45	6.0◈	Tube Voltage Drop: 12 volts at 140 ma d-c				
17BS3-A¶	Half-Wave High-Vacuum Rectifier	9HP	T-X	16.8	0.45	6.0◈	Tube Voltage Drop: 12 volts at 140 ma d-c				
17BW3¶ ■	Half-Wave, High-Vacuum Rectifier	12FX	9–60	16.8	0.6	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
17BZ3¶ ■	Half-Wave, High-Vacuum Rectifier	12FX	9–60	16.8	0.45	6.5◈	Tube Voltage Drop: 21 volts at 350 ma d-c				

■Compactron. † Zero signal. ♠Per section. ‡ Plate-to-plate. ♣Maximum. ‡ Supply voltage. ◉Subminiature type. ▲Without external shield. ◈Design maximum rating. ⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	135	120	10	56	3.0	12,000	9,300	—	—	—	16LU8-A¶ ■
Class A Amplifier	250	—	4.0	2.3	—	16,000	3,600	58	—	—	
Class A Amplifier	135	120	10	56	3.0	12,000	9,300	—	—	—	16MY8¶ ■
	45	125	0	200	20	—	—	—	—	—	
Class A Amplifier	250	—	4.0	2.3	—	16,000	3,600	58	—	—	
Class A Amplifier	170	170	2.6	30	6.5	40,000	21,000	—	—	—	*16Y9*
Class A Amplifier	150	150	2.3	10	3.0	160,000	8,500	—	—	—	
Class A Amplifier	170	170	2.0	10	2.8	400,000	6,200	—	—	—	*17A8*
Class A Amplifier	100	—	2.0	14	—	—	5,000	20	—	—	
Class A Amplifier ♠	125	80	1.0	8.0	2.0	110,000	10,000	—	—	—	*17AB9*
Class A Amplifier	145	110	6.0	36†	3.0†	30,000	8,600	—	3,000	2.4	17AB10¶■
FM Limiter-Discriminator	135	280‡	—	5.0	(R_{g2} = 33,000 ohms) (E_{c3} = +4.0 volts)						
Horizontal Amplifier	250	150	22.5	57	2.1	14,500	5,900	—	—	—	17AV5-GA¶
	60	150	0	260	26	—	—	—	—	—	
	Max positive pulse plate voltage ▣ = 5,500 volts; max screen dissipation = 2.5 watts; max d-c cathode current = 110 ma										
TV Damper	Max d-c output current ◈ = 165 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,000 ma										17AX3¶■
TV Damper	Max d-c output current = 125 ma; max peak inverse voltage ▣ = 4,400 volts; max peak current = 750 ma										17AX4-GT¶
TV Damper	Max d-c output current ◈ = 165 ma; max peak inverse voltage ◈ = 5,000 volts max peak current ◈ = 1,000 ma										17AX4-GTA¶
TV Damper	Max d-c output current ◈ = 175 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,100 ma										17AY3¶
TV Damper	Max d-c output current ◈ = 175 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,100 ma										17AY3-A¶
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,200 ma										17BE3¶■
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,200 ma										17BE3-A¶■
Class A Amplifier	145	110	6.0	36†	3.0†	30,000	8,600	—	3,000	2.4	17BF11¶ ■
Class A Amplifier	150	100	R_k = 560	1.3	2.0	150,000	1,000	E_{c3} = 0 Volts			
Class A Amplifier	145	110	6.0	36†	3.0†	30,000	8,600	—	3,000	24	17BF11-A¶ ■
Class A Amplifier	150	100	R_k = 560	1.3	2.0	150,000	1,000	(E_{c3} = 0 volts)			
TV Damper	Max d-c output current ◈ = 180 ma; max peak inverse voltage ◈ = 5,500 volts; max peak current ◈ = 1,100 ma										17BH3¶
TV Damper	Max d-c output current ◈ = 180 ma; max peak inverse voltage ◈ = 5,500 volts; max peak current ◈ = 1,100 ma										17BH3-A¶
Horizontal Amplifier	250	150	22.5	57	2.1	14,500	5,900	—	—	—	17BQ6-GTB¶
	60	150	0	260	26	—	—	—	—	—	
	Max positive pulse plate voltage ▣ = 6,000; max d-c cathode current = 110 ma										
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 5,500; max peak current ◈ = 1,200 ma										17BR3¶
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 5,000; max peak current ◈ = 1,100 ma										17BS3¶
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 5,000; max peak current ◈ = 1,100 ma										17BS3-A¶
TV Damper	Max d-c output current ◈ = 175 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,100 ma										17BW3¶ ■
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 4,500 volts; max peak current ◈ = 1,200 ma										17BZ3¶■

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♠ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

‡ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts pnd Watts ✱	Capacitance in Picofarads Input	Out-put	Grid-plate
17C5¶	Beam Power Amplifier	7CV	5–3	16.8	0.45	6.0	135	117 1.25	13▲	8.5▲	0.6▲
17C9 *17C9-A*¶	Twin Tetrode	10F	6–13	16.8	0.15	1.5◈ ♠ 2.5◈⊕	250◈	180◈❚ 0.5◈	4.4_1 4.2_2	2.2	$.055_1$ $.06_2$
17CA5¶	Beam Power Amplifier	7CV	5–3	16.8	0.45	5.0	130	130 1.4	15▲	9.0▲	0.5▲
17CK3¶	Half-Wave, High-Vacuum Rectifier	9HP	T-X or 9–86	16.8	0.45	6.5◈	Tube Voltage Drop: 16 volts at 350 ma d-c				
17CL3¶	Half-Wave, High-Vacuum Rectifier	9HP	T-X or 9–86	16.8	0.45	8.5◈	Tube Voltage Drop: 16 volts at 350 ma d-c				
17CT3¶	Half-Wave, High-Vacuum Rectifier	9RX	T-X	16.8	0.45	4.75◈	Tube Voltage Drop: 16 volts at 350 ma d-c				
17CU5¶	Beam Power Amplifier	7CV	5–3	16.8	0.45	7.0◈	150◈	130◈ 1.4◈	13▲	8.5▲	0.6▲
17D4¶	Half-Wave High-Vacuum Rectifier	4CG	9–11, 9–41	16.8	0.45	5.5◈	—	—	—	—	—
17D4-A¶	Half-wave High-Vacuum Rectifier	4CG	9–41	16.8	0.45	8.0◈	Tube Voltage Drop: 30 volts at 340 ma d-c				
17DE4¶	Half-Wave High-Vacuum Rectifier	4CG	9–44	17.0	0.6	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
17DM4¶	Half-Wave High-Vacuum Rectifier	4CG	9–44	16.8	0.45	6.5◈	Tube Voltage Drop: 35 volts at 400 ma d-c				
17DM4A¶	Half-Wave High-Vacuum Rectifier	4CG	9–44	16.8	0.45	6.5◈	Tube Voltage Drop: 35 volts at 400 ma d-c				
17DQ4¶	Half-Wave High-Vacuum Rectifier	4CG	9–43	16.8	0.45	6.0◈	Tube Voltage Drop: 32 volts at 250 ma d-c				
17DQ6¶	Beam Power Amplifier	6AM	T-X	16.8	0.45	15	550❚	175 2.5	15▲	7.0▲	0.55▲
17DQ6-A¶	Beam Power Amplifier	6AM	12–51	16.8	0.45	18◈	770◈	220◈ 3.6◈	15▲	7.0▲	0.5▲
17DQ6-B¶	Beam Power Amplifier	6AM	12–51	16.8	0.45	18◈	770◈❚	220◈ 3.6◈	15▲	7.0▲	0.5▲
17DW4-A¶	Half-Wave, High-Vacuum Rectifier	9HP	T-X or 9–86	16.8	0.45	8.5◈	Tube Voltage Drop: 25 volts at 350 ma d-c				
17EW8	Twin Triode	9AJ	6–2	17.5	0.15	2.5♠ 4.5⊕	250	—	3.0▲	1.2▲	1.5▲
17GE5¶■	Beam Power Amplifier	12BJ	12–56	16.8	0.45	17.5◈	770❚◈	220◈ 3.5◈	16▲	7.0▲	0.34▲
17GJ5¶	Beam Power Amplifier	9QK	T-X	16.8	0.45	17.5◈	770❚◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
17GJ5-A¶	Beam Power Amplifier	9QK	T-X	16.8	0.45	17.5◈	770❚◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
17GT5¶	Beam Power Amplifier	9NZ	12–64	16.8	0.45	17.5◈	770◈❚	220◈ 3.5◈	15▲	6.5▲	0.26▲
17GT5-A¶	Beam Power Amplifier	9NZ	12–95	16.8	0.45	17.5◈	770❚◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
17GV5¶■	Beam Power Amplifier	12DR	12–79	16.8	0.45	17.5◈	770❚◈	220◈ 3.5◈	16▲	7.0▲	0.6▲
17GW6¶	Beam Power Amplifier	6AM	12–51	16.8	0.45	17.5◈	770◈❚	220◈ 3.5◈	17▲	7.0▲	0.5▲
17H3¶	Half-Wave High-Vacuum Rectifier	9FK	6–3	17.5	0.3	3.0◈	Tube Voltage Drop: 22 v at 140 ma d-c				
17HC8¶	Triode-Pentode	9EX	9–70	16.8	0.45	11◈ 1.0◈	350◈ 330◈	315◈ 1.5◈ —	Pentode Section Triode Section		

■Compactron.
† Zero signal.
♠Per section.
● See X-Radiation Warning, page 4.
‡ Plate-to-plate.
♣Maximum.
❚ Supply voltage.
◉Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
Conversion transconductance.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	120	110	8.0	49†	4.0†	10,000	7,500	—	2,500	2.3	*17C5*¶
Class A Amplifier ♠	125	80	1.0	10	1.5	100,000	8,000	—	—	—	*17C9* *17C9-A*¶
Class A Amplifier	125 110	125 110	4.5 4.0	37† 32†	4.0† 4.5†	15,000 16,000	9,200 8,100	— —	4,500 3,500	1.5 1.1	*17CA5*¶
TV Damper	Max d-c output current ◈ = 250 ma; max peak inverse voltage ◈ = 5,200 volts; max peak current ◈ = 1,200 ma										17CK3¶
TV Damper	Max d-c output current ◈ = 250 ma; max peak inverse voltage ◈ = 5,500 volts; max peak current ◈ = 1,300 ma										17CL3¶
TV Damper	Max d-c output current ◈ = 250 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,200 ma										*17CT3*¶
Class A Amplifier	120	110	8.0	49†	4.0†	10,000	7,500	—	2,500	2.3	*17CU5*¶
TV Damper	Max d-c output current ◈ = 155 ma; max peak inverse voltage ◈ = 4,400 volts; max peak current ◈ = 900 ma										17D4¶
TV Damper	Max d-c output current ◈ = 185 ma; max peak inverse voltage ◈ = 5,000 volts, max peak current ◈ = 900 ma										17D4-A¶
TV Damper	Max d-c output current ◈ = 180 ma; max peak inverse voltage ◈ = 5,500 volts, max peak current ◈ = 1,100 ma										17DE4¶
TV Damper	Max d-c output current ◈ = 175 ma; max peak inverse voltage ◈ = 5,000 volts, max peak current ◈ = 1,100 ma										17DM4¶
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,200 ma										17DM4A¶
TV Damper	Max d-c output current ◈ = 175 ma; max peak inverse voltage ◈ = 5,500 volts; max peak current ◈ = 1,000 ma										17DQ4¶
Horizontal Amplifier	250 60	150 150	22.5 0	75 300	2.4 27	20,000 —	6,000 —	— —	— —	— —	17DQ6¶
	Max positive pulse plate voltage ▣ = 6,000 volts; max screen dissipation = 2.5 watts; max d-c cathode current = 120 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	55 315	1.5 25	20,000 —	6,600 —	— —	— —	— —	17DQ6-A¶
	Max positive pulse plate voltage ◈ = 6,000 volts; max d-c cathode current ◈ = 155 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	65 345	1.8 27	18,000 —	7,300 —	— —	— —	— —	17DQ6-B¶
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
TV Damper	Max d-c output current ◈ = 250 ma; max peak inverse voltage ◈ = 5,500 volts; max peak current ◈ = 1,300 ma										17DW4-A¶
Class A Amplifier ♠	200	—	2.1	10	—	—	5,800	48	—	—	*17EW8*
Horizontal Amplifier	250 60	150 150	22.5 0	65 345	1.8 27	18,000 —	7,300 —	— —	— —	— —	17GE5¶■
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	70 390	2.1 32	15,000 —	7,100 —	— —	— —	— —	17GJ5¶
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	70 390	2.1 32	15,000 —	7,100 —	— —	— —	— —	17GJ5-A¶
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	70 390	2.1 32	15,000 —	7,100 —	— —	— —	— —	17GT5¶
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	70 390	2.1 32	15,000 —	7,100 —	— —	— —	— —	17GT5-A¶
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	65 345	1.8 27	18,000 —	7,300 —	— —	— —	— —	17GV5¶■
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250 60	150 150	22.5 0	70 380	2.1 32	15,000 —	7,100 —	— —	— —	— —	17GW6¶
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 175 ma										
TV Damper	Max d-c output current ◈ = 75 ma; max peak inverse voltage ◈ = 2,000 volts max peak current ◈ = 450 ma										*17H3*¶
Vertical Amplifier	250 60	250 250	18 0	38 180	3.0 30	55,000 —	5,100 —	— —	— —	— —	17HC8¶
	Max positive pulse plate voltage ◈ = 2,200; max d-c cathode current ◈ = 65 ma										
Vertical Oscillator	250	—	3	1.4	—	34,000	2,000	68	—	—	
	Max d-c cathode current ◈ = 20 ma; max peak negative grid voltage ◈ = 400										

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Output	Grid-plate
17JB6¶	Beam Power Amplifier	9QL	12–70	16.8	0.45	17.5◈	770**‡**◈	220◈ 3.5◈	15▲	6.0▲	0.2▲
17JB6-A¶	Beam Power Amplifier	9QL	T-X	16.8	0.45	17.5◈	770**‡**◈	220◈ 3.5◈	15▲	6.0▲	0.2▲
17JF6¶	Beam Power Amplifier	9QL	12–70 or T-X	16.8	0.6	17◈	770**‡**◈	220◈ 3.5◈	22▲	9.0▲	1.2▲
17JG6¶	Beam Power Amplifier	9QU	12–64	16.8	0.6	17◈	770**‡**◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
17JG6-A¶	Beam Power Amplifier	9QU	12–96	16.8	0.6	17◈	770**‡**◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
17JK8¶	Double Triode	9AJ	6–2	16.8	0.15	1.0◈ 2.0◈	165◈ 200◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3)		
17JM6¶■	Beam Power Amplifier	12FJ	12–79	16.8	0.45	17.5◈	770**‡**◈	220◈ 3.5◈	16▲	7.0▲	0.6▲
17JM6-A¶■	Beam Power Amplifier	12FJ	12–79	16.8	0.45	17.5◈	770**‡**◈	220◈ 3.5◈	16▲	7.0▲	0.6▲
17JN6¶■	Beam Power Amplifier	12FK	12–56	16.8	0.45	17.5◈	770**‡**◈	220◈ 3.5◈	16▲	7.0▲	0.34▲
17JN6-A¶■	Beam Power Amplifier	12FK	12–56	16.8	0.45	17.5◈	770**‡**◈	220◈ 3.5◈	16▲	7.0▲	0.34▲
17JQ6¶	Beam Pentode with Integral Diode	9RA	6–4	17	0.45	10◈	425◈	330◈ 2.0◈	13▲	6.0▲	0.32▲
17JR6¶	Beam Power Amplifier	9QU	12–96	16.8	0.6	17◈	770**‡**◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
17JT6¶	Beam Power Amplifier	9QU	T-X	16.8	0.45	17.5◈	770**‡**◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
17JT6-A¶	Beam Power Amplifier	9QU	12–95	16.8	0.45	17.5◈	770**‡**◈	220◈ 3.5◈	15▲	6.5▲	0.26▲
17JZ8¶■	Triode-Pentode	12DZ	9–58	16.8	0.45	7.0◈ 1.0◈	250◈ 250◈	200◈ 1.8◈ —	Pentode Section Triode Section		
17JZ8-A¶■	Triode-Pentode	12DZ	9–58	16.8	0.45	10◈ 1.0◈	250◈ 250◈	200◈ 1.8◈ —	Pentode Section Triode Section		
17KV6¶	Beam Power Pentode	9QU	12–97	16.8	0.6	20◈	770**‡**◈	220◈ 2.0◈	22▲	9.0▲	0.6▲
17KV6-A¶	Beam Power Amplifier	9QU	12–97	16.8	0.6	28◈	900**‡**◈	220◈ 2.0◈	22▲	9.0▲	0.6▲

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. **‡** Supply voltage. ◈Design maximum rating. #Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	(g_3 connected to k at socket)			**17JB6¶**
	60	150	0	390	32	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ =175 ma										
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	(g3 connected to k at socket)			17JB6-A¶
	60	150	0	390	32	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	130	125	20	80	2.5	12,000	10,000	(E_{c3} = +25 volts)			17JF6¶
	55	125	0	525	32	—					
	Max positive pulse plate voltage ◈ = 6,500 volts; max d-c cathode current ◈ = 275 ma.										
Horizontal Amplifier	130	125	20	80	2.5	12,000	10,000	(g_3 connected to k at socket)			17JG6¶
	50	125	0	525	32	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ =275 ma										
Horizontal Amplifier	130	125	20	80	2.5	12,000	10,000	(Ec3 = +25 volts)			17JG6-A¶
	55	125	0	525	32	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 275 ma										
Class A Amplifier	100	—	1.0	5.3	—	8,000	6,800	55	—	—	17JK8¶
Class A Amplifier	135	—	1.2	10	—	5,400	13,000	70	—	—	
Horizontal Amplifier	250	150	22.5	65	1.8	18,000	7,300	(b.p. connected to k at socket)			17JM6¶■
	60	150	0	345	27	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ =175 ma										
Horizontal Amplifier	250	150	22.5	70	2.4	15,000	7,300	(b.p. connected to k at socket)			17JM6-A¶■
	55	150	0	345	30	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250	150	22.5	65	1.8	18,000	7,300	(b.p. connected to k at socket)			17JN6¶■
	60	150	0	345	27	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Horizontal Amplifier	250	150	22.5	70	2.4	15,000	7,300	(b.p. connected to k at socket)			17JN6-A¶■
	55	150	0	345	30	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Vertical Amplifier	140	140	18	35	2.5	10,500	4,200	—	—	—	*17JQ6*¶
	40	120	0	150	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,000; max d-c cathode current ◈ =70 ma. Instantaneous diode-plate-to-cathode voltage drop for instantaneous diode-plate current of 2.0 ma =5.0 volts										
Horizontal Amplifier	130	125	20	45	1.5	18,000	7,000	—	—	—	17JR6¶
	50	125	0	470	32	—	—	—	—	—	
	Max positive pluse plate voltage ◈ =6,500; max d-c cathode current ◈ =275ma										
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	(g_3 connected to k at socket)			17JT6¶
	60	150	0	390	32	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ =175 ma										
Horizontal Amplifier	250	150	22.5	70	2.1	15,000	7,100	(g_3 connected to k at socket)			17JT6-A
	60	150	0	390	32	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 175 ma										
Vertical Amplifier	120	110	8.0	46	3.5	11,700	7,100	—	—	—	17JZ8¶■
	45	110	0	122	16.5	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,000; max d-c cathode current ◈ =70 ma										
Vertical Oscillator	150	—	5.0	5.5	—	8,500	2,350	20	—	—	
Vertical Amplifier	120	110	8.0	46	3.5	11,700	7,100	—	—	—	17JZ8-A¶■
	45	110	0	122	16.5	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,200 volts; max d-c cathode current ◈ = 70 ma..										
Vertical Oscillator	150	—	5.0	5.5	—	8.500	2.350	20	—	—	
HV Pulse Shunt Regulator	140	140	24.5	40	2.4	10,000	6,000	(E_{c3} =0 volts)			17KV6¶
	100	140	0	440	30	—	—				
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 275 ma										
Pulse Regulator	140	140	24.5	40	2.4	10,000	6,000	(E_{c3} = 0 volts)			17KV6-A¶
	100	140	0	440	30	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500 volts; max d-c cathode current ◈ = 275 ma.										

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Out-put	Grid-plate
17L6-GT¶	Beam Power Amplifier	7AC	9–11 or 9–41	16.8	0.45	10	200	125 1.25	15▲	10▲	0.8▲
17LD8¶	Triode-Pentode	9QT	T-X	16.8	0.45	7.0◈ 1.0◈	250◈ 250◈	200◈ 1.8◈ —	Pentode Section Triode Section		
17R5¶	Beam Power Amplifier	7CV	5–3	16.8	0.45	4.5	150	150 1.0	13▲	9.0▲	0.55▲
17W6-GT¶	Beam Power Amplifier	7AC	9–11 or 9–41	16.8	0.45	10 7.5	300 300	150 1.25 —	Pentode Connection Triode Connection (G_2 & P Tied)		
17X10¶■	Pentode—Gated-Beam Discriminator	12BT	9–58	16.8	0.45	6.5◈ —	165◈ 330◈	150◈ 1.8◈ 110◈	Pentode Section (Pins 2, 3, 9, 11) Gated-Beam Disc (Pins 4, 5, 6, 7, 8)		
18A5¶	Beam Power Amplifier	6CK	9–15 or 9–43	18.5	0.3	9.0◈	350⁑◈	160◈ 2.5◈	13▲	7.0▲	0.7▲
18AJ10¶■	Dissimilar-Double Pentode	12EZ	9–59	18.0	0.315	6.0◈ 1.7◈	165◈ 300◈	150◈ 1.25◈ 300◈ 1.0◈	Section 1 (pins 8, 9, 10, 11) Section 2 (pins 2, 3, 5, 6, 7)		
18DZ8	Triode-Pentode	9JE	T-X	18.0	0.3	6.5 0.75	150 150	135 1.5 —	Pentode Section Triode Section		
18FW6	Remote-Cutoff RF Pentode	7CC	5–2	18.0	0.1	2.5◈	150◈	150◈⁑ 0.6◈	5.5	5.0	0.0035♣
18FW6-A¶	Remote-Cutoff RF Pentode	7CC	5–2	18.0	0.1	2.5◈	150◈	150◈⁑ 0.6◈	5.5	5.0	0.0035♣
18FX6	Pentagrid Converter	7CH♥	5–2	18.0	0.1	1.0◈	150◈	110◈ 1.2◈	Osc. I_{c1} = 0.5 ma R_{g1} = 20,000 ohms		
18FX6-A¶	Pentagrid Converter	7CH♥	5–2	18.0	0.1	1.0◈	150◈	110◈ 1.2◈	Osc. I_{c1} = 0.5 ma R_{g1} = 20,000 ohms		
18FY6	Duplex-Diode High-Mu Triode	7BT	5–2	18.0	0.1	0.5◈	150◈	—	2.0 Diode Section	2.4	1.8
18FY6-A¶	Duplex-Diode High-Mu Triode	7BT	5–2	18.0	0.1	0.5◈	150◈	—	2.0 Diode Section	2.4	1.8
18GB5	Beam Power Amplifier	9NH	T-X	18.0	0.45	17◈	275◈	275◈ 6.0◈	—	—	—
18GD6	Sharp-Cutoff RF Pentode	7BK	5–2	18.0	0.1	2.5◈	150◈	150◈ 0.6◈	6.0	5.0	0.0035♣
18GD6-A¶	Sharp-Cutoff RF Pentode	7BK	5–2	18.0	0.1	2.5◈	150◈	150◈ 0.6◈	6.0	5.0	0.0035♣
18GE6	Duplex-Diode High-Mu Triode	7BT	5–2	18.0	0.1	0.5◈	150◈	—	2.4▲ Diode Section	0.2▲	1.8▲
18GE6-A¶	Duplex-Diode High-Mu Triode	7BT	5–2	18.0	0.1	0.5◈	150◈	—	2.4▲ Diode Section	0.2▲	1.8▲
18GV8	Triode-Pentode	9LY	6–4	18	0.3	7.0▣ 0.5▣	250▣ 250▣	250▣ 2.0▣ —	Pentode Section Triode Section		
18HB8	Triode Pentode	9ME	6–3	18.0	0.3	6.5◈ 0.75◈	150◈ 150◈	135◈ 1.5◈ —	Pentode Section Triode Section		
19	Twin-Triode Power Amplifier	6C	12–5	2.0 DC	0.26	—	135	—	Both Sections in Push-pull		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage.
⊛Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	17L6-GT¶
	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
Vertical Amplifier	120	110	8.0	46	4.0	11,700	7,100	—	—	—	17LD8¶
	45	110	0	122	17	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,000; max d-c cathode current ◈ =70 ma										
Vertical Oscillator	150	—	5.0	3.3	—	11,300	1,900	21.5	—	—	
	Max d-c cathode current ◈ =20 ma										
Vertical Amplifier	110	110	8.5	40	3.3	13,000	7,000	—	—	—	*17R5¶*
	45	110	0	120	17	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =1,500; max d-c cathode current =45 ma										
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	17W6-GT¶
	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
Vertical Amplifier	225	—	30	22	—	1,600	3,800	6.2	—	—	
	Max positive pulse plate voltage ▣ =1,200; max d-c cathode current ▣ =60 ma										
Class A Amplifier	145	110	6.0	36†	3.0†	30,000	8,600	—	3,000	2.4	17X10¶■
FM Limiter-Discriminator	285‡	100	R_k = 200 to 400	0.49	9.8	—	—	—	330,000		
	E_{c1} = 1.25 Volts RMS										
Horizontal Amplifier	200	125	17	40	1.1	27,000	4,800	—	—	—	18A5¶
	60	125	0	165	15	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =3,000 volts; max screen dissipation ◈ = 2.5 watts; max d-c cathode current ◈ =90 ma										
Class A Amplifier	145	110	7.0	34†	6.5†	33,000	5,600	—	2,500	1.45	18AJ10¶ ■
Class A Amplifier	150	100	R_k = 180	2.8	3.5	180,000	2,400	(E_{c3} = 0 volts)			
Class A Amplifier	145	120	R_k = 180	45†	6.0†	—	7,500	—	2,500	2.0	*18DZ8*
Class A Amplifier	120	—	R_k = 1500	0.8	—	—	1,400	100	—	—	
Class A Amplifier	100	100	R_k = 68	11	4.4	250,000	4,400	—	—	—	*18FW6*
Class A Amplifier	100	100	R_k = 68	11	4.4	250,000	4,400	—	—	—	*18FW6-A¶*
Converter	100	100	1.5	2.3	6.2	400,000	480✱	—	—	—	*18FX6*
Converter	100	100	1.5	2.3	6.2	400,000	480✱	—	—	—	*18FX6-A¶*
Class A Amplifier AM Det.♠	100	—	1.0	0.6	—	77,000	1,300	100	—	—	*18FY6*
	Max d-c output current ◈ =1.0 ma; voltage drop: 10 volts at 2.0 ma d-c										
Class A Amplifier AM Det.♠	100	—	1.0	0.6	—	77,000	1,300	100	—	—	*18FY6-A¶*
	Max d-c output current ◈ =1.0 ma; voltage drop: 10 volts at 2.0 ma d-c										
Horizontal Amplifier	75	200	10	440	37	(Instantaneous Values)					18GB5
	Max positive pulse plate voltage ◈ =7,700; max d-c cathode current ◈ =275 ma										
Class A Amplifier	100	100	R_k = 150	5.0	2.0	500,000	4,300	—	—	—	*18GD6*
Class A Amplifier	100	100	R_k = 150	5.0	2.0	500,000	4,300	—	—	—	*18GD6-A¶*
Class A Amplifier AM Det.♠	100	—	1.0	1.0	—	40,000	1,700	70	—	—	*18GE6*
	Max d-c output current ◈ =1.0 ma; voltage drop: 10 volts at 2.0 ma d-c										
Class A Amplifier AM Det.♠	100	—	1.0	1.0	—	40,000	1,700	70	—	—	*18GE6-A¶*
	Max d-c output current ◈ =1.0 ma; voltage drop: 10 volts at 2.0 ma d-c										
Class A Amplifier	170	170	15	41	2.7	25,000	7,500	—	—	—	*18GV8*
Class A Amplifier	100	—	0.8	5.0	—	7,000	6,500	50	—	—	
Class A Amplifier	115	115	R_k = 150	33†	7.5†	—	6,250	—	3,500	1.0	*18HB8*
Class A Amplifier	115	—	R_k = 410	2.5	—	—	3,900	74	—	—	
Class B Amplifier	135	—	0	5.0† ♠	—	Input Signal =0.170 watt			10,000 ‡	2.1	19

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Out-put	Grid-plate
19AU4¶	Half-Wave High-Vacuum Rectifier	4CG	9–44	18.9	0.6	6.0	Tube Voltage Drop: 25 v at 350 ma d-c				
19AU4-GTA¶	Half-Wave High-Vacuum Rectifier	4CG	9–44	18.9	0.6	6.0	Tube Voltage Drop: 25 v at 350 ma d-c				
19BG6-G 19BG6-GA	Beam Power Amplifier	5BT'	16–5 12–21	18.9	0.3	20	700⁑	350 3.2	12 ▲	6.5 ▲	0.34 ▲
19C8	Triple-Diode, High-Mu Triode	9E	6–2	18.9	0.15	1.0	250	—	—	—	—
19CG3¶ ■	Half-Wave, High-Vacuum Rectifier	12HF	9–62	19	0.6	6.5◈	Tube Voltage Drop: 25 volts at 700 ma d-c				
19CL8-A *19CL8-B*¶	Triode-Tetrode	9FX	6–2	18.9	0.15	3.0◈ 2.5◈	330◈ 330◈	330◈⁑ 0.55◈ —	Tetrode Section Triode Section		
19DE3¶ ■	Half-Wave High-Vacuum Recti-fier	12HX	9–101	19.0	0.6	9.0⬥	Tube Voltage Drop: 25 volts at 700 ma d-c				
19DE7¶	Double Triode	9HF	6–3	19.4	0.3	1.5◈ 7.0◈	330◈ 275◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3, 9)		
19DK3¶	Half-Wave High-Vacuum Recti-fier	9SG	9–117	19	0.6	9.0⬥	Tube Voltage Drop: 16 volts at 400 ma d-c 25 volts at 800 ma d-c				
19DQ3¶ ■	Half-Wave High-Vacuum Recti-fier	12HF	9–62	19	0.6	9.0⬥	Tube Voltage Drop: 16 volts at 400 ma d-c 25 volts at 800 ma d-c				
19DQ3-A¶ ■	Half-Wave High-Vacuum Recti-fier	12HF	9–62	19	0.6	10⬥	Tube Voltage Drop: 17 volts at 450 ma d-c 27 volts at 900 ma d-c				
19EA8 *19EA8-A*¶	Triode-Pentode	9AE	6–2	18.9	0.15	3.1◈ 2.5◈	330◈ 330◈	330◈⁑ 0.55◈ —	Pentode Section Triode Section		
19EW7¶	Dissimilar Double Triode	9HF	9–70	18.9	0.3	1.5◈ 10◈	330◈ 330◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3, 9)		
19EZ8	Triple-Triode	9KA	6–2	18.9	0.15	2.0◈ ♠ 5.0◈ ⊕	330◈	—	2.6	1.4_1 1.2_2 1.2_3	1.5
19FX5¶	Power Ampli-fier Pentode	7CV	5–3	18.9	0.3	5.5⬥	150⬥	130⬥	17▲	9.0▲	0.65▲
19GQ7	Triple Diode	9QM	6–2	18.9	0.15	—	Tube Voltage Drop:♠ 10 volts at 60 ma d-c				
19HR6¶	Semi-Remote-Cutoff RF Pentode	7BK	5–2	18.9	0.15	3.0◈	300◈	300⁑◈ 1.0◈	8.8▲	5.2▲	0.006 ▲♣
19HS6¶	Sharp-Cutoff RF Pentode	7BK	5–2	18.9	0.15	3.0◈	300◈	300⁑◈ 1.0◈	8.8▲	5.2▲	0.006 ▲♣
19HV8	Triode-Pentode	9FA	6–2	18.9	0.15	3.0◈ 0.55◈	330◈ 330◈	330◈⁑ 0.55◈ —	Pentode Section Triode Section		
19J6	Medium-Mu Twin Triode	7BF	5–2	18.9	0.15	1.5♠	300	—	2.0▲	0.4▲	1.5▲
19JN8	Triode-Pentode	9FA	6–2	18.9	0.15	2.5◈ 2.5◈	300◈ 300◈	300◈⁑ 0.55◈ —	Pentode Section Triode Section		
19KG8	Triode-Pentode	9LY	6–2	18.9	0.15	2.5◈ 2.5◈	300◈ 300◈	300⁑◈ 0.55◈ —	Pentode Section Triode Section		
19Q9¶	Triode-Pentode	10H	6–13	18.9	0.15	3.0◈ 2.5◈	330◈ 330◈	330⁑◈ 0.55◈ —	Pentode Section Triode Section		
19T8 *19T8-A*¶	Triple-Diode High-Mu Triode	9E	6–2	18.9	0.15	1.1◈	330◈	—	1.7	2.4	1.7
19V8	Triple-Diode, High-Mu Triode	9AH	6–2	18.9	0.15	1.0	300	—	—	—	—

■ Compactron. ‡ Plate-to-plate. ◉ Subminiature type. ⊕ Total for all similar sections.
† Zero signal. ♣ Maximum. ▲ Without external shield. ◈ Absolute maximum rating.
♠ Per section. ⁑ Supply voltage. ⬥ Design maximum rating. # Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
TV Damper	Max d-c output current =175 ma; max peak inverse voltage ▣ =4,500 volts; max peak current =1,050 ma										19AU4¶
TV Damper	Max d-c output current =190 ma; max peak inverse voltage ▣ =4,500 volts; max peak current =1,150 ma										19AU4-GTA¶
Horizontal Amplifier	250	250	15	75	4	25,000	6,000	—	—	—	19BG6-G
	60	250	0	180	18	—	—	—	—	—	19BG6-GA
	Max positive pulse plate voltage ▣ =6,600 volts; max screen dissipation = 3.2 watts; max d-c cathode current =110 ma										
Class A Amplifier	100	—	1.0	0.5	—	80,000	1,250	100	—	—	*19C8*
TV Damper	Max d-c output current◈ =350 ma; max peak inverse voltage◈ =5,000 volts; max peak current◈ =2,100 ma										19CG3¶ ■
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,500	—	—	—	*19CL8-A*
	100	70	0	—	—	—	7,000	—	—	—	
Class A Amp	125	—	1.0	14	—	5,000	8,000	40	—	—	*19CL8-B*¶
TV Damper	Max d-c output current ◆ = 350 ma; max peak inverse voltage ◆ = 5,000 volts; max peak current ◆ = 1050 ma.										19DE3¶ ■
Vertical Oscillator	250	—	11	5.5	—	8,750	2,000	17.5	—	—	*19DE7*¶
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	17.5	35	—	925	6,500	6.0	—	—	
	60	—	0	80	—	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ =50 ma										
TV Damper	Max d-c output current ◆ = 400 ma; max peak inverse voltage ◆ = 6,500 volts; max peak current ◆ = 1,200 ma.										19DK3¶
TV Damper	Max d-c output current ◆ = 400 ma; max peak inverse voltage ◆ = 6,500 volts; max peak current ◆ = 1,200 ma.										19DQ3¶ ■
TV Damper	Max d-c output current ◆ = 450 ma; max peak inverse voltage ◆ = 6,500 volts; max peak current ◆ = 1,200 ma.										19DQ3-A¶ ■
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,400	—	—	—	*19EA8*
Class A Amplifier	150	—	R_k = 56	18	—	5,000	8,500	40	—	—	*19EA8-A*¶
Vertical Oscillator	250	—	11	5.5	—	8,750	2,000	17.5	—	—	19EW7¶
	Max d-c cathode current ◈ =22 ma										
Vertical Amplifier	150	—	17.5	45	—	800	7,500	6.0	—	—	
	Max positive pulse plate voltage ◈ =1,500; max d-c cathode current ◈ = 50 ma										
Class A Amplifier ♠	125	—	1.0	4.2	—	13,600	4,200	57	—	—	*19EZ8*
Class A Amplifier	110	115	R_k = 62	36+	10+	17,500	13,500	—	3,000	1.3	*19FX5*¶
Half-Wave Rectifier	Max d-c output current per plate ◈ =9 ma; max peak inverse voltage ◈ =330 volts; max RMS supply voltage per plate ◈ =117 volts; max peak current per plate ◈ =54 ma										*19GQ7*
Class A Amplifier	200	115	R_k = 68	13.2	4.3	500,000	8,500	—	—	—	*19HR6*¶
Class A Amplifier	150	75	R_k = 68	8.8	2.8	500,000	9,500	—	—	—	*19HS6*¶
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,500	—	—	—	*19HV8*
Class A Amp	100	—	1.0	0.8	—	54,000	1,300	70	—	—	
Class A Amplifier ♠	100	—	R_k = 150 ⊕	8.5	—	7,100	5,300	38	—	—	*19J6*
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	*19JN8*
Class A Amp	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	*19KG8*
Class A Amp	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Class A Amplifier	125	125	1.0	12	4.0	200,000	6,500	—	—	—	*19Q9*¶
	100	70	—	—	—	—	7,000	—	—	—	
Class A Amp	125	—	1.0	14	—	5,000	8,000	40	—	—	
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	*19T8*
	100	—	1.0	0.8	—	54,000	1,300	70	—	—	*19T8-A*¶
Class A Amplifier	250	—	3.0	1.0	—	58,000	1,200	70	—	—	*19V8*
	100	—	1.0	0.8	—	54,000	1,300	70	—	—	

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads: Input	Output	Grid-plate
19X8	Triode-Pentode Converter	9AK	6–2	18.9	0.15	2.0 1.5	250 250	250‡ 0.4 —	Pentode Section Triode Section		
20	Power-Amplifier Triode	4D	9–25	3.3 DC	0.132	—	135	—	2.0	2.3	4.1
20EQ7	Diode-Pentode	9LQ	6–3	20	0.1	3.0◈	300◈	300◈‡ 0.6◈	5.5▲ Diode Section	5.0▲	0.002 ▲♣
20EW7¶	Dissimilar Double Triode	9HF	9–70	20.5	0.3	1.5◈ 10◈	330◈ 330◈	— —	Section 1 (Pins 6, 7, 8) Section 2 (Pins 1, 2, 3, 9)		
20EZ7¶	High-Mu Twin Triode	9PG	6–2	20	0.1	1.2◈ ♠	330◈	—	1.6▲	0.2(1)▲ 0.3(2)▲	1.5▲
21EX6¶	Beam-Power Amplifier	5BT	12–21	21.5	0.6	22◈	770◈‡	195◈ 3.5◈	22▲	8.5▲	1.1▲
21GY5¶■	Beam Pentode	12DR	12–79	21	0.45	18◈	770‡◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
21HB5¶■	Beam Power Amplifier	12BJ	12–58	21	0.45	18◈	770‡◈	220◈ 3.5◈	22▲	9.0▲	0.4▲
21HB5-A¶■	Beam Power Amplifier	12BJ	12–58	21	0.45	18◈	770‡◈	220◈ 3.5◈	24▲	9.5▲	0.4▲
21HD5¶■	Beam Power Amplifier	12ES	12–59	21.5	0.6	24◈	770‡◈	220◈ 6.0◈	—	—	—
21HJ5¶■	Beam Pentode	12FL	12–59	21.5	0.6	24◈	770‡◈	220◈ 6.0◈	—	—	—
21JS6-A¶■	Beam Power Amplifier	12FY	12–89	21.0	0.6	28◈	990‡◈	190◈ 5.5◈	24▲	10▲	0.7▲
21JV6¶■	Beam Power Amplifier	12FK	12–58	21	0.45	18◈	770‡◈	220◈ 3.5◈	22▲	9.0▲	0.4▲
21JZ6¶■	Beam Power Amplifier	12GD	12–79	21	0.45	18◈	770‡◈	220◈ 3.5◈	24▲	8.5▲	0.34▲
21KA6¶■	Beam Power Amplifier	12GH	12–79	21	0.45	18◈	770‡◈	220◈ 3.5◈	23▲	8.5▲	0.6▲
21KQ6	Beam Power Amplifier	9RJ	T-X	21.5	0.45	17◈	275◈	275◈ 6.0◈	27▲	11▲	1.5▲
21LG6¶■	Beam Power Amplifier	12HL	12–89	21	0.6	28◈	900‡◈	200◈ 5.0◈	25▲	13▲	0.8▲
21LG6-A¶■	Beam Power Amplifier	12HL	12–89	21.0	0.6	28◈	900‡◈	200◈ 5.0◈	25▲	13▲	0.8▲
21LR8¶	Triode-Pentode	9QT	12–65	21	0.45	14◈ 2.5◈	400◈ 400◈	300◈ 2.75◈ —	Pentode Section Triode Section		
21LU8¶■	Triode-Pentode	12DZ	12–57	21	0.45	14◈ 2.5◈	400◈ 400◈	300◈ 2.75◈ —	Pentode Section Triode Section		

■Compactron.
† Zero signal.
♠Per section.
‡ Plate-to-plate.
♣Maximum.
‡ Supply voltage.
◉Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
\# Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250	150	R_k = 200	7.7	1.6	750,000	4,600	—	—	—	*19X8*
Class A Amplifier	100	—	R_k = 100	8.5	—	6,900	5,800	40	—	—	
Class A Amplifier	135	—	22.5	6.5†	—	6,300	525	3.3	6,500	0.110	20
Class A Amplifier	100	100	E_{cc1} =0	9.0	3.5	250,000	3,800	R_{g1} = 2.2 Meg			*20EQ7*
AM Det.	Max d-c output current ◈ = 1.0 ma; voltage drop: 10 volts at 2 ma										
Vertical Oscillator	250	—	11	5.5	—	8,750	2,000	17.5	—	—	20EW7¶
	Max d-c cathode current ◈ = 22 ma										
Vertical Amplifier	150	—	17.5	45	—	800	7,500	6.0	—	—	
	Max positive pulse plate voltage ◈ = 1,500; max d-c cathode current ◈ = 50 ma										
Class A Amplifier ♦	250	—	2.0	1.2	—	62,500	1,600	100	—	—	*20EZ7¶*
	100	—	1.0	0.5	—	80,000	1,250	100	—	—	
Horizontal Amplifier	175	175	30	67	3.3	8,500	7,700	—	—	—	*21EX6¶*
	60	150	0	460	45	—	—	—	—	—	
	60	125	0	360	30	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 7,000; max d-c cathode current ◈ = 220 ma										
Horizontal Amplifier	130	130	20	50	1.75	11,000	9,100	—	—	—	*21GY5¶■*
	60	130	0	410	24	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 230 ma										
Horizontal Amplifier	130	130	20	50	1.75	11,100	9,100	—	—	—	21HB5¶■
	60	130	0	410	24	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,000; max d-c cathode current ◈ = 230 ma										
Horizontal Amplifier	130	130	20	46	1.8	9,900	9,000	—	—	—	21HB5-A¶ ■
	50	130	0	450	29	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,000; max d-c cathode current ◈ = 230 ma										
Horizontal Amplifier	135	135	22	65	4.0	5,000	10,000	—	—	—	21HD5¶■
	60	135	0	540	48	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 7,000; max d-c cathode current ◈ = 280 ma										
Horizontal Amplifier	135	135	22	80	5.5	5,000	10,000	(b.p. connected to k at socket)			21HJ5¶■
	60	135	0	540	48	—	—				
	Max positive pulse plate voltage ◈ = 7,000; max d-c cathode current ◈ = 280 ma										
Horizontal Amplifier	175	125	25	125	4.5	5,600	11,300	(b.p. connected to k at socket)			21JS6-A¶ ■
	62	125	0	570	34	—	—				
	Max positive pulse plate voltage ◈ = 7,500 volts; max d-c cathode current ◈ = 315 ma.										
Horizontal Amplifier	130	130	20	50	1.75	11,000	9,100	(b.p. connected to k at socket)			21JV6¶■
	60	130	0	410	24	—	—				
	Max positive pulse plate voltage ◈ = 6,000; max d-c cathode current ◈ = 230 ma										
Horizontal Amplifier	130	130	20	46	1.8	9,900	9,000	—	—	—	21JZ6¶■
	50	130	0	450	29	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 230 ma										
Horizontal Amplifier	130	130	20	50	1.75	11,000	9,100	(b.p. connected to k at socket)			21KA6¶■
	60	130	0	410	24	—	—				
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 230 ma										
Horizontal Amplifier	50	200	12	550	50	(E_{c3} = 0 volts)		—	—	—	21KQ6
	40	135	0	450	35	(E_{c3} = 0 volts)		—	—	—	
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 275 ma										
Horizontal Amplifier	175	125	23	90	1.7	7,500	11,500	—	—	—	21LG6¶ ■
	60	125	0	600	42	—	—	—	—	—	
	Max positive pulse plate voltage◈ = 7,500; max d-c cathode current ◈ = 375 ma										
Horizontal Amplifier	175	125	23	90	1.7	7,500	11,500	—	—	—	21LG6-A¶ ■
	50	125	0	600	42	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 7,500 volts; max d-c cathode current ◈ = 315 ma.										
Class A Amplifier	135	120	10	56	3.0	12,000	9,300	—	—	—	21LR8¶
Class A Amplifier	250	—	4.0	2.3	—	16,000	3,600	58	—	—	
Class A Amplifier	135	120	10	56	3.0	12,000	9,300	—	—	—	21LU8¶■
Class A Amplifier	250	—	4.0	2.3	—	16,000	3,600	58	—	—	

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♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Out-put	Grid-plate
21MY8¶ ■	Triode-Pentode	12DZ	12–57	21.0	0.45	16◆ 2.5◈	400◈ 400◈	300◈ 2.75◈ —	Pentode Section Triode Section		
22	Sharp-Cutoff RF Tetrode	4K	14–2	3.3 DC	0.132	—	135	67.5	3.5	10.0	0.02 ♣
22BH3¶	Half-Wave High-Vacuum Rectifier	9HP	9–86	22.4	0.45	6.5◈	Tube Voltage Drop: 33 volts at 360 ma d-c				
22BH3-A¶	Half-Wave High-Vacuum Rectifier	9HP	T-X	22.4	0.45	6.5◈	Tube Voltage Drop: 33 volts at 360 ma d-c				
22BW3■	Half-Wave High-Vacuum Rectifier	12FX	9–60	22.4	0.45	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
22DE4¶	Half-Wave High-Vacuum Rectifier	4CG	9–44	22.4	0.45	6.5◈	Tube Voltage Drop: 32 volts at 350 ma d-c				
22JF6¶	Beam Power Amplifier	9QL	T-X	22	0.45	17◈	770⁑◈	220◈ 3.5◈	22▲	9.0▲	1.2▲
22JG6¶	Beam Power Amplifier	9QU	T-X	22	0.45	17◈	770⁑◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
22JG6-A¶	Beam Power Amplifier	9QU	12–96	22	0.45	17◈	770⁑◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
22JR6¶	Beam Power Amplifier	9QU	12–96	22	0.45	17◈	770⁑◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
22JU6¶	Beam Power Amplifier	9QL	T-X	22	0.45	17◈	770⁑◈	220◈ 3.5◈	22▲	9.0▲	1.2▲
22KM6¶	Beam Power Amplifier	9QL	T-X or 12–70	22	0.45	20◈	770⁑◈	220◈ 3.5◈	22▲	9.0▲	1.2▲
22KV6-A¶	Beam Power Amplifier	9QU	12–97	22.0	0.45	28◈	900⁑◈	220◈ 2.0◈	22▲	9.0▲	0.6▲
23JS6-A¶ ■	Beam Power Amplifier	12FY	12–89	23.6	0.6	28◈	990⁑◈	190◈ 5.5◈	24▲	10▲	0.7▲
23MB6¶ ■	Beam Power Amplifier	12FY	T-X	23	0.6	35◈	990⁑◈	225◈ 7.0◈	25▲	17▲	0.5▲
23Z9¶ ■	Dissimilar-Double-Triode Pentode	12GZ	9–58	23	0.45	7.0◈ 1.25◈ 1.0◈	250◈ 330◈ 250◈	200◈ 1.8◈ — —	Pentode Section Triode Section 1 (Pins 7, 10, 11) Triode Section 2 (Pins 2, 3, 7)		
24A	Sharp-Cutoff RF Tetrode	5E	14–2	2.5	1.75	—	250	90	5.3▲	10.5▲	0.007 ♣
24BF11¶ ■	Dissimilar Double Pentode	12EZ	9–59	24.2	0.315	6.5◈ 1.7◈	165◈ 330◈	150◈ 1.8◈ 330⁑◈ 1.1◈	Section 1 (Pins 8, 9, 10, 11) Section 2 (Pins 2, 3, 5, 6, 7)		
24JE6-A¶	Beam Power Amplifier	9QL	12–116	24	0.6	30◈	990⁑◈	220◈ 5.0◈	22▲	11▲	0.56▲
24JZ8¶ ■	Triode-Pentode	12DZ	9–58	24.2	0.315	7.0◈ 1.0◈	250◈ 250◈	200◈ 1.8◈ —	Pentode Section Triode Section		

■Compactron.
† Zero signal.
◆Per section.
‡ Plate-to-plate.
♣Maximum.
⁑ Supply voltage.
◉Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	Rp, Ohms	Gm, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	135	120	10	56	3.0	12,000	9,300	—	—	—	**21MY8¶■**
	45	125	0	200	20	—	—	—	—	—	
Class A Amplifier	250	—	4.0	2.3	—	16,000	3,600	58	—	—	
Class A Amplifier	135	67.5	1.5	3.7	1.3	325,000	500	—	—	—	22
TV Damper	Max d-c output current◆ =180 ma; max peak inverse voltage◆ =5,500 volts; max peak current◆ =1,100 ma										22BH3¶
TV Damper	Max d-c output current◆ =180 ma; max peak inverse voltage◆ =5,500 volts; max peak current◆ =1,100 ma										22BH3-A¶
TV Damper	Max d-c output current◆ =175 ma; max peak inverse voltage◆ =5,000 volts; max peak current◆ =1,100 ma										22BW3■
TV Damper	Max d-c output current◆ =180 ma; max peak inverse voltage◆ =5,500 volts; max peak current◆ =1,100 ma										22DE4¶
Horizontal Amplifier	130	125	20	80	2.5	12,000	10,000	(Ec3 = +25 volts)			22JF6¶
	55	125	0	525	32	—	—				
	Max positive pulse plate voltage◆ =6,500; max d-c cathode current◆ = 275 ma										
Horizontal Amplifier	130	125	20	80	2.5	12,000	10,000	(g_3 connected to k at socket)			22JG6¶
	50	125	0	525	32	—	—				
	Max positive pulse plate voltage◆ =6,500; max d-c cathode current◆ =275 ma										
Horizontal Amplifier	130	125	20	80	2.5	12,000	10,000	(Ec3 = +25 volts)			22JG6-A¶
	55	125	0	525	32	—	—				
	Max positive pulse plate voltage◆ =6,500; max d-c cathode current◆ = 275 ma										
Horizontal Amplifier	130	125	20	45	1.5	18,000	7,000	—	—	—	22JR6¶
	50	125	0	470	32	—	—	—	—	—	
	Max positive pulse plate voltage◆ =6,500; max d-c cathode current◆ =275ma										
Horizontal Amplifier	130	125	20	45	1.5	18,000	7,000	(b.p. connected to k at socket)			22JU6¶
	50	125	0	470	32	—	—				
	Max positive pulse plate voltage◆ =6,500; max d-c cathode current◆ = 275 ma										
Horizontal Amplifier	140	140	24.5	80	2.4	6,000	9,500	(E_{c3} = 0 volts)			22KM6¶
	60	140	0	560	31	—	—				
	Max positive pulse plate voltage◆ =6,500 volts; max d-c cathode current ◆ = 275 ma										
Pulse Regulator	140	140	24.5	40	2.4	10,000	6,000	(E_{c3} = 0 volts)			22KV6-A¶
	100	140	0	440	30	—	—				
	Max positive pulse plate voltage ◆ = 6,500 volts; max d-c cathode current ◆ = 275 ma.										
Horizontal Amplifier	175	125	25	125	4.5	5,600	11,300	(b.p. connected to k at socket)			23JS6-A¶■
	62	120	0	570	34	—	—				
	Max positive pulse plate voltage◆ =7,500; max d-c cathode current◆ = 315 ma										
Horizontal Amplifier	150	110	20	110	2.0	5,000	14,000	—	—	—	23MB6¶■
	60	110	0	660	42	—	—	—	—	—	
	Max positive pulse plate voltage ◆ = 8,000 volts; max d-c cathode current ◆ = 400 ma.										
Vertical Amplifier	120	110	8.0	46	3.5	11,700	7,100	—	—	—	23Z9¶■
	45	110	0	122	16.5	—	—	—	—	—	
	Max positive pulse plate voltage◆ =2,000; total d-c plate and screen current ◆ =70 ma										
Class A Amplifier	150	—	2.0	5.4	—	11,000	3,900	43	—	—	
Vertical Oscillator	150	—	5.0	5.5	—	8,500	2,350	20	—	—	
	Max d-c plate current◆ =20 ma										
Class A Amplifier	250	90	3.0	4.0	1.7 ♣	600,000	1,050	—	—	—	24A
Class A Amplifier	145	110	6.0	36†	3.0†	30,000	8,600	—	3,000	2.4	24BF11¶■
Class A Amplifier	150	100	Rk = 560	1.3	2.0	150,000	1,000	(Ec3 =0 volts)			
Horizontal Amplifier	175	125	25	130	2.8	5,800	9,600	(E_{c3} =30 volts)			24JE6-A¶
	55	125	0	580	40	—	—				
	Max positive pulse plate voltage◆ =7,500; max d-c cathode current◆ = 350 ma										
Vertical Amplifier	120	110	8,0	46	3.5	11,700	7,100	—	—	—	24JZ8¶■
	45	110	0	122	16.5	—	—	—	—	—	
	Max positive pulse plate voltage◆ =2,000; max d-c cathode current◆ =70 ma										
Vertical Oscillator	150	—	5.0	5.5	—	8,500	2,350	20	—	—	
	Max d-c cathode current◆ =20 ma										

etal tubes are shown in bold-face type, *miniature tubes in italics*.
G3 and G5 are screen. G4 is signal-input grid.
G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
♣Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✚	Capacitance in Picofarads: Input	Output	Grid-plate
24LQ6¶	Beam Power Amplifier	9QL	12–117	24	0.6	30◈	990‡◈	220◈ 5.0◈	22▲	11▲	0.56▲
24LZ6¶	Beam Power Amplifier	9QL	12–117	24	0.6	30◈	990‡◈	220◈ 5.0◈	22▲	11▲	0.6▲
25A6 25A6-GT	Power-Amplifier Pentode	7S	8–6 9–11	25.0	0.3	5.3	160	135 1.9	8.5 —	12.5 —	0.2 —
25A7-GT	Half-Wave Rectifier, Power Amplifier Pentode	8F	9–11	25.0	0.3	2.25 —	117 —	117 0.8 Tube Voltage Drop: 23 v at 150 ma d-c	—	—	—
25AC5-GT	Triode Power Amplifier	6Q	9–11	25.0	0.3	10	180	—	2 tubes, Push-pull		
25AV5-GA	Beam Power Amplifier	6CK	T-X	25.0	0.3	11	550⁑	175 2.5	14▲	7.0▲	0.5▲
25AV5-GT	Beam Power Amplifier	6CK	9–11 or 9–41	25.0	0.3	11	550⁑	175 2.5	14▲	7.0▲	0.7▲
25AX4-GT	Half-Wave High-Vacuum Rectifier	4CG	9–11 9–41	25.0	0.3	4.8	Tube Voltage Drop: 32 v at 250 ma d-c				
25B5	Direct-Coupled Power Amplifier	6D	12–1	25.0	0.3	8.5 1.1‖	180	—	—	—	—
25B6-G	Power Amplifier Pentode	7S	14–3	25.0	0.3	12.5	200	135 2.0	—	—	—
25B8-GT	Triode Remote-Cutoff Pentode	8T	9–24	25.0	0.15	— —	100	100	Pentode Section Triode Section		
25BK5	Beam Power Amplifier	9BQ	6–3	25.0	0.3	9.0	250	250 2.5	13▲	5.0▲	0.6▲
25BQ6-GA 25BQ6-GTB	Beam Power Amplifier	6AM	T-X 9–49 9–50	25.0	0.3	11	600⁑	200 2.5	15▲	7.0▲	0.6▲
25BQ6-GT	Beam Power Amplifier	6AM	9–49 or 9–50	25.0	0.3	11	550⁑	175 2.5	15▲	7.5▲	0.6▲
25BR3¶	Half-Wave High-Vacuum Rectifier	9CB	T-X	25.0	0.3	6.5◈	Tube Voltage Drop: 19 volts at 250 ma d-c				
25C5	Beam Power Amplifier	7CV	5–3	25.0	0.3	7.0◈	150◈	130◈ 1.4◈	13▲	8.5▲	0.6▲
25C6-G 25C6-GA	Beam Power Amplifier	7AC	14–3 12–16	25.0	0.3	12.5	200	135 1.75	—	—	—
25CA5	Beam Power Amplifier	7CV	5–3	25.0	0.3	5.0	130	130 1.	15▲	9.0▲	0.5▲
25CD6-G 25CD6-GA¶	Beam Power Amplifier	5BT	16–5	25.0	0.6	15	700⁑	175 3.0	25▲	9.5▲	0.6▲
25CD6-GB¶	Beam Power Amplifier	5BT	12–21	25.0	0.6	20	700⁑	175 3.0	22▲	8.5▲	1.1▲
25CG3¶■	Half-Wave, High-Vacuum Rectifier	12HF	9–62	25	0.45	6.5◈	Tube Voltage Drop: 25 volts at 700 ma d-c				
25CK3¶	Half-Wave High-Vacuum Rectifier	9HP	T-X or 9–86	25.0	0.3	6.5◈	Tube Voltage Drop: 16 volts at 350 ma d-c				
25CM3¶	Half-Wave, High-Vacuum Rectifier	9HP	T-X	25	0.6	12◈	Tube Voltage Drop: 10 volts at 350 ma d-c				
25CT3¶	Half-Wave High-Vacuum Rectifier	9RX	T-X	25.0	0.3	4.75◈	Tube Voltage Drop: 16 volts at 350 ma d-c				

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ✚Maximum. ▲Without external shield. ⊞Absolute maximum rating.
◆Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	175	145	35	95	2.4	7,000	7,500	(Ec3 =30 volts)			24LQ6¶
	60	145	0	710	55	—	—	—	—	—	
	Max positive pulse plate voltage◈ =7,500; max d-c cathode current◈ =350 ma										
Horizontal Amplifier	175	125	25	140	2.0	6,000	11,000	—	—	—	24LZ6¶
	55	125	0	800	56	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 7,500 volts; d-c cathode current ◈ = 350 ma.										
Class A Amplifier	160	120	18	33†	6.5†	42,000	2,375	—	5,000	2.2	**25A6** 25A6-GT
Class A Amplifier	100	100	15	20.5†	4.0†	50,000	1,800	—	4,500	0.77	25A7-GT
Half-Wave Rectifier	Max d-c output current =75 ma; max peak inverse voltage =350 v; max rms supply voltage =117 v; max peak current =450 ma										
Class B Amplifier	180	—	0	4.0†	—	Peak Input Signal = 0.810 watt			4,800 ‡	6.0	25AC5-GT
Horizontal Amplifier	250	150	22.5	57	2.1	14,500	5,900	—	—	—	25AV5-GA
	60	150	0	260	26	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =5,500 volts; max screen dissipation = 2.5 watts; max d-c cathode current =110 ma										
Horizontal Amplifier	250	150	22.5	55	2.1	20,000	5,500	—	—	—	25AV5-GT
	60	150	0	225	25	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =5,500 volts; max screen dissipation = 2.5 watts; max d-c cathode current =110 ma										
TV Damper	Max d-c output current =125 ma; max peak inverse voltage ▣ = 4,400 volts max peak current =750 ma										25AX4-GT
Class A Amplifier	180	100‖	0	46	5.8‖	15,000	2,300	—	4,000	3.8	25B5
					‖Input Plate						
Class A Amplifier	200	135	23	62†	1.8†	18,000	5,000	—	2,500	7.1	25B6-G
Class A Amplifier	100	100	3.0	7.6	2.0	185,000	2,000	—	—	—	25B8-GT
Class A Amp	100	—	1.0	0.6	—	75,000	1,500	112	—	—	
Class A Amplifier	250	250	5.0	35†	3.5†	100,000	8,500	—	6,500	3.5	***25BK5***
Horizontal Amplifier	250	150	22.5	57	2.1	14,500	5,900	—	—	—	25BQ6-GA 25BQ6-GTB
	60	150	0	260	26	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =6,000 volts; max screen dissipation =2.5 watts; max d-c cathode current =110 ma										
Horizontal Amplifier	250	150	22.5	55	2.1	20,000	5,500	—	—	—	25BQ6-GT
	60	150	0	225	25	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =5,500 volts; max screen dissipation = 2.5 watts; max d-c cathode current =110 ma										
TV Damper	Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ =5,500; max peak current ◈ =1,200 ma										25BR3¶
Class A Amplifier	120	110	8.0	49†	4.0†	10,000	7,500	—	2,500	2.3	***25C5***
Class A Amplifier	200	135	14	61†	2.2†	18,300	7,100	—	2,600	6.0	25C6-G 25C6-GA
Class A Amplifier	125	125	4.5	37†	4.0†	15,000	9,200	—	4,500	1.5	***25CA5***
	110	110	4.0	32†	3.5†	16,000	8,100	—	3,500	1.1	
Horizontal Amplifier	175	175	30	75	5.5	7,200	7,700	—	—	—	25CD6-G 25CD6-GA¶
	60	100	0	230	21	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =6,600 volts; max screen dissipation =3.0 watts; max d-c cathode current =200 ma										
Horizontal Amplifier	175	175	30	75	5.5	7,200	7,700	—	—	—	25CD6-GB¶
	60	100	0	230	21	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =7,000 volts; max screen dissipation =3.0 watts; max d-c cathode current =200 ma										
TV Damper	Max d-c output current ◈ =350 ma; max peak inverse voltage ◈ =5,000 volts; max peak current ◈ =2,100 ma										25CG3¶ ■
TV Damper	Max d-c output current ◈ = 250 ma; max peak inverse voltage ◈ = 5,200 volts; max peak current ◈ = 1,200 ma.										25CK3¶
TV Damper	Max d-c output current◈ =400 ma; max peak inverse voltage◈ =5,500 volts; max peak current◈ =1,700 ma										25CM3¶
TV Damper	Max d-c output current ◈ = 250 ma; max peak inverse voltage ◈ = 5,000 volts; max peak current ◈ = 1,200 ma.										***25CT3***¶

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
¹, ², ³, etc. indicate tube sections.
⁑Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♠	Capacitance in Picofarads Input	Out-put	Grid-plate
25CU6	Beam Power Amplifier	6AM	T-X	25.0	0.3	11	600**‡**	200 2.5	15▲	7.0▲	0.6▲
25D4¶	Half-Wave High-Vacuum Rectifier	4CG	9–11, 9–41	25.0	0.3	5.5◈	Tube Voltage Drop: 22 volts at 250 ma d-c				
25D8-GT	Diode-Triode-Pentode	8AF	9–23	25.0	0.15	— —	100	100	Pentode Section Triode Section		
25DK3¶	Half-Wave High-Vacuum Recti-fier	9SG	9–117	25.0	0.45	9.0◈	Tube Voltage Drop: 16 volts at 400 ma d-c 25 volts at 800 ma d-c				
25DK4	Half-Wave High-Vacuum Rectifier	5BQ	5–3	25	0.15	—	Tube Voltage Drop: 19 volts at 200 ma d-c				
25DN6¶	Beam Power Amplifier	5BT	12–21	25.0	0.6	15	700**‡**	175 3.0	22▲	11.5▲	0.8▲
25DQ6	Beam Power Amplifier	6AM	T-X	25.0	0.3	15	550**‡**	175 2.5	15▲	7.0▲	0.55▲
25DQ6-A¶	Beam-Power Amplifier	6AM	12–51	25.0	0.3	18◈	770◈**‡**	220◈ 3.6◈	15▲	7.0▲	0.5▲
25DT5¶	Beam-Power Pentode	9HN	6–3	25.0	0.3	9.0◈	315◈	285◈ 2.0◈	12.5▲	4.9▲	0.57▲
25E5	Beam Power Amplifier	8GT	T-X	25	0.3	11	250	250 5.0	17.5▲	8.0▲	1.1▲
25EC6¶	Beam Power Amplifier	5BT	T-X	25	0.6	10◈	700◈**‡**	175◈ 4.0◈	24▲	10▲	0.6▲
25EH5	Power-Amplifier Pentode	7CV	5–3	25	0.3	5.5◈	150◈	130◈ 2.0◈	17▲	9.0▲	0.65▲
25F5	Beam Power Amplifier	7CV	5–3	25.0	0.15	4.5	135	117 1.0	12▲	8.0▲	0.44▲
25F5A¶	Beam Pentode	7CV	5–3	25	0.15	5.5◈	150◈	130◈ 1.1◈	12▲	8.0▲	0.44▲
25FY8	Triode-Pentode	9EX	6–4	25	0.3	8.0◈ 1.0◈	150◈ 150◈	150◈ 2.0◈ —	Pentode Section Triode Section		
25HX5	Beam Power Amplifier	9SB	T-X	25.0	0.3	14◈	400◈	300◈ 3.5◈	17.3▲	7.7▲	1.1▲
25JQ6¶	Beam Pentode with Integral Diode	9RA	6–4	25.2	0.3	10◈	425◈	330◈ 2.0◈	13▲	6.0▲	0.32▲
25JZ8¶■	Triode-Pentode	12DZ	9–58	25.2	0.3	7.0◈ 1.0◈	250◈ 250◈	200◈ 1.8◈ —	Pentode Section Triode Section		
25L6	Beam Power Amplifier	7AC	8–6	25.0	0.3	10	200	117 1.25	16.0	13.5	0.3
25L6-GT	Beam Power Amplifier	7AC	9–11 or 9–41	25.0	0.3	10	200	125 1.25	15▲	10▲	0.8▲
25N6-G	Direct-Coupled Power Amplifier	7W	12–3	25.0	0.3	8.5 1.1‖	180 180‖	—	—	—	—
25W4-GT	Half-Wave High-Vacuum Rectifier	4CG	9–11, 9–41	25.0	0.3	3.5	Tube Voltage Drop: 21 v at 250 ma d-c				

■ Compactron.
† Zero signal.
♠ Per section.
● See X-Radiation Warning, page 4.
‡ Plate-to-plate.
♣ Maximum.
‡ Supply voltage.
● Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
⊞ Absolute maximum rating.
\# Conversion transconductance.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load For Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	250	150	22.5	57	2.1	14,500	5,900	—	—	—	25CU6
	60	150	0	260	26	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =6,000 volts; max screen dissipation =2.5 watts; max d-c cathode current =110 ma										
TV Damper	Max d-c output current ◈ =155 ma; max peak inverse voltage ◈ =4,400 volts; max peak current ◈ =900 ma										25D4¶
Class A Amplifier	100	100	3.0	8.5	2.7	200,000	1,900	—	—	—	25D8-GT
Class A Amp	100	—	1.0	0.5	—	91,000	1,100	—	—	—	
TV Damper	Max d-c output current ◈ = 400 ma; max peak inverse voltage ◈ = 6,500 volts; max peak current ◈ = 1,200 ma.										25DK3¶
Half-Wave Rectifier	Max d-c output current ◈ =100 ma; max peak inverse voltage ◈ =330 volts; max RMS supply voltage ◈ =129 volts; max peak current ◈ =600 ma										*25DK4*
Horizontal Amplifier	125	125	18	70	6.3	4,000	9,000	—	—	—	25DN6¶
	50	100	0	240	30	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =6,600 volts; max screen dissipation = 3.0 watts; max d-c cathode current =200 ma										
Horizontal Amplifier	250	150	22.5	75	2.4	20,000	6,000	—	—	—	25DQ6
	60	150	0	300	27	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =6,000 volts; max screen dissipation = 2.5 watts; max d-c cathode current =120 ma										
Horizontal Amplifier	250	150	22.5	55	1.5	20,000	6,600	—	—	—	25DQ6-A¶
	60	150	0	315	25	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =6,000; max d-c cathode current ◈ =155 ma										
Vertical Amplifier	250	250	16.5	44	1.5	—	6,200	—	—	—	*25DT5*¶
	80	250	0	195	19	—	—	—	—	—	
	Max positive pulse plate voltage ▣ =2,200; max d-c cathode current ◈ =55 ma										
Horizontal Amplifier	100	100	8.2	100	7.0	5,000	14,000	—	—	—	25E5
	Max positive pulse plate voltage=7,000; max d-c cathode current=200 ma										
Horizontal Amplifier	135	135	22.5	70	4.5	4,700	7,500	—	—	—	25EC6¶
	60	135	0	350	40	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =7,000; max d-c cathode current ◈ =200 ma										
Class A Amplifier	110	115	R_k = 62	42†	11.5†	11,000	14,600	—	8,000	1.4	*25EH5*
Class A Amplifier	110	110	7.5	36†	3.0†	16,000	5,800	—	2,500	1.2	*25F5*
Class A Amplifier	110	110	7.5	43†	3.8†	13,000	6,400	—	2,500	1.5	*25F5A*¶
Class A Amplifier	125	125	13.5	50†	10†	—	7,500	—	2,000	2.7	*25FY8*
Class A Amp	125	—	1.5	2.5	—	—	2,000	—	—	—	
Vertical Amplifier	100	100	8.2	100	7.0	5,000	14,000	—	—	—	*25HX5*
	40	100	0	240	19	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,500 volts; max d-c cathode current ◈ = 220 ma.										
Vertical Amplifier	140	140	18	35	2.5	10,500	4,200	—	—	—	25JQ6¶
	40	120	0	150	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =2,000 volts; max d-c cathode current ◈ = 70 ma. Instantaneous diode-plate-to-cathode voltage drop for instantaneous diode-plate current of 2.0 ma =5.0 volts										
Vertical Amplifier	120	110	8.0	46	3.5	11,700	7,100	—	—	—	25JZ8¶ ■
	45	110	0	122	16.5	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 2,000 volts; max d-c cathode current = 70 ma.										
Vertical Oscillator	150	—	5.0	5.5	—	8,500	2,350	20	—	—	
	Max d-c cathode current ◈ = 20 ma.										
Class A Amplifier	200	110	8.0	50†	2.0†	30,000	9,500	—	3,000	4.3	**25L6**
	110	110	7.5	49†	4.0†	13,000	9,000	—	2,000	2.1	
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	25L6-GT
	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
Class A Amplifier	180	100‖	0	46	5.8 Input Plate	15,000	2,300	—	4,000	3.8	25N6-G
TV Damper	Max d-c output current =125 ma; max peak inverse voltage ▣ =3850 volts; max peak current =750 ma										25W4-GT

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♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.

✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads: Input	Output	Grid-plate
25W6-GT	Beam Power Amplifier	7AC	9–11 or 9–41	25.0	0.3	10 7.5	300 300	150 1.25 —	Pentode Connection Triode Connection (G_2 & P tied)		
25X6-GT	High-Vacuum Rectifier Doubler	7Q	9–11	25.0	0.15	—	Tube Voltage Drop:♠ 25 v at 120 ma d-c				
25Y5	High-Vacuum Rectifier Doubler	6E	12–5	25.0	0.3	—	—	—	—	—	—
25Z4	Half-Wave High-Vacuum Rectifier	5AA	8–1	25.0	0.3	—	Tube Voltage Drop: 20.5 v at 250 ma d-c				
25Z5	High-Vacuum Rectifier Doubler	6E	12–5	25.0	0.3	—	Tube Voltage Drop:♠ 22 v at 150 ma d-c				
25Z6 25Z6-GT	High-Vacuum Rectifier Doubler	7Q	8–6 9–11	25.0	0.3	—	Tube Voltage Drop:♠ 22 v at 150 ma d-c				
26	Medium-Mu Triode	4D	14–1	1.5	1.05	—	180	—	2.8	2.5	8.1
26A6	Remote-Cutoff RF Pentode	7BK	5–2	26.5	0.07	5.3	250	100 0.4	5.5	5.0	0.004 ♣
26A7-GT	Twin-Pentode Power Amplifier	8BU	9–33, 9–44	26.5	0.6	2.0♠	50	50 0.5	16.0▲	13.0▲	1.2▲
26C6	Duplex-Diode Medium-Mu Triode	7BT	5–2	26.5	0.07	2.5	250	—	1.8	1.4	2.0
26CG6	Remote-Cutoff Pentode	7BK	5–2	26.5	0.07	4.0	300	150 0.75	5.0	5.0	0.008 ♣
26D6	Pentagrid Converter	7CH♥	5–2	26.5	0.07	1.0	300	100 1.0	Osc I_{c1} = 0.5 ma R_{g1} = 20,000 ohms		
26E6-G	Beam Power Amplifier	7S	T-X	26.5	0.3	12.5	200	135 1.5	—	—	—
26HU5¶	Beam Power Amplifier	8NB	12–21	26.0	0.6	33◈	990§◈	250◈ 5.0◈	40▲	17▲	1.0▲
26LW6¶	Beam Power Amplifier	8NC	14–7	26	0.6	40◈	990§◈	280◈ 7.0◈	40▲	14.5▲	1.0▲
26LX6¶ ■	Beam Power Amplifier	12JA	12–136	26.0	0.6	33◈	990§◈	250◈ 5.0◈	40▲	17▲	1.0▲
26Z5	Full-Wave High-Vacuum Rectifier	9BS	6–2	26.5	0.2	—	Tube Voltage Drop:♠ 22 v at 100 ma d-c				
27	Medium-Mu Triode	5A	12–5	2.5	1.75	—	275	—	3.1	2.3	3.3
FG-27-A	Thyratron	FG-27-A	T-X	5.0	4.5	—	Anode Voltage Drop = 16 Volts Peak				
27GB5	Beam Power Amplifier	9NH	T-X	27	0.3	17◈	275◈	275◈ 6.0◈	—	—	—
27KG6	Beam Power Amplifier	9RJ	T-X	26.7	0.45	34◈	700§◈	250◈ 7.0◈	—	—	—
28D7	Twin Beam Power Amplifier	8BS	9–31	28.0	0.4	3.0♠	100	67.5 0.5	—	—	—
28GB5	Beam Power Amplifier	9NH	T-X	28	0.3	17◈	275◈	275◈ 6.0◈	—	—	—
28HA6	Pentode	9NW	6–4	28.6	0.15	8.0◈	300◈	250◈ 1.5◈	13▲	8.0▲	0.18▲
28HD5¶ ■	Beam Power Amplifier	12ES	12–59	28	0.45	24◈	770§◈	220◈ 6.0◈	—	—	—
28Z5	Full-Wave High-Vacuum Rectifier	6BJ	9–31	28.0	0.24	—	Tube Voltage Drop:♠ 40 v at 100 ma d-c				

■ Compactron.
† Zero signal.
♠ Per section.
‡ Plate-to-plate.
♣ Maximum.
§ Supply voltage.
● Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
⊞ Absolute maximum rating.
\# Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	25W6-GT
	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
Vertical Amplifier	225	—	30	22	—	1,600	3,800	6.2	—	—	
	Max positive pulse plate voltage ▣ = 1200; max d-c cathode current = 60 ma										
Rectifier or Doubler	Max d-c output current per plate = 60 ma; rms supply voltage per plate = 125 volts										25X6-GT
Rectifier or Doubler	Max d-c output current per plate = 42 ma; max peak inverse voltage = 700 volts; max rms supply voltage per plate = 250 volts										25Y5
Half-Wave Rectifier	Max d-c output current = 125 ma; max peak inverse voltage = 700 volts, max rms supply voltage = 235 volts; max peak current = 750 ma										**25Z4**
Rectifier or Doubler	Max d-c output current per plate = 75 ma; max peak inverse voltage = 700; max rms supply voltage per plate = 235; max peak current per plate = 450 ma										25Z5
Rectifier or Doubler	Max d-c output current per plate = 75 ma; max peak inverse voltage = 700; max rms supply voltage per plate = 235; max peak current per plate = 450 ma										**25Z6** 25Z6-GT
Class A Amplifier	180	—	14.5	6.2	—	7,300	1,150	8.3	—	—	26
Class A Amplifier	250	100	R_k = 125	10.5	4.0	1,000,000	4,000	—	—	—	*26A6*
	26.5	26.5	R_{g1} = 2 meg	1.7	0.7	250,000	2,000	—	—	—	
Class A Amplifier ♠	26.5	26.5	4.5	20†	1.9†	—	5,700	—	1,500	0.165	26A7-GT
Class A Amplifier	250	—	9.0	9.5	—	8,500	1,900	16	—	—	*26C6*
	26.5	—	R_g = 2 meg	1.1	—	15,500	1,100	17	—	—	
Class A Amplifier	250	150	8.0	9.0	2.3	720,000	2,000	—	—	—	*26CG6*
Converter	250	100	1.5	3.0	7.8	1,000,000	475 #	—	—	—	*26D6*
Class A Amplifier	200	135	14	61†	3.0†	18,000	7,100	—	2,600	6.0	26E6-G
Horizontal Amplifier	175	110	21	125	3.3	6,000	14,000	—	—	—	26HU5¶
	60	110	0	750	42	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 7,000 volts; max d-c cathode current ◈ = 400 ma.										
Horizontal Amplifier	250	250	56	125	4.2	6,700	12,000	—	—	—	26LW6¶
	60	110	0	650	37	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 7,500 volts; d-c cathode current ◈ = 400 ma.										
Horizontal Amplifier	175	110	21	125	3.3	6,000	14,000	—	—	—	26LX6¶ ■
	60	110	0	750	42	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 7,000 volts; max d-c cathode current ◈ = 400 ma.										
Full-Wave Rectifier	Max d-c output current per plate = 50 ma; max peak inverse voltage = 1250; rms supply voltage per plate = 325; max peak current per plate = 300 ma										*26Z5*
Class A Amp	250	—	21	5.2	—	9,250	975	9.0	—	—	27
Controlled Rectifier	Max d-c cathode current ▣ = 2.5 amperes; max peak inverse voltage ▣ = 1,000 volts; max peak cathode current ▣ = 10 amperes										FG-27-A
Horizontal Amplifier	75	200	10	440	37	(Instantaneous Values)					27GB5
	Max positive pulse plate voltage ◈ = 7,700; max d-c cathode current ◈ = 275 ma										
Horizontal Amplifier	160	160	0	1,400	45	—	—	(E_{c3} = 0 volts)			27KG6
	45	160	0	1,000	—	—	—				
	Max positive pulse plate voltage ◈ = 7,000; max d-c cathode current ◈ = 500 ma										
Class A Amplifier ♠	28	28	3.5	12.5†	1.0†	4,200	3,400	—	4,000	0.100	28D7
Horizontal Amplifier	75	200	10	440	37	(Instantaneous Values)					28GB5
	Max positive pulse plate voltage ◈ = 7,700; max d-c cathode current ◈ = 275 ma										
Class A Amplifier	150	100	R_k = 33	28	3.5	20,000	20,000	—	—	—	*28HA6*
	60	100	0	45	9.0	—	—	—	—	—	
Horizontal Amplifier	135	135	22	65	4.0	5,000	10,000	—	—	—	28HD5¶ ■
	60	135	0	540	48	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 7,000; max d-c cathode current ◈ = 280 ma										
Full-Wave Rectifier	Max d-c output current = 100 ma; max peak inverse voltage = 1250 volts; max rms supply voltage per plate = 325 volts; max peak current per plate = 300 ma										28Z5

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♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
29GK6¶	Beam Power Amplifier	9GK	6–4	28.6	0.15	13.2◈	330◈	330◈ 2.0◈	Single Tube		
									Two Tubes, Push-Pull		
									Two Tubes, Push-Pull		
29KQ6	Beam Power Amplifier	9RJ	T-X	29	0.3	17◈	275◈	275◈ 6.0◈	27▲	11▲	1.5▲
29LE6	Beam Power Amplifier	9RJ	T-X	29.0	0.3	20◈	275◈	275◈ 5.0◈	11▲	27▲	1.5▲
30	Medium-Mu Triode	4D	12–5, 9–26	2.0 DC	0.06	—	180	—	3.0▲	2.2▲	6.0▲
30AG11■	Duplex-Diode Twin Triode	12DA	9–56	30	0.15	2.0◈♠	330◈	—	Triode Sections		
									Diode Sections		
30CW5	Power Amplifier Pentode	9CV	6–4	30	0.15	14◈	275◈	220◈ 2.1◈	11.8▲	6.0▲	0.6♣▲
30HJ5¶■	Beam Pentode	12FL	12–59	30	0.45	24◈	770⁑◈	220◈ 6.0◈	—	—	—
30KD6¶ ■	Beam Power Amplifier	12GW	12–119	30	0.6	33▣	990⁑◈	200◈ 5.0◈	40▲	16▲	0.8▲
30JZ6■	Beam Power Amplifier	12GD	12–79	30.0	0.3	18◈	770⁑◈	220◈ 3.5◈	24▲	8.5▲	0.34▲
30MB6¶■	Beam Power Amplifier	12FY	T-X	30	0.45	35◈	990⁑◈	225◈ 7.0◈	35▲	17▲	0.5▲
31	Power-Amplifier Triode	4D	12–5	2.0 DC	0.13	—	180	—	3.5	2.7	5.7
31AL10¶ ■	Dissimilar-Double Triode Pentode	12HR	9–59	31.5	0.315	7.0◈	250◈	200◈ 1.8◈	Pentode Section		
						1.25◈	330◈	—	Triode Section 1 (pins 9, 10, 11)		
						1.0◈	250◈	—	Triode Section 2 (pins 2, 3, 7)		
31JS6-A¶ ■	Beam Power Amplifier	12FY	12–89	31.5	0.45	28◈	990⁑◈	190◈ 5.5◈	24▲	10▲	0.7▲

■ Compactron.
† Zero signal.
♠ Per section.
‡ Plate-to-plate.
♣ Maximum.
⁑ Supply voltage.
● Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
▣ Absolute maximum rating.
Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250	250	7.3	48†	5.5†	38,000	11,300	—	5,200	5.7	*29GK6*¶
Class AB Amplifier	300	300	R_k = 130	72†	8.0†	—	—	—	8,000‡	17	
	250	250	R_k = 130	62†	7.0†	—	—	—	8,000‡	11	
	300	300	14.7	15†	1.6†	—	—	—	8,000‡	17	
Class AB Amplifier	250	250	11.6	20†	2.2†	—	—	—	8,000‡	11	
Horizontal Amplifier	50	200	12	550	50	(E_{c3} = 0 volts)		—	—	—	29KQ6
	40	135	0	450	35	(E_{c3} = 0 volts)		—	—	—	
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 275 ma										
Horizontal Amplifier	40	135	0	450	35	—	—	—	—	—	29LE6
	50	200	12	550	50	—	—	—	—	—	
Class A Amplifier	180	—	13.5	3.1	—	10,300	900	9.3	—	—	30
Class A Amplifier ♠ Detector ♠	125	—	1.0	7.5	—	8,500	7,800	66	—	—	30AG11■
	Max d-c output current ◈ =5.0 ma										
Class A Amplifier	170	170	12.5	70†	3.5†	26,000	11,000	—	2,400	5.6	*30CW5*
Horizontal Amplifier	135	135	22	80	5.5	5,000	10,000	(b.p. connected to k at socket)			30HJ5¶■
	60	135	0	540	48	—	—				
	Max positive pulse plate voltage ◈ =7,000; max d-c cathode current ◈ =280 ma										
Horizontal Amplifier	150	110	22.5	100	2.0	6,000	14,000	(b.p. connected to k at socket)			30KD6¶■
	45	160	0	1,100	110	—	—				
	Max positive pulse plate voltage ◈ =7,000; max d-c cathode current ◈ = 400 ma										
Horizontal Amplifier	130	130	20	46	1.8	9,900	9,000	—	—	—	30JZ6■
	50	130	0	450	29	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500 volts; max d-c cathode current ◈ = 230 ma.										
Horizontal Amplifier	150	110	20	110	2.0	5,000	14,000	—	—	—	30MB6¶■
	60	110	0	660	42	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 8,000 volts; max d-c cathode current ◈ = 400 ma.										
Class A Amplifier	180	—	30	12.3†	—	3,600	1,050	3.8	5,700	0.375	31
Vertical Amplifier	120	110	8.0	46	3.5	11,700	7,100	—	—	—	31AL10¶■
	45	110	0	122	16.5	—	—	—	—	—	
	Max positive pulse plate voltage = 2,000 volts; max d-c cathode current = 70 ma.										
Sync. Separator	150	—	2.0	5.4	—	11,000	3,900	43	—	—	
Vertical Oscillator	150	—	5.0	5.5	—	8,500	2,350	20	—	—	
	Max d-c cathode current ◈ = 20 ma.										
Horizontal Amplifier	175	125	25	125	4.5	5,600	11,300	(b.p. connected to k at socket)			31JS6-A¶■
	62	120	0	570	34	—	—				
	Max positive pulse plate voltage ◈ =7,500; max d-c cathode current ◈ = 315 ma										

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
31JS6-C¶ ■	Beam Power Amplifier	12FY	12–89	31.5	0.45	30◈	990‡◈	220◈ 5.5◈	24▲	10▲	0.7▲
31LQ6¶	Beam Power Amplifier	9QL	12–117	31.0	0.45	30◈	990‡◈	220◈ 5.0◈	22▲	11▲	0.56▲
31LR8¶	Triode-Pentode	9QT	12–65 or 12–96	31.5	0.3	14◈	400◈	300◈ 2.75◈	Pentode Section		
						2.5◈	400◈	—	Triode Section		
31LZ6¶	Beam Power Amplifier	9QL	12–117	31	0.45	30◈	990‡◈	220◈ 5.0◈	22▲	11▲	0.6▲
32	Sharp-Cutoff RF Tetrode	4K	14–2	2.0 DC	0.06	—	180	67.5	5.3▲	10.5▲	0.015
32ET5	Beam-Power Amplifier	7CV	5–3	32.0	0.1	5.4◈	150◈	130◈ 1.2◈	12▲	6.0▲	0.6▲
32ET5-A¶	Beam-Power Amplifier	7CV	5–3	32.0	0.1	5.4◈	150◈	130◈ 1.2◈	12▲	6.0▲	0.6▲
32HQ7¶ ■	Diode-Pentode	12HT	12–56	32.6	0.315	7.0◈	400‡◈	150◈ 3.0◈	Pentode Section		
						3.8◈	Tube Voltage Drop: 16 volts at 200 ma d-c		Diode Section		
32L7-GT	Half-Wave Rectifier Beam Power Amplifier	8Z	9–11	32.5	0.3	— —	90	90	—	—	—
FG-32	Half-Wave Mercury-Vapor Rectifier same as 5558	—	—	—	—	—	—	—	—	—	—
33	Power-Amplifier Pentode	5K	14–1	2.0 DC	0.26	—	180	180	8.0	12.0	1.0
A33	Photoconductive Cell	—	T-X	—	—	0.01⊡	30⊡	—	—	—	—
33GT7¶ ■	Diode-Pentode	12FC	12–56	33.6	0.45	9.0◈	400‡◈	150◈ 2.5◈	Pentode Section		
						3.5◈	Tube Voltage Drop: 21 volts at 250 ma d-c		Diode Section		
33GY7¶ ■	Diode-Pentode	12FN	12–56	33.6	0.45	9.0◈	400‡◈	150◈ 3.0◈	Pentode Section		
						3.8◈	Tube Voltage Drop: 21 volts at 250 ma d-c		Diode Section		

■ Compactron.
† Zero signal.
♣ Per section.
‡ Plate-to-plate.
♣ Maximum.
‡ Supply voltage.
● Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
⊡ Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load For Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	175 60	125 125	25 0	130 600	2.8 32	5,500 —	11,500 —	— —	(b.p. connected to k at socket)		31JS6-C¶ ■
	Max positive pulse plate voltage ◈ = 7,500 volts; max d-c cathode current ◈ = 350 ma.										
Horizontal Amplifier	175 60	145 145	35 0	95 710	2.4 55	7,000 —	7,500 —	(E_{c3} = 30 volts) —	— —	— —	31LQ6¶
	Max positive pulse plate voltage ◈ = 7,500 volts; max d-c cathode current ◈ = 350 ma.										
Class A Amplifier	135	120	10	56	3.0	12,000	9,300	—	—	—	31LR8¶
Class A Amplifier	250	—	4.0	2.3	—	16,000	3,600	58	—	—	
Horizontal Amplifier	175 55	125 125	25 0	140 800	2.0 56	6,000 —	11,000 —	— —	— —	— —	31LZ6¶
	Max positive pulse plate voltage ◈ = 7,500 volts; d-c cathode current ◈ = 350 ma.										
Class A Amplifier	180	67.5	3.0	1.7	0.4	1,200,000	650	—	—	—	32
Class A Amplifier	110	110	7.5	30†	2.8†	21,500	5,500	—	2,800	1.2	*32ET5*
Class A Amplifier	110	110	7.5	30†	2.8†	21,500	5,500	—	2,800	1.2	*32ET5-A*¶
Horizontal Amplifier	**110** **50**	**110** **110**	**22.5** **0**	**42** **240**	**2.4** **19**	**8,400** —	**4,500** —	— —	— —	— —	**32HQ7¶ ■**
	Max positive pulse plate voltage ◈ = 4,000 volts; max d-c cathode current ◈ = 125 ma.										
TV Damper	**Max d-c output current ◈ = 120 ma; max peak inverse voltage ◈ = 3,300 volts; max peak current = 600 ma.**										
Class A Amplifier {	90 90	90 90	7.0 5.0	27† 38†	2.0† 3.0†	17,000 15,000	4,800 6,000	— —	2,600 2,600	1.0 0.8	32L7-GT
Half-Wave Rectifier	Max d-c output current =60 ma; max rms supply voltage =125 v										
	—	—	—	—	—	—	—	—	—	—	
Class A Amplifier	180	180	18	22†	5.0†	55,000	1,700	—	6,000	1.4	33
Control	Spectral Response =5,500 angstrom units; maximum current ▣ =10 milliamperes										A33
Horizontal Amplifier	130 60	130 130	22.5 0	48 320	2.9 22	10,000 —	6,500 —	— —	— —	— —	33GT7¶ ■
	Max positive pulse plate voltage ◈ =3,500; max d-c cathode current ◈ =140 ma										
TV Damper	Max d-c output current ◈ =125 ma; max peak inverse voltage ◈ =2,500 volts; max peak current ◈ =750 ma										
Horizontal Amplifier	130 60	130 130	22.5 0	48 320	2.9 22	10,000 —	6,500 —	— —	— —	— —	33GY7¶ ■
	Max positive pulse plate voltage ◈ =5,000; max d-c cathode current ◈ = 155 ma										
TV Damper	Max d-c output current ◈ =135 ma; max peak inverse voltage ◈ =4,200 volts; max peak current ◈ =810 ma										

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✚	Capacitance in Picofarads Input	Out-put	Grid-plate
33GY7-A¶ ■	Diode-Pentode	12FN	12–56	33.6	0.45	9.0◈ 3.8◈	400‡◈	150◈ 3.0◈	Pentode Section Diode Section		
							Tube Voltage Drop: 21 volts at 250 ma d-c				
33HE7¶■	Diode-Pentode	12FS	12-57	33.6	0.45	10◈	500‡◈	150◈ 3.5◈	Pentode Section Diode Section		
							Tube Voltage Drop: 21 volts at 350 ma d-c				
33JR6¶	Beam Power Amplifier	9QU	12–96	33.0	0.3	17◈	770‡◈	220◈ 3.5◈	22▲	9.0▲	0.7▲
33JV6¶■	Beam Power Amplifier	12FK	12–58	33	0.3	18◈	770‡◈	220◈ 3.5◈	22▲	9.0▲	0.4▲
34	Remote-Cutoff RF Pentode	4M	14–2	2.0 DC	0.06	—	180	67.5	6.0▲	11.0▲	0.015♣
34CD3¶■	Half-Wave, High-Vacuum Rectifier	12FX	9–62	34.5	0.45	12◈	Tube Voltage Drop: 18 volts at 350 ma d-c				
34CE3¶■	Half-Wave, High-Vacuum Rectifier	12GK	9–62	34.5	0.45	—	Tube Voltage Drop: 20 volts at 680 ma d-c				
34CM3¶	Half-Wave, High-Vacuum Rectifier	9HP	T-X	33.5	0.45	12◈	Tube Voltage Drop: 10 volts at 350 ma d-c				
34GD5 *34GD5-A*¶	Beam-Power Amplifier	7CV	5–3	34.0	0.1	5.0◈	150◈	130◈ 1.1◈	12.0▲	9.0▲	0.6▲
34R3	Half-Wave, High-Vacuum Rectifier	9CB	6–8	34	0.15	—	Tube Voltage Drop: 16.3 volts at 150 ma d-c				
A35	Photoconductive Cell	—	T-X	—	—	0.05▣	50▣	—	—	—	—
35/51	Remote-Cutoff RF Tetrode	5E	14–2	2.5	1.75	—	275	90	5.3▲	10.5▲	0.007♣
35A5	Beam Power Amplifier	6AA	9–31	35.0	0.15	8.5	200	125 1.0	—	—	—
35B5	Beam Power Amplifier	7BZ	5–3	35.0	0.15	4.5	117	117 1.0	11▲	6.5▲	0.4▲
35C5 *35C5-A*¶	Beam Power Amplifier	7CV	5–3	35.0	0.15	5.2◈	150◈	130◈ 1.1◈	12▲	9.0▲	0.6▲
35CD6-GA¶	Beam Power Amplifier	5BT	12–21	35.0	0.45	20	700‡	175 3.0	22▲	8.5▲	1.1▲
35DZ8	Triode-Pentode	9JE	T-X	35.0	0.15	6.5 0.75	150 150	135 1.5 —	Pentode Section Triode Section		
35EH5 *35EH5-A*¶	Beam-Power Amplifier	7CV	5–3	35.0	0.15	5.0◈	150◈	130◈ 1.75◈	17▲	9.0▲	0.65▲
35GL6	Beam-Power Amplifier	7FZ	5–3	35.0	0.15	5.5◈	150◈	130◈ 1.1◈	14▲	9.5▲	0.5▲
35HB8	Triode-Pentode	9ME	6–3	35.0	0.15	6.5◈ 0.75◈	150◈ 150◈	135◈ 1.5◈ —	Pentode Section Triode Section		
35L6-GT	Beam Power Amplifier	7AC	9–11 or 9–41	35.0	0.15	8.5	200	125 1.0	—	—	—
35LR6¶ ■	Beam Power Amplifier	12FY	12–90	35	0.45	30◈	990‡◈	220◈ 5.0◈	33▲	12▲	0.47▲
35W4 *35W4-A*¶	Half-Wave High-Vacuum Rectifier	5BQ	5–3	35.0	0.15	—	Tube Voltage Drop: 18 v at 200 ma d-c				

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ‡ Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load For Rated Output, Ohms	Power Output, Watts	Tube Type
Horizontal Amplifier	130	130	22.5	48	2.9	—	6,500	—	—	—	33GY7-A¶■
	60	130	0	320	22	—	—	—	—	—	
	50	130	0	315	20	—	—	—	—	—	
	Max positive pulse plate voltage ◈ =5,000; max d-c cathode current ◈ = 155 ma										
TV Damper	Max d-c output current ◈ =135 ma; max peak inverse voltage ◈ =4,200 volts; max peak current ◈ =810 ma										
Horizontal Amplifier	130	130	22	60	2.8	6,200	8,800	—	—	—	33HE7¶■
	50	130	0	450	40	—	—	—	—	—	
	Max positive pulse plate voltage = 5,000 volts; max d-c cathode current = 230 ma.										
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 4,200 volts; max peak current ◈ = 1,200 ma.										
Horizontal Amplifier	130	125	20	45	1.5	18,000	7,000	—	—	—	33JR6¶
	50	125	0	470	32	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 6,500 volts; max d-c cathode current ◈ = 275 ma.										
Horizontal Amplifier	130	130	20	50	1.75	11,000	9,100	(b.p. connected to k at socket)			33JV6¶■
	60	130	0	410	24	—	—				
	Max positive pulse plate voltage ◈ =6,000; max d-c cathode current ◈ = 230 ma										
Class A Amplifier	180	67.5	3.0	2.8	1.0	1,000,000	620	—	—	—	34
TV Damper	Max d-c output current ◈ =350 ma; max peak inverse voltage ◈ =6,000 volts; max peak current ◈ =1,500 ma										34CD3¶■
TV Damper	Max d-c output current ◈ =350 ma; max peak inverse voltage ◈ =6,000 volts; max peak current ◈ =1,500 ma										34CE3¶■
TV Damper	Max d-c output current◈ =400 ma; max peak inverse voltage◈ =5,500 volts; max peak current◈ =1,700 ma										6CM3
Class A Amplifier	110	110	7.5	35†	3.0†	13,000	5,700	—	2,500	1.4	*34GD5* *34GD5-A*¶
TV Damper	Max d-c output current =150 ma; max peak inverse voltage =4,500 volts; max peak current =450 ma										*34R3*
Control	Spectral Response =5,500 angstrom units; maximum current ◙ =10 milliamperes										A35
Class A Amplifier	250	90	3.0	6.5	2.5♣	400,000	1,050	—	—	—	35/51
Class A Amplifier	200	125	R_k = 180	43†	2.0†	34,000	6,100	—	5,000	3.0	35A5
	110	110	7.5	40†	3.0†	14,000	5,800	—	2,500	1.5	
Class A Amplifier	110	110	7.5	40†	3.0†	—	5,800	—	2,500	1.5	*35B5*
Class A Amplifier	110	110	7.5	40†	3.0†	—	5,800	—	2,500	1.5	*35C5* *35C5-A*¶
Horizontal Amplifier	175	175	30	75	5.5	7,200	7,700	—	—	—	35CD6-GA¶
	60	100	0	230	21	—	—	—	—	—	
	Max positive pulse plate voltage ◙ =7,000 volts; max screen dissipation =3.0 watts; max d-c cathode current =200 ma										
Class A Amplifier	145	120	R_k = 180	45†	6.0†	—	7,500	—	2,500	2.0	*35DZ8*
Class A Amp	120	—	R_k = 1500	0.8	—	—	1,400	100	—	—	
Class A Amplifier	110	115	R_k = 62	32†	7.2†	14,000	12,000	—	3,000	1.2	*35EH5* *35EH5-A*¶
Class A Amplifier	110	110	7.5	45†	3.0†	12,000	7,500	—	2,500	1.8	*35GL6*
Class A Amplifier	115	115	R_k = 150	33†	7.5†	—	6,250	—	3,500	1.0	*35HB8*
Class A Amplifier	115	—	R_k = 410	2.5	—	—	3,900	74	—	—	
Class A Amplifier	200	125	R_k = 180	43†	2.0†	34,000	6,100	—	5,000	3.0	35L6-GT
	110	110	7.5	40†	3.0†	14,000	5,800	—	2,500	1.5	
Horizontal Amplifier	175	110	20	140	2.4	5,300	16,000	(b.p. connected to k at socket)			35LR6¶■
	60	110	0	700	35	—	—				
	Max positive pulse plate voltage◙ =7,500; max d-c cathode current◈ =350 ma										
Half-Wave Rectifier	Max d-c output current ◈ =110 ma; max peak inverse voltage ◈ =360 volts; rms supply voltage= 117 volts; max peak current ◈ =660 ma. With panel lamp No. 40 or No. 47 between pins 4 and 6 and no shunting resistor, max d-c output current ◈ =66 ma. With panel lamp and 250 ohm shunting resistor (max), max d-c output ◈ = 100 ma										*35W4* *35W4-A*¶

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

♣ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Out-put	Grid-plate
35Y4	Half-Wave High-Vacuum Rectifier	5AL	9–31	35.0	0.15	—	Tube Voltage Drop: 18 v at 200 ma d-c				
35Z3	Half-Wave High-Vacuum Rectifier	4Z	9–31	35.0	0.15	—	Tube Voltage Drop: 18 v at 200 ma d-c				
35Z4-GT	Half-Wave High-Vacuum Rectifier	5AA	9–11	35.0	0.15	—	Tube Voltage Drop: 18 v at 200 ma d-c				
35Z5-GT	Half-Wave High-Vacuum Rectifier	6AD	9–11 or 9–41	35.0	0.15	—	Tube Voltage Drop: 18 v at 200 ma d-c				
35Z6-G	High-Vacuum Rectifier Doubler	7Q	14–3	35.0	0.3	—	Tube Voltage Drop:♦ 20 v at 220 ma d-c				
36	Sharp-Cutoff RF Tetrode	5E	12–6	6.3	0.3	0.8	250	90.0 0.16	3.8▲	9.0▲	0.007 ♣
36AM3	Half-Wave High-Vacuum Rectifier	5BQ	5–3	36	0.1	—	Tube Voltage Drop: 20 volts at 150 ma d-c				
36AM3-A	Half-Wave High-Vacuum Rectifier	5BQ	5–3	36	0.1	—	Tube Voltage Drop: 16 volts at 150 ma				
36AM3-B¶	Half-Wave High-Vacuum Rectifier	5BQ	5–3	36	0.1	—	Tube Voltage Drop: 16 volts at 150 ma				
36KD6¶ ■	Beam Power Amplifier	12GW	12–118	36	0.45	33▣	990⁑◈	200◈ 5.0◈	40▲	16▲	0.8▲
36MC6¶	Beam Power Amplifier	9QL	T-X	36	0.45	33◈	990⁑◈	250◈ 5.0◈	40▲	16▲	1.0▲
37	Medium-Mu Triode	5A	12–5	6.3	0.3	—	250	—	3.5	2.9	2.0
38	Power-Amplifier Pentode	5F	12–6	6.3	0.3	—	250	250	3.5	7.5	0.30
38HE7¶■	Diode-Pentode	12FS	12–57	37.8	0.45	10◈	500⁑◈	150◈ 3.5◈	Pentode Section		
									Diode Section		
							Tube Voltage Drop: 21 volts at 350 ma d-c				
38HK7¶ ■	Diode-Pentode	12FS	12–57	37.8	0.45	10◈	500⁑◈	150◈ 3.5◈	Pentode Section		
									Diode Section		
							Tube Voltage Drop: 16 volts at 350 ma d-c				
39/44	Remote-Cutoff RF Pentode	5F	12–6	6.3	0.3	1.5	250	90 0.15	3.8▲	10.0▲	0.007 ♣
40	Medium-Mu Triode	4D	14–1	5.0 DC	0.25	—	180	—	2.8	2.2	2.0
40FR5¶	Beam-Power Amplifier	7CV	5–3	40.0	0.1	5.2◈	150◈	130◈ 1.2◈	12▲	9.0▲	0.3▲
40KD6¶ ■	Beam Power Amplifier	12GW	12–119	40	0.45	33▣	990⁑◈	200◈ 5.0◈	40▲	16▲	0.8▲
40KG6	Beam Power Amplifier	9RJ	T-X	40	0.3	34◈	700⁑◈	250◈ 7.0◈	—	—	—

■Compactron. † Zero signal. ♦Per section. ‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage. ●Subminiature type. ▲Without external shield. ◈Design maximum rating. ⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Half-Wave Rectifier	Max d-c output current = 100 ma; max peak inverse voltage = 700 volts; max rms supply voltage = 235 volts; max peak current = 600 ma. With panel lamp No. 40 or No. 47 between pins 1 and 4 and no shunting resistor, max d-c output current = 60 ma With panel lamp and 250 ohm shunting resistor (max), max d-c output = 90 ma										35Y4
Half-Wave Rectifier	Max d-c output current = 100 ma; max peak inverse voltage = 700 volts; rms supply voltage = 235 volts, max peak current = 600 ma										35Z3
Half-Wave Rectifier	Max d-c output current = 100 ma; max peak inverse voltage = 700 volts; max rms supply voltage = 235 volts; max peak current = 600 ma										35Z4-GT
Half-Wave Rectifier	Max d-c output current = 100 ma; max peak inverse voltage = 700 volts; max rms supply voltage = 235 volts; max peak current = 600 ma With panel lamp No. 40 or No. 47 between pins 2 and 3 and no shunting resistor, max d-c output current = 60 ma With panel lamp and 250 ohm shunting resistor (max), max d-c output = 90 ma										35Z5-GT
Rectifier or Doubler	Max d-c output current per plate = 110 ma; max peak inverse voltage = 700; max rms supply voltage per plate = 235; max peak current per plate = 660 ma										35Z6-G
Class A Amplifier	250	90	3.0	3.2	1.7♣	550,000	1,080	—	—	—	36
Half-Wave Rectifier	Max d-c output current ◈ = 82 ma; max peak inverse voltage ◈ = 365 volts; max RMS supply voltage ◈ = 129 volts; max peak current ◈ = 530 ma										*36AM3*
Half-Wave Rectifier	Max d-c output current ◈ = 82 ma; max peak inverse voltage ◈ = 365 volts; max RMS supply voltage ◈ = 129 volts; max peak current ◈ = 530 ma										*36AM3-A*
Half-Wave Rectifier	Max d-c output current ◈ = 82 ma; max peak inverse voltage ◈ = 365 volts; max RMS supply voltage ◈ = 129 volts; max peak current per plate ◈ = 580 ma										*36AM3-B*¶
Horizontal Amplifier	150	110	22.5	100	2.0	6,000	14,000	(b.p. connected to k at socket)			36KD6¶ ■
	45	160	0	1,100	110	—	—				
	Max positive pulse plate voltage ◙ = 7,000; max d-c cathode current ◈ = 400 ma										
Horizontal Amplifier	175	125	25	150	2.8	5,800	9,600	—	—	—	36MC6¶
	55	125	0	580	40	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 8,000 volts; d-c cathode current ◈ = 400 ma.										
Class A Amplifier	250	—	18	7.5	—	8,400	1,100	9.2	—	—	37
Class A Amplifier	250	250	25	22	3.8	100,000	1,200	—	10,000	2.5	38
Horizontal Amplifier	130	130	22	60	2.8	6,200	8,800	—	—	—	38HE7¶ ■
	50	130	0	450	40	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 5,000; max d-c cathode current ◈ = 230 ma										
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 4,200; max peak current ◈ = 1,200 ma										
Horizontal Amplifier	130	130	22	60	2.8	6,200	8,800	—	—	—	38HK7¶ ■
	50	130	0	450	40	—	—	—	—	—	
	Max positive pulse plate voltage ◈ = 5,000; max d-c cathode current ◈ = 230 ma										
TV Damper	Max d-c output current ◈ = 200 ma; max peak inverse voltage ◈ = 3,700; max peak current ◈ = 1,200 ma										
Class A Amplifier	250	90	3.0*	5.8	1.4	1,000,000	1,050	—	—	—	39/44
Class A Amplifier	180	—	3.0	0.2	—	150,000	200	30	250,000	—	40
Class A Amplifier	110	110	7.5	32†	3.0†	20,000	6,000	—	2,800	1.5	*40FR5*¶
	115	115	R_k = 180	34†	3.2†	—	—	—	3,200	1.3	
Horizontal Amplifier	150	110	22.5	100	2.0	6,000	14,000	(b.p. connected to k at socket)			40KD6¶ ■
	45	160	0	1,100	110	—	—				
	Max positive pulse plate voltage ◈ = 7,000; max d-c cathode current ◈ = 400 ma										
Horizontal Amplifier	160	160	0	1,400	45	—	—	(E_{c3} = 0 volts)			40KG6
	45	160	0	1,000	—	—	—				
	Max positive pulse plate voltage ◈ = 7,000; max d-c cathode current ◈ = 500 ma										

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♦G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
♣Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✤	Capacitance in Picofarads		
									Input	Output	Grid-plate
41	Power-Amplifier Pentode	6B	12–5	6.3	0.4	8.5	315	285 2.8	—	—	—
42	Power-Amplifier Pentode	6B	14–1	6.3	0.7	11	375	285 3.75	—	—	—
42KN6¶ ■	Beam Power Amplifier	12GU	12–82	42	0.45	30◈	770§◈	220◈ 5.0◈	44▲	18▲	1.0▲
43	Power-Amplifier Pentode	6B	14–1	25.0	0.3	5.3	160	135 1.9	8.5	12.5	0.2
45	Power-Amplifier Triode	4D	14–1	2.5	1.5	10	275	—	4.0	3.0	7.0
45B5	Power Amplifier Pentode	9CV	6–4	45	0.1	14◈	275◈	220◈ 2.1◈	Single Tube Two Tubes Push-Pull		
45Z3	Half-Wave High-Vacuum Rectifier	5AM	5–2	45.0	0.075	—	Tube Voltage Drop: 23 v at 130 ma d-c				
45Z5-GT	Half-Wave High-Vacuum Rectifier	6AD	9–11	45.0	0.15	—	Tube Voltage Drop: 16 v at 200 ma d-c				
46	Dual-Grid Power-Amplifier	5C	16–1	2.5	1.75	10	400	—	Single tube (G_2 & P tied)		
B46	Photoconductive Cell	—	T-X	—	—	0.12▣	60▣	—	—	—	—
47	Power-Amplifier Pentode	5B	16–1	2.5	1.75	—	250	250	8.6	13.0	1.2
48	Power-Amplifier Tetrode	6A	16–1	30.0 DC	0.4	—	125	100	—	—	—
49	Dual-Grid Power-Amplifier	5C	14–1	2.0 DC	0.12	—	135	—	Single tube (G_2 & P tied)		
50	Power-Amplifier Triode	4D	T-X	7.5	1.25	25	450	—	4.2	3.4	7.1
50A5	Beam Power Amplifier	6AA	9–31	50.0	0.15	10	200	125 1.25	—	—	—
50AX6-G	Full-Wave High-Vacuum Rectifier	7Q	14–3	50.0	0.3	—	Tube Voltage Drop:♠ 21 v at 250 ma d-c				
50B5	Beam Power Amplifier	7BZ	5–3	50.0	0.15	6.0	135	117 1.25	13.0▲	8.5▲	0.6▲
50BK5	Beam Power Amplifier	9BQ	6–3	50.0	0.15	9.0	250	250 2.5	13▲	5.0▲	0.6▲
50BM8	Triode-Pentode	9EX	6–4	50	0.1	7.0 1.0	250 250	250 1.8 —	Pentode Section Triode Section		
50C5 *50C5-A*¶	Beam Power Amplifier	7CV	5–3	50.0	0.15	7.0◈	150◈	130◈ 1.4◈	13.0▲	8.5▲	0.6▲
50C6-G 50C6-GA	Beam Power Amplifier	7AC	14–3 12-16	50	0.15	12.5	200	200§ 1.75	—	—	—
50CA5	Beam Power Amplifier	7CV	5–3	50.0	0.15	5.0	130	130 1.4	15▲	9.0▲	0.5▲
50DC4	Half-Wave High-Vacuum Rectifier	5BQ	5–3	50.0	0.15	—	Tube Voltage Drop: 21 volts at 240 ma d-c				
50E5	Beam Power Amplifier	8GT	T-X	50	0.15	11	250	250 5.0	17.5▲	8.0▲	1.1▲
50EH5 *50EH5-A*¶	Power-Amplifier Pentode	7CV	5–3	50	0.15	5.5◈	150◈	130◈ 2.0◈	17▲	9.0▲	0.65▲
50FA5¶	Beam-Power Amplifier	7CV	5–3	50.0	0.1	5.2◈	150◈	130◈ 1.1◈	11▲	8.5▲	0.28▲

■Compactron.
† Zero signal.
♠Per section.
‡ Plate-to-plate.
♣Maximum.
§ Supply voltage.
●Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250	250	18	32†	5.5†	90,000	2,300	—	7,600	3.4	41
Class A Amplifier	285	285	20	38†	7.0†	78,000	2,550	—	7 000	4.8	42
Horizontal Amplifier	130 60	130 125	20 0	100 800	4.0 50	4,000 —	16,000 —	(b.p. connected to k at socket)			42KN6¶ ■
	Max positive pulse plate voltage ◈ = 6,500; max d-c cathode current ◈ = 400 ma										
Class A Amplifier	160	120	18	33†	6.5†	42,000	2,375	—	5,000	2.2	43
Class A Amplifier	275	—	56	36†	—	1,700	2,050	3.5	4,600	2.0	45
Class A Amplifier	200	200	17.3	60†	4.1†	28,000	8,800	—	2,400	5.2	*45B5*
Class AB Amplifier	170	170	R_k = 120	113†	6.0†	—	—	—	3,500‡	13	
Half-Wave Rectifier	Max d-c output current = 65 ma; max peak inverse voltage = 350 v; max rms supply voltage = 117 volts; max peak current = 390 ma										*45Z3*
Half-Wave Rectifier	Max d-c output current = 100 ma; max peak inverse voltage = 700 volts; max rms supply voltage = 235 volts; max peak current = 600 ma With panel lamp No. 40 or No. 47 between pins 2 and 3 and no shunting resistor, max d-c output current = 60 ma With panel lamp and 250 ohm shunting resistor (max), max d-c output = 90 ma										45Z5-GT
Class A Amplifier	250	—	33	22†	—	2,380	2,350	5.6	6,400	1.25	46
Control	Spectral Response = 6,100 angstrom units; maximum current ◉ = 20 milliamperes										B46
Class A Amplifier	250	250	16.5	31†	6.0†	60,000	2,500	—	7,000	2.7	47
Class A Amplifier	125	100	20	56	9.5	—	3,900	—	1,500	2.5	48
Class A Amplifier	135	—	20	6.0	—	4,175	1,125	4.7	11,000	0.170	49
Class A Amp	450	—	84	55	—	1,800	2,100	3.8	4,350	4.6	50
Class A Amplifier	200 110	125 110	R_k = 180 7.5	46† 49†	2.2† 4.0†	28,000 13,000	8,000 8,000	— —	4,000 2,000	3.8 2.1	50A5
Full-Wave Rectifier	Max d-c output current = 250 ma; max peak inverse voltage = 1250 volts; rms supply voltage per plate = 350 volts; max peak current per plate = 600 ma										50AX6-G
TV Damper	Max d-c output current per plate = 125 ma; max peak inverse voltage = 2000 volts; max peak current per plate = 600 ma										
Class A Amplifier	120	110	8.0	49†	4.0†	10,000	7,500	—	2,500	2.3	*50B5*
Class A Amplifier	250	250	5.0	35†	3.5†	100,000	8,500	—	6,500	3.5	*50BK5*
Class A Amplifier	200	200	16	35	7.0	20,000	6,400	—	5,600	3.5	*50BM8*
Class A Amp	100	—	0	3.5	—	—	2,500	70	—	—	
Class A Amplifier	120	110	8.0	49†	4.0†	10,000	7,500	—	2,500	2.3	*50C5* *50C5-A* ¶
Class A Amplifier	135 200	135 135	13.5 14	58† 61†	3.5† 2.2†	9,300 18,300	7,000 7,100	— —	2,000 2,600	3.6 6.0	50C6-G 50C6-GA
Class A Amplifier	125 110	125 110	4.5 4.0	37† 32†	4.0† 3.5†	15,000 16,000	9,200 8,100	— —	4,500 3,500	1.5 1.1	*50CA5*
Half-Wave Rectifier	Max d-c output current ◈ = 120 ma; max peak inverse voltage ◈ = 330 volts; max rms supply voltage ◈ = 117 volts; max peak current ◈ = 720 ma. With panel lamp No. 40 or No. 47 between pins 1 and 4 and no shunting resistor, max d-c output current ◈ = 70 ma										*50DC4*
Horizontal Amplifier	100	100	8.2	100	7.0	5,000	14,000	—	—	—	50E5
	Max positive pulse plate voltage = 7,000; max d-c cathode current = 200 ma										
Class A Amplifier	110	115	R_k = 62	42†	11.5†	11,000	14,600	—	8,000	1.4	*50EH5* *50EH5-A* ¶
Class A Amplifier	110	110	7.5	40†	3.0†	13,000	5,800	—	2,500	1.5	*50FA5* ¶

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads: Input	Output	Grid-plate
50FE5	Beam-Power Amplifier	8KB	9–33	50.0	0.15	14.5◈	175◈	175◈ 2.4◈	Single Tube 2 Tubes, Push-Pull		
50FK5	Beam-Power Amplifier	7CV	5–3	50.0	0.1	5.0◈	150◈	130◈ 1.75◈	17▲	9.0▲	0.65▲
50FY8	Triode-Pentode	9EX	6–4	50.0	0.15	10◈ 1.0◈	150◈ 150◈	150◈ 3.0◈ —	Pentode Section Triode Section		
50GY7¶ ■	Diode-Pentode	12FN	12–56	50	0.3	9.0◈ 3.8◈	400‡◈	150◈ 3.0◈	Pentode Section Diode Section		
							Tube Voltage Drop: 21 volts at 250 ma d-c				
50GY7-A¶ ■	Diode-Pentode	12FN	12–56	50	0.3	9.0◈ 3.8◈	400‡	150◈ 3.0◈	Pentode Section Diode Section		
							Tube Voltage Drop: 21 volts at 250 ma d-c				
50HC6	Beam Power Amplifier	7FZ	5–3	50	0.15	5.5◈	150◈	130◈ 2.0◈	17▲	9.0▲	0.5▲
50HK6	Beam Pentode	7FZ	5–3	50	0.15	5.5◈	150◈	130◈ 1.1◈	14▲	9.0▲	0.5▲
50HN5	Beam Power Amplifier	9QW	6–4	50	0.15	12◈	330◈	250◈ 2.5◈	—	—	—
50JY6	Beam Power Amplifier	8MG	T-X	50	0.15	13◈	275◈	275◈ 5.5◈	17.5▲	8.0▲	1.1♣ ▲
50L6-GT	Beam Power Amplifier	7AC	9–11 or 9–41	50.0	0.15	10	135	125 1.25	—	—	—
50X6	High-Vacuum Rectifier-Doubler	7AJ	9–31	50.0	0.15	—	Tube Voltage Drop:♠ 22 v at 150 ma d-c				
50Y6-GT	High-Vacuum Rectifier-Doubler	7Q	9–11	50.0	0.15	—	Tube Voltage Drop:♠ 22 v at 150 ma d-c				
50Y7-GT	High-Vacuum Rectifier-Doubler	8AN	9–11 or 9–41	50.0	0.15	—	Tube Voltage Drop:♠ 22 v at 150 ma d-c				
50Z6-G	High-Vacuum Rectifier-Doubler	7Q	14–3	50.0	0.3	—	—	—	—	—	—
50Z7-G	High-Vacuum Rectifier Doubler	8AN	12–7	50.0	0.15	—	Tube Voltage Drop:♠ 21 v at 130 ma d-c				
53	Twin-Triode Power Amplifier	7B	14–1	2.5	2.0	1.0♣	300	— —	Both Sections in Push-pull Both Sections in Parallel		
53HK7¶ ■	Diode-Pentode	12FS	12–57	53.2	0.315	10◈	500‡◈	150◈ 3.5◈	Pentode Section Diode Section		
							Tube Voltage Drop: 16 volts at 350 ma d-c				
55	Duplex-Diode Medium-Mu Triode	6G	12–6	2.5	1.0	—	250	—	—	—	—
56	Medium-Mu Triode	5A	12-5	2.5	1.0	1.3	250	—	—	—	—
56R9■	Triode-Pentode	12EN	9–58	42 (Pins 7 12) 14 (Pins 1 6)	0.15 0.15	6.5◈ 1.0◈	150◈ 150◈	135◈ 1.8◈ —	Pentode Section Triode Section		

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ⊞Absolute maximum rating.
♠Per section. ‡ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	130	130	R_k = 120	88†	5.0†	—	—	—	1,000	3.5	50FE5
Class A Amplifier	130	130	R_k = 75	150†	7.2†	—	—	—	1,600‡	7.0	
Class A Amplifier	100	115	R_k = 62	32†	8.5†	14,000	12,800	—	3,000	1.2	*50FK5*
Class A Amplifier	125	125	R_k = 120	70†	10†	5,000	7,500	—	2,000	3.0	*50FY8*
Class A Amp	125	—	1.5	2.5	—	17,000	2,700	46	—	—	
Horizontal Amplifier	130 60	130 130	22.5 0	48 320	2.9 22	10,000 —	6,500 —	— —	— —	— —	50GY7¶ ■
	Max positive pulse plate voltage ◈ = 5,000 volts; max d-c cathode current ◈ = 155 ma.										
TV Damper	Max d-c output current ◈ = 135 ma; max peak inverse voltage ◈ = 4,200 volts; max peak current ◈ = 810 ma.										
Horizontal Amplifier	130 60	130 130	22.5 0	48 320	2.9 22	10,000 —	6,500 —	— —	— —	— —	50GY7-A¶ ■
	Max positive plate voltage ◈ = 5,000 volts; max d-c cathode current ◈ = 155 ma.										
TV Damper	Max d-c output current ◈ = 135 ma; max peak inverse voltage ◈ = 4,200 volts; max peak current ◈ = 810 ma.										
Class A Amplifier	110	115	R_k = 62	42	11.5	11,000	14,600	—	3,000	1.4	*50HC6*
Class A_1 Amplifier	110	110	7.5	49†	4.0†	10,000	7,500	—	2,500	1.9	*50HK6*
Class A Amplifier	130	130	R_k = 56	70†	5.0†	7,500	17,000	—	2,000	3.0	*50HN5*
Horizontal Amplifier	100	100	8.2	100	7.0	5,000	14,000	(b.p. connected to k at socket)			50JY6
Class A Amplifier	200	125	R_k = 180	46†	2.2†	28,000	8,000	—	4,000	3.8	50L6-GT
	110	110	7.5	49†	4.0†	13,000	8,000	—	2,000	2.1	
Rectifier or Doubler	Max d-c output current per plate = 75 ma; max peak inverse voltage = 700; rms supply voltage per plate = 235; max peak current per plate = 450 ma										50X6
Rectifier or Doubler	Max d-c output current per plate = 75 ma; max peak inverse voltage = 700; max rms supply voltage per plate = 235; max peak current per plate = 450 ma										50Y6-GT
Rectifier or Doubler	Max d-c output current per plate = 75 ma; max peak inverse voltage = 700 volts; max rms supply voltage per plate = 235 volts; max peak current per plate = 450 ma With panel lamp No. 40 or No. 47 between pins 6 and 7 and no shunting resistor, max d-c output current per plate = 60 ma. With panel lamp and 250 ohm shunting resistor (max), max d-c output per plate = 65 ma.										50Y7-GT
Rectifier or Doubler	Max d-c output current per plate = 125 ma; max peak inverse voltage = 700 volts; max rms supply voltage per plate = 235 volts; max peak current per plate = 750 ma										50Z6-G
Rectifier or Doubler	Max d-c output current per plate = 65 ma; max peak inverse voltage = 700 volts; max rms supply voltage per plate = 235 volts; max peak current per plate = 400 ma. Ratings also apply with panel lamp 292 or 292A between pins 6 and 7.										50Z7-G
Class B Amplifier	300	—	0.0	17.5† ♠	—	—	—	—	8,000 ‡	10	53
Class A Amplifier	294	—	6.0	7.0	—	11,000	3,200	35	—	—	
Horizontal Amplifier	130 50	130 130	22 0	60 450	2.8 40	6,200 —	8,800 —	— —	— —	— —	53HK7¶ ■
	Max positive pulse plate voltage◈ = 5,000; max d-c cathode current◈ = 230 ma.										
TV Damper	Max d-c output current◈ = 200 ma; max peak inverse voltage◈ = 3,700 volts; max peak current◈ = 1,200 ma										
Class A Amplifier	250	—	20	8.0†	—	7,500	1,100	8.3	20,000	0.350	55
Class A Amplifier	250	—	13.5	5.0	—	9,500	1,450	13.8	—	—	56
Class A Amplifier	120	110	8.0	49†	4.0†	10,000	7,500	—	2,500	2.3	56R9■
Class A Amplifier	100	—	R_k = 1500	0.6	—	55,500	1,800	100	—	—	

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
♣ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads		
									Input	Output	Grid-plate
57	Sharp-Cutoff Pentode	6F	12–2	2.5	1.0	0.75	300	125	Pentode Connection		
						1.75	250		Triode Connection (G_2, G_3, & P Tied)		
FG-57	Thyratron same as 5559										
58	Remote-Cutoff RF Pentode	6F	12–2	2.5	1.0	2.25	300	100	—	—	—
58HE7¶ ■	Diode-Pentode	12FS	12–57	58	0.3	10 ◈	500§ ◈	150 ◈ 3.5 ◈	Pentode Section		
							Tube Voltage Drop: 21 volts at 350 ma d-c		Diode Section		
59	Power-Amplifier Pentode	7A	16–1	2.5	2.0	10	250	250	—	—	—
60FX5	Beam-Power Amplifier	7CV	5–3	60.0	0.1	5.5 ◈	150 ◈	130 ◈ 2.0 ◈	17 ▲	9.0 ▲	0.65 ▲
60HL5	Beam Power Amplifier	9QW	6–4	60	0.1	12 ◈	330 ◈	250 ◈ 2.5 ◈	—	—	—
70A7-GT	Half-Wave Rectifier Beam Power Amplifier	8AB	9–11	70.0	0.15	—	110	110	—	—	—
						—			Tube Voltage Drop: 14 v at 120 ma d-c		
70L7-GT	Half-Wave Rectifier Beam Power Amplifier	8AA	9–15	70.0	0.15	—	117	117 1.0	—	—	—
						—			Tube Voltage Drop: 20 v at 140 ma d-c		
71-A	Power-Amplifier Triode	4D	14–1	5.0	0.25	—	180	—	3.2	2.9	7.5
75	Duplex-Diode High-Mu Triode	6G	12–6	6.3	0.3	—	250	—	—	—	—
76	Medium-Mu Triode	5A	12–5	6.3	0.3	—	250	—	3.5	2.5	2.8
77	Sharp-Cutoff Pentode	6F	12–6	6.3	0.3	0.75	300	100 0.1	4.7 ▲	11.0 ▲	0.007 ♣
78	Remote-Cutoff RF Pentode	6F	12–6	6.3	0.3	2.75	300	300§ 0.35	4.5	11.0	0.007 ♣
79	Twin-Triode Power Amplifier	6H	12–6	6.3	0.6	11.5 ⊕	250	—	Both Sections in Push-pull		
80	Full-Wave High-Vacuum Rectifier	4C	14–1, 9–26	5.0	2.0	—	Tube Voltage Drop: ♠ 60 v at 125 ma d-c				
81	Half-Wave High-Vacuum Rectifier	4B	T-X, 16–1	7.5	1.25	—	Tube Voltage Drop: 91 v at 170 ma d-c				
FG-81-A	Thyratron	3G	T-X	2.5	5.0	—	Anode voltage drop = 16 volts peak				
82	Full-Wave Mercury-Vapor Rectifier	4C	14–1	2.5	3.0	—	Tube Voltage Drop: 15 v				
83	Full-Wave Mercury-Vapor Rectifier	4C	16–1	5.0	3.0	—	Tube Voltage Drop: 15 v				
83-V	Full-Wave High-Vacuum Rectifier	4AD	14–1	5.0	2.0	—	Tube Voltage Drop: ♠ 25 v at 175 ma d-c				
84/6Z4	Full-Wave High-Vacuum Rectifier	5D	12–5	6.3	0.5	—	Tube Voltage Drop: ♠ 20 v at 60 ma d-c				
85	Duplex Diode Medium-Mu Triode	6G	12–6	6.3	0.3	—	250	—	1.5	4.3	1.5
89	Power-Amplifier Pentode	6F	12–6	6.3	0.4	—	250	—	Triode connection (G_2, G_3, & P tied)		
						—	250	250	Pentode connection		

■ Compactron.
† Zero signal.
♠ Per section.
‡ Plate-to-plate.
♣ Maximum.
§ Supply voltage.
● Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
⊞ Absolute maximum rating.
\# Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250	100	3.0	2.0	0.5	1,000,000	1,225	—	—	—	57
Class A Amplifier	250	—	8.0	6.5	—	10,500	1,900	20	—	—	
Class A Amplifier	250	100	3.0	8.2	2.0	800,000	1,600	—	—	—	58
Horizontal Amplifier	130 50	130 130	22 0	60 450	2.8 40	6,200 —	8,800 —	— —	— —	— —	58HE7¶■
	Max positive pulse plate voltage ◈ =6,500; max d-c cathode current ◈ = 230 ma										
TV Damper	Max d-c output current ◈ =200 ma; max peak inverse voltage ◈ =4,200; max peak current ◈ =1,200 ma										
Class A Amplifier	250	250	18	35	9.0	40,000	2,500	—	6,000	3.0	59
Class A Amplifier	110	115	R_k = 62	36†	10†	17,500	13,500	—	3,000	1.3	*60FX5*
Class A Amplifier	130	130	R_k = 56	70†	5.0†	7,500	17,000	—	2,000	3.0	*60HL5*
Class A Amplifier	110	110	7.5	40†	3.0†	—	5,800	—	2,500	1.5	70A7-GT
Half-Wave Rectifier	Max d-c output current =60 ma; max rms supply voltage =125 volts. A panel lamp must be connected between pins 6 and 7.										
Class A Amplifier	110	110	7.5	40†	3.0†	15,000	7,500	—	2,000	1.8	70L7-GT
Half-Wave Rectifier	Max d-c output current =70 ma; max peak inverse voltage =350 volts; max rms supply voltage =117 volts; max peak current =420 ma										
Class A Amplifier	180	—	40.5	20†	—	1,750	1,700	3.0	4,800	0.790	71-A
Class A Amplifier	250	—	2.0	0.9	—	91,000	1,100	100	—	—	75
Class A Amplifier	250	—	13.5	5.0	—	9,500	1,450	13.8	—	—	76
Class A Amplifier	250	100	3.0	2.3	0.5	1,000,000	1,250	—	—	—	77
Class A Amplifier	250	125	3.0	10.5	2.6	600,000	1,650	—	—	—	78
Class B Amplifier	250	—	0	10.5†	—	Input signal =.380 watt			14,000 ‡	8.0	79
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1400 volts; rms supply voltage per plate =350 volts; max peak current per plate =400 ma										80
Half-Wave Rectifier	Max d-c output current =85 ma; max peak inverse voltage =2000 volts; max rms supply voltage =700 volts; max peak current =500 ma										81
Controlled Rectifier	Max d-c cathode current ▣ =0.5 amperes; max peak inverse voltage ▣ =500 volts; max peak cathode current ▣ =2.0 amperes										FG-81-A
Full-Wave Rectifier	Max d-c output current =115 ma; max peak inverse voltage =1,550 volts; max rms supply voltage per plate =450 volts; max peak current per plate =600 ma										82
Full-Wave Rectifier	Max d-c output current =225 ma; max peak inverse voltage =1,550; max rms supply voltage per plate =450; max peak current per plate =1,000 ma										83
Full-Wave Rectifier	Max d-c output current =175 ma; max peak inverse voltage =1400 volts; max rms supply voltage per plate =375 volts; max peak current per plate =525 ma										83-V
Full-Wave Rectifier	Max d-c output current =60 ma; max peak inverse voltage =1,250 volts; max rms supply voltage per plate =325 volts; max peak current per plate =180 ma										84/6Z4
Class A Amplifier	250	—	20	8†	—	7,500	1,100	8.3	20,000	0.350	85
Class A Amplifier	250	—	31	32†	—	2,600	1,800	4.7	5,500	0.900	89
Class A Amp	250	250	25	32†	5.5†	70,000	1,800	—	6,750	3.4	

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
FG-97	Thyratron	FG-97	T-X	2.5	5.0	—	Anode voltage drop = 16 volts peak				
FG-98-A	Thyratron	FG-97	T-X	2.5	5.0	—	Anode voltage drop = 16 volts peak				
V99 X99	Low-Mu Triode	4E 4D	T-X 9-25	3.3 DC	0.063	—	90	—	2.5	2.5	3.3
FG-105	Thyratron	FG-105	T-X	5.0	10	—	Anode voltage drop = 16 volts peak				
117L7/M7-GT	Half-Wave Rectifier Beam Power Amplifier	8AO	9-15	117	0.09	6.0 —	117	117 1.0	— Tube Voltage Drop: 16 v at 150 ma d-c	—	—
117N7-GT	Half-Wave Rectifier Beam Power Amplifier	8AV	9-15	117	0.09	5.5 —	117	117 1.0	— Tube Voltage Drop: 16 v at 150 ma d-c	—	—
117P7-GT	Half-Wave Rectifier Beam Power Amplifier	8AV	9-15	117	0.09	6.0 —	117	117 1.0	— Tube Voltage Drop: 16 v at 150 ma d-c	—	—
117Z3	Half-Wave High-Vacuum Rectifier	4CB	5-3	117	0.04	—	Tube Voltage Drop: 22.5 v at 180 ma d-c				
117Z4-GT	Half-Wave High-Vacuum Rectifier	5AA	9-5	117	0.04	—	Tube Voltage Drop: 22.5 v at 180 ma d-c				
117Z6-GT	High-Vacuum Rectifier Doubler	7Q	9-11	117	0.075	—	Tube Voltage Drop: ♠ 15.5 v at 120 ma d-c				
FG-154	Thyratron	FG-154	T-X	5.0	7.0	—	Anode voltage drop = 16 volts				
FG172	Thyratron	FG-172	T-X	5.0	10	—	Anode Voltage Drop = 16 Volts				
182-B/482B	Power-Amplifier Triode	4D	14-1	5.0	1.25	—	250	—	—	—	—
183/483	Power-Amplifier Triode	4D	14-1	5.0	1.25	—	250	—	—	—	—
393-A	Thyratron	5AV	T-X	2.5	7.0	—	Anode voltage drop = 15 volts				
407A	Medium-Mu Twin Triode	407A	6-1	{40 {20	0.05} 0.1}	1.35 ▣ ♠	330 ▣	—	2.2 ▲	1.0 ▲	1.1 ▲
408A	Sharp-Cutoff Pentode	7BD	5-1	20	0.05	1.7 ▣	180 ▣	180§ ▣ 0.5 ▣	3.9	2,85	0.01
414	Thyratron	414	T-X	5.0	19	—	Anode Voltage Drop = 20 Volts				
B425	Photoconductive Cell	—	T-X	—	—	0.25 ▣	250 ▣	—	—	—	—
482B	Power-Amplifier Triode same as 182B										
485	Medium-Mu Triode	5A	12-5	3.0	1.25	—	180	—	—	—	—
502-A	Thyratron	6BS	8-1	6.3	0.6	—	Anode voltage drop = 8 volts				
512AX ◉	AF Pentode	512AX	2-2	0.625	0.02	—	45	45	2.0 ▲	1.5 ▲	0.045 ▲

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. § Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Controlled Rectifier	Max d-c cathode current ▣ =0.5 amperes; max peak inverse voltage ▣ =1,000 volts; max peak cathode current ▣ =2.0 amperes										FG-97
Controlled Rectifier	Max d-c cathode current ▣ =0.5 amperes; max peak inverse voltage ▣ =500 volts; max peak cathode current ▣ =2.0 amperes										FG-98-A
Class A Amplifier	90	—	4.5	2.5	—	15,500	425	6.6	—	—	V99 X99
Controlled Rectifier	Max d-c cathode current ▣ =6.4 amperes; max peak inverse voltage ▣ =2,500 volts; max peak cathode current ▣ =40 amperes										FG-105
Class A Amplifier	105	105	5.2	43†	4†	17,000	5,300	—	4,000	0.85	117L7/M7-GT
Half-Wave Rectifier	Max d-c output current =75 ma; max peak inverse voltage =350 volts; max rms supply voltage =117 volts; max peak current =450 ma										
Class A Amplifier	100	100	6.0	51†	5†	16,000	7,000	—	3,000	1.2	117N7-GT
Half-Wave Rectifier	Max d-c output current =75 ma; max peak inverse voltage =350 volts; max rms supply voltage =117 volts; max peak current =450 ma										
Class A Amplifier	105	105	5.2	43†	4†	17,000	5,300	—	4,000	0.85	117P7-GT
Half-Wave Rectifier	Max d-c output current =75 ma; max peak inverse voltage =350 volts; max rms supply voltage =117 volts; max peak current =450 ma										
Half-Wave Rectifier	Max d-c output current =90 ma; max peak inverse voltage =330 volts; max rms supply voltage =117 volts; max peak current =540 ma										*117Z3*
Half-Wave Rectifier	Max d-c output current =90 ma; max peak inverse voltage =350 volts; max rms supply voltage =117 volts; max peak current =540 ma										117Z4-GT
Rectifier or Doubler	Max d-c output current per plate =60 ma; max peak inverse voltage =700 volts; max rms supply voltage per plate =235 volts; max peak current per plate =360 ma										117Z6-GT
Controlled Rectifier	Max d-c cathode current ▣ =2.5 amperes; max peak inverse voltage ▣ =500 volts; max peak cathode current ▣ =10 amperes										FG-154
Mercury Thyratron	Max d-c cathode current ▣ = 6.4 amperes; max peak inverse voltage ▣ = 2000 volts; max. peak cathode current ▣ = 40 amperes.										FG172
Class A Amplifier	250	—	35	18	—	—	1,500	5.0	—	—	182-B/482B
Class A Amplifier	250	—	60	30	—	1,750	1,700	3.0	—	—	183/483
Controlled Rectifier	Max d-c cathode current ▣ =1.5 amperes; max peak inverse voltage ▣ =1,250 volts; max peak cathode current ▣ =6.0 amperes										393-A
Class A Amplifier	150	—	R_k = 240	8.2	—	6,350	5,500	35	—	—	*407A*
Class A Amplifier	120	120	R_k = 200	7.0	2.2	340,000	5,000	—	—	—	*408A*
Mercury Thyratron	Max d-c cathode current ▣ = 5.0 amperes; max peak inverse voltage ▣ = 3000 volts; max peak cathode current ▣ = 100 amperes.										414
Control	Spectral Response =6,100 angstrom units; maximum current ▣ =20 milliamperes										B425
Class A Amplifier	180	—	9.0	5.8	—	8,900	1,400	12.5	—	—	485
Controlled Rectifier	Max d-c cathode current ▣ =100 ma; max peak inverse voltage ▣ =1,300 volts; max peak cathode current ▣ =1.0 ampere										**502-A**
Class A Amplifier	22.5	22.5	0.625	0.125	0.040	1,250,000	160	—	—	—	**512AX** ●

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♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♠	Capacitance in Picofarads Input	Output	Grid-plate
● 575-A	Half-Wave Mercury-Vapor Rectifier	575-A	T-X	5.0	10	—	Tube voltage drop: 10 volts				
627	Thyratron	4BZ	T-X	2.5	6.0	—	Anode voltage drop = 12 volts				
672-A	Thyratron	672-A	T-X	5.0	5.0	—	Anode voltage drop = 12 volts				
● 673	Half-Wave Mercury-Vapor Rectifier	2P	T-X	5.0	10	—	Tube voltage drop: 10 volts				
● 678	Thyratron	678	T-X	5.0	7.5	—	Anode voltage drop = 15 volts				
710	Thyratron same as 6011										
710L	Thyratron same as 7518										
740	Thyratron same as 6856										
760	Thyratron same as 6858										
760P	Thyratron same as 6859										
807	Beam Power Amplifier	5AW	16–2	6.3	0.9	25 ▣ 25 ▣	400 ▣ 600 ▣	— 300 ▣ 3.5 ▣	Triode Connection Two Tubes, Push-Pull Pentode Connection Two Tubes, Push-Pull		
816	Half-Wave Mercury-Vapor Rectifier	4P	T-X	2.5	2.0	—	Tube Voltage Drop = 15 Volts				
866-A	Half-Wave Mercury-Vapor Rectifier	4P	T-X	2.5	5.0	—	Tube Voltage Drop = 15 Volts				
872-A	Half-Wave Mercury-Vapor Rectifier	4AT	T-X	5.0	7.5	—	Tube Voltage Drop = 10 Volts				
884	Thyratron	6Q	12–7	6.3	0.6	—	Anode voltage drop = 16 volts				
950	Power-Amplifier Pentode	5K	14–1	2.0 DC	0.12	—	135	135	—	—	—
954	Detector Amplifier Pentode (Acorn)	5BB	4–3	6.3	0.15	1.5	250	100	3.4	3.0	0.007 ♣
955	Medium-Mu Triode (Acorn)	5BC	4–1	6.3	0.15	1.6 —	250 180	— —	1.0 ▲ —	0.4 ▲ —	1.3 ▲ —
956	Remote-Cutoff RF Pentode (Acorn)	5BB	4–3	6.3	0.15	1.7	250	100 0.3	3.1	2.5	0.009 ♣
957	Medium-Mu Triode (Acorn)	5BD	4–1	1.25 DC	0.05	—	135	—	0.25	0.5	1.1
958-A	Medium-Mu Triode (Acorn)	5BD	4–1	1.25 DC	0.1	0.6 —	135 135	—	0.45	0.6	2.5
959	Sharp-Cutoff Pentode (Acorn)	5BE	4–3	1.25 DC	0.05	—	145	67.5	1.8	2.5	0.015 ♣
B1035	Photoconductive Cell	—	T-X	—	—	0.3 ▣	350 ▣	—	—	—	—
1612	Pentagrid Mixer (Special 6L7)	7T	8–4	6.3	0.3	1.5	250	100 1.0	—	—	—
1614	Beam Power Amplifier	7AC	10–1	6.3	0.9	21 ▣	375 ▣	300 ▣ 3.5 ▣	Two tubes, Push-pull		
1620	Sharp-Cutoff Pentode (Special 6J7)	7R	8–4	6.3	0.3	—	250	100	7.0	12.0	0.005 ♣
1621	Power-Amplifier Pentode (Special 6F6)	7S	8–6	6.3	0.7	7.9	300	300	2 tubes, Push-pull		
1622	Beam Power Amplifier (Special 6L6)	7AC	10–1	6.3	0.9	13.8	300	250 1.4	2 tubes, Push-pull		
1625	Beam Power Amplifier	5AZ	16–2	12.6	0.45	25 ▣ 25 ▣	400 ▣ 600 ▣	— 300 ▣ 3.5 ▣	Triode Connection Two Tubes, Push-Pull Pentode Connection Two Tubes, Push-Pull		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. § Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Half-Wave Rectifier	Max d-c output current ▣ =2.5 amperes; max peak inverse voltage ▣ =15,000 volts; max peak current ▣ =10 amperes										575-A ●
Controlled Rectifier	Max d-c cathode current ▣ =0.64 amperes; max peak inverse voltage ▣ = 2,500 volts; max peak cathode current ▣ =2.5 amperes										627
Controlled Rectifier	Max d-c cathode current ▣ =3.2 amperes; max peak inverse voltage ▣ = 2,500 volts; max peak cathode current ▣ =40 amperes										672-A
Half-Wave Rectifier	Max d-c output current ▣ =2.5 amperes; max peak inverse voltage ▣ = 15,000 volts; max peak current ▣ =10 amperes										673 ●
Controlled Rectifier	Max d-c cathode current ▣ =1.6 amperes; max peak inverse voltage ▣ = 15,000 volts; max peak cathode current ▣ =6.0 amperes										678 ●
Class AB_1 Amplifier	400	—	45	64†	—	—	—	—	3,000‡	15	807
Class AB_2 Amplifier	600	300	29	48†	0.7†	—	—	—	6,900‡	80	
Half-Wave Rectifier	Max d-c output current ▣ =0.125 amperes; max peak inverse voltage ▣ = 5,000 volts; max peak current ▣ =0.5 amperes										816
Half-Wave Rectifier	Max d-c output current ▣ =0.25 amperes; max peak inverse voltage ▣ =5,000 volts; max peak current ▣ =1.0 amperes										866-A
Half-Wave Rectifier	Max d-c output current ▣ =1.25 amperes; max peak inverse voltage ▣ =5,000 volts; max peak current ▣ =5.0 amperes										872-A
Controlled Rectifier	Max d-c cathode current ▣ =75 ma; Max peak anode voltage ▣ =350 volts; Max peak cathode current ▣ =300 ma										884
Relaxation Oscillator	Max peak anode voltage ▣ =300; max peak cathode current ▣ =300 ma										
Class A Amplifier	135	135	16.5	7.0†	2.0†	105,300	950	—	13,500	0.450	950
Class A Amplifier	250	100	3.0	2.0	0.7	1,000,000	1,400	—	—	—	954
	90	90	3.0	1.2	0.5	1,000,000	1,100	—	—	—	
Class A Amplifier	250	—	7.0	6.3	—	11,400	2,200	25	—	—	955
	180	—	5.0	4.5†	—	12,500	2,000	25	20,000	0.135	
	90	—	2.5	2.5	—	14,700	1,700	25	—	—	
Class C Amp	180	—	35	7.0†	—	—	—	—	—	0.5	
Class A Amplifier	250	100	3.0	6.7	2.7	700,000	1,800	—	—	—	956
Class A Amplifier	135	—	5.0	2.0	—	20,800	650	13.5	—	—	957
Class A Amplifier	135	—	7.5	3.0	—	10,000	1,200	12	—	—	958-A
Class C Amp	135	—	20	7.0	—	Input Signal =0.035 watt			—	0.6	
Class A Amplifier	135	67.5	3.0	1.7	0.4	800,000	600	—	—	—	959
Control	Spectral Response =6,100 angstrom units; resistance at 1 footcandle = 11,900 ohms; resistance at 20 footcandles =1,200 ohms										B1035
Class A Amplifier	250	100	3.0	5.3	6.5	600,000	1,100	E_{c3} = −3.0 volts			**1612**
Class AB_1 Amplifier	360	270	22.5	88†	15†	—	—	—	6,600‡	26.5	**1614**
Class A Amplifier	250	100	3.0	2.0	0.5	1,000,000	1,225	—	—	—	**1620**
	100	100	3.0	2.0	0.5	1,000,000	1,185	—	—	—	
Class A Amplifier	300	300	30	38†	6.5†	—	—	—	4,000‡	5	**1621**
Class A Amplifier	300	250	20	86†	4†	—	—	—	4,000‡	10	**1622**
Class AB_1 Amplifier	400	—	45	64†	—	—	—	—	3,000‡	15	1625
Class AB_2 Amplifier	600	300	29	48†	0.7†	—	—	—	6,900‡	80	

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♥G2 and G4 are screen. G3 is signal-input grid.
₁, ₂, ₃, etc. indicate tube sections.
✠Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ⊞	Capacitance in Picofarads		
									Input	Output	Grid-plate
1629	Electron-Ray Indicator	7AL	T-X	12.6	0.15	—	250§	Max target voltage = 250 Min target voltage = 125			
1631	Beam Power Amplifier	7AC	10–1	12.6	0.45	16	360	270 2.5	2 tubes, Push-pull		
1632	Beam Power Amplifier	7AC	8–6	12.6	0.6	5.5	117	117 1.25	—	—	—
1633	Medium-Mu Twin Triode	8BD	9–11	25.0	0.15	2.5♠	300	—	—	—	—
1634	High-Mu Twin Triode (Special 12SC7)	8S	8–1	12.6	0.15	—	250	—	—	—	—
1635	Twin-Triode Power Amplifier	8B	9–11	6.3	0.6	3.0♠	300	—	Both sections in push-pull		
1642	Medium-Mu Twin Triode same as 2C21	—	—	—	—	—	—	—	—	—	—
1644	Twin-Pentode Power Amplifier (Special 12L8-GT)	8BU	9–11	12.6	0.15	2.5♠	180	180 1.0	5.0▲	6.0▲	0.7▲
1654	Half-Wave High-Vacuum Rectifier	2Z	T-X	1.4	0.05	—	—	—	—	—	—
1853	Remote-Cutoff RF Pentode same as 6AB7	—	—	—	—	—	—	—	—	—	—
2050	Thyratron	6BS	12–7	6.3	0.6	—	Anode Voltage Drop = 8.0 Volts				
2050-A	Thyratron	6BS	9–7	6.3	0.6	—	Anode Voltage Drop = 8.0 Volts				
5544	Thyratron	4BZ	T-X	2.5	12	—	Anode Voltage Drop = 16 Volts				
GL5550	Ignitron	GL 5550	TX	—	—	—	—	—	—	—	—
GL5551A/ GL5551A -PC	Ignitron	GL 5551A	TX	—	—	—	—	—	—	—	—
GL5551A	Ignitron	GL 5551A	TX	—	—	—	—	—	—	—	—
GL5551A -PC	Ignitron	GL 5551A	TX	—	—	—	—	—	—	—	—
GL5552A/ GL5552A -PC	Ignitron	GL 5552A	TX	—	—	—	—	—	—	—	—
GL5553B/ GL5553B -PC	Ignitron	GL 5553B	TX	—	—	—	—	—	—	—	—
GL5553B	Ignitron	GL 5553B	TX	—	—	—	—	—	—	—	—
GL5553B -PC	Ignitron	GL 5553B	TX	—	—	—	—	—	—	—	—
GL5554	Ignitron	GL 5554	TX	—	—	—	—	—	—	—	—
GL5555	Ignitron	GL 5555	TX	—	—	—	—	—	—	—	—
5557	Thyratron	3G	T-X	2.5	5.0	—	Anode Voltage Drop = 16 Volts				
5558/ FG-32	Half-Wave Mercury-Vapor Rectifier	5558/ FG-32	T-X	5.0	4.5	—	Tube Voltage Drop = 15 Volts				
5559/ FG-57	Thyratron	4BL	T-X	5.0	4.5	—	Anode Voltage Drop = 16 Volts				
5560	Thyratron	4CD	T-X	5.0	4.5	—	Anode Voltage Drop = 16 Volts				
5561	Half-Wave Mercury-Vapor Rectifier	5561	T-X	5.0	10	—	Tube Voltage Drop = 15 Volts				
● 5563-A	Thyratron	5563-A	T-X	5.0	10	—	Anode Voltage Drop = 15 Volts				

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ⊞Absolute maximum rating.
♠Per section. § Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Tuning Indicator	Plate voltage = 250 thru 1 meg; Target voltage = 250 (E_c = −8 volts; Shadow = 0°) (E_c = 0 volts, Shadow = 90°, Plate current = 0.24 ma, Target current = 4 ma)										1629
Class AB_1 Amplifier	360	270	22.5	88†	5†	—	—	—	6,600‡	26.5	**1631**
Class A Amplifier	110	110	7.5	49†	4†	13,000	9,000	—	2,000	2.1	**1632**
Class A Amplifier ♠	250	—	8	11.5	—	6,900	2,600	18	—	—	**1633**
Class A Amplifier ♠	250	—	2	2.0	—	53,000	1,325	70	—	—	**1634**
Class B Amplifier	300	—	0	6.6†	—	—	—	—	12,000‡	10.4	**1635**
	—	—	—	—	—	—	—	—	—	—	
Class A Amplifier ♠	180	180	9	13†	2.8†	160,000	2,150	—	10,000	1.0	1644
Half-Wave Rectifier	Max d-c output current = 1.0 ma; max peak inverse voltage = 4,300 volts; rms supply voltage = 1,500 volts; max peak current = 6 ma										*1654*
	—	—	—	—	—	—	—	—	—	—	
Controlled Rectifier	Max d-c cathode current ▣ = 100 ma; max peak inverse voltage ▣ = 1,300 volts; max peak cathode current ▣ = 1.0 ampere										2050
Controlled Rectifier	Max d-c cathode current ◆ = 100 ma; max peak inverse voltage ◆ = 1,300 volts; max peak cathode current ◆ = 1.0 ampere										2050-A
Controlled Rectifier	Max d-c cathode current ▣ = 3.2 amperes; max peak inverse voltage ▣ = 1,500 volts; max peak cathode current ▣ = 40 amperes										5544
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 300; corresponding av. anode curr. 12.1 A.; max. av. anode curr. 22.4 A;. corresponding demand KVA 100.										GL5550
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 600; corresponding av. anode curr. 30.2 A.; max. av. anode curr. 56 A.; corresponding demand KVA 200.										GL5551A/ GL5551A -PC
Frequency Changer	Max. peak inverse voltage 1200 V.; max. peak anode curr. 600 A.;.corresponding av. anode curr. 5 A.; max. av. anode curr. 22.5 A.; corresponding peak anode curr. 135 A.										GL5551A
Frequency Changer	Max. peak inverse voltage 1500 V.; max. peak anode curr. 480 A.; corresponding av. anode curr. 4 A.; max av. anode curr. 18 A.; corresponding peak anode curr. 108 A.										GL5551A -PC
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 1200; corresponding av. anode curr. 75.6 A.; max. av. anode curr. 140 A.; corresponding demand KVA 400.										GL5552A/ GL5552A -PC
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 2400; corresponding av. anode curr. 192 A.; max. av. anode curr. 355 A.; corresponding demand KVA 800.										GL5553B/ GL5553B -PC
Frequency Changer	Max. peak inverse voltage 1200 V.; max. peak anode curr. 3000 A.; corresponding av. anode curr. 40 A.; max. av. anode curr. 140 A.; corresponding anode curr. 840 A.										GL5553B
Frequency Changer	Max. peak inverse voltage 1500 V.; max. peak anode curr. 2400 A.; corresponding anode curr. 672 A.										GL5553B -PC
Resistance Welding	Max. supply volts RMS 2400; max. demand KVA 1200; corresponding av. anode curr. 75 A.; max. av. anode curr. 113 A.; corresponding demand KVA 600.										GL5554
Resistance Welding	Max. supply volts RMS 2400; max. demand KVA 2400; corresponding av. anode curr. 135 A.; max. av. anode curr. 207 A.; corresponding demand KVA 1105.										GL5555
Controlled Rectifier	Max d-c cathode current ▣ = 0.25 amperes; max peak inverse voltage ▣ = 10,000 volts; max peak cathode current ▣ = 1.0 amperes										5557
Half-Wave Rectifier	Max d-c output current ▣ = 2.5 amperes; max peak inverse voltage ▣ = 5,000 volts; max peak current ▣ = 15 amperes										5558/FG-32
Controlled Rectifier	Max d-c cathode current ▣ = 2.5 amperes; max peak inverse voltage ▣ = 1,000 volts; max peak cathode current ▣ = 15 amperes										5559/FG-57
Controlled Rectifier	Max d-c cathode current ▣ = 2.5 amperes; max peak inverse voltage ▣ = 1,000 volts; max peak cathode current ▣ = 15 amperes										5560
Half-Wave Rectifier	Max d-c output current ▣ = 6.4 amperes; max peak inverse voltage ▣ = 3,000 volts; max peak current ▣ = 40 amperes										5561
Controlled Rectifier	Max d-c cathode current ▣ = 1.8 amperes; max peak inverse voltage ▣ = 15,000 volts; max peak cathode current ▣ = 10 amperes										5563-A ●

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

♣ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Output	Grid-plate
GL5564	Ignitron	GL 5564	TX	—	—	—	—	—	—	—	—
5590	RF Pentode	7BD	5–1	6.3	0.15	1.7	180	140 0.5	3.40	2.90	0.01
5591	Sharp-Cutoff RF Pentode (Special 6AK5)	7BD	5–1	6.3	0.15	1.7	180	180§ 0.5	4.0	2.8	0.02 ♣
5608-A	Medium-Mu Twin-Triode	7B	14–1	2.5	2.0	5.5♠	350	—	—	—	—
5610	Medium-Mu Triode	6CG	5–2	6.3	0.15	3.0	300	—	—	—	—
GL5630	Ignitron	GL 5630	TX	—	—	—	—	—	—	—	—
5632/C3J	Thyratron	FG-27-A	T-X	2.5	9.0	—	Anode Voltage Drop = 10 Volts				
5633 ●	Remote-Cutoff RF Pentode	5633	T-X	6.3	0.15	0.8	150	140 0.3	4.0▲	2.2▲	0.015 ♣▲
5634 ●	Sharp-Cutoff RF Pentode	5633	T-X	6.3	0.15	0.8	150	140 0.3	4.4▲	2.2▲	0.015 ♣▲
5635 ●	Medium-Mu Twin Triode	8DB	3–1	6.3	0.45	1.25 ♠	150	—	2.6	1.6	1.2
5636 ●	Dual-Control Pentode	8DC	3–1	6.3	0.15	0.65 ◈	165◈	155◈ 0.7◈	—	—	—
5637 ●	High-Mu Triode	5637	3–2	6.3	0.15	0.3	150	—	2.6▲	0.7▲	1.4▲
5638 ●	Amplifier Pentode	5638	3–2	6.3	0.15	0.6	150	140 0.2	4.0	6.5	0.19
5639 ●	Video Pentode	8DL	3–3	6.3	0.45	3.8◈	165◈	155◈ 1.0◈	9.5	7.5	0.10♣
5640 ●	Beam Power Amplifier	5640	3–4	6.3	0.45	3.5	150	140 1.0	9.0	7.0	0.18
5641 ●	Half-Wave Rectifier	6CJ	3–3	6.3	0.45	—	Tube Voltage Drop: 23 v at 90 ma d-c				
5642 ●	Half-Wave High-Voltage Rectifier	5642	T-X	1.25	0.2	—	Tube Voltage Drop: 30 v at 4.0 ma d-c				
5645 ●	Medium-Mu Triode	5645	T-X	6.3	0.15	1.0	150	—	2.2	3.0	1.7
5646 ●	High-Mu Triode	5645	T-X	6.3	0.15	0.3	150	—	2.2▲	1.0▲	1.3▲
5647 ●	High-Frequency Diode	5647	T-X	6.3	0.15	—	Tube Voltage Drop: 2.8 v at 18 ma d-c				
5651	Glow-Discharge Diode Voltage Reference	5BO	5–2	—	—	—	—	Anode supply voltage ▣ = 150 Volts, max			
5651-A	Glow-Discharge Diode Voltage Reference	5BO	5–2	—	—	—	Anode Supply Voltage ▣ = 150 Volts Max				
5654 5★	Sharp-Cutoff RF Pentode (Special 6AK5)	7BD	5–1	6.3	0.175	1.55 ◈	200◈	155◈ 0.55◈	4.0	2.9	0.02 ♣
5663	Thyratron	6CE	T-X	6.3	0.15	—	Anode voltage drop = 11 volts				
5665/C16J	Thyratron	5665/C16J	T-X	2.5	31	—	Anode Voltage Drop = 11 Volts				
5670 5★	High-Frequency Twin Triode (Special 2C51)	8CJ	6-1	6.3	0.35	1.4◈ ♠	330◈	—	2.2▲	1.0▲	1.1▲
5672 ●	Power Amplifier Pentode	2E31	2–1	1.25 DC	0.05	—	90	90	—	—	—
5675	Medium-Mu Triode (Pencil)	5675	T-X	6.3	0.135	5.0▣	300▣	—	2.4▲	0.09▲ ♣	1.5♣ ▲
5676 ●	Medium-Mu Triode	5676	T-X	1.25 DC	0.12	—	135	—	1.3	4.0	2.0

■Compactron.
† Zero signal.
♠Per section.
‡ Plate-to-plate.
♣Maximum.
§ Supply voltage.
●Subminiature type.
▲Without external shield.
◈Design maximum rating.
⊕Total for all similar sections.
▣Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Resistance Welding	Max. supply volts RMS 2400; max. demand KVA 4800; corresponding av. anode curr. 270 A.; max. av. anode curr. 414 A.; corresponding demand KVA 2210.										GL5564
Class A Amplifier	90	90	R_k = 820	3.9	1.4	300,000	2,000	—	—	—	*5590*
Class A Amplifier	180	120	R_k = 180	7.7	2.4	500,000	5,100	—	—	—	*5591*
	120	120	R_k = 180	7.5	2.5	300,000	5,000	—	—	—	
Class A Amplifier ♠	300	—	6.0	6.0	—	13,000	2,450	32	—	—	5608-A
Class A Amp	90	—	1.5	17	—	3,500	4,000	14	—	—	*5610*
Capacitor Discharge	Max. forward peak anode voltage 35000 volts; inverse peak anode voltage 35000 volts; max. peak anode curr. 20000 A.; typical discharge rate pulses per minute 2.										GL5630
Controlled Rectifier	Max d-c cathode current ▣ =2.5 amperes; max peak inverse voltage ▣ =1,250 volts; max peak cathode current ▣ =30 amperes										5632/C3J
Class A Amplifier	100	100	R_k = 150	7.0	2.8	200,000	3,400	—	—	—	5633 ●
Class A Amplifier	100	100	R_k = 150	6.5	2.5	240,000	3,500	—	—	—	5634 ●
Class A Amplifier ♠	100	—	R_k = 100 ⊕	4.8	—	10,000	3,800	38	—	—	5635 ●
Gated Amplifier	100	100	R_k = 150	5.3	3.6	110,000	3,200	G_3 tied to cathode			5636 ●
	100	100	R_k = 150	4.0	5.8	50,000	1,950	E_{c3} = −1.0 volt			
Class A Amplifier	100	—	R_k = 820	1.4	—	26,000	2,700	70	—	—	5637 ●
Class A Amplifier	100	100	R_k = 270	4.8	1.25	150,000	3,300	—	—	—	5638 ●
Class A Amplifier	150	100	R_k = 100	21	4.0	50,000	9,000	—	—	—	5639 ●
Class A Amplifier	100	100	9.0	31†	2.2†	15,000	5,000	—	3,000	1.25	5640 ●
Half-Wave Rectifier	Max d-c output current ▣ =50 ma; max peak inverse voltage ▣ =930; rms supply voltage per plate =275; max peak current ▣ =300 ma										5641 ◉
TV Flyback Rectifier	Max d-c output current =0.25 ma; max peak inverse voltage =10,000 volts; max peak current =5.0 ma										5642 ◉
Class A Amplifier	100	—	R_k = 560	5.0	—	7,400	2,700	20	—	—	5645 ◉
Class A Amplifier	100	—	R_k = 820	1.4	—	29,000	2,400	70	—	—	5646 ◉
Half-Wave Rectifier	Max d-c output current ▣ =10 ma; max peak inverse voltage ▣ =460 volts; max rms supply voltage ▣ =165 volts; max peak current ▣ =60 ma										5647 ◉
D-c operating current =1.5 ma min D-c operating current ▣ =3.5 ma max	Ionization voltage =115 volts d-c, max Operating voltage =87 volts d-c Regulation (1.5 to 3.5 ma) =3.0 volts max										*5651*
D-c operating current =1.5 ma, min D-c operating current ▣ =3.5 ma, max	Ionization voltage =115 volts d-c, max Operating voltage =85.5 volts d-c Regulation (1.5 to 3.5 ma) =3.0 volts, max										*5651-A*
Class A Amplifier	120	120	R_k = 200	7.5	2.5	340,000	5,000	—	—	—	*5654* 5★
Controlled Rectifier	Max d-c cathode current ▣ =20 ma; max peak inverse voltage ▣ =500 volts; max peak cathode current ▣ =60 ma										*5663*
Controlled Rectifier	Max d-c cathode current ▣ =16 amperes; max peak inverse voltage ▣ =1,250 volts; max peak cathode current ▣ =160 amperes										5665/C16J
Class A Amplifier ♠	150	—	R_k = 240	8.2	—	6,400	5,500	35	—	—	*5670* 5★
Class AB_1 Amplifier	300	—	R_k = 800 ⊕	9.8†	—	—	—	—	27,000 ‡	1.0	
Class A Amplifier	67.5	67.5	6.5	3.25	1.1	—	650	—	20,000	0.065	5672 ◉
Class A Amplifier	135	—	R_k = 68	24	—	3,225	6,200	20	—	—	5675
Class A Amplifier	135	—	5.0	4.0	—	—	1,600	15	—	—	5676 ◉

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♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
♣ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ❋	Capacitance in Picofarads Input	Output	Grid-plate
5677 ◉	Medium-Mu Triode	5676	T-X	1.25 DC	0.06	—	135	—	1.3	3.8	2.0
5678 ◉	Pentode Amplifier	1AD4	T-X	1.25 DC	0.05	—	90	67.5	3.3	3.8	0.01 ♣
5679	Twin Diode (Special 7A6)	7CX	9–30	6.3	0.15	—	Tube Voltage Drop: ♠ 11 v at 16 ma d-c				
5686 5★	Beam Power Amplifier	9G	6–2	6.3	0.35	8.25 ▣	275 ▣ 275 ▣	275 ▣ 3.0 ▣ 275 ▣ 3.0 ▣	6.5	8.5	0.08 ♣
5687 5★	Medium-Mu Twin Triode	9H	6–2	6.3 / 12.6	0.9 / 0.45	4.2 ♠	300	—	4.0 ▲	0.6_1 ▲ 0.5_2 ▲	4.0 ▲
5690	Full-Wave High-Vacuum Rectifier	5690	12–25	12.6 / 6.3	1.2 / 2.4	—	Tube Voltage Drop: ♠ 17 v at 150 ma d-c				
5691	High-Mu Twin Triode (Special 6SL7-GT)	8BD	9–37	6.3	0.6	1.0 ♠ ▣	275 ▣	—	—	—	—
5692	Medium-Mu Twin Triode (Special 6SN7-GT)	8BD	9–37	6.3	0.6	1.75 ♠ ▣	275 ▣	—	—	—	—
5693	Sharp-Cutoff Pentode (Special 6SJ7)	8N	8–1	6.3	0.3	2.0 ▣	300 ▣	125 ▣ 0.3 ▣	5.3	6.2	0.005 ♣
5694	Medium-Mu Twin Triode	8CS	14–3	6.3	0.8	5.5 ♠	300	—	Both Sections in Parallel		
5696	Thyratron	7BN	5–1	6.3	0.15	—	Anode voltage drop = 10 volts				
5696-A	Thyratron	7BN	5–1	6.3	0.15	—	Anode Voltage Drop = 10 volts				
5702 ◉	RF Pentode	5702	3–7	6.3	0.2	—	180	140 0.5	4.4	3.5	0.03 ♣
5703 ◉	Medium-Mu Triode	5703	3–6	6.3	0.2	3.0	250	—	2.6	0.7	1.2
5704 ◉	Diode	5704	T-X	6.3	0.15	—	Tube Voltage Drop: 2 v at 9 ma d-c				
5718 ◉	Medium-Mu Triode	8DK	3–1	6.3	0.15	1.0 ◈	165 ◈	—	2.4	2.4	1.3
5719 ◉	High-Mu Triode	8DK	3–1	6.3	0.15	0.3 ◈	165 ◈	—	1.9	2.2	0.8
5720	Thyratron	5559	T-X	5.0	4.5	—	Anode Voltage Drop = 16 Volts				
5725 5★	Dual-Control RF Pentode (Special 6AS6)	7CM	5–1	6.3	0.175	1.55 ◈	200 ◈	155 ◈ 0.75 ◈	4.0	3.0	0.01
5726 5★	Twin Diode (Special 6AL5)	6BT	5–1	6.3	0.30	—	Tube Voltage Drop: ♠ 10 v at 60 ma d-c				
5727 5★	Thyratron (Special 2D21)	7BN	5–2	6.3	0.6	—	Anode Voltage Drop = 8 Volts				
5728	Thyratron	5559	T-X	5.0	4.5	—	Anode Voltage Drop = 16 Volts				
5731	Power Amplifier Triode (Acorn)	5BC	4–1	6.3	0.15	—	250	—	1.0	0.4	1.3
5744 ◉	High-Mu Triode	5744	3–6	6.3	0.2	—	250	—	—	—	—
5749 5★	Remote-Cutoff RF Pentode (Special 6BA6)	7BK	5–2	6.3	0.3	3.1 ◈	330 ◈	300 ◈ $ 0.6 ◈	5.5	5.5	0.0035 ♣
5750 5★	Pentagrid Converter (Special 6BE6)	7CH ♥	5–2	6.3	0.3	1.1 ▣	330 ▣	110 ▣ 1.0 ▣	Osc I_{c1} = 0.5 ma R_{g1} = 20,000 ohms		
5751 5★	High-Mu Twin Triode (Special 12AX7)	9A	6–2	6.3 / 12.6	0.35 / 0.175	0.7 ♠ ◈	330 ◈	—	1.4 ▲	0.46_1 0.36_2 ▲	1.4 ▲
5763	Beam Power Amplifier	9K	6–3	6.0	0.75	8.0 ▣ 12 ▣	250 ▣ 300 ▣	250 ▣ 1.5 ▣ 250 ▣ 2.0 ▣	— —	— —	— —
5767	UHF Triode (Planar)	5767	T-X	6.3	0.4	6.0	350	—	1.3 ▲	0.025 ▲	1.3 ▲

■ Compactron.
† Zero signal.
♠ Per section.
‡ Plate-to-plate.
♣ Maximum.
$ Supply voltage.
◉ Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
▣ Absolute maximum rating.
\# Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	135	—	6.0	1.9	—	—	650	13.5	—	—	**5677** ●
Class A Amplifier	67.5	67.5	0	1.8	0.48	1,000,000	1,100	—	—	—	**5678** ●
Half-Wave Rectifier	Max d-c output current per plate =8 ma; max rms supply voltage per plate =150 volts; max peak current per plate =45 ma										5679
Class A Amplifier Class C Amplifier	250 250	250 250	12.5 50	27† 40	3.0† 10.5	45,000 Input Signal = 0.15 watt	3,100	— —	9,000 —	2.7 6.5	*5686* 5★
Class A Amplifier ♠	180 250	— —	7.0 12.5	23 12	— —	2,000 3,000	8,500 5,400	17 16	— —	— —	*5687* 5★
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1,120; rms supply voltage per plate =350; max peak current per plate =375 ma										5690
Class A Amplifier ♠	250	—	2.0	2.3	—	44,000	1,600	70	—	—	5691
Class A Amplifier ♠	250	—	9.0	6.5	—	9,100	2,200	20	—	—	5692
Class A Amplifier	250	100	3.0	3.0	0.85	1,000,000	1,650	—	—	—	**5693**
Class A Amplifier	294 250	— —	6.0 5.0	7.0 6.0	— —	11,000 11,300	3,200 3,100	35 35	— —	— —	5694
Controlled Rectifier	Max d-c cathode current ▣ =25 ma; max peak inverse voltage ▣ =500 volts; max peak cathode current ▣ =100 ma										*5696*
Controlled Rectifier	Max d-c cathode current ▣ =28 ma; max peak inverse voltage ▣ =500 volts; max peak cathode current ▣ =125 ma										*5696-A*
Class A Amplifier	120	120	R_k = 200	7.5	2.5	340,000	5,000	—	—	—	5702 ◉
Class A Amplifier	120	—	R_k = 220	9.0	—	—	5,000	25	—	—	5703 ◉
Half-Wave Rectifier	Max d-c output current =9 ma; max peak inverse voltage =420 volts; max rms supply voltage =150 volts; max peak current =54 ma										5704 ◉
Class A Amplifier	100	—	R_k = 150	8.5	—	4,650	5,800	27	—	—	5718 ◉
Class A Amplifier	100	—	R_k = 1,500	0.73	—	41,000	1,700	70	—	—	5719 ◉
Controlled Rectifier	Max d-c cathode current ▣ =2.5 amperes; max peak inverse voltage ▣ =1,000 volts; max peak cathode current ▣ =15 amperes										5720
Class A Amplifier	120	120	2.0	5.2	3.5	—	3,200	E_{c3} =0 volts			*5725* 5★
Half-Wave Rectifier	Max d-c output current per plate ▣ =10 ma; max peak inverse voltage ▣ =360; rms supply voltage per plate =117; max peak current per plate ▣ =60 ma										*5726* 5★
Controlled Rectifier	Max d-c cathode current ▣ =100 ma; max peak inverse voltage ▣ = 1,300 volts; max peak cathode current ▣ =500 ma										*5727* 5★
Controlled Rectifier	Max d-c cathode current ▣ =2.5 amperes; max peak inverse voltage ▣ =1,000 volts; max peak cathode current ▣ =15 amperes										5728
Class A Amplifier	250	—	7.0	6.3	—	11,400	2,200	25	—	—	5731
Class A Amplifier	250	—	R_k = 500	4.0	—	—	4,000	70	—	—	5744 ◉
Class A Amplifier	250 100	100 100	R_k = 68 R_k = 68	11 10.8	4.2 4.4	1,000,000 250,000	4,400 4,300	— —	— —	— —	*5749* 5★
Converter	250	100	1.5	2.6	7.5	1,000,000	475 #	—	—	—	*5750* 5★
Class A Amplifier ♠	250 100	— —	3.0 1.0	1.0 0.8	— —	58,000 58,000	1,200 1,200	70 70	— —	— —	*5751* 5★
Class C Telephony Class C Telegraphy	250 300	250 250	39 28.5	40 50	5.6 6.6	(bias obtained from R_{g1} = 39,000) (bias obtained from R_{g1} = 18,000)				6.4 10.3	*5763*
UHF Oscillator at 3300 Mc	200	—	R_k = 100	25	—	—	—	—	—	0.45	5767

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¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
5784 ●	Dual-Control RF Pentode	5702	3–7	6.3	0.2	1.7	180	140 0.75	3.9	3.0	0.03♣
5785 ●	Half-Wave High-Voltage Rectifier	5785	T-X	1.25 DC	0.015	—	Tube Voltage Drop: 17 v at 0.1 ma d-c				
5797 ●	Semi-Remote-Cutoff RF Pentode	8CY	3–2	26.5	0.045	0.8	50	50 0.25	4.2	3.2	0.024 ♣
5798 ●	Medium-Mu Twin Triode	8CZ	3–2	26.5	0.09	0.2♠	50	—	1.9	1.7	1.7
5814 *5814-A* 5★	Medium-Mu Twin Triode (Special 12AU7)	9A	6–2	6.3 12.6	0.35 0.175	2.7 ♠◈	330◈	—	1.6▲	0.5_1▲ 0.4_2▲	1.5▲
GL5822A	Ignitron	GL 5822A	TX	—	—	—	—	—	—	—	—
GL5822A-PC	Ignitron	GL 5822A	TX	—	—	—	—	—	—	—	—
5823	Gas Triode	4CK	5–2	—	—	—	—	—	—	—	—
5824	Beam Power Amplifier (Special 25B6-G)	7AC	14–3 or 9–11 or 9–41	25.0	0.3	12.5	200	135 2.0	—	—	—
● 5825	Half-Wave High-Voltage Rectifier	4P	T-X	1.6	1.25	—	Tube Voltage Drop: 1,750 v at 40 ma d-c				
5829 ●	Twin Diode	5829	2–5	6.3	0.15	—	Tube Voltage Drop: ♠ 5 v at 15 ma d-c				
5830	Thyratron	5830	T-X	5.0	20	—	Anode Voltage Drop = 16 Volts				
5838	Full-Wave High-Vacuum Rectifier	6S	T-X	12.0	0.6	—	—	—	—	—	—
5839	Full-Wave High-Vacuum Rectifier	6S	T-X	26.5	0.285	—	—	—	—	—	—
5840 ●	Sharp-Cutoff RF Pentode	8DE	3–1	6.3	0.15	0.9◈	165◈	155◈ 0.55◈	4.2	3.4	0.015 ♣
5842	High-Mu Triode	9V	6–1	6.3	0.3	4.0	180	—	—	—	—
5844 5★	Medium-Mu Twin Triode	7BF	5–2	6.3	0.3	1.0 ♠⊡	200⊡	—	2.4▲	0.5_1▲ 0.4_2▲	2.7▲
5847	Sharp-Cutoff RF Pentode	9X	6–1	6.3	0.3	3.0	180	150 0.75	7.1	2.9	0.04
5847-A	Sharp-Cutoff RF Pentode	9X	6–1	6.3	0.3	3.0	180	150 0.75	7.1	2.9	0.04
5851 ●	Beam Power Amplifier	6CL	T-X	1.25 2.50 DC	0.11 0.055	1.5	180	135 0.3	2.5	3.0	0.055
5852	Full-Wave High-Vacuum Rectifier	6S	T-X	6.3	1.2	—	—	—	—	—	—
5854 ●	Power Amplifier Pentode	2E31	2–1	1.25	0.03	—	50⊡	50⊡	—	—	—
5855	Thyratron	5855	T-X	2.5	34	—	Anode Voltage Drop = 16 Volts				
5873 ●	Medium-Mu Twin Triode	5873	3–2	6.3	0.3	1.6♠	300	—	—	—	—
5875 ●	Sharp-Cutoff Pentode	1AD4	2–1	1.25 DC	0.1	—	90	90	4.0	4.0	0.03 ♣
5876	High-Mu Triode (Pencil)	5675	T-X	6.3	0.135	6.25⊡	300⊡	—	2.5▲	0.035 ▲	1.4▲
5876-A	High-Mu Triode (Pencil)	5675	T-X	6.3	0.135	6.25⊡	300⊡	—	2.4▲	0.035 ▲	1.4▲
5879	Sharp-Cutoff AF Pentode	9AD	6–2	6.3	0.15	1.25◈ 1.7◈	330◈ 275◈	330◈‡ 0.25◈ —	Pentode Connection Triode Connection (G_2, G_3 & P Tied)		

■ Compactron. † Zero signal. ♠ Per section.
‡ Plate-to-plate. ♣ Maximum. ‡ Supply voltage.
● Subminiature type. ▲ Without external shield. ◈ Design maximum rating.
⊕ Total for all similar sections. ⊡ Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	120 120	120 120	2.0 2.0	5.2 3.6	3.5 4.8	— —	3,200 1,850	E_{c3} = 0 volts E_{c3} = −3.0 volts			5784 ●
Half-Wave Rectifier	Max d-c output current = 0.1 ma; max peak current = 0.45 ma; max peak inverse voltage = 3,500 volts with supply impedance = 1 meg min.										5785 ●
Class A Amplifier	26.5	26.5	0	2.8	0.9	70,000	3,450	—	—	—	5797 ●
Class A Amplifier ♠	26.5	—	0	2.0	—	7,100	3,400	24	—	—	5798 ●
Class A Amplifier ♠	250 100	— —	8.5 0	10.5 11.8	— —	7,700 6,250	2,200 3,100	17 19.5	— —	— —	*5814* *5814-A* 5★
Frequency Changer	Max. peak inverse voltage 1200 V.; max. peak anode curr. 1500 A.; corresponding av. anode curr. 20 A.; max. av. anode curr. 70 A.; corresponding peak anode curr. 420 A.										GL5822A
Frequency Changer ♦	Max. peak inverse voltage 1500 V.; max. peak anode curr. 1200 A.; corresponding av. anode curr. 16 A.; max. av. anode curr. 56 A.; corresponding peak anode curr. 336 A.										GL5822A-PC
Peak cathode current ▣ = 100 ma max; d-c cathode current ▣ = 25 ma max; starter voltage drop ▣ = 61 volts; anode drop ▣ = 62 volts											*5823*
Class A Amplifier	135	135	22	61†	2.5†	15,000	5,000	—	1,700	4.3	5824
Half-Wave Rectifier	Max d-c output current ▣ = 2 ma; max peak inverse voltage ▣ = 60,000 volts, rms supply voltage = 21,200 volts; max peak current ▣ = 40 ma										5825
Half-Wave Rectifier	Max d-c output current per plate = 5 ma; max peak inverse voltage = 330; rms supply voltage per plate = 117; max peak current per plate = 30 ma										5829 ●
Mercury Thyratron	Max d-c cathode current ▣ = 12.5 amperes; max peak inverse voltage ▣ = 10,000 volts; max peak cathode current ▣ = 75 amperes.										5830
Full-Wave Rectifier	Max d-c output current = 65 ma; max peak inverse voltage = 1,375 volts; rms supply voltage per plate = 300 volts; max peak current per plate = 270 ma										5838
Full-Wave Rectifier	Max d-c output current = 65 ma; max peak inverse voltage = 1,375 volts; rms supply voltage per plate = 300 volts; max peak current per plate = 270 ma										5839
Class A Amplifier	100	100	R_k = 150	7.5	2.4	260,000	5,000	—	—	—	5840 ●
Class A Amplifier	150	—	R_k = 62	26	—	1,800	24,000	43	—	—	*5842*
Class A Amplifier ♠	100	—	R_k = 470	4.8	—	7,550	3,700	28	—	—	*5844* 5★
Frequency Halfer ♠	150‡ 150‡	— —	0 10	4.8 0.1	— —	R_g = 47,000 ohms R_g = 47,000 ohms			20,000 20,000	— —	
Class A Amplifier	150	150	R_k = 110	13	4.5	—	12,500	—	—	—	*5847*
Class A Amplifier	150 150	150 150	R_k = 110 R_k = 4,000	13 4.4	4.5 1.2	— —	12,500 8,500	— E_{cc1} = +20 volts	—	—	*5847-A*
Class A Amplifier	125	125	7.5	5.5	0.9	175,000	1,600	—	—	—	5851 ●
Full-Wave Rectifier	Max d-c output current = 65 ma; max peak inverse voltage = 1,375 volts; rms supply voltage per plate = 300 volts; max peak current per plate = 270 ma										5852
Class A Amplifier	45	45	2.0	0.8	0.25	350,000	550	—	50,000	0.0095	5854 ●
Controlled Rectifier	Max d-c cathode current ▣ = 18 amperes; max peak inverse voltage ▣ = 1,500 volts; max peak cathode current ▣ = 160 amperes										5855
Class A Amplifier ♠	150	—	3.0	9.0	—	—	2,900	22	—	—	5873 ●
Class A Amplifier	90	90	0	3.5	1.0	—	2,500	—	—	—	5875 ●
Class A Amplifier	250	—	R_k = 75	18	—	8,625	6,500	56	—	—	5876
Class A Amplifier	250	—	R_k = 75	18	—	8,625	6,500	56	—	—	5876-A
Class A Amplifier Class A Amplifier	250 250	100 —	3.0 8.0	1.8 5.5	0.4 —	2,000,000 13,700	1,000 1,530	— 21	— —	— —	*5879*

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✠Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads: Input	Output	Grid-plate
5881	Beam Power Amplifier (Special 6L6-G)	7AC	T-X	6.3	0.9	23	360	270 3.0	Single Tube Two tubes, Push-pull		
5885 ◉	Twin Tetrode	5885	3-2	1.25	0.02	—	22.5 ▣	22.5 ▣	Triode Connection (G_2 and P Tied)		
5886 ◉	Electrometer Pentode	5886	2.1	1.25	0.01	—	45	45	Pentode Connection Triode Connection (G_2 and P Tied)		
● 5890	Remote-Cutoff Pentode Regulator	12J	T-X	6.3	0.6	10 ▣	30,000 ▣	450 ▣	E_{c3} = 5,500 volts E_{c3} = 5,500 volts E_{c3} = 5,500 volts		
5894-B	Tetrode	5894-B	TX	6.7	2.1	40	600 750	300 300	11.6	3.7	0.08
5896 ◉	High-Frequency Twin Diode	8DJ	3-1	6.3	0.3	—	Tube Voltage Drop: ♠ 4.5 v at 18 ma d-c				
5897 ◉	Medium-Mu Triode	8DK	3-1	6.3	0.15	3.3 ▣	165 ▣	—	2.2	0.7	1.40
5898 ◉	High-Mu Triode	8DK	3-1	6.3	0.15	0.55 ▣	165 ▣	—	2.40	0.60	0.70
5899 ◉	Semi-Remote-Cutoff RF Pentode	8DL	3-1	6.3	0.15	0.85 ◈	165 ◈	155 ◈ 0.55 ◈	4.2	3.4	0.015 ♣
5900 ◉	Semi-Remote-Cutoff RF Pentode	8DL	3-1	6.3	0.15	1.1 ▣	165 ▣	155 ▣ 0.55 ▣	4.4	3.4	0.015 ♣
5901 ◉	Sharp-Cutoff RF Pentode	8DL	3-1	6.3	0.15	1.1 ▣	165 ▣	155 ▣ 0.55 ▣	4.2	3.4	0.015
5902 ◉	Beam Power Amplifier	8DL	3-3	6.3	0.45	4.1 ◈	165 ◈	155 ◈ 0.4 ◈	6.5	7.5	0.11
5903 ◉	High-Frequency Twin Diode	8DJ	3-1	26.5	0.075	—	Tube Voltage Drop: ♠ 4.5 v at 18 ma d-c				
5904 ◉	Medium-Mu Triode	8DK	3-1	26.5	0.045	—	55 ▣	—	2.4	2.2	1.8
5905 ◉	Sharp-Cutoff RF Pentode	8DL	3-1	26.5	0.045	—	55 ▣	55 ▣	4.4	3.4	0.015 ♣
5906 ◉	Sharp-Cutoff RF Pentode	8DL	3-1	26.5	0.045	1.1 ▣	165 ▣	155 ▣ 0.55 ▣	4.2	3.4	0.015 ♣
5907 ◉	Remote-Cutoff RF Pentode	8DL	3-1	26.5	0.045	—	55 ▣	55 ▣	4.0	3.4	0.015 ♣
5908 ◉	Dual-Control RF Pentode	8DC	3-1	26.5	0.045	—	55 ▣	55 ▣	E_{c3} = 0 volts		
5910	Sharp-Cutoff Pentode	6AR	5-2	1.4 DC	0.05	—	90	90	3.6	7.5	0.008 ♣
5915 *5915-A*	Pentagrid Amplifier	7CH ♥	5-2	6.3	0.3	1.0 ▣	250 ▣	250 ▣ ⁑ 1.0 ▣	E_{c3} = 0 volts E_{c3} = −10 volts E_{c3} = 0 volts		
5916 ◉	Dual-Control Pentode	8DC	3-1	26.5	0.045	1.1 ▣	165 ▣	155 ▣ 0.7 ▣	G_3 tied to cathode E_{c3} = −1 volt		
5930	Low-Mu Power-Amplifier Triode (Special 2A3)	4D	T-X	2.5	2.5	15 ▣	360 ▣	—	—	—	—
5931	Full-Wave High-Vacuum Rectifier (Special 5U4-G)	5T	T-X	5.0	3.0	—	Tube Voltage Drop: ♠ 47 volts at 275 ma d-c				
5932	Beam Power Amplifier (Special 6L6-G)	7AC	T-X	6.3	0.9	21 ▣	400 ▣	300 ▣ 2.75 ▣	—	—	—

■ Compactron. † Zero signal. ♠ Per section.
‡ Plate-to-plate. ♣ Maximum. ⁑ Supply voltage.
◉ Subminiature type. ▲ Without external shield. ◈ Design maximum rating.
⊕ Total for all similar sections. ▣ Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	350	250	18	53†	2.5†	48,000	5,200	—	4,200	11.3	5881
	250	250	14	75†	4.3†	30,000	6,100	—	2,500	6.7	
Class AB_1 Amplifier	360	270	22.5	88†	5.0†	—	—	—	3,800	18	
	360	270	22.5	88†	5.0†	—	—	—	6,600	26.5	
Electrometer ♠	13.5	—	3.0	0.185	—	—	160	2.4	—	—	5885 ◉
Electrometer	12	4.5	2.0	6.0	3.6	18,000,000	14	—	—	—	5886 ◉
Electrometer	10.5	—	3.0	200	—	—	160	2.0	—	—	
Shunt Regulator	30,000	200	60	0	0	—	Peak G_1 signal = 0 volts				5890
	30,000	200	60	0.06	0	—	Peak G_1 signal = 20 volts				
	30,000	200	60	0.50	0	—	Peak G_1 signal = 45 volts				
Amplifier Class B	**450**	**300**	**25**	**200**	**26**	**—**	**—**	**—**	**—**	**86**	**5894-B**
Amplifier-Oscillator Telegraphy	**500**	**250**	**80**	**200**	**16**	**—**	**—**	**8.2**	**—**	**90**	
Class C Telegraphy	**600**	**250**	**80**	**150**	**20**	**—**	**—**	**—**	**—**	**71**	
Full-Wave Rectifier	Max d-c output current per plate ▣ = 10 ma; max peak inverse voltage ▣ = 460; rms supply voltage per plate = 150; max peak current per plate ▣ = 60 ma										5896 ◉
Class A Amplifier	100	—	R_k = 150	8.5	—	—	5,800	27	—	—	5897 ◉
RF Oscillator	150	—	—	20	—	Frequency = 500 mc			—	0.9	
Class A Amplifier	150	—	R_k = 680	1.7	—	—	2,700	70	—	—	5898 ◉
Class A Amplifier	100	100	R_k = 120	7.2	2.0	260,000	4,500	—	—	—	5899 ◉
Class A Amplifier	100	100	R_k = 120	7.2	2.2	260,000	4,500	—	—	—	5900 ◉
Class A Amplifier	100	100	R_k = 150	7.5	2.4	230,000	5,000	—	—	—	5901 ◉
Class A Amplifier	110	110	R_k = 270	30	2.2	15,000	4,200	—	3,000	1.0	5902 ◉
Full-Wave Rectifier	Max d-c output current per plate ▣ = 10 ma; max peak inverse voltage ▣ = 460; rms supply voltage per plate ◈ = 165; max peak current per plate ▣ = 60 ma										5903 ◉
Class A Amplifier	26.5	—	R_g = 2.2 meg	3.0	—	4,250	5,000	20	—	—	5904 ◉
Class A Amplifier	26.5	26.5	R_g = 2.2 meg	2.1	0.9	110,000	2,850	—	—	—	5905 ◉
Class A Amplifier	100	100	R_k = 150	7.5	2.4	260,000	5,000	—	—	—	5906 ◉
Class A Amplifier	26.5	26.5	R_{g1} = 2.2 meg	2.7	1.1	100,000	3,000	—	—	—	5907 ◉
Class A Amplifier	26.5	26.5	R_{g1} = 2.2 meg	3.3	2.0	31,000	2,200	—	—	—	5908 ◉
Class A Amplifier	90	90	0	1.6	0.45	1,500,000	900	—	—	—	*5910*
Gated Amplifier	150‡	75	10	0	0	$R_{g1} = R_{g3}$ = 47,000		—	20,000	—	*5915*
	150‡	69	0	0	14	$R_{g1} = R_{g3}$ = 47,000		—	20,000	—	*5915-A*
	150‡	71	0	5.8	9.0	$R_{g1} = R_{g3}$ = 47,000		—	20,000	—	
Class A Amplifier	100	100	R_k = 150	5.3	3.6	110,000	3,200	—	—	—	5916 ◉
	100	100	R_k = 150	4.0	5.8	50,000	1,950	—	—	—	
Class A Amplifier	250	—	45	60†	—	800	5,250	4.2	2,500	3.5	5930
Full-Wave Rectifier	Max d-c output current ◈ = 300 ma; max peak inverse voltage ◈ = 1,700 volts; max rms supply voltage per plate ◈ = 600 volts; max peak current per plate ◈ = 1100 ma										5931
Class A Amplifier	250	250	14	72†	5.0†	22,500	6,000	—	2,500	6.5	5932

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads: Input	Output	Grid-plate
5963	Medium-Mu Twin Triode	9A	6–2	12.6 6.3	0.15 0.3	2.5 ♠▣	250▣	—	1.9▲	0.5_1▲ 0.35_2▲	1.5▲
5964	High-Mu Twin Triode	7BF	5–2	6.3	0.45	1.5 ♠▣	250▣	—	2.1▲	0.4▲	1.3▲
5965	Twin Triode	9A	6–2	12.6 6.3	0.225 0.45	2.4 ♠▣ 4.4 ⊕▣	300	—	3.8▲	0.5_1▲ 0.38_2▲	3.0▲
5965-A 5★	Twin Triode	9A	6–2	12.6 6.3	0.225 0.45	2.2◈ ♠ 4.0◈ ⊕	330◈	—	4.0▲	0.5_1▲ 0.36_2 ▲	3.0▲
5967 ◉	Medium-Mu Twin Triode	8DQ	3–8	1.25	0.12	—	50▣	—	0.9▲	0.9▲	1.7▲
5968 ◉	Twin Triode	8DQ	3–8	1.25	0.12	—	45▣	—	0.9▲	0.9▲	2.3▲
5969 ◉	Twin Tetrode	8DR	3–8	1.25	0.2	0.96▣ ♠	150▣	50▣	2.5▲	2.5▲	0.3▲ ♣
5970 ◉	Twin Pentode	8DS	3–3	1.25	0.16	—	45▣	45▣	3.3▲	2.4▲	0.1▲ ♣
5971 ◉	Medium-Mu Triode	5971	2–1	1.25 DC	0.08	0.7	135	—	1.6▲	1.7▲	2.3▲
5972 ◉	Remote-Cutoff RF Pentode	1AD4	2–1	1.25	0.06	—	75▣	75▣	4.3▲	4.1▲	0.01▲ ♣
5975 ◉	Medium-Mu Triode	5975	3–6	6.3	0.175	3.0	250	—	—	—	—
5977 ◉	Medium-Mu Triode	8DK	3-1	6.3	0.15	1.2◈	180◈	—	2.0	2.2	1.3
5987 ◉	Low-Mu Triode	8DM	3–4	6.3	0.45	4.0▣	165▣	—	3.2	5.0	3.2
5992	Beam Power Amplifier (Special 6V6-GT)	7AC	9–9	6.3	0.6	10	300	275 2.0	—	—	—
5993	Full-Wave High-Vacuum Rectifier	5993	6–3	6.3	0.8	—	—	—	—	—	—
5995 ◉	Half-Wave High-Vacuum Rectifier	5995	T-X	6.3	0.3	—	Tube Voltage Drop: 25 volts at 100 ma d-c				
5998	Low-Mu Twin Triode	8BD	16–3	6.3	2.4	13♠	250	—	—	—	—
5998A	Low-Mu Twin Triode	8BD	12–15	6.3	2.4	15▣♠	275▣	—	6.5▲	2.0▲	14.5▲
6000	Beam-Power Amplifier	6CK	T-X	26.5	0.28	25▣	600▣	300▣ 4.0▣	15▲	7.0▲	0.18▲
6004	Full-Wave High-Vacuum Rectifier	2AJ	T-X	5.0	2.0	—	Tube Voltage Drop:♠ 60 volts at 145 ma d-c				
6005 5★	Beam Power Amplifier (Special 6AQ5)	7BZ	5–3	6.3	0.45	11◈	275◈	275◈ 2.0◈	Single Tube 2 Tubes, Push-pull		
6011/710	Thyratron	FG-27-A	T-X	2.5	9.0	—	Anode Voltage Drop = 15 Volts				
6012	Thyratron	6CO	12–24	6.3	2.6	—	Anode Voltage Drop = 10 Volts				
6014/C1K	Thyratron	4AX	T-X	2.5	6.3	—	Anode Voltage Drop = 14 Volts				
6021 ◉	Medium-Mu Twin Triode	8DG	3–1	6.3	0.3	0.8 ♠◈	165◈	—	2.4▲	0.28_1▲ 0.32_2▲	1.5▲
6028	Sharp-Cutoff RF Pentode	7BD	5–1	20.0	0.05	1.7	180	180§ 0.5	4.0	2.8	0.02 ♣
6029 ◉	Medium-Mu Triode	5676	2–1	1.25 DC	0.2	1.0	135	—	1.3▲	1.4▲	1.6▲
6046	Medium-Mu Twin Triode	7BF	5–2	6.3	0.35	1.6 ♠▣	330▣	—	2.0▲	0.45_1▲ 0.34_2▲	1.3▲

■ Compactron. † Zero signal. ♠ Per section. ‡ Plate-to-plate. ♣ Maximum. § Supply voltage. ◉ Subminiature type. ▲ Without external shield. ◈ Design maximum rating. ⊕ Total for all similar sections. ▣ Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier ♠	67.5	—	0	8.5	—	6,600	3,200	21	—	—	*5963*
Frequency Halfer ♠	150‡	—	15	0	—	R_g =47,000		—	20,000	—	
	150‡	—	0	5.1	—	R_g =47,000		—	20,000	—	
Class A Amplifier ♠	100	—	R_k = 50 ⊕	9.5	—	6,500	6,000	39	—	—	*5964*
Frequency Halfer ♠	150‡	—	10	0	—	R_g =47,000			20,000	—	
	150‡	—	0	5.0	—	R_g =47,000			20,000	—	
Class A Amplifier ♠	150	—	R_k = 220	8.5	—	7,000	6,700	47	—	—	*5965*
Frequency Halfer ♠	150‡	—	—	10.5	—		I_c =140 µamp		7,200	—	
	150‡	—	5.5	0.15	—	—	—	—	7,200	—	
Class A Amplifier ♠	150	—	2.0	8.5	—	6,700	7,000	47	—	—	*5965-A* 5★
Frequency Halfer ♠	100	—	—	17.8	—	—	I_c =200 µamp		—	—	
Class A Amplifier ♠	45	—	E_{cc} = 0	3.0	—	8,500	2,000	17	R_g =5.0 meg		5967 ◉
Class A Amplifier ♠	45	—	0	0.7	—	—	1,300	50	—	—	5968 ◉
Class A Amplifier ♠	135	45	3.0	6.0	0.6	—	1,700	—	—	—	5969 ◉
Class A Amplifier ♠	45	45	0	3.0	0.9	170,000	1,850	—	—	—	5970 ◉
Class A Amplifier	135	—	2.5	4.0	—	—	2,150	23	—	—	5971 ◉
Class A Amplifier	67.5	67.5	0	2.5	0.8	1,000,000	1,300	—	—	—	5972 ◉
	45	45	0	1.5	0.4	800,000	1,100	—	—	—	
Class A Amplifier	200	—	R_k = 680	12	—	4,000	4,000	16	—	—	5975 ◉
Class A Amplifier	100	—	R_k = 270	10	—	—	4,500	16	—	—	5977 ◉
Class A Amp	100	—	18	9.0	—	—	1,850	4.1	—	—	5987 ◉
Class A Amplifier	250	250	12.5	45†	4.5†	45,000	4,000	—	5,000	4.0	5992
Full-Wave Rectifier	Max d-c output current =60 ma; max peak inverse voltage =1,250 volts; rms supply voltage per plate =260 volts; max peak current per plate =230 ma										*5993*
Half-Wave Rectifier	Max d-c output current =45 ma; max peak inverse voltage =850 volts; max rms supply voltage =300 volts; max peak current =275 ma										5995 ◉
Class A Amplifier ♠	110	—	R_k = 105	100	—	350	15,500	5.4	—	—	5998
Class A Amplifier ♠	110‡	—	R_k = 105	100	—	350	15,500	5.4	—	—	5998A
Class C Amplifier	600	225	60	100	18	—	—	—	—	35	6000
	400	200	60	125	16	—	—	—	—	28	
Full-Wave Rectifier	Max d-c output current =120 ma; max peak inverse voltage =1400 volts; rms supply voltage per plate =375 volts; max peak current per plate =375 ma										6004
Class A Amplifier	250	250	12.5	45†	4.5†	52,000	4,100	—	5,000	4.5	*6005* 5★
	180	180	8.5	29†	3.0†	58,000	3,700	—	5,500	2.0	
Class AB_1 Amplifier	250	250	15	70†	5†	—	—	—	10,000 ‡	10	
Controlled Rectifier	Max d-c cathode current ▣ =2.5 amperes; max peak inverse voltage ▣ =1,500 volts; max peak cathode current ▣ =30 amperes										6011/710
Controlled Rectifier	Max d-c cathode current ▣ =0.5 amperes; max peak inverse voltage ▣ =1,300 volts; max peak cathode current ▣ =5.0 amperes										6012
Controlled Rectifier	Max d-c cathode current ▣ =1.0 amperes; max peak inverse voltage ▣ =1,250 volts; max peak cathode current ▣ =8.0 amperes										6014/C1K
Class A Amplifier ♠	100	—	R_k = 150	6.5	—	6,500	5,400	35	—	—	6021 ◉
Class A Amplifier	120	120	R_k = 180	7.5	2.5	300,000	5,000	—	—	—	*6028*
Class A Amplifier	90	—	4.0	11	—	4,250	2,000	8.5	—	—	6029 ◉
Class A Amplifier ♠	100	—	R_k = 50 ⊕	9.0	—	5,900	6,400	38	—	—	*6045*

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♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Out-put	Grid-plate
6046	Beam Power Amplifier (Special 25L6-GT)	7AC	9–11	25.0	0.3	10	200	125 1.5	—	—	—
6049 ◉	Semi-remote Cutoff RF Pentode	8DL	3–1	6.3	0.15	1.1 ▣	165 ▣	155 ▣ 0.55 ▣	3.6	3.8	0.009 ♣
6050 ◉	High-Frequency Medium-Mu Triode	5676	2–1	1.25 DC	0.12	—	135	—	1.3	3.4	1.4
6051 ◉	Pentode	6051	T-X	1.25	0.1	0.37 ◈	67.5 ◈	67.5 ◈ 0.11 ◈	3.65 ▲	3.0 ▲	0.25 ▲ ♣
6072	Twin Triode (Special 12AY7)	9A	6–2	{12.6 6.3	0.175} 0.35	1.5 ◈ ♠	330 ◈	—	1.4 ▲	0.5_1 ▲ 0.38_2 ▲	1.5 ▲
6072A 5★	Twin Triode (Special 12AY7)	9A	6–2	12.6 6.3	0.175 0.35	1.5 ◈ ♠	330 ◈	—	1.4 ▲	0.5_1 ▲ 0.38_2 ▲	1.5 ▲
6080	Low-Mu Twin Triode Power Amplifier (Special 6AS7-G)	8BD	12–43	6.3	2.5	13 ♠ ▣	250 ▣	—	6.0 ▲	2.2 ▲	8.0 ▲
6082	Low-Mu Twin Triode Power Amplifier	8BD	12–43	26.5	0.6	13 ♠ ▣	250 ▣	—	8.0 ▲	2.2 ▲	8.0 ▲
6082-A	Low-Mu Twin Triode	8BD	12–25	26.5	0.6	13 ♠	250	—	—	—	—
6087 5★	Full-Wave High-Vacuum Rectifier (Special 5Y3-GT)	5L	9–41	5.0	2.0	—	Tube Voltage Drop: ♠ 50 v at 125 ma d-c				
6088 ◉	Power Amplifier Pentode	512-AX	2–1	1.25 DC	0.02	—	67.5 ▣	67.5 ▣	—	—	—
6092 ◉	Power Amplifier Pentode	2E31	2–1	1.25	0.05	—	67.5 ▣	67.5 ▣	—	—	—
6094	Beam Power Amplifier	9DH	T-X	6.3	0.6	12.5 ▣	275 ▣	275 ▣ 2.0 ▣	8.5 ▲	5.3 ▲	1.45 ▲
6095	Beam Power Amplifier	7BZ	5–3	6.3	0.45	12 ◈	275 ◈	275 ◈ 2.0 ◈	8.0 ▲	8.5 ▲	0.4 ▲
6096	Sharp-Cutoff RF Pentode	7DB	5–1	6.3	0.175	1.55 ◈	200 ◈	155 ◈ 0.55 ◈	4.0	2.9	0.02 ♣
6097	Twin Diode	6BT	5–1	6.3	0.3	—	Tube Voltage Drop: ♠ 10 volts at 60 ma d-c				
6098	Beam Power Tetrode	6BQ	T-X	6.3	1.2	21 ▣	630 ▣	315 ▣ 3.5 ▣	11 ▲	7.0 ▲	0.8 ♣ ▲
6100	Medium-Mu Triode	6BG	5–2	6.3	0.15	3.5 5.0	300 300	— —	1.8	2.5	1.4
6101	Medium-Mu Twin Triode (Special 6J6)	7BF	5–2	6.3	0.45	0.85 ♠ ▣	330 ▣	—	2.0 ▲	0.4 ▲	1.5 ▲
6106	Full-Wave High-Vacuum Rectifier (Special 5Y3-GT)	5L	T-X	5.0	1.7	—	Tube Voltage Drop: ♠ 60 v at 125 ma d-c				
6110 ◉	Twin Diode	8DJ	3–1	6.3	0.15	—	Tube Voltage Drop: ♠ 10 v at 15 ma d-c				
6111 ◉	Medium-Mu Twin Triode	8DG	3–1	6.3	0.3	1.0 ♠ ◈	165 ◈	—	2.1	1.3_1 1.4_2	1.4
6112 ◉	High-Mu Twin Triode	8DG	3–1	6.3	0.3	0.3 ♠ ◈	165 ◈	—	1.9	1.5	1.0

■ Compactron.
† Zero signal.
♠ Per section.
‡ Plate-to-plate.
♣ Maximum.
✱ Supply voltage.
◉ Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
▣ Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	200 110	125 110	R_k = 180 7.5	46† 49†	2.2† 4.0†	28,000 13,000	8,000 8,000	— —	4,000 2,000	3.8 2.1	6046
Relay Energizer	115‡ 115‡	115‡ 115‡	0 25	105 0.1	12.8 —	R_{g1} = 2 meg R_{g2} = 1000 ohms		— —	500 500	— —	
Class A Amplifier	100	100	R_k = 150	7.5	2.5	400,000	3,550	—	—	—	6049 ◉
Class A Amplifier	135	—	5	4.0	—	—	1,600	16	—	—	6050 ◉
Class A Amplifier	45	45	4.0	4.0	1.1	35,000	1,350	—	—	—	6051 ◉
Class A Amplifier ♠	250	—	4.0	3.0	—	25,000	1,750	44	—	—	*6072*
Class A Amplifier ♠	250	—	4.0	3.0	—	25,000	1,750	44	—	—	*6072A* 5★
DC Amplifier ♠	135	—	R_k = 250	125	—	280	7,000	2	—	—	6080
DC Amplifier ♠	135	—	R_k = 250	125	—	280	7,000	2	—	—	6082
Class A Amplifier ♠	135	—	R_k = 250	125	—	280	7,000	2.0	—	—	6082-A
Full-Wave Rectifier	Max d-c output current = 125 ma; max peak inverse voltage = 1400 volts; rms supply voltage per plate = 350 volts; max peak current per plate = 375 ma										6087 5★
Class A Amplifier	45	45	1.25	0.65†	0.15†	700,000	625	—	80,000	0.0105	6088 ◉
Class A Amplifier	45	45	4.5	1.4	0.4	—	600	—	30,000	0.025	6092 ◉
Class A Amplifier	250	250	12.5	45	3.5	32,000	4,100	—	—	4.5	*6094*
Class A Amplifier	250	250	12.5	45†	4.5†	52,000	4,100	—	5,000	4.5	*6095*
Class A Amplifier	120	120	R_k = 200	7.5	2.5	340,000	5,000	—	—	—	*6096*
Half-Wave Rectifier	Max d-c output current per plate ▣ = 10 ma; max peak inverse voltage ▣ = 360; max rms supply voltage per plate ▣ = 117; max peak current per plate ▣ = 60 ma										*6097*
Class A Amplifier	300	300	36	58	4.0	22,000	4,300	95	—	—	6098
Class A Amplifier	250 100	— —	8.5 0	10.5 11.8	— —	7,700 6,250	2,200 3,100	17 19.5	— —	— —	*6100*
Class C Amplifier	300	—	27	25	—	Input Signal = 0.35 watts				5.5	
Class A Amplifier ♠	100	—	R_k = 50 ⊕	8.5	—	6,300	6,000	38	—	—	*6101*
Full-Wave Rectifier	Max d-c output current = 125 ma; max peak inverse voltage = 1,550 volts; rms supply voltage per plate = 350 volts; max peak current per plate = 415 ma										6106
Full-Wave Rectifier	Max d-c output current per plate ▣ = 4.4 ma; max peak inverse voltage ▣ = 460; max rms supply voltage per plate ▣ = 165; max peak current per plate ▣ = 26.5 ma										6110 ◉
Class A Amplifier ♠	100	—	R_k = 220	8.5	—	4,000	5,000	20	—	—	6111 ◉
Class A Amplifier ♠	150 100	— —	R_k = 820 R_k = 1,500	1.75 0.8	— —	28,000 39,000	2,500 1,800	70 70	— —	— —	6112 ◉

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✤Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads		
									Input	Out-put	Grid-plate
6113	High-Mu Twin Triode (Special 6SL7-GT)	8BD	9–11	6.3	0.3	1.0 ♠	250	—	3.0	3.8	2.8
6121 ◉	Medium-Mu Triode	5676	2–1	1.25 ·	0.12	1.1 ▣	185 ▣	—	1.4 ▲	1.9 ▲	1.4 ▲
6134 5 ★	Sharp-Cutoff RF Pentode (Special 6AC7)	8N	8–1	6.3	0.45	3.0 ◈	330 ◈	330 ◈ **‡** 0.4 ◈	11	5.0	0.015 ♣
6135 5 ★	Medium-Mu Triode (Special 6C4)	6BG	5–2	6.3	0.175	3.4 ◈	330 ◈	—	1.5 ▲	0.7 ▲	1.4 ▲
6136 5 ★	Sharp-Cutoff RF Pentode (Special 6AU6)	7BK	5–2	6.3	0.3	3.3 ▣	330 ▣	330 **‡** ▣ 0.7 ▣	6.0 ▲	5.0 ▲	0.0035 ♣ ▲
6137 5 ★	Remote-Cutoff RF Pentode (Special 6SK7)	8N	8–1	6.3	0.3	3.0 ◈	330 ◈	330 ◈ **‡** 0.45 ◈	5.0	7.0	0.003 ♣
6145	Sharp-Cutoff Pentode	8V	9–31	6.3	0.6	10	300	300 **‡** 2.5	14	7.5	0.06 ♣
6146	Beam Power Amplifier	7CK	T-X	6.3	1.25	20 ▣ 20 ▣	400 ▣ 600 ▣	— 250 ▣ 3.0 ▣	Triode Connection Two Tubes, Push-Pull Pentode Connection Two Tubes, Push-Pull		
6146-A	Beam Power Amplifier	7CK	T-X	6.3	1.25	20 ▣	600 ▣	250 ▣ 3.0 ▣	Pentode Connection Two Tubes, Push-Pull		
6146-B	Beam Power Amplifier	7CK	T-X	6.3	1.125	27 ▣	600 ▣	250 ▣ 3.0 ▣	Pentode Connection Two Tubes, Push-Pull		
6147 ◉	RF Pentode	6CL	3–8	{1.25 {2.5	0.125} .0625}	1.5 ▣	180 ▣	125 ▣ 0.6 ▣	2.6	3.0	0.055 ♣
6152 ◉	Low-mu Triode	5975	3–6	6.3	0.2	1.1 ▣	180 ▣	—	2.9 ▲	1.28 ▲	1.32 ▲
6159-A	Beam Power Amplifier	7CK	T-X	26.5	0.3	20 ▣	600 ▣	250 ▣ 3.0 ▣	Pentode Connection Two Tubes, Push-Pull		
6159-B	Beam Power Amplifier	7CK	T-X	26.5	0.3	27 ▣	600 ▣	250 ▣ 3.0 ▣	Pentode Connection Two Tubes, Push-Pull		
6169 ◉	High-Frequency Triode	8EE	3–1	6.3	0.15	3.0	250	—	2.5	2.6	1.6
6173	UHF Diode (Pencil)	6173	T-X	6.3	0.135	—	—	—	—	—	—
6184 ◉	UHF Twin Diode	8EH	T-X	6.3	0.15	—	Tube Voltage Drop: ♠ 5.0 v at 8.0 ma				
6186	Sharp-Cutoff RF Pentode	7BD	5–2	6.3	0.3	2.5 ▣	330 ▣	250 ▣ 0.55 ▣	6.5 ▲	1.8 ▲	0.03 ▲ ♣
6187	Sharp-Cutoff RF Pentode	7CM	5–1	6.3	0.175	1.65 ▣	200 ▣	155 ▣ 0.55 ▣	4.0	3.0	0.02 ♣
6188	High-Mu Twin Triode	8BD	9–11	6.3	0.3	1.1 ▣ ♠	275 ▣	—	—	—	—
6189 5 ★	Medium-Mu Twin Triode	9A	6–2	{12.6 {6.3	0.15} 0.3}	2.75 ♠	300	—	1.8	2.0	1.5
6193 ◉	High-Frequency Twin Triode	6193	3–3	6.3	0.3	2.0 ♠	250	—	2.75	2.20	1.46
6195 ◉	Beam Power Amplifier	6CL	T-X	{1.25 {2.5 {DC	0.22} 0.11}	2.5	180	150 0.6	2.4	1.3	0.045
6197	Sharp-Cutoff Power Amplifier Pentode	9BV	6–3	6.3	0.65	7.5 ▣	300 ▣	250 ▣ 2.5 ▣	—	—	—

■ Compactron. † Zero signal. ♠ Per section.
‡ Plate-to-plate. ♣ Maximum. **‡** Supply voltage.
◉ Subminiature type. ▲ Without external shield. ◈ Design maximum rating.
⊕ Total for all similar sections. ▣ Absolute maximum rating. # Conversion transconductance.

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Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier ♠	250	—	2.0	2.3	—	44,000	1,600	70	—	—	6113
Class A Amplifier	135	—	5.0	4.0	—	9,400	1,600	15	—	—	6121 ◉
Class A Amplifier	300	150	R_k = 160	10	2.5	1,000,000	9,000	—	—	—	**6134** 5★
Class A Amplifier	250 100	— —	8.5 0	10.5 11.8	— —	7,700 6,250	2,200 3,100	17 19.5	— —	— —	*6135* 5★
Class A Amplifier	250 100	150 100	R_k = 68 R_k = 150	10.6 5.0	4.3 2.1	1,000,000 500,000	5,200 3,900	— —	— —	— —	*6136* 5★
Class A Amplifier	250 100	100 100	3 1	9.2 13	2.6 4.0	800,000 120,000	2,000 2,350	— —	— —	— —	**6137** 5★
Pulse Amplifier	150 150 60	100 100 100	0 5.3 0	34 2.0 —	8 — 12	100,000 — —	— — —	— — —	— — —	— — —	6145
Class AB_1 Amplifier Class AB_2 Amplifier	400 600	— 165	100 44	40† 22†	— 0.6†	— —	— —	— —	8,000‡ 6,800‡	22 90	6146
Class AB_1 Amplifier	400 600	190 180	40 45	63† 26†	2.5† 1.0†	— —	— —	— —	4,000‡ 7,000‡	55 82	6146-A
Class AB_1 Amplifier	600	200	47	48†	14.8†	—	—	—	5,600	96	6146-B
Class A Amplifier	125	125	7.5	5.5	0.9	175,000	1,600	—	—	—	6147 ◉
Class A Amplifier	100	—	R_k = 270	10	—	3,400	5,100	17.5	—	—	6152 ◉
Class AB_1 Amplifier	400 600	190 180	40 45	63† 26†	2.5† 1.0†	— —	— —	— —	4,000‡ 7,000‡	55 82	6159-A
Class AB_1 Amplifier	600	200	47	48†	14.8†	—	—	—	5,600‡	96	6159-B
Class A Amplifier	180	—	1.0	11.5	—	8,500	6,500	55	—	—	6169 ◉
Half-Wave Rectifier	Max d-c output current ▣ =5.5 ma; max peak inverse voltage ▣ =375 volts; max peak current ▣ =50 ma										6173
Full-Wave Rectifier	Max d-c output current =20 ma; max peak inverse voltage =450; max rms supply voltage per plate =200; max peak current per plate =50 ma										6184 ◉
Class A Amplifier	250	150	R_k = 200	7.0	2.0	—	5,000	—	—	—	*6186*
Class A Amplifier	120	120	2.0	5.2	3.5	—	3,200	—	—	—	*6187*
Class A Amplifier ♠	250	—	2.0	2.3	—	44,000	1,600	70	—	—	6188
Class A Amplifier ♠	250 100	— —	8.5 0	10.5 11.8	— —	7,700 6,500	2,200 3,100	17 20	— —	— —	*6189* 5★
Class A Amplifier ♠	180 90	— —	1.0 0.50	11.5 4.5	— —	8,500 9,000	6,500 5,800	55 50	— —	— —	6193 ◉
Class A Amplifier	125	125	7.5	9.0	1.5	120,000	2,100	—	—	—	6195 ◉
Class A Amplifier	250	150	3.0	30	7.0	90,000	11,000	—	—	—	*6197*

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♥ G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✤	Capacitance in Picofarads Input	Output	Grid-plate
6201 5★	High-Frequency Twin Triode (Special 12AT7)	9A	6–2	12.6 / 6.3	0.15 / 0.3	2.5 ♠◈	330◈	—	2.5▲	0.45_1▲ 0.38_2▲	1.6▲
6202 5★	Full-Wave High-Vacuum Rectifier (Special 6X4)	5BS	5–3	6.3	0.6	—	Tube Voltage Drop: ♠ 22 v at 50 ma d-c				
6203 5★	Full-Wave High-Vacuum Rectifier	9CD	6–3	6.3	0.9	—	Tube Voltage Drop: ♠ 22 v at 70 ma d-c				
6205 ◉	Sharp-Cutoff RF Pentode	8DC	3–1	6.3	0.15	0.9▣	165▣	155▣ 0.55▣	4.2	3.4	0.015 ♣
6206 ◉	Semi-Remote-Cutoff RF Pentode	8DC	3–1	6.3	0.15	0.85 ▣	165▣	155▣ 0.55▣	4.2	3.4	0.015 ♣
6211	Medium-Mu Twin Triode	9A	6–2	12.6 / 6.3	0.15 / 0.3	1.5 ♠▣	200▣	—	2.9▲	0.54_1▲ 0.46_2▲	2.22▲
6211-A 5★	Medium-Mu Twin Triode	9A	6–2	12.6	0.15	1.3◈ ♠	200◈	—	2.9▲	0.54_1 ▲	2.22▲
				6.3	0.3	—	—	—	—	0.46_2 ▲	—
⬤6215	Half-Wave High-Voltage Rectifier	3C	T-X	1.25	0.2	—	Tube Voltage Drop: 56 v at 2.0 ma d-c				
6216 5★	Beam Power Amplifier	9CE	6–3	6.3	1.2	10	300	200 2.0	13.2▲	6.7▲	0.37♣ ▲
6221 ◉	Medium-Mu Triode	8HF	3–1	6.3	0.175	3.3▣	165▣	—	—	—	—
6222 ◉	High-Mu Triode	8HF	3–1	6.3	0.175	0.55▣	165▣	—	—	—	—
6223 ◉	Sharp-Cutoff Pentode	8DL	3–1	6.3	0.175	1.1▣	165▣	155▣ 0.55▣	4.2	3.4	0.015
6224 ◉	Beam Power Amplifier	8DL	3–3	6.3	0.45	5.0▣	165▣	155▣ 0.6▣	6.5	7.5	0.2
6225 ◉	Semi-remote Cutoff Pentode	8DL	3–1	6.3	0.175	1.1▣	165▣	155▣ 0.55▣	4.1	3.4	0.015
GL6228	Ignitron	GL 6228	TX	—	—	—	—	—	—	—	—
6245 ◉	Sharp-Cutoff Pentode	5702	3–6	6.3	0.2	1.85▣	200▣	155▣ 0.55▣	4.35	3.15	0.03♣
6247 ◉	High-Mu Triode	8FO	3–2	6.3	0.2	1.6▣	275▣	—	—	—	—
GL-6251	Tetrode	GL-6251	TX	5.5	19.0	25000	7000	700	Cathode-Plate 0.06; Input 75; Output 27		
6265 5★	Sharp-Cutoff RF Pentode (Special 6BH6)	7CM	5–2	6.3	0.175	2.0	300	300⁑ 0.5	5.2▲	4.4▲	0.004 ♣▲
6267	AF Pentode	9CQ	6–2	6.3	0.2	1.0	300	200 0.2	—	—	—
6281 ◉	Sharp-Cutoff AF Pentode	2E31	2–2	0.625	0.02	—	25▣	25▣	2.5	3.4	0.01 ♣
GL-6283	Tetrode	GL-6283	TX	6.3	3.6	300	2000	320	Cathode-Plate 0.006; Input 18.25; Output 6.4		
6286 ◉	Medium-Mu Triode	5676	2–1	1.25	0.125	0.45▣	100▣	—	1.3▲	2.1▲	1.6▲
6287	Beam Power Amplifier	9CT	T-X	6.3	0.6	13.2▣	275▣	275▣ 3.2▣	8.0▲	9.0▲	1.1♣ ▲
6299	High-Mu UHF Triode (Planar)	6299	T-X	6.3	0.3	2.0▣	200▣	—	3.5▲	0.015 ▲	1.7▲
6320 ◉	High-mu Twin Triode	8DG	T-X	6.3	0.085	0.6♠	150	—	1.0	1.4	0.6

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ⁑ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

⬤ See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier ♠	250	—	R_k = 200	10	—	10,900	5,500	60	—	—	*6201* 5★
	100	—	R_k = 270	3.3	—	14,300	4,000	57	—	—	
Full-Wave Rectifier	Max d-c output current ▣ =55 ma; max peak inverse voltage ▣ =1375 volts; rms supply voltage per plate =325 volts; max peak current per plate ▣ =220 ma										*6202* 5★
Full-Wave Rectifier	Max d-c output current ▣ =77 ma; max peak inverse voltage ▣ =1375 volts; rms supply voltage per plate =325 volts; max peak current per plate ▣ =300 ma										*6203* 5★
Class A Amplifier	100	100	R_k = 150	7.5	2.4	260,000	5,000	—	—	—	6205 ◉
Class A Amplifier	100	100	R_k = 120	7.2	2.2	260,000	4,500	—	—	—	6206 ◉
Class A Amplifier ♠	100	—	R_k = 470	4.6	—	7,500	3,600	27	—	—	*6211*
Frequency Halfer ♠	150‡	—	0	4.8	—	R_g =47,000 ohms		—	20,000	—	
	150‡	—	10	0.1	—	R_g =47,000 ohms		—	20,000	—	
Class A Amplifier ♠	100	—	2.0	6.6	—	6,500	4,700	30	—	—	*6211-A* 5★
Frequency Halfer ♠	85	—	—	16	—	—	(I_c =0.2 ma)		—	—	
Half-Wave Rectifier	Max d-c output current =1.0 ma; max peak inverse voltage =18,000 volts; max peak current =8.0 ma										6215
Class A Amp Filter Reactor	200	100	6.0	47†	2.0†	38,000	8,800	—	4,500	3.8	*6216* 5★
	100	100	3.0	72	3.0	18,500	12,500	R_{g1} =0.1 meg		—	
Class A Amplifier	100	—	R_k = 150	8.5	—	4,700	5,800	27	—	—	6221 ◉
Class A Amplifier	100	—	R_k = 1500	0.7	—	41,000	1,700	70	—	—	6222 ◉
Class A Amplifier	100	100	R_k = 150	7.5	2.4	175,000	5,000	—	—	—	6223 ◉
Class A Amplifier	110	110	R_k = 270	30	2.0	10,000	4,200	—	—	—	6224 ◉
Class A Amplifier	100	100	R_k = 120	7.2	2.0	175,000	4,500	—	—	—	6225 ◉
Capacitor Discharge	Max. forward peak anode voltage 50000 volts; max. inverse peak anode voltage 50000 volts; max. peak anode curr. 30000 A.; typical discharge rate pulses per minute 2.										GL6228
Class A Amplifier	120	120	R_k = 200	7.5	2.6	—	5,000	E_{c3} =0 volts		—	6245 ◉
	20	30	0	2.5	1.5	—	3,275	E_{c3} =0 volts		—	
Class A Amplifier	250	—	R_k = 500	4.2	—	22,600	2,650	60	—	—	6247 ◉
VHF Amplifier-Oscillator	6800	600	20	7500	50	—	—	20	—	25000	GL-6251
Class A Amplifier	250	150	R_k = 100	7.4	2.9	1,000,000	4,600	—	—	—	*6265* 5★
Class A Amplifier	250	140	2.0	3.0	0.6	2,500,000	2,000	E_{c3} =0 volts		—	*6267*
Class A Amplifier	15	15	1.0	0.05	0.02	2,000,000	105	—	—	—	6281 ◉
Oscillator/Amplifier Class C	1600	250	40	290	—	—	—	10	—	154	GL-6283
Amplifier Class B	1500	250	25	400	7	—	—	—	—	260	
Class A Amplifier	67.5	—	2.0	6.0	—	5,500	2,100	11.5	—	—	6286 ◉
Class A Amplifier	250	250	12.5	46†	5.0†	55,000	4,100	—	6,000	4.5	*6287*
Class A Amplifier	175	—	Adjust for I_b = 10 ma	10	—	9,600	15,000	115	—	—	6299
Class A Amplifier ♠	100	—	R_k = 680	—	—	33,000	1,800	60	—	—	6320 ◉

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads: Input	Output	Grid-plate
6321 ◉	Low-Mu Twin Triode	8DG	T-X	6.3	0.085	0.6♠	150	—	1.0	1.4	0.55
6325	Full-Wave High-Vacuum Rectifier	6325	T-X	6.3	2.7	—	—	—	—	—	—
6327	Beam Power Amplifier	6327	T-X	6.3	1.8	35▣	1,650 ▣	330▣ 6.0▣	13▲	13▲	0.6♣ ▲
6336	Low-Mu Twin Triode	8BD	T-X	6.3	4.75	30▣♠	400▣	—	13.7▲	4.7▲	15.2▲
6336-A	Low-Mu Twin Triode	8BD	T-X	6.3	5.0	30▣♠	400▣	—	16.7▲	3.8▲	21.8▲
6350	Medium-Mu Twin Triode	9CZ	6-3	6.3 / 12.6	0.6 / 0.3	4.0▣ ♠	330▣	—	3.6▲	0.6▲	3.2▲
6352 ◉	Temperature-Limited Twin Diode	8EY	3-2	3.0 AC	0.36	—	Max filament voltage ▣ =4.0 a-c Max plate voltage ▣ =250 d-c Max plate current ▣ =1.1 ma ⊕				
6355	Twin Electron-Ray Indicator	6355	T-X	6.3	0.14	—	Max target voltage =275 v				
6360	Twin Tetrode	9PW	6-4	12.6 / 6.3	0.41 / 0.82	7.0▣ ♠	300▣	200▣ 2.0▣	Two Sections, Push-Pull		
6384	Beam Power Amplifier	6BQ	T-X	6.3	1.2	30▣	750▣	325▣ 3.5▣	—	—	—
6385	High-Frequency Twin Triode	8CJ	6-2	6.3	0.5	1.5♠	300	—	2.4▲	1.1▲	1.7▲
6386 5★	Medium-Mu Remote-Cutoff Twin Triode	8CJ	6-1	6.3	0.35	1.5♠	300	—	2.0▲	1.1▲	1.2▲
6394	Low-Mu Twin Triode	8BD	T-X	26.5	1.2	30▣♠	400▣	—	13.7▲	4.7▲	15.2▲
6394-A	Low-Mu Twin Triode	8BD	T-X	26.5	1.3	30▣♠	400▣	—	16.7▲	3.8▲	21.8▲
6397 ◉	Power-Amplifier Pentode	6CL	T-X	2.5 / 1.25	0.0625 / 0.125	1.5▣	135▣	135▣ 0.6▣	2.75	3.0	0.055
6414 5★	Twin Triode	9A	6-3	12.6 / 6.3	0.225 / 0.45	2.0◈ ♠ 3.6◈ ⊕	200◈	—	4.0▲	0.47_1 ▲ 0.38_2 ▲	3.0▲
6418 ◉	Power-Amplifier Pentode	512-AX	T-X	1.25	0.01	—	30▣	30▣	—	—	—
6419 ◉	Power-Amplifier Pentode	512-AX	T-X	0.625	0.01	—	25▣	25▣ —	—	—	—
6442	Medium-Mu UHF Triode (Planar)	6442	T-X	6.3	0.9	8.0▣	350▣	—	5.5▲	0.035 ▲	2.3▲
6463	Medium-Mu Twin Triode	9CZ	6-3	12.6 / 6.3	0.3 / 0.6	4.0♠ 7.0⊕	300	—	3.0▲	0.6_1▲ 0.5_2▲	5.0▲
6485	Sharp-Cutoff RF Pentode	7BK	5-2	6.3	0.45	3.2	300	150 0.6	10	3.6	0.02♣
6486	Dual-Control Pentode	9DV	6-2	6.3	0.25	2.0	180	140 0.75	4.5♣	3.3	0.035 ♣
6486-A	Dual-Control Pentode	9DV	6-2	6.3	0.25	2.0▣	200▣	155▣ 0.85▣	4.4♣	3.7	0.04♣
GL6512	Ignitron	GL 6512	Integral thermostat version of GL-5554. Same ratings apply.								
GL6513	Ignitron	GL 6513	Integral thermostat version of GL-5555. Same ratings apply.								
GL6515	Ignitron	GL 6515	Integral thermostat version of GL-5564. Same ratings apply.								
6519 ◉	Power-Amplifier Pentode	512AX	T-X	1.25	0.01	—	30▣	30▣	R_{g1} =10 meg		
6520	Low-Mu Twin Triode	8BD	16-3	6.3	2.5	14▣♠	300▣	—	8.4▲	2.2▲	9.4▲

■ Compactron.
† Zero signal.
♠ Per section.
‡ Plate-to-plate.
♣ Maximum.
‡ Supply voltage.
◉ Subminiature type.
▲ Without external shield.
◈ Design maximum rating.
⊕ Total for all similar sections.
▣ Absolute maximum rating.
Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-am-peres	Screen Milli-am-peres	R_p, Ohms	G_m, μmhos	μ Fac-tor	Load for Rated Out-put, Ohms	Power Out-put, Watts	Tube Type
Class A Amplifier ♠	100	—	R_k = 680	—	—	9,400	1,700	16	—	—	6321 ◉
Full-Wave Rectifier	Max d-c output current ▣ =250 ma; max peak inverse voltage ▣ =2200; rms supply voltage per plate ▣ =780; max peak current per plate ▣ =550 ma										6325
Class A Amplifier	400 250	300 250	40 22.5	75 120	3.5 7.0	20,000 —	5,500 8,000	— —	— —	— —	6327
DC Amplifier ♠	190	—	R_k = 200	185	—	250	11,000	2.7	—	—	6336
DC Amplifier ♠	190	—	R_k = 200	185	—	—	13,500	2.7	—	—	6336-A
Class A Amplifier ♠	150	—	5.0	11	—	3,900	4,600	18	—	—	*6350*
Control Service	Plate voltage =250 d-c thru 1 meg; plate current =50 μa ⊕										6352 ◉
Tuning Indicator	Target voltage =250 v; Focus-electrode-1 voltage =120 to 190 v; Focus-electrode-2 voltage =120 to 190 v										*6355*
Class AB_1 Amplifier	300	200	21.5	30†	1.2†	—	—	—	10,000 ‡	12	*6360*
Horizontal Amplifier	250	250	22.5	77	3.5	—	5,400	—	—	—	6384
	Max positive pulse plate voltage =1,500 volts; max screen dissipation =3.5 watts; max d-c cathode current =125 ma										
Class A Amplifier ♠	150	—	2.0	8.0	—	7,000	5,000	35	—	—	*6385*
Class A Amplifier ♠	100	—	R_k = 200	9.6	—	4,250	4,000	17	—	—	*6386* 5★
DC Amplifier ♠	190	—	R_k = 200	185	—	200	13,500	2.7	—	—	6394
DC Amplifier ♠	190	—	R_k = 200	185	—	—	13,500	2.7	—	—	6394-A
Class A Amplifier	125	125	7.5	7.25	1.2	—	1,950	—	—	—	6397 ◉
Class A Amplifier ♠	180 150 100	— — —	2.0 4.8 —	8.0 0.15 17	— — —	7,650 — —	5,550 — I_c =0.2 ma	42.5 — 	— — —	— — —	*6414* 5★
Class A Amplifier	22.5	22.5	1.2	0.24†	0.06†	420,000	300	—	100,000	0.0022	6418 ◉
Class A Amplifier	15	15	0.625	0.055	0.02	2,000,000	100	—	—	—	6419 ◉
Class C Amplifier	250	—	I_c = 6 ma	23	—	—	—	—	—	2.8	6442
Class A Amplifier ♠	250	—	R_k = 620	14.5	—	3,850	5,200	20	—	—	*6463*
Frequency Halfer ♠	100 200	— —	— 11	29 1.0	— —	— —	I_c =200 μa —	 —	— —	— —	
Class A Amplifier	300	150	R_k = 160	10	2.5	500,000	9,000	—	—	—	*6485*
Class A Amplifier	120	120	−2.0	3.5	3.3	—	3,250	E_{c3} =0 volts		—	*6486*
Class A Amplifier	120 120	120 120	2.0 2.0	3.5 4.2	3.3 5.1	— —	3,250 2,100	E_{c3} =0 volts E_{c3} = −3 volts		— —	*6486-A*
	—	—	—	—	—	—	—	—	—	—	GL6512
	—	—	—	—	—	—	—	—	—	—	GL6513
	—	—	—	—	—	—	—	—	—	—	GL6515
Class A Amplifier	22.5	22.5	E_{cc1}=0	0.4	0.1	300,000	450	—	100,000	0.0015	6519 ◉
DC Amplifier ♠	135	—	R_k = 250	112	—	280	7,000	2.0	—	—	6520

Metal tubes are shown in bold-face type, *miniature tubes in italics.*

♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

♣ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Output	Grid-plate
6525	Thyratron	7BN	5–1	6.3	0.15	—	500◈	Anode voltage drop = 8 volts			
6526◉	Power-Amplifier Pentode	512-AX	2–1	1.25	0.125	1.1▣	135▣	135▣ 0.4▣	—	—	—
6528	Twin Triode	8BD	T-X	6.3	5.0	30▣♠	400▣	—	17.8▲	2.9▲	23.8▲
6533◉	High-Mu Triode	8FY	3–1	6.3	0.2	0.35◈	150◈	—	1.75▲	0.6▲	1.6▲
6540◉	Sharp-Cutoff Pentode	5702	3–6	6.3	0.2	1.1◈	165◈	155◈ 0.4◈	4.8	3.5	0.03♣
6550	Beam Power Amplifier	7AC	T-X	6.3	1.8	42◈	660◈	440◈ 6.0◈	15▲	10▲	0.8▲
6582	RF Pentode	9EJ	6–2	6.3	0.25	2.0	200	155 0.85	5.0	3.4	0.03♣
6582-A	Sharp-Cutoff RF Pentode	9EJ	6–2	6.3	0.25	2.0▣	200▣	155▣ 0.85▣	4.5	3.0	0.03♣
6611◉	RF Pentode	512AX	2–1	1.25	0.02	0.1▣	50▣	50▣ 0.02▣	4.0	4.0	0.008♣
6612◉	RF Pentode	512AX	2–1	1.25	0.08	0.2▣	50▣	50▣ 0.05▣	5.5	4.2	0.01♣
6660	Remote-Cutoff RF Pentode (Special 6BA6)	7BK	5–2	6.3	0.3	3.3◈	330◈	330◈§ 0.65◈	5.5	5.5	0.0035♣
6661	Sharp-Cutoff RF Pentode (Special 6BH6)	7CM	5–2	6.3	0.15	3.3◈	330◈	330◈§ 0.55◈	5.4	4.4	0.0035♣
6662	Remote-Cutoff RF Pentode (Special 6BJ6)	7CM	5–2	6.3	0.15	3.3◈	330◈	330◈§ 0.65	4.5	5.5	0.0035♣
6663	Twin Diode (Special 6AL5)	6BT	5–1	6.3	0.3	—	Tube Voltage Drop:♠ 10 v at 60 ma d-c				
6664	High-Frequency Triode	5CE	5–2	6.3	0.15	2.9◈	330◈	—	2.2	1.4	1.5
6669	Beam Power Amplifier (Special 6AQ5)	7BZ	5–3	6.3	0.45	12◈	250◈	250◈ 2.0◈	Single Tube 2 Tubes, Push Pull		
6676	Sharp-Cutoff RF Pentode	7CM	5–2	6.3	0.3	2.3◈	330◈	330◈§ 0.55◈	6.5	3.0	0.015♣
6677	Power-Amplifier Pentode (Special 6CL6)	9BV	6–3	6.3	0.65	8.5◈	330◈	330◈§ 2.0◈	11▲	5.5▲	0.12♣▲
6678	Triode-Pentode (Special 6U8)	9AE	6–2	6.3	0.45	3.0◈ 3.0◈	330◈ 330◈	330◈§ 0.55◈ —	Pentode Section Triode Section		
6679	High-Mu Twin Triode (Special 12AT7)	9A	6–2	12.6 6.3	0.15 0.3	2.8◈♠	330◈	—	2.2	1.2_1 1.5_2	1.5
6680	Medium-Mu Twin Triode (Special 12AU7)	9A	6–2	12.6 6.3	0.15 0.3	3.0◈♠	330◈	—	1.8	2.0	1.5
6681	High-Mu Twin Triode (Special 12AX7)	9A	6–2	12.6 6.3	0.15 0.3	1.1◈♠	330◈	—	1.8	1.9	1.7

■Compactron. ‡ Plate-to-plate. ◉Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. § Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Relay Energizer	DC control-grid supply voltage for anode conduction: −2.5 volts at E_{bb} = 105 volts d-c, Ec_{c2} = 0 volts, RL = 22,000 ohms, R_{g2} = 1.0 meg R_{g1} = 0										*6525*
Class A Amplifier	110	110	6.0	6.5†	1.15†	140,000	1,900	—	10,000	0.375	6526 ◉
DC Amplifier ♠	100	—	4.0	185	—	245	37,000	9.0	—	—	6528
Class A Amplifier	120	—	R_k = 1500	0.9	—	31,000	1,750	54	—	—	6533 ◉
Class A Amplifier	120	120	R_k = 200	7.5	2.6	150,000	5,000	—	E_{c3} = 0 volts		6540 ◉
Class A Amplifier	400 250	225 250	16.5 14	87 140	4.0 12	— 15,000	— 11,000	— —	3,000 1,500	20 12.5	6550
Class A Amplifier	120	120	2.0	7.5	2.5	—	4,500	—	—	—	*6582*
Class A Amplifier	120	120	R_k = 180	7.5	2.5	500,000	4,500	—	—	—	*6582-A*
Class A Amplifier	30	30	E_{cc1}=0	1.0	0.35	400,000	1,000	R_{g1} = 5.0 meg			6611 ◉
Class A Amplifier	30	30	E_{cc1}=0	3.0	1.0	180,000	3,000	R_{g1}=2.0 meg			6612 ◉
Class A Amplifier	250 100	100 100	R_k = 68 R_k = 68	11 10.8	4.2 4.4	1,000,000 250,000	4,400 4,300	E_{c3} = 0 volts E_{c3} = 0 volts			*6660*
Class A Amplifier	250	150	R_k = 100	7.4	2.6	1,400,000	4,600	E_{c3} = 0 volts			*6661*
Class A Amplifier	250 100	100 100	R_k = 80 R_k = 80	9.2 9.0	3.3 3.5	1,300,000 250,000	3,600 3,650	E_{c3} = 0 volts E_{c3} = 0 volts			*6662*
Rectifier Service	Max d-c output current per plate ◈ = 10 ma; max peak inverse voltage ◈ = 275 volts; max peak current per plate ◈ = 60 ma										*6663*
Class A Amplifier	250 100	— —	R_k = 200 R_k = 270	10 3.7	— —	10,900 15,000	5,500 4,000	60 60	— —	— —	*6664*
Class A Amplifier Class AB_1 Amplifier	250 250	250 250	12.5 15	45† 70†	4.5† 5.0†	52,000 —	4,100 —	— —	5,000 10,000 ‡	4.5 10	*6669*
Class A Amplifier	125 125	125 125	R_k = 56 3.0	13 2.8	3.7 —	280,000 —	8,000 —	— —	— —	— —	*6676*
Class A Amplifier	250	150	3.0	30†	7.0†	150,000	11,000	G_3 tied to K	7,500	2.8	*6677*
Class A Amplifier Class A Amplifier	250 150	110 —	R_k = 68 R_k = 56	10 18	3.5 —	400,000 5,000	5,200 8,500	— 40	— —	— —	*6678*
Class A Amplifier ♠	250	—	R_k = 200	10	—	10,900	5,500	60	—	—	*6679*
Class A Amplifier	250 100	— —	8.5 0	10.5 11.8	— —	7,700 6,500	2,200 3,100	17 20	— —	— —	*6680*
Class A Amplifier ♠	250 100	— —	2.0 1.0	1.2 0.5	— —	62,000 80,000	1,600 1,250	100 100	— —	— —	*6681*

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1, 2, 3, etc. indicate tube sections.
✱ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Output	Grid-plate
6688 5★	RF Pentode	9EQ	6-1	6.3	0.3	3.0▣	210▣	175▣ 0.9▣	7.5	3.0	0.03♣
6690●	Medium-Mu Twin Triode	8GQ	T-X	6.3	0.3	1.1▣ ♠	120▣	—	2.6	1.7_1 2.1_2	1.8
6754	Full-Wave High-Vacuum Rectifier	9ET	T-X	6.3	1.0	—	—	—	—	—	—
6763	Cold-Cathode Half-Wave Rectifier	6763	T-X	—	—	—	Tube Voltage Drop: 100 volts				
6771	High-Mu UHF Triode (Planar)	6442	T-X	6.3	0.57	6.25 ▣	300▣	—	4.05 ▲	0.018 ▲	2.0▲
6788●	Sharp-Cutoff Pentode	8DL	3-11	6.3	0.175	0.5▣	250▣	150▣ 0.15▣	2.4	3.3	0.032 ♣
●6792	High-Vacuum Beam Tetrode	8GL	T-X	6.3	0.45	25	25,000	—	2.0▲	4.0▲	0.03▲
6807	Thyratron	6807	T-X	2.5	21	—	Anode Voltage Drop = 16 Volts				
6808	Thyratron	6808	T-X	2.5	21	—	Anode Voltage Drop = 16 Volts				
6809	Thyratron	6807	T-X	2.5	21	—	Anode Voltage Drop = 16 Volts				
6814●	Medium-Mu Triode	8DK	3-1	6.3	0.15	2.0	250	—	2.4	2.4	1.3
6829 5★	Twin Triode	9A	6-3	12.6 / 6.3	0.225 / 0.45	2.2◈ ♠ 4.0◈ ⊕	275◈	—	4.0▲	0.51▲ 0.38_2 ▲	3.0▲
6832●	Medium-Mu Twin Triode	8DG	3-2	6.3	0.4	0.1▣ ♠	165▣	—	—	—	—
6840	Medium-Mu Twin Triode	9CZ	6-3	12.6 / 6.3	0.4 / 0.8	4.0◈ ♠ 7.0◈ ⊕	300◈	—	4.0▲	0.70_1▲ 0.65_2▲	5.5▲
6842	High-Voltage Regulator	7EQ	T-X	6.3	0.15	8.0	4000	150	3.95▲	1.34▲	0.067 ▲
GL6848	Tetrode	GL 6848	TX	7.0	13.5	2000	4500 7000	500 750	Cathode-Plate 0.01; Input 27.8; Output 6.4		
6851	High-Mu Twin Triode	9A	6-2	6.3	0.25	1.0▣ ♠	330▣	—	1.6▲	0.46_1▲ 0.36_2▲	1.4▲
6853	Full-Wave High-Vacuum Rectifier	8HE	9-42	5.0	1.7	—	Tube Voltage Drop: ♠ 60 volts at 125 ma d-c				
6854	Medium-Mu Twin Triode	8CJ	6-2	6.3	0.5	1.5♠	300	—	2.4▲	1.1▲	1.7▲
6856/740	Thyratron	6856	T-X	2.5	16	—	Anode Voltage Drop = 12 Volts				
6858/760	Thyratron	6807	T-X	2.5	21	—	Anode Voltage Drop = 12 Volts				
6859/760-P	Thyratron	6808	T-X	2.5	21	—	Anode Voltage Drop = 12 Volts				
6872●	Pentode	5702	3-7	6.3	0.2	1.1◈	165◈	155◈ 0.4◈	5.0	3.5	0.03♣
6877	Low-Mu Triode	9GB	6-4	6.3	0.8	12▣	200▣	—	—	—	—
6883	Beam Power Amplifier	7CK	T-X	12.6	0.625	20▣ / 20▣	400▣ / 400▣	— / 250▣ 3.0▣	Triode Connection Two Tubes, Push-Pull / Pentode Connection Two Tubes, Push-Pull		
6883-A	Beam Power Amplifier	7CK	T-X	12.6	0.625	20▣	600▣	250▣ 3.0▣	Pentode Connection Two Tubes, Push-Pull		

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. ‖ Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	190	160	R_k = 630	13	3.3	90,000	16,500	E_{cc1} = +9.0 volts			*6688* 5★
Class A Amplifier ♠	100	—	R_k = 100	8.0	—	—	4,800	—	—	—	6690 ●
Full-Wave Rectifier	Max d-c output current =90 ma; max peak inverse voltage =1,450 volts; rms supply voltage =325 volts; max peak current per plate =330 ma										*6754*
Half-Wave Rectifier	Max d-c output current ▣ =12 ma; max peak inverse voltage ▣ =2,800 volts; min plate supply voltage ▣ =500 volts										6763
Class A Amplifier	250	—	1.6	25	—	—	23,000	90	—	—	6771
Class A Amplifier	100	100	R_k = 1500	0.7	0.1	1,200,000	1,100	—	—	—	6788 ◉
HV Shunt Regulator	25,000	200	18	1.0	0.1	10,000,000	195	—	—	—	6792 ●
	Max screen dissipation =1.0 watt; max d-c cathode current =10 ma										
Controlled Rectifier	Max d-c cathode current ▣ =6.4 amperes; max peak inverse voltage ▣ =1,500 volts; max peak cathode current ▣ =80 amperes										6807
Controlled Rectifier	Max d-c cathode current ▣ =6.4 amperes; max peak inverse voltage ▣ =1,500 volts; max peak cathode current ▣ =80 amperes										6808
Controlled Rectifier	Max d-c cathode current ▣ =6.4 amperes; max peak inverse voltage ▣ =1,500 volts; max peak cathode current ▣ =80 amperes										6809
Class A Amplifier	100	—	R_k = 150	10	—	4,800	6,000	29	—	—	6814 ◉
Class A Amplifier ♠	150 150 100	— — —	R_k = 220 4.8 —	8.5 0.15 17	— — —	7,000 — —	6,700 — I_c =0.2 ma	47 —	— — —	— — —	*6829* 5★
Class A Amplifier ♠	100	—	R_k = 3000	0.8	—	—	1,050	26	—	—	6832 ◉
Class A Amplifier ♠	250 100 80	— — —	R_k = 620 6.5 —	14 0.1 31	— — —	3,400 — —	5,900 — I_c =200 µa	20 —	— — —	— — —	*6840*
Class A Amplifier	1500	100	1.0	4.5	0.5	930,000	2,500	—	—	—	*6842*
RF Amplifier Class C	**4000**	**400**	**100**	**570**	**20**	—	—	—	—	**1250**	**GL6848**
RF Amp/Osc Class C	**6500**	**700**	**100**	**800**	**25**	—	—	—	—	**3200**	
Class A Amplifier ♠	250	—	R_k = 3100	1.0	—	60,000	1,200	70	—	—	*6851*
Full-Wave Rectifier	Max d-c output current =125 ma; max peak inverse voltage =1550 volts; max RMS supply voltage per plate =350 volts; max peak current per plate = 415 ma										6853
Class A Amplifier ♠	150	—	R_k = 240	8.2	—	6,500	5,225	35	—	—	*6854*
Controlled Rectifier	Max d-c cathode current ▣ =2.5 amperes; max peak inverse voltage ▣ = 1,500 volts; max peak cathode current ▣ =50 amperes										6856/740
Controlled Rectifier	Max d-c cathode current ▣ =6.4 amperes; max peak inverse voltage ▣ = 1,500 volts; max peak cathode current ▣ =77 amperes										6858/760
Controlled Rectifier	Max d-c cathode current ▣ =6.4 amperes; max peak inverse voltage ▣ = 1,500 volts; max peak cathode current ▣ =77 amperes										6859/ 760-P
Class A Amplifier	120	120	R_k = 200	7.75	2.7	340,000	4,100	—	—	—	6872 ◉
Class A Amplifier	150	—	12	75	—	2,000	6,500	3.75	—	—	*6877*
Class AB_1 Amplifier	400	—	100	40†	—	—	—	—	8,000‡	22	6883
Class AB_2 Amplifier	600	165	44	22†	0.6†	—	—	—	6,800‡	90	
Class AB_1 Amplifier	400 600	190 180	40 45	63† 26†	2.5† 1.0†	— —	— —	— —	4,000‡ 7,000‡	55 82	6883-A

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♥G2 and G4 are screen. G3 is signal-input grid.
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✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
6883-B	Beam Power Amplifier	7CK	T-X	12.6	0.562	27 ▣	600 ▣	250 ▣ 3.0 ▣	Pentode Connection Two Tubes, Push-Pull		
6887	Twin Diode	6BT	5–1	6.3	0.2	—	Tube Voltage Drop: ♠ 1.2 volts at 6.0 ma d-c				
6888	Dual-Control Pentode	8N	9–12	6.3	0.8	8.0 ▣	250 ▣	150 ▣ 2.0 ▣	12 ▲	6.5 ▲	0.7 ▲
6889	Beam-Power Amplifier	8HG	T-X	6.3	1.2	30 ▣	3,000	850 3.5 ▣	—	—	—
6897	High-Mu UHF Triode (Planar)	2C39-B	T-X	6.3	1.05	100 ▣	1,000 ▣	—	6.5 ▲	0.023 ▲	2.01 ▲
6900	Medium-Mu Twin Triode	9H	6–3	12.6 6.3	0.5 1.0	4.25 ▣ ♠	600 ▣	—	6.5 ▲	0.8_1 ▲ 0.61_2 ▲	4.0 ▲
6913	Medium-Mu Twin Triode	9A	6–3	12.6 6.3	0.3 0.6	3.5 ♠	300	—	3.6 ▲	0.5 ▲	3.4 ▲
6919 5★	Twin Diode	6BT	5–1	6.3	0.2	—	Tube Voltage Drop: ♠ 1.2 volts at 6.0 ma d-c				
6922	Twin Triode	9AJ	6–2	6.3	0.3	1.5	220	—	3.3 ▲	1.75_1 ▲ 1.65_2 ▲	1.4 ▲
GL6942	Tetrode	GL 6942	TX	5.7	24	1500 1200 1500	4000 3200 4000	600	Cathode-Plate 0.04; Input 18.5; Output 5.8		
6943 ◉	Sharp-Cutoff RF Pentode	8DC	3–11	6.3	0.175	1.0 ▣	250 ▣	150 ▣ 0.33 ▣	3.0	3.0	0.015 ♣
6944 ◉	Semi-Remote Cutoff RF Pentode	8DC	3–11	6.3	0.175	1.0 ▣	250 ▣	150 ▣ 0.36 ▣	2.9	3.1	0.015 ♣
6945 ◉	Beam Power Amplifier	8DL	3–3	6.3	0.35	3.0 ▣	250 ▣	150 ▣ 0.33 ▣	5.0	5.5	0.13 ♣
6946 ◉	Medium-Mu Triode	8DK	3–11	6.3	0.175	1.5 ▣	250 ▣	—	1.6 ▲	0.75 ▲	1.0 ▲
6947 ◉	Medium-Mu Twin Triode	8DG	3–11	6.3	0.35	0.75 ▣ ♠	250 ▣	—	1.6 ▲	0.20_1 ▲ 0.25_2 ▲	1.2 ▲
6948 ◉	High-Mu Twin Triode	8DG	3–11	6.3	0.35	0.5 ▣ ♠	250 ▣	—	1.6 ▲	0.20_1 ▲ 0.25_2 ▲	0.75 ▲
6954	Dual-Control Sharp-Cutoff Pentode	7CM	5–2	6.3	0.3	3.0	300	300**‡** 1.0	6.0 ▲	5.0 ▲	0.0035 ▲♣
6956	Medium-Mu Twin Triode	9A	6–2	12.6 6.3	0.175 0.35	2.75 ♠	300	—	1.5 ▲	0.5_1 ▲ 0.4_2 ▲	1.4 ▲
6968	Sharp-Cutoff Pentode	7BD	5–1	6.3	0.175	1.65 ▣	200 ▣	155 ▣ 0.55 ▣	4.0	2.85	0.02 ♣
6973	Beam Power Amplifier	9EU	6–4	6.3	0.45	12	400	300 2.0	Single Tube Two Tubes, Push-Pull		
6999 ◉	Power Amplifier Pentode	6999	T-X	2.64	0.05	0.75 ▣	145 ▣	95 ▣ 0.12 ▣	—	—	—
7025	High-Mu Twin Triode	9A	6–2	12.6 6.3	0.15 0.3	1.0 ♠	300	—	1.8	1.9	1.7
7027	Beam Pentode	8HY	T-X	6.3	0.9	25 25	450 450**‡**	400 3.5 450**‡** 3.0	Two Tubes, Push-Pull Two Tubes, Push-Pull (With Screen Tap Transformer)		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. **‡**Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class AB₁ Amplifier	600	200	47	48†	14.8†	—	—	—	5,600‡	96	**6883-B**
Gating and Clamping	Max d-c output current per plate ▣ =10 ma; max peak inverse voltage ▣ = 360 volts; max peak current per plate ▣ =30 ma										*6887*
Gated Amplifier	150 150 150 150	90 90 90 90	— 9.4 13.8 0	37.5 2.5 0.03 2.0	19 — — —	I_{c1} =190 µa — — —	 — — —	E_{c3} =0 volts E_{c3} =0 volts E_{c3} =0 volts E_{c3} = −8.6 volts			6888
Class A Amplifier	250	250	22.5	77	3.5	—	5,400	—	—	—	6889
Class C Amplifier	900	—	40	90	—	—	—	—	—	40	6897
Class A Amplifier ♠	120	—	2.0	36	—	1,600	11,500	18.5	—	—	*6900*
Class A Amplifier ♠	150	—	5.0	11	—	3,900	4,600	18	—	—	*6913*
Gating and Clamping	Max d-c output current per plate ◈ =10 ma; max peak inverse voltage ◈ = 300 volts; max peak current per plate ◈ =30 ma										*6919* 5★
Class A Amplifier	90	—	R_k = 120	12	—	—	11,500	33	—	—	*6922*
RF Amplifier Class B Class C Telephony Class C Telegraphy	3500 3000 3800	500	40 100 120	520 250 500	35 10 22	— — —	— — —	— — —	— — —	1000 565 1200	GL6942
Class A Amplifier	100	100	R_k = 150	8.0	2.3	300,000	3,600	—	—	—	6943 ◉
Class A Amplifier	100	100	R_k = 150	7.0	2.0	280,000	3,200	—	—	—	6944 ◉
Class A Amplifier	100	100	R_k = 270	25	1.5	20,000	3,500	—	—	—	6945 ◉
Class A Amplifier	100	—	R_k = 270	9.0	—	—	3,800	16.5	—	—	6946 ◉
Class A Amplifier ♠	150	—	R_k = 270	6.5	—	—	4,000	35	—	—	6947 ◉
Class A Amplifier ♠	100	—	R_k = 1500	0.8	—	—	1,650	70	—	—	6948 ◉
Class A Amplifier	150	150	1.0	5.8	6.6	50,000	2,050	E_{c3} = −3.0 volts			*6954*
Class A Amplifier ♠	250 100	— —	8.5 0	11.5 13	— —	7,000 5,800	2,350 3,500	16.5 21.3	— —	— —	*6955*
Class A Amplifier	120	120	2.0	7.5	2.5	—	5,000	—	—	—	*6968*
Class A Amplifier Class AB₁ Amplifier	250 400 350 250	250 290 280 250	15 25 22 15	46 50† 58† 92†	3.5 2.5† 3.5† 7.0†	73,000 — — —	4,800 — — —	— — — —	— 8,000‡ 7,500‡ 8,000‡	— 24 20 12.5	*6973*
Class A Amplifier	67.5	67.5	4.0	4.0	0.9	—	1,650	—	12,000	0.135	6999 ◉
Class A Amplifier ♠	100 250	— —	1.0 2.0	0.5 1.2	— —	80,000 62,500	1,250 1,600	100 100	— —	— —	*7025*
Class AB₁ Amplifier Class AB₁ Amplifier	450 400 330 410‡	350 300 330 410‡	30 25 24 R_k = 220	95† 102† 122† I_k = 134 ma†	3.4† 6.0† 5.6† —	— — — —	— — — —	— — — —	6,000‡ 6,600‡ 4,500‡ 8,000‡	50 34 31.5 24	7027

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Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Output	Grid-plate
7027-A	Beam Pentode	8HY	T-X	6.3	0.9	35◈	600◈	500◈ 5.0◈	Two Tubes, Push-Pull Two Tubes, Push-Pull (With Screen Tap Transformer)		
7036 5★	Pentagrid Amplifier	7CH ♥	5–3	6.3	0.3	0.9◈	250◈	250◈⁑ 1.35◈	E_{c1} =0 volts E_{c3} = −10 Volts E_{c3} =0 Volts		
7044	Medium-Mu Twin Triode	9H	6–3	6.3 12.6	0.9 0.45	4.5▣♠ 8.0▣⊕	300▣	—	4.8▲	0.65_1▲ 0.55_2▲	6.0▲
7054	RF Pentode	9GT	6–3	13.5	0.275	5.0▣	330▣	180▣ 1.0▣	10.2▲	3.5▲	0.063▲
7055	Twin Diode	6BT	5–1	13.5	0.155	—	—	—	—	—	—
7056	Sharp-Cutoff Pentode	7CM	5–2	13.5	0.15	2.0▣	330▣	330▣⁑ 0.5▣	6.5	3.0	0.015♣
7057	Medium-Mu Twin Triode	9AJ	6–2	13.5	0.18	2.2▣♠	275▣	—	—	—	—
7058	High-Mu Twin Triode	9AJ	6–2	13.5	0.155	1.0▣♠	330▣	—	1.6▲	0.46_1▲ 0.34_2▲	1.7▲
7059	Triode-Pentode	9AE	6–2	13.5	0.195	2.8▣ 2.5▣	300▣ 300▣	300▣⁑ 0.5▣ —	Pentode Section Triode Section		
7060	Triode-Pentode	9DA	6–2	13.5	0.28	3.0▣ 2.5▣	300▣ 300▣	300▣⁑ 1.0▣ —	Pentode Section Triode Section		
7061	Beam Power Amplifier	9EU	6–3	13.5	0.21	9.0▣	345▣	310▣ 2.0▣	8.0▲	8.5▲	0.7▲♣
7077	High-Mu UHF Triode (Planar)	7077	3–16	6.3	0.24	1.0◈	250◈	—	—	—	—
7079●	Twin Triode	8DG	3–1	6.3	0.3	1.1▣♠	165▣	—	2.1	1.3_1 1.4_2	0.01♣
7083●	Sharp-Cutoff RF Pentode	5702	3–6	6.3	0.2	1.1▣	165▣	155▣ 0.55▣	5.0	3.75	0.03♣
7105	Low-Mu Twin Triode Power Amplifier	8BD	T-X	12.6	1.25	13▣♠	250▣	—	6.2▲	2.2▲	8.4▲
7137	Medium-Mu Triode	7BQ	5–2	6.3	0.225	2.25◈	150◈	—	6.0	4.5	1.7
GL7151	Ignitron	GL 7151	TX	—	—	—	—	—	—	—	—
7167	Tetrode	7EW	5–2	13.5	0.09	2.0◈	180◈	180◈⁑ 0.5◈	4.4	2.74	0.03♣
GL7171	Ignitron	GL 7171	TX	—	—	—	—	—	—	—	—
7189	Beam Pentode	9CV	6–4	6.3	0.76	12 12	400 375	300 2.0 375 2.0	Single Tube Two Tubes, Push-Pull Two Tubes, Push-Pull With Screen Tap Transformer		
7189-A	Beam Pentode	9LE	6–4	6.3	0.76	13.2◈	440◈	400◈ 2.2◈	Single Tube Two Tubes, Push-Pull		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ⁑ Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milliamperes	Screen Milliamperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class AB_1 Amplifier	425‡	425‡	R_k = 200	150†	8.0†	—	—	—	3,800 ‡	44	7027-A
	400‡	300‡	R_k = 200	112†	7.0†	—	—	—	6,600 ‡	32	
Class AB_1 Amplifier	410‡	410‡	R_k = 220	I_k = 134†	—	—	—	—	8,000 ‡	24	
Gated Amplifier	150‡	75	10	0	0	$R_{g1} = R_{g3}$ = 47,000		—	20,000	—	*7036*
	150‡	69	0	0	14	$R_{g1} = R_{g3}$ = 47,000		—	20,000	—	5★
	150‡	71	0	5.8	9.0	$R_{g1} = R_{g3}$ = 47,000		—	20,000	—	
Class A Amplifier ♠	120	—	2.0	36	—	1,750	12,000	21	—	—	*7044*
Class A Amplifier	250	150	R_k = 120	19	3.5	100,000	11,500	—	—	—	*7054*
Half-Wave Rectifier	Max d-c output current per plate ▣ = 10 ma; max peak inverse voltage ▣ = 250; max rms supply voltage per plate ▣ = 117; max peak current per plate ▣ = 60 ma										*7055*
Class A Amplifier	200	150	R_k = 180	9.5	2.8	600,000	6,200	—	—	—	*7056*
Class A Amplifier ♠	150	—	R_k = 220	10	—	5,300	6,800	36	—	—	*7057*
Class A Amplifier ♠	250	—	2.0	1.25	—	61,000	1,650	100	—	—	*7058*
Class A Amplifier	250	110	R_k = 68	10	3.5	400,000	5,200	—	—	—	*7059*
Class A Amplifier	150	—	R_k = 56	18	—	4,700	8,500	40	—	—	
Class A Amplifier	200	125	R_k = 82	15	3.4	150,000	7,000	—	—	—	*7060*
Class A Amplifier	150	—	R_k = 150	9.0	—	8,200	4,900	40	—	—	
Class A Amplifier	200	200	10.0	35.5†	9.0†	60,000	4,200	—	5,000	3.0	*7061*
Class A Amplifier	250	—	R_k = 82	6.5	—	9,000	10,000	90	—	—	7077
	(With 18,000-ohm bypassed resistor in plate circuit)										
Class A Amplifier ♠	100	—	R_k = 220	8.5	—	4,000	5,000	20	—	—	7079 ◉
Class A Amplifier	120	120	R_k = 200	7.5	2.6	340,000	5,000	—	—	—	7083 ◉
DC Amplifier ♠	135	—	R_k = 250	125	—	—	7,000	2.0	—	—	7105
Class A Amplifier	150	—	R_k = 100	13.5	—	—	8,500	40	—	—	*7137*
Resistance Welding	Max. supply volts RMS 250-600; max demand KVA 4800; corresponding av. anode curr. 486 A.; max. av. anode curr. 900 A.; corresponding demand KVA 1600.										GL7151
Class A Amplifier	125	80	1.0	10	1.4	125,000	8,000	—	—	—	*7167*
Capacitor Discharge	Max. forward peak anode voltage 15000 volts; max. inverse peak anode voltage 15000 volts; max. peak anode curr. 35000 A.; typical discharge rate pulses per minute 2.										GL7171
Class A Amplifier	250	250	7.3	48	5.5	40,000	11,300	—	—	—	*7189*
Class AB_1 Amplifier	400	300	15	15†	1.6†	—	—	—	8,000 ‡	24	
Class AB_1 Amplifier	375	375	R_k = 220	I_k = 70†	—	—	—	—	11,000 ‡	16.5	
Class A Amplifier	250	250	7.3	48	5.5	40,000	11,300	—	—	—	*7189-A*
Class AB_1 Amplifier	400	300	15	15†	1.6†	—	—	—	8,000 ‡	24	

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♥ G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✠ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✤	Capacitance in Picofarads Input	Output	Grid-plate
7199	Triode Pentode	9JT	6–2	6.3	0.45	3.0◆	330◆	330◆§ 0.6◆	Pentode Section		
						2.4◆	330◆	—	Triode Section		
7211	High-Mu Triode (Planar)	7815R	T-X	6.3	1.3	10▣	1000▣	—	8.0▲	0.06♣▲	2.25▲
7212	Beam Power Amplifier	7CK	T-X	6.3	1.25	20▣	400▣	—	Triode Connection Two Tubes, Push-Pull		
						20▣	600▣	250▣ 3.0▣	Pentode Connection Two Tubes, Push-Pull		
7216/ C3JL	Control Rectifier	7216/ C3JL	TX	2.5	9	—	Average Arc Drop = 10 Volts				
7233	Low-Mu Triode	9FR	6–4	6.3	1.0	8.0▣	330▣	—	7.5▲	2.2▲	14▲
7234	Pentode	9KD	T-X	6.3	0.15	10	8,000	200 0.5	4.06▲	2.23▲	0.0159▲
7235	Triode	9KE	T-X	6.3	0.3	10	10,000	—	2.24▲	1.03▲	1.03▲
7236	Low-Mu Twin Triode Power Amplifier	8BD	12–25	6.3	2.4	15▣♠	300▣	—	9.0▲	3.3▲	10▲
7239	Beam Pentode	9KH	6–6	6.3	0.3	4.0▣	2,000▣	220▣ 0.5▣	7.0▲	4.0▲	0.12▲♣
7244	Medium-mu Twin Triode	7BF	5–2	6.3	0.45	1.1◆♠	300◆	—	3.0▲	0.34_1▲ 0.28_2▲	1.4▲
7244-A	Medium-Mu Twin Triode	7BF	5–1	6.3	0.45	1.1◆♠	300◆	—	3.0▲	0.34_1▲ 0.28_2▲	1.4▲
7245	High-Mu Triode	7BQ	5–2	6.3	0.4	2.25◆	150◆	—	—	—	—
7245-A	High-Mu Triode	7BQ	5–1	6.3	0.4	2.25◆	150◆	—	—	—	—
7246●	Triode	5676	2–1	1.25	0.15	0.7◆	150◆	—	1.6▲	1.9▲	1.5▲
7247	Double Triode	9A	6–2	12.6 6.3	0.15 0.3	1.2◆	330◆	—	Section 1 (Pins 6, 7, 8)		
						3.0◆	330◆	—	Section 2 (Pins 1, 2, 3)		
7258	Triode-Pentode	9DA	6–2	13.5	0.21	2.3◆	330◆	330◆§ 0.55◆	Pentode Section		
						2.8◆	330◆	—	Triode Section		
7266	High-Frequency Diode (Planar)	7266	T-X	6.3	0.215	—	Tube Voltage Drop: 1.0 volts at 1.0 ma d-c				
7289	High-Mu Triode (Planar)	7289	T-X	6.0	1.0	100▣	1,000▣	—	6.3▲	0.035▲♣	2.0▲
7296	High-Mu Triode (Planar)	7296	T-X	6.3	0.4	5.5▣	330▣	—	5.0▲	0.075▲	2.2▲
⬤ 7310	Half-Wave, High-Voltage Rectifier	4P	T-X	5.0	6.5	—	—	—	—	—	—
7311	Beam Power Amplifier	7311	T-X	6.3	0.8	21▣	300	300 2.75▣	—	—	—
7312	Low-Mu Triode	7312	T-X	6.3	1.25	20▣	275	—	—	—	—
7313	Half-Wave High-Vacuum Rectifier	7313	T-X	6.3	1.55	—	—	—	—	—	—
7314	Power Amplifier Pentode	7314	T-X	6.3	0.6	10▣	300	300	—	—	—
7318	Twin Triode	9A	6–2	12.6 6.3	0.175 0.350	3.0▣♠	330▣	—	1.5▲	0.5▲	1.4▲

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ▣Absolute maximum rating.
♠Per section. § Supply voltage. ◆Design maximum rating. # Conversion transconductance.

⬤ See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	220	130	R_k = 62	12.5	3.5	400,000	7,000	—	—	—	*7199*
	100	50	R_k = 1000	1.1	0.35	1,000,000	1,500	—	—	—	
Class A Amp	215	—	8.5	9.0	—	8,100	2,100	17	—	—	
RF Oscillator	900	—	20	140	—	—	—	—	—	25	7211
Class AB_1 Amplifier	400	—	100	40†	—	—	—	—	8,000‡	22	7212
Class AB_2 Amplifier	600	165	44	22†	0.6†	—	—	—	6,800‡	90	
Grid Control Rectifier	Max peak inverse voltage (max. instantaneous) = 900 volts; max peak forward voltage (max. instantaneous) = 1250 volts.										7216/ C3JL
DC Amplifier	50§	—	R_k = 22	120	—	230	17,500	4.0	—	—	*7233*
DC Amplifier	1,500	150	1.0	5.0	2.0	1,000,000	3,800	—	—	—	*7234*
DC Amp	1,500	—	1.0	1.5	—	—	850	—	—	—	*7235*
DC Amplifier	150	—	24	60	—	—	—	—	—	—	7236
	120	—	14	100	—	—	12,500	4.8	—	—	
DC Amplifier	300	100	5.0	10.5	2.6	300,000	4,200	E_{c3} = 0			*7239*
	100	100	—	43	13.5	I_{c1} = 400	microamperes; E_{c3} = 0				
	1,500	100	12	0.2	—	—	—	E_{c3} = 0			
Class A Amplifier ♠	100	—	R_k = 50 ⊕	9.0	—	6,300	6,000	38	—	—	*7244*
Class A Amplifier ♠	100	—	R_k = 50 ⊕	9.0	—	6,300	6,000	38	—	—	*7244-A*
Class A Amplifier	150	—	R_k = 100	13.5	—	—	11,000	50	—	—	*7245*
Class A Amplifier	150	—	R_k = 100	13.5	—	—	11,000	50	—	—	*7245-A*
Class A Amp	105	—	2.5	4.5	—	8,150	2,700	22	—	—	7246 ◉
Class A Amplifier	250	—	2.0	1.2	—	62,500	1,600	100	—	—	*7247*
	100	—	1.0	0.5	—	80,000	1,250	100	—	—	
Class A Amplifier	250	—	8.5	10.5	—	7,700	2,200	17	—	—	
	100	—	0	11.8	—	6,500	3,100	20	—	—	
Class A Amplifier	125	125	R_k = 56	12	3.8	170,000	7,800	—	—	—	*7258*
Class A Amplifier	150	—	−3	15	—	4,700	4,500	21	—	—	
Detector	Max d-c output current ◈ =2.0 ma; max peak inverse voltage ◈ =600 volts; max peak current ◈ =10 ma										7266
Class C Amp at 500 Mc	900	—	40	90	—	—	—	—	—	40	7289
Class A Amplifier	200	—	R_k = 68	17	—	5,450	16,500	90	—	—	7296
Half-Wave Rectifier	Max d-c output current =115 ma; max peak inverse voltage =20,000 volts; max peak current =450 ma										7310 ●
Class A Amplifier	300	200	12.5	48†	2.5†	35,000	5,300	—	4,500	6.5	7311
Class A Amplifier	135	—	R_k = 250	125	—	280	7,000	2	—	—	7312
Half-Wave Rectifier	Max d-c output current =140 ma; max peak inverse voltage =2,800 volts; max RMS supply voltage =700 volts; max peak current =1,000 ma										7313
Class A Amplifier	300	150	3.0	30†	7.0†	130,000	11,000	—	10,000	3.0	7314
Class A Amplifier ♠	250	—	8.5	11.5	—	7,000	2,350	16.5	—	—	*7318*
	100	—	0	13	—	5,800	3,500	21.3	—	—	

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1, 2, 3, etc. indicate tube sections.

✤Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads		
									Input	Output	Grid-plate
7327 ●	Twin Triode	8DG	3–1	6.3	0.3	0.95♠ ▣	250▣	—	2.0▲	0.28_1▲ 0.30_2▲	1.5▲
7355	Beam-Power Amplifier	8KN	9–15	6.3	0.8	18◈	500◈	400◈ 3.5◈	Single Tube Two Tubes, Push-Pull		
7357	Beam-Power Amplifier	7CK	T-X	26.5	0.3	20▣ 20▣	400▣ 600▣	— 250▣ 3.0▣	Triode Connection Two Tubes, Push-Pull Pentode Connection Two Tubes, Push-Pull		
7358	Beam Power Amplifier	7CK	T-X	6.3	1.25	10▣	3,500 ▣⁑	500▣⁑ 1.75▣	13.0▲	8.5▲	0.24▲ ♣
7360	Double Plate Sheet-Beam Tube	9KS	6–3	6.3	0.35	1.5◈	300◈	250◈ 0.5◈	—	—	—
7370	Medium-Mu Twin Triode	9H	6–2	20 40	0.26 0.13	4.75▣ ♠ 8.5▣ ⊕	330▣	—	4.0▲	0.6_1▲ 0.5_2▲	4.0▲
7391	High-Mu UHF Triode (Planar)	6299	T-X	6.3	0.385	2.0▣	200▣	—	3.25▲	0.016 ▲	1.58▲
GL7399	Tetrode	GL 7399	TX	6.3	5.6	500	10000	2000	Cathode-Plate 0.012; Input 21.5; Output 9.3		
7403	Beam-Power Amplifier	8JU	T-X	6.3	1.7	40▣	4,000 ▣	850▣ 3.5▣	—	—	—
7408	Beam-Power Amplifier	7AC	9–41	6.3	0.45	14◈	350◈	315◈ 2.2◈	9.0▲	7.5▲	0.7▲
7427	Photoconductive Cell	9LN	6–3	—	—	0.4◈	350◈	—	—	—	—
7430	Sharp-Cutoff RF Pentode	7430	T-X	6.3	0.2	1.7	180	140 0.5	—	—	—
7462	High-Mu Triode (Planar)	7462	T-X	6.3	0.24	1.0◈	250◈	—	1.8▲	0.032 ▲	1.2▲
7486	High-Mu Triode (Planar)	7077	3–16	6.3	0.24	1.0◈	250◈	—	1.7▲	0.01▲	1.0▲
7518/710L	Thyratron	7518/ 710L	T-X	2.5	9.0	—	Anode Voltage Drop = 15 Volts				
7543	Sharp-Cutoff RF Pentode	7BK	5–2	6.3	0.3	3.0 3.2	300 250	300⁑ 0.65 —	Pentode Connection (G_3 tied to K at socket) Triode Connection (G_2, G_3, and P tied)		
7548	Secondary Emission Hexode	9LJ	6–4	6.3	0.7	3.5◈	1,000 ◈	300◈ 1.5◈	8.0▲	3.1▲	0.027 ▲
7550 ◉	Twin Triode	8DG	3–3	6.3	0.500	2.0▣ ♠ 3.6▣ ⊕	150▣ —	— —	4.0▲ —	0.24_1 ▲ 0.28_2 ▲	4.0▲ —
7551	Beam-Power Amplifier	9LK	6–3	13.5	0.36	10▣	375▣	300▣ 2.0▣	Single Tube Two Tubes, Push-Pull		

■ Compactron. † Zero signal. ♠ Per section.
‡ Plate-to-plate. ♣ Maximum. ⁑ Supply voltage.
◉ Subminiature type. ▲ Without external shield. ◈ Design maximum rating.
⊕ Total for all similar sections. ▣ Absolute maximum rating. # Conversion transconductance.

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Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milliamperes	Screen Milliamperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Pulse Applications ♠	Max peak cathode current ⊡ = 1.25 amperes at 0.25% duty cycle; pulse width 2.5 μsec										**7327** ●
Class A Amplifier	250	225	15	62†	3.2†	42,000	7,600	—	2,500	9.0	**7355**
Class AB_1 Amplifier	400	300	34	56†	3.5†	—	—	—	5,000‡	40	
	300	250	21	100†	5.5†	—	—	—	4,000‡	28.5	
Class AB_1 Amplifier	400	—	100	40†	—	—	—	—	8,000	22	7357
Class AB_2 Amplifier	600	165	44	22†	0.6†	—	—	—	6,800‡	90	
Pulse Modulator	Max pulse cathode current ⊡ = 3.0 amperes (for duty cycle up to 0.3%)										7358
Balanced Modulator and Product Detector	150	175	R_k = 150	8.5 ⊕	2.1	—	5,400	—	—	—	*7360*
	Deflector voltage = 25 volts d-c										
Class A Amplifier ♠	250	—	12.5	12	—	3,000	5,400	16	—	—	*7370*
	180	—	7.0	23	—	2,000	8,500	17	—	—	
	120	—	2.0	36	—	1,560	11,500	18	—	—	
Class A Amplifier	175	—	1.5	10	—	—	11,000	62	—	—	7391
RF Amp/Osc Class B	9000	1400	125	—	470	—	—	—	—	52000	GL7399
Class C	4800	1000	200	4200	100	—	—	—	—	11000	
DC Amplifier	600	300	R_k = 825	32.5	1.5	—	6,000	—	—	—	7403
Class A Amplifier	250	250	12.5	45†	4.5†	50,000	4,100	—	5,000	4.5	7408
	60	250	0	100	22	—	—	—	—	—	
Relay Control	Spectral Response, S-15; sensitivity, 4,000 microamperes per foot-candle (with polarizing voltage = 50); maximum current ◈ = 20 milliamperes										7427
Class A Amplifier	180	120	2.0	7.7	2.4	500,000	5,100	—	—	—	7430
	120	120	2.0	7.5	2.5	300,000	5,000	—	—	—	
Class A Amplifier	150	—	R_k = 910,	7.2	—	9,000	10,500	94	—	—	7462
	—	—	E_{c1} = +6.0	—	—	—	—	—	—	—	
Class A Amplifier	150	—	R_k = 82	7.5	—	—	10,500	90	—	—	7486
	100	—	0	8.0	—	—	11,500	—	—	—	
Controlled Rectifier	Max d-c cathode current ⊡ = 2.5 amperes; max peak inverse voltage ⊡ = 1,500 volts; max peak cathode current ⊡ = 30 amperes										7518/ 710L
Class A Amplifier	250	150	R_k = 68	10.6	4.3	1,000,000	5,200	—	—	—	*7543*
	250	125	R_k = 100	7.6	3.0	1,500,000	4,500	—	—	—	
	100	100	R_k = 150	5.0	2.1	500,000	3,900	—	—	—	
Class A Amplifier	250	—	R_k = 330	12.2	—	—	4,800	36	—	—	
Class A Amplifier	300	50	1.5	18.0	2.0	—	26,000	Dynode voltage = 150 volts Dynode current = −12 ma			*7548*
Pulse Applications ♠	Max peak cathode current ⊡ = 3.0 amperes at 0.25% duty cycle; pulse width 2.5 μsec										7550 ●
Class A Amplifier	250	250	18	40	3.0	—	5,300	E_{c3} = 0 Volts			*7551*
Class AB_1 Amplifier	300	250	21	40†	2.0†	E_{c3} = 0 Volts	—	—	5,000‡	20.5	

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♥ G2 and G4 are screen. G3 is signal-input grid.

$_1$, $_2$, $_3$, etc. indicate tube sections.

✱ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✤	Capacitance in Picofarads Input	Output	Grid-plate
7558	Beam-Power Amplifier	9LK	6–3	6.3	0.8	10▣	375▣	300▣ 2.0▣	Single Tube Two Tubes, Push-Pull		
7576◉	High-Mu Triode	8KM	3–3	6.3	0.45	4.1▣	250▣	—	—	—	—
7581	Beam-Power Amplifier	7AC	12–15	6.3	0.9	30◈ 30◈	500◈ 450◈	450◈ 5.0◈ —	Single Tube Two Tubes, Push-Pull Two Tubes, Push-Pull Two Tubes, Push-Pull Triode Connection (G₂ and P tied)		
7581-A	Beam Power Amplifier	7AC	12–15	6.3	0.9	35◈ 35◈	500◈ 450◈	450◈ 5.0◈ —	Pentode Connection Triode Connection (G₂ and P Tied)		
7586	Medium-Mu Triode (Nuvistor)	12AQ	4–4	6.3	0.14	1.0▣	110▣	—	4.2▲	1.4▲	2.2▲
7587	Sharp-Cutoff Tetrode (Nuvistor)	12AS	4–5	6.3	0.15	2.2▣	250▣	110▣ 0.2▣	7.0▲	1.4▲	0.015 ▲♣
7588	High-Mu Triode (Planar)	7296	T-X	6.3	0.4	5.5◈	300◈	—	6.5▲	0.075 ▲	2.8▲
7591	Beam-Power Amplifier	8KQ	9–41	6.3	0.8	19◈	550◈	440◈ 3.3◈	Single Tube Two Tubes, Push-Pull		
7591-A	Beam Power Amplifier	8KQ	9–41	6.3	0.8	19◈	550◈	440◈ 3.3◈	Single Tube Two Tubes, Push-Pull		
7607	Beam-Power Amplifier	7CK	12–44	6.3	1.6	23▣	600▣	400▣ 4.0▣	15▲	8.5▲	0.28▲
7623	Beam Pentode	6AM	T-X	6.3	1.6	37.5▣	1,250▣	600▣ 6.0▣	17▲	13.5▲	0.25▲
7624	Beam Pentode	6AM	T-X	12.6	0.8	37.5▣	1,250▣	600▣ 6.0▣	17▲	13.5▲	0.25▲
7625	High-Mu Triode (Planar)	7462	T-X	6.3	0.215	0.8◈	275◈	—	1.5▲	0.03▲	1.5▲
7626◉	Power Amplifier Pentode	7626	2–1	1.25	0.125	1.1▣	135▣	135▣ 0.4▣	3.2▲	2.9▲	0.1▲
7644	High-Mu UHF Triode (Planar)	6299	T-X	6.3	0.3	2.0▣	200▣	—	3.65▲	0.02 ♣▲	1.75▲
7645	Twin Tetrode	9HL	6–2	{6.3 {12.6	0.6} 0.3}	2.75 ▣♠	250▣	200▣ 3.0▣ ⊕	Two Sections, Push-Pull		
GL7669/ GL7669 -PC	Ignitron	GL 7669	TX	—	—	—	—	—	—	—	—
GL7669	Ignitron	GL 7669	TX	—	—	—	—	—	—	—	—
GL7669 -PC	Ignitron	GL 7669	TX	—	—	—	—	—	—	—	—
GL7671/ GL7671 -PC	Ignitron	GL 7671	TX	—	—	—	—	—	—	—	—

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ‡ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250	250	18	40	3.0	—	5,300	E_{c3} = 0 Volts			*7558*
Class AB₁ Amplifier	300	250	21	40†	2.0†	E_{c3} = 0 Volts			5,000‡	20.5	
Class A Amplifier	200	—	R_k = 150	15.5	—	—	10,700	46	—	—	7576 ◉
Class A Amplifier	350	250	18	54†	2.5†	33,000	5,200	—	4,200	10.8	7581
	300	200	12.5	48†	2.5†	35,000	5,300	—	4,500	6.5	
	250	250	14	72†	5.0†	22,500	6,000	—	2,500	6.5	
Class A Amplifier	270	270	17.5	134†	11†	—	—	—	5,000‡	17.5	
	250	250	16	120†	10†	—	—	—	5,000‡	14.5	
Class AB₁ Amplifier	450	400	37	116†	5.6†	—	—	—	5,600‡	55	
	360	270	22.5	88†	5.0†	—	—	—	3,800‡	18	
	360	270	22.5	88†	5.0†	—	—	—	6,600‡	26.5	
Class AB₂ Amplifier	360	270	22.5	88†	5.0†	—	—	—	3,800‡	47	
	360	225	18	78†	3.5†	—	—	—	6,000‡	31	
Class A Amplifier	250	—	20	40†	—	1,700	4,700	8	5,000	1.4	
	Service, operating conditions, and characteristics given above for 7581 apply										7581-A
Class A Amplifier	75‡	—	R_k = 100	10.5	—	3,000	11,500	35	—	—	7586
Class A Amplifier	125	50	R_k = 68	10	2.7	200,000	10,600	—	—	—	7587
Class A Amplifier	200	—	R_k = 270; E_{c1} = +6	24	—	3,900	45,000	175	—	—	7588
Class A₁ Amplifier	300	300	10	60†	8.0†	29,000	10,200	—	3,000	11	7591
Class AB₁ Amplifier	450	400	21	66†	9.4†	—	—	—	6,600‡	45	
Class A Amplifier	300	300	10	60†	8.0†	29,000	10,200	—	3,000	11	7591-A
Class AB₁ Amplifier	450	400	21	66†	9.4†	—	—	—	6,600‡	45	
Class A Amplifier	300	225	17.0	80	6.0	40,000	8,000	—	—	—	7607
Class C Amplifier	1,250	300	115	160	20	—	—	—	—	162.5	7623
Class C Amplifier	1,250	300	115	160	20	—	—	—	—	162.5	7624
Class A Amplifier	150	—	R_k = 1000	0.95	—	57,000	1,400	80	—	—	7625
Class C Amplifier	120	120	20	10	2.0	—	—	—	—	0.6	7626 ◉
Class A Amplifier	175	—	Adjust for I_b = 10 ma	10	—	—	15,000	110	—	—	7644
Frequency Tripler	170	150	100	40	10	—	—	—	—	1.5	*7645*
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 600; corresponding av. anode curr. 30.2 A.; max. av. anode curr. 56 A.; corresponding demand KVA 200.										GL7669/ GL7669 -PC
Frequency Changer	Max. peak inverse voltage 1200 V.; max. peak anode curr. 600 A.; corresponding av. anode curr. 5 A.; max. av. anode curr. 22.5 A.; corresponding peak anode curr. 135 A.										GL7669
Frequency Changer	Max. peak inverse voltage 1500 V.; max. peak anode curr. 480 A.; corresponding av. anode curr. 4 A.; max. av. anode curr. 18 A.; corresponding peak anode curr. 108 A.										GL7669 -PC
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 1200; corresponding av. anode curr. 75.6 A.; max. av. anode curr. 140 A.; corresponding demand KVA 400.										GL7671/ GL7671 -PC

Metal tubes are shown in bold-face type, *miniature tubes in italics.*
♦ G3 and G5 are screen. G4 is signal-input grid.
♥ G2 and G4 are screen. G3 is signal-input grid.
₁, ₂, ₃, etc. indicate tube sections.
✤ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
GL7672	Ignitron	GL 7672	TX	—	—	—	—	—	—	—	—
GL7672-PC	Ignitron	GL 7672	TX	—	—	—	—	—	—	—	—
GL7673/ GL7673-PC	Ignitron	GL 7673	TX	—	—	—	—	—	—	—	—
GL7673	Ignitron	GL 7673	TX	—	—	—	—	—	—	—	—
GL7673-PC	Ignitron	GL 7673	TX	—	—	—	—	—	—	—	—
GL7681/ GL7681-PC	Ignitron	GL 7681	TX	—	—	—	—	—	—	—	—
GL7681	Ignitron	GL 7681	TX	—	—	—	—	—	—	—	—
GL7681-PC	Ignitron	GL 7681	TX	—	—	—	—	—	—	—	—
7683	High Voltage Pentode	9MN	6–3	6.3	0.15	15▣	1,000 ▣	250▣ 0.7▣	—	—	—
7687	Triode-Pentode	9AE	6–3	6.3	0.5	3.0◈ 2.4◈	330◈ 330◈	330◈ 0.6◈ —	Pentode Section Triode Section		
7688	Medium-Mu Triple Triode	12BA	7–3	6.3	0.45	3.0◈ ♠	330◈	—	—	—	—
7689	High-Mu Triple Triode	12BA	7–3	6.3	0.45	1.1◈ ♠	330◈	—	—	—	—
7690	Medium-Mu Triple Triode	12BA	7–3	6.3	0.45	2.8◈ ♠	330◈	—	—	—	—
7695	Beam-Power Amplifier	9PX	T-X	50	0.15	16◈	150◈	150◈ 2.5◈	Single Tube Two Tubes, Push-Pull		
7701	Beam-Power Amplifier	9MS	6–3	13.6	0.16	9.0◈	350◈	300◈ 3.5◈	7.0▲	3.6▲	0.15▲
GL7703	Ignitron	GL 7703	TX	—	—	—	—	—	—	—	—
7716	Triode Pentode	9DX	6–3	13.6	0.35	5.0◈ 1.0◈	330◈ 330◈	330◈⁑ 1.1◈ —	Pentode Section Triode Section		
7717	Sharp-Cutoff RF Tetrode	7EW	5–2	6.3	0.2	2.0◈	180◈	180◈⁑ 0.5◈	4.4	2.74	0.3♣
7719	Medium-Mu Triode	9MX	6–3	6.3 12.6	0.45 0.225	6.0◈	330◈	—	6.5▲	1.0▲	5.5▲
7720	High-Mu Triode (Planar)	7462	T-X	6.3	0.24	1.0◈	250◈	—	1.8▲	0.032 ▲	1.3▲
7721	RF Pentode	9EQ	6–3	6.3	0.32	4.0▣	220▣	180▣ 0.9▣	10▲	2.0▲	0.035 ▲
7722	RF Pentode	9EQ	6–3	6.3	0.32	4.0▣	220▣	180▣ 1.1▣	9.3▲	2.6▲	0.035 ▲
7724	Duplex-Diode Triode	9KR	6–2	14.0	0.15	1.1◈	330◈	—	1.6 Diode Section	0.24	1.8

■ Compactron. † Zero signal. ♠ Per section.
‡ Plate-to-plate. ♣ Maximum. ⁑ Supply voltage.
● Subminiature type. ▲ Without external shield. ◈ Design maximum rating.
⊕ Total for all similar sections. ▣ Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Frequency Changer	Max. peak inverse voltage 1200 V.; max. peak anode curr. 1500 A.; corresponding av. anode curr. 20 A.; max. av. anode curr. 70 A.; corresponding peak anode curr. 420 A.										GL7672
Frequency Changer	Max. peak inverse voltage 1500 V.; max. peak anode curr. 1200 A.; corresponding av. anode curr. 16 A.; max. av. anode curr. 56 A.; peak anode curr. 336 A.										GL7672 -PC
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 2400; corresponding av. anode curr. 192 A.; max. av. anode curr. 355 A.; corresponding demand KVA 800.										GL7673/ GL7673 -PC
Frequency Changer	Max. peak inverse voltage 1200 V.; max. peak anode curr. 3000 A.; corresponding av. anode curr. 40 A.; max. av. anode curr. 140 A.; corresponding peak anode curr. 840 A.										GL7673
Frequency Changer	Max. peak inverse voltage 1500 V.; max. peak anode curr. 2400 A.; corresponding av. anode curr. 32 A.; max. av. anode curr. 112 A.; corresponding peak anode curr. 672A.										GL7673 -PC
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 1800; corresponding av. anode curr. 135 A.; max. av. anode curr. 220 A.; corresponding demand KVA 600.										GL7681/ GL7681 -PC
Frequency Changer	Max. peak inverse voltage 1200 V.; max. peak anode curr. 2250 A.; corresponding av. anode curr. 30 A.; max. av. anode curr. 105 A.; corresponding peak anode curr. 630 A.										GL7681
Frequency Changer	Max. peak inverse voltage 1500 V.; max. peak anode curr. 1800 A.; corresponding av. anode curr. 24 A.; max. av. anode curr. 84 A.; corresponding peak anode curr. 502 A.										GL7681 -PC
DC Amplifier	800	250	1.0	12	1.6	35,000	4,200	—	—	—	*7683*
	600	250	1.0	10.6	1.7	34,000	4,200	—	—	—	
	300	250	0.5	12.6	2.2	28,000	4,200	—	—	—	
Class A Amplifier	220	130	R_k = 62	10 *	3.4	500,000	5,800	—	—	—	*7687*
Class A Amplifier	215	—	8.5	7.5	—	7,200	2,500	18	—	—	
Class A Amplifier ♠	250	—	8.5	10.5	—	7,700	2,200	17	—	—	7688
	100	—	0	11.8	—	6,500	3,100	20	—	—	
Class A Amplifier	250	—	2.0	1.2	—	62,500	1,600	100	—	—	7689
	100	—	1.0	0.5	—	80,000	1,250	100	—	—	
Class A Amplifier ♠	250	—	2.0	10	—	10,900	5,500	60	—	—	7690
	100	—	1.0	3.7	—	15,000	4,000	60	—	—	
Class A Amplifier	130	130	11.0	100†	5.0†	7,000	11,000	—	1,100	4.5	7695
Class AB_1 Amplifier	140	140	R_k = 50	210†	9.0†	—	—	—	1,500‡	10	
	130	130	12.0	195†	9.0†	—	—	—	1,800‡	10	
Class A Amplifier	250	250	12.5	28	3.1	31,000	3,600	—	—	—	*7701*
Capacitor Discharge	Max. forward peak anode voltage 20000 volts; max. inverse peak anode voltage 20000 volts; max. peak anode curr. 100,000 A.; typical discharge rate pulses per minute 2.										GL7703
Class A Amplifier	200	125	R_k = 68	24	5.2	70,000	10,000	—	—	—	*7716*
Class A Amp	125	—	1.0	1.5	—	35,000	2,900	102	—	—	
Class A Amplifier	125	80	1.0	10	1.4	125,000	8,000	—	—	—	*7717*
Class A Amplifier	300	—	10.5	4.0	—	7,100	3,500	25	—	—	*7719*
Class A Amplifier	150	—	R_k = 82	7.5	—	—	10,500	90	—	—	7720
	100	—	0	9.0	—	—	11,500	—	—	—	
450 Mc UHF Oscillator	150	—	R_g = 7,500	4.0	—	—	—	I_c = 0.5 ma		0.1	
Class A Amplifier	190	160	R_k = 400; E_{c1} = +10	22	6.0	120,000	35,000	—	—	—	*7721*
Class A Amplifier	190	160	R_k = 370; E_{c1} = +8	20	6.0	100,000	26,000	—	—	—	*7722*
Class A Amplifier	250	—	3.0	0.7	—	72,000	1,000	72	—	—	*7724*
FM Det.	Max d-c output current ◈ ♠ =5.0 ma; tube voltage drop ♠: 5.0 volts at 18 ma d-c										

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
$_1$, $_2$, $_3$, etc. indicate tube sections.
♣Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
7725	Thyratron	FG-27-A	T-X	2.5	9.0	—	Anode Voltage Drop = 15 Volts				
7726	Thyratron	7518/710L	T-X	2.5	9.0	—	Anode Voltage Drop = 15 Volts				
7728	Medium-Mu Twin Triode	9A	6–2	12.6 6.3	0.15 0.3	2.8◈ ♠	330◈	—	2.2▲	0.5_1▲ 0.4_2▲	1.5▲
7729	High-Mu Twin Triode	9A	6–2	12.6 6.3	0.15 0.3	1.1◈ ♠	330◈	—	1.6▲	0.46_1▲ 0.34_2▲	1.7▲
7730	Medium-Mu Twin Triode	9A	6–2	12.6 6.3	0.15 0.3	3.0◈ ♠	330◈	—	1.8	2.0	1.5
7731	Triode-Pentode	9AE	6–2	6.3	0.45	3.0◈ 3.0◈	330◈ 330◈	330◈‡ 0.6◈ —	Pentode Section Triode Section		
7732	Sharp-Cutoff RF Pentode	7CM	5–2	6.3	0.3	2.3◈	330◈	330◈‡ 0.55◈	6.5	3.0	0.15
7733	Sharp-Cutoff Pentode	9BF	6–3	12.6 6.3	0.3 0.6	6.5◈	330◈	190◈ 1.2◈	10.7◈	4.0▲	0.063 ▲♣
7734	Triode-Pentode	9LC	6–3	6.3	0.9	1.0◈ 7.0◈	330◈ 275◈	275◈ 0.5◈ —	Pentode Section Triode Section		
7737	RF Pentode	9MZ	6–1	6.3	0.32	3.0▣	210▣	175▣ 0.7▣	7.6▲	3.3▲	0.03♣ ▲
7738	High-Frequency Triode	7DK	5–1	6.3	0.225	5.0◈	330◈	—	3.0	1.8	1.7
7751	Beam-Power Amplifier	8KB	T-X	6.3	1.2	10▣	250▣	250▣ 5.0▣	17.5▲	9.0▲	1.3▲ ♣
7754	Beam-Power Amplifier	9PX	T-X	6.3	1.2	16◈	150◈	150◈ 2.5◈	Single Tube Two Tubes, Push-Pull		
7757	Beam Power Amplifier	9NE	T-X	6.3	0.6	14▣	3,000▣	700▣ 3.0▣	—	—	—
7759◉	Medium-Mu Twin Triode	8DG	3–1	26.5	0.09	1.1▣ ♠	165▣	—	2.2	1.3	1.4
7760◉	Medium-Mu Twin Triode	8DG	3–1	26.5	0.09	—	55▣	—	2.5	1.3	1.8
7761◉	Semi-Remote Cutoff Pentode	8DL	3–3	26.5	0.11	4.0▣	165▣	155▣ 1.0▣	8.5	8.0	0.18♣
7762◉	Power Amplifier Pentode	8DL	3–3	26.5	0.11	4.0▣	165▣	155▣ 1.0▣	6.5	7.5	0.11
7763	Double-Plate Sheet-Beam Tube	9NF	6–3	6.3	0.3	0.75▣	330▣	330▣ 1.5▣	—	—	—
7768	High-Mu Triode (Ceramic)	7768	T-X	6.3	0.4	5.5▣	330▣	—	6.0▲	0.025 ▲	1.7▲
7784	High-Mu UHF Triode (Planar)	7784	T-X	6.3	0.3	2.0▣	200▣	—	3.65▲	0.02▲ ♣	1.75▲
7788	Pentode	9NK	6–2	6.3	0.34	5.0▣	250▣	200▣ 1.0▣	16	4.1	0.035 ♣
7802	Low-Mu Twin Triode	8BD	12–43	6.3	2.5	13▣ ♠	250▣	—	—	—	—
7803	Medium-Mu Twin Triode	9AJ	6–2	6.3	0.365	3.5◈ ♠	200◈	—	3.3	2.5	1.4
7815	High-Mu Triode (Planar)	7815	T-X	6.0	1.0	10▣	3500▣ Peak	—	6.3▲	0.035 ♣▲	2.05▲
7815R	High-mu Triode (Planar)	7815R	T-X	6.0	1.0	10▣	3500▣ Peak	—	6.3▲	0.035 ♣▲	2.05▲
7841	Diode (Planar)	7266	T-X	6.3	0.215	—	Tube Voltage Drop: 2.6 volts at 5.0 ma d-c				

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ‡ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Controlled Rectifier	Max d-c cathode current ▣ =2.5 amperes; max peak inverse voltage ▣ = 3,500 volts; max peak cathode current ▣ =30 amperes										7725
Controlled Rectifier	Max d-c cathode current ▣ =2.5 amperes; max peak inverse voltage ▣ = 3,500 volts; max peak cathode current ▣ =30 amperes										7726
Class A Amplifier ♠	250 100	— —	2.0 1.0	10 3.7	— —	10,900 15,000	5,500 4,000	60 60	— —	— —	*7728*
Class A Amplifier ♠	250 100	— —	2.0 1.0	1.2 0.5	— —	62,500 80,000	1,600 1,250	100 100	— —	— —	*7729*
Class A Amplifier ♠	250 100	— —	8.5 0	10.5 11.8	— —	7,700 6,500	2,200 3,100	17 20	— —	— —	*7730*
Class A Amplifier Class A Amplifier	250 150	110 —	R_k = 68 R_k = 56	10 18	3.5 —	400,000 5,000	5,200 8,500	— 40	— —	— —	*7731*
Class A Amplifier	250	150	R_k = 200	8.5	2.5	600,000	6,000	G_3 connected to cathode at socket			*7732*
Class A Amplifier	250	180	R_k = 100	24	5.0	90,000	12,000	G_3 connected to cathode at socket			*7733*
Class A Amplifier Series Regulator	150 150	150 —	2.0 21	5.5 35	1.7 —	340,000 1,080	3,200 5,000	— 5.4	— —	— —	*7734*
Class A Amplifier	180	150	R_k = 100	11.5	2.9	—	15,900	E_{c3} =0 volts			*7737*
Class A Amplifier	200	—	R_k = 100	12	—	—	9,500	80	—	—	*7738*
Class A Amplifier	100	100	8.2	100	7.0	5,000	14,000	—	—	—	7751
Class A Amplifier	130	130	11.0	100†	5.0†	7,000	11,000	—	1,100	4.5	7754
Class AB_1 Amplifier	140 130	140 130	R_k = 50 12.0	210† 195†	9.0† 9.0†	— —	— —	— —	1,500‡ 1,800‡	10 10	
DC Amplifier	250	250	12.5	45	3.5	—	4,100	—	—	—	*7757*
Class A Amplifier ♠	100	—	R_k = 150	6.5	—	—	5,400	35	—	—	7759 ●
Class A Amplifier ♠	26.5	—	R_g = 2.2 meg.	3.0	—	—	5,000	20	—	—	7760 ●
Class A Amplifier	150	100	R_k = 100	21	4.0	50,000	9,000	—	—	—	7761 ●
Class A Amplifier	110	110	R_k = 270	30†	2.2†	15,000	4,200	—	3,000	1.0	7762 ●
IF Amplifier-Limiter	135	300	0	4.2 ⊕	4.0	—	—	—	—	—	*7763*
	Deflector Voltage =135 volts d-c (each deflector); deflector-to-deflector voltage =10 volts RMS										
Class A Amplifier	200	—	R_k = 270 E_{c1} = +6	24	—	4,500	50,000	225	—	—	7768
Class A Amplifier	175	—	Adjust for I_b = 10 ma	10	—	—	15,000	110	—	—	7784
Class A Amplifier	135	165	R_k = 360; E_{c1} = +12.5	35	5.0	—	50,000	—	—	—	*7788*
DC Amplifier ♠	100	—	4	115	—	—	20,000	8.5	—	—	7802
Class A Amplifier ♠	90	—	1.3	15	—	—	12,500	33	—	—	*7803*
Plate-Pulsed Oscillator	3500	—	—	9.0	—	—	—	—	—	2,000 Peak	7815
Plate-Pulsed Oscillator	3500	—	—	9.0	—	—	—	—	—	2,000 Peak	7815R
Half-Wave Rectifier	Max d-c output current ◈ =5.0 ma; max peak inverse voltage ◈ =350 volts; max peak current ◈ =20 ma										7841

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥ G2 and G4 are screen. G3 is signal-input grid.

¹, ², ³, etc. indicate tube sections.

✱ Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Output	Grid-plate
7851	Tetrode	7GE	T-X	2.5	0.2	—	12	12	2.6▲	1.8▲	0.19▲
7855	High-Mu UHF Triode (Planar)	7815R	T-X	6.0	1.0	20▣	2500 ▣	—	6.3▲	0.06♣ ▲	2.5▲
7861 5★	High-Frequency Twin Triode	8CJ	6-1	12.6	0.175	1.35◆ ♠	330◆	—	2.2▲	1.0▲	1.1▲
7867	Beam-Power Amplifier	5BT	12-21	6.3	2.5	24◆	700◆	175◆ 3.6◆	Single Tube Two Tubes, Push-Pull		
7868	Power Amplifier Pentode	9RW	9-85	6.3	0.8	19◆	550◆	440◆ 3.3◆	Single Tube 2 Tubes, Push-Pull		
7887 ●	Medium-Mu Twin Triode	8DG	3-1	26.5	0.09	1.1▣ ♠	165▣	—	2.1	1.3_1 1.4_2	1.4
7888 ●	Medium-Mu Triode	8DK	3-1	26.5	0.045	3.3▣	165▣	—	2.4	2.4	1.3
7889 ●	Medium-Mu Twin Triode	8DG	3-1	26.5	0.09	0.55▣ ♠	165▣	—	2.2	1.3_1 1.4_2	1.0
7892	Twin Triode	9H	6-2	12.6 6.3	0.45 0.9	4.2◆ ♠ 7.5◆ ⊕	330◆	—	4.0▲	0.6_1▲ 0.5_2▲	4.0▲
7894 ●	Glow-Discharge Diode Voltage Regulator	7894	T-X	—	—	—	—	—	—	—	—
7895	High-Mu Triode (Nuvistor)	12AQ	4-4	6.3	0.135	1.0▣	110▣	—	4.2▲	1.7▲	0.9▲
7898	High-Mu Twin Triode	9EP	6-2	13.5	0.15	2.75▣ ♠	330▣	—	2.5	1.2_1 1.3_2	1.6
7905	Beam Power Amplifier	9PB	6-3	6.3	0.65	10▣	300▣	250▣ 1.5▣	8.5▲	5.5▲	0.14▲
7910	Plate-Pulsed UHF Oscillator (Planar)	7910	T-X	6.3	0.275	1.5▣	1200▣ Peak	—	2.1▲	0.02▲	1.0▲
7911	Plate-Pulsed UHF Oscillator (Planar)	7911	T-X	6.3	0.55	6.5▣	3000▣ Peak	—	5.0▲	0.05▲	1.4▲
7913	High-Mu Triode (Planar)	7768	T-X	6.3	0.4	5.5▣	330▣	—	6.0▲	0.03▲	2.4▲
7962 ●	Twin Triode	8DG	3-1	6.3	0.24	1.0▣ ♠	100▣	—	3.0	1.1	2.4
7963 ●	Twin Triode	8DG	3-1	6.3	0.35	1.1▣ ♠	165▣	—	4.0	1.0_1 1.3_2	2.7
7979 ●	Gas Triode	7979	T-X	1.25	0.25	—	—	—	—	—	—
7983	Twin Tetrode	9PS	6-4	3.15	1.65	7.0▣ ♠	300▣	200▣ 1.0▣ ♠	Two Sections, Push-Pull		
7984■	Beam Power Amplifier	12EU	12-56	13.5	0.58	35▣	750▣	250▣ 3.0▣	16▲	6.0▲	0.16▲
GL7985	Tetrode	GL 7985	TX	6.7	13.5	3500	7000 4500 7000	750 500 750	Cathode-Plate 0.01; Input 28.0; Output 6.6		
7994 ●	Triode	8KM	3-1	6.3	0.25	2.0▣	200▣	—	—	—	—
7995 ●	Sharp-Cutoff Pentode	8KZ	3-1	6.3	0.25	1.6▣	200▣	165▣ 0.6▣	8.5	2.75	0.035 ♣

■Compactron. † Zero signal. ♠Per section. ‡ Plate-to-plate. ♣Maximum. § Supply voltage. ●Subminiature type. ▲Without external shield. ◆Design maximum rating. ⊕Total for all similar sections. ▣Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	11.0	11.0	2.2	0.016	—	1,700,000	40	5	—	—	*7851*
Grid-Pulsed Oscillator	1700	—	45	1900 peak	—	—	—	—	—	1,500 peak	7855
Class A Amplifier ♠	150	—	R_k = 240	8.2	—	6,400	5,500	35	—	—	*7861* 5★
Class A_1 Amplifier	250	90	R_k = 120	80†	1.0†	12,000	10,000	—	3,000	7.5	7867
Class AB_1 Amplifier	450	150	35	58†	1.4†	—	—	—	5,000‡	65	
Class A Amplifier	300	300	10	60†	8.0†	29,000	10,200	—	3,000	11	7868
Class AB_1 Amplifier	450	400	21	40†	5.0†	—	—	—	6,600‡	44	
	450	400	R_k = 170	86†	10†	—	—	—	10,000‡	28	
Class A Amplifier ♠	100	—	R_k = 220	8.5	—	—	5,000	20	—	—	7887 ●
Class A Amplifier	150	—	R_k = 180	13	—	—	6,500	27	—	—	7888 ●
	100	—	R_k = 150	8.5	—	—	5,800	27	—	—	
Class A Amplifier	150	—	R_k = 820	1.75	—	—	2,500	70	—	—	7889 ●
	100	—	R_k = 1500	0.8	—	—	1,800	70	—	—	
Pulse Amplifier ♠	Max pulse cathode current ♦ = 5.0 amperes (for duty cycle up to 0.25%)										*7892*
d-c operation current = 0.03 ma min.; d-c operation current = 1.6 ma max.	Ionization voltage = 3,300 volts d-c; Operating voltage = 3,000 volts d-c; Regulation (0.03 to 0.85 milliamperes = 85 volts)										7894 ●
Class A Amplifier	110	—	R_k = 150	7.0	—	6,800	9,400	64	—	—	7895
Class A Amplifier ♠	250	—	R_k = 200	10	—	10,900	5,500	60	—	—	*7898*
Class C Amplifier	300	160	36	50	2.5	—	—	—	—	5.5	*7905*
Plate-Pulsed Oscillator at 5,900 Mc	Peak plate voltage = 1,000 volts; PRF = 1,000; PD = 1.0 microsecond; peak power output = 100 watts										7910
Plate-Pulsed Oscillator at 4,100 Mc	Peak plate voltage = 3,000 volts; PRF = 1,000; PD = 1.0 microsecond; peak power output = 2.2 kilowatts										7911
Class A Amplifier	200	—	R_k = 47	25	—	2,500	40,000	100	—	—	7913
Class A Amplifier ♠	60	—	R_k = 220	7.8	—	2,100	10,000	21	—	—	7962 ●
Class A Amplifier ♠	100	—	R_k = 270	7.5	—	3,100	13,000	40	—	—	7963 ●
Indicator	Peak anode current ⊞ = 11 ma max; d-c anode current ⊞ = 3 ma max										7979 ●
Class C Amplifier	250; R_{g2} = 22,000 ohms	250§	40	90	8.4	—	—	—	—	11	*7983*
Class A Amplifier	200	125	20	125	4.5	—	7,300	—	—	—	7984 ■
Class C Amp	450	200	60	180	12	—	—	—	—	46	
RF Amplifier Class B	7000	600	35	475	10	—	—	—	—	1100	GL7985
Class C Telephony	4000	400	100	570	20	—	—	—	—	1250	
Amp/Osc Telegraphy	6500	700	100	800	25	—	—	—	—	3200	
Class A Amplifier	100	—	R_k = 82	13	—	22,000	18,000	42	—	—	7994 ●
Class A Amplifier	150	150	R_k = 160	8.0	2.0	85,000	13,000	—	—	—	7995 ●

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.
♠ G2 and G4 are screen. G3 is signal-input grid.
1, 2, etc. indicate tube sections.
§ Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads		
									Input	Output	Grid-plate
GL7998/ GL7998 -PC	Ignitron	GL 7998	TX	—	—	—	—	—	—	—	—
GL7998	Ignitron	GL 7998	TX	—	—	—	—	—	—	—	—
GL7998 -PC	Ignitron	GL 7998	TX	—	—	—	—	—	—	—	—
8008	Half-Wave Mercury-Vapor Rectifier	2P	T-X	5.0	7.5	—	Tube Voltage Drop = 10 Volts				
8032	Beam Power Amplifier	7CK	T-X	13.5	0.585	20▣ 20▣	400▣ 400▣	— 250▣ 3.0▣	Triode Connection Two Tubes, Push-Pull Pentode Connection Two Tubes, Push-Pull		
8032-A	Beam Power Amplifier	7CK	T-X	12.6	0.562	27▣	600▣	250▣ 3.0▣	Pentode Connection Two Tubes, Push-Pull		
8042	Beam Power Amplifier	8LJ	T-X	1.6	3.2	25▣	650▣	200▣ 5.0▣	13.5▲	8.5▲	0.24▲
8056	Medium-Mu Triode (Nuvistor)	12AQ	4–4	6.3	0.135	0.45▣	50▣	—	4.0	1.7	2.1
8058	High-Mu Triode (Nuvistor)	12CT	4–6	6.3	0.135	1.5▣	150▣	—	—	—	—
8064 ◉	Semi-Remote-Cutoff Pentode	8DL	3–1	26.5	0.045	0.75▣	165▣	155▣ 0.35▣	4.0	3.4	0.015 ♣
8068	Beam Pentode	8LC	12–20	6.3	0.9	35▣	3500▣	250▣ 1.0▣	10▲	5.5▲	0.6▲
8070	High-Mu Triode	8LD	3–1	6.3	0.125	1.0▣	165▣	—	3.3	2.1	1.7
8071 ◉	High-Mu Triode	8LE	3–1	6.3	0.125	2.0▣	165▣	—	4.0	1.8	2.4
8077	Pentode	9GK	6–2	13.5	0.275	5.0▣	330▣	180▣ 1.0▣	10.2▲	3.5▲	0.063 ▲
8081	Triode (Ceramic)	8081	T-X	6.3	0.22	0.85▣	275▣	—	1.5▲	0.03▲	1.0▲
8082	Triode (Planar)	8081	T-X	6.3	0.24	1.0▣	250▣	—	1.8▲	0.032 •▲	1.3▲
8083	Triode (Planar)	8081	T-X	6.3	0.24	1.1▣	250▣	—	1.8▲	0.032 ▲	1.2▲
8084	Sharp-Cutoff RF Pentode	7CM	5–2	13.5	0.16	2.3▣	250▣	180§▣ 0.5▣	8.0	3.0	0.04♣
8096 ◉	Triode	8FY	3–1	6.3	0.2	0.5▣	150▣	—	1.75▲	0.6▲	2.0▲ ♣
8100	Photoconductive Cell	8100	T-X	—	—	0.3▣	400▣	—	—	—	—
8102	Triode-Pentode	9PJ	6–2	13.5	0.23	2.5▣ 2.5▣	330▣ 330▣	330§▣ 0.55▣ —	Pentode Section Triode Section		
8103	Medium-Mu Twin Triode	8DG	3–1	26.5	0.075	—	55▣	—	3.8	1.3	2.7
8106	Beam Pentode	9PL	6–2	13.5	0.25	6.0▣	330▣	300▣ 1.25▣	10▲	2.8▲	0.09▲
8108	Medium-Mu Triode (Planar)	8108	T-X	6.3	0.735	12.5▣	300▣	—	3.0▲	0.035 ▲	1.4▲
8113 5★	Sharp-Cutoff RF Tetrode	7EW	5–2	6.3	0.2	2.0▣	180▣	180§▣ 0.5▣	4.3	2.8	0.035 ♣
8116	Tetrode	8116	TX	26.5 13.25	0.433 0.866	2x30▣	1000▣	300▣	11.8	3.7	0.09
8116A	Tetrode	8116A	TX	13.25	1.0	2x30▣	1000▣	360▣	11.8	3.7	0.09
8117	Tetrode	8117	TX	12.6 6.3	0.9 1.8	2x30▣	1000▣	360▣	11.8	3.7	0.09
8117A	Tetrode	8117A	TX	13.25	1.0	2x30▣	1000▣	360▣	11.8	3.7	0.09

■Compactron. † Zero signal. ✠Per section.
‡ Plate-to-plate. ♣Maximum. § Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 1800; corresponding av. anode curr. 135 A.; max. av. anode curr. 220 A.; corresponding demand KVA 600.										GL7998/ GL7998 -PC
Frequency Changer	Max. peak inverse voltage 1200 V.; max. peak anode curr. 2250 A.; corresponding av. anode curr. 30 A.; max. av. anode curr. 105 A.; corresponding peak anode curr. 630 A.										GL7998
Frequency Changer	Max. peak inverse voltage 1500 V.; max. peak anode curr. 1800 A.; corresponding av. anode curr. 24 A.; max. av. anode curr. 84 A.; corresponding peak anode curr. 502 A.										GL7998 -PC
Half-Wave Rectifier	Max d-c output current ▣ =1.25 amperes; max peak inverse voltage ▣ = 5,000 volts; max peak current ▣ =5.0 amperes										8008
Class AB_1 Amplifier	400	—	100	40†	—	—	—	—	8,000‡	22	8032
Class AB_2 Amplifier	600	165	44	22†	0.6†	—	—	—	6,000‡	90	
Class AB_1 Amplifier	600	200	47	48†	14.8†	—	—	—	5,600‡	96	8032-A
Class C Amplifier	600	180	71	150	15	—	—	—	—	65	8042
Class A Amplifier	24	—	R_k = 100	8.7	—	1,530	7,500	11.5	—	—	8056
Class A Amplifier	110	—	R_k = 47	10	—	5,600	12,400	70	—	—	8058
Class A Amplifier	100	100	R_k = 120	7.2	2.0	275,000	4,500	—	—	—	8064 ◉
Series Regulator	600	125	7.5	36	1.0	54,500	5,200	—	—	—	8068
	Max d-c cathode current ▣ =100 ma										
Class A Amplifier	110	—	R_k = 130	7.5	—	5,300	10,500	55	—	—	8070
Class A Amplifier	150	—	R_k = 100	13	—	4,670	12,750	55	—	—	8071 ◉
Class A Amplifier	250	150	R_k = 120	19	3.5	100,000	11,500	—	—	—	*8077*
Class A Amplifier	150	—	R_k = 1,000	0.95	—	57,000	1,400	80	—	—	8081
Class A Amplifier	150	—	R_k = 82	7.5	—	—	10,500	90	—	—	8082
Class A Amplifier	150	—	R_k = 910; E_c = +6.0	7.2	—	9,000	10,500	94	—	—	8083
Class A Amplifier	125	80	1.0	7.0	1.7	—	10,500	—	—	—	*8084*
Class A Amplifier	120	—	R_k = 1,500	0.9	—	—	1,750	54	—	—	8096 ◉
TV Brightness Control	Wave length of maximum response =6,100 angstroms; cell resistance (dark) =500,000 ohms: cell resistance (2 foot-candles) =5,000 ohms										8100
Class A Amplifier	125	125	1.0	12	4.0	200,000	7,500	—	—	—	*8102*
Class A Amp	125	—	1.0	13.5	—	5,400	8,500	46	—	—	
Class A Amplifier ♠	26.5	—	R_g = 2.2meg	5.5	—	—	11,000	20	—	—	8103
Class A Amplifier	300	150	3.5	16	3.2	90,000	9,000	—	—	—	*8106*
Class A Amplifier	180	—	2.8	30	—	—	18,000	43	—	—	8108
Class A Amplifier	120	120	2.0	10	2.3	20,000	7,000	—	—	—	*8113* 5★
Amp/Osc (Parallel)	800	250	34	50	1.2	—	—	7.0	—	—	8116
Class AB_1 Amplifier	1000	265	41	30	—	—	—	7.0	—	—	8116A
Class AB_1 Amplifier	800	250	34	50	1.2	—	—	7.0	—	—	8117
Class AB_1 Amplifier	1000	265	41	30	—	—	—	7.0	—	—	8117A

Metal tubes are shown in bold-face type, *miniature tubes in italics*.

♦ G3 and G5 are screen. G4 is signal-input grid.

♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✠Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Output	Grid-plate
8118	Tetrode	8118	TX	1.6	4.25	2x10 ⊡ 2x7 ⊡ 2x10 ⊡	600 ⊡ 500 ⊡ 600 ⊡	300 ⊡	4.5	1.8	—
8136	Sharp-Cutoff Pentode	7CM	5–2	6.3	0.3	2.2 ⊡	330 ⊡	165 ⊡ 0.65 ⊡	7.0▲	2.2▲	0.02▲
8142	Photoconductive Cell	8100	T-X	—	—	0.3 ⊡	400 ⊡	—	—	—	—
8143	Photoconductive Cell	8100	T-X	—	—	0.3 ⊡	400 ⊡	—	—	—	—
8149 ■	Beam Power Amplifier	12DT	12–57	13 6.5	0.6 1.2	35 ⊡	750 ⊡	250 ⊡ 3.3 ⊡	13▲	6.0▲	0.35▲
8150 ■	Beam Power Amplifier	12DU	12–86	13 6.5	0.6 1.2	35 ⊡	750 ⊡	250 ⊡ 3.3 ⊡	13▲	6.5▲	0.2▲
8156 ■	Beam Pentode	12EU	T-X	13.5	0.3	15 ⊡	600 ⊡	250 ⊡ 2.5 ⊡	11▲	5.0▲	0.07▲
8185 ◉	Medium-Mu Triode	8KM	3–8	6.3	0.3	4.25 ⊡	250 ⊡	—	—	—	—
8186 ◉	Medium-Mu Triode	8KM	3–8	26.5	0.075	4.25 ⊡	250 ⊡	—	—	—	—
8203	Medium-Mu Triode (Nuvistor)	12AQ	4–4	6.3	0.16	1.5 ⊡	250 ⊡	—	4.2▲	1.6▲	2.2▲
GL8205	Ignitron	GL 8205	TX	—	—	—	—	—	—	—	—
8210 ◉	Sharp-Cutoff RF Pentode	8LS	T-X	6.3	0.125	1.1 ⊡	165 ⊡	155 ⊡ 0.55 ⊡	5.0	3.8	0.012 ♣
8211 ◉	Video Pentode	8DL	3–3	6.3	0.36	4.0 ⊡	165 ⊡	155 ⊡ 1.0 ⊡	12	8.0	0.16♣
8212	Medium-Mu Triode	9PY	6–2	6.3 12.6	0.46 0.23	10 ⊡	300 ⊡	—	10▲	1.2▲	2.9▲
8213 ◉	Medium-Mu Triode	8LT	3–8	6.3 12.6	0.38 0.19	5.0 ⊡	300 ⊡	—	7.0	3.2	1.9
8217	Photoconductive Cell	8100	T-X	—	—	0.4 ⊡	300 ⊡	—	—	—	—
8318-A	Photoconductive Cell	8100	T-X	—	—	0.075 ⊡	300 ⊡	—	—	—	—
8223	Medium-Mu Twin Triode	9AJ	T-X	6.3	0.475	3.0 ⊡ ♠	250 ⊡	—	4.7▲	1.9_1▲ 1.8_2▲	1.8▲
8228 ◉	Glow-Discharge Diode	7894	T-X	—	—	—	—	—	—	—	—
8233	Power Amplifier Pentode	9PZ	T-X	6.3	0.6	10 ⊡	200 ⊡	175 ⊡ 1.5 ⊡	18	6.0	0.08
8236	Beam Power Amplifier	8JC	T-X	6.3	2.5	50 ⊡	1,000 ⊡	200 ⊡ 3.2 ⊡	23▲	11▲	0.5▲
8254 ◉	Triode	8LW	T-X	6.3	0.185	1.5 ⊡	110 ⊡	—	3.5▲	0.5▲	1.9▲
8255	High-Mu Triode	9NY	T-X	6.3	0.16	1.8	175	—	—	—	—
8278	Beam Power Amplifier	9QB	T-X	6.3	1.2	25	300	300 4.0	Single Tube 2 Tubes, Push-Pull		

■ Compactron. ‡ Plate-to-plate. ◉ Subminiature type. ⊕ Total for all similar sections.
† Zero signal. ♣ Maximum. ▲ Without external shield. ⊡ Absolute maximum rating.
♠ Per section. ⁑ Supply voltage. ◈ Design maximum rating. # Conversion transconductance.
● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Amp-Class C Telegraphy	400	250	50	2x50	2x3.5	—	2500	9	—	28	8118
Class C Modulation	500	250	80	2x40	2x4.0	—	—	—	—	29	
Class C Freq Tripler	300	250	175	2x45	3.5	—	—	—	—	9	
Class A Amplifier	125	125	R_k = 56	10.8	2.9	—	9,800	—	—	—	*8136*
Relay Control	Wavelength of maximum response =6,100 angstroms; cell resistance: 1,500 ohms with an illumination of 2 foot-candles at a color temperature of 2,870 K										8142
Relay Control	Wavelength of maximum response =6,100 angstroms; cell resistance: 9,000 ohms with an illumination of 2 foot-candles at a color temperature of 2,870 K										8143
Class A Amplifier	200	200	—	100	—	—	7,500	—	—	—	8149■
Class C Amp	380	E_{cc2}= 380 R_{g2} = 10,000	78	180	12	—	—	—	—	40	
Class A Amplifier	200	200	—	100	—	—	7,500	—	—	—	8150■
Class C Amp	380	E_{cc2}= 380 R_{g2} = 10,000	78	180	12	—	—	—	—	40	
Class A Amplifier	200	125	9.0	75	3.5	—	7,600	—	—	—	8156■
Class C Amp	400	170	60	90	10	—	—	—	—	21	
Class A Amplifier	200	—	R_k = 220	17	—	—	19,000	42	—	—	8185●
Class A Amplifier	200	—	R_k = 220	17	—	—	19,000	42	—	—	8186●
Class A Amplifier	150	—	R_k = 560	7.0	—	5,000	6,000	30	—	—	8203
Resistance Welding	Max. supply volts 250-600; max. demand KVA 4800; corresponding av. anode curr. 486 A.; max. av. anode curr. 900 A.; corresponding demand KVA 1600.										GL8205
Class A Amplifier	100	100	R_k = 100	8.5	2.8	260,000	9,000	—	—	—	8210●
Class A Amplifier	150	100	R_k = 62	17	4.2	65,000	15,500	—	—	—	8211●
Class A Amplifier	105	—	R_k = 75	25	—	965	29,000	28	—	—	*8212*
Class A Amplifier	105	—	R_k = 75	23	—	1,348	23,000	31	—	—	8213●
Relay Control	Spectral response, S-15; minimum dark resistance =1.0 megohm; resistance with 10 foot-candles, average =7,000 ohms; maximum current ◙ =20 ma										8217
Relay Control	Wavelength of maximum response = 6,100 A; minimum dark resistance = 10 megohms; resistance with 2 foot-candles, average =32,000 ohms										8318-A
Class A Amplifier ♠	100	—	R_k = 350 E_{c1} = +9.0	30	—	1,400	18,000	25	—	—	*8223*
Voltage Reference	D-c operating current =3.0 ma; Ionization voltage =115 volts d-c, min; operating voltage =81 volts d-c										8228●
Class A Amplifier	125	125	3.0	50	5.5	20,000	45,000	—	—	—	8233
Class C Amplifier	700	140	75	200	14	—	—	—	—	105	8236
Class A Amplifier	80	—	2.0	14	—	—	14,500	24	—	—	8254●
Class A Amplifier	150	—	R_k = 100	12	—	—	13,500	65	—	—	8255
Class A Amplifier	250	250	12.5	100	8.0	7,300	24,000	—	—	—	8278
Class AB_1 Amplifier	265	265	R_k = 56	200†	16†	—	—	—	2,400‡	40	

Metal tubes are shown in bold-face type, *miniature tubes in italics*.
♦ G3 and G5 are screen. G4 is signal-input grid.
♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
■Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads		
									Input	Output	Grid-plate
8298	Beam Power Amplifier	7CK	T-X	6.75	1.165	20▣ 20▣	400▣ 400▣	— 250▣ 3.0▣	Triode Connection Two Tubes, Push-Pull Pentode Connection Two Tubes, Push-Pull		
8298-A	Beam Power Amplifier	7CK	T-X	6.3	1.125	27▣	600▣	250▣ 3.0▣	Pentode Connection Two Tubes, Push-Pull		
8318	Photoconductive Cell	8100	T-X	—	—	0.05▣	300▣	—	—	—	—
8319 ●	High-Mu Triode	8LD	3-1	6.3	0.15	1.0▣	165▣	—	4.2	2.2	1.8
8327	Power Amplifier Pentode	9CV	6-4	6.3	0.76	13.2◈	450◈	400◈ 2.2◈	10.8▲	6.5▲	0.5▲
8334	High-Mu Triode	7DK	5-1	6.3	0.225	4.4▣	330▣	—	3.3	1.8	1.7
8345	Photoconductive Cell	8100	T-X	—	—	0.3▣	400▣	—	—	—	—
8346	Photoconductive Cell	8100	T-X	—	—	0.3▣	400▣	—	—	—	—
8347	Photoconductive Cell	8100	T-X	—	—	0.3▣	400▣	—	—	—	—
8348	Twin Tetrode	9QN	6-4	1.6	2.5	5.0▣ ♦	300▣	200▣ 2.0▣ ⊕	Two Sections, Push-Pull		
8368	Twin Pentode	9QR	6-3	1.9	3.15	7.5▣ ⊕	250▣	200▣ 3.5▣ ⊕	Two Sections, Push-Pull		
8380	Power Tetrode (Nuvistor)	12AS	4-5	6.0-8.5	—	1.6▣	250▣	100▣ 0.2▣	7.0▲	1.4▲	0.015 ♣▲
8382	Triode (Nuvistor)	12AQ	4-4	6.0-8.5	—	2.0▣	250▣	—	4.2▲	1.6▲	2.2▣
8393	Medium-Mu Triode (Nuvistor)	12AQ	4-4	13.5	0.06	1.0▣	110▣	—	4.4▲	1.6▲	2.4▲
8403	High-Mu UHF Triode (Planar)	7815R	T-X	6.3	1.25	33▣	2,500▣	—	8.0▲	0.065 ♣▲	3.1▲
8408	Twin Tetrode	9QV	T-X	1.1	3.0	4.0▣ ♦	300▣	200▣ 2.5▣ ⊕	Two Sections, Push-Pull		
8412	High-Mu Triode (Planar)	8412	T-X	6.0	0.8	30▣	600▣	—	2.6▲	0.02▲	1.7▲
8413	High-Mu Triode (Planar)	8413	T-X	6.0	0.8	25▣	600▣	—	2.6▲	0.02▲	1.7▲
8414 ●	Sharp-Cutoff RF Pentode	8DC	3-1	26.5	0.045	—	55▣	55▣	4.9	3.0	0.02 ♣
8417	Beam Power Amplifier	7S	T-X	6.3	1.6	35◈	660◈	500◈ 5.0◈	Single Tube 2 Tubes, Push-Pull		
8425	Sharp-Cutoff RF Pentode	7BK	5-2	6.3	0.3	3.5◈ 3.5◈	330◈ 275◈	330§◈ 0.75◈ —	Pentode Connection Triode Connection (G_2, G_3, & P tied)		
8425-A	Sharp-Cutoff RF Pentode	7BK	5-2	6.3	0.3	3.5◈ 3.5◈	330◈ 275◈	330§◈ 0.75◈ —	Pentode Connection Triode Connection (G_2, G_3, & P tied)		

■Compactron. † Zero signal. ♦Per section.
‡ Plate-to-plate. ♣Maximum. § Supply voltage.
●Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohm	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class AB_1 Amplifier	400	—	100	40†	—	—	—	—	8,000‡	22	8298
Class AB_2 Amplifier	600	165	44	22†	0.6†	—	—	—	6,000‡	90	
Class AB_1 Amplifier	600	200	47	48†	14.8†	—	—	—	5,600	96	8298-A
Relay Control	Wave length of maximum response ■ =6,100 A; minimum dark resistance ■ = 10 megohm; resistance with 2 foot-candles, average ■ =48,000 ohms										8318
Class A Amplifier	100	—	R_k = 160	7.5	—	—	14,000	55	—	—	8319 ●
Class C Amplifier	250	250	30	20	4.5	Input Signa =0.1 watts			—	3.0	*8327*
Class A Amplifier	200	—	R_k = 100	18	—	—	10,750	55	—	—	*8334*
Relay Control	Wavelength of maximum response =6,100 angstroms; cell resistance (Dark) =75,000 ohms; cell resistance (2 foot-candles) =750 ohms										8345
Relay Control	Spectral response =6,100 angstrom units; cell resistance at 2 foot-candles = 3,000 ohms										8346
Relay Control	Spectral response =6,100 angstrom units; cell resistance at 2 foot-candles = 16,000 ohms										8347
Class C Amplifier	300	300✱	40	75	2.3	R_{g2} =56,000 ohms		—	—	12	*8348*
Class C Amplifier	180	180	20	50	11.5	—	—	—	—	4.5	*8358*
Class A Amplifier	100	50	R_k = 68	11	2.9	—	11,000	—	—	—	8380
Class A Amplifier	75	—	R_k = 100	15	—	2,200	12,800	28	—	—	8382
Class A Amplifier	75	—	R_k = 100	10.5	—	3,000	11,500	35	—	—	8393
Grid-Pulsed Oscillator	2,000	—	150	4000 Peak	—	—	—	—	—	1,000 Peak	8403
Class C Amplifier	275	275✱	25	80	13	R_{g2} =8,200 ohms		—	—	15	*8408*
Class A Amplifier	420	—	R_k = 390	60	—	—	16,000	60	E_{cc1} = +20 volts		8412
Class A Amplifier	420	—	R_k = 390	60	—	—	16,000	60	E_{cc1} = +20 volts		8413
Class A Amplifier	26.5	26.5	E_{cc1}= 0	4.5	1.5	50,000	5,000	R_{g1} =2.2 meg		—	8414 ●
Class A Amplifier	300	300	12	100	5.5	16,000	23,000	—	—	—	8417
Class AB_1 Amplifier	560	300	15.5	100	3.4	—	—	—	4,200‡	100	
Class A Amplifier	250	150	R_k = 68	10.5	4.1	1,100,000	6,200	—	—	—	*8425*
	250	125	R_k = 100	7.4	2.8	1,300,000	5,500	—	—	—	
Class A Amplifier	250	—	R_k = 330	11.2	—	—	6,000	41	—	—	
Class A Amplifier	250	150	R_k = 68	10.5	4.1	1,100,000	6,200	—	—	—	*8425-A*
	100	100	R_k = 150	4.8	1.9	600,000	4,500	—	—	—	
Class A Amplifier	250	—	R_k = 330	11.2	—	—	6,000	41	—	—	

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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Output	Grid-plate
8426	Sharp-Cutoff RF Pentode	7BK	5–2	12.6	0.15	3.5◈ 3.5◈	330◈ 275◈	330**‡**◈ 0.75◈ —	Pentode Connection Triode Connection (G_2, G_3, & P tied)		
8426-A	Sharp-Cutoff RF Pentode	7BK	5–2	12.6	0.15	3.5◈ 3.5◈	330◈ 275◈	330**‡**◈ 0.75◈ —	Pentode Connection Triode Connection (G_2, G_3, & P tied)		
8431	Medium-Mu Twin Triode	9AJ	6–2	12.6	0.18	3.5◈ ♠	200◈	—	3.3	2.5	1.4
8441	Triode (Nuvistor)	12AQ	4–4	6.0–8.5	—	1.0▣	250▣	—	4.2▲	1.7▲	0.9▲
8444◉	Sharp-Cutoff RF Pentode	8DC	3–1	6.3	0.125	1.1▣	165▣	155▣ 0.55▣	5.2	3.8	0.016 ♠
8445	Triode-Pentode	9AE	6–2	6.75	0.44	1.7◈ 2.0◈	330◈ 330◈	200◈ 0.5◈ —	Pentode Section Triode Section		
8446	Triode-Pentode	9FA	6–2	6.75	0.44	1.7◈ 2.0◈	330◈ 330◈	200◈ 0.5◈ —	Pentode Section Triode Section		
8447	Duplex-Diode High-Mu Triode	9CF	6–2	{6.75 13.5	0.38} 0.19}	2.5◈	300◈	—	2.8	1.0	1.9
8448	Sharp-Cutoff Pentode	9BF	6–3	{6.75 13.5	0.52} 0.26}	6.5◈	330◈	190◈ 1.2◈	10.2 ▲	3.5▲	0.063 ♣▲
8456	Triode (Nuvistor)	12AQ	4–4	6.0–8.5	—	0.45 ▣	50▣	—	4.0▲	1.7▲	2.1▲
8457	Twin Tetrode	9PW	6–4	{6.75 13.5	0.76} 0.38}	7.0▣ ♠	300▣	200▣ 2.0▣ ⊕	Two Sections, Push-Pull		
8458	Twin Tetrode	9PW	T-X	{6.75 13.5	0.76} 0.38}	7.5▣ ♠	400▣	200▣ 2.0▣ ⊕	Two Sections, Push-Pull		
8463	Pentode	9QX	6–3	1.1	1.05	5.0▣	300▣	300▣ 1.0▣	6.5▲	3.8▲	0.15▲
8474	Photoconductive Cell	8100	T-X	—	—	0.05▣	150▣	—	—	—	—
8475	Photoconductive Cell	8100	T-X	—	—	0.05▣	200▣	—	—	—	—
8475-A	Photoconductive Cell	8100	T-X	—	—	0.075 ▣	200▣	—	—	—	—
8476	Photoconductive Cell	8100	T-X	—	—	0.05 ▣	300▣	—	—	—	—
8477	Photoconductive Cell	8100	T-X	—	—	0.05 ▣	300▣	—	—	—	—
8477-A	Photoconductive Cell	8100	T-X	—	—	0.075 ▣	300▣	—	—	—	—
8478	Photoconductive Cell	8100	T-X	—	—	0.05 ▣	300▣	—	—	—	—
8489	Triode-Pentode	9DA	6–2	6.3	0.45	2.3◈ 2.8◈	330◈ 330◈	330**‡**◈ 0.55◈ —	Pentode Section Triode Section		
GL8500	Tetrode	GL 8500	TX	6.3	3.8	500	2000 1600	320	Cathode-Plate 0.006; Input 19.5; Output 6.4		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. **‡**Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250	150	R_k = 68	10.5	4.1	1,100,000	6,200	—	—	—	*8426*
	250	125	R_k = 100	7.4	2.8	1,300,000	5,500	—	—	—	
Class A Amplifier	250	—	R_k = 330	11.2	—	—	6,000	41	—	—	
Class A Amplifier	250	150	R_k = 68	10.5	4.1	1,100,000	6,200	—	—	—	*8426-A*
	100	100	R_k = 150	4.8	1.9	600,000	4,500	—	—	—	
Class A Amplifier	250	—	R_k = 330	11.2	—	—	6,000	41	—	—	
Class A Amplifier ♣	90	—	1.3	15	—	—	12,500	33	—	—	*8431*
Class A Amplifier	110	—	R_k = 150	7.0	—	6,800	9,400	64	—	—	8441
Class A Amplifier	100	100	R_k = 100	8.5	2.8	260,000	9,000	—	—	—	8444 ◉
Class A Amplifier	170	170	2.0	10	2.5	400,000	6,200	—	—	—	*8445*
Class A Amplifier	100	—	1.0	12.5	—	—	7,000	43	—	—	
Class A Amplifier	170	170	2.0	10	2.5	400,000	6,200	—	—	—	*8446*
Class A Amplifier	100	—	1.0	12.5	—	—	7,000	43	—	—	
Class A Amplifier	250	—	R_k = 200	10	—	10,900	5,500	60	—	—	*8447*
Class A Amplifier	250	180	R_k = 100	26	5.7	93,000	11,000	—	—	—	*8448*
Class A Amplifier	24	—	R_k = 100	8.7	—	1,530	7,500	11.5	—	—	8456
Class AB_1 Amplifier	300	200	21.5	30†	1.2†	—	—	—	10,000 ‡	12	*8457*
Class C Amplifier	400	155	59	85	2.3	—	—	—	—	20	8458
Class C Amplifier	300	150	35	40	3.5	—	—	—	—	8.0	*8463*
Relay Control	Spectral response = 6,100 angstrom units; cell resistance at 2 foot-candles = 1,500 ohms; minimum dark resistance = 150,000 ohms										8474
Relay Control	Spectral response = 6,100 angstrom units; cell resistance at 2 foot-candles = 3,000 ohms; minimum dark resistance = 300,000 ohms										8475
Relay Control	Wavelength of maximum response = 6,100 A; minimum dark resistance = 0.2 megohms; resistance with 2 foot-candles, average = 2,000 ohms										8475-A
Relay Control	Spectral response = 6,100 angstrom units; cell resistance at 2 foot-candles = 6,000 ohms; minimum dark resistance = 600,000 ohms										8476
Relay Control	Spectral response = 6,100 angstrom units; cell resistance at 2 foot-candles = 12,000 ohms; minimum dark resistance = 1,200,000 ohms										8477
Relay Control	Wavelength of maximum response = 6,100 A; minimum dark resistance = 0.8 megohms; resistance with 2 foot-candles, average = 8,000 ohms										8477-A
Relay Control	Spectral response = 6,100 angstrom units; cell resistance at 2 foot-candles = 24,000 ohms; minimum dark resistance = 2,400,000 ohms										8478
Class A Amplifier	125	125	1.0	12	3.8	170,000	7,000	—	—	—	*8489*
Class A Amplifier	150	—	3.0	15	—	4,700	4,500	21	—	—	
RF Amplifier Class B	1750	250	20	200	5	—	—	14	—	110	GL8500
Telegraphy Class C	2000	225	40	250	10	—	—	—	—	300	

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♥G2 and G4 are screen. G3 is signal-input grid.

1, 2, 3, etc. indicate tube sections.

✱Maximum screen dissipation appears immediately below the screen voltage.

¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✠	Capacitance in Picofarads Input	Output	Grid-plate
8506	Triode (Planar)	8506	T-X	6.3	0.4	5.0◈	300◈	—	4.8▲	0.025 ▲	2.5▲
GL8513	Tetrode	GL 8513	TX	7.0	13.5	4000	9000 4500 7000	800 500 750	Cathode-Plate 0.01; Input 27.8; Output 6.7		
8517●	Pentode	8DC	3–1	6.3	0.15	0.8▣	165▣	155▣ 0.55▣	4.3	3.5	0.02♣
8522●	Dual-Control Pentode	8DC	3–1	6.3	0.15	0.7▣	165▣	155▣ 0.55▣	—	—	—
8524	Sharp-Cutoff Pentode	8DC	T-X	6.3	0.15	0.55▣	165▣	155▣ 0.45▣	—	—	—
8525	Medium-Mu Twin Triode	8DG	T-X	6.3	0.3	0.7▣ ♠	165▣	—	2.1▲	1.3_1▲ 1.4_2▲	1.4▲
8526	Medium-Mu Twin Triode	8DG	T-X	6.3	0.3	0.95▣ ♠	165▣	—	2.1▲	1.3_1▲ 1.4_2▲	1.4▲
8527	Medium-Mu Triode	8DK	T-X	6.3	0.15	3.3▣	165▣	—	2.4▲	2.4▲	1.3▲
8528	Beam Power Amplifier	8DE	T-X	6.3	0.45	3.7▣	165▣	155▣ 0.4▣	6.5▲	7.5▲	0.11▲
8529	Semi-Remote-Cutoff Pentode	8DE	T-X	6.3	0.15	0.85◈	165▣	155▣ 0.25◈	4.2▲	3.4▲	0.015 ♣▲
8530	Sharp-Cutoff Pentode	8DE	T-X	6.3	0.15	1.1▣	165▣	155▣ 0.55▣	4.2▲	3.4▲	0.015 ▲
8532	High-Mu Triode	7BQ	5–2	6.3	0.4	2.5▣	150▣	—	—	—	—
8533	Triode (Planar)	8533	TX	6.3	1.3	100▣	8000▣	—	8.0	.06	1.65
8534	Triode (Planar)	8534	TX	6.3	1.3	10▣ 60▣	2500▣ Grid▣ 2500 Plate▣ 3500	— —	9.5 —	.06 —	2.25 —
8535	Triode (Planar)	8535	TX	6.3	1.3	150▣ 60▣	2500▣ 2500▣ 3500▣	— —	9.5 —	.06 —	2.25 —
8536	Triode (Planar)	8536	TX	6.0	1.0	10▣	2500▣ 2500▣ 3500▣	— —	7.5 —	0.4 —	1.65 —
8537	Triode (Planar)	8537	TX	6.0 5.8	1.0	150▣ 35▣	2500▣ —	— —	7.5 —	.04 —	1.65 —
8538	Hi Mu Triode (Planar)	8538	TX	6.3	1.3	10▣	8000▣ 10000▣	— —	9.5 —	.06 —	1.40 —
8539	Hi Mu Triode (Planar)	8539	TX	6.3	1.3	100▣	8000▣ 10000▣	—	9.5	.06	1.40
8552	Beam Power Amplifier	7CK	T-X	12.6	0.562	27▣	600▣	250▣ 3.0▣	Pentode Connection Two Tubes, Push-Pull		

■Compactron. † Zero signal. ♠Per section.
‡ Plate-to-plate. ♣Maximum. ‡ Supply voltage.
◉Subminiature type. ▲Without external shield. ◈Design maximum rating.
⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.

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Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Average Characteristics	200	—	R_k = 40	25	—	—	29,000	110	—	—	8506
RF Amplifier Class B	8000	750	50	600	10	—	—	—	—	1500	GL8513
Telephony Class C	4000	400	100	570	20	—	—	—	—	1250	
Telegraphy Class C	6500	700	100	800	25					3200	
Average Characteristics	100	100	R_k = 150	6.1	4.2	—	—	—	—	—	8517 ●
Gated Amplifier	100	100	R_k = 150	5.3	3.6	110,000	3,200	(g_3 tied to cathode)			8522 ●
	100	100	R_k = 330	—	—	—	1,300	(E_{c3} = −1.65 volts)			
Class A Amplifier	100	100	R_k = 150	5.3	3.6	110,000	3,200	(g_3 tied to cathode)			8524
Class A Amplifier ♠	100	—	R_k = 150	6.5	—	6,500	5,400	35	—	—	8525
Class A Amplifier ♠	100	—	R_k = 220	8.5	—	4,000	5,000	20	—	—	8526
Class A Amplifier	150	—	R_k = 180	13	—	4,150	6,500	27	—	—	8527
Class A Amplifier	110	110	R_k = 270	30	2.2	15,000	4,200	—	3,000	1.0	8528
Class A Amplifier	100	100	R_k = 120	7.2	2.0	260,000	4,500	—	—	—	8529
Class A Amplifier	100	100	R_k = 150	7.5	2.4	260,000	5,000	—	—	—	8530
Class A Amplifier	150	—	R_k = 100	13.5	—	4,800	11,000	52.5	—	—	*8532*
Hi Mu Triode RF Oscillator	—	—	—	150	—	—	38000	90 Cut-off	—	—	8533
CW RF Osc/Amp Class C	900	—	30	140	—	—	—	—	—	65	8534
Pulsed RF Osc/Amp Class C	2000	—	70	3000	—	—	—	—	—	2500kw	
CW RF Osc/Amp Class C	900	—	30	140	—	—	—	—	—	65	8535
RF Osc/Amp Grid Pulsed Plate Pulsed	2000	—	70	3000	—	—	—	—	—	2500kw	
CW RF Osc/Amp Class C	900	—	40	90	—	—	—	—	—	40	8536
Grid Pulsed RF Oscillator	−45	—	1700 (Pos)	1900	—	—	—	—	—	2500kw	
Plate Pulsed Oscillator	peak 3500	—	—	9.0	—	—	—	—	—	2500kw	
CW RF Osc/Amp Oscillator	900	—	40	90	—	—	—	—	—	40	8537
Grid Pulsed Oscillator	−45	—	1700 (Pos)	peak 1900	—	—	—	—	—	2000kw	
Plate Pulsed	peak 3500	—	—	9.0	—	—	—	—	—	2000kw	
Pulsed RF Amp/ Modulator Plate Pulsed RF Oscillator	—	—	—	—	—	—	38000	90 Cut-off	—	—	8538
Pulsed RF Amp/ Modulator Plate Pulsed RF Oscillator	—	—	—	—	—	—	38000	90 Cut-off	—	—	8539
Class AB_1 Amplifier	600	200	47	48†	14.8†	—	—	—	5,600‡	96	8552

Metal tubes are shown in bold-face type, ***miniature tubes in italics.***
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♥G2 and G4 are screen. G3 is signal-input grid.
1, 2, 3, etc. indicate tube sections.
✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Connections	Outline Dwg	Filament Volts	Filament Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads Input	Output	Grid-plate
8582	Photoconductive Cell	8100	T-X	—	—	0.05 ⊞	300 ⊞	—	—	—	—
8582-A	Photoconductive Cell	8100	T-X	—	—	0.075 ⊞	300 ⊞	—	—	—	—
8595	Twin Tetrode	8595	TX	6.3	0.6	2x2 ⊞ 2x3 ⊞	200 ⊞ 250 ⊞	200	6.4	1.6	0.15
8627	Triode (Nuvistor)	12CT	4-6	6.3	0.15	2.5 ⊞	250 ⊞	—	—	—	—
8628	Triode (Nuvistor)	12AQ	4-4	6.3	0.1	0.3 ⊞	250 ⊞	—	3.4▲	1.7▲	0.7♣▲
8632	Hi Mu Triode	8632	TX	6.3	.30	18	—	—	5.0	1.9	.75
8639	Beam Power Tetrode	8639	TX	6.3	1.8	40	4000	450	21.0	6.5	.3
8643	Twin Tetrode	8643	TX	13.5 6.7	1.0 2.0	2x38 ⊞	800 ⊞	300 ⊞	6.7	2.1	—
		—	—	—	—	—	—	—	—	—	—
8727	High-Mu Triode (Pencil Tube)	5675	T-X	6.3	0.225	2.5 ⊞	250 ⊞	—	4.4	0.04	2.1
8745	High-Mu Triode (Planar)	7815R	T-X	6.0	1.0	10 ⊞	3500 ⊞ Peak	—	6.3▲	0.035 ♣▲	2.05▲
GL8751	TRIODE	GL 8751	TX	6.3	1.05	2500 Peak 30	—	—	—	—	—
8755	Triode (Planar)	8755	TX	6.3	1.3	150	8000	—	9.3	.06	1.25
8755A	Triode (Planar)	8755-A	TX	6.3	1.3	150	8000	—	9.5	.06	1.05
8808	Hi Mu Triode	8808	TX	6.3	.34	6 ⊞	1000 ⊞	—	9.6	.05	2.7
8847	Triode (Planar)	8847	TX	6.3	1.3	150 ⊞	2500 ⊞ 3000 ⊞ peak ⊞ 3500 ⊞	— —	9.5 —	.06 —	1.4 —
8847A	Triode (Planar)	8847-A	TX	6.0	0.95	150 ⊞	2500 ⊞ 3000 ⊞ peak 3500 ⊞	— —	9.5 —	.06 —	1.4 —
8859	High-Mu Triode (Planar)	8413	T-X	6.3	0.35	15 ⊞	450 ⊞	—	—	—	—
GL8866	Tetrode	GL 8866	TX	6.3	3.8	150	3500	750	Cathode-Plate .006; Input 20; Output 8.9		
8892	Triode (Planar)	8892	TX	6.3	.65	50	2000 ⊞	—	5.0	.06	1.6
8893	Triode (Planar)	8893	TX	6.3	1.3	100	2000 ⊞	—	8.0	.10	2.35
8906	Triode (Planar)	8906	TX	6.0	1.0	10 ⊞	2500 ⊞ 3500	—	8.0	.06	1.98
8907	Triode (Planar)	8907	TX	6.0	1.0	100 ⊞	2500 ⊞ 3500 ⊞	—	8.0	.06	1.98
8917	Triode (Planar)	8917	TX	6.3	1.2	—	1600	—	—	—	—
9001	Detector Amplifier Pentode	7BD	5-1	6.3	0.15	—	250	100	3.6	3.0	0.01 ♣
9002	Medium-Mu Triode	7BS	5-1	6.3	0.15	—	250	—	1.2	1.1	1.4

■Compactron. ‡ Plate-to-plate. ●Subminiature type. ⊕Total for all similar sections.
† Zero signal. ♣Maximum. ▲Without external shield. ⊞Absolute maximum rating.
♠Per section. § Supply voltage. ◈Design maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, μmhos	μ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Relay Control	Cell resistance (dark) = 10 megohms; cell resistance (2 foot-candles) = 100,000 ohms										8582
Relay Control	Wavelength of maximum response = 6,100 A; minimum dark resistance = 10 megohms; resistance with 2 foot-candles, average = 128,000 ohms										8582-A
Amplifier Class C(CCS)	180	180	20	2x20	9.5	—	—	—	—	4.2	8595
Frequency Multiplier	180	180	R_g = 82 ohm	2x20	9.7	—	—	—	—	2.3	
Class A Amplifier	110	—	R_k = 47	11.5	—	5,400	13,000	70	—	—	8627
Class A Amplifier	120	—	R_k = 200	1.5	—	41,000	3,100	127	—	—	8628
Amplifier	14000	—	—	0.7	—	—	—	—	—	—	**8632**
Pass Tube	—	—	—	—	—	—	—	8.2	—	—	**8639**
RF Amp/Osc	750	300	90	266	9.5	—	—	7	—	137	**8643**
	—	—	—	—	—	—	—	—	—	—	
Avg. Char.	125	—	R_k = 50	14	—	—	16,000	70	—	—	8727
Plate-Pulsed Oscillator	3500	—	—	9.0	—	—	—	—	—	2000 Peak	8745
Plate Pulsed Oscillator	2000 Peak	—	—	3000 Peak	1200 Peak	—	—	—	—	PEAK 2500	**GL8751**
Hi Mu Amp/ Oscillator	5000	—	100	5000	—	—	—	—	—	7000kw	**8755**
Hi Mu Amp/ Oscillator Grid Pulsed	1750	—	20	1000 Peak	—	—	—	—	—	650w	**8755A**
RF Amp/Osc Freq Mult	200	—	0	15	R_k = 68 ohms	6400	18000	100	—	—	**8808**
Cw RF Amp/ Oscillator Grid Pulsed Plate Pulsed	—	—	—	—	—	—	38,000	75	—	—	**8847**
Cw RF Amp/Osc Grid Pulsed Plate Pulsed	—	—	—	—	—	—	38000	75	—	—	**8874A**
Avg. Char.	250	—	R_k = 75	25	—	—	17,000	70	—	—	8859
RF Amplifier Class C	2500	600	70	1400	50	—	—	—	—	1600	**GL8866**
RF Oscillator Class C	—	—	—	—	—	—	30000	60	—	—	**8892**
RF Oscillator Class C	—	—	—	—	—	—	30000	60	—	—	
Cw RF Amp/Osc	630	—	—	—	—	—	38	80	—	45	**8906**
RF Amp/Osc	2200		50	Peak 2500						2500w	
Cw RF Amp/Osc	630	—	—	Peak	—	—	38	80	—	45	**8907**
RF Amp/Osc	2200		50	2500							
Linear Amplifier	1000	—	—	100	—	—	65000	210	—	—	**8917**
Class A Amplifier	250	100	3.0	2.0	0.7	1,000,000	1,400	—	—	—	*9001*
Class A Amplifier	250	—	7.0	6.3	—	11,400	2,200	25	—	—	*9002*

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✱Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ♣	Capacitance in Picofarads Input	Out-put	Grid-plate
9003	Remote-Cutoff Pentode	7BD	5–1	6.3	0.15	—	250	100	3.6	3.0	0.01 ♣
9004	High-Frequency Diode (Acorn)	4BJ	4–1	6.3	0.15	—	—	—	—	—	—
9005	High-Frequency Diode (Acorn)	5BG	4–1	3.6	0.165	—	—	—	—	—	—
9006	High-Frequency Diode	6BH	5–1	6.3	0.15	—	—	—	—	—	—
GE12661	Triode (Planar)	GE 12661	TX	6.3	.24	4 ▣	350 ▣	—	1.6	.015	1.35
GE13971	Triode (Planar)	GE 13971	TX	6.3	.55	6.5	1500	—	4.8	0.05	1.5
GE14501	Triode (Planar) Hi Mu	GE 14501	TX	6.3	.24	2.0 ▣	250 ▣	—	1.75	0.01	1.25
GE14811	Triode (Planar)	GE 14811	TX	6.3	.36	6.5 ▣	1200 ▣	—	4.4	.036	1.65
GE15371	Triode (Planar)	GE 15371	TX	6.3	.50	10 ▣	2000 ▣	—	5.0	.035	1.9
GE16231	Triode (Planar)	GE 16231	TX	6.3	.40	6.5 ▣	1250 ▣	—	6.0	.018	1.7
GE16411	Triode (Planar) Hi Mu	GE 16411	TX	6.3	.15	1.0 ▣	250 ▣	—	1.5	.01	1.3
GE16841	Triode (Planar)	GE 16841	TX	5.7	.27	1.5 ▣	250 ▣	—	2.1	.018	1.05
GE17241	Triode (Planar)	GE 17241	TX	6.0	.97	—	1500 ▣	—	6.3	.035	1.9
						10 ▣	1750 ▣ Peak 2500 ▣	—	—	—	—
GE17701	Triode (Planar)	GE 17701	TX	6.3	1.25	30 ▣	2500 ▣	—	9.0	0.1	2.15
GE18651	Triode (Planar)	GE 18651	TX	6.3	.55	6.5 ▣	1500 ▣	—	4.9	—	1.6
GL37207	Ignitron	GL 32207	TX	—	—	—	—	—	—	—	—
GL37248	Ignitron	GL 37248	TX	—	—	—	—	—	—	—	—
GL37250/ GL37250 -PC	Ignitron	GL 37250	TX	—	—	—	—	—	—	—	—

■Compactron. † Zero signal. ♦Per section. ‡ Plate-to-plate. ♣Maximum. ‡ Supply voltage. ●Subminiature type. ▲Without external shield. ◈Design maximum rating. ⊕Total for all similar sections. ▣Absolute maximum rating. #Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Class A Amplifier	250	100	3.0	6.7	2.7	700,000	1,800	—	—	—	*9003*
Half-Wave Rectifier	Max d-c output current = 5 ma; max rms supply voltage = 117 volts										9004
Half-Wave Rectifier	Max d-c output current = 1.0 ma; max rms supply voltage = 117 volts										9005
Half-Wave Rectifier	Max d-c output current = 5 ma; max peak inverse voltage = 750 volts; rms supply voltage = 270 volts; max peak current = 15 ma										*9006*
Power Osc. 450MHz	150	— I_k = 40mA	0	25 30	—	—	8500	40	—	— 6	GE12661
Osc./Amp. 1200MHz	200 1500 Peak	— — I_k = 1.8a	R_k = 100 ohms —	23 1.5a	— —	— —	25000 —	58 —	— —	— 900w	GE13971
Osc./RF Amp. 450MHz	150 250	— I_k = 21mA	R_k = 82 ohms —	9.5 —	— —	— —	12500 —	90 —	— —	— 2.3	GE14501
C Band Osc. 4300MHz	200 800	— I_k = 1.2a	R_k = 100 ohms —	27 —	— —	— —	29000 —	60 —	— —	— 190w	GE14811
Osc./Amp. 1090MHz	200 1800	— I_k = 2.0A	R_k = 100 ohms —	17 —	— —	— —	22000 —	85 —	— —	— 700w	GE15371
Amplifier	200	—	R_k = 22 ohms	22	—	—	50000	225	—	20w	GE16231
Osc./RF Amp. 450 MHz	150 150	— I_k = 10mA	R_k = 82 ohms —	12.5 —	— —	— —	12500 —	75 —	— —	— 450mW	GE16411
CW Osc./Amp 4300MHz	150 100	— I_k = 18mA	R_k = 82 ohms —	14 —	— —	— —	17000 —	78 —	— —	— 25mW	GE16841
Osc./Amp. 1100MHz Grid Pulsed Plate Pulsed	600 1500	— I_k = 3.0a	5 115	25 1.4a	— —	— —	13500 —	95 —	— —	— 675w	GE17241
Osc./Amp. 1200MHz	200 2500 Peak	R_k = 68 i_k = 6a	34 ohms —	— —	— —	— —	26000 —	58 —	— —	— 3.5	GE17701
Osc./Amp. 1200MHz	200 1500 Peak	— i_k = 1.8a	R_k = 100 ohms —	21 —	— —	— —	22000 —	58 —	— —	— 800w	GE18651
Capacitor Discharge	Max. forward peak anode voltage 25000 volts; max. inverse peak anode voltage 25000 volts; max. peak anode curr. 500 A.; typical discharge rate pulses per minute 500.										GL37207
Capacitor Discharge	Max. forward peak anode voltage 50000 volts; max. inverse peak anode voltage 50000 volts; max. peak anode curr. 25000 A.; typical discharge rate pulses per minute 2.										GL37248
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 1000; corresponding av. anode curr. 43.2 A.; max. av. anode curr. 75 A.; corresponding demand KVA 200.										GL37250 GL37250-PC

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¶ Heater warm-up time controlled.

Tube Type	Classification by Construction	Base Con-nec-tions	Out-line Dwg	Fila-ment Volts	Fila-ment Amp	Max Plate Watts	Max Plate Volts	Max Screen Volts and Watts ✱	Capacitance in Picofarads		
									Input	Out-put	Grid-plate
GL37251/ GL37251 -PC	Ignitron —	GL 37251	TX								
GL37252/ GL37252 -PC	Ignitron —	GL 37252	TX								
GL37253/ GL37253 -PC	Ignitron —	GL 37253	TX								
GL37254/ GL37254 -PC	Ignitron —	GL 37254	TX								
GL37255 GL37255 -PC	Ignitron —	GL 37255	TX								
GL51025	Triode —	GL 51025	TX	6.3	3.8	110 100	8000 2500		Cathode to Plate 0.45; Input 15.5; Output 5.9		
GL51038	Tetrode —	GL 51038	TX	6.3	5.6	500	10000 5000	2000 1100	24	9	—
GL51064	Tetrode —	GL 51064	TX	5.7	24	2750 ▣	8000 ▣	650 ▣	Cathode to Plate .006 max; Input 17.0; Output 6.0		
GL51065	Tetrode —	GL 51065	TX	6.3	3.8	600	5000	1000	Cathode-Plate .006; Input 20; Output 7.5		
GL51070	Tetrode —	GL 51070	TX		3.8	600					
GL51074	Triode —	GL 51074	TX		3.8	110					

■ Compactron. † Zero signal. ♣ Per section.
‡ Plate-to-plate. ♣ Maximum. ⁑ Supply voltage.
● Subminiature type. ▲ Without external shield. ◈ Design maximum rating.
⊕ Total for all similar sections. ▣ Absolute maximum rating. # Conversion transconductance.

● See X-Radiation Warning, page 4.

Service	Plate Volts	Screen Volts	Neg Grid Volts	Plate Milli-amperes	Screen Milli-amperes	R_p, Ohms	G_m, µmhos	µ Factor	Load for Rated Output, Ohms	Power Output, Watts	Tube Type
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 1000; corresponding av. anode curr. 43.2 A.; max. av. anode curr. 75 A.; corresponding demand KVA 200.										GL37251/ GL37251 -PC
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 2000; corresponding av. anode curr. 108 A.; max. av. anode curr. 150 A.; corresponding demand KVA 380.										GL37252/ GL37252 -PC
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 2000; corresponding av. anode curr. 108 A.; max. av. anode curr. 150 A.; corresponding demand KVA 380.										GL37253/ GL37253 -PC
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 3000; corresponding av. anode curr. 224 A.; max. av. anode curr. 400 A.; corresponding demand KVA 1000.										GL37254/ GL37254 PC-
Resistance Welding	Max. supply volts RMS 250-600; max. demand KVA 3000; corresponding av. anode curr. 224 A.; max. av. anode curr. 400 A.; corresponding demand KVA 1000.										GL37255 GL37255 -PC
Oscillator Plate Pulsed	6000	i_k = 11.3a		7a						24000w	GL51025
Grid Pulsed 1100MHz	1950	i_k = 3.8a		2.6a						2000w	
Amplifier Class B	9000	1400	125	9.2A	470					52000	GL51038
Amplifier Class C	4800	1000	200	4.2A	100					11000	
Amplifier/ Oscillator Class C 420 mcs	7500	600	100	650	16					4000	GL51064
Amplifier Class B 420 mcs	7500	600	50	330	5					750	
Amplifier	4500	750	115	5.3A	110					11000	GL51065
										260	GL51070
										40KW	GL51074

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$_1$, $_2$, $_3$, etc. indicate tube sections.
✠Maximum screen dissipation appears immediately below the screen voltage.
¶ Heater warm-up time controlled.

GENERAL ELECTRIC MULTIPLE/BRAND RECEIVING TUBE REPLACEMENT GUIDE

Tube Type to be Replaced	General Electric Multiple/Brand
0Z4 0Z4A	0Z4/0Z4A
1AD2 1AD2A	1BY2A/1AD2A
1B3GT	1G3GTA/1B3GT
1BX2	1X2C/1BX2
1BY2 1BY2A	1BY2A/1AD2A
1G3GT 1G3GTA	1G3GTA/1B3GT
1K3 1K3A	1K3A/1J3
1R-K23	1S2A/DY87
1S2A	1S2A/DY87
1X2 1X2A 1X2B 1X2C	1X2C/1BX2
2AF4 2AF4A 2AF4B	2DZ4/2AF4B
2AH2	2BU2/2AS2A/2AH2
2AS2 2AS2A	2BU2/2AS2A/2AH2
2BU2	2BU2/2AS2/2AH2
2DZ4	2DZ4/2AF4B
2FQ5 2FQ5A	2GK5/2FQ5A
2GK5	2GK5/2FQ5A
3A3 3A3A 3A3B 3A3C	3A3C/3AW3/3B2
3AF4A 3AF4B	3DZ4/3AF4B
3AW3	3A3C/3AW3/3B2
3B2	3A3C/3AW3/3B2
3BC5	3CE5/3BC5
3BS2 3BS2A	3BW2/3BS2A/3BT2A
3BT2 3BT2A	3BW2/3BS2A/3BT2A
3BU8	3BU8/3GS8
3BW2	3BW2/3BS2A/3BT2A
3CB6	3CB6/3CF6
3CE5	3CE5/3BC5
3CF6	3CB6/3CF6
3CX3	3DA3/3CX3
3CY3	3DB3/3CY3
3DA3	3DA3/3CX3
3DB3	3DB3/3CY3
3DZ4	3DZ4/3AF4B
3EH7	3EH7/XF183
3EJ7	3EJ7/XF184
3GS8	3BU8/3GS8
3HA5	3HM5/3HA5
3HM5	3HM5/3HA5
4BL8	4BL8/XCF80
4BQ7A	4BZ7/4BQ7A
4BU8	4BU8/4GS8
4BZ7	4BZ7/4BQ7A
4GS8	4BU8/4GS8
4HA5	4HA5/PC900
4HA7	4HA7/4HC7
4KN8	4KN8/4R-HH8
4R-HH8	4KN8/4R-HH8
5AR4	5AR4/GZ34
5AS4A	5U4GB/5AS4A
5AU4	5V3/5AU4
5BQ7A	5BZ7/5BQ7A
5BR8	5FV8/5BR8
5BZ7	5BZ7/5BQ7A
5FV8	5FV8/5BR8
5HG8	5HG8/LCF86
5KD8	6U8A/6AX8/6KD8/5KD8
5U4GA 5U4GB	5U4GB/5AS4A
5U9	5U9/LCF201
5V3	5V3/5AU4
6AF4A	6DZ4/6AF4A
6AK5	6AK5/EF95
6AL3	6AL3/EY88
6AQ5A	6AQ5A/6HG5
6AQ8	6AQ8/ECC85
6AX8	6U8A/6AX8/6KD8/5KD8
6AY3B	6AY3B/6BS3A
6BA6	6BA6/EF93
6BC5	6CE5/6BC5
6BC8	6BC8/6BZ8
6BE3	6BE3/6BZ3
6BK4 6BK4A 6BK4B 6BK4C	6BK4C/6EL4A
6BL8	6BL8/ECF80
6BM8	6BM8/ECL82
6BN6	6KS6/6BN6
6BQ5	6BQ5/EL84
6BQ6GA	6BQ6GTB/6CU6
6BQ6GTB	6BQ6GTB/6CU6
6BQ7A	6BZ7/6BQ7A
6BR3	6BR3/6R-K19
6BR8 6BR8A	6FV8A/6BR8A
6BS3A	6AY3B/6BS3A
6BZ3	6BE3/6BZ3
6BZ7	6BZ7/6BQ7A
6BZ8	6BC8/6BZ8
6CA7	6CA7/EL34
6CB6 6CB6A	6CB6A/6CF6
6CD3	6CG3/6CE3/6CD3
6CE3	6CG3/6CE3/6CD3
6CE5	6CE5/6BC5
6CF6	6CB6A/6CF6
6CG3	6CG3/6CE3/6CD3
6CG7	6FQ7/6CG7
6CJ3 6CL3	6CJ3/6DW4B/6CL3
6CQ4	6DE4/6CQ4
6CU6	6BQ6GTB/6CU6
6CW5	6CW5/EL86
6DA4A	6DA4A/6DM4A

Tube Type to be Replaced	General Electric Multiple/Brand
6DE4	6DE4/6CQ4
6DG6GT	6W6GT/6DG6GT
6DJ8	6DJ8/ECC88
6DL5	6DL5/EL95
6DM4A	6DA4A/6DM4A
6DQ3A	6DU3/6DQ3A
6DQ6 6DQ6A 6DQ6B	6DQ6B/6GW6
6DT6 6DT6A	6DT6/6DQ6A
6DU3	6DU3/6DQ3A
6DW4B	6CJ3/6DW4B/ 6CL3
6DX8	6DX8/ECL84
6DZ4	6DZ4/6AF4A
6EA7	6EM7/6EA7
6EB8	6GN8/6EB8
6EC4A	6EC4A/EY500
6EH7	6EH7/EF183
6EJ7	6EJ7/EF184
6EL4 6EL4A	6BK4C/6EL4A
6EM7	6EM7/6EA7
6ES8	6ES8/ECC189
6FG6	6FG6/EM84
6FQ5 6FQ5A	6GK5/6FQ5A
6FQ7	6FQ7/6CG7
6FV8A	6FV8A/6BR8A
6GB5	6GB5/EL500
6GJ7	6GJ7/ECF801
6GK5	6GK5/6FQ5A
6GM8	6GM8/ECC86
6GN8	6GN8/6EB8
6GW6	6DQ6B/6GW6
6GW8	6GW8/ECL86
6GX6	6GY6/6GX6
6GY6	6GY6/6GX6
6HA5	6HM5/6HA5
6HA6	6HB6/6HA6
6HB6	6HB6/6HA6
6HE5	6JB5/6HE5
6HG5	6AQ5A/6HG5
6HG8	6HG8/ECF86

Tube Type to be Replaced	General Electric Multiple/Brand
6HM5	6HM5/6HA5
6J10	6Z10/6J10
6JB5	6JB6/6HE5
6JE6 6JE6A 6JE6B 6JE6C	6JE6C/6LQ6
6JW8	6JW8/ECF802
6K11	6K11/6Q11
6KD8	6U8A/6AX8/ 6KD8/5KD8
6KN8	6KN8/6R-HH8
6KS6	6KS6/6BN6
6LC6	6LJ6A/6LH6A
6LH6 6LH6A	6LJ6A/6LH6A
6LJ6A	6LJ6A/6LH6A
6LQ6	6JE6C/6LQ6
6LX8	6LX8/LCF802
6Q11	6K11/6Q11
6R-HH2	6BC8/6BZ8
6R-HH8	6KN8/6R-HH8
6R-K19	6BR3/6R-K19
6U8A	6U8A/6AX8/ 6KD8/5KD8
6V4	6V4/EZ80
6W6GT	6W6GT/6DG6GT
6X9	6X9/ECF200
6Z10	6Z10/6J10
7HG8	7HG8/PCF86
7KY6	7KY6/9KX6
8A8	9A8/8A8/PCF80
8CG7	8FQ7/8CG7
8EB8	8GN8/8EB8
8FQ7	8FQ7/8CG7
8GJ7	8GJ7/PCF801
8GN8	8GN8/8EB8
9A8	9A8/8A8/PCF80
9KX6	7KY6/9KX6
10CW5	10CW5/LL86
10DX8	10DX8/LCL84
10JA8	10LZ8/10JA8
10LZ8	10LZ8/10JA8
11Y9	11Y9/LFL200
12AT7	12AT7/ECC81

Tube Type to be Replaced	General Electric Multiple/Brand
12AU7A	12AU7A/ECC82
12AX7	12AX7/ECC83
12AX7A	12AX7A/7025
12AY3A	12AY3A/12BS3A
12BQ6GA	12BQ6GA/ 12CU6
12BQ6GTB	12BQ6GTB/ 12CU6
12BR3	12BR3/12R-K19
12BS3A	12AY3A/12BS3A
12BV7	12BY7A/12BV7/ 12DQ7
12BY7A	12BY7A/12BV7/ 12DQ7
12C5	12CU5/12C5
12CU5	12CU5/12C5
12CU6	12BQ6GTB/ 12CU6
12DQ6B	12DQ6B/12GW6
12DQ7	12BY7A/12BV7/ 12DQ7
12DZ6	12EK6/12DZ6/ 12EA6
12EA6	12EK6/12DZ6/ 12EA6
12EK6	12EK6/12DZ6/ 12EA6
12G-B7	12BQ6B/12GW6
12GN7A/ 12HG7	12HG7/12GN7
12GW6	12DQ6B/12GW6
12HG7	12HG7/12GN7
12R-K19	12BR3/12R-K19
13EM7	15EA7/13EM7
13FM7	15FM7/13FM7
13GB5	13GB5/XL500
13J10	13Z10/13J10
13Z10	13Z10/13J10
15CW5	15CW5/PL84
15EA7	15EA7/15EM7
15FM7	15FM7/13FM7
16A8	16A8/PCL82
16AQ3	16AQ3/XY88
17AB10	17AB10/17X10
17AY3A	17AY3A/17BS3A
17BE3	17BE3/17BZ3
17BR3	17BR3/17R-K19

Tube Type to be Replaced	General Electric Multiple/Brand
17BS3A	17AY3A/17BS3A
17BZ3	17BE3/17BZ3
17C5	17CU5/17C5
17CU5	17CU5/17C5
17D4	17D4/17DM4A
17DM4A	17D4/17DM4A
17DQ6B	17DQ6B/17GW6
17EW8	17EW8/HCC85
17GW6	17DQ6B/17GW6
17R-K19	17BR3/17R-K19
17X10	17AB10/17X10
18GV8	18GV8/PCL85
19CG3	19DQ3/19CG3
19CL8A	19JN8/19CL8A
19DQ3	19DQ3/19CG3
19JN8	19JN8/19CL8A
20AQ3	20AQ3/LY88
21JS6A	21JS6A/23JS6A
23JS6A	21JS6A/23JS6A
24JE6A	24LQ6/24JE6C
24LQ6	24LQ6/24JE6C
25BQ5GA	25BQ5GA/ 25CU6
25BQ6GTB	25BQ6GTB/ 25CU6
25CU6	25BQ6GTB/ 25CU6
25L6GT	25L6GT/ 25W6GT
25W6GT	25L6GT/ 25W6GT
27GB5	27GB5/PL500
34CE3	34CE3/34CD3
36KD6	36KD6/40KD6
40KD6	36KD6/40KD6
42EC4A	42EC4A/PY500
45B5	45B5/UL84
6883B	6883B/8032A/ 8552
7025	12AX7A/7025
7054	8077/7054
7581A	7581A/KT66
8032A	6883B/8032A/ 8552
8077	8077/7054
8425A	8425A/6AU6A
8426A	8426A/12AU6
8552	6883B/8032A/ 8552
DY87	1S2A/DY87
ECC81	12AT7/ECC81
ECC82	12AU7A/ECC82
ECC83	12AX7/ECC83
ECC85	6AQ8/ECC85
ECC86	6GM8/ECC86
ECC88	6DJ8/ECC88
ECC189	6ES8/ECC189
ECF80	6BL8/ECF80
ECF86	6HG8/ECF86
ECF200	6X9/ECF200
ECF801	6GJ7/ECF801
ECF802	6JW8/ECF802
ECL82	6BM8/ECL82
ECL84	6DX8/ECL84
ECL86	6GW8/ECL86
EF93	6BA6/EF93
EF95	6AK5/EF95
EF183	6EH7/EF183
EF184	6EJ7/EF184
EL34	6CA7/EL34
EL84	6BQ5/EL84
EL86	6CW5/EL86
EL95	6DL5/EL95
EL500	6GB5/EL500
EM84	6FG6/EM84
EY88	6AL3/EY88
EZ80	6V4/EZ80
GZ34	5AR4/GZ34
HCC85	17EW8/HCC85
KT66	7581A/KT66
LCF86	5HG8/LCF86
LCF201	5U9/LCF201
LCL84	10DX8/LCL84
LFL200	11Y9/LFL200
LL86	10CW5/LL86
LY88	20AQ3/LY88
PC900	4HA5/PC900
PCF80	9A8/8A8/PCF80
PCF86	7HG8/PCF86
PCF801	8GJ7/PCF801
PCL82	16A8/PCL82
PL84	15CW5/PL84
PL500	27GB5/PL500
UL84	45B5/UL84
XCF80	4BL8/XCF80
XF183	3EH7/XF183
XF184	3EJ7/XF184
XL500	13GB5/XL500
XY88	16AQ3/XY88

RECEIVING TUBE—INTERCHANGEABILITY GUIDE
FOREIGN TYPES vs. AMERICAN TYPES

In most cases the domestic tube types shown below are satisfactory replacements for the corresponding foreign types however, in some circuits a few of the indicated replacements may be unsatisfactory owing to mechanical or electrical differences (which can be more critical in some circuits than others). The domestic types shown are not necessarily all available at present from domestic sources. Tubes set in bold type are presently available from General Electric.

Foreign Type To Be Replaced	American Type For Replacement
1C1	**1R5**
1C2	1AC6
1C3	1AB6
1D13	1A3
1F1	1AJ4
1F2	1L4
1F3	**1T4**
1FD1	1AH5
1FD9	**1S5**
1G50	**2050A**
1H2	1S2, **1S2A/DY87**
1H33	1AQ5
1H35	1AB6
1P1	3C4
1P10	**3S4**
1P11	**3V4**
1R5SF	1AQ5
1RK23	1S2, **1S2A/DY87**
1S5SF	1AR5
1T4SF	1AM4
1U5SF	1AS5
2B/250A	**807**
2D	**1P40**
2XM600A	**866A**
3D-HH13	3EX7
3M-R24	**3DK6**
3M-V7	**3BZ6**
3S4SF	3W4
4G280K	**2D21**
4R-HH2	**4BC8**
4R-HH8	**4KN8/4R-HH8**
4Y25	**807**
5A/160H	6AM6
5B/250A	**807**
5C/100A	**813**
5M-HH3	**5J6**
5P-29	6CN6
5R-HP1	**4BL8/XCF80**
5S1	**807**
5Z10	**5U4GB/5AS4A**
6/30L2	6GA8
6AT7N	**6DT8**
6B32	**6AL5**
6BC32	**6AV6**
6C10	6CU7
6C12	6AJ8
6C15	6CJ5
6C16	**6BL8/ECF80**
6C18	6GV7
6C31	6K8
6CC10	**5692**
6CC31	**6J6A**
6CC42	**5670, 5670W**
6CC43	**6AQ8/ECC85**
6CF8	**6267**
6CH40	6AJ8
6D1	6DR4
6D2	**6AL5**
6D-HH13	6FX7
6E8	6A8
6F10	**6AC7**
6F11	6AM6
6F12	6AM6
6F15	6CJ5
6F16	6CJ5
6F18	6EC7
6F19	6BY7
6F21	6CQ6
6F22	**6267**
6F23	6EL7, **6EH7/EF183**
6F24	**6EJ7/EF183**
6F25	**6EH7/EF183**
6F26	6BY7
6F29	**6EH7/EF183**
6F30	**6EJ7/EF184**
6F31	**6BA6/EF93**
6F32	**6AK5/EF95**
6F33	**6AS6**
6F35	6AJ5
6F36	**6AH6**
6FD12	6DC8
6FX4	6AV4
6G-B3A	**6BQ6GTB/6CU6**
6G-B6	**6BQ6GTB/6CU6**
6G-B9	**6GW6, 6DQ6B/6GW6**
6G-K17	**6AU4GTA**
6H-31	**6BE6**
6L10	**6AG7**
6L12	**6AQ8/ECC85**
6L13	**12AX7A/7025**
6L16	6CW7
6L31	**6AQ5A/6HG5**
6L34	6AQ4
6L43	**6CL6**
6LD3	6CV7
6LD12	6AK8, **6T8-A**
6LD13	6BD7A
6LP12	**6BM8/ECL82**
6M1	6U5-G
6M2	6CD7
6M-H1	**6J4**
6M-HH3	**6J6A**
6P9	6BM5, **6AQ5A/6HG5**
6P15	**6BQ5/EL84**
6P17	6AM5
6P25	6AG6
6PL12	**6BM8/ECL82**
6Q8	6A8
6R-HH2	6HK8, **6BZ8/6BC8**
6R-HH8	6KN8, **6KN8/6R-HH8**
6R-K19	**6BR3/6R-K19**
6R-R8C	**5847/404A**
6S5G	**6E5**
6T1	6AF4, **6DZ4/6AF4**
6V4	**6CA4**
6Z4	6BX4, **6X4**
6Z31	**6X4**
7D9	6AM5
7D10	6CH6
7D11	6550, **6550A**
7F16	6CJ5
8D3	6AM6
8D5	6BR7
8D6	6BW7
8D7	6BS7
8D8	**6267**
8R-HP1	8B8
9D6	6CQ6
9M-HH3	9J6
9P9	9BM5
9R-AL1	**10DE7**
9R-HH2	**9GH8A**
10C14	19D8, 19AJ8
10F9	12AC5
10F18	13EC7
10FD12	19FL8
10L14	26AQ8
10LD3	14L7
10LD12	28AK8
10LD13	14G6
10P18	**45B5/UL84**
10PL12	50BM8
12B-B14	**13GB5/XL500**
12BC32	**12AV6**
12E13	6550, **6550A**
12F31	**12BA6**
12G-B6	12BQ6GT, **12BQ6GTB/12CU6**
12G-B7	**12DQ6B/12GW6**
12G-K17	12D4A, **12D4**
12H31	**12BE6**
12R-K19	**12BR3/12R-K19**
12R-LL3	**12AV7**
12R-LL5	**12FQ7**
13D2	**6SN7GTB**
13D3	6158
16A	6AM5
17N8	17C8
17R-K19	**17BR3/17R-K19**
18AK5	6028, **408A**
19AJ8	19D8

Foreign Type To Be Replaced	American Type For Replacement	Foreign Type To Be Replaced	American Type For Replacement	Foreign Type To Be Replaced	American Type For Replacement
19BD	19X3	A677	6C6	CV143	**813**
19M-R9	**18FW6A**	A863	**6J7**	CV144	**829B**
19M-R10	18GD6	A1834	**6AS7GA**	CV177	**813**
19SU	19Y3	A2252	**5675**	CV216	**OD3**
19U3	19X3	A2521	6CR4	CV281	6K8
19W3	19X3	A2599	6CT4	CV283	**6AL5**
20A3	**2D21**	A2900	12AT7,	CV303	7G7
20D3	12AH8		**12AT7/ECC81**	CV346	7Y4
20D4	6AJ8	A4051	**807**	CV394	6CD7
25G-B6	**25BQ6GA/25CU6**	A4051J	**807**	CV417	6AQ4
25R-K19	25BR3	AA91E	**5726**	CV424	**5894**
30C1	**9A8/8A8/PCF80**	ABC91	12A6	CV426	6X2
30C15	9EN7	AD	6Z3	CV431	OE3
30C18	**7GV7**	AFX212	**6D4**	CV449	OG3, **5651**
30F5	7ED7	AG	**83**	CV450	6CN6
30FL1	9GB8	AG866A	**866A**	CV452	**6AT6**
30L1	7AN7	AG2509	OG3, **5651**	CV453	**6BE6**
30L15	7EK7	AG5211	**OA2**	CV454	**6BA6/EF93**
30P4	25GF6	AH201	866A	CV455	**12AT7/ECC81**
30P12	12FB5	AH216	**872A/872**	CV466	**6488**
30P16	16A5	ARS25	**807**	CV467	**6487**
30P18	**15CW5/PL84**	ARS25A	**807**	CV469	**6489**
30P19	25GF6	ASG512	**2D21**	CV472	**6391**
30PL1	13GC8	ASG5023	**3C23**	CV475	5899
30PL10	13GC8	ATS25	**807**	CV476	6391
30PL12	**16A8/PCL82**	ATS225A	**807**	CV477	5899
30PL13	16GK8	AX224	**3B28**	CV484	**3S4**
30PL14	16GK8	B36	**12SN7GTA**	CV491	**12AU7A/ECC82**
40SUA	1D5	B63	6A6	CV492	**12AX7A/7025**
52KU	5Z4G, **5V4GA**	B65	**6SN7GTB**	CV493	**6X4**
53AWB	**927**	B139	7AN7	CV500	6T7G
54KU	5AQ4, **5V4GA**	B152	**12AT7/ECC81**	CV503	5W4GT, **5V4GA**
61A3	**930**	B309	**12AT7/ECC81**	CV509	6V6G, **6V6GT**
61DV3	929	B319	7AN7	CV510	**6V6**
62DDT	6CV7	B329	**12AU7/ECC82**	CV511	**6V6GTA**
62TH	6CU7	B339	**12AX7A/7025**	CV512	6W7G
62VP	6CJ5	B349	7EK7	CV515	6Y6G, **6Y6GT**
63TP	6AB8	B719	**6AQ8/ECC85**	CV522	7B7
63T1	**6BA8A**	B729	6GA8	CV523	12Y4
64ME	6CD7	B739	**12AT7/ECC81**	CV525	12A6
64SPT	6BX6,	B749	**12AU7A/ECC82**	CV526	12A6GT
	6EH7/EF183	B759	**12AX7A/7025**	CV529	12AH7GT
65ME	6BR5	BA2	**2050**	CV531	12C8
66KU	6BT4	BF61	6CK5	CV534	12J5
67PT	6CK5	BF451	45A5	CV535	12J5GT
85A1	OE3	BPM04	**6AQ5/6HG5**	CV537	**12SA7**
85A2	OG3, **5651**	BVA264	6AG6G	CV538	12SA7GT, **12SA7**
85A3	5783	BVA265	6AG6G	CV540	12SC7
108C1	**OB2**	C143	**813**	CV543	**12SK7**
121VP	12AC5	C180	**832A**	CV544	12SK7GT, **12SK7**
141DDT	14L7	C610	7J7	CV546	**12SQ7**
141TH	14K7	C866	**866A**	CV547	12SQ7GT, **12SQ7**
150B2	6354	CC81E	12AT7WA, **6201,**	CV549	25A6
150C1	**OA2**		**12AT7WC**	CV550	25A6GT
150C2	**OA2**	CC86E	**6GM8/ECC86**	CV551	25L6G,
150C3	**OD3**	CCa	**6922/E88CC**		**25L6GT/25W6GT**
150C4	**OA2**	CR27	**866A**	CV552	25L6,
163 PEN	16A5	CV26	**813**		**25L6GT/25W6GT**
171DDP	17C8, 17N8	CV32	**866A**	CV553	**25L6GT/25W6GT**
213 PEN	21A6	CV124	**807**	CV555	25Z5
311SU	31A3	CV131	6CQ6	CV561	35L6, **35L6GT**
451PT	45A5	CV133	**6C4**	CV562	**35L6GT**
866AX	**866A**	CV136	6AM5	CV568	**35Z5GT**
3874A	**813**	CV138	6AM6	CV569	**6SL7GT**
A61	17Z3	CV140	**6AL5**	CV571	**50L6GT**

Foreign Type To Be Replaced	American Type For Replacement
CV574	**6X5GT**
CV578	6A8G
CV579	6A8
CV580	6A8GT
CV581	6C5G, **6C5**
CV582	**6C5**
CV583	6C5GT, **6C5**
CV585	6C6
CV586	**6L6GC**
CV587	6Q7G
CV588	6Q7
CV589	6Q7GT
CV590	6SJ7G, **6SJ7**
CV591	**6SJ7**
CV592	6SJ7GT, **6SJ7**
CV593	5AQ4, **5V4GA**
CV594	**6SH7**
CV595	6SH7GT, **6SH7**
CV597	2X2A
CV599	1851
CV603	10
CV604	30
CV606	37
CV608	41
CV609	42
CV610	45
CV611	56
CV612	57
CV613	58
CV614	75
CV615	76
CV616	77
CV617	**80**
CV618	**83**
CV627	**810**
CV628	**811A**
CV642	**872A/872**
CV660	**6AC7**
CV661	6AB7, **6AC7**
CV686	**OC3**
CV694	**12SG7**
CV698	12SJ7GT, **12SJ7**
CV700	12SR7
CV703	12K8
CV705	1D5GP
CV706	6U7G, **6K7**
CV711	32
CV712	38
CV724	**816**
CV728	1P5GT
CV729	**5V4GA**
CV730	6A3
CV731	**6V6GTA**
CV741	6CA7, **EL34/6CA7**
CV747	**6AC7**
CV750	**01A**
CV752	**0A4G**
CV753	**1A3**
CV754	1A4P
CV755	1T5
CV756	1A5
CV757	1A6
CV758	1B4P
CV759	1B5/25S
CV760	1A7GT
CV765	1D7G
CV766	1E5GP
CV767	1F4
CV768	1F5G
CV769	1F6
CV770	1F7
CV771	1G5
CV772	1G6
CV773	1G6GT
CV774	1H4
CV775	1LA6
CV776	1LB4
CV777	1LC5
CV778	1LC6
CV779	1LD5
CV780	1LH4
CV781	1LN5
CV782	**1R5**
CV783	1S4
CV784	**1S5**
CV785	**1T4**
CV786	1T5
CV787	2A7
CV797	**2D21**
CV807	3A4
CV808	3A5
CV815	3D6/1299
CV818	3Q4
CV819	3Q5
CV820	**3S4**
CV833	89
CV837	12C8
CV844	6AC5G
CV845	6AC5GT
CV846	**6AC7**
CV847	6AF6G
CV848	**6AG5**
CV849	**6AC7**
CV850	**6AK5/EF95**
CV851	6B4
CV852	**6C4**
CV854	6C7
CV856	6G8G
CV858	**6J6A**
CV859	6J8G
CV860	6K5
CV861	6K5GT
CV862	6L5G
CV864	6P5G
CV865	6SD7GT
CV866	**6SJ7Y**
CV867	6SR7
CV870	6V7G
CV872	6Z7G
CV873	6ZY5
CV876	7A6
CV877	7A7
CV878	7A8
CV779	7B4
CV880	7B5
CV881	7B5
CV882	7B6
CV883	7B8
CV885	**7C5**
CV886	7C5LT, **7C5**
CV887	7C6
CV888	7D7
CV889	7D8
CV890	7E5
CV891	7E6
CV892	7E7
CV893	**7F7**
CV894	7G7
CV895	7H7
CV896	7K7
CV897	7J7
CV898	**7N7**
CV899	7Q7
CV900	7R7
CV901	7Z4
CV902	7W7
CV908	12A5
CV909	12A7
CV910	12A8GT
CV911	12B8GT
CV916	**12H6**
CV917	12J7GT
CV918	12K7GT
CV919	12SF5
CV920	12SF5GT, 12SF5
CV921	12SF7
CV922	12SH7
CV923	12SJ7GT, **12SJ7**
CV924	12SL7, **12SL7GT**
CV925	**12SN7GTA**
CV930	14F7
CV931	15
CV936	24A
CV937	25A7
CV938	25AC5
CV939	25B6, **5824**
CV940	25B8
CV942	25Y5
CV943	26
CV944	**27**
CV945	28D7
CV946	28D7GT
CV947	31
CV948	32L7
CV949	33
CV951	32A
CV953	32G
CV966	6ED8
CV995	6AJ5
CV1060	**807**
CV1067	**6J5**
CV1074	**6J5**
CV1075	**6L6GC**
CV1100	6S7
CV1195	**6K7**
CV1280	6L7
CV1285	**6N7**
CV1286	**6L6**
CV1287	**25L6GT/25W6GT**
CV1301	**6H6**
CV1347	6E8
CV1352	6BR5
CV1364	**807**
CV1375	6BY7

Foreign Type To Be Replaced	American Type For Replacement
CV1376	6BX6, **6EH7/EF183**
CV1377	**5AR4/GZ34**
CV1449	**872A/872**
CV1535	**6V4/EZ80**
CV1572	**807**
CV1633	**3V4**
CV1741	6CA7, **EL34/6CA7**
CV1751	34
CV1752	35/51
CV1753	35A5
CV1758	1L4
CV1762	**6AK6**
CV1763	**6J4**
CV1769	2A6
CV1770	7A4
CV1771	39/44
CV1772	47
CV1773	82
CV1774	112A
CV1775	36
CV1776	6D7
CV1777	**7C7**
CV1784	6AK7, **6AG7**
CV1800	1A7G, 1A7GT
CV1802	1A7GT
CV1803	1C5G
CV1805	1C5GT
CV1806	1D5GT
CV1811	1D8GT
CV1812	1E7
CV1815	6Q5G
CV1817	1G4
CV1818	1H5G
CV1819	6P5GT
CV1820	1H5GT
CV1821	1N5
CV1823	1N5GT
CV1824	1Q5G
CV1826	1Q5GT
CV1829	1T5GT
CV1831	2A3
CV1832	**OA2**
CV1833	**OB2**
CV1834	2A5
CV1837	2B7
CV1838	5895
CV1852	**OA2**
CV1854	5Y3G, **5Y3GT**
CV1856	**5Y3GT**
CV1862	**6AQ5A/6HG5**
CV1865	6R4
CV1867	6A6
CV1870	6A7
CV1873	6AB7, **6AC7**
CV1878	6AD7
CV1882	**6AG7**
CV1885	6B5
CV1886	6Q4
CV1887	6B6G
CV1888	6R4
CV1891	6B7
CV1893	6B8G
CV1894	6B8
CV1896	6C8
CV1900	6D6
CV1901	6AM6
CV1902	6D8
CV1908	6F5G, **6F5**
CV1909	**6F5**
CV1910	6F5GT, **6F5**
CV1911	6F6G, **6F6**
CV1912	**6F6**
CV1915	6F7
CV1917	6F8G
CV1918	6F8
CV1924	5866
CV1926	6G6
CV1928	**12BA6**
CV1929	6H6G, **6H6**
CV1930	**6H6**
CV1931	6H6GT, **6H6**
CV1932	6J5G, **6J5**
CV1933	**6J5**
CV1934	6J5GT, **6J5**
CV1935	6J7G, **6J7**
CV1936	**6J7**
CV1937	6J7GT, **6J7**
CV1938	6K6G, **6K6GT**
CV1940	**6K6GT**
CV1941	6K7G, **6K7**
CV1942	**6K7**
CV1943	6K7GT, **6K7**
CV1944	6K8G
CV1945	6K8
CV1946	6K8GT
CV1947	6L6G, **6L6GC**
CV1948	**6L6**
CV1949	**6D4**
CV1950	6L7G
CV1951	6L7
CV1953	6N6G
CV1954	6N6
CV1956	6N7G, **6N7**
CV1957	**6N7**
CV1958	6N7GT, **6N7**
CV1959	**50C5**
CV1960	6R6G
CV1961	**12AU6**
CV1962	6R7G
CV1963	6R7
CV1964	6R7GT
CV1966	**6SA7**
CV1967	6SA7GT, **6SA7**
CV1969	**6SC7**
CV1970	6SC7GT, **6SC7**
CV1971	**1T4**
CV1972	**6SF5**
CV1973	6SF5GT, **6SF5**
CV1974	6S7G
CV1975	6S7
CV1977	45A5
CV1978	**6SG7**
CV1981	**6SK7**
CV1982	6SK7GT, **6SK7**
CV1984	6SL7, **6SL7GT**
CV1985	**6SL7GT**
CV1986	6SN7, **6SN7GTB**
CV1988	6SN7GT, **6SN7GTB**
CV1990	**6SQ7**
CV1991	6SQ7GT, **6SQ7**
CV1992	**OA4G**
CV1993	6SS7
CV1995	6ST7G
CV1996	6ST7
CV2004	**6AL5**
CV2005	**6AL5**
CV2007	**12AU7A/ECC82**
CV2009	6AQ4
CV2010	**6J6A**
CV2011	**12AU7A/ECC82**
CV2012	0G3, **5651**
CV2013	6CH6
CV2014	**5763**
CV2016	**12AT7/ECC81**
CV2020	**6AK5/EF95**
CV2021	**6X4**
CV2022	6BW6
CV2023	6CQ6
CV2024	**6BE6**
CV2026	**6BA6/EF93**
CV2105	**6973**
CV2127	6CH6
CV2128	6AJ8
CV2129	**5763**
CV2130	6155
CV2131	6156
CV2135	6BR7
CV2136	6BW6
CV2137	6ED6
CV2180	19H4
CV2195	6AM6
CV2210	**5544**
CV2215	5545A
CV2225	6374
CV2235	6374
CV2237	**1AD4**
CV2238	5672
CV2239	5676
CV2240	3B4
CV2241	**5642**
CV2253	6574
CV2254	5678
CV2275	6375
CV2300	3A4
CV2361	3C4
CV2370	**3S4**
CV2382	6CH7
CV2390	3A4
CV2432	6205
CV2434	6779
CV2466	6939
CV2492	**6DJ8/ECC88**
CV2500	35Z4GT
CV2501	40
CV2507	**1U4**
CV2514	43
CV2520	6279
CV2522	**6AS6**
CV2523	6AS7G, **6AS7GA**
CV2524	**6AU6A**
CV2526	**6AV6**
CV2527	**6BA7**
CV2530	45Z5

Foreign Type To Be Replaced	American Type For Replacement
CV2531	46
CV2532	49
CV2533	50
CV2534	**50L6GT**
CV2535	53
CV2536	53A
CV2537	55
CV2538	59
CV2541	71A
CV2542	72
CV2543	73
CV2544	78
CV2545	79
CV2546	81
CV2547	83V
CV2548	84
CV2549	85
CV2556	117L7/M7GT
CV2557	117N7GT
CV2558	117Z6GT
CV2565	**2050**
CV2573	**5651**
CV2575	**5670, 5670W**
CV2578	**5687, 5687WA, 5687WB**
CV2638	**393A**
CV2642	417A, **5842/417A**
CV2658	806
CV2660	809
CV2661	**812A**
CV2662	5639
CV2663	815
CV2666	**829B**
CV2669	849
CV2671	851
CV2680	868
CV2683	878A
CV2685	**880**
CV2692	918
CV2693	929
CV2694	**930**
CV2695	931, **931A**
CV2696	**931A**
CV2697	935
CV2698	**5896**
CV2700	957
CV2701	958A
CV2704	7E5
CV2706	7C4
CV2707	1231
CV2709	1R4
CV2710	3D6
CV2714	1614, **6L6**
CV2715	1630
CV2716	**6SC7**
CV2721	6CJ6
CV2726	6CK6
CV2729	6084
CV2742	1L4
CV2748	5Z4GT, **5V4GA**
CV2769	9006
CV2795	1L4
CV2797	**5894**
CV2798	**6360**
CV2799	6252
CV2810	6ED6B
CV2842	6C4W, **6C4WA**, 6100
CV2844	6X4W, **6202**
CV2854	**6AN5**
CV2876	**5727**
CV2877	**5654, 5654W**
CV2882	**5726**
CV2883	**6005, 6005W**
CV2884	**5725, 5725W**
CV2901	**6267**
CV2903	6073
CV2940	6CM5
CV2967	**8020**
CV2975	**6BQ5/EL84**
CV2980	1M3
CV2983	**3V4**
CV2984	**6080**
CV3508	**12AT7WA, 6201, 12AT7WC**
CV3512	5696, **5696A**
CV3521	5949/1907
CV3522	6079
CV3523	**6146B**
CV3526	6BN5
CV3789	417A, **5842/417A**
CV3798	**OA3**
CV3799	**OB3**
CV3882	6CV7
CV3883	6CT7
CV3886	6CJ5
CV3888	6CU7
CV3889	6CK5
CV3891	6BT4
CV3905	5847
CV3908	**6BH6**
CV3912	**1U5**
CV3928	5636
CV3929	**5840**
CV3930	**5718**
CV3933	5783
CV3938	5636
CV3939	6BM6A
CV3960	5783WA
CV3986	**6021**
CV3987	5644
CV3990	**2E26**
CV3995	**6CB6A/6CF6**
CV3998	**6688**
CV4003	**6189, 6189W**
CV4004	**12AX7A/7025**
CV4007	**5726**
CV4008	5719
CV4009	**5749, 5749W**
CV4010	**5654, 5654W**
CV4011	**5725, 5725W**
CV4012	**6BE6**
CV4014	6084
CV4015	6065
CV4016	**6189, 6189W**
CV4017	**5751**
CV4018	**5727**
CV4019	**6005, 6005W**
CV4020	OA2WA
CV4022	**6135**
CV4023	6AU6WA, **6136, 6AU6WC**
CV4024	**6201, 12AT7WC**
CV4025	**5726**
CV4026	6R4WGA
CV4028	OB2WA
CV4029	**5902**
CV4031	6101, **6J6WA**
CV4039	**5763**
CV4044	6443
CV4058	6100, **6C4WA**
CV4066	5783WA
CV4100	OA2WA
CV4101	OB2WA
CV4108	7308
CV5008	**6080**
CV5021	**6V3A**
CV5032	1X2A, **1X2C/1BX2**
CV5034	**6FG6/EM84**
CV5036	6AF4, **6DZ4/6AF4A**
CV5037	**6BA6W, 5749**
CV5040	**6BQ6GTB/6CU6**
CV5042	**12BH7A**
CV5055	6DA5
CV5065	**6U8A/6AX8/6KD8/5KD8**
CV5071	**6CA4**
CV5072	**6CA4**
CV5074	6AN4
CV5077	21A6
CV5079	5643
CV5094	**6CW5/EL86**
CV5122	**5823**
CV5126	6AJ4
CV5140	6923
CV5156	6DA6
CV5172	1AC6
CV5181	5R4GY, **5R4GYB**
CV5186	5681
CV5188	**5651**
CV5189	**5726**
CV5190	**6005, 6005W**
CV5192	7AN7
CV5212	12AT7WB, **6201, 12AT7WC**
CV5214	5920
CV5215	**6BL8/ECF80**
CV5216	**5654, 5654W**
CV5220	6550, **6550A**
CV5231	7308
CV5242	6CT4
CV5268	7384
CV5281	6CW7
CV5311	**6J4WA**
CV5331	**6ES8/ECC189**
CV5354	7308
CV5358	**6DJ8/ECC88**
CV5365	**6BQ7A/6BZ7**
CV5397	8108
CV5404	**6463**
CV5427	1X2B, **1X2C/1BX2**
CV5434	**6FG6/EM84**

Foreign Type To Be Replaced	American Type For Replacement
CV5724	6218
CV5817	6BW7, **6EH7/EF183**
CV5831	**6EH7/EF183**
CV5843	**5965A**
CV5893	**5654, 5654W**
CV5894	**5670, 5670W**
CV5895	**5750**
CV5896	**6136, 6AU6WC**
CV5905	6R3
CV5948	18D3
CV5986	**6112**
CV5989	6085
CV7047	OA5
CV8017	6CQ6
CV8020	6AM6
CV8038	6CN6
CV8039	**5840**
CV8041	6489
CV8045	6CH6
CV8047	6BR7
CV8048	6BW6
CV8065	6922
CV8068	**6267**
CV8069	**6BQ5/EL84**
CV8070	6059
CV8071	6CQ6
CV8073	6072, **6072A**
CV8076	6132
CV8080	6158
CV8086	OA5
CV8154	**12AT7/ECC81**
CV8155	**12AU7A/ECC82**
CV8156	**12AX7A/7025**
CV8158	**2D21**
CV8159	**6AK5/EF95**
CV8160	**6J6A**
CV8161	**OA2**
CV8162	**OB2**
CV8189	5R4GY, **5R4GYA**
CV8190	**6AH6**
CV8191	**6CL6**
CV8192	**6J4**
CV8200	**6AL5**
CV8201	**6BE6**
CV8202	**6BA6**
CV8203	**6X4**
CV8204	**5R4GYA**
CV8205	**6D4**
CV8206	**5763**
CV8208	**6AH6**
CV8209	**6AS6**
CV8210	**6AU6A**
CV8211	**6AN5**
CV8214	**8020**
CV8215	5656
CV8216	**6080**
CV8218	6146, **6146B**
CV8221	**12AU7A/ECC82**
CV8222	**12AX7A/7025**
CV8223	**6X4**
CV8224	**5726**
CV8225	**6AK5/EF95**
CV8226	**6AS6**
CV8227	**5750**
CV8229	**6AQ5/6HG5**
CV8231	**6J6A**
CV8232	**6080**
CV8237	**6X4**
CV8239	5783
CV8246	**5654, 5654W**
CV8247	**5670, 5670W**
CV8248	**5750**
CV8249	**6136, 6AU6WC**
CV8280	**6AX5GT**
CV8287	**5686**
CV8297	**6GW8/ECL86**
CV8310	**5725, 5725W**
CV8311	**5726**
CV8312	**5751**
CV8324	**5744WB**
CV8403	6AU6WB, **6136, 6AU6WC**
CV8430	**6BK4B**
CV8431	7062
CV8433	**9A8/8A8/PCF80**
CV8450	OA5
CV8458	6DL5
CV8469	7554
CV8470	7587
D1C	957
D2C	958A
D2M9	**6AL5**
D3F	959
D63	**6H6**
D77	**6AL5**
D152	**6AL5**
D717	**6AL5**
DA90	1A3
DAC21	**1S5**
DAC32	1H5GT
DAF90	1A3
DAF91	**1S5**
DAF92	**1U5**
DAF96	1AH5
DAF97	1AN5
DC70	6375
DC80	1E3
DCC90	3A5
DCF60	1V6
DCG4/1000G	**866A**
DD6	**6AL5**
DD7	6AM5
DD77	**5726**
DDR7	6AM5
DET17	**810**
DF26	**1S5**
DF33	1N5GT
DF60	5678
DF62	**1AD4**
DF67	5911, 6008
DF91	**1T4**
DF92	1L4
DF96	1AJ4
DF97	1AN5
DF650	6419
DF652	**1AD4**
DF668	**1AD4**
DF904	**1U4**
DH63	6Q7
DH74	12Q7GT
DH76	12Q7GT
DH77	**6AT6**
DH81	7B6
DH118	14L7
DH119	14G6
DH142	14L7
DH149	7C6
DH150	6CV7
DH718	6CV7
DH719	**6T8A**
DH817	6CV7
DK32	1A7GT
DK91	**1R5**
DK92	1AC6
DK96	1AB6
DK97	1AB6
DL29	3D6/1299
DL31	1A5GT
DL33	3Q5GT
DL35	1C5GT
DL36	1Q5GT
DL37	**6L6GC**
DL67	6007
DL70	6373
DL82	7B6
DL91	1S4
DL92	**3S4**
DL93	3A4
DL94	**3V4**
DL95	**3Q4**
DL96	3C4
DL98	3B4
DL620	5672
DM70	1M3
DM71	1N3
DM160	6977
DP61	**6AK5/EF95**
DY30	1B3GT, **1G3GTA/1B3GT**
DY51	**1BG2**
DY70	**5642**
DY80	1X2A, **1X2C/1BX2**
DY86	1S2, **1S2A/DY87**
DY87	**1S2A/DY87**
DY802	1BQ2
E1F	954
E2F	956
E55L	8233
E80CC	6085
E80CF	7643
E80F	6084
E80L	6227
E80T	6218
E81CC	**6201, 12AT7WC**
E81L	6686
E82CC	**6189, 6189W**
E83CC	**6681**
E83F	6689
E84L	7320
E88C	6DL4, 8255
E88CC	**6922/E88CC**
E89F	6DG7
E90C	5920

Foreign Type To Be Replaced	American Type For Replacement
E90CC	5920
E90F	7693, **6661**
E90Z	**6X4**
E91AA	**5726**
E91H	6687
E91N	**5727**
E95F	**5654, 5654W**
E99F	**6662**
E108K	**OB2**
E130L	7534
E180CC	7062
E180F	**6688**
E180L	7534
E182CC	7119, **7044**
E182F	**5847/404A**
E186F	7737
E188CC	7308
E280F	7722
E288C	8223
E810F	7788
E902	**6X4**
E1485	3A4
E2016	6CQ6
E2157	**12AT7/ECC81**
E2163	**12AU7A/ECC82**
E2164	**12AX7A/7025**
EA41	6CT7
EA50	2B35
EA52	6923
EA76	6489
EAA91	**6AL5**
EAA901	**5726**
EAA901S	**5726**
EABC80	6AK8, **6T8-A**
EAF42	6CT7
EAM86	6GX8
EB91	**6AL5**
EBC3	6BD7A
EBC41	6CV7
EBC80	6BD7
EBC81	6BD7A
EBC90	**6AT6**
EBC91	**6AV6**
EBF41	6CJ5
EBF80	6N8
EBF81	6AD8
EBF83	6DR8
EBF85	6DC8
EBF89	6DC8
EC22	6R4
EC51	5861
EC55	5861
EC56	8108
EC57	8108
EC70	6778, **5718**
EC71	**5718**
EC80	6Q4
EC81	6R4
EC84	6AJ4
EC86	6CM4
EC88	6DL4, 8255
EC90	**6C4**
EC91	6AQ4
EC92	**6AB4**
EC93	6BS4
EC94	6AF4, **6DZ4/6AF4A**
EC95	**6ER5**
EC97	**6FY5**
EC157	8108
EC158	8436
EC900	**6HA5/6HM5**
EC903	6BS4
EC1000	8254
ECC32	**6SN7GTB**
ECC70	**6021, 12AT7WC**
ECC81	**12AT7/ECC81**
ECC82	**12AU7A/ECC82**
ECC83	**12AX7A/7025**
ECC84	6CW7
ECC85	**6AQ8/ECC85**
ECC86	**6GM8/ECC86**
ECC88	**6DJ8/ECC88**
ECC89	6FC7
ECC91	**6J6A**
ECC180	**6BQ7A/6BZ7**
ECC186	**12AU7A/ECC82**
ECC189	**6ES8/ECC189**
ECC230	**6080**
ECC801	12AT7WA, **6201, 12AT7WC**
ECC801S	12AT7WA, **6201, 12AT7WC**
ECC802	**6189, 6189W**
ECC802S	**6189, 6189W**
ECC803	**12AX7A/7025**
ECC 803S	**12AX7A/7025**
ECC804	6GA8
ECC808	6KX8
ECC813	**6463**
ECC863	12DT7, **12AX7A/7025**
ECC900	6HA5, **6HM5/6HA5**
ECC960	5920
ECF80	**6BL8/ECF80**
ECF82	**6U8A/6AX8/6KD8/5KD8**
ECF86	**6HG8/ECF86**
ECF200	**6X9/ECF200**
ECF201	**6U9**
ECF202	6AJ9
ECF801	**6GJ7/ECF801**
ECF802	**6JW8/ECF802**
ECF805	6GV7
ECH42	6CU7
ECH80	6AN7
ECH81	6AJ8
ECH82	6E8
ECH83	6DS8
ECH84	6JX8
ECH113	6CU7
ECH200	6V9
ECL80	6AB8
ECL82	**6BM8/ECL82**
ECL84	**6DX8/ECL84**
ECL85	6GV8
ECL86	**6GW8/ECL86**
ECL821	6CH6
ECLL800	6KH8
ED2	**6AL5**
ED500	6ED4
EF2	6DA6
EF5	6DA6
EF13	6DA6
EF22	7G7
EF36	6J7GT, **6J7**
EF41	6CJ5
EF70	6487
EF71	5899
EF72	**5840**
EF73	6488
EF74	6391
EF80	6BX6, **6EH7/EF183**
EF81	6BH5
EF82	6CH6
EF83	6BK8
EF85	6BY7, **6EH7/EF183**
EF86	6CF8, **6267**
EF87	6CF8, **6267**
EF89	6DA6
EF89F	6DG7
EF91	6AM6
EF92	6CQ6
EF93	**6BA6/EF93**
EF94	**6AU6A**
EF95	**6AK5/EF95**
EF96	**6AG5**
EF97	6ES6
EF98	6ET6
EF183	**6EH7/EF183**
EF184	**6EJ7/EF184**
EF190	**6CB6A/6CF6**
EF730	5636
EF731	5899
EF732	5840
EF734	6205
EF811	**6EH7/EF183**
EF812	6EL7, **6EH7/EF183**
EF861	**6688**
EF905	**5654, 5654W**
EFL200	**6Y9**
EH90	**6CS6**
EK90	**6BE6**
EL33	6AG6
EL34	6CA7, **EL34/6CA7**
EL36	6CM5
EL37	**6L6GC**
EL38	6CN6
EL41	6CK5
EL71	**5902**
EL80	6M5
EL81	6CJ6
EL82	6DY5
EL83	6CK6
EL84	**6BQ5/EL84**
EL85	6BN5
EL86	**6CW5/EL86**
EL90	**6AQ5A/6HG5**
EL91	6AM5
EL95	6DL5

Foreign Type To Be Replaced	American Type For Replacement
EL136	6FV5
EL180	**12BY7A/12BV7/ 12DQ7**
EL300	6FN5
EL500	**6GB5/EL500**
EL503	8278
EL504	6GB5A, **6GB5/EL500**
EL505	6KG6, **6KG6A**
EL508	6KW6
EL509	**6KG6A**
EL802	6LD6
EL821	6CH6
EL822	6CH6
EL861	6686
ELF86	**6HG8/ECF86**
ELL80	6HU8
EM34	6CD7
EM35	6U5
EM80	6BR5
EM81	6DA5/EM81
EM84	**6FG6/EM84**
EM85	6DG7
EM87	6HU6
EM840	**6FG6/EM84**
EN32	**2050**
EN91	**2D21**
EN92	**5696A**
EN93	**6D4**
EQ80	6BE7
ESU866	**866A**
EY51	6X2
EY80	6U3
EY81	6R3
EY81F	**6V3A**
EY82	6N3
EY84	6374
EY86	6S2
EY87	6S2A
EY88	**6AL3/EY88**
EY500	**6EC4A/EY500**
EZ3	**6V4/EZ80**
EZ4	**6CA4**
EZ11	**6V4/EZ80**
EZ22	7Y4
EZ35	**6X5GT**
EZ40	6BT4
EZ80	**6V4/EZ80**
EZ81	**6CA4**
EZ90	**6X4**
EZ91	6AV4
EZ900	**6X4**
FA6	5677
F1EL	8278
G75/2D	**OA3**
G77	6C6
G105/1D	**OC3**
G150/3D	**OD3**
G150/4K	**OA2**
GU12	**866A**
GY501	3BH2
GZ30	5Z4G, **5V4GA**
GZ31	**5U4GB/5AS4A**
GZ32	**5V4GA**
GZ34	**5AR4/GZ34**

Foreign Type To Be Replaced	American Type For Replacement
H2-10	2X2A
H52	**5U4GB/5AS4A**
H63	6F5GT, **6F5**
HAA91	**12AL5**
HBC80	**19T8A**
HBC90	**12AT6**
HBC91	**12AV6**
HCC85	**17EW8/HCC85**
HCH81	12AJ7
HD14	1H5GT
HD30	3B4
HD51	**OA2**
HD52	**OB2**
HD93	1X2B, **1X2C/1BX2**
HD94	**6BQ6GTB/6CU6**
HD96	**25BQ6GTB/ 25CU6**
HF61	6CJ5
HF93	**12BA6**
HF94	**12AU6**
HF121	12AC5
HK90	**12BE6**
HL86	30CW5
HL90	19AQ5
HL92	**50C5**
HL94	30A5
HM04	**6BE6**
HP6	6AM6
HY51B	**829B**
HY61	**807**
HY90	**35W4**
HY145	**1U4**
HZ50	14Z3
HZ90	**12X4**
KD21	**OA3**
KD24	**OC3**
KD25	**OD3**
KF35	1E3
KK32	1C7
KT32	**25L6GT/25W6GT**
KT33	25A6
KT61	6AG6G
KT63	6F6GT, **6F6**
KT66	**7581A/KT66**
KT71	**50L6GT**
KT77	**6CA7/EL34**
KT88	6550, **6550A**
KTW63	**6J7**
KTZ63	6K7GT, **6K7**
KTZ63M	6J7GT, **6J7**
KY50	2L2
KY80	2J2
L63	**6C5**
L63B	**6C5**
L77	**6C4**
LC97	3FY5, **3ER5**
LC900	3HA5, **3HM5/3HA5**
LCC189	**5ES8**
LCF80	**6LN8**
LCF86	**5HG8**
LCF200	**5X9**
LCF201	**5U9/LCF201**
LCF801	**5GJ7**

Foreign Type To Be Replaced	American Type For Replacement
LCF802	**6LX8/LCF802**
LCH200	5V9
LCL82	**11BM8**
LCL84	**10DX8/LCL84**
LCL85	**10GV8**
LF183	**4EH7**
LF184	**4EJ7**
LFL200	**11Y9/LFL200**
LL86	**10CW5/LL86**
LL500	**18GB5**
LL505	27KG6
LL521	**21KQ6**
LN119	50BM8
LN152	6AB8
LN309	**16A8/PCL82**
LN319	13GC8
LY81	**11R3**
LY88	**20AQ3/LY88**
LY500	28EC4
LZ319	8A8, **9A8/8A8/PCF80**
LZ329	**9A8/8A8/PCF80**
LZ339	9EN7
M8063	6AM6
M8079	**5726**
M8081	6101/6J6WA
M8096	**5763**
M8100	**5654, 5654W**
M8121	**5840**
M8136	**6189, 6189W**
M8137	**12AX7A/7025**
M8161	6065
M8162	12AT7WA, **6201, 12AT7WC**
M8190	5783WA
M8196	**5725, 5725W**
M8204	**5727**
M8212	**5726**
M8223	OA2WA
M8224	OB2WA
M8232	8532/6J4WA, **6J4WA**
M8245	**6005, 6005W**
MU14	6BT4
MV6-5	6SA7GT, **6SA7**
N2ED	6HT5
N14	1C5GT
N15	3Q5GT
N16	3Q5GT
N17	**3S4**
N18	3Q4
N19	**3V4**
N22LL	19FK6
N25	3C4
N30EL	**6LF6**
N47	6AM5
N63	**6K6GT**
N66	6L6GT, **6L6GC**
N77	6AM5
N78	6BJ5
N119	**45B5/UL84**
N142	45A5
N144	6AM5
N147	6AG6G
N148	**7C5**

Foreign Type To Be Replaced	American Type For Replacement
N150	6CK5
N152	21A6
N153	15A6
N154	16A5
N155	6BN5
N308	25E5
N309	15A6
N329	16A5
N359	21A6
N369	**16A8**/**PCL82**
N378	**15CW5**/**PL84**
N379	**15CW5**/**PL84**
N389	25GF6
N709	**6BQ5**/**EL84**
N727	**6AQ5A**/**6HG5**
OBC3	**12SQ7**
OF1	6S7
OF5	12K7GT
OH4	12A8
OM6	**6K7**
OSW2190	**6AC7**
OSW2192	**6AG7**
OSW2600	**6AC7**
OSW2601	**6AG7**
OSW3104	**6SA7**
OSW3105	**6SQ7**
OSW3107	5CG4, **5V4GA**
OSW3109	**6H6**
OSW3110	**6E5**
OSW3111	**6SK7**
OSW3112	**6J5**
P17A	**807**
PA5021	**866A**
PABC80	9AK8
PC86	4CM4
PC88	4DL4
PC92	3AB4
PC93	4BS4
PC95	**4GK5**
PC97	4FY5
PC900	**4HA5**/**PC900**
PCC84	7AN7
PCC85	9AQ8
PCC88	7DJ8
PCC89	7FC7
PCC186	**7AU7**
PCC189	7ES8
PCC805	7EK7
PCE800	9GB8
PCF80	**9A8**/**8A8**/**PCF80**
PCF82	9U8A, **9GH8A**
PCF86	**7HG8**/**PCF86**
PCF200	8X9
PCF201	8U9
PCF800	9EN7
PCF801	**8GJ7**/**PCF801**
PCF802	**9JW8**
PCF805	**7GV7**
PCF806	**8GJ7**/**PCF801**
PCH200	9V9
PCL82	**16A8**/**PCL82**
PCL84	**15DQ8**
PCL85	**18GV8**/**PCL85**
PCL86	14GW8
PCL88	16GK8
PCL800	16GK8
PCL801	13GC8
PD500	9ED4
PF9	**6K7**
PF86	4HR8
PF818	7ED7
PFL200	16Y9
PH4	6A8GT
PL21	**2D21**
PL36	25E5
PL81	21A6
PL82	16A5
PL83	15A6
PL84	**15CW5**/**PL84**
PL86	14GW8
PL136	35FV5
PL300	35FN5
PL302	25GF6
PL500	**27GB5**/**PL500**
PL505	**40KG6A**
PL508	17KW6
PL509	**40GK6A**
PL521	**29KQ6**
PL800	16KG8
PL801	12FB5
PL802	16LD8
PL820	21A6
PL1267	OA4G
PLL80	12HU8
PM04	**6BA6**/**EF93**
PM05	**6AK5**/**EF95**
PM07	6AM6
PM84	9FG6
PM95	**6AK6**
PY80	19X3
PY81	17Z3
PY82	19Y3
PY83	17Z3
PY88	30AE3
PY301	19CS4
PY500	**42EC4A**
PY800	17Z3
PY801	17Z3
QA2400	6065
QA2401	**6135**
QA2404	**5726**
QA2406	12AT7WB, **6201**, **12AT7WC**
QA2407	**6201**, **12AT7WC**
QA2408	**5692**
QB2/250	**813**
QB3-5/750	6156
QB5/1750	6079
QB65	**6SN7GTA**
QB309	**12AT7**
QE03/10	**5763**
QE05-40	**6146B**
QE05-40H	6159
QE06/50	**807**
QF408	**1AD4**
QL77	**6C4**
QM328	**5686**
QM556	6X4W, **6202**
QM557	**5654**, **5654W**
QM558	**5725**, **5725W**
QM559	**5726**
QQC04/14	5895
QQE02/5	**6939**
QQE03/12	**6360**
QQE03/20	6252
QQE06/40	**5894**
QQV02-6	**6939**
QQV03-10	**6360**
QQV03-20	6252
QQV07/40	**829B**
QS83/3	**5651**
QS150/40	**OD3**
QS1205	**OA3**
QS1206	**OC3**
QS1207	**OA2**
QS1208	**OB2**
QS1209	5651A, **5651**
QS1210	OA2WA
QS1211	OB2WA
QS2404	**5726**
QS2406	12AT7WA, **6201**, **12AT7WC**
QV03-12	**5763**
QV05/25	**807**
QV06-20	**6146B**
QV06-20B	**6883**
QV06-20C	6159
QW77	6CQ6
QY2-100	**813**
QY2/250	**813**
QZ77	6AM6
R3	1W4
R12	6X2
R12A	6X2
R16	1T2
R19	1X2A, **1X2C**/**1BX2**
R20	2J2
R52	5Z4, **5V4GA**
R144	6AM6
RG3-250A/866	**866A**
RK39	**807**
RL21	**2D21**
RL1267	OA4G
RS2	5Z4, **5V4GA**
RS1029	**6360**
S6F12	6AM6
S856	**OA2**
S860	**OB2**
S901C	**5651**
SM150-30	**OA2**
SP6	6AM6
SR2	OG3
SR3	**OB3**
SR55	**OB2**
SR56	**OA2**
STR85/10	OG3
STR108/30	**OB2**
STR150/30	**OA2**
STV85/10	OG3
STV108/30	**OB2**
STV150/30	**OA2**
SU61	6X2
T2M05	**6J6A**
T77	6C6

Foreign Type To Be Replaced	American Type For Replacement
T866A/866	**866A**
TB2.5/300	5866
TH813	**813**
TH5021B	**866A**
TM12	**6J7**
TS229	**5687**
TT10	**813**
TTZ63	**6J7**
TX2/3	**5544**
U25	2L2
U26	2J2
U31	25Z4GT
U37	**1T4**
U41	1B3GT, **1G3GT/1B3GT**
U43	6X2
U49	6S2A
U50	**5Y3GT**
U51	5W4GT, **5V4GA**
U52	**5U4GB/5AS4A**
U70	**6X5GT**
U74	35Z4GT
U76	35Z4GT
U77	**5AR4/GZ34**
U78	**6X4**
U82	7Y4
U118	31A3
U119	38A3
U142	31A3
U145	31A3
U147	6X5G, **6X5GT**
U149	7Y4
U150	6BT4
U151	6X2
U152	19X3
U153	17Z3
U154	19Y3
U191	19CS4
U192	19Y3
U193	17Z3
U251	17Z3
U309	19X3
U319	19Y3
U329	25BR3
U339	19CS4
U349	17Z3
U381	38A3
U707	**6X4**
U709	**6CA4**
UABC80	28AK8
UAF42	12S7
UBC41	14L7
UBC80	14G6
UBC81	14G6
UBF80	17C8
UBF89	19FL8, 19DC8
UC92	9AB4
UCC85	26AQ8
UCH42	14K7
UCH80	14Y7
UCH81	19D8, 19AJ8
UCL82	50BM8
UF41	12AC5
UF80	19BX6
UF85	19BY7
UF89	**12AD6**
UL41	45A5
UL84	**45B5/UL84**
UM80	19BR5
UM84	12FG6
UN954	954
UN955	955
UQ80	12BE7
UU5	6BT4
UU9	6BT4
UU12	**6CA4**
UX866	**866A**
UY41	31A3
UY42	31A3
UY82	55N3
UY85	38A3
UY89	31AV3
UY807	**807**
V2M70	**6X4**
V61	6BT4
V177	6CQ6
V311	31A3
V312	31A3
V741	**6C4**
V884	6CQ6
V886	6AM5
VH550H	**866A**
VP6	6CQ6
VP12D	12C8
VR150	**OD3**
VT83	**83**
W17	**1T4**
W25	1AJ4
W63	**6K7**
W77	6CQ6
W81	7A7
W110	13EC7
W118	12AC5
W119	13EC7
W142	12AC5
W145	12AC5
W148	7A7
W149	7B7
W150	6CJ5
W719	6BY7, **6EH7/EF183**
W727	**6BA6/EF93**
W739	6EC7
WD119	19FL8
WD142	12S7
WD150	6CT7
WD709	6N8
WT294	**OD3**
WT301	**83**
X14	1A7GT
X17	**1R5**
X18	1AC6
X20	1AC6
X25	1AB6
X61M	6K8
X63	6A8
X64	6L7
X65	6E8
X71M	12K8
X76M	12K8GT
X77	**6BE6**
X79	6AE8
X81	7S7
X107	18FX6A, **18FX6**
X119	19D8
X142	14K7
X147	6E8
X148	7S7
X155	6BZ8, **6BC8/6BZ8**
X319	6351
X719	6AJ8
X727	**6BE6**
XAA91	**3AL5**
XB91	**3AL5**
XC88	2DL4
XC95	**2ER5**
XC97	2FY5, **2GK5/2FQ5**
XC900	**2HA5**
XCC82	**7AU7**
XCC89	4FC7
XCC189	**4ES8**
XCF80	**4BL8/XCF80**
XCF82	**5U8A**
XCF801	**4GJ7**
XCH81	3AJ8
XCL82	8B8
XCL84	8DX8
XCL85	**9GV8**
XCL86	8GW8
XF80	3BX6
XF85	3BY7
XF86	2HR8
XF94	**3AU6**
XF183	**3EH7/XF183**
XF184	**3EJ7/XF184**
XFR3	5676
XL36	13CM5
XL84	**8BQ5**
XL86	**8CW5**
XL136	17FV5
XL500	**13GB5/XL500**
XXB	3C6
XXD	14F7
XXFM	7X7
XXL	**7A4**
XY88	**16AQ3/XY88**
Y25	1N3
Y64	6U5
Y119	19BR5
YC88	3DL4
YC95	**3ER5**
YC97	3FY5, **3ER5**
YCC89	5FC7
YCC189	**5ES8**
YCF86	**5HG8/LCF86**
YCL82	10BM8
YCL84	**10DX8/XCL84**
YCL86	10GW8
YF183	**4EH7**
YF184	**4EJ7**
YL84	**10BQ5**
YL86	**10CW5/LL86**
YL1370	**6146B/8298A**
YL1371	8032A

Foreign Type To Be Replaced	American Type For Replacement
YL1372	6159B
Z14	1N5G
Z63	**6J7**
Z77	6AM6
Z150	6CU7
Z152	6BX6, **6EH7**/**EF183**
Z300T	**OA4G**
Z319	6351
Z329	7ED7
Z550M	8453
Z719	6BX6, **6EH7**/**EF183**
Z729	6CF8, **6267**
Z749	6EL7, **6EH7**/**EF183**
Z900T	**5823**
ZD17	**1S5**
ZD25	1AH5
ZD152	6N8
ZM1050	8453
ZZ1000	8228

INDUSTRIAL, MILITARY, AND SPECIAL-PURPOSE TUBES AND THEIR PROTOTYPES

Industrial, military, and various special-purpose types are all listed under the heading "Special Type," along with an indication of the general type of service for which the special type was originally intended. Based on an examination of the data, these special types appear to be similar to the types listed opposite them under the heading "Prototype or Similar Receiving Tube Type." Notes are referenced to describe some of the apparent differences between the associated types. Following the basic listing in order of the "Special Type" number, a cross-reference listing in order of the "Prototype or Similar Receiving Tube Type" number is given.

The inclusion of a type number under either heading does not necessarily mean that it is currently available, or that it is the latest modification of the basic type. All of the modifications of types, as represented by the addition of various suffix letters, are not listed. General information on the interpretation of suffix letters is presented near the front of this book under the heading "Arrangement of Data."

The associated types in these lists are not generally interchangeable in all respects, even where no specific differences are mentioned in the notes. However, the lists may be used as an aid in locating emergency replacements for unavailable tube types. Although reasonable care has been taken in compiling the lists and notes, no tube substitution should be made without a prior independent investigation to make sure that the tube under consideration is basically compatible with the specific circuit.

In Order By Special Types

Special Type	MIL Designation if Other Than EIA	Service	Prototype or Similar Receiving Tube Type
1612*	—	Broadcast—Audio Voltage Amplifier	6L7
1620*	—	Broadcast—Audio Voltage Amplifier	6J7
1621	—	Ind.—Audio Power Output	6F6
1622	—	Ind.—Audio Power Output	6L6
1634†	—	Ind.—Voltage Amplifier	12SC7
1644	—	Ind.—Audio Power Output	12L8GT
5591‡	—	Ind.—Wide-band Amplifier	6AK5
5654	5654W	Ind. or Mil.—Wide-band Amplifier (5★)	6AK5
5670§	5670W	Ind. or Mil.—General Purpose (5★)	2C51
5679¶	—	Ind.—Low-current Rectifier	7A6
5691†§△	—	Ind. or Mil.—Voltage Amplifier	6SL7GT
5692#△	—	Ind.—General Purpose	6SN7GT
5693#	—	Ind. or Mil.—Voltage Amplifier	6SJ7
5725	5725W	Ind. or Mil.—Gated Amplifier (5★)	6AS6
5726†	—	Ind. or Mil.—Dectector, Low-current Rectifier (5★)	6AL5
5727	—	Ind. or Mil.—Relay Control (5★)	2D21
5749	5749W	Ind. or Mil—RF or IF Amplifier (5★)	6BA6
5750	—	Ind. or Mil.—Converter (5★)	6BE6
5751†#§	—	Ind. or Mil.—Voltage Amplifier (5★)	12AX7
5814A†§	—	Ind. or Mil.—General Purpose (5★)	12AU7
5824	—	Ind.—Audio Power Output	25B6G
5842	—	Ind. or Mil.—Wide-band Amplifier	417A
5844‡	—	Ind. or Mil.—Computer (5★)	6J6
5847	—	Ind. or Mil.—RF Amplifier	404A
5852§	—	Ind. or Mil.—Rectifier	6X5
5871	—	Mobile—Audio Power Output	6V6GT
5881##	—	Audio—Power Output	6L6G
5915	—	Ind. or Mil.—Computer—Gated Amplifier	6BE6
5930	—	Ind.—Audio Power Output	2A3
5931	—	Ind. or Mil.—Rectifier	5U4G
5932	—	Ind.—Audio Power Output	6L6G
5965†	—	Ind. or Mil.—Computer	12AV7
5965A†	—	Computer (5★)	12AV7
5992§#	—	Ind.—Audio Power Output	6V6GT
5998	—	Ind. or Mil.—Series Regulator	421A

*Low-microphonic
†Balanced Sections
‡Lower Heater Current
§Higher Heater Current
¶Center-tapped Heater
#Lower Ratings
##Higher Ratings
△Shorter Envelope
¶¶Longer Envelope
△△Cathode Type
††Different Basing
5★General Electric Five-Star Tube

Special Type	MIL Designation if Other Than EIA	Service	Prototype or Similar Receiving Tube Type
5998A	—	Ind.—Series Regulator	421A
6005	6005W	Ind. or Mil.—Audio Power Output (5★)	6AQ5
6028	—	Ind. or Mil.—RF Amplifier	408A
6045‡	—	Ind.—General Purpose	6J6
6046	—	Ind.—Relay Energizer	25L6GT
6057	—	Ind.—Voltage Amplifier	12AX7
6058	—	Ind.—Detector, Low-current Rectifier	6AL5
6060	—	Ind.—Oscillator-mixer	12AT7
6061	—	Ind.—Audio Power Output	6BW6
6063	—	Ind.—Rectifier	6X4
6066	—	Ind.—Dectector, Voltage Amplifier	6AT6
6067	—	Ind.—General Purpose	12AU7
6072*§	6072A	Ind. or Mil.—Audio Voltage Amplifier (5★)	12AY7
6073	—	Ind.—Voltage Regulator	0A2
6074	—	Ind.—Voltage Regulator	0B2
6080	—	Ind.—Series Regulator	6AS7G
6087△△	5Y3WGTB	Ind. or Mil.—Rectifier (5★)	5Y3GT
6095	—	Ind.—Audio Power Output	6AQ5
6096	—	Ind.—Wide-band Amplifier	6AK5
6097	—	Ind.—Dectector, Low-current Rectifier	6AL5
6100	6C4WA	Ind. or Mil.—General Purpose (5★)	6C4
6101†#	—	Ind.—General Purpose	6J6
6106△△	—	Ind.—Rectifier	5Y3GT
6113*	—	Ind.—Audio Voltage Amplifier	6SL7GT
6134	6AC7WA	Ind. or Mil.—RF Amplifier (5★)	6AC7
6135§	—	Ind. or Mil.—General Purpose (5★)	6C4
6136	6AU6WC	Ind. or Mil.—RF or IF Amplifier (5★)	6AU6
6137	6SK7WA	Ind. or Mil—RF or IF Amplifier (5★)	6SK7
6180#	—	Ind.—General Purpose	6SN7GT
6186	6186W	Ind. or Mil.—RF or IF Amplifier	6AG5
6187	—	Ind.—Gated Amplifier	6AS6
6188	—	Ind. or Mil.—DC Amplifier	6SU7WGT
6189	6189W	Ind. or Mil.—General Purpose (5★)	12AU7
6197	—	Ind. or Mil.—Computer—Frequency-divider	6CL6
6201	12AT7WC	Ind. or Mil.—Oscillator-mixer (5★)	12AT7
6202#	6X4WA	Ind. or Mil.—Rectifier (5★)	6X4
6203††§	—	Ind. or Mil.—Rectifier (5★)	6X4
6265§	—	Ind.—Wide-band Amplifier (5★)	6BH6
6384	—	Ind. or Mil.—Pulse Amplifier	6AR6
6385¶¶§	—	Ind.—General Purpose	2C51
6386§	—	Ind. or Mil.—Cascode Amplifier (5★)	2C51
6388	—	Ind.—Cold-cathode Relay Tube	443A
6414	6414W	Ind. or Mil.—Computer—General Purpose (5★)	12AV7
6485	—	Ind.—Wide-band Amplifier	6AH6
6520†	—	Ind.—Series Regulator	6AS7G
6626	—	Ind.—Voltage Regulator	0A2
6627	—	Ind.—Voltage Regulator	0B2
6660	—	Mobile—RF or IF Amplifier	6BA6
6661	—	Mobile—Wide-band Amplifier	6BH6
6662	—	Mobile—Wide-band Amplifier	6BJ6
6663	—	Mobile—Detector, Low-current Rectifier	6AL5
6664	—	Mobile—General Purpose	6AB4
6669	—	Mobile—Audio Power Output	6AQ5
6676	—	Mobile—RF or IF Amplifier	6CB6
6677	—	Mobile—Audio Power Output	6CL6
6678	—	Mobile—Oscillator-mixer	6U8
6679	—	Mobile—Oscillator-mixer	12AT7
6680	—	Mobile—General Purpose	12AU7
6681	—	Mobile—Voltage Amplifier	12AX7
6829	—	Ind. or Mil.—Computer (5★)	12AV7
6913	—	Computer	12BH7
6928‡#	—	Ind.—Audio Power Output	6AQ5
6968	—	Ind.—Wide-band Amplifier	6AK5
7025	—	Audio—Voltage Amplifier	12AX7
7036	—	Computer—Gated Amplifier (5★)	6BE6

***Low-microphonic**
†Balanced Sections
‡Lower Heater Current
§Higher Heater Current
¶Center-tapped Heater
#Lower Ratings
##Higher Ratings
△Shorter Envelope
¶¶Longer Envelope
△△Cathode Type
††Different Basing
5★General Electric Five-Star Tube

Special Type	MIL Designation if Other Than EIA	Service	Prototype or Similar Receiving Tube Type
7189##	—	Audio—Power Output	6BQ5
7212	—	Mobile—RF Power Output	6146
7244	—	Ind.—General Purpose	6J6
7245A△	—	Ind.—RF Amplifier	6J4
7318§	—	Ind.—Pulse Amplifier	12AU7
7320	—	Mobile—Audio Power Output	6BQ5
7408	—	Audio—Power Output	6V6GT
7543*	—	Audio—Voltage Amplifier	6AU6
7581	—	Audio Power Output	6L6GC
7581A##	—	Audio—Power Output	6L6GC
7717	—	Mobile—RF Amplifier	6CY5
7724	—	Mobile—Detector, Voltage Amplifier	14GT8
7728	—	Industrial—Instrument Service	12AT7
7729	—	Industrial—Instrument Service	12AX7
7730	—	Industrial—Instrument Service	12AU7
7731	—	Industrial—Instrument Service	6U8
7732	—	Industrial—Instrument Service	6CB6
7733	—	Industrial—Instrument Service	12BY7
7734	—	Ind.—Voltage Regulator	6GE8
7738##	—	Ind.—Class C Amplifier	6AN4
7803	—	Ind.—Class C Amplifier	6FW8
8113	—	Ind.—RF Amplifier	6CY5
8425A	—	Industrial—Instrument Service	6AU6
8426A	—	Industrial—Instrument Service	12AU6
8532	8532W	Ind. or Mil.—RF Amplifier	6J4

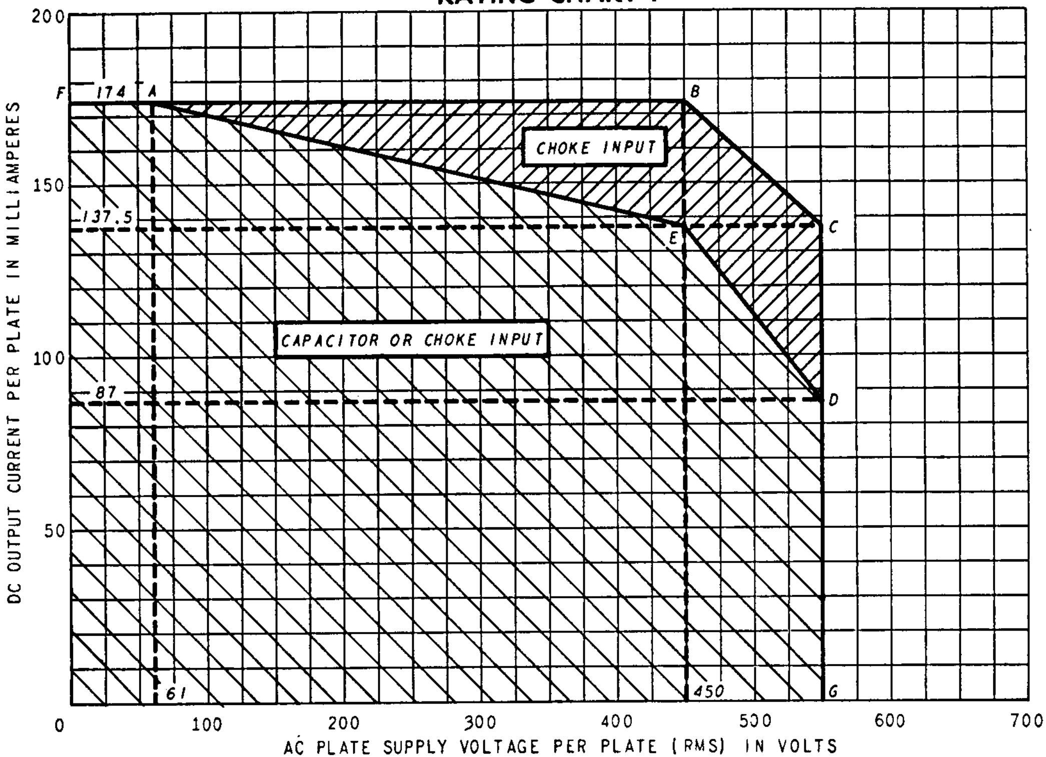
***Low-microphonic**
†Balanced Sections
‡Lower Heater Current
§Higher Heater Current
¶Center-tapped Heater
#Lower Ratings
##Higher Ratings
△Shorter Envelope
¶¶Longer Envelope
△△Cathode Type
††Different Basing
5★General Electric Five-Star Tube

In Order by Prototype or Similar Receiving Tube Type

Prototype or Similar Receiving Tube Type	Special Type (Refer to Preceding List for Service and Notes)	Prototype or Similar Receiving Tube Type	Special Type (Refer to Preceding List for Service and Notes)
0A2	6073, 6626	6J7	1620
0B2	6074, 6627	6L6	1622
2A3	5930	6L6G	5881, 5932
2C51	5670, 6385, 6386, 396A	6L6GC	7581, 7581A
2D21	5727	6L7	1612
5U4G	5931	6SJ7	5693
5Y3GT	6087, 6106, 5Y3WGTB	6SK7	6137
6AB4	6664	6SL7GT	5691, 6113
6AC7	6134	6SN7GT	5692, 6180
6AG5	6186	6SU7WGT	6188
6AH6	6485	6U8	6678, 7731
6AK5	5591, 5654, 6096, 6968, 403B	6V6GT	5871, 5992, 7408
6AL5	5726, 6058, 6097, 6663	6X4	6063, 6202, 6203
6AN4	7738	6X5	5852
6AQ5	6005, 6095, 6669, 6928	7A6	5679
6AR6	6384	12AT7	6060, 6201, 6679, 7728
6AS6	5725, 6187	12AU6	8426A
6AS7G	6080, 6520	12AU7	5814A, 6067, 6189, 6680, 7318, 7730
6AT6	6066	12AV7	5965, 5965A, 6829, 6414, 6414W
6AU6	6136, 7543, 8425A	12AX7	5751, 6057, 6681, 7025, 7729
6BA6	5749, 6660	12AY7	6072
6BE6	5750, 5915, 7036	12BH7	6913
6BH6	6265, 6661	12BY7	7733
6BJ6	6662	12L8GT	1644
6BQ5	7189, 7320	12SC7	1634
6BW6	6061	14GT8	7724
6C4	6100, 6135, 6C4WA	25B6G	5824
6CB6	6676, 7732	25L6GT	6046
6CL6	6197, 6677	403B	5591
6CY5	7717, 8113	404A	5847
6F6	1621	408A	6028
6FW8	7803	417A	5842
6GE8	7734	421A	5998, 5998A
6J4	7245A, 8532, 8532W	443A	6388
6J6	5844, 6045, 6101, 7244	6146	7212

5U4-GB

RATING CHART I

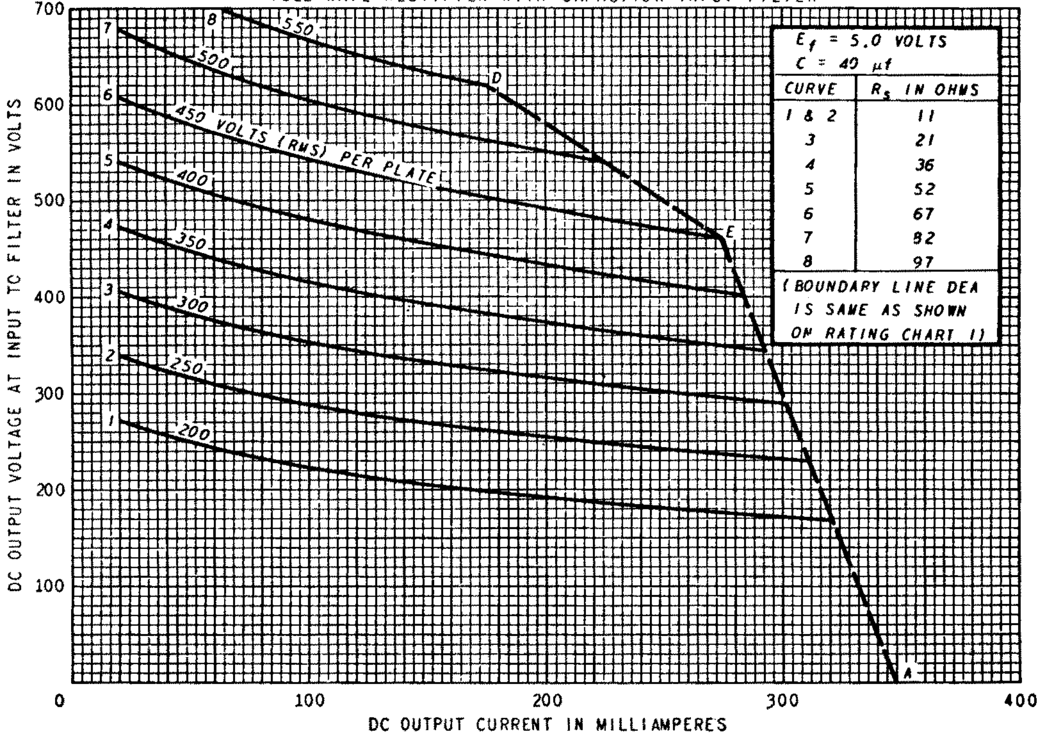


With a capacitor-input filter, the operating point of d-c output current and a-c supply voltage must fall within the curve FAEDG. With a choke-input filter, the operating point must fall within the curve FABCDG.

5U4-GB

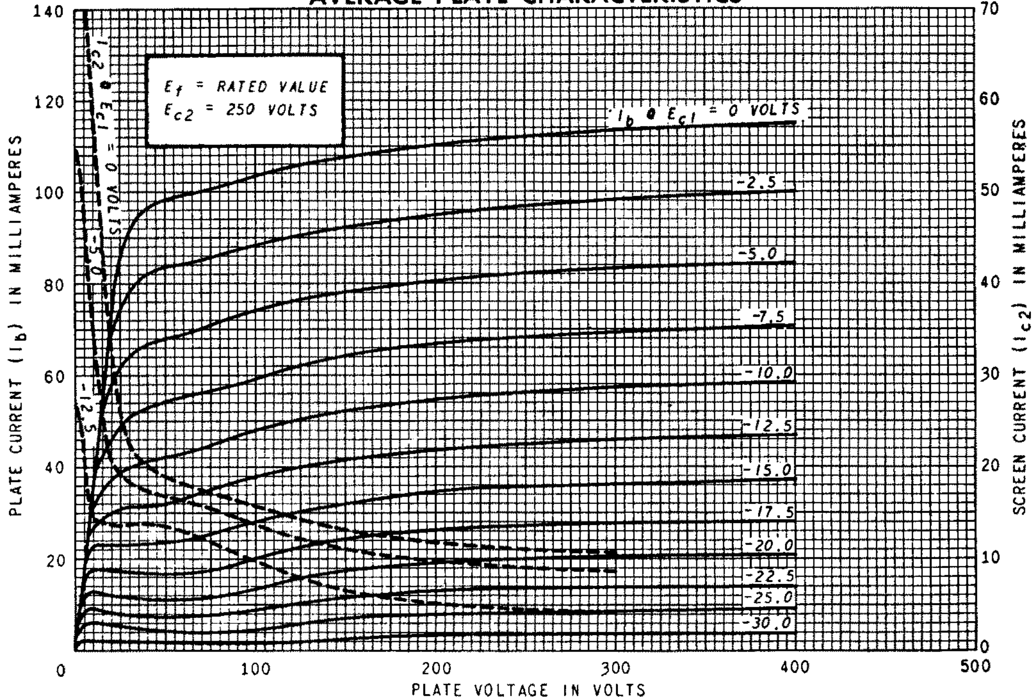
OPERATION CHARACTERISTICS

FULL-WAVE RECTIFIER WITH CAPACITOR-INPUT FILTER



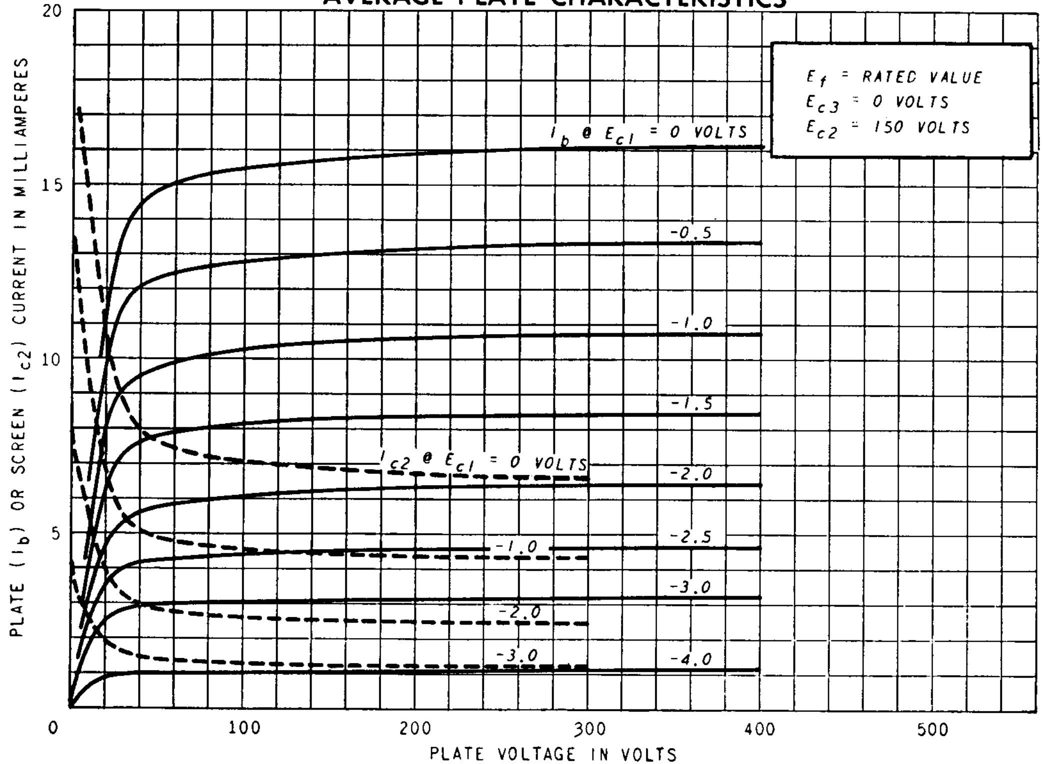
6AQ5, 5AQ5, 12AQ5, 6AQ5-A, 5V6-GT, 6V6-GT, 12V6-GT, 6V6-GTA

AVERAGE PLATE CHARACTERISTICS



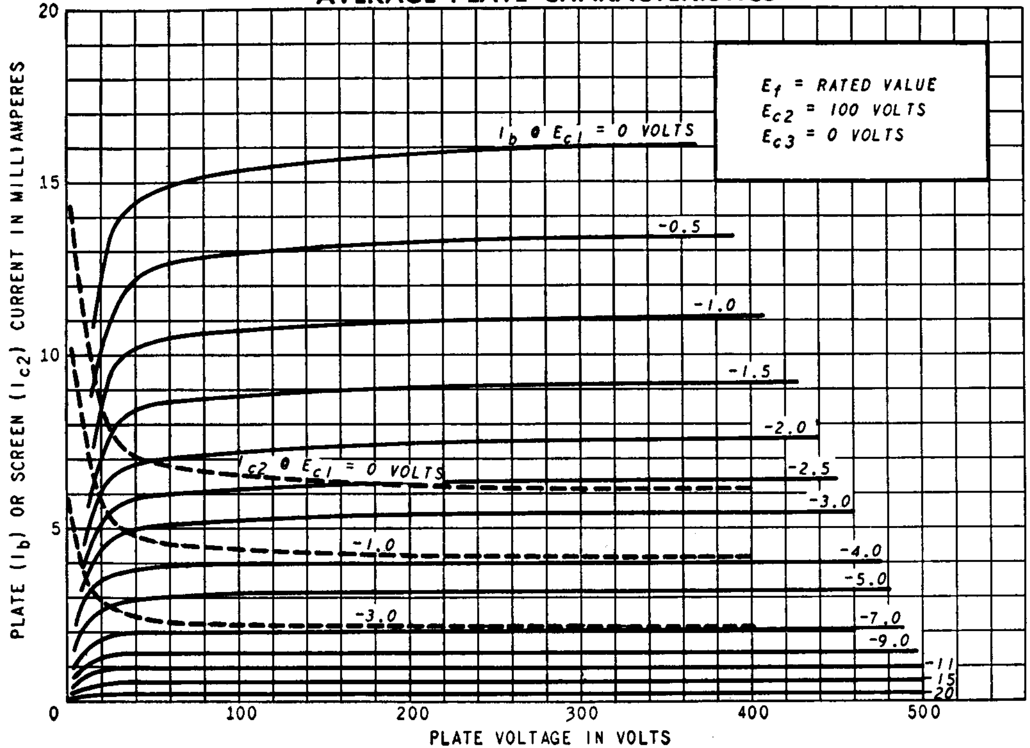
6AU6, 3AU6, 4AU6, 12AU6, 6AU6-A

AVERAGE PLATE CHARACTERISTICS



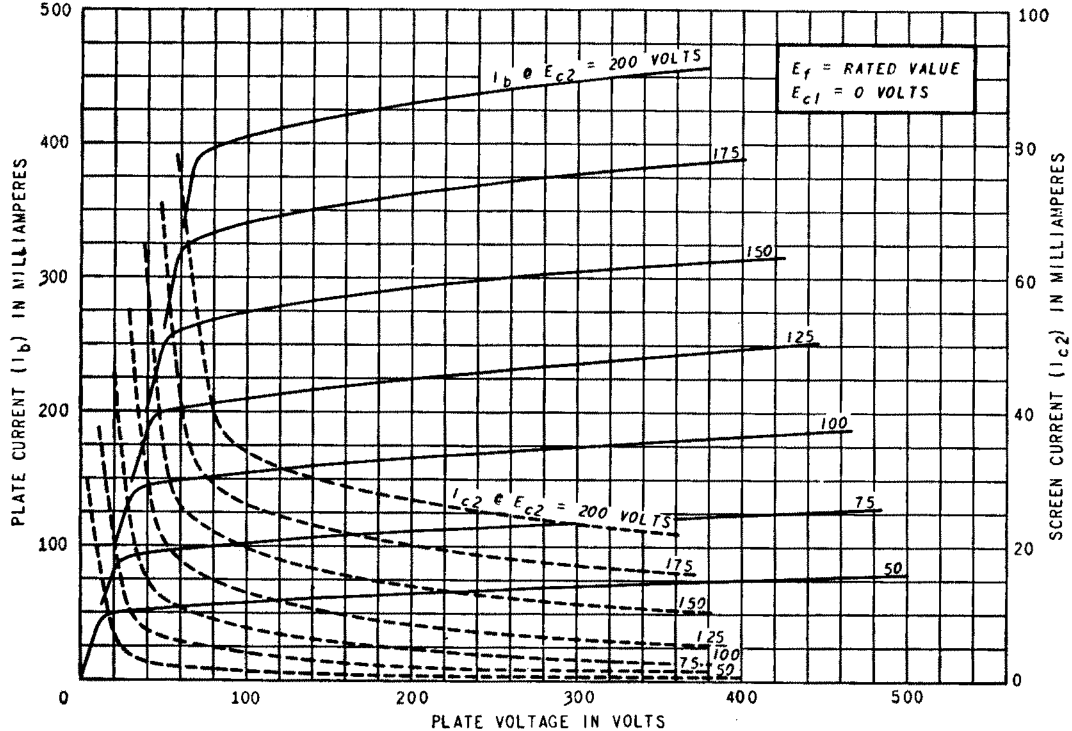
6BA6, 3BA6, 4BA6, 12BA6

AVERAGE PLATE CHARACTERISTICS

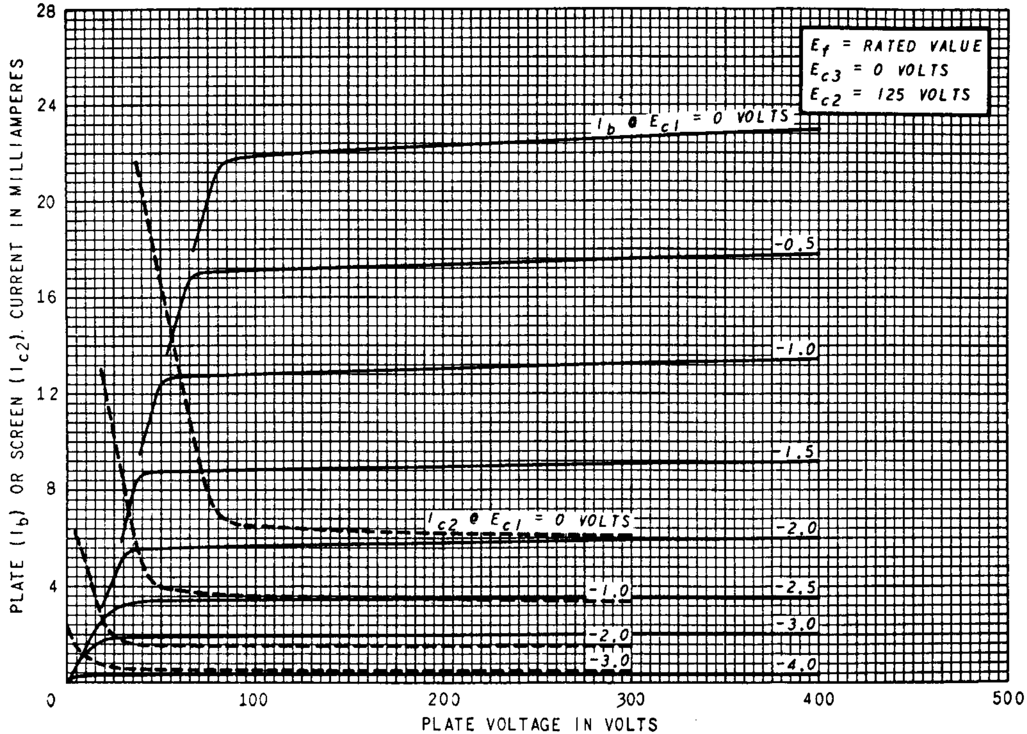


6BQ6-GA, 12BQ6-GA, 25BQ6-GA, 6CU6, 12CU6, 25CU6, 6AV5-GA, 12AV5-GA, 17AV5-GA, 25AV5-GA

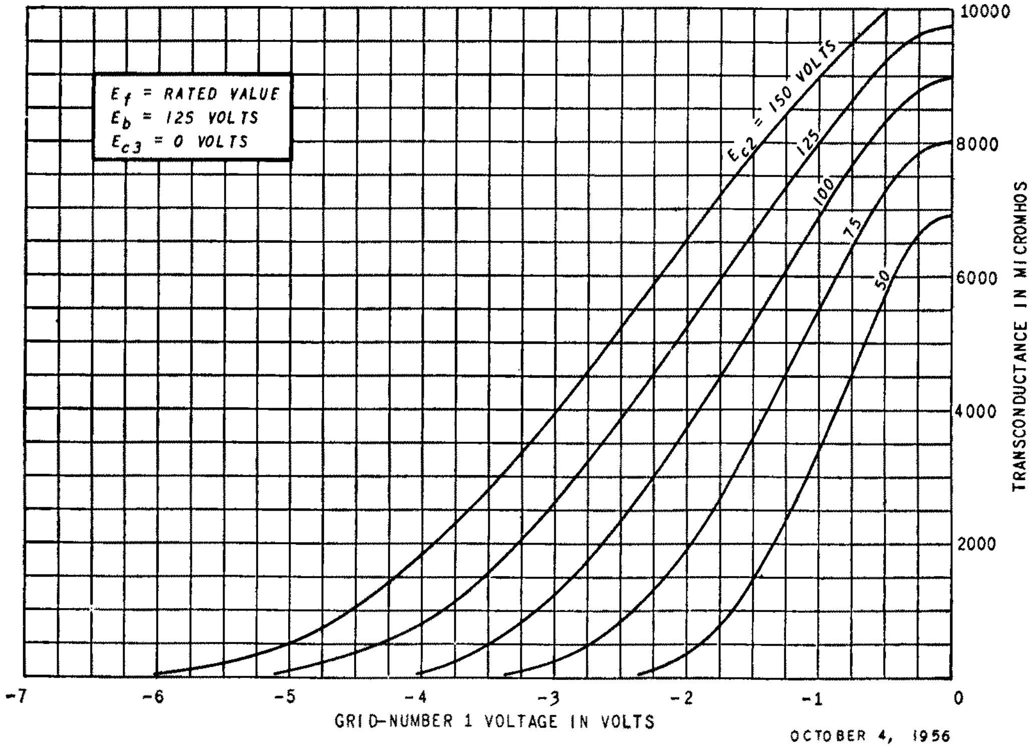
AVERAGE PLATE CHARACTERISTICS



6CB6, 3CB6, 4CB6, 6CB6-A
AVERAGE PLATE CHARACTERISTICS



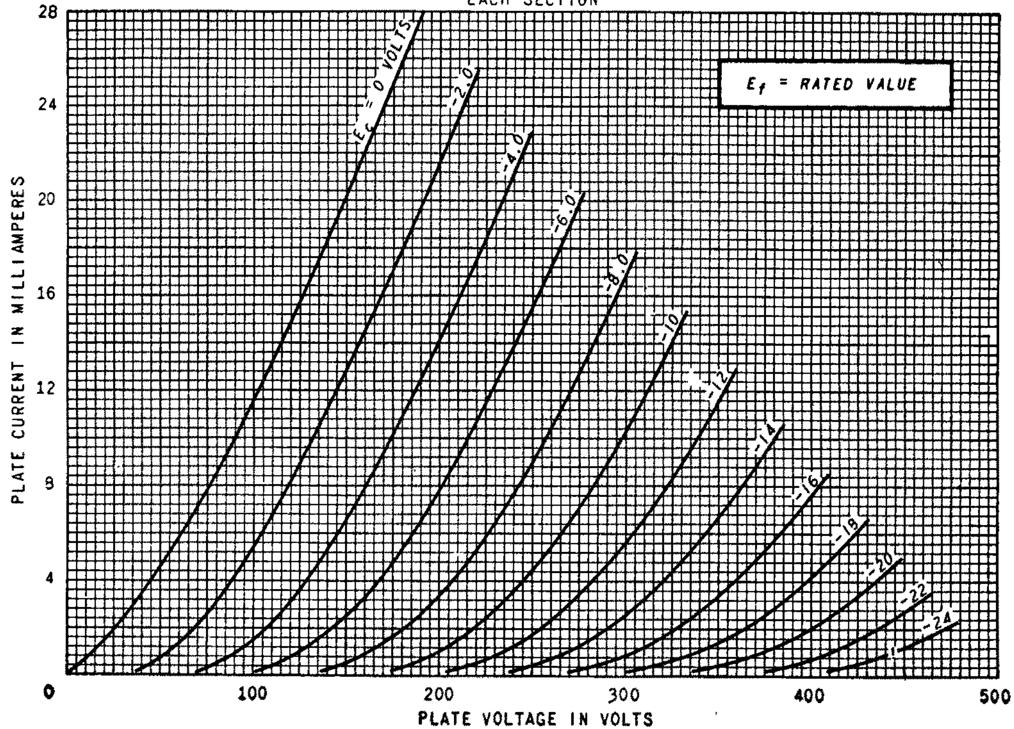
6CB6, 3CB6, 4CB6, 6CB6-A
AVERAGE TRANSFER CHARACTERISTICS



6SN7-GTB, 6SN7-GTA, 12SN7-GTA, 6SN7-GT, 12SN7-GT, 6CG7, 8CG7

AVERAGE PLATE CHARACTERISTICS

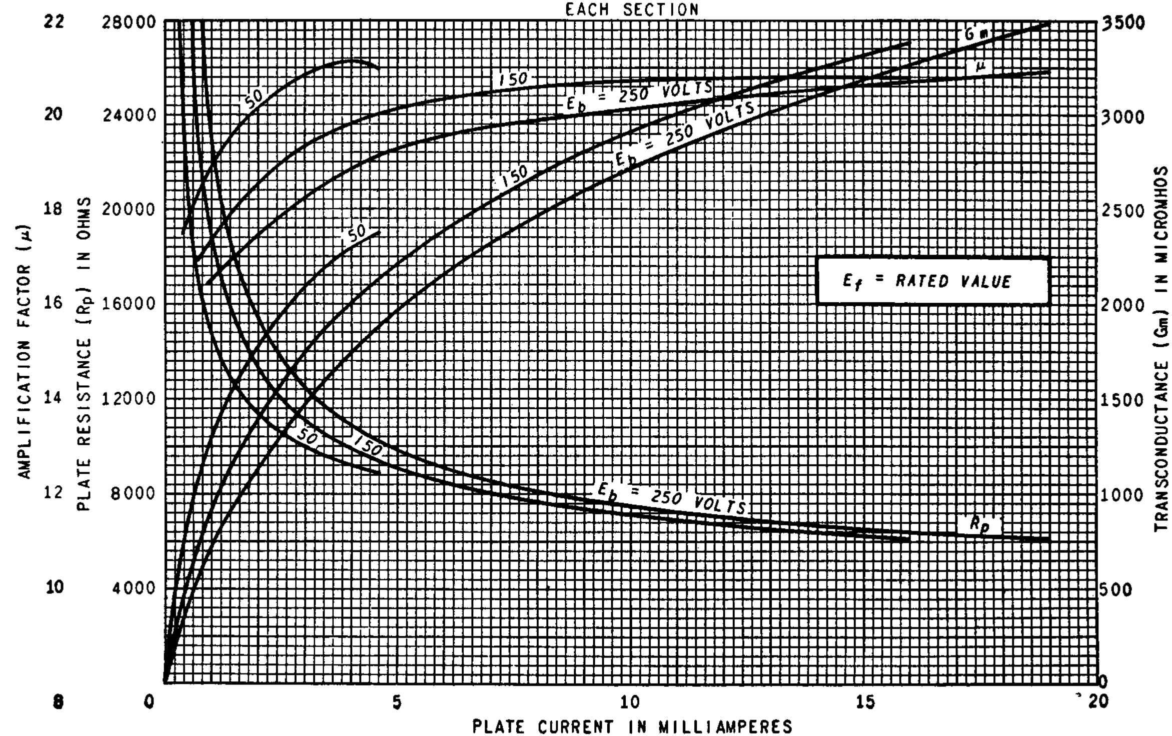
EACH SECTION



6SN7-GTB, 6SN7-GTA, 12SN7-GTA, 6SN7-GT, 12SN7-GT, 6CG7, 8CG7

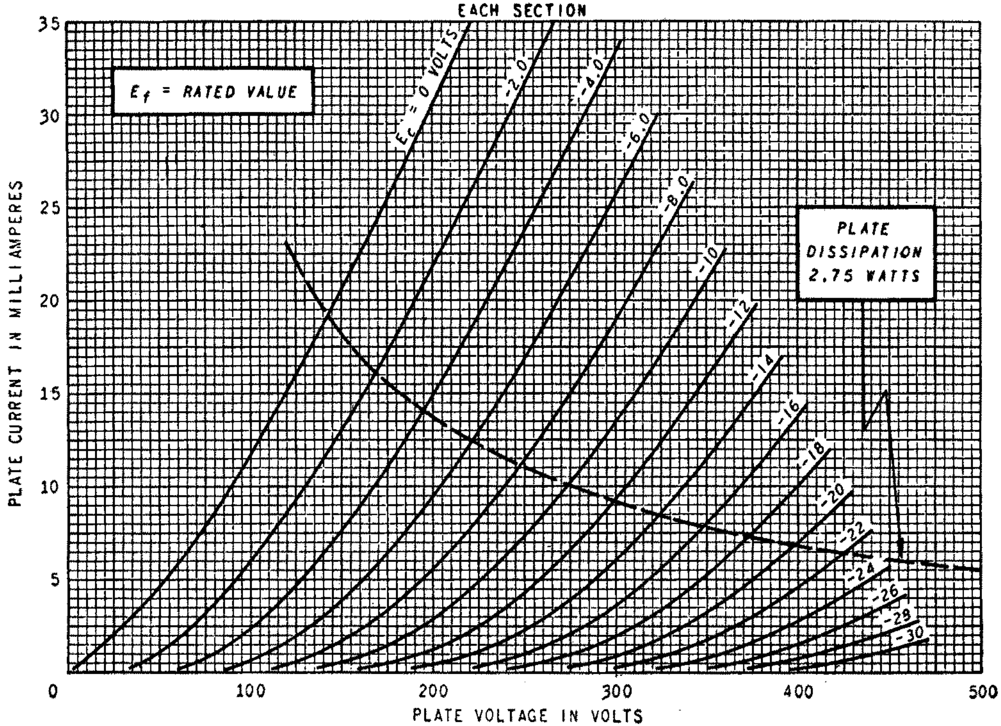
AVERAGE CHARACTERISTICS

EACH SECTION



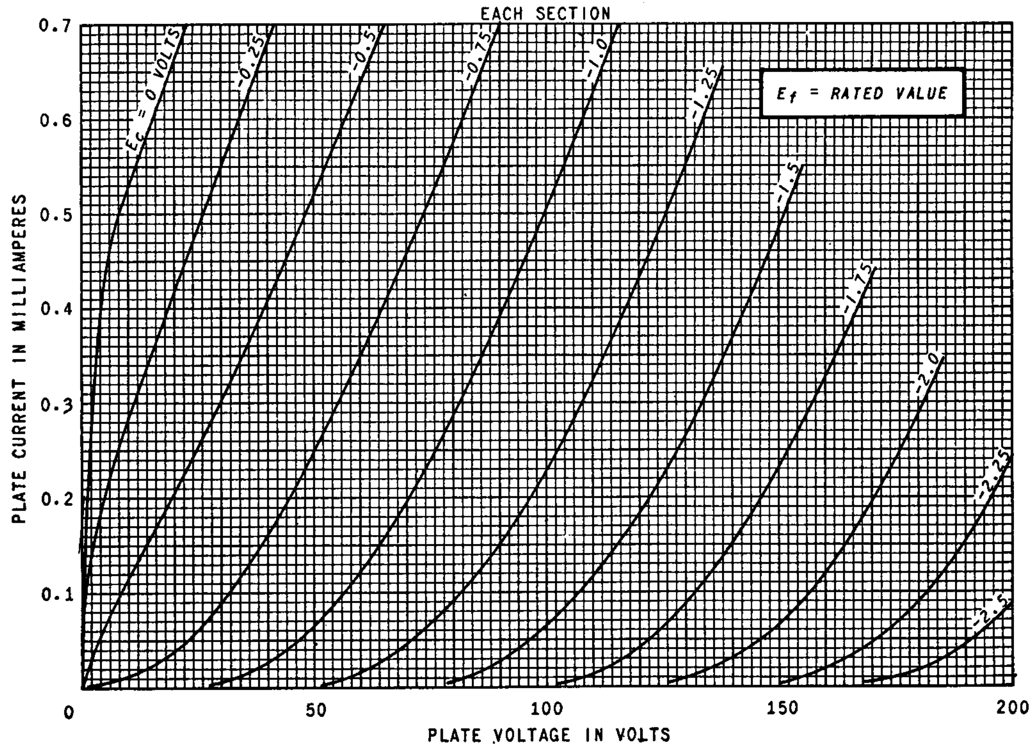
6K11 (SECTION 1), 7AU7, 9AU7, **12AU7,** 12AU7-A, 7247 (SECTION 2)

AVERAGE PLATE CHARACTERISTICS



6C10, 6EU7, 6K11 (SECTIONS 2 AND 3), **12AX7**, 12AX7-A, 7025, 7247 (SECTION 1)

AVERAGE PLATE CHARACTERISTICS



Radio & TV Pilot Lamps

Lamp Number	Voltage	Amperes	Type of Base	Max. Overall Length Inches	Max. Overall Length Millimeters
12	6.3	0.15	Miniature 2 Pin	0.938	23.825
39	6.3	0.36	Miniature Bayonet	1.188	30.175
40	6.3	0.15	Miniature Screw	1.188	30.175
41	2.5	0.50	Miniature Screw	1.188	30.175
42	3.2	0.35	Miniature Screw	1.188	30.175
44	6.3	0.25	Miniature Bayonet	1.188	30.175
45	3.2	0.35	Miniature Bayonet	1.188	30.175
46	6.3	0.25	Miniature Screw	1.188	30.175
47	6.3	0.15	Miniature Bayonet	1.188	30.175
48	2.0	0.06	Miniature Screw	1.188	30.175
49	2.0	0.06	Miniature Bayonet	1.188	30.175
130	6.3	0.15	Miniature Bayonet	0.938	23.825
137	6.3	0.25	Miniature Bayonet	0.938	23.825
159	6.3	0.15	Wedge	1.063	27.000
239	6.3	0.36	Miniature Bayonet	1.188	30.175
240	6.3	0.36	Miniature Bayonet	1.188	30.175
242	6.3	0.15	Miniature Bayonet	1.188	30.175
259	6.3	0.25	Wedge	1.063	27.000
1490	3.2	0.16	Miniature Bayonet	1.188	30.175
1847	6.3	0.15	Miniature Bayonet	1.188	30.175
1847AF	6.3	0.15	Miniature Bayonet	1.188	30.175
1855	6.3	0.80	Miniature Bayonet	1.375	34.925
1866	6.3	0.25	Miniature Bayonet	1.188	30.175
1891	14.0	0.24	Miniature Bayonet	1.188	30.175
1893	14.0	0.33	Miniature Bayonet	1.188	30.175
2067D	4.0	0.06	Wire Terminal	1.188	30.175

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACE PLATE SHAPE	FACE PLATE IMPLOSION PROTECTION	FACE PLATE TREATMENT	FACE PLATE LIGHT TRANSMIT-TANCE IN %	Overall Length (Inches)	NECK LENGTH (Inches)	EXTERNAL COATING IN pf	BASING	FOCUS	HEATER V.	HEATER A.
10VABP22	⧄	72	G	□	B	U	72.0	15.240	7.930	600/800	14BM	IBPES	6.3	0.90
11SP22	⧄	72	G	□	B	U	72.0	14.915	7.605	600/800	14BJ	IUPES	13.8	0.58
11WP22	⧄	72	G	□	B	U	52.0	14.915	7.605	600/800	14BJ	IUPES	13.8	0.58
12DCP22	△	90	G	□	V	U	65.0	13.976	6.968	500/900	14BH	DUPES	6.3	0.90
12VAHP22	△	90	G	□	X	UR	81.5	13.870	6.693	500/1000	14BH	DUPES	6.3	0.90
13GP22	△	90	G	□	E	U	48.0	13.594	6.417	500/1000	14BH	DUPES	6.3	0.90
13JP22	△	90	G	□	X	U	52.0	13.861	6.693	500/1000	14BH	DUPES	6.3	1.35
13LP22	△	90	G	□	V	U	69.0	13.594	6.417	500/1000	14BH	DUPES	6.3	0.90
13MP22	△	90	G	□	E	U	69.0	13.594	6.417	500/1000	14BH	DUPES	6.3	0.90
14BCP22	△	65	G	□	—	—	—	19.281	9.562	500/1500	14AU	DBPES	6.3	1.80
14VABP22	△	90	G	□	E	U	52.0	15.000	6.693	500/1000	14BH	DUPES	6.3	0.90
14VADP22	⧄	90	G	□	X	U	52.0	15.199	6.893	550/1050	14BH	DUPES	6.3	0.90
14VAEP22	⧄	90	G	□	Y	U	52.0	15.199	6.893	550/1050	14BH	DUPES	6.3	0.90
14VAFP22	⧄	90	G	□	E	U	52.0	15.000	6.693	700/1200	14BH	DUPES	6.3	0.90
14VAGP22	△	90	G	□	W	U	60.0	15.000	6.693	550/1050	14BH	DUPES	6.3	0.90
14VAHP22	⧄	90	G	□	X	U	60.5	15.199	6.893	550/1050	14BH	DUPES	6.3	0.90
14VALP22	⧄	90	G	□	Y	U	60.5	15.199	6.893	550/1050	14BH	DUPES	6.3	0.90
15ACP22	△	90	G	□	E	U	52.0	15.000	6.693	500/1000	14BH	DUPES	6.3	0.90
15AEP22	⧄	90	G	□	Y	U	52.0	15.000	6.693	550/1050	14BH	DUPES	6.3	0.90
15AFP22	△	90	G	□	E	U	60.5	14.724	6.417	700/1300	14BH	DUPES	6.3	0.90
15GP22	△	45	G	○	—	—	—	26.125	10.375	1500/3000	20A	H.V.E.S.	6.3	1.80
15HP22	△	45	G	○	—	—	—	26.125	10.375	1500/3000	20A	H.V.E.S.	6.3	1.80
15KP22	△	90	G	□	—	U	74.0	15.000	6.693	550/1050	14BH	DUPES	6.3	0.90
15LP22	⧄	90	G	□	P	UR	44.0	15.191	6.693	550/1050	14BH	DUPES	6.3	0.90
15MP22	⧄	90	G	□	P	UR	56.0	15.838	7.332	750/1200	14BK	DBPES	6.3	1.35
15NP22	⧄	90	G	□	X	U	52.0	15.000	6.693	550/1050	14BH	DUPES	6.3	0.90
15RP22	△	90	G	□	—	U	48.0	14.724	6.417	550/1050	14BH	DUPES	6.3	0.90
15SP22	△	90	G	□	E	U	48.0	14.724	6.417	550/1050	14BH	DUPES	6.3	0.90
15WP22	△	90	G	□	P	U	44.0	14.924	6.417	550/1050	14BH	DUPES	6.3	0.90
15XP22	△	90	G	□	X	U	52.0	15.000	6.693	500/1050	14BH	DUPES	6.3	1.30
15YP22	⧄	90	G	□	V	U	52.0	15.648	7.332	750/1200	14BK	DBPES	6.3	1.35
16CDP22	△	90	G	□	—	—	72.0	15.125	6.420	500/1000	14BE	DBPES	6.3	0.90
16CSP22	△	90	G	□	V	U	54.0	15.120	6.420	700/1300	14BE	DBPES	6.3	0.90
16CYP22	△	90	G	□	V	U	65.0	15.709	7.008	700/1300	14BH	DUPES	6.3	0.90
16DAP22	△	90	G	□	V	U	65.0	15.120	6.420	700/1300	14BE	DBPES	6.3	0.90
16VABP22	⧄	90	G	□	V	U	48.0	16.798	6.893	1000/1500	14BH	DUPES	6.3	0.90
16VACP22	⧄	90	G	□	X	U	57.0	16.598	6.693	1000/1500	14BH	DUPES	6.3	0.90
16VAFP22	⧄	90	G	□	E	U	48.0	16.598	6.693	1200/1700	14BH	DUPES	6.3	0.90
16VAHP22	△	90	G	□	V	U	57.0	16.598	6.693	1000/1500	14BH	DUPES	6.3	0.90
16VAKP22	⧄	90	G	□	Y	U	57.0	16.798	6.893	1000/1500	14BH	DUPES	6.3	0.90
16VASP22	⧄	90	G	□	E	U	57.0	16.598	6.693	1000/1500	14BE	DBPES	6.3	0.90
16VATP22	⧄	90	G	□	E	UM	86.0	16.598	6.693	1000/1500	14BE	DBPES	6.3	0.90
16VAWP22	⧄	90	G	□	V	U	57.0	17.247	7.332	1000/1500	14BK	IBPES	6.3	1.35
16VBDP22	⧄	90	G	□	V	U	57.0	17.259	7.344	1000/1500	14BK	IBPES	6.3	0.90
17ETP22	△	90	G	□	P	U	44.0	16.727	6.837	500/1000	14BE	DBPES	6.3	1.30
17EVP22	△	90	G	□	E	U	48.0	16.598	6.693	1000/1500	14BH	DUPES	6.3	0.90
17EXP22	⧄	90	G	□	V	U	48.0	17.247	7.332	1000/1500	14BK	IBPES	6.3	1.35
17EZP22	⧄	90	G	□	V	U	48.0	16.598	6.693	1000/1500	14BH	DUPES	6.3	0.90
17FGP22	⧄	90	G	□	P	U	55.0	16.790	6.693	1000/1500	14BH	DUPES	6.3	0.90
17FHP22	△	90	G	□	E	U	67.0	16.322	6.417	1200/1700	14BH	DUPES	6.3	0.90
17FJP22	⧄	90	G	□	V	U	48.0	17.247	7.332	1000/1500	14BK	IBPES	6.3	1.35
17FKP22	△	90	G	□	V	U	48.0	16.598	6.693	1000/1500	14BH	DUPES	6.3	0.90
17VABP22	⧄	90	G	□	W	U	54.5	16.650	6.420	1400/1900	14BH	DUPES	6.3	0.90
17VACP22	⧄	90	G	□	V	U	56.5	17.122	6.893	1200/1600	14BH	DUPES	6.3	0.90
17VADP22	⧄	90	G	□	V	UM	72.0	17.122	6.893	1200/1600	14BH	DUPES	6.3	0.90
18VABP22	⧄	90	G	□	V	U	53.5	17.876	6.703	1500/2000	14BE	DBPES	6.3	1.35
18VACP22	△	90	G	□	P	UR	41.0	18.048	6.693	1400/1900	14BE	DBPES	6.3	0.90
18VADP22	△	90	G	□	V	U	43.5	17.856	6.693	1500/2100	14BE	DBPES	6.3	0.90
18VAFP22	△	90	G	□	W	U	43.5	17.856	6.693	1500/2100	14BH	DUPES	6.3	0.90
18VAHP22	⧄	90	G	□	P	UR	53.0	18.248	6.893	1400/1900	14BE	DBPES	6.3	0.90

ANODE KV DESIGN MAX. ◆	TYPICAL OPERATING CONDITIONS				TUBE TYPE
	ANODE KV.	FOCUS ELEC-TRODE VOLTS	SPOT CUTOFF		
			GRID-NUMBER 2 VOLTS	GRID-NUMBER 1 VOLTS	
22.0	20	3200/4300	355/595	-70	**10VABP22**
18.0	15	-250/500	250/540	-55	**11SP22**
18.0	15	-250/500	250/540	-55	**11WP22**
20.0	16	-75/400	260/540	-80	**12DCP22**
22.5	20	-75/400	150/420	-100	**12VAHP22**
20.0	18	-75/400	150/390	-100	**13GP22**
22.5	20	-75/400	150/390	-100	**13JP22**
22.5	18	-75/400	150/390	-100	**13LP22**
22.5	20	-75/400	150/390	-100	**13MP22**
22.0	16	2400/3400	200	-50/-105	**14BCP22**
22.5	20	-75/400	150/380	-100	**14VABP22**
22.5	20	-75/400	210/508	-125	**14VADP22**
22.5	20	-75/400	210/505	-125	**14VAEP22**
22.5	20	-75/400	70/220	-60	**14VAFP22**
22.5	20	-75/400	150/390	-100	**14VAGP22**
22.5	20	-75/400	210/505	-125	**14VAHP22**
22.5	20	-75/400	210/505	-125	**14VALP22**
22.5	20	-75/400	150/380	-100	**15ACP22**
22.5	20	-75/400	150/390	-100	**15AEP22**
22.5	20	-75/400	150/390	-100	**15AFP22**
22.0 ▣	20	2400/3800	—	—	**15GP22**
22.0 ▣	20	3100	—	—	**15HP22**
22.5	20	-75/400	150/390	-100	**15KP22**
22.5	20	-75/400	150/390	-100	**15LP22**
24.0	20	3300/4300	215/360	-60	**15MP22**
22.5	20	-75/400	150/390	-100	**15NP22**
22.5	20	-75/400	150/390	-100	**15RP22**
22.5	20	-75/400	150/390	-100	**15SP22**
22.5	20	-75/400	150/390	-100	**15WP22**
22.5	20	-75/400	150/390	-100	**15XP22**
24.0	20	3300/4300	220/370	-60	**15YP22**
20.0	18	3000/3600	200/650	-100	**16CDP22**
23.0	18	3020/3600	110/300	-70	**16CSP22**
23.0	20	-75/400	125/370	-70	**16CYP22**
23.0	20	3360/4000	110/300	-70	**16DAP22**
22.5	20	-75/400	210/505	-125	**16VABP22**
22.5	20	-75/400	160/400	-100	**16VACP22**
22.5	20	-75/400	150/385	-100	**16VAFP22**
22.5	20	-75/400	150/390	-100	**16VAHP22**
22.5	20	-75/400	210/505	-125	**16VAKP22**
22.5	20	3360/4000	140/410	-100	**16VASP22**
22.5	20	3360/4000	140/410	-100	**16VATP22**
24.0	20	3300/4300	355/600	-70	**16VAWP22**
24.0	20	3300/4300	355/690	-70	**16VBDP22**
22.5	20	3200/4000	135/335	-75	**17ETP22**
22.5	20	-75/400	150/380	-100	**17EVP22**
24.0	20	3300/4300	330/550	-60	**17EXP22**
22.5	20	-75/400	150/390	-100	**17EZP22**
22.5	20	-75/400	165/430	-100	**17FGP22**
22.5	20	-75/400	150/390	-100	**17FHP22**
24.0	20	3300/4300	330/550	-60	**17FJP22**
22.5	20	-75/400	150/390	-100	**17FKP22**
22.5	20	-75/400	150/370	-100	**17VABP22**
22.5	20	-75/400	210/505	-125	**17VACP22**
22.5	20	-75/400	210/505	-125	**17VADP22**
27.5	25	4200/5000	175/460	-100	**18VABP22**
27.5	25	4200/5000	285/685	-150	**18VACP22**
27.5	25	4200/5000	285/685	-150	**18VADP22**
22.5	20	-75/400	150/390	-100	**18VAFP22**
27.5	25	4200/5000	200/535	-125	**18VAHP22**

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⧅ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorbtion characteristics.

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EXPLANATION OF SYMBOLS

O—Round Tube

□—Rectangular Tube

B—Fiberglass wrap implosion protection

E—Filled rim type implosion protection

G—Glass Tube

MET—Metal Tube

M—Matrix Screen

P—Sagged glass implosion plate attached to face

R—Anti-reflection faceplate

U—Rare earth red phosphor

V—Rim bands and tension band

W—Rim bands and tension band with mounting lugs

X—Tension band

Y—Tension band and mounting lugs

DUPES—Uni-potential electrostatic focus, delta

DBPES—Bi-potential electrostatic focus, delta

IUPES—Uni-potential electrostatic focus, inline

IBPES—Bi-potential electrostatic focus, inline

L.V.E.S.—Low voltage electrostatic focus

H.V.E.S.—High voltage electrostatic focus

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACE PLATE				Overall Length (Inches)	NECK LENGTH (Inches)	EXTERNAL COATING IN pf	BASING	FOCUS	HEATER	
				SHAPE	IMPLOSION PROTECTION	TREATMENT	LIGHT TRANSMIT-TANCE IN %						V.	A.
18VAJP22	⧅	90	G	□	V	U	53.5	18.056	6.893	1500/2100	14BE	DBPES	6.3	0.90
18VAKP22	⧅	90	G	□	W	U	53.5	18.056	6.893	1500/2100	14BE	DBPES	6.3	0.90
18VALP22	⧅	90	G	□	P	UR	42.5	18.248	6.893	1500/2100	14BH	DUPES	6.3	0.90
18VAMP22	⧅	90	G	□	V	U	43.5	18.056	6.893	1500/2100	14BH	DUPES	6.3	0.90
18VANP22	⧅	110	G	□	V	U	53.0	13.872	5.538	1350/1750	13C	DBPES	6.3	0.90
18VAQP22	△	90	G	□	V	U	52.0	17.856	6.693	1500/2100	14BE	DBPES	6.3	1.35
18VASP22	⧅	90	G	□	V	U	53.5	17.856	6.693	1500/2000	14BE	DBPES	6.3	0.90
18VATP22	⧅	90	G	□	V	U	43.5	17.856	6.693	1500/2000	14BE	DBPES	6.3	0.90
18VAZP22	⧅	90	G	□	V	U	53.5	18.056	6.893	1500/2100	14BH	DUPES	6.3	0.90
18VBAP22	△	90	G	□	V	U	52.0	18.050	6.900	1400/1900	14BE	DBPES	6.3	1.30
18VBDP22	⧅	90	G	□	V	U	53.5	18.056	6.893	1500/2100	14BH	DUPES	6.3	0.90
18VBEP22	⧅	90	G	□	W	U	53.0	18.056	6.893	1500/2100	14BH	DUPES	6.3	0.90
18VBGP22	⧅	90	G	□	P	UR	52.0	18.248	6.893	1500/2100	14BH	DUPES	6.3	0.90
18VBHP22	⧅	90	G	□	V	U	53.5	17.876	6.703	1500/2000	14BE	DBPES	6.3	1.35
18VBJP22	⧅	90	G	□	W	U	53.0	18.056	6.893	1500/2100	14BH	DUPES	6.3	0.90
18VBKP22	⧅	90	G	□	V	UM	85.5	18.056	6.893	1500/2100	14BE	DBPES	6.3	0.90
18VBMP22	⧅	90	G	□	W	U	53.5	18.056	6.893	1500/2100	14BE	DBPES	6.3	0.90
19EXP22	⧅	90	G	□	—	U	69.0	17.856	6.693	1500/2100	14BE	DBPES	6.3	0.90
19EYP22	⧅	90	G	□	P	UR	41.0	18.048	6.693	1500/2100	14BE	DBPES	6.3	0.90
19FMP22	△	90	G	□	P	U	50.0	18.048	6.693	1500/2100	14BE	DBPES	6.3	0.90
19FXP22	⧅	92	G	□	P	UR	41.0	18.062	6.687	1500/2000	14BE	DBPES	6.3	1.35
19GLP22	△	90	G	□	P	UR	41.0	17.937	6.437	1500/2000	14BE	DBPES	6.3	0.90
19GSP22	⧅	90	G	□	P	UR	41.0	18.066	6.703	1500/2000	14BE	DBPES	6.3	1.35
19GVP22	⧅	90	G	□	—	U	69.0	17.856	6.693	1400/1900	14BE	DBPES	6.3	0.90
19GWP22	⧅	90	G	□	P	UR	41.0	18.048	6.693	1400/1900	14BE	DBPES	6.3	0.90
19GXP22	△	90	G	□	—	U	72.0	17.520	6.417	1300/1800	14BE	DBPES	6.3	0.90
19GYP22	△	90	G	□	—	U	72.0	17.520	6.417	1000/2000	14BE	DBPES	6.3	0.90
19HBP22	△	90	G	□	P	U	41.0	18.048	6.693	1400/1900	14BE	DBPES	6.3	0.90
19HCP22	⧅	90	G	□	V	U	43.5	17.856	6.693	1500/2100	14BE	DBPES	6.3	0.90
19HFP22	△	90	G	□	P	UR	55.0	18.255	6.900	1400/1900	14BE	DBPES	6.3	1.30
19HKP22	△	90	G	□	V	U	43.5	17.856	6.693	1500/2000	14BE	DBPES	6.3	0.90
19HMP22	⧅	90	G	□	W	U	43.5	17.856	6.693	1500/2100	14BE	DBPES	6.3	0.90
19HNP22	⧅	90	G	□	V	U	43.5	17.856	6.693	1500/2100	14BH	DUPES	6.3	0.90
19HQP22	△	90	G	□	—	U	64.0	17.579	6.417	1400/1900	14BE	DBPES	6.3	0.90
19HRP22	△	90	G	□	P	UR	45.0	17.772	6.417	1400/1900	14BE	DBPES	6.3	0.90
19HTP22	△	90	G	□	W	U	43.5	17.856	6.693	1500/2100	14BH	DUPES	6.3	0.90
19HXP22	⧅	90	G	□	V	U	43.5	17.876	6.703	1500/2000	14BE	DBPES	6.3	1.35
19HYP22	△	90	G	□	V	U	43.5	17.856	6.693	1500/2100	14BH	DUPES	6.3	0.90
19JLP22	△	90	G	□	W	U	42.0	18.050	6.900	1400/1900	14BE	DBPES	6.3	1.30
19JNP22	⧅	90	G	□	V	U	43.5	17.876	6.703	1500/2000	14BE	DBPES	6.3	1.35
19JWP22	⧅	90	G	□	P	UR	42.5	18.048	6.693	1500/2100	14BH	DUPES	6.3	0.90
19JYP22	⧅	90	G	□	P	UR	51.5	18.048	6.693	1400/1900	14BE	DBPES	6.3	0.90
19JZP22	⧅	90	G	□	V	U	53.0	17.856	6.693	1500/2100	14BE	DBPES	6.3	0.90
19KLP22	⧅	90	G	□	W	U	53.0	17.856	6.693	1500/2100	14BE	DBPES	6.3	0.90
19TP22	△	60	G	○	—	—	—	24.375	8.843	1500/3000	20A	H.V.E.S.	6.3	1.80
19VABP22	△	70	G	□	P	UR	39.0	25.219	9.625	2000/2500	14AU	DBPES	6.3	1.80
19VAFP22	⧅	90	G	□	E	UM	80.5	18.047	6.693	1750/2250	14BE	DBPES	6.3	0.90
19VAGP22	⧅	90	G	□	E	U	52.0	18.047	6.693	1750/2250	14BE	DBPES	6.3	0.90
19VAMP22	⧅	90	G	□	P	UR	52.0	18.439	6.893	1400/1900	14BE	DBPES	6.3	0.90
19VANP22	⧅	90	G	□	V	U	53.0	18.247	6.893	1800/2300	14BH	DUPES	6.3	0.90
19VAQP22	⧅	90	G	□	W	U	53.5	18.247	6.893	1800/2300	14BE	DBPES	6.3	0.90
19VATP22	⧅	90	G	□	V	U	53.5	18.247	6.893	1800/2300	14BE	DBPES	6.3	0.90
19VAUP22	△	90	G	□	V	U	43.5	18.047	6.693	1500/2000	14BE	DBPES	6.3	0.90
19VBDP22	△	90	G	□	P	UR	52.0	18.239	6.693	1500/2000	14BE	DBPES	6.3	0.90
19VBLP22	⧅	110	G	□	V	U	53.5	14.091	5.568	1350/1750	13C	DBPES	6.3	0.90
19VBQP22	⧅	90	G	□	V	UM	70.0	18.247	6.893	1800/2300	14BH	DUPES	6.3	0.90
19VBRP22	⧅	90	G	□	V	UM	70.0	18.247	6.893	1800/2300	14BE	DBPES	6.3	0.90
19VBSP22	⧅	90	G	□	W	U	53.5	18.247	6.893	1800/2300	14BE	DBPES	6.3	0.90
19VBWP22	⧅	90	G	□	V	U	70.0	18.065	6.703	1800/2300	14BE	DBPES	6.3	1.35
19VCBP22	⧅	90	G	□	W	UM	70.0	18.247	6.893	1800/2300	14BE	DBPES	6.3	0.90

ANODE KV DESIGN MAX. ◈	TYPICAL OPERATING CONDITIONS				TUBE TYPE
	ANODE KV.	FOCUS ELEC-TRODE VOLTS	SPOT CUTOFF		
			GRID-NUMBER 2 VOLTS	GRID-NUMBER 1 VOLTS	
27.5	25	4200/5000	215/550	-125	**18VAJP22**
27.5	25	4200/5000	215/550	-125	**18VAKP22**
22.5	20	-75/400	210/505	-125	**18VALP22**
22.5	20	-75/400	210/505	-125	**18VAMP22**
22.5	20	3360/4000	210/540	-125	**18VANP22**
27.5	25	4200/5000	285/685	-150	**18VAQP22**
27.5	25	4200/5000	250/650	-150	**18VASP22**
27.5	25	4200/5000	250/650	-150	**18VATP22**
22.5	20	-75/400	210/505	-125	**18VAZP22**
27.5	25	4200/5000	340/970	-150	**18VBAP22**
22.5	20	-75/400	210/505	-125	**18VBDP22**
22.5	20	-75/400	150/390	-100	**18VBEP22**
22.5	20	-75/400	210/505	-125	**18VBGP22**
27.5	25	4200/5000	220/545	-125	**18VBHP22**
22.5	20	-75/400	150/390	-100	**18VBJP22**
27.5	25	4200/5000	215/550	-125	**18VBKP22**
27.5	25	4200/5000	205/535	-125	**18VBMP22**
27.5	25	4200/5000	285/685	-150	**19EXP22**
27.5	25	4200/5000	285/685	-150	**19EYP22**
27.5	25	4200/5000	285/685	-150	**19FMP22**
27.5	25	4200/5000	285/685	-150	**19FXP22**
23.0	22	3700/4400	100/400	-75	**19GLP22**
27.5	25	4200/5000	285/685	-150	**19GSP22**
27.5	25	4200/5000	285/685	-150	**19GVP22**
27.5	25	4200/5000	285/685	-150	**19GWP22**
24.0	22	3700/4400	190/460	-100	**19GXP22**
25.0	22	3530/4200	130/300	-70	**19GYP22**
27.5	25	4200/5000	285/685	-150	**19HBP22**
27.5	25	4200/5000	285/685	-150	**19HCP22**
27.5	25	4200/5000	340/970	-150	**19HFP22**
27.5	25	4200/5000	285/685	-150	**19HKP22**
27.5	25	4200/5000	285/685	-150	**19HMP22**
22.5	20	-75/400	150/390	-100	**19HNP22**
27.5	25	4200/5000	285/685	-150	**19HQP22**
27.5	25	4200/5000	285/685	-150	**19HRP22**
22.5	20	-75/400	150/390	-100	**19HTP22**
27.5	25	4200/5000	175/460	-100	**19HXP22**
22.5	20	-75/400	150/390	-100	**19HYP22**
27.5	25	4200/5000	340/970	-150	**19JLP22**
27.5	25	4200/5000	175/460	-100	**19JNP22**
22.5	20	-75/400	150/390	-100	**19JWP22**
27.5	25	4200/5000	285/685	-150	**19JYP22**
27.5	25	4200/5000	285/685	-150	**19JZP22**
27.5	25	4200/5000	285/685	-150	**19KLP22**
24.2▣	20	1950/3250	—	—	**19TP22**
27.5	25	4200/5000	310/690	-150	**19VABP22**
27.5	25	4200/5000	250/640	-150	**19VAFP22**
27.5	25	4200/5000	250/640	-150	**19VAGP22**
27.5	25	4200/5000	215/550	-125	**19VAMP22**
22.5	20	-75/400	210/505	-125	**19VANP22**
27.5	25	4200/5000	215/550	-125	**19VAQP22**
27.5	25	4200/5000	215/550	-125	**19VATP22**
27.5	25	4200/5000	200/540	-125	**19VAUP22**
27.5	25	4200/5000	200/540	-125	**19VBDP22**
27.5	25	4200/5000	205/535	-125	**19VBLP22**
22.5	20	-75/400	210/505	-125	**19VBQP22**
27.5	25	4200/5000	215/550	-125	**19VBRP22**
27.5	25	4200/5000	205/535	-125	**19VBSP22**
27.5	25	4200/5000	220/545	-125	**19VBWP22**
27.5	25	4200/5000	215/550	-125	**19VCBP22**

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⍂ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

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R—Anti-reflection faceplate

U—Rare earth red phosphor

V—Rim bands and tension band

W—Rim bands and tension band with mounting lugs

X—Tension band

Y—Tension band and mounting lugs

DUPES—Uni-potential electrostatic focus, delta

DBPES—Bi-potential electrostatic focus, delta

IUPES—Uni-potential electrostatic focus, inline

IBPES—Bi-potential electrostatic focus, inline

L.V.E.S.—Low voltage electrostatic focus

H.V.E.S.—High voltage electrostatic focus

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACE PLATE SHAPE	FACE PLATE IMPLOSION PROTECTION	FACE PLATE TREATMENT	FACE PLATE LIGHT TRANSMITTANCE IN %	Overall Length (Inches)	NECK LENGTH (Inches)	EXTERNAL COATING IN pf	BASING	FOCUS	HEATER V.	HEATER A.
19VCSP22	⧅	90	G	□	W	UM	69.0	18.247	6.893	1800/2300	14BE	DBPES	6.3	0.90
19VP22	△	62	G	○	—	—	—	26.437	10.531	1500/3000	14W	H.V.E.S.	6.3	1.80
20VABP22	△	90	G	□	V	U	42.0	19.012	6.693	2000/2500	14BE	DBPES	6.3	0.90
20VADP22	⧅	90	G	□	P	UR	49.5	19.404	6.893	2000/2500	14BE	DBPES	6.3	0.90
20VAEP22	⧅	90	G	□	V	U	51.0	19.212	6.893	2000/2500	14BE	DBPES	6.3	0.90
20VAFP22	⧅	90	G	□	W	U	51.0	19.212	6.893	2000/2500	14BE	DBPES	6.3	0.90
20VAGP22	⧅	90	G	□	P	UR	41.0	19.404	6.893	2000/2500	14BE	DBPES	6.3	0.90
20VAHP22	⧅	90	G	□	V	U	52.0	19.212	6.893	2000/2500	14BH	DUPES	6.3	0.90
20VAJP22	⧅	90	G	□	V	U	52.0	19.032	6.703	1800/2300	14BE	DBPES	6.3	1.35
20VAMP22	△	90	G	□	P	UR	52.0	19.204	6.693	2000/2500	14BE	DBPES	6.3	1.35
20VANP22	△	90	G	□	P	UR	52.0	19.204	6.693	2000/2500	14BE	DBPES	6.3	1.35
20VASP22	⧅	90	G	□	V	U	51.0	19.032	6.703	2000/2500	14BE	DBPES	6.3	1.35
21AXP22	△	70	MET	○	—	—	—	25.312	9.625	—	14W	—	6.3	1.80
21AXP22A	△	70	MET	○	—	—	—	24.937	9.625	—	14AH	—	6.3	1.80
21CYP22	△	70	G	○	—	—	72.0	25.031	9.625	2000/2500	14AL	DBPES	6.3	1.60
21CYP22A	⧅	70	G	○	—	—	—	25.031	9.625	2000/2500	14AL	—	6.3	1.80
21FBP22	⧅	70	G	○	—	—	72.0	25.031	9.625	2000/2500	14AU	DBPES	6.3	1.80
21FBP22A	⧅	70	G	○	—	U	72.0	25.031	9.625	2000/2500	14AU	DBPES	6.3	1.80
21FJP22	⧅	70	G	○	P	R	39.0	25.219	9.625	2000/2500	14AU	DBPES	6.3	1.80
21FJP22A	⧅	70	G	○	P	UR	39.0	25.219	9.625	2000/2500	14AU	DBPES	6.3	1.80
21FKP22	△	70	G	○	P	—	39.0	25.219	9.625	2000/2500	14AU	DBPES	6.3	1.80
21GFP22	⧅	90	G	□	P	UR	41.0	19.457	6.994	1500/2000	14BE	DBPES	6.3	1.35
21GRP22	△	90	G	□	V	U	41.0	19.300	6.875	1500/2000	14BE	DBPES	6.3	1.35
21GUP22	⧅	70	G	○	—	U	72.0	25.031	9.625	2000/2500	14AU	DBPES	6.3	1.90
21GVP22	⧅	70	G	○	P	UR	39.0	25.219	9.625	2000/5000	14AU	DBPES	6.3	1.90
21GWP22	⧅	90	G	□	P	UR	41.0	19.457	6.994	1500/2000	14BE	DBPES	6.3	1.35
21GYP22	△	70	G	○	P	U	69.0	25.219	9.625	2000/2500	14AU	DBPES	6.3	1.90
21HBP22	⧅	90	G	□	P	UR	52.0	19.457	6.994	1700/2200	14BE	DBPES	6.3	1.35
21VABP22	⧅	92	G	□	P	UR	40.5	19.228	6.893	1750/2250	14BE	DBPES	6.3	0.90
21VACP22	⧅	92	G	□	V	U	50.5	19.036	6.893	1750/2250	14BE	DBPES	6.3	0.90
21VADP22	⧅	92	G	□	W	U	50.5	19.036	6.893	1750/2250	14BE	DBPES	6.3	0.90
21VAJP22	△	92	G	□	V	U	53.0	18.820	6.693	1400/1800	14BE	DBPES	6.3	0.90
21VAKP22	⧅	92	G	□	P	URM	66.0	19.228	6.893	1750/2250	14BE	DBPES	6.3	0.90
21VALP22	⧅	92	G	□	W	UR	50.5	19.036	6.893	1750/2250	14BE	DBPES	6.3	0.90
21VAQP22	⧅	92	G	□	V	UM	68.0	19.036	6.893	1750/2250	14BE	DBPES	6.3	0.90
21VARP22	⧅	92	G	□	W	UM	68.0	19.036	6.893	1750/2250	14BE	DBPES	6.3	0.90
21VAUP22	⧅	92	G	□	V	UM	84.5	19.036	6.893	1750/2250	14BE	DBPES	6.3	0.90
22AHP22	△	90	G	□	V	U	42.0	19.012	6.693	1700/2200	14BE	DBPES	6.3	1.35
22ALP22	⧅	90	G	□	V	U	42.0	19.032	6.703	1800/2300	14BE	DBPES	6.3	1.35
22ANP22	⧅	90	G	□	V	U	52.0	19.012	6.693	2000/2500	14BH	DUPES	6.3	0.90
22ARP22	⧅	90	G	□	P	UR	50.5	19.204	6.693	2000/2500	14BE	DBPES	6.3	0.90
22ASP22	⧅	90	G	□	V	U	52.0	19.012	6.693	2000/2500	14BE	DBPES	6.3	0.90
22ATP22	⧅	90	G	□	W	U	52.0	19.012	6.693	2000/2500	14BE	DBPES	6.3	0.90
22EP22	△	70	G	□	—	—	73.0	25.375	11.688	1500/2800	14W	—	6.3	1.80
22JP22	⧅	90	G	□	P	UR	41.0	19.204	6.693	2000/2500	14BE	DBPES	6.3	0.90
22KP22	⧅	90	G	□	—	U	69.0	19.012	6.693	2000/2500	14BE	DBPES	6.3	0.90
22LP22	△	90	G	□	P	U	50.0	19.204	6.693	2000/2500	14BE	DBPES	6.3	0.90
22QP22	△	90	G	□	P	UR	42.0	19.427	6.920	1700/2200	14BE	DBPES	6.3	1.35
22RP22	△	90	G	□	—	U	69.0	19.239	6.920	1700/2200	14BE	DBPES	6.3	1.35
22SP22	⧅	90	G	□	P	UR	41.0	19.204	6.693	2000/2500	14BE	DBPES	6.3	1.35
22UP22	⧅	90	G	□	V	U	42.0	19.012	6.693	2000/2500	14BE	DBPES	6.3	0.90
22WP22	⧅	90	G	□	W	U	42.0	19.012	6.693	2000/2500	14BE	DBPES	6.3	0.90
22YP22	△	90	G	□	P	UR	52.0	19.469	6.950	1700/2200	14BE	DBPES	6.3	1.35
23EGP22	⧅	92	G	□	P	R	41.0	19.969	7.219	2000/2500	14BE	DBPES	6.3	1.35
23EGP22A	⧅	92	G	□	P	UR	41.0	19.969	7.219	1800/2500	14BE	DBPES	6.3	1.35
23VABP22	⧅	90	G	□	P	UR	50.0	20.912	6.703	2000/2500	14BE	DBPES	6.3	1.35
23VACP22	⧅	90	G	□	V	U	52.0	20.722	6.703	2000/2500	14BE	DBPES	6.3	1.35
23VADP22	△	90	G	□	V	U	42.0	20.702	6.693	2000/2500	14BE	DBPES	6.3	0.90
23VALP22	⧅	90	G	□	P	URM	67.0	21.094	6.893	2000/2500	14BE	DBPES	6.3	0.90
23VAMP22	⧅	90	G	□	V	UM	69.0	20.902	6.893	2000/2500	14BE	DBPES	6.3	0.90

ANODE KV DESIGN MAX. ◈	TYPICAL OPERATING CONDITIONS				TUBE TYPE
	ANODE KV.	FOCUS ELEC-TRODE VOLTS	SPOT CUTOFF		
			GRID-NUMBER 2 VOLTS	GRID-NUMBER 1 VOLTS	
27.5	25	4200/5000	205/535	-125	**19VCSP22**
29.7▣	25	6500/8000	150/330	-75	**19VP22**
27.5	25	4200/5000	285/685	-150	**20VABP22**
27.5	25	4200/5000	215/550	-125	**20VADP22**
27.5	25	4200/5000	215/550	-125	**20VAEP22**
27.5	25	4200/5000	215/550	-125	**20VAFP22**
27.5	25	4200/5000	215/550	-125	**20VAGP22**
22.5	20	-75/400	210/505	-125	**20VAHP22**
27.5	25	4200/5000	320/750	-150	**20VAJP22**
27.5	25	4200/5000	300/660	-150	**20VAMP22**
27.5	25	4200/5000	300/660	-150	**20VANP22**
27.5	25	4200/5000	220/545	-125	**20VASP22**
27.5▣	25	3800/5300	140/310	-39/-73	**21AXP22**
27.5▣	25	3800/5300	130/370	-45/-100	**21AXP22A**
27.5▣	25	4200/5000	105/345	-70	**21CYP22**
27.5▣	25	4200/5000	—	—	**21CYP22A**
27.5	25	4200/5000	105/345	-70	**21FBP22**
27.5	25	4200/5000	310/690	-150	**21FBP22A**
27.5	25	4200/5000	105/345	-70	**21FJP22**
27.5	25	4200/5000	310/690	-150	**21FJP22A**
27.5	25	4200/5000	105/345	-70	**21FKP22**
27.5	25	4200/5000	225/425	-100	**21GFP22**
27.5	25	4125/5000	340/970	-150	**21GRP22**
27.5	25	4200/5000	310/690	-150	**21GUP22**
27.5	25	4200/5000	310/690	-150	**21GVP22**
27.5	25	4125/5000	225/425	-100	**21GWP22**
27.5	25	4200/5000	310/690	-150	**21GYP22**
27.5	25	4200/5000	225/425	-100	**21HBP22**
27.5	25	4200/5000	215/550	-125	**21VABP22**
27.5	25	4200/5000	215/550	-125	**21VACP22**
27.5	25	4200/5000	215/550	-125	**21VADP22**
27.5	25	4200/5000	150/410	-100	**21VAJP22**
27.5	25	4200/5000	215/550	-125	**21VAKP22**
27.5	25	4200/5000	205/535	-125	**21VALP22**
27.5	25	4200/5000	215/550	-125	**21VAQP22**
27.5	25	4200/5000	215/550	-125	**21VARP22**
27.5	25	4200/5000	215/550	-125	**21VAUP22**
27.5	25	4200/5000	285/685	-150	**22AHP22**
27.5	25	4200/5000	320/750	-150	**22ALP22**
22.5	20	-75/400	150/390	-100	**22ANP22**
27.5	25	4200/5000	285/685	-150	**22ARP22**
27.5	25	4200/5000	285/685	-150	**22ASP22**
27.5	25	4200/5000	285/685	-150	**22ATP22**
27.5▣	25	4000/5100	50/225	-55/-105	**22EP22**
27.5	25	4200/5000	285/685	-150	**22JP22**
27.5	25	4200/5000	285/685	-150	**22KP22**
27.5	25	4200/5000	285/685	-150	**22LP22**
27.5	25	4200/5000	280/690	-150	**22QP22**
27.5	25	4200/5000	280/690	-150	**22RP22**
27.5	25	4200/5000	300/660	-150	**22SP22**
27.5	25	4200/5000	285/685	-150	**22UP22**
27.5	25	4200/5000	285/685	-150	**22WP22**
27.5	25	4200/5000	330/665	-150	**22YP22**
27.5	25	4175/5400	265/565	-90	**23EGP22**
27.5	25	4175/5400	265/565	-90	**23EGP22A**
27.5	25	4200/5000	220/545	-125	**23VABP22**
27.5	25	4200/5000	175/460	-100	**23VACP22**
27.5	25	4200/5000	285/685	-150	**23VADP22**
27.5	25	4200/5000	205/535	-125	**23VALP22**
27.5	25	4200/5000	205/535	-125	**23VAMP22**

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⊠ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorbtion characteristics.

☆ This type summary is based on EIA registered data, registered envelope data, and manufacturer's published data. Data presented herein have been carefully prepared from such publicly available data to assure technical correctness; however, no responsibility is assumed by the General Electric Company for possible inaccuracies.

EXPLANATION OF SYMBOLS

O—Round Tube

□—Rectangular Tube

B—Fiberglass wrap implosion protection

E—Filled rim type implosion protection

G—Glass Tube

MET—Metal Tube

M—Matrix Screen

P—Sagged glass implosion plate attached to face

R—Anti-reflection faceplate

U—Rare earth red phosphor

V—Rim bands and tension band

W—Rim bands and tension band with mounting lugs

X—Tension band

Y—Tension band and mounting lugs

DUPES—Uni-potential electrostatic focus, delta

DBPES—Bi-potential electrostatic focus, delta

IUPES—Uni-potential electrostatic focus, inline

IBPES—Bi-potential electrostatic focus, inline

L.V.E.S.—Low voltage electrostatic focus

H.V.E.S.—High voltage electrostatic focus

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACE PLATE SHAPE	FACE PLATE IMPLOSION PROTECTION	FACE PLATE TREATMENT	FACE PLATE LIGHT TRANSMIT-TANCE IN %	Overall Length (Inches)	NECK LENGTH (Inches)	EXTERNAL COATING IN pf	BASING	FOCUS	HEATER V.	HEATER A.
23VANP22	⧅	90	G	□	P	UR	50.5	21.094	6.893	2000/2500	14BE	DBPES	6.3	0.90
23VAQP22	⧅	90	G	□	V	U	52.0	20.902	6.893	2000/2500	14BE	DBPES	6.3	0.90
23VARP22	⧅	90	G	□	P	UR	41.0	21.094	6.893	2000/2500	14BE	DBPES	6.3	0.90
23VASP22	△	90	G	□	P	URM	67.5	20.894	6.693	2000/2500	14BE	DBPES	6.3	1.35
23VATP22	⧅	90	G	□	P	URM	78.2	20.924	6.693	2000/2500	14BE	DBPES	6.3	0.90
23VAXP22	⧅	90	G	□	P	URM	78.2	20.924	6.693	2000/2500	14BE	DBPES	6.3	1.35
23VAYP22	⧅	90	G	□	V	UM	80.0	20.732	6.693	2350/2850	14BE	DBPES	6.3	1.35
23VAZP22	⧅	90	G	□	—	UM	80.0	20.732	6.693	2000/2500	14BE	DBPES	6.3	0.90
23VBAP22	⧅	90	G	□	V	UM	80.0	20.732	6.693	2350/2850	14BE	DBPES	6.3	0.90
23VBCP22	⧅	90	G	□	V	U	42.0	20.702	6.693	2000/2500	14BE	DBPES	6.3	1.35
23VBDP22	⧅	90	G	□	V	U	42.0	20.702	6.693	2000/2500	14BE	DBPES	6.3	0.90
23VBJP22	△	90	G	□	V	U	53.0	20.702	6.693	1400/1800	14BE	DBPES	6.3	0.90
23VBKP22	⧅	90	G	□	W	UR	52.0	20.702	6.893	2000/2500	14BE	DBPES	6.3	0.90
23VBNP22	⧅	90	G	□	V	U	69.0	20.722	6.703	2000/2500	14BE	DBPES	6.3	1.35
23VBRP22	⧅	90	G	□	V	U	69.0	20.902	6.703	2000/2500	14BE	DBPES	6.3	0.90
23VBSP22	⧅	90	G	□	P	UR	67.0	20.912	6.703	2000/2500	14BE	DBPES	6.3	1.35
23VBTP22	⧅	90	G	□	V	U	52.0	20.722	6.703	2000/2500	14BE	DBPES	6.3	1.35
25ABP22	△	90	G	□	P	U	41.0	20.924	6.693	2000/2500	14BE	DBPES	6.3	0.90
25AEP22	△	90	G	□	—	U	69.0	20.960	6.950	2000/2500	14BE	DBPES	6.3	1.35
25AFP22	△	90	G	□	P	UR	52.0	21.160	6.950	2000/2500	14BE	DBPES	6.3	1.35
25AJP22	△	90	G	□	V	U	42.0	20.702	6.693	2000/2500	14BE	DBPES	6.3	0.90
25AKP22	△	90	G	□	E	U	42.0	20.960	6.950	2000/2500	14BE	DBPES	6.3	1.35
25ALP22	△	90	G	□	E	UR	52.0	20.732	6.693	2000/2500	14BE	DBPES	6.3	0.90
25ALP22A	△	90	G	□	W	UR	52.0	20.732	6.693	2000/2500	14BE	DBPES	6.3	0.90
25AMP22	△	90	G	□	W	U	42.0	20.732	6.693	2000/2500	14BE	DBPES	6.3	0.90
25ANP22	△	90	G	□	P	U	41.0	20.924	6.693	2000/2500	14BE	DBPES	6.3	1.35
25AP22	△	90	G	□	P	R	41.0	20.924	6.693	2000/2500	14BE	DBPES	6.3	0.90
25AP22A	⧅	90	G	□	P	UR	41.0	20.924	6.693	2000/2500	14BE	DBPES	6.3	0.90
25AQP22	⧅	90	G	□	P	UR	41.0	20.912	6.703	2000/2500	14BE	DBPES	6.3	1.35
25AWP22	⧅	90	G	□	V	U	42.0	20.722	6.703	2000/2500	14BE	DBPES	6.3	1.35
25AYP22	△	90	G	□	W	U	42.0	20.797	6.788	2000/2500	14BE	DBPES	6.3	1.35
25AZP22	△	90	G	□	V	U	42.0	20.702	6.693	2000/2500	14BE	DBPES	6.3	1.35
25BAP22	△	90	G	□	P	URM	78.2	20.924	6.693	2000/2500	14BE	DBPES	6.3	1.35
25BCP22	⧅	90	G	□	P	URM	67.5	20.894	6.693	2000/2500	14BE	DBPES	6.3	0.90
25BDP22	△	90	G	□	V	UM	69.0	20.702	6.693	2000/2500	14BE	DBPES	6.3	0.90
25BFP22	⧅	90	G	□	V	U	42.0	20.722	6.703	2000/2500	14BE	DBPES	6.3	1.35
25BGP22	⧅	90	G	□	P	UR	52.5	20.924	6.693	2000/2500	14BE	DBPES	6.3	0.90
25BHP22	△	90	G	□	V	U	52.0	20.702	6.693	2000/2500	14BE	DBPES	6.3	0.90
25BKP22	△	90	G	□	V	U	78.2	20.702	6.693	2000/2500	14BE	DBPES	6.3	1.35
25BMP22	△	90	G	□	P	UR	52.0	21.160	6.950	2000/2500	14BE	DBPES	6.3	1.35
25BP22	△	90	G	□	—	—	69.0	20.732	6.693	2000/2500	14BE	DBPES	6.3	0.90
25BP22A	⧅	90	G	□	—	U	69.0	20.732	6.693	2000/2500	14BE	DBPES	6.3	0.90
25CAP22	△	90	G	□	W	U	52.0	20.827	6.788	2000/2500	14BE	DBPES	6.3	1.35
25CBP22	△	90	G	□	P	UR	52.0	21.125	6.875	2000/2800	14BE	DBPES	6.3	1.30
25FP22	△	90	G	□	—	—	69.0	20.939	6.920	2000/2500	14BE	DBPES	6.3	1.30
25FP22A	△	90	G	□	—	U	69.0	20.736	6.693	2000/2500	14BE	DBPES	6.3	1.35
25GP22	△	90	G	□	P	R	42.0	21.127	6.920	2000/2500	14BE	DBPES	6.3	1.35
25GP22A	△	90	G	□	P	UR	42.0	20.924	6.693	2000/2500	14BE	DBPES	6.3	1.35
25RP22	△	90	G	□	—	U	69.0	20.535	6.496	2000/2500	14BE	DBPES	6.3	0.90
25SP22	△	90	G	□	P	R	41.0	21.125	6.875	2000/2800	14BE	DBPES	6.3	1.30
25UP22	△	90	G	□	E	U	55.0	20.512	6.500	2000/2500	14BE	DBPES	6.3	0.90
25VABP22	⧅	90	G	□	P	URM	66.0	21.822	6.893	2000/2500	14BE	DBPES	6.3	0.90
25VACP22	⧅	90	G	□	V	UM	67.5	21.630	6.893	2000/2500	14BE	DBPES	6.3	0.90
25VADP22	⧅	90	G	□	P	URM	48.0	21.822	6.893	2000/2500	14BE	DBPES	6.3	0.90
25VAEP22	⧅	90	G	□	P	UR	48.0	21.822	6.893	2000/2500	14BE	DBPES	6.3	0.90
25VAFP22	⧅	90	G	□	V	U	49.5	21.630	6.893	2000/2500	14BE	DBPES	6.3	0.90
25VAGP22	⧅	90	G	□	W	U	49.5	21.630	6.893	2000/2500	14BE	DBPES	6.3	0.90
25VAJP22	⧅	90	G	□	P	UR	48.0	21.603	6.693	2000/2500	14BE	DBPES	6.3	0.90
25VAKP22	⧅	90	G	□	P	UR	48.0	21.632	6.703	2000/2500	14BE	DBPES	6.3	1.35
25VAMP22	⧅	90	G	□	P	URM	78.0	21.628	6.693	2000/2500	14BE	DBPES	6.3	0.90

ANODE KV DESIGN MAX. ◆	TYPICAL OPERATING CONDITIONS				TUBE TYPE
	ANODE KV.	FOCUS ELEC-TRODE VOLTS	SPOT CUTOFF		
			GRID-NUMBER 2 VOLTS	GRID-NUMBER 1 VOLTS	
27.5	25	4200/5000	200/535	-125	**23VANP22**
27.5	25	4200/5000	200/535	-125	**23VAQP22**
27.5	25	4200/5000	205/535	-125	**23VARP22**
27.5	25	4200/5000	255/655	-150	**23VASP22**
27.5	25	4200/5000	250/650	-150	**23VATP22**
27.5	25	4200/5000	250/650	-150	**23VAXP22**
27.5	25	4200/5000	250/650	-150	**23VAYP22**
27.5	25	4200/5000	250/650	-150	**23VAZP22**
27.5	25	4200/5000	250/650	-150	**23VBAP22**
27.5	25	4200/5000	200/535	-125	**23VBCP22**
27.5	25	4200/5000	200/535	-125	**23VBDP22**
27.5	25	4200/5000	285/685	-150	**23VBJP22**
27.5	25	4200/5000	205/535	-125	**23VBKP22**
27.5	25	4200/5000	220/545	-125	**23VBNP22**
27.5	25	4200/5000	285/685	-150	**23VBRP22**
27.5	25	4200/5000	220/545	-125	**23VBSP22**
27.5	25	4200/5000	220/545	-125	**23VBTP22**
27.5	25	4200/5000	285/685	-150	**25ABP22**
27.5	25	4200/5000	355/685	-150	**25AEP22**
27.5	25	4200/5000	355/685	-150	**25AFP22**
27.5	25	4200/5000	285/685	-150	**25AJP22**
27.5	25	4200/5000	355/685	-150	**25AKP22**
27.5	25	4200/5000	285/685	-150	**25ALP22**
27.5	25	4200/5000	285/685	-150	**25ALP22A**
27.5	25	4200/5000	285/685	-150	**25AMP22**
27.5	25	4200/5000	300/660	-150	**25ANP22**
27.5	25	4200/5000	285/685	-150	**25AP22**
27.5	25	4200/5000	285/685	-150	**25AP22A**
27.5	25	4200/5000	320/750	-150	**25AQP22**
27.5	25	4200/5000	175/460	-100	**25AWP22**
27.5	25	4200/5000	335/975	-150	**25AYP22**
27.5	25	4200/5000	285/685	-150	**25AZP22**
27.5	25	4200/5000	290/650	-150	**25BAP22**
27.5	25	4200/5000	255/655	-150	**25BCP22**
27.5	25	4200/5000	255/655	-150	**25BDP22**
27.5	25	4200/5000	175/460	-100	**25BFP22**
27.5	25	4200/5000	285/685	-150	**25BGP22**
27.5	25	4200/5000	285/685	-150	**25BHP22**
27.5	25	4200/5000	120/370	-100	**25BKP22**
27.5	25	4200/5000	330/660	-150	**25BMP22**
27.5	25	4200/5000	285/685	-150	**25BP22**
27.5	25	4200/5000	285/685	-150	**25BP22A**
27.5	25	4200/5000	335/975	-150	**25CAP22**
27.5	25	4250/5000	340/990	-150	**25CBP22**
27.5	25	3600/4400	360/1000	-150	**25FP22**
27.5	25	4200/5000	285/685	-150	**25FP22A**
27.5	25	3600/4400	360/1000	-150	**25GP22**
27.5	25	4200/5000	285/685	-150	**25GP22A**
27.5	25	4200/5000	285/685	-150	**25RP22**
27.5	25	4250/5000	340/990	-150	**25SP22**
27.5	25	4200/5000	210/495	-105	**25UP22**
27.5	25	4200/5000	205/535	-125	**25VABP22**
27.5	25	4200/5000	205/535	-125	**25VACP22**
27.5	25	4200/5000	205/535	-125	**25VADP22**
27.5	25	4200/5000	205/535	-125	**25VAEP22**
27.5	25	4200/5000	205/535	-125	**25VAFP22**
27.5	25	4200/5000	205/535	-125	**25VAGP22**
27.5	25	4200/5000	160/410	-100	**25VAJP22**
27.5	25	4200/5000	220/545	-125	**25VAKP22**
27.5	25	4200/5000	250/650	-150	**25VAMP22**

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⧅ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

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EXPLANATION OF SYMBOLS

O—Round Tube

□—Rectangular Tube

B—Fiberglass wrap implosion protection

E—Filled rim type implosion protection

G—Glass Tube

MET—Metal Tube

M—Matrix Screen

P—Sagged glass implosion plate attached to face

R—Anti-reflection faceplate

U—Rare earth red phosphor

V—Rim bands and tension band

W—Rim bands and tension band with mounting lugs

X—Tension band

Y—Tension band and mounting lugs

DUPES—Uni-potential electrostatic focus, delta

DBPES—Bi-potential electrostatic focus, delta

IUPES—Uni-potential electrostatic focus, inline

IBPES—Bi-potential electrostatic focus, inline

L.V.E.S.—Low voltage electrostatic focus

H.V.E.S.—High voltage electrostatic focus

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACE PLATE: SHAPE	FACE PLATE: IMPLOSION PROTECTION	FACE PLATE: TREATMENT	FACE PLATE: LIGHT TRANSMIT-TANCE IN %	Overall Length (Inches)	NECK LENGTH (Inches)	EXTERNAL COATING IN pf	BASING	FOCUS	HEATER V.	HEATER A.
25VAQP22	⧅	90	G	□	V	UM	80.0	21.430	6.693	2300/2800	14BE	DBPES	6.3	0.90
25VAWP22	⧅	90	G	□	V	UM	67.5	21.430	6.693	1400/1800	14BE	DBPES	6.3	0.90
25VAXP22	⧅	90	G	□	W	UM	67.5	21.630	6.893	2000/2500	14BE	DBPES	6.3	0.90
25VAZP22	⧅	90	G	□	V	U	49.5	21.457	6.703	2000/2500	14BE	DBPES	6.3	1.35
25VBAP22	△	90	G	□	P	UR	66.0	21.622	6.693	2000/2500	14BE	DBPES	6.3	1.35
25VBGP22	⧅	90	G	□	V	U	67.5	21.457	6.703	2000/2500	14BE	DBPES	6.3	1.35
25VBJP22	⧅	90	G	□	W	U	49.5	21.630	6.893	2000/2500	14BE	DBPES	6.3	0.90
25VBKP22	⧅	90	G	□	W	U	67.5	21.457	6.703	2000/2500	14BE	DBPES	6.3	1.35
25VBLP22	⧅	90	G	□	P	UR	65.5	21.632	6.703	2000/2500	14BE	DBPES	6.3	1.35
25VBMP22	⧅	90	G	□	P	URM	82.5	21.822	6.893	2000/2500	14BE	DBPES	6.3	1.35
25WP22	⧅	90	G	□	P	UR	41.0	20.924	6.693	2000/2500	14BE	DBPES	6.3	1.35
25XP22	⧅	90	G	□	P	UR	41.0	20.924	6.693	2000/2500	14BE	DBPES	6.3	0.90
25YP22	⧅	90	G	□	—	U	69.0	20.732	6.693	2000/2500	14BE	DBPES	6.3	0.90
25ZP22	⧅	90	G	□	P	UR	41.0	21.160	6.950	2000/2500	14BE	DBPES	6.3	1.35
370AB22	△	90	G	□	W	—	—	14.725	—	—	14BH	—	6.3	0.90
370CB22	—	90	G	□	W	—	—	14.725	—	—	14BH	—	6.3	0.90
490AB22	—	90	G	□	—	—	—	17.520	—	—	14BE	—	6.3	0.90
490ACB22	—	90	G	□	—	—	—	17.520	—	—	14BE	—	6.3	0.90
490ADB22	—	90	G	□	—	—	—	17.992	—	—	14BE	—	6.3	0.80
490AEB22	—	90	G	□	P	—	—	17.992	—	—	14BE	—	6.3	0.80
490AFB22	—	90	G	□	P	—	—	17.792	—	—	14BE	—	6.3	0.80
490AGB22	—	90	G	□	P	—	—	17.756	—	—	14BE	—	6.3	0.90
490AHB22	—	90	G	□	—	—	—	17.950	—	—	14BE	—	6.3	0.90
490AHB22A	—	90	G	□	—	—	—	17.954	—	—	14BE	—	6.3	0.90
490AJB22	—	90	G	□	P	—	—	18.147	—	—	14BE	—	6.3	0.90
490AJB22A	—	90	G	□	P	—	—	18.147	—	—	14BE	—	6.3	0.90
490AKB22	—	90	G	□	—	—	—	17.579	—	—	14BE	—	6.3	0.80
490ALB22	—	90	G	□	—	—	—	17.520	—	—	14BE	—	6.3	0.90
490AMB22	—	90	G	□	—	—	—	17.952	—	—	14BE	—	6.3	0.90
490ANB22	—	90	G	□	—	—	—	17.579	—	—	14BE	—	6.3	0.90
490ARB22	—	90	G	□	P	—	—	17.756	—	—	14BE	—	6.3	0.90
490ASB22	△	90	G	□	P	—	54.0	17.772	6.418	1300/1900	14BE	—	6.3	0.90
490BAB22	—	90	G	□	—	—	—	18.228	—	—	14BE	—	6.3	0.80
490BCB22	—	90	G	□	P	—	—	18.421	—	—	14BE	—	6.3	0.80
490BDB22	—	90	G	□	W	—	—	18.140	—	—	14BE	—	6.3	0.90
490BGB22	△	90	G	□	—	U	64.0	17.601	6.439	1500/2100	14BH	—	6.3	0.90
490BHB22	△	90	G	□	E	U	45.0	17.793	6.439	1500/2100	14BE	—	6.3	0.90
490BNB22	—	90	G	□	P	—	—	18.151	—	—	14BH	—	6.3	0.90
490BRB22	△	90	G	□	V	U	45.5	17.793	6.439	1500/2100	14BE	—	6.3	0.90
490BUB22	△	90	G	□	W	UR	64.0	17.601	6.439	1500/2100	14BE	—	6.3	0.90
490BVB22	—	90	G	□	P	—	—	18.540	—	—	14BH	—	6.3	0.90
490BXB22	△	90	G	□	P	UR	45.0	17.793	6.439	1400/1900	14BE	—	6.3	0.90
490CB22	—	90	G	□	W	—	—	17.520	—	—	14BE	—	6.3	0.90
490DB22	—	90	G	□	W	—	—	18.110	—	—	14BE	—	6.3	0.90
490EB22	—	90	G	□	—	—	—	17.520	—	—	14BE	—	6.3	0.90
490EB22A	—	90	G	□	—	—	—	17.520	—	—	14BE	—	6.3	0.90
490FB22	—	90	G	□	—	—	—	18.110	—	—	14BE	—	6.3	0.90
490GB22	—	90	G	□	—	—	—	17.520	—	—	14BE	—	6.3	0.90
490HB22	—	90	G	□	—	—	—	17.913	—	—	14BE	—	6.3	0.90
490JB22	—	90	G	□	—	—	—	18.504	—	—	14BE	—	6.3	0.90
490JB22A	—	90	G	□	—	—	—	—	—	—	14BE	—	6.3	0.90
490KB22	—	90	G	□	—	—	—	18.110	—	—	14BE	—	6.3	0.80
490KB22A	—	90	G	□	—	—	—	18.110	—	—	14BE	—	6.3	0.80
490LB22	—	90	G	□	—	—	—	17.913	—	—	14BE	—	6.3	0.80
490MB22	—	90	G	□	W	—	—	18.150	—	—	14BE	—	6.3	0.90
490NB22	—	90	G	□	P	—	—	18.346	—	—	14BE	—	6.3	0.90
490RB22	—	90	G	□	P	—	—	17.756	—	—	14BE	—	6.3	0.90
490SB22	—	90	G	□	P	—	—	17.795	—	—	14BE	—	6.3	0.90
490TB22	—	90	G	□	P	—	—	17.520	—	—	14BE	—	6.3	0.80
490UB22	—	90	G	□	—	—	—	17.520	—	—	14BE	—	6.3	0.90

ANODE KV DESIGN MAX. ◈	TYPICAL OPERATING CONDITIONS				TUBE TYPE
	ANODE KV.	FOCUS ELEC-TRODE VOLTS	SPOT CUTOFF		
			GRID-NUMBER 2 VOLTS	GRID-NUMBER 1 VOLTS	
27.5	25	4200/5000	250/650	-150	**25VAQP22**
27.5	25	4200/5000	250/650	-150	**25VAWP22**
27.5	25	4200/5000	205/535	-125	**25VAXP22**
27.5	25	4200/5000	220/545	-125	**25VAZP22**
27.5	25	4200/5000	200/525	-125	**25VBAP22**
27.5	25	4200/5000	220/545	-125	**25VBGP22**
27.5	25	4200/5000	205/535	-125	**25VBJP22**
27.5	25	4200/5000	220/545	-125	**25VBKP22**
27.5	25	4200/5000	220/545	-125	**25VBLP22**
27.5	25	4200/5000	205/535	-125	**25VBMP22**
27.5	25	4200/5000	300/660	-150	**25WP22**
27.5	25	4200/5000	285/685	-150	**25XP22**
27.5	25	4200/5000	285/685	-150	**25YP22**
27.5	25	4200/5000	355/685	-150	**25ZP22**
22.5	20	-75/400	200	-57/-125	**370AB22**
22.5	20	-75/400	200	-57/-125	**370CB22**
23.0	20	3360/4000	200	-50/-105	**490AB22**
23.0	20	3360/4000	200	-50/-105	**490ACB22**
23.0	20	3360/4000	200	-50/-105	**490ADB22**
23.0	20	3360/4000	200	-50/-105	**490AEB22**
23.0	20	3360/4000	200	-50/-105	**490AFB22**
23.0	20	3360/4000	200	-50/-105	**490AGB22**
27.5	25	4200/5000	285/684	-150	**490AHB22**
27.5	25	4200/5000	300/695	-150	**490AHB22A**
26.0	24	4030/4800	150/420	-150	**490AJB22**
27.5	25	4200/5000	300/695	-150	**490AJB22A**
26.0	24	4030/4800	200	-50/-105	**490AKB22**
23.0	20	3360/4000	200	-50/-105	**490ALB22**
26.0	24	4030/4800	200	-50/-105	**490AMB22**
25.5	22	3700/4400	200	-50/-105	**490ANB22**
23.0	20	3360/4000	200	-50/-105	**490ARB22**
26.0	24	4030/4800	200	-50/-105	**490ASB22**
26.0	24	4030/4800	285/685	-150	**490BAB22**
26.0	24	4030/4800	285/685	-150	**490BCB22**
26.0	24	4030/4800	150/420	-100	**490BDB22**
22.5	20	4200/5000	200/375	-100	**490BGB22**
27.5	25	4200/5000	190/380	-100	**490BHB22**
22.5	20	-75/400	150/390	-100	**490BNB22**
27.5	25	4200/5000	340/630	-150	**490BRB22**
27.5	25	4200/5000	190/380	-100	**490BUB22**
23.0	20	-75/400	150/410	-100	**490BVB22**
22.5	20	-75/400	200/350	-100	**490BXB22**
23.0	20	3360/4000	200	-50/-105	**490CB22**
23.0	20	3360/4000	200	-50/-105	**490DB22**
23.0	20	3360/4000	200	-50/-105	**490EB22**
23.0	20	3360/4000	200	-50/-105	**490EB22A**
23.0	20	3360/4000	200	-50/-105	**490FB22**
23.0	20	3360/4000	200/520	-200	**490GB22**
24.0	22	3700/4400	325/800	-150	**490HB22**
23.0	20	3360/4000	290/670	-150	**490JB22**
23.0	20	3360/4000	200	-50/-105	**490JB22A**
23.0	20	3360/4000	200	-50/-105	**490KB22**
23.0	20	3360/4000	200	-50/-105	**490KB22A**
23.0	20	3360/4000	200	-50/-105	**490LB22**
23.0	20	3360/4000	200	-50/-105	**490MB22**
23.0	20	3360/4000	200	-50/-105	**490NB22**
23.0	20	3360/4000	200	-50/-105	**490RB22**
23.0	20	3360/4000	200	-50/-105	**490SB22**
23.0	20	3360/4000	200	-50/-105	**490TB22**
23.0	20	3360/4000	200	-50/-105	**490UB22**

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⊠ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

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EXPLANATION OF SYMBOLS

O—Round Tube

□—Rectangular Tube

B—Fiberglass wrap implosion protection

E—Filled rim type implosion protection

G—Glass Tube

MET—Metal Tube

M—Matrix Screen

P—Sagged glass implosion plate attached to face

R—Anti-reflection faceplate

U—Rare earth red phosphor

V—Rim bands and tension band

W—Rim bands and tension band with mounting lugs

X—Tension band

Y—Tension band and mounting lugs

DUPES—Uni-potential electrostatic focus, delta

DBPES—Bi-potential electrostatic focus, delta

IUPES—Uni-potential electrostatic focus, inline

IBPES—Bi-potential electrostatic focus, inline

L.V.E.S.—Low voltage electrostatic focus

H.V.E.S.—High voltage electrostatic focus

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACE PLATE SHAPE	FACE PLATE IMPLOSION PROTECTION	FACE PLATE TREATMENT	FACE PLATE LIGHT TRANSMIT-TANCE IN %	Overall Length (Inches)	NECK LENGTH (Inches)	EXTERNAL COATING IN pf	BASING	FOCUS	HEATER V.	HEATER A.
490VB22	—	90	G	□	P	—	—	17.756	—	—	14BE	—	6.3	0.90
490WB22	—	90	G	□	—	—	—	17.520	—	—	14BE	—	6.3	0.90
490XB22	—	90	G	□	P	—	—	17.756	—	—	14BE	—	6.3	0.90
490YB22	—	90	G	□	P	—	—	17.756	—	—	14BE	—	6.3	0.90
490ZB22	—	90	G	□	P	—	—	17.756	—	—	14BE	—	6.3	0.90

ANODE KV DESIGN MAX. ◆	TYPICAL OPERATING CONDITIONS				TUBE TYPE
	ANODE KV.	FOCUS ELEC-TRODE VOLTS	SPOT CUTOFF		
			GRID-NUMBER 2 VOLTS	GRID-NUMBER 1 VOLTS	
23.0	20	3360/4000	200	-50/-105	490VB22
23.0	20	3360/4000	200	-50/-105	490WB22
23.0	20	3360/4000	200	-50/-105	490XB22
25.5	23	3860/4600	200	-50/-105	490YB22
23.0	20	3360/4000	200	-50/-105	490ZB22

NOTES

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B—Fiberglass wrap implosion protection

E—Filled rim type implosion protection

G—Glass Tube

MET—Metal Tube

M—Matrix Screen

P—Sagged glass implosion plate attached to face

R—Anti-reflection faceplate

U—Rare earth red phosphor

V—Rim bands and tension band

W—Rim bands and tension band with mounting lugs

X—Tension band

Y—Tension band and mounting lugs

DUPES—Uni-potential electrostatic focus, delta

DBPES—Bi-potential electrostatic focus, delta

IUPES—Uni-potential electrostatic focus, inline

IBPES—Bi-potential electrostatic focus, inline

L.V.E.S.—Low voltage electrostatic focus

H.V.E.S.—High voltage electrostatic focus

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE			EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER	
				SHAPE	IMPLOSION PROTECTION	TREATMENT							V.	A.
2EP4	△	30	G	○	—	A	300/500	L.V.E.S.	N	8.250	5.625	8JK	6.3	0.145
5AXP4	△	53	G	○	—	C	None	Auto.Es.	N	10.625	7.375	12S	6.3	0.60
7DP4	△	50	G	○	—	C	400/1500	H.V.E.S.	D	14.062	8.125	12C	6.3	0.60
7RP4	△	50	G	○	—	CA	None	Mag.	S	14.062	8.125	12D	6.3	0.60
8AP4	△	54	MET	○	—	C	None	Mag.	S	14.250	7.000	12H	6.3	0.60
8AP4A	△	54	MET	○	—	F	None	Mag.	S	14.250	7.000	12H	6.3	0.60
8DP4	△	90	G	□	—	F	250/350	L.V.E.S.	S	10.438	6.500	12AB	6.3	0.60
8JP4	△	110	G	□	—	FA	None	Auto.Es.	N	8.938	5.438	8JL	6.3	0.60
8LP4	△	110	G	□	—	FA	200/400	L.V.E.S.	N	8.688	5.188	7FA	6.3	0.30
8MP4	△	90	G	□	—	FA	250/350	L.V.E.S.	N	9.938	6.000	12L	6.3	0.60
8XP4	△	90	G	□	—	F	None	Auto.Es.	N	11.348	7.500	12S	6.3	0.60
8YP4	△	110	G	□	—	F	None	Auto.Es.	N	8.688	5.188	7FG	6.3	0.60
9ACP4	△	90	G	□	X	FA	300/750	L.V.E.S.	N	8.265	3.698	7GR	12.0	0.065
9AGP4	△	90	G	□	X	FA	300/750	L.V.E.S.	N	8.346	3.700	7GR	12.0	0.065
9QP4	△	70	G	□	—	C	None	L.V.E.S.	S	12.750	6.500	12AD	4.7	0.30
9QP4A	△	70	G	□	—	F	None	L.V.E.S.	S	12.750	6.500	12AD	4.7	0.30
9SP4	△	90	G	□	—	A	300/500	L.V.E.S.	N	10.500	5.719	8HR	6.3	0.60
9TP4	△	110	G	□	E	A	350/600	L.V.E.S.	N	8.375	4.250	8HR	6.3	0.45
9UP4	△	90	G	□	—	FA	300/750	L.V.E.S.	N	8.267	3.540	7GR	12.6	0.075
9VP4	△	90	G	□	—	FA	300/750	L.V.E.S.	N	7.906	3.344	7GR	12.6	0.075
9WP4	△	90	G	□	X	FA	300/750	L.V.E.S.	N	8.270	2.920	7GR	12.0	0.075
9YP4	△	90	G	□	X	FA	300/750	L.V.E.S.	N	8.440	3.250	7GR	12.6	0.075
10ABP4	△	90	G	□	—	C	400/850	L.V.E.S.	S	11.875	6.500	12L	6.3	0.60
10ABP4A	△	90	G	□	—	CA	400/850	L.V.E.S.	S	11.875	6.500	12L	6.3	0.60
10ABP4B	△	90	G	□	—	F	400/850	L.V.E.S.	S	11.875	6.500	12L	6.3	0.60
10ABP4C	△	90	G	□	—	FA	400/850	L.V.E.S.	S	11.875	6.500	12L	6.3	0.60
10ADP4	△	90	G	□	—	F	400/850	L.V.E.S.	S	11.875	6.500	12L	8.4	0.45
10AEP4	△	90	G	□	—	F	400/850	L.V.E.S.	S	11.875	6.500	12L	6.3	0.45
10ARP4	△	90	G	□	X	FA	300/750	L.V.E.S.	N	9.425	3.875	7GR	6.3	0.30
10ASP4	△	90	G	□	X	FA	300/750	L.V.E.S.	N	8.700	4.020	7GR	6.3	0.45
10BP4	△	50	G	○	—	C	500/2500	Mag.	D	17.625	8.188	12N	6.3	0.60
10BP4A	△	50	G	○	—	F	500/2500	Mag.	D	17.625	8.188	12N	6.3	0.60
10BP4C	△	50	G	○	—	CA	500/2500	Mag.	S	17.625	8.188	12N	6.3	0.60
10BP4D	△	50	G	○	—	FA	500/2500	Mag.	S	17.625	8.188	12N	6.3	0.60
10DP4	△	50	G	○	—	CA	None	H.V.E.S.	N	17.625	8.188	12M	6.3	0.60
10FP4	△	50	G	○	—	CA	500/2500	Mag.	N	17.625	8.188	12N	6.3	0.60
10FP4A	△	50	G	○	—	FA	500/2500	Mag.	N	17.625	8.188	12N	6.3	0.60
SG-10FP4A	△	50	G	○	—	FA	500/2500	Mag.	N	17.625	8.188	12N	6.3	0.60
10MP4	△	50	G	○	—	C	500/2500	Mag.	D	17.000	7.557	12G	6.3	0.60
10MP4A	△	50	G	○	—	F	500/2500	Mag.	D	17.000	7.557	12G	6.3	0.60
10RP4	△	50	G	○	—	CA	750/1500	L.V.E.S.	N	16.500	7.062	12L	6.3	0.60
11AP4	△	110	G	□	L	FA	500/750	L.V.E.S.	N	8.938	4.250	8HR	6.3	0.45
11BP4	△	110	G	□	—	FA	400/700	L.V.E.S.	N	8.938	4.250	8HR	6.3	0.45
11CP4	△	110	G	□	—	FA	500/750	L.V.E.S.	N	8.938	4.250	8HR	6.3	0.45
11DP4	△	110	G	□	—	FA	500/750	L.V.E.S.	N	8.938	4.250	8HR	6.3	0.45
11EP4	△	114	G	□	—	FA	300/500	L.V.E.S.	N	8.460	4.130	8HR	6.3	0.60
11FP4	△	114	G	□	—	FA	300/500	L.V.E.S.	N	8.460	4.130	8HR	6.3	0.45
11GP4	△	110	G	□	E	FA	400/600	L.V.E.S.	N	8.938	4.250	8HR	6.3	0.45
11HP4	△	110	G	□	X	FA	500/750	L.V.E.S.	N	8.938	4.250	8HR	6.3	0.45
11HP4A	△	110	G	□	X	FA	500/750	L.V.E.S.	N	8.785	4.125	8HR	6.3	0.45
11JP4	△	110	G	□	E	FA	400/600	L.V.E.S.	N	8.938	4.250	8HR	6.3	0.30
11KP4	△	110	G	□	X	FA	500/750	L.V.E.S.	N	8.910	4.250	8HR	6.3	0.45
11LP4	△	110	G	□	—	FA	400/600	L.V.E.S.	N	9.250	4.590	8HR	6.3	0.30
11MP4	△	110	G	□	E	FA	400/600	L.V.E.S.	N	8.938	4.250	8HR	6.3	0.30
11QP4	△	90	G	□	—	FA	400/800	L.V.E.S.	N	9.610	3.710	7GR	12.6	0.075
11RP4	△	104	G	□	X	FA	400/750	L.V.E.S.	N	9.000	3.875	7GR	6.3	0.45
11TP4	△	110	G	□	X	FA	400/600	L.V.E.S.	N	8.937	4.277	8HR	6.3	0.30
11UP4	△	104	G	□	X	FA	400/750	L.V.E.S.	N	9.000	3.875	7GR	6.3	0.45
12AYP4	△	110	G	□	—	FA	400/900	L.V.E.S.	N	9.312	4.125	8HR	6.3	0.45
12AZP4	△	110	G	□	—	FA	400/900	L.V.E.S.	N	9.312	4.125	8HR	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES◆	TYPICAL OPERATING CONDITIONS DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELECTRODE VOLTS	RASTER CUTOFF VOLTS	TUBE TYPE
11.0▣	Grid	9	300	-50/350	-15/-25	**2EP4**
19.8▣	Grid	14	300	—	-28/-72	**5AXP4**
8.8▣	Grid	6	250	1215/1465	-22/-58	**7DP4**
13.2▣	Grid	9	250	—	-22/-58	**7RP4**
9.9▣	Grid	9	—	—	-22/-58	**8AP4**
9.9▣	Grid	9	—	—	-22/-58	**8AP4A**
8.8▣	Grid	6	150	15/315	-13/-35	**8DP4**
22.0▣	Grid	16	300	—	-35/-72	**8JP4**
20.0	Grid	16	300	0/400	-35/-72	**8LP4**
18.0▣	Grid	15	300	0/450	-28/-72	**8MP4**
22.0▣	Grid	16	300	—	-28/-72	**8XP4**
22.0▣	Grid	16	300	—	-28/-72	**8YP4**
12.0	Cath.	10	100	0/300	30/60	**9ACP4**
12.0	Cath.	10	100	0/300	26/56	**9AGP4**
7.5▣	Cath.	5.5	200	0/400	28/52	**9QP4**
7.5▣	Cath.	5.5	200	0/400	28/52	**9QP4A**
18.0	Cath.	14	300	0/400	33/77	**9SP4**
15.0	Cath.	12	50	0/300	37/53	**9TP4**
12.0	Cath.	9	100	0/300	35/55	**9UP4**
12.0	Grid	9	100	0/300	-38/-84	**9VP4**
12.0	Cath.	9	100	0/300	32/50	**9WP4**
12.0	Grid	9	100	0/300	-38/-84	**9YP4**
13.2▣	Grid	7.5	300	0/500	-38/-62	**10ABP4**
13.2▣	Grid	7.5	300	0/500	-38/-62	**10ABP4A**
13.2▣	Grid	7.5	300	0/500	-38/-62	**10ABP4B**
13.2▣	Grid	7.5	300	0/500	-38/-62	**10ABP4C**
13.2▣	Grid	7.5	300	0/500	-33/-72	**10ADP4**
13.2▣	Grid	7.5	300	0/500	-38/-62	**10AEP4**
13.0	Cath.	9	140	-250/+150	31/49	**10ARP4**
12.0	Cath.	9	100	0/300	33/52	**10ASP4**
11.0▣	Grid	9	250	—	-22/-58	**10BP4**
13.2▣	Grid	9	250	—	-22/-58	**10BP4A**
11.0▣	Grid	9	250	—	-22/-58	**10BP4C**
11.0▣	Grid	9	250	—	-22/-58	**10BP4D**
11.0▣	Grid	9	250	2550/3250	-36/-84	**10DP4**
11.0▣	Grid	9	250	—	-22/-58	**10FP4**
13.2▣	Grid	11	250	—	-22/-58	**10FP4A**
13.2▣	Grid	11	250	—	-22/-58	**SG-10FP4A**
11.0▣	Grid	9	—	—	-22/-58	**10MP4**
11.0▣	Grid	9	—	—	-22/-58	**10MP4A**
17.6▣	Grid	14	300	-55/300	-28/-72	**10RP4**
15.0	Cath.	11	150	0/400	31/49	**11AP4**
15.0	Cath.	11	150	0/400	31/49	**11BP4**
15.0	Grid	12	400	0/400	-39/-94	**11CP4**
15.0	Cath.	11	50	-100/300	31/49	**11DP4**
14.0	Grid	10	400	0/400	-36/-94	**11EP4**
14.0	Grid	10	400	0/400	-36/-94	**11FP4**
15.0	Cath.	11	135	-200/200	27/43	**11GP4**
15.0	Cath.	11	150	—	31/49	**11HP4**
15.0	Cath.	11	150	—	31/49	**11HP4A**
15.0	Cath.	11	50	-200/200	24/75	**11JP4**
15.0	Cath.	11	150	-100/300	31/49	**11KP4**
15.0	Grid	10	400	0/400	-36/-94	**11LP4**
15.0	Cath.	11	135	-200/200	27/43	**11MP4**
14.0	Cath.	10	100	0/300	32/50	**11QP4**
15.0	Cath.	11	140	—	31/49	**11RP4**
15.0	Cath.	10	400	0/400	36/78	**11TP4**
15.0	Cath.	11	140	—	31/49	**11UP4**
14.0	Grid	10	400	0/400	-36/-94	**12AYP4**
14.0	Grid	10	400	0/400	-36/-94	**12AZP4**

EXPLANATION OF SYMBOLS

M—Metal cone tube
G—Glass tube
LWG—Light weight glass tube
G°—Glass tube, dimensions different from normal
MET—Metal tube
O—Round tube
□—Rectangular tube, spherical face
◎—Rectangular tube, cylindrical face
B—Fiberglass wrap implosion protection
E—Filled rim type implosion protection
T—Molded glass implosion panel attached to face
P—Sagged glass implosion plate attached to face
L—Plastic implosion barrier attached to face
K—Banded tube with coated funnel for implosion protection
H—Tube sealed into steel sheath for implosion protection
C—Clear glass faceplate
F—Gray filter glass faceplate
R—Anti-reflection faceplate
A—Aluminized screen
V—Rim bands and tension band
W—Rim bands and tension band with mounting lugs
X—Formed with tension band
Y—Formed rim with tension band and mounting lugs
Mag.—Magnetic focus
L.V.E.S.—Low voltage electrostatic focus
H.V.E.S.—High Voltage electrostatic focus
Auto.Es.—Self-focusing electrostatic
Int.Mag.—Internal magnetic focus
TPF—Tri-potential focus
N—No ion trap
S—Single field ion trap
D—Double field ion trap
I—Internal ion trap
*—18 second heater warm-up time (all others are 11 second)
Grid—Grid drive service (all voltages with respect to cathode)
Cath.—Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

◆ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

□ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorbtion characteristics.

☆ This type summary is based on EIA registered data, registered envelope data, and manufacturer's published data. Data presented herein have been carefully prepared from such publicly available data to assure technical correctness; however, no responsibility is assumed by the General Electric Company for possible inaccuracies.

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
12BAP4	△	110	G	□	—	FA	400/900	L.V.E.S.	N	9.312	4.125	8HR	6.3	0.30
12BEP4	△	110	G	□	E	FA	500/900	L.V.E.S.	N	9.312	4.375	7FA	6.3	0.45
12BFP4	△	110	G	□	—	FA	400/1200	L.V.E.S.	N	9.330	3.270	7GR	4.2	0.45
12BGP4	△	110	G	□	E	FA	550/850	L.V.E.S.	N	9.312	4.375	8HR	6.3	0.45
12BJP4	△	110	G	□	—	FA	400/900	L.V.E.S.	N	9.300	4.130	8HR	4.2	0.45
12BKP4	△	110	G	□	X	FA	500/1000	L.V.E.S.	N	9.348	4.375	8HR	6.3	0.45
12BLP4	△	110	G	□	X	FA	800/1000	L.V.E.S.	N	9.348	4.375	8HR	6.3	0.45
12BMP4	△	104	G	□	X	FA	500/750	L.V.E.S.	N	9.531	3.875	7GR	6.3	0.45
12BNP4	△	110	G	□	X	FA	500/750	L.V.E.S.	N	9.348	4.375	8HR	6.3	0.45
12BNP4A	△	110	G	□	X	FA	500/750	L.V.E.S.	N	9.348	4.375	8HR	6.3	0.45
12BQP4	△	110	G	□	X	FA	600/900	L.V.E.S.	N	9.348	4.375	8HR	6.3	0.45
12BSP4	△	110	G	□	—	FA	400/900	L.V.E.S.	N	9.300	4.130	8HR	6.3	0.30
12BTP4	△	110	G	□	E	FA	550/850	L.V.E.S.	N	9.344	4.375	8HR	12.6	0.150
12BUP4	△	110	G	□	V	FA	450/900	L.V.E.S.	N	9.290	4.120	8HR	6.3	0.45
12BUP4A	△	110	G	□	X	FA	450/900	L.V.E.S.	N	9.290	4.130	8HR	6.3	0.45
12BUP4B	△	110	G	□	X	FA	450/900	L.V.E.S.	N	9.290	4.130	8HR	6.3	0.45
12BUP4C	△	110	G	□	X	FA	450/900	L.V.E.S.	N	9.290	4.130	8HR	6.3	0.45
12BVP4	△	110	G	□	X	FA	450/900	L.V.E.S.	N	9.350	3.900	7GR	12.6	0.075
12BZP4	△	104	G	□	X	FA	500/750	L.V.E.S.	N	9.531	3.875	7GR	12.0	0.157
12CBP4	△	110	G	□	X	FA	500/900	L.V.E.S.	N	9.312	4.375	7FA	6.3	0.45
12CDP4	△	104	G	□	X	FA	500/750	L.V.E.S.	N	9.500	3.875	7GR	6.3	0.45
12CEP4	△	110	G	□	E	FA	600/900	L.V.E.S.	N	9.021	3.867	7GR	12.6	0.15
12CFP4	△	110	G	□	X	FA	450/900	L.V.E.S.	N	9.330	3.900	7GR	4.2	0.45
12CHP4	△	110	G	□	X	FA	450/900	L.V.E.S.	N	9.330	3.900	7GR	6.3	0.45
12CNP4	△	110	G	□	X	FA	600/1200	L.V.E.S.	N	9.530	4.090	7GR	4.2	0.45
12CNP4A	△	110	G	□	X	FA	600/1200	L.V.E.S.	N	9.530	4.090	7GR	4.2	0.45
12CQP4	△	110	G	□	E	FA	400/900	L.V.E.S.	N	9.312	4.125	8HR	6.3	0.45
12CSP4	△	90	G	□	E	FA	600/900	L.V.E.S.	N	10.814	3.750	7GR	12.6	0.15
12CTP4	△	110	G	□	X	FA	700/1000	L.V.E.S.	N	9.021	3.887	7GR	6.3	0.45
12CVP4	△	100	G	□	X	FA	500/750	L.V.E.S.	N	10.035	3.875	7GR	12.0	0.157
12CWP4	⧄	100	G	□	X	FA	500/750	L.V.E.S.	N	10.031	3.875	7GR	6.3	0.45
12CZP4	△	110	G	□	X	FA	400/1200	L.V.E.S.	N	9.330	3.900	7GR	12.6	0.075
12DEP4	△	110	G	□	X	FA	600/900	L.V.E.S.	N	9.190	4.190	7GR	6.3	0.45
12DFP4	△	110	G	□	X	FA	800/1100	L.V.E.S.	N	8.810	3.810	7GR	6.3	0.45
12DGP4	△	110	G	□	X	FA	600/1000	L.V.E.S.	N	9.187	4.187	7GR	6.3	0.45
12DHP4	△	110	G	□	X	FA	600/1200	L.V.E.S.	N	9.528	4.370	8HR	6.3	0.45
12DKP4	△	110	G	□	X	FA	600/1000	L.V.E.S.	N	9.187	4.187	7GR	6.3	0.45
12DMP4	△	110	G	□	X	FA	None	L.V.E.S.	N	9.350	4.380	8HR	6.3	0.60
12DQP4	△	110	G	□	X	FA	800/1000	L.V.E.S.	N	9.280	4.310	8HR	6.3	0.45
12KP4	△	54	G	○	—	CA	500/2500	Mag.	N	17.625	7.125	12N	6.3	0.60
12KP4A	△	54	G	○	—	FA	500/2500	Mag.	N	17.625	7.125	12N	6.3	0.60
SG-12KP4A	△	54	G	○	—	FA	500/2500	Mag.	N	17.625	7.125	12N	6.3	0.60
12LP4	△	54	G	○	—	C	750/3000	Mag.	D	18.750	8.250	12N	6.3	0.60
12LP4A	△	54	G	○	—	F	750/3000	Mag.	D	18.750	8.250	12N	6.3	0.60
12LP4C	△	54	G	○	—	FA	750/3000	Mag.	D	18.750	8.250	12N	6.3	0.60
12TP4	△	54	G	○	—	C	None	Mag.	D	18.750	8.250	12D	6.3	0.60
12UP4	△	54	M	○	—	C	None	Mag.	S	18.750	8.000	12D	6.3	0.60
12UP4A	△	54	M	○	—	F	None	Mag.	S	18.750	8.000	12D	6.3	0.60
12UP4B	△	54	M	○	—	FR	None	Mag.	S	18.750	8.000	12D	6.3	0.60
12VABP4	△	110	G	□	X	FA	800/1000	L.V.E.S.	N	9.350	4.380	8HR	6.3	0.45
12VP4	△	54	G	○	—	C	750/3000	Mag.	D	18.000	7.500	12G	6.3	0.60
12VP4A	△	54	G	○	—	F	750/3000	Mag.	D	18.000	7.500	12G	6.3	0.60
12YP4	△	54	G	○	—	C	750/3000	Auto.Es.	S	18.750	8.250	12P	6.3	0.60
12ZP4	△	54	G	○	—	CA	500/2500	Mag.	S	17.625	7.125	12N	6.3	0.60
12ZP4A	△	54	G	○	—	FA	500/2500	Mag.	S	17.625	7.125	12N	6.3	0.60
13AP4	△	110	G	□	E	FA	550/800	L.V.E.S.	N	9.266	4.250	8HR	6.3	0.45
13DP4	△	110	G	□	E	FA	500/1000	L.V.E.S.	N	9.688	4.375	8HR	6.3	0.45
14ACP4	△	90	G	□	—	FA	800/1200	L.V.E.S.	S	14.188	6.500	12L	6.3	0.60
14AEP4	△	90	G	□	—	FA	800/1200	L.V.E.S.	N	13.188	5.500	12L	6.3	0.60
14AJP4	△	110	G	□	—	FA	500/850	L.V.E.S.	S	11.438	5.500	8HR	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES◆	TYPICAL OPERATING CONDITIONS DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	TUBE TYPE
14.0	Grid	10	400	0/400	-36/-94	**12BAP4**
16.0	Cath.	12	30	0/500	25/40	**12BEP4**
14.0	Cath.	10	300	0/400	40/77	**12BFP4**
15.0	Cath.	12	50	0/400	35/55	**12BGP4**
13.0	Cath.	10	450	0/400	38/73	**12BJP4**
15.0	Cath.	12	50	0/400	35/55	**12BKP4**
16.0	Cath.	12	30	0/400	30/45	**12BLP4**
15.0	Cath.	12	140	—	31/49	**12BMP4**
16.0	Cath.	12	250	0/400	35/65	**12BNP4**
16.0	Cath.	12	250	0/400	35/65	**12BNP4A**
16.0	Cath.	12	50	0/400	30/50	**12BQP4**
14.0	Grid	10	500	0/400	-50/-93	**12BSP4**
15.0	Cath.	12	50	—	35/55	**12BTP4**
14.0	Cath.	12	50	0/400	37/49	**12BUP4**
14.0	Cath.	12	50	0/400	32/52	**12BUP4A**
14.0	Cath.	12	50	0/400	35/55	**12BUP4B**
14.0	Cath.	12	50	0/400	35/55	**12BUP4C**
14.0	Cath.	12	50	0/400	37/49	**12BVP4**
15.0	Cath.	11	100	—	31/49	**12BZP4**
16.0	Cath.	12	50	0/500	30/50	**12CBP4**
15.0	Cath.	11	140	—	31/49	**12CDP4**
15.0	Cath.	12	100	-200/200	30/50	**12CEP4**
14.0	Cath.	10	200	0/300	27/57	**12CFP4**
14.0	Grid	10	300	0/400	-30/-72	**12CHP4**
14.0	Cath.	10	200	0/400	25/55	**12CNP4**
14.0	Cath.	10	200	0/400	25/55	**12CNP4A**
15.4	Cath.	12	40	0/400	30/50	**12CQP4**
15.0	Cath.	12	100	-200/200	30/50	**12CSP4**
15.0	Cath.	12	100	-200/200	30/50	**12CTP4**
15.0	Cath.	11	100	—	31/49	**12CVP4**
15.0	Cath.	11	140	—	31/49	**12CWP4**
14.0	Cath.	12	100	0/400	33/52	**12CZP4**
15.0	Cath.	12	100	-200/+200	30/50	**12DEP4**
15.0	Cath.	12	200	-200/+200	30/55	**12DFP4**
16.0	Cath.	12	50	0/400	30/50	**12DGP4**
16.0	Cath.	12	50	0/400	30/50	**12DHP4**
16.0	Cath.	12	140	0/400	30/50	**12DKP4**
22.0	Grid	12	300	-200/+200	-35/-72	**12DMP4**
15.0	Cath.	12	50	-200/+200	35/55	**12DQP4**
13.2⊡	Grid	11	250	—	-22/-58	**12KP4**
13.2⊡	Grid	12	300	—	-28/-72	**12KP4A**
13.2⊡	Grid	12	300	—	-28/-72	**SG-12KP4A**
13.2⊡	Grid	11	250	—	-22/-58	**12LP4**
13.2⊡	Grid	11	250	—	-22/-58	**12LP4A**
13.2⊡	Grid	11	250	—	-22/-58	**12LP4C**
13.2⊡	Grid	11	250	—	-22/-58	**12TP4**
13.2⊡	Grid	12	300	—	-28/-72	**12UP4**
13.2⊡	Grid	12	300	—	-28/-72	**12UP4A**
13.2⊡	Grid	12	300	—	-28/-72	**12UP4B**
15.0	Cath.	12	50	-200/+200	35/55	**12VABP4**
13.2⊡	Grid	11	—	—	-28/-72	**12VP4**
13.2⊡	Grid	11	—	—	-28/-72	**12VP4A**
13.2⊡	Grid	11	250	—	-28/-72	**12YP4**
13.2⊡	Grid	11	250	—	-22/-58	**12ZP4**
13.2⊡	Grid	11	250	—	-22/-58	**12ZP4A**
15.0	Cath.	12	50	0/400	35/55	**13AP4**
16.0	Cath.	12	50	0/250	30/50	**13DP4**
15.4⊡	Cath.	10	125	-50/350	40/80	**14ACP4**
15.4⊡	Cath.	10	110	-50/350	32/50	**14AEP4**
12.1⊡	Grid	9	250	-100/400	-24/-64	**14AJP4**

EXPLANATION OF SYMBOLS

M—Metal cone tube
G—Glass tube
LWG—Light weight glass tube
G*—Glass tube, dimensions different from normal
MET—Metal tube
O—Round tube
□—Rectangular tube, spherical face
©—Rectangular tube, cylindrical face
B—Fiberglass wrap implosion protection
E—Filled rim type implosion protection
T—Molded glass implosion panel attached to face
P—Sagged glass implosion plate attached to face
L—Plastic implosion barrier attached to face
K—Banded tube with coated funnel for implosion protection
H—Tube sealed into steel sheath for implosion protection
C—Clear glass faceplate
F—Gray filter glass faceplate
R—Anti-reflection faceplate
A—Aluminized screen
V—Rim bands and tension band
W—Rim bands and tension band with mounting lugs
X—Formed with tension band
Y—Formed rim with tension band and mounting lugs
Mag.—Magnetic focus
L.V.E.S.—Low voltage electrostatic focus
H.V.E.S.—High Voltage electrostatic focus
Auto.Es.—Self-focusing electrostatic
Int.Mag.—Internal magnetic focus
TPF—Tri-potential focus
N—No ion trap
S—Single field ion trap
D—Double field ion trap
I—Internal ion trap
*—18 second heater warm-up time (all others are 11 second)
Grid—Grid drive service (all voltages with respect to cathode)
Cath.—Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

◆ Design-Maximum Values Unless Otherwise Indicated

⊡ Absolute-Maximum Values

⊠ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorption characteristics.

☆ This type summary is based on EIA registered data, registered envelope data, and manufacturer's published data. Data presented herein have been carefully prepared from such publicly available data to assure technical correctness, however, no responsibility is assumed by the General Electric Company for possible inaccuracies.

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
SG-14AJP4	△	110	G	□	—	FA	800/850	L.V.E.S.	N	11.438	5.500	8HR	6.3	0.60
14ARP4	⧅	90	G	□	—	FA	800/1200	L.V.E.S.	N	13.188	5.500	12L	6.3	0.60
14ASP4	△	110	G	□	—	FA	500/850	L.V.E.S.	N	11.375	5.438	8HR	6.3	0.60
14ATP4	△	90	G	□	—	FA	500/1000	L.V.E.S.	N	13.188	5.500	12L	8.4	0.45
14AUP4	△	90	G	□	—	FA	1000/1500	L.V.E.S.	N	13.188	5.500	12L	6.3	0.45
14AVP4	△	110	G	□	—	FA	450/700	L.V.E.S.	N	11.375	5.438	8HR	6.3	0.60
14AWP4	△	90	G	□	—	FA	800/1200	L.V.E.S.	N	13.188	5.500	12L	6.3	0.45
14BDP4	△	70	G	□	P	FA	600/1000	L.V.E.S.	N	17.375	7.500	12L	6.3	0.60
14BP4	△	70	G	□	—	F	500/2000	Mag.	S	16.812	7.531	12N	6.3	0.60
14BP4A	△	70	G	□	—	FR	500/2000	Mag.	S	16.812	7.531	12N	6.3	0.60
14CP4	△	70	G	□	—	F	750/2000	Mag.	S	16.750	7.469	12N	6.3	0.60
14CP4A	△	70	G	□	—	FA	750/2000	Mag.	S	16.750	7.469	12N	6.3	0.60
SG-14CP4A	△	70	G	□	—	FA	750/2000	Mag.	N	16.750	7.500	12N	6.3	0.60
14CP4B	△	70	G	□	—	FA	750/2000	Mag.	N	16.500	7.188	12N	6.3	0.60
14DP4	△	70	G	□	—	F	None	Mag.	D	16.750	7.469	12D	6.3	0.60
14EP4	△	70	G	□	—	F	500/2000	Mag.	S	16.500	7.187	12N	6.3	0.60
14GP4	△	70	G	□	—	F	750/2000	H.V.E.S.	S	16.812	7.500	12L	6.3	0.60
14HP4	△	70	G	□	—	F	750/2000	L.V.E.S.	S	16.781	7.500	12L	6.3	0.60
14NP4	△	90	G	□	—	F	800/1200	L.V.E.S.	S	14.188	6.500	12L	6.3	0.60
14NP4A	△	90	G	□	—	FA	800/1200	L.V.E.S.	S	14.188	6.500	12L	6.3	0.60
14QP4	△	70	G	□	—	F	600/1000	L.V.E.S.	S	16.156	6.875	12L	6.3	0.60
14QP4A	△	70	G	□	—	FA	600/1000	L.V.E.S.	S	16.156	6.875	12L	6.3	0.60
SG-14QP4A	△	70	G	□	—	FA	600/1000	L.V.E.S.	N	16.156	6.875	12L	6.3	0.60
14QP4B	△	70	G	□	—	FA	600/1000	L.V.E.S.	N	16.156	6.875	12L	6.3	0.60
14RP4	△	90	G	□	—	F	800/1000	L.V.E.S.	S	14.562	6.875	12L	6.3	0.60
14RP4A	△	90	G	□	—	FA	800/1000	L.V.E.S.	S	14.562	6.875	12L	6.3	0.60
14SP4	△	90	G	□	—	FA	900/1200	L.V.E.S.	S	14.188	6.500	12L	6.3	0.60
14UP4	△	70	G	□	—	FA	None	Mag.	S	16.781	7.500	12D	6.3	0.60
14WP4	△	90	G	□	—	FA	800/1200	L.V.E.S.	N	13.188	5.500	12L	6.3	0.60
SG-14WP4	△	90	G	□	—	FA	800/1200	L.V.E.S.	N	13.188	5.500	12L	6.3	0.60
14XP4	△	90	G	□	—	F	1100/1500	L.V.E.S.	S	14.188	6.500	12L	6.3	0.45
14XP4A	△	90	G	□	—	FA	1100/1500	L.V.E.S.	S	14.188	6.500	12L	6.3	0.45
14ZP4	△	90	G	□	—	FA	800/1200	L.V.E.S.	N	13.188	5.500	12L	6.3	0.60
15ADP4	△	110	G	□	X	FA	700/1100	L.V.E.S.	N	10.750	4.370	8HR	6.3	0.45
15JP4	△	110	G	□	E	FA	600/1000	L.V.E.S.	N	11.000	4.375	8HR	6.3	0.45
16ABP4	△	70	G	□	—	F	750/1500	Auto.Es.	S	18.750	7.500	12P	6.3	0.60
16ACP4	△	60	G	○	—	C	750/2000	Auto.Es.	S	20.875	8.000	12P	6.3	0.60
16AEP4	△	70	G	□	—	F	750/1500	L.V.E.S.	S	18.750	7.500	12L	6.3	0.60
16ANP4	⧅	114	G	□	P	FA	800/1200	L.V.E.S.	N	10.438	4.125	8HR	6.3	0.60
16AP4	△	53	M	○	—	C	None	Mag.	D	22.250	7.562	12D	6.3	0.60
16AP4A	△	53	M	○	—	F	None	Mag.	D	22.250	7.562	12D	6.3	0.60
16AQP4	⧅	114	G	□	P	FAR	800/1200	L.V.E.S.	N	10.438	4.125	8HR	6.3	0.60
16ASP4	⧅	114	G	□	P	FA	1000/1500	L.V.E.S.	N	10.406	4.125	8HR	6.3	0.45
16ATP4	⧅	114	G	□	L	FA	1000/1500	L.V.E.S.	N	10.125	4.000	8HR	6.3	0.45
16AUP4	△	114	G	□	—	FA	800/1500	L.V.E.S.	N	10.062	4.000	8HR	6.3	0.60
16AVP4	△	114	G	□	P	FA	900/1400	L.V.E.S.	N	10.688	4.375	7FA	6.3	0.45
16AWP4	△	114	G	□	L	FA	1000/1500	L.V.E.S.	N	10.125	4.000	8HR	6.3	0.30*
16AXP4	△	114	G	□	P	FA	1000/1500	L.V.E.S.	N	10.125	3.813	8HR	6.3	0.45
16AYP4	△	114	G	□	—	FA	800/1300	L.V.E.S.	N	10.250	4.125	8HR	6.3	0.45
16AZP4	⧅	114	G	□	L	FA	1000/1500	L.V.E.S.	N	10.375	4.250	8HR	6.3	0.45
16BAP4	△	114	G	□	P	FA	1000/1500	L.V.E.S.	N	10.688	4.375	8HR	6.3	0.60
16BDP4	△	114	G	□	—	FA	800/1300	L.V.E.S.	N	10.250	4.125	8HR	6.3	0.60
16BEP4	⧅	114	G	□	P	FA	800/1200	L.V.E.S.	N	10.688	4.375	8HR	6.3	0.30
16BFP4	△	114	G	□	—	FA	800/1500	L.V.E.S.	N	10.062	4.000	8HR	6.3	0.45
16BGP4	⧅	114	G	□	V	FA	800/1300	L.V.E.S.	N	10.569	4.375	8HR	6.3	0.45
16BMP4	△	114	G	□	—	FA	800/1500	L.V.E.S.	N	10.062	4.000	8HR	6.3	0.45
16BNP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	10.500	4.375	8HR	6.3	0.60
16BRP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	10.281	4.125	8HR	6.3	0.60
16BSP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	10.531	4.375	8HR	6.3	0.45
16BUP4	⧅	114	G	□	L	FA	1000/1500	L.V.E.S.	N	10.375	4.250	8HR	6.3	0.45

ANODE KV. DESIGN-MAX. VALUES ◈	TYPICAL OPERATING CONDITIONS					TUBE TYPE
	DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	
15.4▣	Grid	9	300	-100/400	-28/-72	**SG-14AJP4**
15.4▣	Cath.	10	50	- 50/350	35/50	**14ARP4**
15.4▣	Grid	12	300	- 50/350	-28/-72	**14ASP4**
15.4▣	Grid	10	300	0/400	-25/-69	**14ATP4**
16.5▣	Cath.	12	50	0/350	30/50	**14AUP4**
15.4▣	Grid	12	300	-50/350	-28/-72	**14AVP4**
15.4▣	Cath.	12	50	-50/350	32/47	**14AWP4**
24.2▣	Grid	18	300	0/400	-33/-77	**14BDP4**
13.2▣	Grid	12	300	—	-28/-72	**14BP4**
13.2▣	Grid	12	300	—	-28/-72	**14BP4A**
15.4▣	Grid	12	300	—	-28/-72	**14CP4**
15.4▣	Grid	12	300	—	-28/-72	**14CP4A**
15.4▣	Grid	12	300	—	-28/-72	**SG-14CP4A**
15.4▣	Grid	11	300	—	-28/-72	**14CP4B**
15.4▣	Grid	11	250	—	-22/-58	**14DP4**
15.4▣	Grid	12	300	—	-28/-72	**14EP4**
15.4▣	Grid	12	300	2170/2950	-28/-72	**14GP4**
15.4▣	Grid	12	300	-48/264	-28/-72	**14HP4**
15.4▣	Grid	12	300	-50/350	-28/-72	**14NP4**
15.4▣	Grid	12	300	-50/350	-28/-72	**14NP4A**
12.1▣	Grid	9	250	-50/250	-24/-64	**14QP4**
12.1▣	Grid	9	250	-50/250	-24/-64	**14QP4A**
15.4▣	Grid	9	300	-50/300	-28/-72	**SG-14QP4A**
12.1▣	Grid	9	250	-50/250	-24/-64	**14QP4B**
15.4▣	Grid	10	300	-50/350	-26/-70	**14RP4**
15.4▣	Grid	10	300	-50/350	-26/-70	**14RP4A**
15.4▣	Grid	12	300	-48/264	-28/-72	**14SP4**
15.4▣	Grid	12	300	—	-28/-72	**14UP4**
15.4▣	Grid	12	300	-50/350	-28/-72	**14WP4**
15.4▣	Grid	12	300	-50/350	-28/-72	**SG-14WP4**
16.5▣	Grid	12	300	-50/350	-28/-72	**14XP4**
16.5▣	Grid	12	300	-50/350	-28/-72	**14XP4A**
15.4▣	Grid	12	300	0/450	-28/-72	**14ZP4**
20.0	Cath.	16	50	-200/+200	33/52	**15ADP4**
15.0	Cath.	12	50	0/400	35/55	**15JP4**
17.6▣	Grid	14	300	—	-28/-72	**16ABP4**
15.4▣	Grid	12	250	—	-28/-63	**16ACP4**
17.6▣	Grid	14	300	-64/350	-28/-72	**16AEP4**
18.0	Grid	14	300	0/400	-33/-70	**16ANP4**
15.4▣	Grid	12	300	—	-28/-72	**16AP4**
15.4▣	Grid	12	300	—	-28/-72	**16AP4A**
18.0	Grid	14	300	0/400	-33/-70	**16AQP4**
20.0▣	Grid	15	300	-100/300	-43/-70	**16ASP4**
18.0	Cath.	15	50	0/500	31/49	**16ATP4**
15.4	Grid	12	400	0/400	-36/-94	**16AUP4**
17.6	Cath.	15	35	0/500	25/50	**16AVP4**
18.0	Cath.	15	150	0/500	31/49	**16AWP4**
18.0	Grid	15	300	0/500	-40/-72	**16AXP4**
20.0	Cath.	16	300	-100/300	28/60	**16AYP4**
18.0	Cath.	15	150	0/400	31/49	**16AZP4**
18.0	Cath.	15	50	0/400	35/55	**16BAP4**
20.0	Cath.	16	300	-100/300	28/60	**16BDP4**
18.0	Cath.	14	50	0/400	30/48	**16BEP4**
15.4	Grid	12	400	0/400	-36/-94	**16BFP4**
20.0	Cath.	16	300	-100/+300	28/60	**16BGP4**
15.4	Grid	12	400	0/400	-36/-94	**16BMP4**
18.0	Cath.	15	50	0/400	35/35	**16BNP4**
18.0	Grid	15	400	0/400	-46/-94	**16BRP4**
21.0	Cath.	15	50	0/400	35/35	**16BSP4**
16.0	Cath.	13	100	-250/150	31/49	**16BUP4**

EXPLANATION OF SYMBOLS

- M —Metal cone tube
- G —Glass tube
- LWG —Light weight glass tube
- G° —Glass tube, dimensions different from normal
- MET —Metal tube
- O —Round tube
- ▢ —Rectangular tube, spherical face
- © —Rectangular tube, cylindrical face
- B —Fiberglass wrap implosion protection
- E —Filled rim type implosion protection
- T —Molded glass implosion panel attached to face
- P —Sagged glass implosion plate attached to face
- L —Plastic implosion barrier attached to face
- K —Banded tube with coated funnel for implosion protection
- H —Tube sealed into steel sheath for implosion protection
- C —Clear glass faceplate
- F —Gray filter glass faceplate
- R —Anti-reflection faceplate
- A —Aluminized screen
- V —Rim bands and tension band
- W —Rim bands and tension band with mounting lugs
- X —Formed with tension band
- Y —Formed rim with tension band and mounting lugs
- Mag. —Magnetic focus
- L.V.E.S. —Low voltage electrostatic focus
- H.V.E.S. —High Voltage electrostatic focus
- Auto.Es. —Self-focusing electrostatic
- Int.Mag. —Internal magnetic focus
- TPF —Tri-potential focus
- N —No ion trap
- S —Single field ion trap
- D —Double field ion trap
- I —Internal ion trap
- * —18 second heater warm-up time (all others are 11 second)
- Grid —Grid drive service (all voltages with respect to cathode)
- Cath. —Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⊠ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorbtion characteristics.

☆ This type summary is based on EIA registered data, registered envelope data, and manufacturer's published data. Data presented herein have been carefully prepared from such publicly available data to assure technical correctness, however, no responsibility is assumed by the General Electric Company for possible inaccuracies.

Monochrome Picture Tubes—Condensed Data

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
16BVP4	⧅	114	G	□	V	FA	1050/1450	L.V.E.S.	N	10.413	4.219	8HR	6.3	0.45
16BWP4	⧅	114	G	□	V	FA	800/1300	L.V.E.S.	N	10.563	4.375	8HR	6.3	0.45
16BXP4	△	114	G	□	E	FA	900/1400	L.V.E.S.	N	10.562	4.375	7FA	6.3	0.45
16BYP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	10.438	4.250	8HR	6.3	0.45
16CAP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	10.531	4.375	8HR	6.3	0.45
16CEP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	10.531	4.375	8HR	6.3	0.45
16CFP4	△	104	G	□	V	FA	1000/1500	L.V.E.S.	N	11.075	3.875	7GR	6.3	0.45
16CHP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	10.569	4.375	8HR	6.3	0.45
16CHP4A	⧅	114	G	□	X	FA	1000/1500	L.V.E.S.	N	10.569	4.375	8HR	6.3	0.45
16CJP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	10.594	4.406	8HR	6.3	0.45
16CKP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	10.281	4.125	8HR	6.3	0.30
16CMP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	10.531	4.375	8HR	6.3	0.45
16CNP4	△	104	G	□	V	FA	1000/1500	L.V.E.S.	N	11.075	3.875	7GR	12.0	0.157
16CP4	△	52	G	○	—	C	None	Mag.	D	21.500	6.625	12D	6.3	0.60
16CQP4	△	104	G	□	V	FA	1000/1500	L.V.E.S.	N	11.075	3.875	7GR	6.3	0.45
16CTP4	△	114	G	□	V	FA	800/1500	L.V.E.S.	N	10.080	4.020	8HR	6.3	0.45
16CUP4	△	114	G	□	V	FA	800/1500	L.V.E.S.	N	10.080	4.020	8HR	6.3	0.45
16CWP4	⧅	100	G	□	V	FA	1000/1500	L.V.E.S.	N	11.675	3.875	7GR	6.3	0.45
16CXP4	△	100	G	□	V	FA	1000/1500	L.V.E.S.	N	11.675	3.875	7GR	12.0	0.157
16DCP4	△	100	G	□	V	FA	1000/1500	L.V.E.S.	N	11.675	3.875	7GR	6.3	0.45
16DCP4A	△	100	G	□	X	FA	1000/1500	L.V.E.S.	N	11.610	3.810	7GR	6.3	0.45
16DP4	△	60	G	○	—	C	None	Mag.	D	20.750	7.891	12D	6.3	0.60
16DP4A	△	60	G	○	—	F	None	Mag.	D	20.750	7.875	12D	6.3	0.60
16EP4	△	60	M	○	—	C	None	Mag.	S	19.625	6.875	12D	6.3	0.60
16EP4A	△	60	M	○	—	F	None	Mag.	S	19.625	6.875	12D	6.3	0.60
16EP4B	△	60	M	○	—	FR	None	Mag.	S	19.625	6.875	12D	6.3	0.60
16GP4	△	70	M	○	—	F	None	Mag.	S	17.688	7.313	12D	6.3	0.60
16GP4A	△	70	M	○	—	C	None	Mag.	S	17.688	7.313	12D	6.3	0.60
16GP4B	△	70	M	○	—	FR	None	Mag.	S	17.688	7.313	12D	6.3	0.60
16GP4C	△	70	M	○	—	CR	None	Mag.	S	17.688	7.313	12D	6.3	0.60
16HP4	△	60	G	○	—	C	750/2000	Mag.	D	21.250	8.375	12N	6.3	0.60
16HP4A	△	60	G	○	—	F	750/2000	Mag.	D	21.250	8.375	12N	6.3	0.60
16JP4	△	60	G	○	—	C	750/2000	Mag.	D	20.750	7.500	12N	6.3	0.60
16JP4A	△	60	G	○	—	F	750/2000	Mag.	D	20.750	7.500	12N	6.3	0.60
16KP4	△	70	G	□	—	F	750/1500	Mag.	S	18.750	7.500	12N	6.3	0.60
16KP4A	△	70	G	□	—	FA	750/1500	Mag.	S	18.750	7.500	12N	6.3	0.60
SG-16KP4A	△	70	G	□	—	FA	750/1500	Mag.	N	18.750	7.500	12N	6.3	0.60
16LP4	△	52	G	○	—	C	750/2000	Mag.	D	22.250	7.375	12N	6.3	0.60
16LP4A	△	52	G	○	—	F	750/2000	Mag.	D	22.250	7.375	12N	6.3	0.60
16MP4	△	60	G	○	—	C	750/2000	Mag.	D	21.750	8.500	12N	6.3	0.60
16MP4A	△	60	G	○	—	F	750/2000	Mag.	D	21.750	8.500	12N	6.3	0.60
16QP4	△	70	G	□	—	F	None	Mag.	D	19.146	8.079	12D	6.3	0.60
16RP4	△	70	G	□	—	F	750/1500	Mag.	S	18.750	7.500	12N	6.3	0.60
16RP4A	△	70	G	□	—	F	750/1500	Mag.	S	18.750	7.500	12N	6.3	0.60
16RP4B	⧅	70	G	□	—	F	750/1500	Mag.	N	18.750	7.500	12N	6.3	0.60
16SP4	△	70	G	○	—	C	750/2000	Mag.	D	17.312	7.000	12N	6.3	0.60
16SP4A	△	70	G	○	—	F	750/2000	Mag.	D	17.312	7.000	12N	6.3	0.60
16TP4	△	70	G	□	—	F	750/2000	Mag.	S	18.125	6.875	12N	6.3	0.60
16UP4	△	70	G	□	—	F	None	Mag.	S	18.125	6.875	12D	6.3	0.60
16VAGP4	⧅	114	G	□	V	FA	1300/1700	L.V.E.S.	N	11.445	4.375	8HR	6.3	0.45
16VBAP4	⧅	114	G	□	V	FA	1300/1700	L.V.E.S.	N	11.312	4.500	8HR	6.3	0.45
16VBCP4	⧅	114	G	□	V	FA	1000/1400	L.V.E.S.	N	11.200	4.380	8HR	6.3	0.45
16VP4	△	70	G	○	—	F	None	Mag.	S	17.188	6.876	12D	6.3	0.60
16WP4	△	70	G	○	—	F	None	Mag.	D	17.750	7.438	12D	6.3	0.60
16WP4A	△	70	G	○	—	F	750/1500	Mag.	D	17.750	7.438	12N	6.3	0.60
16WP4B	△	70	G	○	—	FA	750/1500	Mag.	D	17.750	7.438	12N	6.3	0.60
16XP4	△	70	G	□	—	F	None	Mag.	D	18.750	7.500	12D	6.3	0.60
16YP4	△	70	G	○	—	F	750/2000	Mag.	S	17.312	7.000	12N	6.3	0.60
16ZP4	△	52	G	○	—	F	750/1500	Mag.	D	22.250	7.375	12N	6.3	0.60
17AP4	△	70	G	□	—	F	750/2000	Mag.	S	18.625	6.875	12N	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES ◈	TYPICAL OPERATING CONDITIONS					TUBE TYPE
	DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELECTRODE VOLTS	RASTER CUTOFF VOLTS	
20.0	Cath.	15	300	−200/300	38/59	16BVP4
20.0	Grid	16	300	−200/300	−35/−72	16BWP4
17.6	Cath.	15	35	0/500	25/50	16BXP4
16.0	Cath.	13	100	—	31/49	16BYP4
18.0	Grid	15	400	0/400	−46/−94	16CAP4
18.0	Grid	15	400	0/400	−46/−94	16CEP4
15.0	Cath.	11	140	—	31/49	16CFP4
20.0	Cath.	16	30	0/400	30/45	16CHP4
20.0	Cath.	16	30	0/400	30/45	16CHP4A
23.0	Grid	15	400	0/400	−39/−94	16CJP4
18.0	Grid	15	400	0/400	−46/−94	16CKP4
18.0	Grid	15	400	0/400	−46/−94	16CMP4
15.0	Cath.	11	100	—	31/49	16CNP4
16.5	Grid	12	250	—	−22/−58	16CP4
15.0	Cath.	11	140	—	31/49	16CQP4
15.4	Grid	12	400	0/400	−36/−94	16CTP4
15.4	Grid	12	400	0/400	−36/−94	16CUP4
15.0	Cath.	11	140	—	31/49	16CWP4
15.0	Cath.	11	100	—	31/49	16CXP4
15.0	Cath.	11	140	—	31/49	16DCP4
15.0	Cath.	11	140	—	31/49	16DCP4A
16.5▣	Grid	12	250	—	−22/−58	16DP4
16.5▣	Grid	12	250	—	−22/−58	16DP4A
15.4▣	Grid	12	300	—	−28/−72	16EP4
15.4▣	Grid	12	300	—	−28/−72	16EP4A
15.4▣	Grid	12	300	—	−28/−72	16EP4B
15.4▣	Grid	12	300	—	−28/−72	16GP4
15.4▣	Grid	12	300	—	−28/−72	16GP4A
15.4▣	Grid	12	300	—	−28/−72	16GP4B
15.4▣	Grid	12	300	—	−28/−72	16GP4C
15.4▣	Grid	12	300	—	−28/−72	16HP4
15.4▣	Grid	12	300	—	−28/−72	16HP4A
15.4▣	Grid	11	250	—	−22/−58	16JP4
15.4▣	Grid	11	250	—	−22/−58	16JP4A
17.6▣	Grid	12	300	—	−28/−72	16KP4
17.6▣	Grid	12	300	—	−28/−72	16KP4A
17.6▣	Grid	12	300	—	−28/−72	SG-16KP4A
15.4▣	Grid	12	300	—	−28/−72	16LP4
15.4▣	Grid	12	300	—	−28/−72	16LP4A
15.4▣	Grid	12	300	—	−28/−72	16MP4
15.4▣	Grid	12	300	—	−28/−72	16MP4A
17.6▣	Grid	12	250	—	−22/−58	16QP4
17.6▣	Grid	12	300	—	−28/−72	16RP4
17.6▣	Grid	12	300	—	−28/−72	16RP4A
17.6▣	Grid	12	300	—	−28/−72	16RP4B
15.4▣	Grid	12	300	—	−28/−72	16SP4
15.4▣	Grid	12	300	—	−28/−72	16SP4A
15.4▣	Grid	12	300	—	−28/−72	16TP4
16.5▣	Grid	12	250	—	−22/−58	16UP4
20.0	Cath.	16	30	−100/+300	22/45	16VAGP4
22.0	Cath.	16	50	0/400	33/45	16VBAP4
23.0	Grid	16	300	−200/200	−35/−72	16VBCP4
16.5▣	Grid	12	250	—	−22/−58	16VP4
16.5▣	Grid	12	250	—	−22/−58	16WP4
17.6▣	Grid	12	250	—	−22/−58	16WP4A
17.6▣	Grid	12	250	—	−22/−58	16WP4B
16.5▣	Grid	12	250	—	−22/−58	16XP4
15.4▣	Grid	12	300	—	−28/−72	16YP4
17.6▣	Grid	12	300	—	−28/−72	16ZP4
17.6▣	Grid	12	300	—	−28/−72	17AP4

EXPLANATION OF SYMBOLS

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©—Rectangular tube, cylindrical face
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E—Filled rim type implosion protection
T—Molded glass implosion panel attached to face
P—Sagged glass implosion plate attached to face
L—Plastic implosion barrier attached to face
K—Banded tube with coated funnel for implosion protection
H—Tube sealed into steel sheath for implosion protection
C—Clear glass faceplate
F—Gray filter glass faceplate
R—Anti-reflection faceplate
A—Aluminized screen
V—Rim bands and tension band
W—Rim bands and tension band with mounting lugs
X—Formed with tension band
Y—Formed rim with tension band and mounting lugs
Mag.—Magnetic focus
L.V.E.S.—Low voltage electrostatic focus
H.V.E.S.—High Voltage electrostatic focus
Auto.Es.—Self-focusing electrostatic
Int.Mag.—Internal magnetic focus
TPF—Tri-potential focus
N—No ion trap
S—Single field ion trap
D—Double field ion trap
I—Internal ion trap
*—18 second heater warm-up time (all others are 11 second)
Grid—Grid drive service (all voltages with respect to cathode)
Cath.—Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⊠ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorbtion characteristics.

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TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
17DXP4	△	110	G	□	—	FA	1000/1500	L.V.E.S.TPF	N	10.688	3.562	8JR	6.3	0.45
17DZP4	△	110	G	□	—	FA	1000/1500	L.V.E.S.	N	10.688	3.562	8HR	6.3	0.45
17EAP4	△	70	G	□	—	FA	1000/1500	Auto.Es.	S	19.188	7.500	12AT	6.3	0.60
17EBP4	△	110	G	□	—	FA	1100/1700	L.V.E.S.	N	11.250	4.125	8HR	6.3	0.45
17EFP4	⧅	110	G	□	—	FA	1000/1500	L.V.E.S.	N	11.250	4.125	8HR	6.3	0.45
17EHP4	△	110	G	□	—	FA	1000/1500	L.V.E.S.	N	11.500	4.375	8HR	6.3	0.60
17EKP4	△	70	G	□	P	FA	600/1000	L.V.E.S.	N	19.438	7.500	12L	6.3	0.60
17ELP4	△	114	G	□	E	FA	1150/1650	L.V.E.S.	N	11.188	4.375	8HR	6.3	0.45
17EMP4	⧅	114	G	□	V	FA	1300/1700	L.V.E.S.	N	11.312	4.500	8HR	6.3	0.45
17EQP4	△	114	G	□	E	FA	900/1500	L.V.E.S.	N	11.250	4.375	8HR	6.3	0.45
17ESP4	⧅	114	G	□	V	FA	1000/1400	L.V.E.S.	N	11.200	4.380	8HR	6.3	0.45
17FCP4	△	114	G	□	E	FA	900/1500	L.V.E.S.	N	11.250	4.375	8HR	6.3	0.45
17FDP4	⧅	114	G	□	V	FA	1300/1700	L.V.E.S.	N	11.180	4.370	8HR	6.3	0.45
17FP4	△	70	G	□	—	F	500/1500	H.V.E.S.	S	19.250	7.500	12L	6.3	0.60
17FP4A	△	70	G	□	—	F	750/1500	H.V.E.S.	S	19.250	7.500	12L	6.3	0.60
17GP4	△	70	M	□	—	FR	None	H.V.E.S.	S	19.312	7.500	12M	6.3	0.60
17HP4	△	70	G	□	—	F	750/1500	L.V.E.S.	S	19.188	7.500	12L	6.3	0.60
17HP4A	△	70	G	□	—	FR	750/1500	L.V.E.S.	S	19.188	7.500	12L	6.3	0.60
17HP4B	△	70	G	□	—	FA	750/1500	L.V.E.S.	S	19.188	7.500	12L	6.3	0.60
SG-17HP4B	△	70	G	□	—	FA	750/1500	L.V.E.S.	N	19.188	7.500	12L	6.3	0.60
17HP4C	△	70	G	□	—	FA	750/1500	L.V.E.S.	N	19.188	7.500	12L	6.3	0.60
17JP4	△	70	G	□	—	F	500/1500	Mag.	S	19.250	7.500	12N	6.3	0.60
17KP4	△	70	G	□	—	F	1000/1500	Auto.Es.	S	19.250	7.500	12P	6.3	0.60
17KP4A	△	70	G	□	—	FA	1000/1500	Auto.Es.	S	19.250	7.500	12P	6.3	0.60
17LP4	△	70	G	◎	—	F	750/1500	L.V.E.S.	S	19.188	7.500	12L	6.3	0.60
17LP4A	△	70	G	◎	—	FA	750/1500	L.V.E.S.	S	19.188	7.500	12L	6.3	0.60
SG-17LP4A	△	70	G	◎	—	FA	750/1500	L.V.E.S.	N	19.188	7.500	12L	6.3	0.60
17LP4B	⧅	70	G	◎	—	FA	750/1500	L.V.E.S.	N	19.188	7.500	12L	6.3	0.60
17QP4	△	70	G	◎	—	F	750/1500	Mag.	S	19.188	7.500	12N	6.3	0.60
17QP4A	△	70	G	◎	—	FA	750/1500	Mag.	S	19.188	7.500	12N	6.3	0.60
SG-17QP4A	△	70	G	◎	—	FA	750/1500	Mag.	N	19.188	7.500	12N	6.3	0.60
17QP4B	⧅	70	G	◎	—	FA	750/1500	Mag.	N	19.188	7.500	12N	6.3	0.60
17RP4	△	70	G	□	—	F	750/1500	L.V.E.S.	S	19.250	7.500	12L	6.3	0.60
17RP4C	△	70	G	□	—	FA	750/1500	L.V.E.S.	S	19.250	7.500	12L	6.3	0.60
17SP4	△	70	G	◎	—	F	500/750	Auto.Es.	S	19.188	7.500	12P	6.3	0.60
17TP4	△	70	MET	□	—	FR	None	L.V.E.S.	S	18.125	6.875	12M	6.3	0.60
17UP4	△	70	G	◎	—	F	750/1500	Mag.	S	19.188	7.500	12N	6.3	0.60
17VP4	△	70	G	◎	—	F	750/1500	L.V.E.S.	S	19.188	7.500	12L	6.3	0.60
17VP4B	△	70	G	◎	—	FA	750/1500	L.V.E.S.	S	19.188	7.500	12L	6.3	0.60
17YP4	△	70	G	◎	—	F	500/1500	Mag.	S	19.188	7.500	12N	6.3	0.60
18VAUP4	⧅	114	G	□	X	FA	1250/1750	L.V.E.S.	N	11.875	4.375	8HR	6.3	0.45
19ABP4	⧅	114	G	□	—	FA	850/1400	L.V.E.S.	N	10.938	3.688	8JK	2.68	0.45
19ACP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	12.375	5.125	8HR	6.3	0.60
19AEP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	12.6	0.15
19AFP4	⧅	114	G	□	T	FA	1000/1500	L.V.E.S.	N	11.625	4.125	8HR	6.3	0.60
19AHP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.45
19AJP4	△	114	G	□	—	FA	1400/1900	L.V.E.S.	N	11.375	4.125	7FA	6.3	0.45
19ALP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.30*
19ANP4	⧅	114	G	□	—	FA	1000/1500	L.V.E.S.TPF	N	10.812	3.562	8JR	6.3	0.45
19AP4	△	66	M	○	—	C	None	Mag.	S	21.500	7.125	12D	6.3	0.60
19AP4A	△	66	M	○	—	F	None	Mag.	S	21.500	7.125	12D	6.3	0.60
19AP4B	△	66	M	○	—	FR	None	Mag.	S	21.500	7.125	12D	6.3	0.60
19AP4C	△	66	M	○	—	FA	None	Mag.	S	21.500	7.125	12D	6.3	0.60
19AP4D	△	66	M	○	—	CR	None	Mag.	S	21.500	7.125	12D	6.3	0.60
19AQP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.30
19ARP4	⧅	114	G	□	T	FA	1000/1500	L.V.E.S.	N	12.625	5.125	8HR	6.3	0.60
19ASP4	⧅	114	G	□	T	FA	1000/1500	L.V.E.S.	N	12.625	5.125	8HR	6.3	0.30
19ATP4	⧅	114	G	□	T	FA	1000/1500	L.V.E.S.TPF	N	11.062	3.562	8JR	6.3	0.60
19AUP4	△	113	G	□	T	FAR	1000/1500	L.V.E.S.	N	11.625	4.125	8HR	6.3	0.60
19AVP4	⧅	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES ◈	TYPICAL OPERATING CONDITIONS					TUBE TYPE
	DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	
17.6▣	Grid	14	500	0/400	-43/-78	**17DXP4**
17.6▣	Grid	14	300	0/400	-28/-72	**17DZP4**
17.6▣	Grid	12	300	—	-28/-72	**17EAP4**
20.0	Grid	14	500	0/400	-43/-72	**17EBP4**
19.8▣	Grid	14	400	0/400	-45/-90	**17EFP4**
20.0	Cath.	16	50	0/400	35/55	**17EHP4**
24.2▣	Grid	18	300	0/400	-33/-77	**17EKP4**
15.0	Cath.	12	50	0/400	35/55	**17ELP4**
22.0	Cath.	16	50	0/400	33/45	**17EMP4**
19.8	Cath.	16	400	0/500	35/72	**17EQP4**
23.0	Grid	16	300	-200/+200	-35/-72	**17ESP4**
19.8	Cath.	16	400	0/500	35/72	**17FCP4**
22.0	Cath.	14	50	0/400	33/52	**17FDP4**
19.8▣	Grid	12	300	2300/3100	-28/-72	**17FP4**
19.8▣	Grid	12	300	2170/2970	-28/-72	**17FP4A**
17.6▣	Grid	12	300	2290/3100	-28/-72	**17GP4**
17.6▣	Grid	14	300	-56/310	-28/-72	**17HP4**
17.6▣	Grid	14	300	-56/310	-28/-72	**17HP4A**
17.6▣	Grid	14	300	-56/310	-28/-72	**17HP4B**
17.6▣	Grid	14	300	-56/310	-28/-72	**SG-17HP4B**
17.6▣	Grid	14	300	-56/310	-28/-72	**17HP4C**
19.8▣	Grid	12	300	—	-28/-72	**17JP4**
17.6▣	Grid	12	300	—	-28/-72	**17KP4**
17.6▣	Grid	12	300	—	-28/-72	**17KP4A**
17.6▣	Grid	12	300	-48/260	-28/-72	**17LP4**
17.6▣	Grid	14	300	-56/310	-28/-72	**17LP4A**
17.6▣	Grid	14	300	-56/310	-28/-72	**SG-17LP4A**
17.6▣	Grid	14	300	-56/310	-28/-72	**17LP4B**
17.6▣	Grid	12	300	—	-28/-72	**17QP4**
19.8▣	Grid	14	300	—	-28/-72	**17QP4A**
19.8▣	Grid	14	300	—	-28/-72	**SG-17QP4A**
19.8▣	Grid	14	300	—	-28/-72	**17QP4B**
17.6▣	Grid	14	300	-56/310	-28/-72	**17RP4**
17.6▣	Grid	14	300	-56/310	-28/-72	**17RP4C**
15.4▣	Grid	12	250	—	-28/-72	**17SP4**
17.6▣	Grid	14	300	0/350	-28/-72	**17TP4**
15.4▣	Grid	12	250	—	-28/-72	**17UP4**
17.6▣	Grid	14	300	-48/260	-28/-72	**17VP4**
17.6▣	Grid	14	300	-48/260	-28/-72	**17VP4B**
19.8▣	Grid	16	300	—	-28/-72	**17YP4**
23.5	Cath.	16	30	0/400	22/45	**18VAUP4**
20.0▣	Grid	16	300	100/500	-35/-72	**19ABP4**
20.0	Cath.	14	50	0/400	35/50	**19ACP4**
17.6	Cath.	14	100	-100/100	32/47	**19AEP4**
20.0	Grid	16	300	0/400	-35/-72	**19AFP4**
17.6	Cath.	14	500	0/400	40/63	**19AHP4**
19.8	Cath.	14.5	50	0/500	31/49	**19AJP4**
22.0	Cath.	14	500	0/400	45/95	**19ALP4**
20.0	Grid	16	500	0/400	-43/-78	**19ANP4**
17.6▣	Grid	12	300	—	-28/-72	**19AP4**
17.6▣	Grid	12	300	—	-28/-72	**19AP4A**
17.6▣	Grid	12	300	—	-28/-72	**19AP4B**
17.6▣	Grid	12	300	—	-28/-72	**19AP4C**
17.6▣	Grid	12	300	—	-28/-72	**19AP4D**
20.0	Grid	16	300	0/400	-38/-72	**19AQP4**
20.0	Grid	16	300	0/400	-35/-72	**19ARP4**
20.0	Grid	16	300	0/400	-35/-72	**19ASP4**
20.0	Grid	16	500	0/400	-43/-78	**19ATP4**
20.0	Grid	16	300	0/400	-35/-72	**19AUP4**
23.0	Grid	20	400	0/400	-36/-94	**19AVP4**

EXPLANATION OF SYMBOLS

- M—Metal cone tube
- G—Glass tube
- LWG—Light weight glass tube
- G°—Glass tube, dimensions different from normal
- MET—Metal tube
- O—Round tube
- □—Rectangular tube, spherical face
- ©—Rectangular tube, cylindrical face
- B—Fiberglass wrap implosion protection
- E—Filled rim type implosion protection
- T—Molded glass implosion panel attached to face
- P—Sagged glass implosion plate attached to face
- L—Plastic implosion barrier attached to face
- K—Banded tube with coated funnel for implosion protection
- H—Tube sealed into steel sheath for implosion protection
- C—Clear glass faceplate
- F—Gray filter glass faceplate
- R—Anti-reflection faceplate
- A—Aluminized screen
- V—Rim bands and tension band
- W—Rim bands and tension band with mounting lugs
- X—Formed with tension band
- Y—Formed rim with tension band and mounting lugs
- Mag.—Magnetic focus
- L.V.E.S.—Low voltage electrostatic focus
- H.V.E.S.—High Voltage electrostatic focus
- Auto.Es.—Self-focusing electrostatic
- Int.Mag.—Internal magnetic focus
- TPF—Tri-potential focus
- N—No ion trap
- S—Single field ion trap
- D—Double field ion trap
- I—Internal ion trap
- *—18 second heater warm-up time (all others are 11 second)
- Grid—Grid drive service (all voltages with respect to cathode)
- Cath.—Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⧅ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorption characteristics.

☆ This type summary is based on EIA registered data, registered envelope data, and manufacturer's published data. Data presented herein have been carefully prepared from such publicly available data to assure technical correctness, however, no responsibility is assumed by the General Electric Company for possible inaccuracies.

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
19AXP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.45
19AYP4	⧅	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.45
19BAP4	⧅	114	G	□	T	FA	1000/1500	L.V.E.S.	N	11.625	4.125	8HR	6.3	0.30
19BCP4	⧅	114	G	□	T	FAR	1000/1500	L.V.E.S.	N	11.625	4.125	8HR	6.3	0.30
19BDP4	△	92	G	□	—	FA	1500/2000	L.V.E.S.	N	15.250	5.500	12L	6.3	0.60
19BEP4	△	110	G	□	—	FA	1000/1500	L.V.E.S.	N	11.812	4.250	8HR	6.3	0.30
19BFP4	△	92	G	□	—	FA	1500/2000	L.V.E.S.	N	15.250	5.500	12L	6.3	0.60
19BHP4	⧅	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.750	4.500	8HR	6.3	0.60
19BLP4	⧅	114	G	□	—	FA	1300/1700	L.V.E.S.	N	11.312	4.125	8HR	6.3	0.60
19BMP4	⧅	114	G	□	T	FA	1300/1700	L.V.E.S.	N	11.562	4.062	8HR	6.3	0.60
19BNP4	⧅	114	G	□	T	FA	1000/1500	L.V.E.S.	N	12.625	5.125	8HR	6.3	0.60
19BQP4	⧅	114	G	□	T	FAR	1000/1500	L.V.E.S.	N	12.562	5.125	8HR	6.3	0.60
19BRP4	△	114	G	□	P	FA	1000/1500	L.V.E.S.	N	11.812	4.374	8HR	6.3	0.60
19BSP4	△	110	G	□	—	FA	1000/1500	L.V.E.S.	N	11.812	4.250	8HR	6.3	0.60
19BTP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.TPF	N	10.812	3.562	8JR	6.3	0.60
19BUP4	⧅	114	G	□	—	FA	1300/1700	L.V.E.S.	N	11.625	4.375	8HR	2.2	0.102
19BVP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.750	4.500	8HR	6.3	0.60
19BWP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.750	4.500	8HR	6.3	0.45
19CAP4	△	110	G	□	—	FA	1000/1500	L.V.E.S.TPF	N	11.125	3.562	8JR	6.3	0.60
19CDP4	△	114	G	□	—	FA	1400/1900	L.V.E.S.	N	11.625	4.375	7FA	6.3	0.60
19CEP4	△	114	G	□	T	FAR	1000/1500	L.V.E.S.	N	11.625	4.125	8HR	6.3	0.30*
19CFP4	⧅	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.500	4.250	8HR	6.3	0.60
19CGP4	△	92	G	□	T	FAR	1400/1700	L.V.E.S.	N	15.500	5.500	12L	6.3	0.60
19CHP4	⧅	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.750	4.500	8HR	6.3	0.60
19CJP4	⧅	114	G	□	—	FA	1300/1700	L.V.E.S.	N	11.312	4.125	8HR	6.3	0.60
19CKP4	⧅	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.750	4.500	8HR	6.3	0.60
19CLP4	△	92	G	□	—	FA	1500/2000	L.V.E.S.	N	15.250	5.500	12L	6.3	0.60
19CMP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19CMP4A	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19CQP4	△	114	G	□	—	FA	1400/1900	L.V.E.S.	N	11.625	4.375	7FA	6.3	0.60
19CRP4	△	92	G	□	—	FA	1500/2000	L.V.E.S.	N	15.250	5.500	12L	6.3	0.60
19CUP4	⧅	114	G	□	—	FA	1300/1700	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19CVP4	⧅	114	G	□	T	FA	1700/2100	L.V.E.S.	N	11.625	4.125	8HR	6.3	0.45
19CXP4	△	114	G	□	—	FA	1400/1900	L.V.E.S.	N	11.625	4.375	7FA	6.3	0.60
19CYP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	10.875	3.625	8HR	6.3	0.60
19CZP4	⧅	114	G	□	P	FA	1000/1500	L.V.E.S.	N	11.562	4.125	8HR	6.3	0.45
19DAP4	⧅	114	G	□	P	FAR	1000/1500	L.V.E.S.	N	11.562	4.125	8HR	6.3	0.45
19DBP4	△	114	G	□	P	FA	1400/1900	L.V.E.S.	N	11.812	4.375	7FA	6.3	0.45
19DCP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19DEP4	⧅	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.875	4.625	8HR	6.3	0.60
19DFP4	⧅	114	G	□	—	FA	1300/1700	L.V.E.S.	N	11.688	4.438	8HR	6.3	0.60
19DHP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19DJP4	△	110	G	□	—	FA	1000/1500	L.V.E.S.	N	11.875	4.328	8HR	6.3	0.60
19DKP4	⧅	114	G	□	P	FA	1000/1500	L.V.E.S.	N	11.562	4.125	8HR	6.3	0.60
19DLP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19DNP4	⧅	114	G	□	P	FA	1000/1500	L.V.E.S.	N	11.562	4.125	8HR	6.3	0.60
19DP4	△	66	G	○	—	C	750/2500	Mag.	S	21.500	7.125	12N	6.3	0.60
19DP4A	△	66	G	○	—	F	750/2500	Mag.	S	21.500	7.125	12N	6.3	0.60
19DQP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.45
19DRP4	⧅	114	G	□	V	FA	1250/1750	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19DSP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19DUP4	⧅	114	G	□	V	FA	1150/1550	L.V.E.S.	N	11.750	4.500	8HR	6.3	0.45
19DVP4	⧅	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.750	4.500	8HR	6.3	0.45
19DWP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.45
19DYP4	⧅	114	G	□	T	FAR	1700/2100	L.V.E.S.	N	11.625	4.125	8HR	6.3	0.45
19DZP4	⧅	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.750	4.500	8HR	6.3	0.45
19EAP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19EBP4	△	114	G	□	E	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19ECP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.750	4.500	8HR	6.3	0.45
19EDP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES ◈	TYPICAL OPERATING CONDITIONS					TUBE TYPE
	DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	
20.0	Grid	16	400	0/400	-36/-94	19AXP4
23.0	Grid	20	400	0/400	-36/-94	19AYP4
20.0	Grid	16	300	0/400	-35/-72	19BAP4
20.0	Grid	16	300	0/400	-35/-72	19BCP4
20.0	Cath.	14.5	50	0/500	31/49	19BDP4
20.0	Cath.	16	400	0/400	42/78	19BEP4
20.0	Grid	16	400	0/400	-36/-94	19BFP4
22.0	Grid	18.5	450	0/500	-28/-61	19BHP4
20.0▣	Grid	16	400	0/400	-36/-94	19BLP4
20.0	Grid	16	400	0/400	-36/-94	19BMP4
20.0	Cath.	16	50	0/400	32/50	19BNP4
20.0	Cath.	16	50	0/400	32/50	19BQP4
23.0	Grid	16	300	0/400	-35/-72	19BRP4
20.0	Cath.	16	400	0/400	42/78	19BSP4
23.0	Grid	16	500	0/400	-43/-78	19BTP4
18.75▣	Cath.	14	100	0/400	45/60	19BUP4
23.5	Cath.	20	500	0/500	45/95	19BVP4
23.5	Cath.	20	500	0/500	45/95	19BWP4
20.0	Grid	16	500	0/400	-43/-78	19CAP4
19.8	Cath.	16	50	0/500	35/50	19CDP4
20.0	Grid	16	300	0/400	-35/-72	19CEP4
17.5	Cath.	13	50	0/400	31/49	19CFP4
20.0	Grid	16	300	0/400	-35/-72	19CGP4
20.0	Cath.	16	50	-50/250	32/50	19CHP4
20.0	Grid	16	400	0/400	-65/-105	19CJP4
22.0	Cath.	18	50	0/500	36/54	19CKP4
19.8	Cath.	14.5	35	0/500	25/40	19CLP4
20.0	Cath.	16	30	0/400	30/45	19CMP4
23.5	Cath.	16	30	0/400	30/45	19CMP4A
19.8	Cath.	16	35	0/500	25/50	19CQP4
22.0	Cath.	16	35	0/500	25/50	19CRP4
22.0	Cath.	16	65	-100/300	41/56	19CUP4
23.0	Cath.	16	50	0/400	32/50	19CVP4
19.8	Cath.	16	45	0/500	35/50	19CXP4
23.0	Grid	20	400	0/400	-36/-94	19CYP4
23.0	Grid	20	400	0/400	-46/-94	19CZP4
23.0	Grid	20	400	0/400	-46/-94	19DAP4
19.8	Cath.	16	40	0/500	35/50	19DBP4
20.0	Grid	16	400	0/400	-39/-94	19DCP4
22.0	Cath.	18	300	0/500	36/54	19DEP4
22.0	Cath.	16	65	-100/300	41/56	19DFP4
20.0	Cath.	16	50	0/400	35/65	19DHP4
20.0	Cath.	16	400	0/400	42/78	19DJP4
23.0	Grid	20	400	0/400	-46/-94	19DKP4
20.0	Cath.	16	50	0/400	35/55	19DLP4
18.0	Grid	16	300	0/400	-35/-72	19DNP4
18.7▣	Grid	13	250	—	-21/-58	19DP4
18.7▣	Grid	13	250	—	-21/-58	19DP4A
23.0	Cath.	16	300	0/400	28/62	19DQP4
23.0	Cath.	16	300	0/400	28/62	19DRP4
20.0	Cath.	16	50	-100/300	32/50	19DSP4
22.0	Cath.	16	50	-200/200	33/45	19DUP4
20.0	Cath.	16	150	-250/150	36/54	19DVP4
23.0	Grid	20	400	-200/200	-50/-98	19DWP4
23.0	Cath.	16	50	0/400	32/50	19DYP4
18.0	Cath.	13	150	-250/150	36/54	19DZP4
20.0	Cath.	16	50	-100/300	32/50	19EAP4
23.0	Grid	16	400	0/400	-39/-94	19EBP4
20.0	Cath.	16	150	-250/150	36/54	19ECP4
23.0	Cath.	20	400	0/400	42/78	19EDP4

EXPLANATION OF SYMBOLS

- M—Metal cone tube
- G—Glass tube
- LWG—Light weight glass tube
- G°—Glass tube, dimensions different from normal
- MET—Metal tube
- O—Round tube
- □—Rectangular tube, spherical face
- ©—Rectangular tube, cylindrical face
- B—Fiberglass wrap implosion protection
- E—Filled rim type implosion protection
- T—Molded glass implosion panel attached to face
- P—Sagged glass implosion plate attached to face
- L—Plastic implosion barrier attached to face
- K—Banded tube with coated funnel for implosion protection
- H—Tube sealed into steel sheath for implosion protection
- C—Clear glass faceplate
- F—Gray filter glass faceplate
- R—Anti-reflection faceplate
- A—Aluminized screen
- V—Rim bands and tension band
- W—Rim bands and tension band with mounting lugs
- X—Formed with tension band
- Y—Formed rim with tension band and mounting lugs
- Mag.—Magnetic focus
- L.V.E.S.—Low voltage electrostatic focus
- H.V.E.S.—High Voltage electrostatic focus
- Auto.Es.—Self-focusing electrostatic
- Int.Mag.—Internal magnetic focus
- TPF—Tri-potential focus
- N—No ion trap
- S—Single field ion trap
- D—Double field ion trap
- I—Internal ion trap
- •—18 second heater warm-up time (all others are 11 second)
- Grid—Grid drive service (all voltages with respect to cathode)
- Cath.—Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⊠ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorption characteristics.

☆ This type summary is based on EIA registered data, registered envelope data, and manufacturer's published data. Data presented herein have been carefully prepared from such publicly available data to assure technical correctness, however, no responsibility is assumed by the General Electric Company for possible inaccuracies.

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
19EFP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19EGP4	△	114	G	□	E	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19EHP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19EHP4A	△	114	G	□	V	FA	1250/1750	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19EJP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19EKP4	△	114	G	□	E	FA	1000/1500	L.V.E.S.	N	11.625	4.375	7FA	6.3	0.45
19ELP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.60
19ENP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19ENP4A	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19EP4	△	70	G	□	—	F	None	Mag.	S	21.125	7.500	12D	6.3	0.60
19ESP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19ETP4	△	114	G	□	W	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19EUP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19EZP4	△	114	G	□	E	FA	1000/1500	L.V.E.S.	N	11.625	4.375	7FA	6.3	0.45
19FBP4	△	114	G	□	E	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19FCP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19FDP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.45
19FEP4	△	114	G	□	V	FA	1250/1750	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19FEP4A	△	114	G	□	V	FA	1250/1750	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19FEP4B	⧅	114	G	□	V	FA	1250/1750	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19FGP4	⧅	114	G	□	W	FA	1000/1500	L.V.E.S.	N	10.813	3.563	8JR	6.3	0.60
19FHP4	△	114	G	□	W	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19FJP4	⧅	114	G	□	W	FA	1250/1750	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19FJP4A	△	114	G	□	W	FA	1250/1750	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19FKP4	△	110	G	□	E	FA	1000/1500	L.V.E.S.	N	11.812	4.250	8HR	6.3	0.30
19FLP4	⧅	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.45
19FNP4	△	114	G	□	W	FA	1250/1750	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.60
19FP4	△	66	G	○	—	F	None	Mag.	S	22.000	7.625	12D	6.3	0.60
19FRP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.30
19FTP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.500	4.250	8HR	6.3	0.45
19FWP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.380	4.130	8HR	4.2	0.45
19GAP4	△	114	G	□	E	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19GBP4	△	114	G	□	T	FA	1000/1500	L.V.E.S.	N	11.625	4.125	8HR	6.3	0.45
19GEP4	△	114	G	□	W	FA	1250/1750	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.45
19GFP4	⧅	114	G	□	E	FA	1000/1500	L.V.E.S.	N	11.656	4.406	8HR	6.3	0.45
19GHP4	⧅	114	G	□	V	FA	1150/1550	L.V.E.S.	N	11.750	4.500	8HR	6.3	0.45
19GJP4	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.630	4.380	8HR	6.3	0.45
19GJP4A	△	114	G	□	V	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.45
19GKP4	△	114	G	□	W	FAR	1250/1750	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.30
19GMP4	⧅	114	G	□	T	FA	700/900	L.V.E.S.	N	11.625	4.125	8HR	6.3	0.45
19GP4	△	66	G	○	—	F	None	Mag.	S	21.250	6.875	12D	6.3	0.60
19HAP4	⧅	114	G	□	E	FA	1000/1500	L.V.E.S.	N	11.625	4.375	8HR	6.3	0.315
19HGP4	△	114	G	□	V	FA	1000/1700	L.V.E.S.	N	11.380	4.130	8HR	6.3	0.45
19JP4	△	70	G	□	—	F	None	Mag.	S	20.812	7.188	12D	6.3	0.60
19QP4	△	70	G	□	—	F	500/750	L.V.E.S.	S	21.125	7.500	12L	6.3	0.60
19VAHP4	⧅	114	G	□	X	FA	1400/2000	L.V.E.S.	N	12.519	4.375	8HR	6.3	0.45
19VAJP4	⧅	114	G	□	X	FA	1400/2000	L.V.E.S.	N	12.519	4.375	8HR	9.45	0.30
19VENP4	⧅	114	G	□	V	FAR	1400/2000	L.V.E.S.	N	12.390	4.500	8HR	6.3	0.45
19XP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.375	4.125	8HR	6.3	0.60
19YP4	△	114	G	□	—	FA	1000/1500	L.V.E.S.	N	10.812	3.562	8JR	6.3	0.60
19ZP4	⧅	114	G	□	—	FA	1000/1500	L.V.E.S.	N	11.500	4.250	8HR	6.3	0.60
20ABP4	△	114	G	□	V	FA	700/900	L.V.E.S.	N	12.270	4.380	8HR	6.3	0.45
20ADP4	⧅	114	G	□	W	FA	1500/2000	L.V.E.S.	N	12.270	4.380	8HR	6.3	0.45
20AEP4	⧅	114	G	□	V	FA	1500/2200	L.V.E.S.	N	12.269	4.375	8HR	6.3	0.45
20AHP4	⧅	114	G	□	V	FA	1400/2000	L.V.E.S.	N	12.390	4.500	8HR	6.3	0.45
20CP4	△	70	G	□	—	F	None	Mag.	S	21.438	7.188	12D	6.3	0.60
20CP4A	△	70	G	□	—	F	500/1500	Mag.	S	21.438	7.188	12N	6.3	0.60
20CP4B	△	70	G	□	—	FA	None	Mag.	S	21.438	7.188	12D	6.3	0.60
20CP4C	△	70	G	□	—	FR	None	Mag.	S	21.438	7.188	12D	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES ◈	TYPICAL OPERATING CONDITIONS					TUBE TYPE
	DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	
20.0	Cath.	16	50	0/400	35/55	**19EFP4**
21.0	Cath.	16	50	0/400	35/55	**19EGP4**
18.0	Cath.	16	400	0/400	40/76	**19EHP4**
18.0	Cath.	16	400	0/400	40/76	**19EHP4A**
20.0	Cath.	16	30	0/400	30/45	**19EJP4**
19.8	Cath.	16	45	0/500	35/50	**19EKP4**
18.0	Cath.	14	400	0/400	36/94	**19ELP4**
21.0	Cath.	16	50	0/400	32/50	**19ENP4**
21.0	Cath.	16	50	0/400	32/50	**19ENP4A**
20.9▣	Grid	13	250	—	-21/-58	**19EP4**
20.0	Cath.	16	50	0/400	32/50	**19ESP4**
21.0	Cath.	16	50	0/400	32/50	**19ETP4**
23.0	Grid	16	400	0/400	-39/-94	**19EUP4**
19.8	Cath.	16	45	0/500	35/50	**19EZP4**
15.0	Cath.	12	50	0/400	35/55	**19FBP4**
23.0	Grid	20	400	-200/200	-50/-98	**19FCP4**
23.0	Grid	20	400	0/400	-36/-78	**19FDP4**
20.0	Cath.	16	30	0/400	30/45	**19FEP4**
23.5	Cath.	16	30	0/400	30/45	**19FEP4A**
23.5	Cath.	16	30	0/400	22/45	**19FEP4B**
20.0	Grid	16	500	0/400	-43/-78	**19FGP4**
21.0	Grid	16	400	0/400	-39/-94	**19FHP4**
18.0	Cath.	16	400	0/400	40/76	**19FJP4**
18.0	Cath.	16	400	0/400	40/76	**19FJP4A**
20.0	Grid	16	300	0/400	-35/-72	**19FKP4**
23.0	Cath.	16	300	0/400	28/62	**19FLP4**
23.0	Cath.	16	300	0/400	28/62	**19FNP4**
20.9▣	Grid	13	250	—	-22/-58	**19FP4**
23.0	Cath.	16	300	0/400	28/62	**19FRP4**
21.0	Cath.	16	400	0/400	39/94	**19FTP4**
20.0	Grid	16	500	0/400	-50/-93	**19FWP4**
19.8	Cath.	16	400	0/500	35/72	**19GAP4**
23.0	Cath.	20	400	0/500	45/70	**19GBP4**
23.0	Cath.	18	400	0/400	36/78	**19GEP4**
23.0	Grid	16	400	0/400	39/-94	**19GFP4**
22.0	Cath.	16	50	-200/200	33/45	**19GHP4**
23.0	Grid	20	400	-200/200	-50/-98	**19GJP4**
23.0	Grid	20	400	-200/200	-50/-98	**19GJP4A**
23.0	Cath.	16	300	0/400	28/62	**19GKP4**
23.0	Cath.	16	50	0/400	32/50	**19GMP4**
20.9▣	Grid	13	250	—	-22/-58	**19GP4**
21.0	Cath.	16	50	0/400	35/55	**19HAP4**
20.0	Grid	16	150	0/400	-38/-62	**19HGP4**
19.8▣	Grid	12	300	—	-28/-72	**19JP4**
19.8▣	Grid	12	300	-50/350	-28/-72	**19QP4**
23.0	Cath.	16	30	-100/+300	22/45	**19VAHP4**
23.0	Cath.	16	30	-100/+300	22/45	**19VAJP4**
20.0	Cath.	16	150	-250/+150	-36/-54	**19VBNP4**
20.0	Grid	16	400	0/400	-36/-94	**19XP4**
20.0	Grid	16	500	0/400	-43/-78	**19YP4**
20.0	Grid	16.5	450	0/500	-28/-72	**19ZP4**
23.0	Cath.	16	50	-200/+200	32/52	**20ABP4**
23.0	Cath.	16	35	-200/200	30/42	**20ADP4**
23.5	Cath.	16	30	0/400	30/45	**20AEP4**
20.0	Cath.	16	150	-250/150	36/54	**20AHP4**
19.8▣	Grid	16	300	—	-28/-72	**20CP4**
19.8▣	Grid	16	300	—	-28/-72	**20CP4A**
19.8▣	Grid	16	300	—	-28/-72	**20CP4B**
19.8▣	Grid	16	300	—	-28/-72	**20CP4C**

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- B—Fiberglass wrap implosion protection
- E—Filled rim type implosion protection
- T—Molded glass implosion panel attached to face
- P—Sagged glass implosion plate attached to face
- L—Plastic implosion barrier attached to face
- K—Banded tube with coated funnel for implosion protection
- H—Tube sealed into steel sheath for implosion protection
- C—Clear glass faceplate
- F—Gray filter glass faceplate
- R—Anti-reflection faceplate
- A—Aluminized screen
- V—Rim bands and tension band
- W—Rim bands and tension band with mounting lugs
- X—Formed with tension band
- Y—Formed rim with tension band and mounting lugs
- Mag.—Magnetic focus
- L.V.E.S.—Low voltage electrostatic focus
- H.V.E.S.—High Voltage electrostatic focus
- Auto.Es.—Self-focusing electrostatic
- Int.Mag.—Internal magnetic focus
- TPF—Tri-potential focus
- N—No ion trap
- S—Single field ion trap
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- *—18 second heater warm-up time (all others are 11 second)
- Grid—Grid drive service (all voltages with respect to cathode)
- Cath.—Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

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TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
20CP4D	△	70	G	□	—	FA	500/1500	Mag.	S	21.438	7.188	12N	6.3	0.60
SG-20CP4D	△	70	G	□	—	FA	500/1500	Mag.	N	21.438	7.188	12N	6.3	0.60
20DP4	△	70	G	□	—	F	None	Mag.	S	21.750	7.500	12D	6.3	0.60
20DP4A	△	70	G	□	—	F	500/1500	Mag.	S	21.750	7.500	12N	6.3	0.60
20DP4B	△	70	G	□	—	FA	None	Mag.	S	21.750	7.500	12D	6.3	0.60
20DP4C	△	70	G	□	—	FA	500/1500	Mag.	S	21.750	7.500	12N	6.3	0.60
20DP4D	△	70	G	□	—	FA	500/1500	Mag.	N	21.750	7.500	12N	6.3	0.60
20FP4	△	70	G	□	—	F	None	H.V.E.S.	S	21.750	7.500	12M	6.3	0.60
20GP4	△	70	G	□	—	F	500/750	H.V.E.S.	S	21.750	7.500	12L	6.3	0.60
20HP4	△	70	G	□	—	F	None	L.V.E.S.	S	21.750	7.500	12M	6.3	0.60
20HP4A	△	70	G	□	—	F	500/1500	L.V.E.S.	S	21.750	7.500	12L	6.3	0.60
20HP4B	△	70	G	□	—	FR	None	L.V.E.S.	S	21.750	7.500	12M	6.3	0.60
20HP4C	△	70	G	□	—	FA	None	L.V.E.S.	S	21.750	7.500	12M	6.3	0.60
20HP4D	△	70	G	□	—	FA	500/1500	L.V.E.S.	S	21.750	7.500	12L	6.3	0.60
SG-20HP4D	△	70	G	□	—	FA	500/1500	L.V.E.S.	N	21.750	7.500	12L	6.3	0.60
20HP4E	△	70	G	□	—	FA	500/1500	L.V.E.S.	N	21.750	7.500	12L	6.3	0.60
20JP4	△	70	G	□	—	F	500/750	Auto.Es.	S	21.750	7.500	12P	6.3	0.60
20LP4	△	70	G	□	—	F	750/1500	L.V.E.S.	S	21.750	7.500	12L	6.3	0.60
20MP4	△	70	G	□	—	F	500/1500	L.V.E.S.	S	21.750	7.500	12L	6.3	0.60
20RP4	⧅	114	G	□	V	FA	1600/2000	L.V.E.S.	N	12.394	4.500	8HR	6.3	0.45
20SP4	⧅	114	G	□	X	FA	1400/2000	L.V.E.S.	N	12.269	4.375	8HR	6.3	0.45
20TP4	⧅	114	G	□	X	FA	1400/2000	L.V.E.S.	N	12.269	4.375	8HR	6.3	0.45
20UP4	△	114	G	□	E	FA	1200/1700	L.V.E.S.	N	12.312	4.375	8HR	6.3	0.45
20WP4	⧅	114	G	□	W	FA	1600/2200	L.V.E.S.	N	12.269	4.375	8HR	6.3	0.45
20XP4	⧅	114	G	□	V	FA	1500/2000	L.V.E.S.	N	12.270	4.380	8HR	6.3	0.45
20YP4	⧅	114	G	□	V	FA	1500/2000	L.V.E.S.	N	12.270	4.380	8HR	6.3	0.45
20ZP4	⧅	114	G	□	V	FA	1500/2000	L.V.E.S.	N	12.270	4.380	8HR	6.3	0.45
21ACP4	⧅	90	G	□	—	F	2000/2500	Mag.	S	20.000	7.500	12N	6.3	0.60
21ACP4A	⧅	90	G	□	—	FA	2000/3500	Mag.	S	20.000	7.500	12N	6.3	0.60
SG-21ACP4A	△	90	G	□	—	FA	2000/2500	Mag.	N	20.000	7.500	12N	6.3	0.60
21AFP4	△	70	G	□	—	F	None	L.V.E.S.	S	23.000	7.500	12M	6.3	0.60
21ALP4	⧅	90	G	□	—	F	500/750	L.V.E.S.	S	20.000	7.500	12L	6.3	0.60
21ALP4A	⧅	90	G	□	—	FA	500/750	L.V.E.S.	S	20.000	7.500	12L	6.3	0.60
21ALP4B	⧅	90	G	□	—	FA	500/750	L.V.E.S.	S	20.000	7.500	12L	6.3	0.60
21AMP4	△	90	G	□	—	F	2000/2500	Mag.	S	20.000	7.500	12L	6.3	0.60
21AMP4A	△	90	G	□	—	FA	2000/2500	Mag.	S	20.000	7.500	12L	6.3	0.60
21AMP4B	⧅	90	G	□	—	FA	2000/2500	Mag.	N	20.000	7.500	12N	6.3	0.60
21ANP4	△	90	G	□	—	F	None	L.V.E.S.	S	20.000	7.500	12M	6.3	0.60
21ANP4A	△	90	G	□	—	FA	None	L.V.E.S.	S	20.000	7.500	12M	6.3	0.60
21AP4	△	70	MET	□	—	FR	None	Mag.	S	22.312	7.500	12D	6.3	0.60
21AQP4	△	90	G	□	—	F	None	Mag.	S	20.000	7.500	12D	6.3	0.60
21AQP4A	△	90	G	□	—	FA	None	Mag.	S	20.000	7.500	12D	6.3	0.60
21ARP4	△	70	G	□	—	F	500/750	Int.Mag.	I	23.031	7.500	12N	6.3	0.60
21ARP4A	△	70	G°	□	—	FA	500/755	Int.Mag.	I	23.031	7.500	12N	6.3	0.60
21ASP4	△	70	G	□	—	F	None	L.V.E.S.	S	22.438	7.500	12M	6.3	0.60
21ATP4	⧅	90	G	□	—	FA	1200/1500	L.V.E.S.	S	20.000	7.500	12L	6.3	0.60
21ATP4A	⧅	90	G	□	—	FA	1200/1500	L.V.E.S.	S	20.000	7.500	12L	6.3	0.60
21ATP4B	⧅	90	G	□	—	F	1200/1500	L.V.E.S.	S	20.000	7.500	12L	6.3	0.60
21AUP4	⧅	72	G	□	—	F	2000/2500	L.V.E.S.	S	23.031	7.500	12L	6.3	0.60
21AUP4A	⧅	72	G	□	—	FA	2000/2500	L.V.E.S.	S	23.031	7.500	12L	6.3	0.60
21AUP4B	⧅	72	G	□	—	FA	2000/2500	L.V.E.S.	S	23.031	7.500	12L	6.3	0.60
SG-21AUP4B	△	72	G	□	—	FA	2000/2500	L.V.E.S.	N	22.031	7.500	12L	6.3	0.60
21AUP4C	△	72	G	□	—	FA	2000/2500	L.V.E.S.	N	23.031	7.500	12L	6.3	0.60
21AVP4	⧅	72	G	□	—	F	2000/2500	L.V.E.S.	S	23.031	7.500	12L	6.3	0.60
21AVP4A	△	72	G	□	—	FA	2000/2500	L.V.E.S.	S	23.031	7.500	12L	6.3	0.60
21AVP4B	⧅	72	G	□	—	FA	2000/2500	L.V.E.S.	S	23.031	7.500	12L	6.3	0.60
21AVP4C	⧅	72	G	□	—	FA	2000/2500	L.V.E.S.	N	23.031	7.500	12L	6.3	0.60
21AWP4	⧅	72	G	□	—	FA	2000/2500	Mag.	S	23.031	7.500	12N	6.3	0.60
21AWP4A	⧅	72	G	□	—	FA	2000/2500	Mag.	N	23.031	7.500	12N	6.3	0.60
SG-21AWP4A	△	72	G	□	—	FA	2000/2500	Mag.	N	23.031	7.500	12N	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES ◈	TYPICAL OPERATING CONDITIONS DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	TUBE TYPE
19.8▣	Grid	16	300	—	-28/-72	**20CP4D**
19.8▣	Grid	16	300	—	-28/-72	**SG-20CP4D**
19.8▣	Grid	16	300	—	-28/-72	**20DP4**
19.8▣	Grid	16	300	—	-28/-72	**20DP4A**
19.8▣	Grid	16	300	—	-28/-72	**20DP4B**
19.8▣	Grid	16	300	—	-28/-72	**20DP4C**
19.8▣	Grid	16	300	—	-28/-72	**20DP4D**
19.8▣	Grid	12	300	2300/3200	-28/-72	**20FP4**
19.8▣	Grid	14	300	2750/3740	-28/-72	**20GP4**
17.6▣	Grid	14	300	-56/310	-28/-72	**20HP4**
17.6▣	Grid	14	300	-56/310	-28/-72	**20HP4A**
17.6▣	Grid	14	300	-56/310	-28/-72	**20HP4B**
17.6▣	Grid	14	300	-56/310	-28/-72	**20HP4C**
17.6▣	Grid	14	300	-56/310	-28/-72	**20HP4D**
17.6▣	Grid	14	300	-56/310	-28/-72	**SG-20HP4D**
17.6▣	Grid	14	300	-56/310	-28/-72	**20HP4E**
19.8▣	Grid	12	300	—	-28/-72	**20JP4**
17.6▣	Grid	14	300	-56/310	-28/-72	**20LP4**
17.6▣	Grid	14	300	-55/300	-28/-72	**20MP4**
22.0	Cath.	16	50	0/400	33/50	**20RP4**
23.0	Cath.	16	30	-100/300	22/40	**20SP4**
23.0	Cath.	16	300	0/400	28/62	**20TP4**
23.0	Cath.	16	400	0/500	35/72	**20UP4**
23.0	Cath.	18	400	0/400	36/78	**20WP4**
23.0	Cath.	20	400	-200/200	48/82	**20XP4**
23.0	Cath.	16	50	-200/200	32/52	**20YP4**
23.0	Cath.	16	50	-200/200	32/52	**20ZP4**
22.0	Grid	16	300	—	-28/-72	**21ACP4**
22.0	Grid	16	300	—	-28/-72	**21ACP4A**
22.0	Grid	16	300	—	-28/-72	**SG-21ACP4A**
19.8▣	Grid	16	300	-64/350	-28/-72	**21AFP4**
19.8▣	Grid	14	300	-55/300	-28/-72	**21ALP4**
19.8▣	Grid	14	300	-55/300	-28/-72	**21ALP4A**
22.0	Grid	14	300	-55/300	-28/-72	**21ALP4B**
19.8▣	Grid	16	300	—	-28/-72	**21AMP4**
19.8▣	Grid	16	300	—	-28/-72	**21AMP4A**
19.8▣	Grid	17	300	—	-28/-72	**21AMP4B**
19.8▣	Grid	14	300	-55/300	-28/-72	**21ANP4**
19.8▣	Grid	14	300	-55/300	-28/-72	**21ANP4A**
19.8▣	Grid	14	300	—	-28/-72	**21AP4**
19.8▣	Grid	16	300	—	-28/-72	**21AQP4**
19.8▣	Grid	16	300	—	-28/-72	**21AQP4A**
22.0▣	Grid	16	300	—	-28/-72	**21ARP4**
22.0▣	Grid	16	300	—	-28/-72	**21ARP4A**
19.8▣	Grid	16	300	-64/352	-28/-72	**21ASP4**
19.8▣	Grid	16	300	-64/350	-28/-72	**21ATP4**
22.0▣	Grid	16	300	-64/350	-28/-72	**21ATP4A**
19.8▣	Grid	16	300	-64/350	-28/-72	**21ATP4B**
19.8▣	Grid	14	300	-55/300	-28/-72	**21AUP4**
19.8▣	Grid	14	300	-55/300	-28/-72	**21AUP4A**
22.0▣	Grid	14	300	-55/300	-28/-72	**21AUP4B**
22.0▣	Grid	14	300	-55/300	-28/-72	**SG-21AUP4B**
22.0▣	Grid	14	300	-55/300	-28/-72	**21AUP4C**
19.8▣	Grid	14	300	-55/300	-28/-72	**21AVP4**
19.8▣	Grid	14	300	-55/300	-28/-72	**21AVP4A**
22.0▣	Grid	14	300	-55/300	-28/-72	**21AVP4B**
22.0▣	Grid	14	300	-55/300	-28/-72	**21AVP4C**
19.8▣	Grid	16	300	—	-28/-72	**21AWP4**
19.8▣	Grid	16	300	—	-28/-72	**21AWP4A**
19.8▣	Grid	16	300	—	-28/-72	**SG-21AWP4A**

EXPLANATION OF SYMBOLS

M—Metal cone tube
G—Glass tube
LWG—Light weight glass tube
G°—Glass tube, dimensions different from normal
MET—Metal tube
O—Round tube
□—Rectangular tube, spherical face
ⓒ—Rectangular tube, cylindrical face
B—Fiberglass wrap implosion protection
E—Filled rim type implosion protection
T—Molded glass implosion panel attached to face
P—Sagged glass implosion plate attached to face
L—Plastic implosion barrier attached to face
K—Banded tube with coated funnel for implosion protection
H—Tube sealed into steel sheath for implosion protection
C—Clear glass faceplate
F—Gray filter glass faceplate
R—Anti-reflection faceplate
A—Aluminized screen
V—Rim bands and tension band
W—Rim bands and tension band with mounting lugs
X—Formed with tension band
Y—Formed rim with tension band and mounting lugs
Mag.—Magnetic focus
L.V.E.S.—Low voltage electrostatic focus
H.V.E.S.—High Voltage electrostatic focus
Auto.Es.—Self-focusing electrostatic
Int.Mag.—Internal magnetic focus
TPF—Tri-potential focus
N—No ion trap
S—Single field ion trap
D—Double field ion trap
I—Internal ion trap
*—18 second heater warm-up time (all others are 11 second)
Grid—Grid drive service (all voltages with respect to cathode)
Cath.—Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⊠ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorption characteristics.

☆ This type summary is based on EIA registered data, registered envelope data, and manufacturer's published data. Data presented herein have been carefully prepared from such publicly available data to assure technical correctness, however, no responsibility is assumed by the General Electric Company for possible inaccuracies.

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE			EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER	
				SHAPE	IMPLOSION PROTECTION	TREATMENT							V.	A.
21AYP4	△	70	G	□	—	F	750/2500	L.V.E.S.	S	22.438	7.500	12L	6.3	0.60
21BAP4	⧅	90	G	□	—	FA	2000/2500	L.V.E.S.	N	20.000	7.500	12L	6.3	0.60
21BCP4	⧅	90	G	□	—	FA	500/750	L.V.E.S.	N	23.031	7.500	12L	6.3	0.60
21BDP4	⧅	72	G	□	—	FA	500/750	L.V.E.S.	N	23.031	7.500	12L	6.3	0.60
21BNP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	20.000	7.500	12L	6.3	0.60
21BSP4	△	90	G	□	—	FA	2000/2500	Mag.	S	20.000	7.500	12N	6.3	0.60
21BTP4	⧅	90	G	□	—	FA	2000/2500	L.V.E.S.	S	20.000	7.500	12L	6.3	0.60
21CBP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
21CBP4A	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
21CBP4B	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
21CDP4	△	90	G	□	—	F	2000/2500	L.V.E.S.	S	20.000	7.500	12L	6.3	0.45
21CDP4A	△	90	G	□	—	FA	2000/2500	L.V.E.S.	S	20.000	7.500	12L	6.3	0.45
21CEP4	△	110	G	□		FA	2000/2500	L.V.E.S.	N	14.438	5.438	8HR	6.3	0.60
21CEP4A	△	110	G	□	—	FA	2000/2500	L.V.E.S.	N	14.438	5.438	8HR	6.3	0.60
21CGP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	S	20.000	7.500	12L	6.3	0.60
21CHP4	△	90	G	□	—	FA	2000/2000	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
21CKP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.45
21CLP4	△	90	G	□	—	FA	1250/1750	L.V.E.S.	S	19.000	6.500	12AJ	6.3	0.30
21CMP4	⧅	90	G	□	—	FA	2000/2500	L.V.E.S.	S	19.000	6.500	12L	6.3	0.60
21CQP4	△	110	LWG	□	—	FA	2000/2500	L.V.E.S.	N	14.438	5.188	7FA	6.3	0.60
21CSP4	△	110	LWG	□	—	FA	2000/2500	L.V.E.S.	N	14.438	5.188	7FA	6.3	0.45
21CUP4	△	90	G	□	—	FA	2000/2500	Mag.	S	20.000	7.500	12N	6.3	0.60
21CVP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	20.000	7.500	12L	6.3	0.60
21CWP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	S	20.000	7.500	12L	6.3	0.60
21CXP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
21CZP4	⧅	110	LWG	□	—	FA	2000/2500	L.V.E.S.	S	14.688	5.438	8HR	6.3	0.60
21DP4	△	70	M	□	—	FR	None	H.V.E.S.	S	22.625	7.500	12M	6.3	0.60
21DAP4	△	110	LWG	□	—	FA	2000/2500	L.V.E.S.	N	14.688	5.438	8HR	6.3	0.60
21DEP4	⧅	110	LWG	□	—	FA	2000/2500	L.V.E.S.	N	14.688	5.438	8HR	6.3	0.60
21DEP4A	△	110	LWG	□	—	FA	2000/2500	L.V.E.S.	N	14.688	5.438	8HR	6.3	0.60
SG-21DEP4A	△	110	LWG	□	—	FA	2000/2500	L.V.E.S.	N	14.688	5.438	8HR	6.3	0.60
21DFP4	△	110	G	□	—	FA	1500/2200	L.V.E.S.	N	14.438	5.438	8HR	6.3	0.60
21DHP4	△	110	LWG	□	—	FA	1700/2500	L.V.E.S.	N	14.688	5.438	8HR	6.3	0.45
21DJP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.30
21DKP4	△	110	LWG	□	—	FA	1700/2500	L.V.E.S.	N	14.688	5.438	8HR	6.3	0.30
21DKP4A	△	110	LWG	□	—	FA	1700/2500	L.V.E.S.	N	14.688	5.438	8HR	6.3	0.30*
21DLP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	17.000	4.500	12L	6.3	0.60
21DMP4	△	110	LWG	□	—	FA	2000/2500	L.V.E.S.	N	13.750	4.500	8HR	6.3	0.60
21DNP4	△	90	G	□	—	FA	1200/1500	L.V.E.S.	S	19.000	6.500	12L	6.3	0.60
21DQP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	17.500	5.000	12L	6.3	0.60
21DRP4	△	90	LWG	□	—	FA	2000/2500	L.V.E.S.	N	18.250	5.500	12L	6.3	0.60
21DSP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
21DVP4	△	90	G	□	—	FA	500/750	L.V.E.S.	S	20.000	7.500	12L	6.3	0.30
21DWP4	△	110	G	□	—	FA	2000/2500	L.V.E.S.	N	14.438	5.438	8HR	6.3	0.30
21EAP4	⧅	110	LWG	□	—	FA	1500/2000	L.V.E.S.	N	12.938	3.688	8JK	2.35	0.60
21ELP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	19.000	6.500	12L	6.3	0.30
21EMP4	△	110	G	□	—	FA	2000/2500	L.V.E.S.	N	13.375	4.375	8HR	6.3	0.60
21ENP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	S	19.000	6.500	12L	6.3	0.30
21EP4	△	70	G	◎	—	F	None	Mag.	S	23.000	7.500	12D	6.3	0.60
21EP4A	△	70	G	◎	—	F	500/750	Mag.	S	23.000	7.500	12N	6.3	0.60
21EP4B	⧅	70	G	◎	—	FA	500/750	Mag.	S	23.000	7.500	12N	6.3	0.60
SG-21EP4B	△	70	G	◎	—	FA	500/750	Mag.	N	23.000	7.500	12N	6.3	0.60
21EP4C	⧅	70	G	◎	—	FA	500/750	Mag.	N	23.000	7.500	12N	6.3	0.60
21EQP4	△	110	G	□	—	FA	2000/2500	L.V.E.S.TPF	N	12.562	3.562	8JR	6.3	0.60
21ERP4	△	110	G	□	P	FAR	1500/2000	L.V.E.S.TPF	N	12.812	3.562	8JR	6.3	0.60
21ESP4	⧅	110	LWG	□	—	FA	2000/2500	L.V.E.S.	N	13.312	4.062	8JS	6.3	0.60
21EVP4	⧅	110	LWG	□	—	FA	1500/2000	L.V.E.S.	N	12.937	3.688	8JK	2.68	0.45
21EXP4	△	110	G	□	—	FA	2000/2500	L.V.E.S.	N	12.562	3.562	8JR	6.3	0.30
21EZP4	△	110	LWG	□	—	FA	2000/2500	L.V.E.S.TPF	N	12.812	3.562	8JR	6.3	0.30
21FAP4	△	110	LWG	□	—	FA	2000/2500	L.V.E.S.TPF	N	12.812	3.562	8JR	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES ◈	TYPICAL OPERATING CONDITIONS					TUBE TYPE
	DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	
19.8 ⊡	Grid	16	300	−64/352	−28/−72	**21AYP4**
22.0 ⊡	Grid	16	300	0/500	−28/−72	**21BAP4**
22.0 ⊡	Grid	16	300	50/550	−28/−72	**21BCP4**
22.0 ⊡	Grid	16	300	50/550	−28/−72	**21BDP4**
22.0 ⊡	Grid	16	300	0/500	−28/−72	**21BNP4**
22.0 ⊡	Grid	16	300	—	−28/−72	**21BSP4**
22.0 ⊡	Grid	16	300	−64/352	−28/−72	**21BTP4**
19.8 ⊡	Grid	14	300	−55/300	−28/−72	**21CBP4**
22.0 ⊡	Grid	16	300	0/400	−28/−72	**21CBP4A**
22.0 ⊡	Grid	16	300	0/450	−28/−72	**21CBP4B**
22.0 ⊡	Grid	16	300	−64/352	−28/−72	**21CDP4**
22.0 ⊡	Grid	16	300	−64/352	−28/−72	**21CDP4A**
19.8 ⊡	Grid	14	300	0/400	−28/−72	**21CEP4**
22.0 ⊡	Grid	14	300	0/400	−28/−72	**21CEP4A**
22.0 ⊡	Cath.	14	110	−55/300	32/50	**21CGP4**
22.0 ⊡	Cath.	14	110	−50/350	32/50	**21CHP4**
22.0 ⊡	Grid	16	300	−50/350	−28/−72	**21CKP4**
19.8 ⊡	Grid	14	300	−103/203	−35/−75	**21CLP4**
22.0 ⊡	Grid	16	300	−64/352	−28/−72	**21CMP4**
19.8 ⊡	Grid	16	300	−50/350	−35/−72	**21CQP4**
19.8 ⊡	Grid	16	300	0/400	−35/−72	**21CSP4**
22.0 ⊡	Grid	16	300	—	−28/−72	**21CUP4**
22.0 ⊡	Grid	16	300	−64/352	−28/−72	**21CVP4**
22.0 ⊡	Grid	16	300	−64/352	−28/−72	**21CWP4**
22.0 ⊡	Grid	18	50	0/350	35/50	**21CXP4**
19.8 ⊡	Grid	17	300	0/500	−28/−72	**21CZP4**
19.8 ⊡	Grid	14	300	2750/3740	−28/−72	**21DP4**
19.8 ⊡	Grid	14	300	0/400	−28/−72	**21DAP4**
19.8 ⊡	Grid	17	300	0/500	−28/−72	**21DEP4**
22.0 ⊡	Grid	17	300	0/500	−28/−72	**21DEP4A**
22.0 ⊡	Grid	17	300	0/500	−28/−72	**SG-21DEP4A**
19.8 ⊡	Grid	14	300	0/400	−28/−72	**21DFP4**
19.8 ⊡	Grid	16	300	0/400	−35/−72	**21DHP4**
22.0 ⊡	Grid	16	300	−50/350	−25/−72	**21DJP4**
19.8 ⊡	Grid	16	300	0/400	−35/−72	**21DKP4**
19.8 ⊡	Grid	16	300	0/400	−35/−72	**21DKP4A**
22.0 ⊡	Grid	16	300	0/400	−28/−72	**21DLP4**
22.0 ⊡	Grid	16	400	−50/350	−36/−92	**21DMP4**
22.0 ⊡	Grid	16	300	−64/352	−35/−72	**21DNP4**
20.0 ⊡	Grid	16	300	−50/350	−35/−72	**21DQP4**
22.0 ⊡	Grid	16	300	0/450	−28/−72	**21DRP4**
22.0 ⊡	Cath.	16	50	0/450	32/50	**21DSP4**
22.0 ⊡	Grid	14	300	−50/300	−28/−72	**21DVP4**
19.8 ⊡	Grid	14	450	−50/350	45/105	**21DWP4**
20.0 ⊡	Grid	16	300	100/500	−35/−72	**21EAP4**
22.0 ⊡	Grid	16	450	0/400	−45/−105	**21ELP4**
19.8 ⊡	Grid	16	450	0/400	−45/−105	**21EMP4**
22.0 ⊡	Grid	16	300	−64/352	−35/−72	**21ENP4**
19.8 ⊡	Grid	16	300	—	−28/−72	**21EP4**
19.8 ⊡	Grid	16	300	—	−28/−72	**21EP4A**
19.8 ⊡	Grid	16	300	—	−28/−72	**21EP4B**
19.8 ⊡	Grid	16	300	—	−28/−72	**SG-21EP4B**
19.8 ⊡	Grid	16	300	—	−28/−72	**21EP4C**
20.0 ⊡	Grid	16	500	0/400	−43/−78	**21EQP4**
20.0	Grid	16	500	0/400	−43/−72	**21ERP4**
19.8 ⊡	Grid	17	450	0/500	−28/−72	**21ESP4**
20.0 ⊡	Grid	16	300	100/500	−35/−72	**21EVP4**
20.0	Grid	16	500	0/400	−43/−78	**21EXP4**
19.8 ⊡	Cath.	18	500	0/400	41/69	**21EZP4**
22.0 ⊡	Grid	16	300	0/400	−43/−78	**21FAP4**

EXPLANATION OF SYMBOLS

- M — Metal cone tube
- G — Glass tube
- LWG — Light weight glass tube
- G° — Glass tube, dimensions different from normal
- MET — Metal tube
- O — Round tube
- □ — Rectangular tube, spherical face
- Ⓒ — Rectangular tube, cylindrical face
- B — Fiberglass wrap implosion protection
- E — Filled rim type implosion protection
- T — Molded glass implosion panel attached to face
- P — Sagged glass implosion plate attached to face
- L — Plastic implosion barrier attached to face
- K — Banded tube with coated funnel for implosion protection
- H — Tube sealed into steel sheath for implosion protection
- C — Clear glass faceplate
- F — Gray filter glass faceplate
- R — Anti-reflection faceplate
- A — Aluminized screen
- V — Rim bands and tension band
- W — Rim bands and tension band with mounting lugs
- X — Formed with tension band
- Y — Formed rim with tension band and mounting lugs
- Mag. — Magnetic focus
- L.V.E.S. — Low voltage electrostatic focus
- H.V.E.S. — High Voltage electrostatic focus
- Auto.Es. — Self-focusing electrostatic
- Int.Mag. — Internal magnetic focus
- TPF — Tri-potential focus
- N — No ion trap
- S — Single field ion trap
- D — Double field ion trap
- I — Internal ion trap
- * — 18 second heater warm-up time (all others are 11 second)
- Grid — Grid drive service (all voltages with respect to cathode)
- Cath. — Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

⊡ Absolute-Maximum Values

⧄ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

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TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN µf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
21FCP4	△	110	LWG	□	—	FA	2000/2500	L.V.E.S.	N	13.500	4.250	8HR	6.3	0.60
21FDP4	△	110	LWG	□	—	FA	1500/2000	L.V.E.S.	N	13.125	3.875	8KW	6.3	0.60
21FLP4	□	90	G	□	—	FA	500/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
SG-21FLP4	△	90	G	□	—	FA	500/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
21FMP4	□	110	LWG	□	—	FA	2000/2500	L.V.E.S.	N	14.375	5.125	8HR	6.3	0.60
21FP4	△	70	G	◎	—	F	None	L.V.E.S.	S	23.000	7.500	12M	6.3	0.60
21FP4A	△	70	G	◎	—	F	500/750	L.V.E.S.	S	23.000	7.500	12L	6.3	0.60
21FP4C	△	70	G	◎	—	FA	500/750	L.V.E.S.	S	23.000	7.500	12L	6.3	0.60
SG-21FP4C	△	70	G	◎	—	FA	500/750	L.V.E.S.	N	22.000	6.500	12L	6.3	0.60
21FP4D	△	70	G	◎	—	FA	500/750	L.V.E.S.	N	23.031	7.500	12L	6.3	0.60
21FUP4	△	114	G	□	E	FA	1700/2500	L.V.E.S.	N	12.656	4.375	8HR	6.3	0.45
21FVP4	□	114	G	□	V	FA	1500/2300	L.V.E.S.	N	12.656	4.375	8HR	6.3	0.45
21FWP4	□	114	G	□	V	FA	1500/2300	L.V.E.S.	N	12.656	4.375	8HR	6.3	0.45
21FXP4	△	114	G	□	E	FA	1500/2300	L.V.E.S.	N	12.660	4.375	8HR	6.3	0.45
21FYP4	□	114	G	□	W	FA	1900/2400	L.V.E.S.	N	12.781	4.500	8HR	6.3	0.45
21FZP4	△	114	G	□	V	FA	1700/2500	L.V.E.S.	N	12.656	4.375	8HR	6.3	0.45
21GAP4	△	114	G	□	V	FA	1300/2000	L.V.E.S.	N	12.656	4.375	8HR	6.3	0.45
21GAP4A	□	114	G	□	V	FA	1300/2000	L.V.E.S.	N	12.656	4.375	8HR	6.3	0.45
21GBP4	□	114	G	□	V	FA	1500/2300	L.V.E.S.	N	12.781	4.500	8HR	6.3	0.45
21GCP4	□	114	G	□	W	FA	1700/2500	L.V.E.S.	N	12.656	4.375	8HR	6.3	0.45
21GEP4	□	114	G	□	W	FA	1700/2300	L.V.E.S.	N	12.660	4.380	8HR	6.3	0.45
21GHP4	□	114	G	□	—	FA	1500/2300	L.V.E.S.	N	12.656	4.375	8HR	6.3	0.45
21GJP4	△	114	G	□	V	FA	1500/2300	L.V.E.S.	N	12.968	4.687	8HR	6.3	0.60
21GKP4	△	114	G	□	Y	FA	1700/2500	L.V.E.S.	N	12.656	4.375	8HR	6.3	0.45
21GTP4	□	114	G	□	Y	FA	1700/2500	L.V.E.S.	N	12.660	4.375	8HR	6.3	0.315
21JP4	△	70	G	◎	—	F	500/750	Int.Mag.	I	23.031	7.500	12N	6.3	0.60
21JP4A	△	70	G	◎	—	FA	500/750	Int.Mag.	I	23.031	7.500	12N	6.3	0.60
21KP4	△	70	G	◎	—	F	None	Auto.Es.	S	22.875	7.500	12S	6.3	0.60
21KP4A	△	70	G	◎	—	F	500/750	Auto.Es.	S	23.000	7.500	12P	6.3	0.60
21MP4	△	70	M	□	—	FR	None	L.V.E.S.	S	22.625	7.500	12M	6.3	0.60
21VASP4	□	114	G	□	W	FA	2000/2500	L.V.E.S.	N	13.130	4.380	8HR	6.3	0.45
21VATP4	□	114	G	□	V	FA	2000/2500	L.V.E.S.	N	13.130	4.380	8HR	6.3	0.45
21WP4	△	70	G°	□	—	F	500/750	Mag.	S	22.562	7.500	12N	6.3	0.60
21WP4A	△	70	G°	□	—	FA	500/750	Mag.	S	22.562	7.500	12N	6.3	0.60
SG-21WP4A	△	70	G°	□	—	FA	500/750	Mag.	N	22.562	7.500	12N	6.3	0.60
21WP4B	□	70	G°	□	—	FA	500/750	Mag.	N	22.562	7.500	12N	6.3	0.60
21XP4	△	70	G°	□	—	F	2000/2500	L.V.E.S.	S	22.438	7.500	12L	6.3	0.60
21XP4A	△	70	G°	□	—	FA	2000/2500	L.V.E.S.	S	22.438	7.500	12L	6.3	0.60
SG-21XP4A	△	70	G°	□	—	FA	2000/2500	L.V.E.S.	N	21.438	7.500	12L	6.3	0.60
21XP4B	△	70	G°	□	—	FA	2000/2500	L.V.E.S.	N	21.438	7.500	12L	6.3	0.60
21YP4	△	70	G	□	—	F	500/750	L.V.E.S.	S	23.000	7.500	12L	6.3	0.60
21YP4A	△	70	G	□	—	FA	500/750	L.V.E.S.	S	23.000	7.500	12L	6.3	0.60
SG-21YP4A	△	70	G	□	—	FA	500/750	L.V.E.S.	N	22.000	7.500	12L	6.3	0.60
21YP4B	□	70	G	□	—	FA	500/750	L.V.E.S.	N	23.000	7.500	12L	6.3	0.60
21ZP4	□	70	G	□	—	F	None	Mag.	S	23.031	7.500	12D	6.3	0.60
21ZP4A	□	70	G	□	—	F	500/750	Mag.	S	23.031	7.500	12N	6.3	0.60
21ZP4B	△	70	G	□	—	FA	500/750	Mag.	S	23.031	7.500	12N	6.3	0.60
SG-21ZP4B	△	70	G	□	—	FA	500/750	Mag.	N	23.031	7.500	12N	6.3	0.60
21ZP4C	□	70	G	□	—	FA	500/750	Mag.	N	23.031	7.500	12N	6.3	0.60
22AFP4	□	114	G	□	V	FA	2000/2500	L.V.E.S.	N	13.130	4.380	8HR	6.3	0.45
22TP4	△	114	G	□	E	FA	1700/2200	L.V.E.S.	N	13.125	4.375	8HR	6.3	0.45
22VABP4	□	110	G	□	X	FA	1700/2500	L.V.E.S.	N	14.406	4.375	8HR	6.3	0.45
22VACP4	□	110	G	□	R	FA	1700/2500	L.V.E.S.	N	14.594	4.375	8HR	6.3	0.45
22VAMP4	□	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.870	5.120	8HR	6.3	0.45
22VANP4	□	110	G	□	V	FAR	2000/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
22VARP4	□	110	G	□	V	FA	2000/2500	L.V.E.S.	N	14.375	4.625	8HR	6.3	0.45
22VASP4	□	114	G	□	V	FA	2000/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
22VATP4	□	114	G	□	W	FA	2000/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
22ZP4	△	114	G	□	W	FA	2000/2500	L.V.E.S.	N	13.130	4.380	8HR	6.3	0.45
23ACP4	△	90	G	□	T	FA	2000/2500	L.V.E.S.	N	19.394	5.500	12L	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES◆	TYPICAL OPERATING CONDITIONS					TUBE TYPE
	DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	
18.0	Cath.	16	300	0/400	34/63	**21FCP4**
20.0	Grid	16	300	100/500	-35/-72	**21FDP4**
22.0▣	Grid	16	300	0/450	-28/-72	**21FLP4**
22.0▣	Grid	16	300	0/450	-28/-72	**SG-21FLP4**
22.0	Cath.	18	50	0/500	31/49	**21FMP4**
19.8▣	Grid	14	300	-56/310	-28/-72	**21FP4**
19.8▣	Grid	14	300	-56/310	-28/-72	**21FP4A**
19.8▣	Grid	14	300	-56/310	-28/-72	**21FP4C**
19.8▣	Grid	14	300	-56/310	-28/-72	**SG-21FP4C**
19.8▣	Grid	14	300	-56/310	-28/-72	**21FP4D**
23.0	Cath.	16	50	0/400	35/55	**21FUP4**
23.0	Cath.	20	400	-100/300	36/78	**21FVP4**
23.0	Cath.	20	400	-100/300	36/78	**21FWP4**
23.0	Cath.	16	400	0/500	35/72	**21FXP4**
22.0	Cath.	16	50	0/400	33/45	**21FYP4**
23.0	Grid	16	400	0/400	-39/-93	**21FZP4**
23.5	Cath.	16	30	0/400	30/45	**21GAP4**
23.5	Cath.	16	30	0/400	30/45	**21GAP4A**
20.0	Cath.	16	50	—	36/54	**21GBP4**
23.0	Cath.	16	400	0/400	39/93	**21GCP4**
23.0	Cath.	16	50	-200/200	32/50	**21GEP4**
23.5	Cath.	16	30	0/400	30/45	**21GHP4**
20.0	Cath.	16	400	0/400	36/78	**21GJP4**
23.0	Cath.	16	50	0/400	35/55	**21GKP4**
23.0	Cath.	16	50	0/400	35/55	**21GTP4**
22.0▣	Grid	16	300	—	-28/-72	**21JP4**
22.0▣	Grid	16	300	—	-28/-72	**21JP4A**
19.8▣	Grid	14	300	—	-28/-72	**21KP4**
19.8▣	Grid	14	300	—	-28/-72	**21KP4A**
17.6▣	Grid	14	300	-55/300	-28/-72	**21MP4**
23.0	Cath.	20	400	-200/+200	48/82	**21VASP4**
23.0	Cath.	20	400	-200/+200	48/82	**21VATP4**
19.8▣	Grid	16	300	—	-28/-72	**21WP4**
19.8▣	Grid	16	300	—	-28/-72	**21WP4A**
19.8▣	Grid	16	300	—	-28/-72	**SG-21WP4A**
19.8▣	Grid	16	300	—	-28/-72	**21WP4B**
19.8▣	Grid	16	300	-64/352	-28/-72	**21XP4**
19.8▣	Grid	16	300	-64/352	-28/-72	**21XP4A**
19.8▣	Grid	16	300	-64/352	-28/-72	**SG-21XP4A**
19.8▣	Grid	16	300	-64/352	-28/-72	**21XP4B**
19.8▣	Grid	14	300	-55/300	-28/-72	**21YP4**
19.8▣	Grid	16	300	-64/350	-28/-72	**21YP4A**
19.8▣	Grid	16	300	-64/350	-28/-72	**SG-21YP4A**
19.8▣	Grid	16	300	-64/350	-28/-72	**21YP4B**
19.8▣	Grid	16	300	—	-28/-72	**21ZP4**
19.8▣	Grid	16	300	—	-28/-72	**21ZP4A**
19.8▣	Grid	16	300	—	-28/-72	**21ZP4B**
19.8▣	Grid	16	300	—	-28/-72	**SG-21ZP4B**
19.8▣	Grid	16	300	—	-28/-72	**21ZP4C**
23.0	Cath.	20	400	-200/+200	48/82	**22AFP4**
23.0	Cath.	18	400	0/500	35/72	**22TP4**
23.5	Cath.	18	30	0/+400	22/45	**22VABP4**
23.0	Cath.	18	30	0/+400	22/45	**22VACP4**
23.0	Grid	16	400	0/400	-35/-94	**22VAMP4**
22.0	Cath.	18	300	0/400	36/54	**22VANP4**
22.0	Cath.	18	50	50/350	33/45	**22VARP4**
23.0	Cath.	20	400	-200/200	48/82	**22VASP4**
23.0	Cath.	20	400	-200/200	48/82	**22VATP4**
23.0	Cath.	20	400	-200/200	48/82	**22ZP4**
18.0	Grid	16	300	0/400	-35/-72	**23ACP4**

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- G°—Glass tube, dimensions different from normal
- MET—Metal tube
- O—Round tube
- □—Rectangular tube, spherical face
- ©—Rectangular tube, cylindrical face
- B—Fiberglass wrap implosion protection
- E—Filled rim type implosion protection
- T—Molded glass implosion panel attached to face
- P—Sagged glass implosion plate attached to face
- L—Plastic implosion barrier attached to face
- K—Banded tube with coated funnel for implosion protection
- H—Tube sealed into steel sheath for implosion protection
- C—Clear glass faceplate
- F—Gray filter glass faceplate
- R—Anti-reflection faceplate
- A—Aluminized screen
- V—Rim bands and tension band
- W—Rim bands and tension band with mounting lugs
- X—Formed with tension band
- Y—Formed rim with tension band and mounting lugs
- Mag.—Magnetic focus
- L.V.E.S.—Low voltage electrostatic focus
- H.V.E.S.—High Voltage electrostatic focus
- Auto.Es.—Self-focusing electrostatic
- Int.Mag.—Internal magnetic focus
- TPF—Tri-potential focus
- N—No ion trap
- S—Single field ion trap
- D—Double field ion trap
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- *—18 second heater warm-up time (all others are 11 second)
- Grid—Grid drive service (all voltages with respect to cathode)
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NOTES

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TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
23AFP4	⧅	92	G	□	T	FA	2000/2500	L.V.E.S.	N	18.812	6.000	12L	6.3	0.60
23AHP4	⧅	92	G	□	—	FA	1700/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
23AKP4	⧅	114	G	□	—	FA	2000/2500	L.V.E.S.TPF	N	12.812	3.562	8JR	6.3	0.60
23ALP4	△	114	G	□	—	FA	1700/2500	L.V.E.S.	N	14.531	5.125	8HR	6.3	0.45
23AMP4	△	114	G	□	—	FA	1700/2500	L.V.E.S.	N	14.531	5.125	8HR	6.3	0.30
23ANP4	△	92	G	□	T	FA	2000/2500	L.V.E.S.	N	18.438	5.625	12L	6.3	0.60
23AQP4	△	114	G	□	—	FA	1700/2500	L.V.E.S.	N	14.531	5.125	8HR	6.3	0.30*
23ARP4	⧅	110	G	□	—	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23ASP4	⧅	92	G	□	—	FA	1700/2500	L.V.E.S.	N	17.000	4.500	12L	6.3	0.60
23ATP4	△	92	G	□	T	FAR	2000/2500	L.V.E.S.	N	18.438	5.625	12L	6.3	0.60
23AUP4	△	92	G	□	—	FA	1700/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
23AVP4	△	110	G	□	T	FAR	2000/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.60
23AWP4	△	92	G	□	—	FA	1700/2500	L.V.E.S.	N	18.125	5.625	12L	6.3	0.60
23AXP4	△	110	G	□	—	FA	2000/2500	L.V.E.S.	N	14.000	4.250	8HR	6.3	0.30
23AYP4	⧅	110	G	□	T	FAR	2000/2500	L.V.E.S.	N	15.187	5.125	8HR	6.3	0.30
23AZP4	△	92	G	□	—	FA	1700/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.30
23BAP4	△	110	G	□	T	FAR	2000/2500	L.V.E.S.	N	14.375	4.375	8HR	6.3	0.60
23BCP4	⧅	110	G	□	—	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.30
23BDP4	⧅	92	G	□	T	FAR	2000/2500	L.V.E.S.	N	18.312	5.500	12L	6.3	0.60
23BEP4	△	110	G	□	T	FA	2000/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.30*
23BEP4A	△	110	G	□	T	FA	2000/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.30*
23BGP4	⧅	110	G	□	T	FA	1700/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.60
23BHP4	⧅	110	G	□	T	FAR	1700/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.60
23BJP4	⧅	92	G	□	—	FA	1700/2500	L.V.E.S.	N	18.125	5.625	12L	6.3	0.60
23BKP4	⧅	92	G	□	T	FA	1700/2500	L.V.E.S.	N	18.438	5.625	12L	6.3	0.60
23BLP4	△	92	G	□	T	FAR	1700/2500	L.V.E.S.	N	18.438	5.625	12L	6.3	0.60
23BMP4	△	92	G	□	T	FA	1200/2500	L.V.E.S.	N	18.312	5.500	12L	6.3	0.60
23BP4	△	110	G	□	T	FA	2000/2500	L.V.E.S.	N	14.438	4.375	8HR	6.3	0.60
23BNP4	⧅	110	G	□	T	FA	2000/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.60
23BQP4	⧅	110	G	□	T	FA	2000/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.45
23BRP4	⧅	110	G	□	T	FAR	2000/2500	L.V.E.S.TPF	N	13.625	3.562	8JR	6.3	0.30
23BSP4	△	110	G	□	T	FAR	2000/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.30*
23BTP4	△	92	G	□	T	FA	2000/2500	L.V.E.S.	N	18.312	5.500	12L	6.3	0.60
23BVP4	⧅	92	G	□	T	FA	2000/2500	L.V.E.S.	N	18.812	6.000	12L	6.3	0.60
23BXP4	△	92	G	□	P	FA	2000/2500	L.V.E.S.	N	18.250	5.500	12L	6.3	0.60
23BYP4	△	110	G	□	T	FA	2000/2500	L.V.E.S.TPF	N	13.265	3.562	8JR	6.3	0.30*
23BZP4	△	92	G	□	—	FA	1700/2500	L.V.E.S.	N	18.000	5.500	12L	8.4	0.45
23CAP4	△	92	G	□	T	FA	2000/2500	L.V.E.S.	N	18.312	5.500	12L	8.4	0.45
23CBP4	⧅	110	G	□	T	FAR	2000/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.45
23CDP4	△	92	G	□	T	FA	2000/2500	L.V.E.S.	N	18.312	5.500	12L	6.3	0.30
23CEP4	△	110	G	□	—	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23CGP4	△	92	G	□	—	FA	1700/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.45
23CMP4	△	110	G	□	—	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.30*
23CP4	⧅	110	G	□	T	FA	2000/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.60
23CP4A	⧅	110	G	□	T	FA	2000/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.60
23CQP4	△	114	G	□	—	FA	1700/2500	L.V.E.S.	N	13.781	4.375	8HR	6.3	0.45
23CSP4	△	110	G	□	T	FAR	2000/2500	L.V.E.S.TPF	N	13.125	3.562	8JR	6.3	0.30*
23CTP4	⧅	92	G	□	T	FA	2000/2500	L.V.E.S.	N	18.312	5.500	12L	6.3	0.45
23CUP4	△	110	G	□	T	FAR	2000/2500	L.V.E.S.TPF	N	13.625	3.562	8JR	6.3	0.60
23CVP4	△	114	G	□	—	FA	2000/2500	L.V.E.S.TPF	N	12.812	3.562	8JR	6.3	0.30*
23CWP4	△	110	G	□	—	FA	2000/2500	L.VE.S.TPF	N	13.312	3.562	8JR	6.3	0.60
23CXP4	△	110	G	□	—	FA	2000/2500	L.V.E.S.TPF	N	13.312	3.562	8JR	6.3	0.30*
23CZP4	⧅	92	G	□	—	FA	2000/2500	L.V.E.S.	N	18.500	6.000	12L	6.3	0.60
23DAP4	△	94	G	□	—	FA	1700/2500	L.V.E.S.	N	16.953	4.875	8HR	6.3	0.60
23DBP4	⧅	110	G	□	—	FA	2000/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23DCP4	△	94	G	□	—	FA	1700/2500	L.V.E.S.	N	17.078	5.000	8HR	6.3	0.45
23DEP4	△	110	G	□	E	FA	2000/2500	L.V.E.S.	N	14.000	4.250	8HR	6.3	0.30
23DFP4	△	110	G	□	—	FA	1500/2000	L.V.E.S.	N	14.000	4.250	8HR	6.3	0.30
23DHP4	△	110	G	□	T	FA	2000/2500	L.V.E.S.	N	14.188	4.125	8HR	6.3	0.30
23DJP4	△	110	G	□	T	FAR	2000/2500	L.V.E.S.	N	14.188	4.125	8HR	6.3	0.30
23DKP4	⧅	92	G	□	V	FA	1700/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES◆	TYPICAL OPERATING CONDITIONS					TUBE TYPE
	DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	
25.0	Grid	20	300	0/400	-35/-72	**23AFP4**
22.0	Grid	18	400	0/400	-36/-94	**23AHP4**
22.0	Grid	16	500	0/400	-43/-78	**23AKP4**
22.0	Grid	18	400	0/400	-36/-94	**23ALP4**
22.0	Grid	18	400	0/400	-36/-94	**23AMP4**
25.0	Cath.	20	50	0/400	35/50	**23ANP4**
19.8	Grid	18	400	0/400	-44/-94	**23AQP4**
22.0	Grid	16	300	0/400	-35/-72	**23ARP4**
22.0	Grid	18	400	0/400	-36/-94	**23ASP4**
25.0	Cath.	20	50	0/400	35/50	**23ATP4**
25.0	Grid	18	400	0/400	-36/-94	**23AUP4**
22.0	Grid	16	300	0/400	-35/-72	**23AVP4**
22.0	Cath.	20	50	0/400	36/54	**23AWP4**
20.0	Cath.	16	400	0/400	42/72	**23AXP4**
22.0	Grid	16	300	0/400	-35/-72	**23AYP4**
22.0	Grid	18	400	0/400	-36/-94	**23AZP4**
22.0	Grid	14	450	0/400	-45/-105	**23BAP4**
22.0	Grid	16	300	0/400	-35/-72	**23BCP4**
22.0	Cath.	16	500	0/400	45/95	**23BDP4**
22.0	Grid	16	300	0/400	-35/-72	**23BEP4**
22.0	Grid	16	300	0/400	-35/-72	**23BEP4A**
22.0	Cath.	16	50	0/400	32/50	**23BGP4**
22.0	Cath.	16	50	0/400	32/50	**23BHP4**
25.0	Cath.	20	50	0/400	36/54	**23BJP4**
25.0	Cath.	20	50	0/400	36/54	**23BKP4**
25.0	Cath.	20	50	0/400	36/54	**23BLP4**
22.0	Grid	16	300	0/400	-35/-72	**23BMP4**
22.0	Grid	14	450	0/400	-45/-105	**23BP4**
22.0	Grid	18	400	-100/300	-60/-110	**23BNP4**
23.0	Grid	16	300	0/400	-35/-72	**23BQP4**
22.0	Grid	16	500	0/400	-43/-78	**23BRP4**
22.0	Grid	16	300	0/400	-35/-72	**23BSP4**
25.0	Grid	16	300	0/400	-35/-72	**23BTP4**
25.0	Grid	20	300	0/400	-35/-72	**23BVP4**
22.0	Grid	16	300	0/400	-35/-72	**23BXP4**
22.0	Grid	16	500	0/400	-43/-78	**23BYP4**
22.0	Grid	18	400	0/400	-36/-94	**23BZP4**
22.0	Grid	16	300	0/400	-35/-72	**23CAP4**
23.0	Grid	16	300	0/400	-35/-72	**23CBP4**
22.0	Grid	16	300	0/400	-35/-72	**23CDP4**
22.0	Grid	16	300	0/400	-35/-72	**23CEP4**
22.0	Cath.	16	500	0/400	45/95	**23CGP4**
22.0	Grid	16	300	0/400	-35/-72	**23CMP4**
22.0	Grid	16	300	0/400	-35/-72	**23CP4**
23.5	Grid	16	300	0/400	-35/-72	**23CP4A**
23.5	Grid	14	450	0/400	-45/-105	**23CQP4**
22.0	Grid	16	500	0/400	-43/-78	**23CSP4**
22.0	Grid	16	300	0/400	-35/-72	**23CTP4**
22.0	Grid	16	500	0/400	-43/-78	**23CUP4**
22.0	Grid	16	500	0/400	-43/-78	**23CVP4**
22.0	Grid	16	500	0/400	-43/-78	**23CWP4**
22.0	Grid	16	500	0/400	-43/-78	**23CXP4**
25.0	Grid	20	300	0/400	-40/-76	**23CZP4**
23.5	Cath.	18	50	-50/250	35/55	**23DAP4**
22.0	Cath.	18	50	0/500	36/54	**23DBP4**
23.5	Cath.	18	50	0/400	35/55	**23DCP4**
20.0	Cath.	16	400	0/400	42/78	**23DEP4**
20.0	Cath.	16	400	0/400	42/78	**23DFP4**
22.0	Cath.	16	400	0/400	36/78	**23DHP4**
22.0	Cath.	16	400	0/400	36/78	**23DJP4**
22.0	Grid	16	300	0/400	-35/-72	**23DKP4**

EXPLANATION OF SYMBOLS

M—Metal cone tube
G—Glass tube
LWG—Light weight glass tube
G°—Glass tube, dimensions different from normal
MET—Metal tube
O—Round tube
□—Rectangular tube, spherical face
©—Rectangular tube, cylindrical face
B—Fiberglass wrap implosion protection
E—Filled rim type implosion protection
T—Molded glass implosion panel attached to face
P—Sagged glass implosion plate attached to face
L—Plastic implosion barrier attached to face
K—Banded tube with coated funnel for implosion protection
H—Tube sealed into steel sheath for implosion protection
C—Clear glass faceplate
F—Gray filter glass faceplate
R—Anti-reflection faceplate
A—Aluminized screen
V—Rim bands and tension band
W—Rim bands and tension band with mounting lugs
X—Formed with tension band
Y—Formed rim with tension band and mounting lugs
Mag.—Magnetic focus
L.V.E.S.—Low voltage electrostatic focus
H.V.E.S.—High Voltage electrostatic focus
Auto.Es.—Self-focusing electrostatic
Int.Mag.—Internal magnetic focus
TPF—Tri-potential focus
N—No ion trap
S—Single field ion trap
D—Double field ion trap
I—Internal ion trap
*—18 second heater warm-up time (all others are 11 second)
Grid—Grid drive service (all voltages with respect to cathode)
Cath.—Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

◆ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⧅ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorption characteristics.

☆ This type summary is based on EIA registered data, registered envelope data, and manufacturer's published data. Data presented herein have been carefully prepared from such publicly available data to assure technical correctness, however, no responsibility is assumed by the General Electric Company for possible inaccuracies.

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
23DLP4	⧅	92	G	□	V	FA	1700/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
23DLP4A	△	92	G	□	V	FA	1700/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
23DNP4	△	92	G	□	T	FA	2000/2500	L.V.E.S.	N	18.418	5.625	12L	6.3	0.60
23DP4	△	110	G	□	T	FA	2000/2500	L.V.E.S.TPF	N	13.562	3.562	8JR	6.3	0.60
23DQP4	⧅	92	G	□	T	FA	2000/2500	L.V.E.S.	N	18.688	5.875	8HR	6.3	0.60
23DRP4	△	114	G	□	V	FA	2000/2500	L.V.E.S.	N	13.688	4.375	8HR	6.3	0.30*
23DSP4	⧅	92	G	□	V	FA	2000/2500	L.V.E.S.	N	18.375	5.875	8HR	6.3	0.60
23DSP4A	⧅	92	G	□	V	FA	2000/2500	L.V.E.S.	N	18.375	5.875	8HR	6.3	0.60
23DTP4	⧅	92	G	□	V	FA	1700/2500	L.V.E.S.	N	18.500	6.000	12L	6.3	0.60
23DVP4	⧅	114	G	□	V	FA	1700/2500	L.V.E.S.	N	14.438	5.125	8HR	6.3	0.60
23DVP4A	△	114	G	□	V	FA	1700/2500	L.V.E.S.	N	14.438	5.125	8HR	6.3	0.60
23DWP4	⧅	94	G	□	V	FA	2000/2500	L.V.E.S.	N	17.188	5.125	8HR	6.3	0.60
23DYP4	⧅	110	G	□	V	FA	2000/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23DZP4	⧅	114	G	□	V	FA	1700/2500	L.V.E.S.	N	14.438	5.125	8HR	6.3	0.45
23EAP4	⧅	92	G	□	T	FAR	2000/2500	L.V.E.S.	N	18.312	5.500	12L	6.3	0.45
23ECP4	△	92	G	□	P	FA	2000/2500	L.V.E.S.	N	18.312	5.625	12L	6.3	0.60
23EDP4	△	92	G	□	P	FA	2000/2500	L.V.E.S.	N	18.188	5.500	12L	6.3	0.60
23EFP4	△	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23EKP4	⧅	92	G	□	V	FA	1700/2500	L.V.E.S.	N	18.000	5.550	12L	6.3	0.45
23ENP4	⧅	92	G	□	V	FA	1700/2500	L.V.E.S.	N	18.125	5.625	12L	6.3	0.60
23EP4	⧅	110	G	□	T	FA	1700/2500	L.V.E.S.	N	15.188	5.125	8KP	6.3	0.60
23EQP4	⧅	114	G	□	V	FA	1700/2500	L.V.E.S.	N	14.531	5.125	8HR	6.3	0.45
23ERP4	△	114	G	□	V	FA	1700/2500	L.V.E.S.	N	14.531	5.125	8HR	6.3	0.60
23ESP4	⧅	110	G	□	V	FAR	2000/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23ETP4	⧅	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23EWP4	⧅	114	G	□	V	FA	1700/2500	L.V.E.S.	N	14.437	5.125	8HR	6.3	0.45
23EWP4A	⧅	114	G	□	V	FA	1700/2500	L.V.E.S.	N	14.500	5.125	8HR	6.3	0.45
23EYP4	△	92	G	□	E	FA	2000/2500	L.V.E.S.	N	18.125	5.625	12L	6.3	0.60
23EZP4	△	94	G	□	W	FA	1700/2500	L.V.E.S.	N	17.078	5.000	8HR	6.3	0.45
23FAP4	⧅	114	G	□	E	FA	1700/2500	L.V.E.S.	N	14.531	5.125	8HR	6.3	0.60
23FBP4	△	92	G	□	V	FAR	1700/2500	L.V.E.S.	N	18.125	5.625	12L	6.3	0.60
23FCP4	△	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23FDP4	△	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23FHP4	⧅	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23FKP4	△	94	G	□	T	FA	1700/2500	L.V.E.S.	N	17.531	5.125	8HR	6.3	0.60
23FLP4	⧅	92	G	□	V	FA	1700/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.45
23FMP4	△	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23FNP4	△	92	G	□	E	FA	2000/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.45
23FP4	△	114	G	□	—	FA	1700/2500	L.V.E.S.	N	13.781	4.375	8HR	6.3	0.60
23FP4A	△	114	G	□	—	FA	1700/2500	L.V.E.S.	N	13.688	4.375	8HR	6.3	0.60
23FRP4	△	110	G	□	E	FA	1700/2500	L.V.E.S.	N	14.250	4.500	8HR	6.3	0.45
23FSP4	△	110	G	□	E	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23FVP4	⧅	110	G	□	V	FA	2000/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23FVP4-A	⧅	110	G	□	V	FA	2000/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23FWP4	△	92	G	□	V	FA	1700/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.45
23FWP4A	△	92	G	□	V	FA	1700/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.45
23GBP4	△	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23GDP4	△	114	G	□	V	FA	2000/2500	L.V.E.S.	N	14.500	5.125	8HR	6.3	0.60
23GEP4	⧅	92	G	□	V	FAR	1700/2500	L.V.E.S.	N	18.125	5.625	12L	6.3	0.60
23GHP4	△	94	G	□	V	FA	2000/2500	L.V.E.S.	N	16.812	4.750	8HR	6.3	0.45
23GJP4	△	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.250	4.500	8HR	6.3	0.45
23GJP4A	⧅	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.250	4.500	8HR	6.3	0.45
23GKP4	△	92	G	□	E	FA	2000/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.60
23GP4	△	110	G	□	T	FA	2000/2500	L.V.E.S.	N	15.187	5.125	8HR	6.3	0.60
23GRP4	△	92	G	□	E	FA	2000/2500	L.V.E.S.	N	18.000	5.500	12L	6.3	0.45
23GSP4	△	110	G	□	W	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23GTP4	△	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23GVP4	△	114	G	□	V	FA	2000/2500	L.V.E.S.	N	14.500	5.125	8HR	6.3	0.45
23GWP4	⧅	110	G	□	V	FA	2000/2500	L.V.E.S.	N	14.375	4.625	8HR	6.3	0.45
23GXP4	△	110	G	□	W	FA	2000/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES◈	TYPICAL OPERATING CONDITIONS DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	TUBE TYPE
22.0	Cath.	20	50	0/500	36/54	**23DLP4**
22.0	Cath.	20	50	0/500	36/54	**23DLP4A**
25.0	Cath.	20	35	0/500	25/50	**23DNP4**
22.0	Grid	16	500	0/400	-43/-78	**23DP4**
25.0	Cath.	20	65	-100/300	41/56	**23DQP4**
22.0	Cath.	16	400	9/300	33/78	**23DRP4**
25.0	Cath.	18	65	-100/300	41/56	**23DSP4**
25.0	Cath.	18	65	-100/300	41/56	**23DSP4A**
25.0	Grid	20	300	0/400	-40/76	**23DTP4**
22.0	Grid	18	400	0/400	-46/-94	**23DVP4**
22.0	Grid	18	400	0/400	-46/-94	**23DVP4A**
22.0	Cath.	18	200	0/500	31/49	**23DWP4**
22.0	Cath.	18	300	0/500	36/54	**23DYP4**
22.0	Grid	18	400	0/400	-46/-94	**23DZP4**
22.0	Grid	16	300	0/400	-35/-72	**23EAP4**
25.0	Cath.	20	35	0/400	25/50	**23ECP4**
25.0	Grid	20	300	0/400	-35/-72	**23EDP4**
22.0	Cath.	18	50	0/400	34/49	**23EFP4**
25.0	Cath.	20	400	0/400	36/78	**23EKP4**
25.0	Cath.	20	50	0/400	36/54	**23ENP4**
22.0	Cath.	16	50	0/400	32/50	**23EP4**
23.0	Cath.	18	300	0/400	28/62	**23EQP4**
23.0	Cath.	18	300	0/400	28/62	**23ERP4**
22.0	Cath.	18	300	0/500	36/54	**23ESP4**
23.0	Cath.	18	300	0/400	28/62	**23ETP4**
22.0	Grid	18	400	0/400	-46/-94	**23EWP4**
22.0	Grid	18	400	-200/200	-48/-96	**23EWP4A**
25.0	Cath.	20	30	0/500	25/50	**23EYP4**
23.5	Cath.	18	50	0/400	35/55	**23EZP4**
22.0	Grid	18	400	-200/200	-48/-96	**23FAP4**
25.0	Cath.	20	50	0/400	36/54	**23FBP4**
22.0	Cath.	18	50	0/400	34/49	**23FCP4**
23.0	Cath.	18	50	0/400	34/52	**23FDP4**
23.5	Cath.	16	50	-200/200	32/50	**23FHP4**
23.5	Cath.	16	500	0/500	45/95	**23FKP4**
25.0	Grid	18	300	-200/200	-37/-74	**23FLP4**
23.0	Cath.	18	300	0/400	28/62	**23FMP4**
25.0	Grid	20	300	0/500	-35/-72	**23FNP4**
22.0	Grid	14	450	0/400	-45/-105	**23FP4**
23.5	Grid	14	450	0/400	-45/-105	**23FP4A**
23.0	Cath.	16	50	0/400	35/55	**23FRP4**
23.0	Grid	16	400	0/400	-39/-94	**23FSP4**
22.0	Cath.	18	300	0/500	36/54	**23FVP4**
22.0	Cath.	18	300	0/500	36/54	**23FVP4-A**
22.0	Cath.	20	50	0/500	36/54	**23FWP4**
22.0	Cath.	20	50	0/500	36/54	**23FWP4A**
23.0	Grid	16	400	0/400	-39/-94	**23GBP4**
22.0	Grid	18	400	0/400	-36/-94	**23GDP4**
25.0	Cath.	20	50	0/400	36/54	**23GEP4**
23.0	Cath.	18	200	0/400	31/49	**23GHP4**
22.0	Cath.	18	50	0/400	32/50	**23GJP4**
22.0	Cath.	18	50	0/400	32/50	**23GJP4A**
22.0	Grid	16	300	0/400	-35/-72	**23GKP4**
22.0	Grid	16	300	0/400	-28/-72	**23GP4**
22.0	Grid	16	300	0/400	-35/-72	**23GRP4**
23.0	Cath.	18	300	0/400	28/62	**23GSP4**
23.0	Cath.	18	300	0/400	28/62	**23GTP4**
22.0	Cath.	18	45	0/500	35/50	**23GVP4**
22.0	Cath.	18	50	50/350	33/45	**23GWP4**
23.0	Grid	16	300	0/400	-35/-72	**23GXP4**

EXPLANATION OF SYMBOLS

- M —Metal cone tube
- G —Glass tube
- LWG —Light weight glass tube
- G° —Glass tube, dimensions different from normal
- MET —Metal tube
- O —Round tube
- □ —Rectangular tube, spherical face
- © —Rectangular tube, cylindrical face
- B —Fiberglass wrap implosion protection
- E —Filled rim type implosion protection
- T —Molded glass implosion panel attached to face
- P —Sagged glass implosion plate attached to face
- L —Plastic implosion barrier attached to face
- K —Banded tube with coated funnel for implosion protection
- H —Tube sealed into steel sheath for implosion protection
- C —Clear glass faceplate
- F —Gray filter glass faceplate
- R —Anti-reflection faceplate
- A —Aluminized screen
- V —Rim bands and tension band
- W —Rim bands and tension band with mounting lugs
- X —Formed with tension band
- Y —Formed rim with tension band and mounting lugs
- Mag. —Magnetic focus
- L.V.E.S. —Low voltage electrostatic focus
- H.V.E.S. —High Voltage electrostatic focus
- Auto.Es. —Self-focusing electrostatic
- Int.Mag. —Internal magnetic focus
- TPF —Tri-potential focus
- N —No ion trap
- S —Single field ion trap
- D —Double field ion trap
- I —Internal ion trap
- * —18 second heater warm-up time (all others are 11 second)
- Grid —Grid drive service (all voltages with respect to cathode)
- Cath. —Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⍂ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorbtion characteristics.

☆ This type summary is based on EIA registered data, registered envelope data, and manufacturer's published data. Data presented herein have been carefully prepared from such publicly available data to assure technical correctness, however, no responsibility is assumed by the General Electric Company for possible inaccuracies.

TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
23HBP4	⧅	110	G	□	E	FA	1700/2500	L.V.E.S.	N	14.000	4.250	8HR	6.3	0.30
23HFP4	⧅	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23HFP4A	⧅	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23HGP4	⧅	110	G	□	W	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23HKP4	△	110	G	□	E	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23HLP4	△	110	G	□	W	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23HMP4	△	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.60
23HP4	△	110	G	□	T	FA	2000/2500	L.V.E.S.	N	15.500	5.438	8HR	6.3	0.60
23HQP4	△	110	G	□	W	FA	1700/2500	L.V.E.S.	N	14.880	5.130	8HR	6.3	0.45
23HRP4	⧅	110	G	□	W	FA	2000/2500	L.V.E.S.	N	14.375	4.625	8HR	6.3	0.45
23HUP4	△	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.125	4.375	8HR	6.3	0.45
23HUP4A	⧅	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.125	4.375	8HR	6.3	0.45
23HWP4	⧅	110	G	□	W	FA	2000/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23HWP4A	⧅	110	G	□	W	FA	2000/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23HXP4	△	110	G	□	V	FAR	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23HZP4	△	110	G	□	W	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.30
23JAP4	△	110	G	□	V	FA	1300/2100	L.V.E.S.	N	14.250	4.500	8HR	6.3	0.45
23JBP4	⧅	110	G	□	E	FA	1700/2500	L.V.E.S.	N	14.125	4.375	8HR	6.3	0.60
23JEP4	⧅	110	G	□	W	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23JFP4	⧅	110	G	□	E	FA	1700/2500	L.V.E.S.	N	14.250	4.500	8HR	6.3	0.315
23JGP4	△	110	G	□	W	FA	1700/2500	L.V.E.S.	N	14.875	5.125	8HR	6.3	0.45
23JLP4	△	110	G	□	V	FA	1700/2500	L.V.E.S.	N	14.125	4.375	8HR	6.3	0.45
23JP4	△	110	G	□	T	FA	2000/2500	L.V.E.S.	N	15.438	5.375	7FA	6.3	0.45
23KP4	⧅	114	G	□	—	FA	2000/2500	L.V.E.S.	N	13.500	4.250	8HR	6.3	0.60
23KP4A	⧅	114	G	□	—	FA	2000/2500	L.V.E.S.	N	13.500	4.250	8HR	6.3	0.60
23MP4	△	114	G	□	—	FA	1700/2500	L.V.E.S.	N	14.531	5.125	8HR	6.3	0.60
23MP4A	△	114	G	□	—	FA	1700/2500	L.V.E.S.	N	14.531	5.125	8HR	6.3	0.60
23NP4	⧅	114	G	□	—	FA	1700/2500	L.V.E.S.	N	14.531	5.125	8HR	6.3	0.60
23RP4	⧅	110	G	□	T	FA	2000/2500	L.VE.S.TPF	N	13.625	3.562	8JR	6.3	0.30
23SP4	⧅	110	G	□	T	FA	2000/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.30
23TP4	△	90	G	□	T	FA	1700/2500	L.V.E.S.	N	19.344	5.500	12L	6.3	0.60
23UP4	⧅	110	G	□	T	FA	2000/2500	L.V.E.S.	N	15.188	5.125	8HR	6.3	0.45
23VP4	△	114	G	□	—	FA	2000/2500	L.V.E.S.	N	13.625	4.375	8HR	6.3	0.30*
23WP4	△	114	G	□	—	FA	2000/2500	L.V.E.S.	N	14.688	5.438	8HR	6.3	0.60
23XP4	⧅	92	G	□	T	FA	2000/2500	L.V.E.S.	N	18.312	5.500	12L	6.3	0.60
23YP4	⧅	92	G	□	T	FA	2000/2500	L.V.E.S.	N	18.312	5.500	12L	6.3	0.60
23ZP4	△	90	G	□	T	FA	2000/2500	L.V.E.S.	N	19.469	5.625	12L	6.3	0.60
24ADP4	△	90	G	□	—	FA	2000/2500	Mag.	N	21.125	7.500	12N	6.3	0.60
24AEP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	19.125	5.500	12L	6.3	0.60
SG-24AEP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	19.125	5.500	12L	6.3	0.60
24AHP4	△	110	G	□	—	FA	1700/2500	L.V.E.S.	N	15.875	5.438	8HR	6.3	0.60
24AJP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	19.125	5.500	12L	6.3	0.60
24ALP4	⧅	110	G	□	—	FA	2000/2500	L.V.E.S.	N	15.875	5.438	8HR	6.3	0.60
24AMP4	△	110	G	□	—	FA	2000/2500	L.V.E.S.	N	15.625	5.187	7FA	6.3	0.60
24ANP4	△	90	G	□	—	FA	1700/2500	L.V.E.S.	S	20.125	6.500	12L	6.3	0.60
24AP4	△	70	MET	○	—	F	None	Mag.	S	23.938	7.156	12D	6.3	0.60
24AP4A	△	70	MET	○	—	FA	None	Mag.	S	23.938	7.156	12D	6.3	0.60
24AP4B	△	70	MET	○	—	FR	None	Mag.	S	23.938	7.156	12D	6.3	0.60
24AQP4	△	110	G	□	—	FA	1700/2500	L.V.E.S.	N	15.875	5.438	8HR	6.3	0.45
24ASP4	△	90	G	□	—	FA	1700/2500	L.V.E.S.	N	19.125	5.500	12L	6.3	0.30
24ATP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	19.125	5.500	12L	6.3	0.60
24AUP4	△	90	G	□	—	FA	1700/2500	L.V.E.S.	N	18.125	4.500	12L	6.3	0.60
24AVP4	△	110	G	□	—	FA	1700/2500	L.V.E.S.	N	14.812	4.375	8JK	2.35	0.60
24AWP4	△	110	G	□	—	FA	2000/2500	L.V.E.S.	N	14.875	4.438	8HR	6.3	0.60
24AXP4	△	110	G	□	—	FA	1700/2500	L.V.E.S.	N	15.875	4.438	8HR	6.3	0.30
24BAP4	△	110	G	□	—	FA	1700/2500	L.V.E.S.	N	15.875	5.438	8HR	6.3	0.60
24BCP4	△	90	G	□	P	FA	2000/2500	L.V.E.S.	N	19.375	5.500	12L	6.3	0.60
24BEP4	△	110	G	□	—	FA	1700/2500	L.V.E.S.	N	14.812	4.375	8KW	6.3	0.60
24BP4	△	70	MET	○	—	F	None	L.V.E.S.	S	24.250	7.500	12M	6.3	0.60
24CP4	⧅	90	G	□	—	F	2000/2500	Mag.	S	21.125	7.500	12N	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES ◈	TYPICAL OPERATING CONDITIONS					TUBE TYPE
	DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	
22.0	Grid	16	300	0/400	-35/-72	**23HBP4**
23.0	Grid	16	400	0/400	-39/-94	**23HFP4**
23.0	Cath.	18	300	0/400	28/62	**23HFP4A**
23.0	Cath.	18	300	0/400	28/62	**23HGP4**
23.0	Cath.	16	150	0/400	36/54	**23HKP4**
23.0	Cath.	18	300	0/400	28/62	**23HLP4**
23.0	Cath.	18	300	0/400	28/62	**23HMP4**
20.0	Grid	16	300	0/400	-35/-72	**23HP4**
23.0	Cath.	16	400	0/400	39/94	**23HQP4**
23.5	Cath.	18	30	0/400	30/45	**23HRP4**
23.5	Cath.	18	30	0/400	22/45	**23HUP4**
23.5	Cath.	17	30	0/400	22/45	**23HUP4A**
22.0	Cath.	16	50	0/400	35/55	**23HWP4**
22.0	Cath.	16	50	0/400	35/55	**23HWP4A**
23.0	Cath.	18	300	0/400	28/62	**23HXP4**
23.0	Cath.	18	300	0/400	28/62	**23HZP4**
22.0	Cath.	18	50	-200/200	32/50	**23JAP4**
23.0	Grid	16	400	0/400	-39/-94	**23JBP4**
23.0	Cath.	18	300	0/400	28/62	**23JEP4**
23.0	Cath.	16	50	0/400	35/55	**23JFP4**
23.5	Cath.	18	30	0/400	22/45	**23JGP4**
23.5	Cath.	18	30	0/400	22/45	**23JLP4**
22.0	Cath.	16	50	0/400	35/50	**23JP4**
20.0	Grid	16.5	450	0/500	-28/-72	**23KP4**
22.0	Grid	16.5	450	0/500	-28/-72	**23KP4A**
22.0	Grid	18	400	0/400	-36/-94	**23MP4**
23.5	Grid	18	400	0/400	-36/-94	**23MP4A**
22.0	Cath.	18	50	0/400	34/49	**23NP4**
22.0	Grid	16	500	0/400	-43/-78	**23RP4**
22.0	Grid	16	300	0/400	-35/-72	**23SP4**
22.0	Grid	16	300	0/400	-28/-72	**23TP4**
18.0	Grid	16	300	0/400	-35/-72	**23UP4**
22.0	Grid	14	450	0/400	-45/-105	**23VP4**
20.0	Grid	16	300	0/400	-35/-72	**23WP4**
18.0	Grid	16	300	0/400	-35/-72	**23XP4**
22.0	Grid	16	300	0/400	-35/-72	**23YP4**
22.0	Grid	18	50	0/500	35/50	**23ZP4**
24.2▣	Grid	18	300	--	-28/-72	**24ADP4**
22.0▣	Grid	18	300	-50/350	-28/-72	**24AEP4**
22.0▣	Grid	18	300	-50/350	-28/-72	**SG-24AEP4**
22.0▣	Grid	16	300	-50/350	-28/-72	**24AHP4**
22.0▣	Grid	18	50	0/350	35/50	**24AJP4**
22.0▣	Grid	17	300	0/500	-28/-72	**24ALP4**
22.0▣	Grid	16	300	0/400	-35/-72	**24AMP4**
22.0▣	Grid	18	300	-72/396	-35/-72	**24ANP4**
17.6▣	Grid	15	300	—	-28/-72	**24AP4**
17.6▣	Grid	15	300	—	-28/-72	**24AP4A**
17.6▣	Grid	15	300	--	-28/-72	**24AP4B**
22.0▣	Grid	16	300	0/400	-35/-72	**24AQP4**
22.0▣	Grid	18	300	0/400	-35/-72	**24ASP4**
22.0▣	Grid	18	50	0/400	34/52	**24ATP4**
22.0▣	Grid	16	300	-75/400	-35/-72	**24AUP4**
20.0▣	Grid	16	300	-100/300	-35/-72	**24AVP4**
22.0▣	Grid	16	300	0/400	-28/-72	**24AWP4**
22.0▣	Grid	16	300	0/400	-35/-72	**24AXP4**
22.0▣	Cath.	16	50	0/400	32/47	**24BAP4**
22.0	Grid	18	400	0/400	-36/-94	**24BCP4**
20.0▣	Grid	16	300	-100/300	-35/-72	**24BEP4**
17.6▣	Grid	14	300	-56/310	-28/-72	**24BP4**
22.0▣	Grid	18	300	—	-28/-72	**24CP4**

EXPLANATION OF SYMBOLS

M—Metal cone tube
G—Glass tube
LWG—Light weight glass tube
G°—Glass tube, dimensions different from normal
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O—Round tube
□—Rectangular tube, spherical face
⊡—Rectangular tube, cylindrical face
B—Fiberglass wrap implosion protection
E—Filled rim type implosion protection
T—Molded glass implosion panel attached to face
P—Sagged glass implosion plate attached to face
L—Plastic implosion barrier attached to face
K—Banded tube with coated funnel for implosion protection
H—Tube sealed into steel sheath for implosion protection
C—Clear glass faceplate
F—Gray filter glass faceplate
R—Anti-reflection faceplate
A—Aluminized screen
V—Rim bands and tension band
W—Rim bands and tension band with mounting lugs
X—Formed with tension band
Y—Formed rim with tension band and mounting lugs
Mag.—Magnetic focus
L.V.E.S.—Low voltage electrostatic focus
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Int.Mag.—Internal magnetic focus
TPF—Tri-potential focus
N—No ion trap
S—Single field ion trap
D—Double field ion trap
I—Internal ion trap
•—18 second heater warm-up time (all others are 11 second)
Grid—Grid drive service (all voltages with respect to cathode)
Cath.—Cathode drive service (all voltages with respect to Grid No. 1)

NOTES

◈ Design-Maximum Values Unless Otherwise Indicated

▣ Absolute-Maximum Values

⊠ For X-Radiation Measurements, Characteristics, Limitations, and Warning see JEDEC Publication 64A, the latest EIA Published Product Information for this type, the specified applicable JEDEC X-Radiation Isodose and Limit Curves, and X-Radiation Warning, page

△ The EIA Published Product Information as of March 1, 1972, does not contain an X-Radiation rating or reference to JEDEC X-Radiation Isodose and Limit Curves for this tube type. This does not necessarily mean the type is not capable of meeting an acceptable X-Radiation limit. Refer to the latest Published Product Information for X-Radiation Ratings and glass absorbtion characteristics.

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TUBE TYPE	X-RADIATION RATING	DEFL. ANGLE DEGREES	GLASS or METAL	FACEPLATE SHAPE	FACEPLATE IMPLOSION PROTECTION	FACEPLATE TREATMENT	EXTERNAL COATING IN pf	FOCUS	ION TRAP MAG.	Overall Length (Inches)	NECK LENGTH (Inches)	BASING	HEATER V.	HEATER A.
24CP4A	⧅	90	G	□	—	FA	2000/2500	Mag.	S	21.125	7.500	12N	6.3	0.60
SG-24CP4A	△	90	G	□	—	FA	2000/2500	Mag.	N	21.125	7.500	12N	6.3	0.60
24CP4B	⧅	90	G	□	—	FA	2000/2500	Mag.	N	21.125	7.500	12N	6.3	0.60
24DP4	⧅	90	G	□	—	F	2000/2500	L.V.E.S.	S	21.125	7.500	12L	6.3	0.60
24DP4A	⧅	90	G	□	—	FA	500/750	L.V.E.S.	S	21.125	7.500	12L	6.3	0.60
24QP4	△	90	G	□	—	F	500/750	Mag.	S	21.125	7.500	12N	6.3	0.60
24TP4	△	90	G	□	—	FA	250/2500	Mag.	S	21.125	7.500	12N	6.3	0.60
24VP4	△	90	G	□	—	F	2000/2500	Mag.	S	21.125	7.500	12N	6.3	0.60
24VP4A	△	90	G	□	—	FA	2000/2500	Mag.	S	21.125	7.500	12N	6.3	0.60
24XP4	△	90	G	□	—	F	None	Mag.	S	21.125	7.500	12D	6.3	0.60
24YP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	S	21.125	7.500	12L	6.3	0.60
24ZP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	21.125	7.500	12L	6.3	0.60
25DP4	△	110	G	□	E	FA	2000/2500	L.V.E.S.	N	15.062	4.375	8HR	6.3	0.30
25EP4	△	110	G	□	E	FA	2000/2500	L.V.E.S.	N	15.812	5.125	8HR	6.3	0.30
25HP4	△	110	G	□	E	FA	2000/2500	L.V.E.S.	N	15.875	5.125	8HR	6.3	0.45
25JP4	△	110	G	□	—	FA	2000/2500	L.V.E.S.	N	15.812	5.125	8HR	6.3	0.30
25KP4	△	110	G	□	P	FAR	2000/2500	L.V.E.S.	N	16.000	5.125	8HR	6.3	0.30
25LP4	△	110	G	□	P	FA	2000/2500	L.V.E.S.	N	16.312	5.437	8HR	6.3	0.60
25TP4	△	110	G	□	W	FA	2000/2500	L.V.E.S.	N	15.813	5.125	8HR	6.3	0.60
27ABP4	△	110	G	□	P	FA	2000/2500	L.V.E.S.	N	17.125	5.125	8HR	6.3	0.60
27ACP4	△	90	G	□	P	FA	2000/2500	L.V.E.S.	N	21.812	6.000	12L	6.3	0.60
27ADP4	△	110	G	□	P	FA	2000/2500	L.V.E.S.	N	17.562	5.375	8HR	6.3	0.60
27AEP4	△	110	G	□	—	FA	2000/2500	L.V.E.S.	N	17.312	5.375	8HR	6.3	0.60
27AFP4	△	110	G	□	P	FA	2000/2500	L.V.E.S.	N	17.562	5.375	8HR	6.3	0.60
27AGP4	△	110	G	□	P	FAR	2000/2500	L.V.E.S.	N	17.125	5.125	8HR	6.3	0.60
27AP4	△	90	MET	□	—	FR	None	L.V.E.S.	S	21.625	7.500	12M	6.3	0.60
27EP4	△	90	G	□	—	FA	None	Mag.	S	23.062	7.500	12D	6.3	0.60
27GP4	△	90	G	□	—	F	None	Mag.	S	23.062	7.500	12D	6.3	0.60
27LP4	△	90	G°	□	—	FA	250/400	Mag.	S	24.359	9.703	12N	6.3	0.60
27MP4	△	90	MET	□	—	FAR	None	Mag.	S	22.812	7.500	12D	6.3	0.60
27NP4	△	90	G	□	—	FA	2000/2500	Mag.	S	26.812	7.500	12N	6.3	0.60
27RP4	△	90	G	□	—	FA	500/2500	Mag.	S	23.062	7.500	12N	6.3	0.60
27RP4A	△	90	G	□	—	FA	500/2500	Mag.	N	23.062	7.500	12N	6.3	0.60
SG-27RP4	△	90	G	□	—	FA	500/2500	Mag.	N	23.062	7.500	12N	6.3	0.60
27SP4	△	90	G	□	—	FA	500/750	L.V.E.S.	S	23.062	7.500	12L	6.3	0.60
27UP4	△	90	G	□	—	F	500/750	L.V.E.S.	S	23.062	7.500	12L	6.3	0.60
27VP4	△	90	G	□	—	FA	2000/2500	L.V.E.S.	N	21.062	5.500	12L	6.3	0.60
27WP4	△	90	G	□	—	FA	750/2500	L.V.E.S.	S	22.094	6.500	12AJ	6.3	0.60
27XP4	△	90	G	□	—	FA	1700/2500	L.V.E.S.	N	20.062	4.500	12L	6.3	0.60
27YP4	△	90	G	□	P	FA	2000/2500	L.V.E.S.	N	21.562	5.750	12L	6.3	0.60
27ZP4	△	110	G	□	—	FA	2000/2500	L.V.E.S.	N	17.312	5.625	8HR	6.3	0.60
30BP4	△	90	MET	○	—	F	None	Mag.	S	23.562	7.187	12D	6.3	0.60

ANODE KV. DESIGN-MAX. VALUES◆	TYPICAL OPERATING CONDITIONS					TUBE TYPE
	DRIVE	ANODE KV.	GRID 2 VOLTS	FOCUS ELEC-TRODE VOLTS	RASTER CUTOFF VOLTS	
22.0▣	Grid	16	300	—	-28/-72	**24CP4A**
22.0▣	Grid	16	300	—	-28/-72	**SG-24CP4A**
22.0▣	Grid	16	300	—	-28/-72	**24CP4B**
22.0▣	Grid	18	300	-72/400	-28/-72	**24DP4**
22.0▣	Grid	16	300	-64/350	-28/-72	**24DP4A**
19.8▣	Grid	16	300	—	-28/-72	**24QP4**
22.0▣	Grid	14	300	—	-28/-72	**24TP4**
24.2▣	Grid	20	300	—	-28/-72	**24VP4**
24.2▣	Grid	20	300	—	-28/-72	**24VP4A**
22.0▣	Grid	18	300	—	-28/-72	**24XP4**
22.0▣	Grid	16	300	-64/350	-28/-72	**24YP4**
22.0▣	Grid	16	300	0/500	-28/-72	**24ZP4**
22.0	Cath.	16	300	-200/200	32/60	**25DP4**
22.0	Cath.	16	300	-200/200	32/60	**25EP4**
23.0	Cath.	16	50	0/400	35/55	**25HP4**
22.0	Grid	16	300	-200/200	-35/-72	**25JP4**
22.0	Grid	16	300	-200/200	-35/-72	**25KP4**
22.0	Grid	18	400	0/400	-36/-94	**25LP4**
22.0	Cath.	18	400	0/400	36/78	**25TP4**
22.0	Grid	18	300	0/400	-35/-72	**27ABP4**
25.0	Grid	18	400	0/400	-48/-96	**27ACP4**
22.0	Grid	18	300	0/400	-37/-74	**27ADP4**
22.0	Grid	18	300	0/400	-35/-72	**27AEP4**
22.0	Grid	18	300	0/400	-37/-74	**27AFP4**
22.0	Grid	18	300	0/400	-35/-72	**27AGP4**
19.8▣	Grid	15	300	-60/300	-28/-72	**27AP4**
22.0▣	Grid	16	300	—	-28/-72	**27EP4**
24.8▣	Grid	16	300	—	-28/-72	**27GP4**
24.2▣	Grid	20	300	—	-28/-72	**27LP4**
19.8▣	Grid	16	300	—	-37/-73	**27MP4**
19.8▣	Grid	16	300	—	-28/-72	**27NP4**
22.0▣	Grid	16	300	—	-28/-72	**27RP4**
22.0▣	Grid	16	300	—	-28/-72	**27RP4A**
22.0▣	Grid	16	300	—	-28/-72	**SG-27RP4**
22.0▣	Grid	18	300	-72/396	-28/-72	**27SP4**
22.0▣	Grid	16	300	0/396	-28/-72	**27UP4**
19.8▣	Grid	16	300	-72/396	-28/-72	**27VP4**
22.0▣	Grid	18	300	-60/350	-40/-80	**27WP4**
23.0	Grid	18	400	0/400	-36/-94	**27XP4**
25.0	Grid	18	300	0/450	-28/-72	**27YP4**
22.0	Grid	18	300	0/450	-35/-72	**27ZP4**
33.0▣	Grid	22	300	—	-28/-72	**30BP4**

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T—Molded glass implosion panel attached to face
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L—Plastic implosion barrier attached to face
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C—Clear glass faceplate
F—Gray filter glass faceplate
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A—Aluminized screen
V—Rim bands and tension band
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Mag.—Magnetic focus
L.V.E.S.—Low voltage electrostatic focus
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*—18 second heater warm-up time (all others are 11 second)
Grid—Grid drive service (all voltages with respect to cathode)
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NOTES

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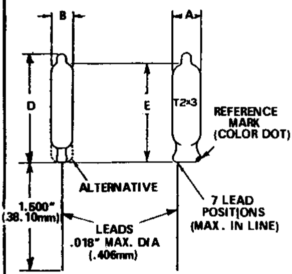
Tube Type	Typical Application	Focus Method	Deflection Method	Outline	Base	Filament Volts	Filament Current mA	Grid #1 Voltage Range	Grid #2 Voltage
7038	Monochrome film and CCTV cameras	Magnetic	Magnetic	TX	8HM	6.3	600	0 to −100	300
7038V	Broadcast color television cameras	Magnetic	Magnetic	TX	8HM	6.3	600	0 to −100	300
7262A	General use CCTV and educational TV cameras	Magnetic	Magnetic	TX	8HM	6.3	90	0 to −100	300
7263A	Ruggidized use CCTV and educational TV Camera	Magnetic	Magnetic	TX	8HM	6.3	90	0 to −100	300
7735A	General use CCTV and educational TV cameras	Magnetic	Magnetic	TX	8HM	6.3	600	0 to −100	300
7735B	High quality CCTV and educational TV cameras	Magnetic	Magnetic	TX	8HM	6.3	600	0 to −100	300
Z7911	Low cost CCTV and educational TV cameras	Magnetic	Magnetic	TX	8HM	6.3	600	0 to −100	300
Z7912	Ruggidized use CCTV and military TV cameras	Magnetic	Magnetic	TX	8ME	6.3	90	0 to −100	300
Z7919	Low cost CCTV and educational TV cameras	Magnetic	Magnetic	TX	8ME	6.3	90	0 to −100	300
Z7929R,B,G,	Chroma channels Broadcast color cameras	Electrostatic	Magnetic	TX	8LN	6.3	95	0 to −100	300
8134	General use CCTV and educational TV cameras	Electrostatic	Magnetic	TX	8LN	6.3	95	0 to −100	300
8134V	Broadcast color television cameras	Electrostatic	Magnetic	TX	8LN	6.3	95	0 to −100	300
8484H	Low light level CCTV and educational TV cameras	Magnetic	Magnetic	TX	8HM	6.3	600	0 to −100	300
8507A	Broadcast, CCTV and educational TV cameras	Magnetic	Magnetic	TX	8ME	6.3	600	0 to −100	300
8541A	Broadcast, CCTV and educational TV cameras	Magnetic	Magnetic	TX	8ME	6.3	90	0 to −100	300
8572	Monochrome film and CCTV cameras	Magnetic	Magnetic	TX	8ME	6.3	600	0 to −100	300
8572V	Broadcast color television cameras	Magnetic	Magnetic	TX	8ME	6.3	600	0 to −100	300
8573A	Military, CCTV and educational TV cameras	Magnetic	Magnetic	TX	8ME	6.3	90	0 to −100	300
8604	Monochrome film and CCTV cameras	Magnetic	Magnetic	TX	8ME	6.3	90	0 to −100	300
7735BX	High quality medical X-ray TV cameras	Magnetic	Magnetic	TX	8HM	6.3	600	0 to −100	300
8541X	High quality medical X-ray TV cameras	Magnetic	Magnetic	TX	8ME	6.3	90	0 to −100	300
8573X	High quality medical X-ray TV cameras	Magnetic	Magnetic	TX	8ME	6.3	90	0 to −100	300
Z7975B	Low light level CCTV and educational TV cameras	Magnetic	Magnetic	TX	8ME	6.3	90	0 to −100	300
Z7975HRB	Low light level CCTV and educational TV cameras	Magnetic	Magnetic	TX	8ME	6.3	90	0 to −100	300
Z7996B	Low light level CCTV and educational TV cameras	Magnetic	Magnetic	TX	8ME	6.3	90	0 to −100	300
Z7996HRB	Low light level CCTV and educational TV cameras	Magnetic	Magnetic	TX	8ME	6.3	90	0 to −100	300
Z7927B	Low light level CCTV and educational TV cameras	Magnetic	Magnetic	TX	——	6.3	90	0 to −150	290
Z7927HRB	Low light level CCTV and educational TV cameras	Magnetic	Magnetic	TX	——	6.3	90	0 to −150	290

Grid #3 Volts 40–50 Gauss	–60	Grid #4 Volts 40–50 Gauss	–60	Grid #5 Voltage	Target Voltage Range	Blanking Volts When Applied To Grid #1	Cathode	Sensitivity—Typical—Resolution .02ua Dark Current 1.0 Ft. Candle Faceplate	Television Lines 40–50 Gauss	–60
300	600	Inter. Conn. to G #3		——	0 to +60	–75	+20 to +35	.20 micro amps	700	850
300	600	Inter. Conn. to G #3		——	0 to +60	–75	+20 to +35	.23 micro amps	700	850
300	600	Inter. Conn. to G #3		——	0 to +60	–75	+20 to +35	.20 micro amps	700	850
300	600	Inter. Conn. to G #3		——	0 to +60	–75	+20 to +35	.20 micro amps	700	850
300	600	Inter. Conn. to G #3		——	0 to +60	–75	+20 to +35	.22 micro amps	700	850
300	600	Inter. Conn. to G #3		——	0 to +60	–75	+20 to +35	.25 micro amps	700	850
300	——	Inter. Conn. tô G #3		——	0 to +60	–75	+20 to +35	.18 micro amps	650	——
300	600	420	850	——	0 to +60	–75	+20 to +35	.23 micro amps	900	1100
300	600	420	850	——	0 to +60	–75	+20 to +35	.18 micro amps	800	1000
600	——	+50 to +150	——	300	0 to +60	–75	+20 to +35	.23 micro amps	600	——
600	——	+50 to +150	——	300	0 to +60	–75	+20 to +35	.23 micro amps	600	——
600	——	+50 to +150	——	300	0 to +60	–75	+20 to +35	.23 micro amps	600	——
300	600	Inter. Conn. to G #3		——	0 to +60	–75	+20 to +35	.25 micro amps	700	850
300	600	420	850	——	0 to +60	–75	+20 to +35	.23 micro amps	900	1100
300	600	420	850	——	0 to +60	–75	+20 to +35	.18 micro amps	900	1100
300	600	420	850	——	0 to +60	–75	+20 to +35	.20 micro amps	900	1100
300	600	420	850	——	0 to +60	–75	+20 to +35	.23 micro amps	900	1100
300	600	420	850	——	0 to +60	–75	+20 to +35	.18 micro amps	900	1100
300	600	420	850	——	0 to +60	–75	+20 to +35	.25 micro amps	900	1100
300	600	Inter. Conn. to G #3		——	0 to +60	–75	+20 to +35	.25 micro amps	700	850
300	600	420	850	——	0 to +60	–75	+20 to +35	.25 micro amps	900	1100
300	600	420	850	——	0 to +60	–75	+20 to +35	.25 micro amps	900	1100
300	600	420	——	——	+8	–75	+20 to +35	1.15 micro amps	700	——
300	——	420	——	——	+8	–75	+20 to +35	1.15 micro amps	1000	——
300	——	420	——	——	+8	–75	+20 to +35	1.15 micro amps	700	——
300	——	420	——	——	+8	–75	+20 to +35	1.15 micro amps	1000	——
270	——	400	——	——	+8	–75	+20 to +35	.75 micro amps	400	——
270	——	400	——	——	+8	–75	+20 to +35	.75 micro amps	700	——



PHYSICAL DIMENSIONS

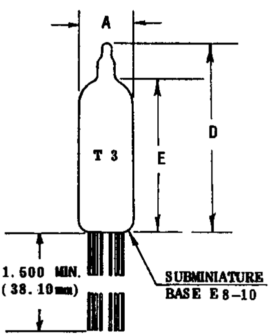
OUTLINE DRAWING NUMBER	INCHES							MILLIMETERS						
	A **		B		D	E *		A **		B		D	E *	
	MIN.	MAX	MIN.	MAX	MAX	MIN.	MAX	MIN.	MAX	MIN.	MAX	MAX	MIN.	MAX
2-1	0.350	0.385	0.245	0.285	1.500	1.200	1.400	8.89	9.77	6.23	7.23	38.10	30.5	35.5
2-2	0.350	0.385	0.245	0.285	1.250	0.970	1.170	8.89	9.77	6.23	7.23	31.75	24.7	29.7
2-5	0.350	0.400	0.245	0.285	1.500	1.200	1.400	8.89	10.16	6.23	7.23	38.10	30.5	35.5
2-6	0.350	0.400	0.245	0.285	1.250	0.970	1.170	8.89	10.16	6.23	7.23	31.75	24.7	29.7

NOTES

** Measured from base seat to bulb—top line as determined by a ring gauge of 0.210" (5.333mm) I.D.

* Minimum dimension applies in a zone 0.500" (12.70mm) up from lead in to 0.200" (5.08mm) down from bulb top line.

2-1 2-2 2-5 2-6



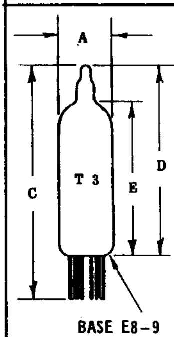
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A		D	E *		A		D	E *	
	MIN.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
3-1	0.366	0.400	1.375	1.015	1.135	9.30	10.16	34.92	25.8	28.8
3-2	0.366	0.400	1.500	1.140	1.260	9.30	10.16	38.10	29.0	32.0
3-3	0.366	0.400	1.750	1.390	1.510	9.30	10.16	44.45	35.3	38.3
3-4	0.366	0.400	2.000	1.640	1.760	9.30	10.16	50.80	41.7	44.7
3-8	0.366	0.400	1.625	1.265	1.385	9.30	10.16	41.27	32.2	35.1
3-11	0.366	0.400	1.250	0.890	1.010	9.30	10.16	31.75	22.7	25.6

NOTES

* Measured from base seat to bulb top line as determined by ring gauge of minimum 0.209 (5.31 mm) and maximum 0.211 (5.36mm) internal diameter.

3-1 TO 3-4 3-8 3-11



PHYSICAL DIMENSIONS

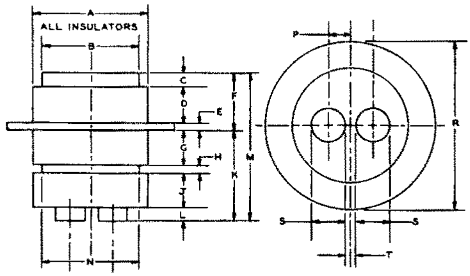
OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A*		C	D	E•		A*		C	D	E•	
	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.
3-5	0.366	0.400	1.750	1.500	1.140	1.260	9.30	10.16	44.45	38.10	29.0	32.0
3-9	0.366	0.400	1.625	1.375	1.015	1.135	9.30	10.16	41.27	34.92	25.8	28.8
3-10	0.366	0.400	2.000	1.750	1.390	1.510	9.30	10.16	50.80	44.45	35.4	38.3
3-12	0.366	0.400	1.500	1.250	0.890	1.010	9.30	10.16	38.10	47.62	22.7	25.6
3-13	0.366	0.400	1.875	1.625	1.265	1.385	9.30	10.16	47.62	41.27	32.2	35.1
3-14	0.366	0.400	2.125	1.875	1.515	1.635	9.30	10.16	53.97	47.62	38.5	41.5
3-15	0.366	0.400	2.250	2.000	1.640	1.760	9.30	10.16	57.15	50.80	41.7	44.7

NOTES:

* The minimum applies in zone starting 0.375" (9.52 mm) from base seat.

• Measured from base seat to bulb-top line as determined by a ring gauge of 0.600" (15.24 mm.) I.D.

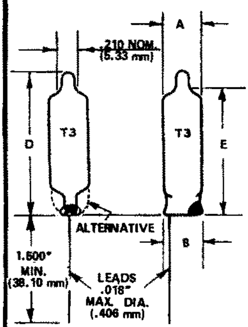
3-5 3-9 3-10 3-12 TO 3-15



REF.	INCHES MIN.	INCHES NOM.	INCHES MAX.	MILLIMETERS MIN.	MILLIMETERS NOM.	MILLIMETERS MAX.
A	---	---	0.335	---	---	8.51
B	0.271	---	0.279	6.88	---	7.09
C	0.034	---	0.046	0.86	---	1.17
D	0.094	---	0.104	2.39	---	2.64
E	0.024	---	0.030	0.61	---	0.76
F	0.156	---	0.174	3.96	---	4.42
G	0.095	---	0.105	2.41	---	2.67
H	0.022	---	0.028	0.56	---	0.71
J	0.095	---	0.105	2.41	---	2.67
K	0.268	---	0.292	6.81	---	7.42
L	0.047	---	0.063	1.19	---	1.60
M	0.430	---	0.460	10.92	---	11.68
N	0.281	---	0.289	7.14	---	7.34
P	0.055	---	0.081	1.40	---	2.06
R	0.476	---	0.484	12.09	---	12.29
S	0.086	---	0.094	2.18	---	2.39
T	0.030	---	---	0.76	---	---

Notes: Maximum eccentricity of plate, cathode and grid contact surfaces 0.005" (0.127 mm) from center line.
Maximum eccentricity of insulators 0.010" (0.25 mm) from center line.

3–16

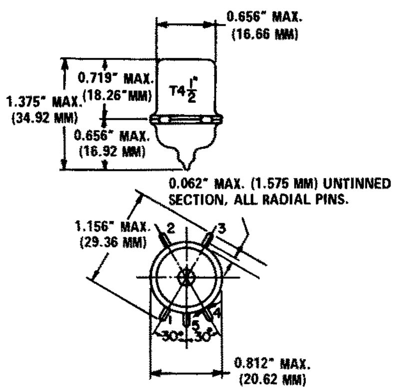


PHYSICAL DIMENSIONS

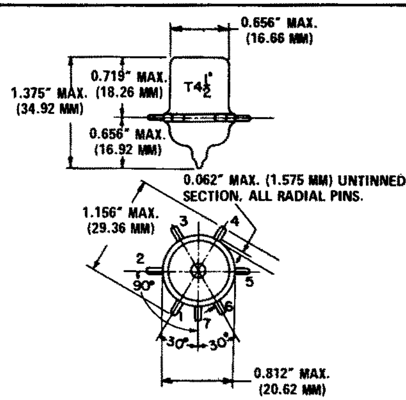
OUTLINE DRAWING NUMBER	INCHES A * MIN.	INCHES A * MAX	INCHES B MAX	INCHES D MAX	INCHES E MIN.	INCHES E MAX	MILLIMETERS A * MIN.	MILLIMETERS A * MAX	MILLIMETERS B MAX	MILLIMETERS D MAX	MILLIMETERS E MIN.	MILLIMETERS E MAX
3-6	.366	.400	.400	1.500	1.150	1.350	9.30	10.16	10.16	38.10	29.3	34.2
3-7	.366	.400	.410	1.500	1.150	1.350	9.30	10.16	10.16	38.10	29.3	34.2

* The minimum applies in a zone 0.500" (12.7mm) up from lead in to 0.200" (5.08mm) down from bulb top

3–6 TO 3–7

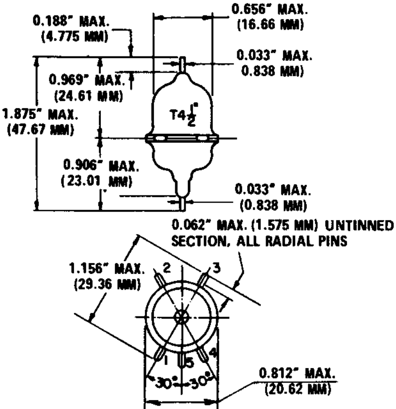


4–1

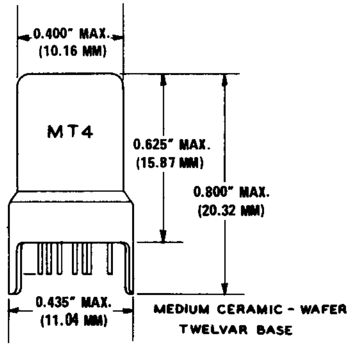


4–2

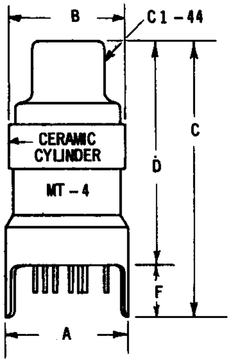
NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURE – 0.250"
SMALL – 0.360"
MEDIUM – 0.566"



4–3



4–4



MEDIUM CERAMIC–WAFER
TWELVAR BASE

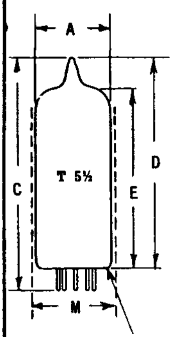
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A	INCHES B	INCHES C	INCHES D		INCHES F	MILLIMETERS A	MILLIMETERS B	MILLIMETERS C	MILLIMETERS D		MILLIMETERS F
	MAX.	MAX.	MAX.	MIN.	MAX.	NOM.	MAX.	MAX.	MAX.	MIN.	MAX.	NOM.
4-5	0.435	0.420	1.050	0.790	0.840	0.190	11.04	10.66	26.67	20.1	21.3	4.83
4-6	0.435	0.420	0.985	0.735	0.780	0.190	11.04	10.66	25.02	18.7	19.8	4.83

NOTES

Maximum O.D. of 0.440"(11.17mm) is permitted along the 0.190"(4.83mm) lug length.

4–5 TO 4–6



E 7–1 MINIATURE–BUTTON
7 PIN BASE

PHYSICAL DIMENSIONS

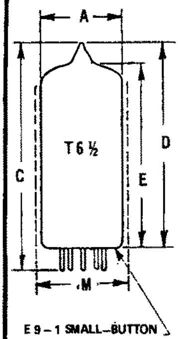
OUTLINE DRAWING NUMBER	INCHES A**		INCHES C	INCHES D	INCHES E*		INCHES M	MILLIMETERS A**		MILLIMETERS C	MILLIMETERS D	MILLIMETERS E*		MILLIMETERS M
	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.	MAX.
5-1	0.695	0.737	1.750	1.500	1.031	1.219	0.750	17.65	18.72	44.45	38.10	26.19	30.96	19.05
5-2	0.695	0.737	2.125	1.875	1.406	1.594	0.750	17.65	18.72	53.97	47.62	35.71	40.49	19.05
5-3	0.695	0.737	2.625	2.375	1.906	2.094	0.750	17.65	18.72	66.67	60.32	48.41	53.19	19.05

NOTES

** Measured from base seat to bulb–top line as determined by a gauge of 0.438"I.D. (11.13mm).

* Applies in zone starting 0.375" (9.525"mm) from base seat.

5–1 TO 5–3



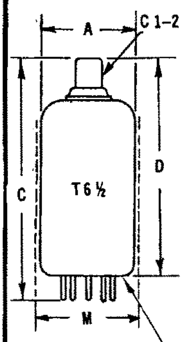
E 9–1 SMALL–BUTTON
9–PIN BASE

PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A** MIN.	INCHES A** MAX.	INCHES C MAX.	INCHES D MAX.	INCHES E* MIN.	INCHES E* MAX.	INCHES M MAX.	MILLIMETERS A** MIN.	MILLIMETERS A** MAX.	MILLIMETERS C MAX.	MILLIMETERS D MAX.	MILLIMETERS E* MIN.	MILLIMETERS E* MAX.	MILLIMETERS M MAX.
6-1	0.800	0.845	1.750	1.500	1.031	1.219	0.875	20.32	21.46	44.45	38.10	26.19	30.96	22.22
6-2	0.800	0.845	2.187	1.937	1.469	1.656	0.875	20.32	21.46	55.54	49.20	37.31	42.06	22.22
6-3	0.800	0.845	2.625	2.375	1.906	2.094	0.875	20.32	21.46	66.67	60.32	48.41	53.19	22.22
6-4	0.800	0.845	3.062	2.812	2.344	2.531	0.875	20.32	21.46	77.77	71.42	59.54	64.29	22.22
6-10	0.800	0.845	2.440	2.190	1.720	1.910	0.875	20.32	21.46	61.98	55.63	43.69	48.51	22.22

NOTES:
* Measured from base seat to bulb-top line as determined by a gauge of 0.438" I.D. (11.13 mm).
** Applies in zone starting 0.375" (9.525 mm) from base seat.

6–1 TO 6–4 6–10



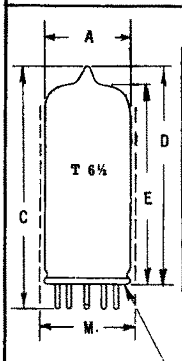
E 9–1 SMALL–BUTTON
9–PIN BASE

PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A MIN.	INCHES A MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	INCHES M MAX.	MILLIMETERS A MIN.	MILLIMETERS A MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.	MILLIMETERS M MAX.
6-5	0.800	0.845	1.969	1.437	1.687	0.875	20.32	21.46	50.01	36.50	42.85	22.22
6-6	0.800	0.845	2.406	1.875	2.125	0.875	20.32	21.46	61.11	47.52	53.97	22.22
6-7	0.800	0.845	2.844	2.312	2.562	0.875	20.32	21.46	72.24	58.72	65.07	22.22
6-8	0.800	0.845	3.281	2.750	3.000	0.875	20.32	21.46	83.34	69.85	76.20	22.22
6-9 +	0.800	0.845	2.844	2.313	2.663	0.875	20.32	21.46	72.24	58.75	67.64	22.22
6-18 ‡	0.800	0.845	2.531	2.000	2.250	0.875	20.32	21.46	64.29	50.80	57.15	22.22

NOTES:
+ C1–40 Minature Cap
‡ C1–45 Minature Cap

6–5 TO 6–9 6–18



10–PIN BASE (CENTER PIN ADDED TO SMALL–BUTTON 9–PIN BASE)

PHYSICAL DIMENSIONS

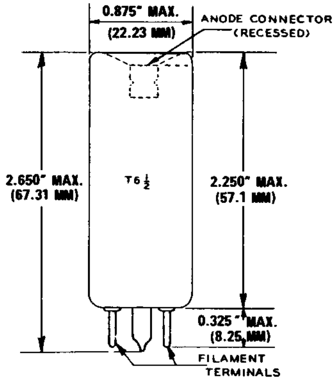
OUTLINE DRAWING NUMBER	INCHES A** MIN.	INCHES A** MAX.	INCHES C MAX.	INCHES D MAX.	INCHES E* MIN.	INCHES E* MAX.	INCHES M MAX.	MILLIMETERS A** MIN.	MILLIMETERS A** MAX.	MILLIMETERS C MAX.	MILLIMETERS D MAX.	MILLIMETERS E* MIN.	MILLIMETERS E* MAX.	MILLIMETERS M MAX.
6-11	0.800	0.845	1.750	1.500	1.020	1.220	0.875	20.32	21.46	44.45	38.10	25.91	30.99	22.22
6-12	0.800	0.845	1.970	1.720	1.240	1.440	0.875	20.32	21.46	30.04	43.69	31.50	36.58	22.22
6-13	0.800	0.845	2.190	1.940	1.460	1.660	0.875	20.32	21.46	55.63	49.28	37.08	42.16	22.22
6-14	0.800	0.845	2.410	2.160	1.680	1.880	0.875	20.32	21.46	61.21	54.86	42.67	47.75	22.22
6-15	0.800	0.845	2.630	2.380	1.900	2.100	0.875	20.32	21.46	66.80	59.45	48.66	53.34	22.22
6-16	0.800	0.845	2.850	2.600	2.220	2.320	0.875	20.32	21.46	72.39	66.04	56.39	58.93	22.22
6-17	0.800	0.845	3.070	2.820	2.340	2.540	0.875	20.32	21.46	77.98	71.63	59.44	64.52	22.22

NOTES:
* Measured from base seat to bulb-top line as determined by a gauge of 0.438" I.D. (11.13 mm).
** Applies in zone starting 0.375" (9.525 mm) from base seat.

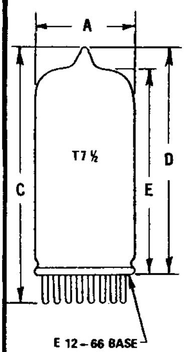
6–11 TO 6–17

NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURE –0.250"

SMALL – 0.360"
MEDIUM – 0.566"



6 – 19

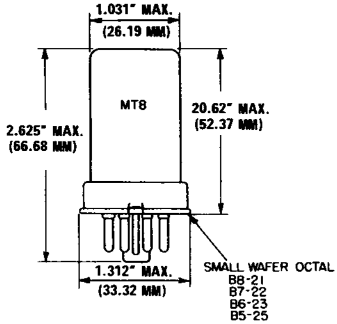


PHYSICAL DIMENSIONS

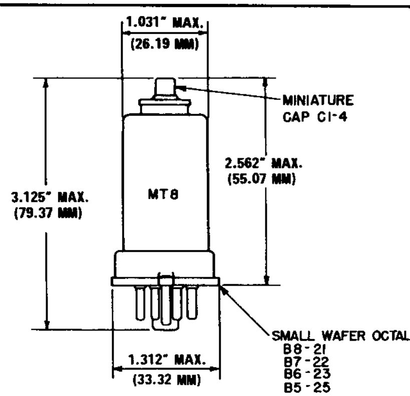
OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A*		C	D	E•		A*		C	D	E•	
	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.
7-1	0.900	1.030	1.750	1.500	1.000	1.200	22.9	26.1	44.5	38.10	25.4	30.4
7-2	0.900	1.030	2.050	1.800	1.300	1.500	22.9	26.1	52.07	45.72	33.1	38.1
7-3	0.900	1.030	2.350	2.100	1.600	1.800	22.9	26.1	59.69	53.34	40.7	45.7
7-4	0.900	1.030	2.650	2.400	1.900	2.100	22.9	26.1	67.31	60.96	48.3	53.3
7-5	0.900	1.030	2.950	2.700	2.200	2.400	22.9	26.1	74.93	68.58	55.9	60.9
7-6	0.900	1.030	3.250	3.000	2.500	2.700	22.9	26.1	82.55	76.20	63.5	68.5

NOTES:
- * The minimum applies in zone starting 0.375" (9.52 mm) from base seat.
- • Measured from base seat to bulb-top line as determined by a ring gauge of 0.438" I.D. (11.13 mm).

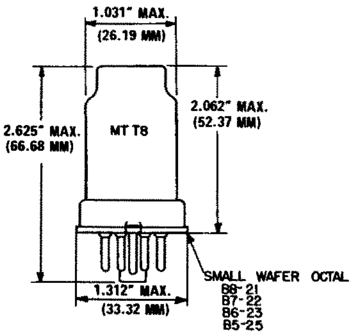
7 – 1 TO 7 – 6



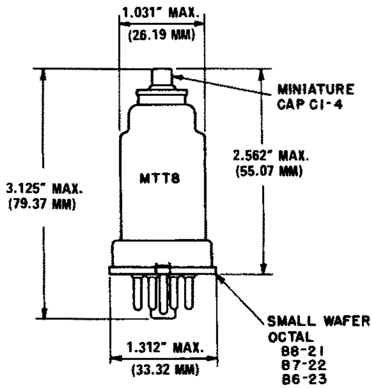
8 – 1



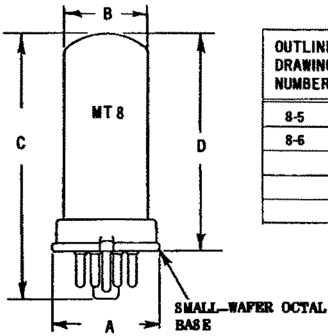
8 – 2



8–3



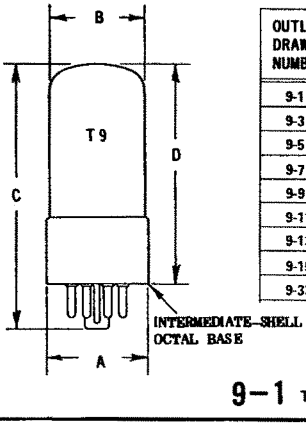
8–4



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A	B	C	D		A	B	C	D	
	MAX.	MAX.	MAX.	MIN.	MAX.	MAX.	MAX.	MAX.	MIN.	MAX.
8-5	1.312	1.031	1.750	1.000	1.188	33.33	26.19	44.45	25.4	30.1
8-6	1.312	1.031	3.125	2.500	2.688	33.33	26.19	82.55	63.5	68.2

8–5 TO 8–6

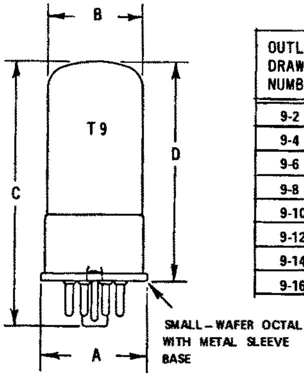


PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A	B		C	D	A	B		C	D
	MAX.	MIN.	MAX.	MAX.	MAX.	MAX.	MIN.	MAX.	MAX.	MAX.
9-1	1.281	1.062	1.188	2.312	1.750	32.54	27.0	30.1	58.73	44.45
9-3	1.281	1.062	1.188	2.875	2.312	32.54	27.0	30.1	73.00	58.73
9-5	1.281	1.062	1.188	3.000	2.438	32.54	27.0	30.1	76.20	61.91
9-7	1.281	1.062	1.188	3.062	2.500	32.54	27.0	30.1	77.78	63.50
9-9	1.281	1.062	1.188	3.250	2.688	32.54	27.0	30.1	82.55	68.26
9-11	1.281	1.062	1.188	3.312	2.750	32.54	27.0	30.1	84.13	69.85
9-13	1.281	1.062	1.188	3.375	2.812	32.54	27.0	30.1	85.72	71.43
9-15	1.281	1.062	1.188	3.438	2.875	32.54	27.0	30.1	87.31	73.02
9-33	1.281	1.062	1.188	3.812	3.250	32.54	27.0	30.1	96.83	82.55

9–1 TO 9–15 (ODD) 9–33

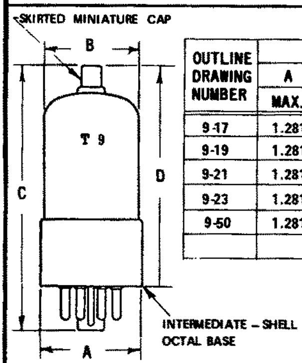
NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURE – 0.250"
SMALL – 0.360"
MEDIUM – 0.566"



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A	B		C	D	A	B		C	D
	MAX.	MIN.	MAX.	MAX.	MAX.	MAX.	MIN.	MAX.	MAX.	MAX.
9-2	1.312	1.062	1.188	2.312	1.750	33.33	27.0	30.1	58.73	44.45
9-4	1.312	1.062	1.188	2.875	2.312	33.33	27.0	30.1	73.02	58.73
9-6	1.312	1.062	1.188	3.000	2.438	33.33	27.0	30.1	76.20	61.93
9-8	1.312	1.062	1.188	3.062	2.500	33.33	27.0	30.1	77.78	63.50
9-10	1.312	1.062	1.188	3.250	2.688	33.33	27.0	30.1	82.55	68.26
9-12	1.312	1.062	1.188	3.312	2.750	33.33	27.0	30.1	84.13	69.85
9-14	1.312	1.062	1.188	3.375	2.812	33.33	27.0	30.1	85.72	71.42
9-16	1.312	1.062	1.188	3.562	2.875	33.33	27.0	30.1	87.31	73.02

9 – 2 TO 9 – 16 (EVEN)



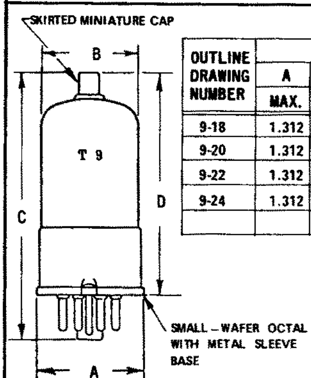
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A	B		C	D		A	B		C	D	
	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-17	1.281	1.062	1.188	3.312	2.312	2.750	32.54	27.0	30.1	84.13	58.8	69.8
9-19	1.281	1.062	1.188	3.438	2.312	2.875	32.54	27.0	30.1	87.31	58.8	73.0
9-21	1.281	1.062	1.188	3.500	2.312	2.938	32.54	27.0	30.1	88.90	58.8	74.6
9-23	1.281	1.062	1.188	3.562	2.312	3.000	32.54	27.0	30.1	90.48	58.8	76.2
9-50	1.281	1.062	1.188	3.875	2.875	3.312	32.54	27.0	30.1	98.42	73.0	84.1

NOTE

Also may use C1–2 or non–standard C1–33

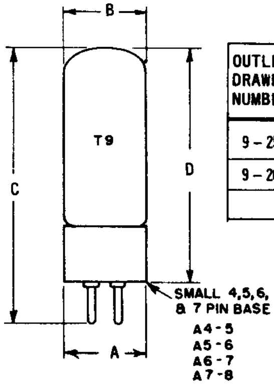
9 – 17 TO 9 – 23 (ODD) 9 – 50



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A	B		C	D		A	B		C	D	
	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-18	1.312	1.062	1.188	3.312	2.312	2.750	33.33	27.0	30.1	84.13	58.8	69.8
9-20	1.312	1.062	1.188	3.438	2.312	2.875	33.33	27.0	30.1	87.31	58.8	73.0
9-22	1.312	1.062	1.188	3.500	2.312	2.938	33.33	27.0	30.1	88.90	58.8	74.6
9-24	1.312	1.062	1.188	3.562	2.312	3.000	33.33	27.0	30.1	90.48	58.8	76.2

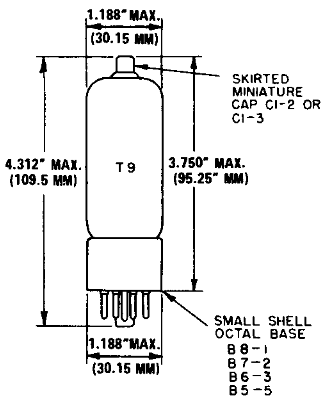
9 – 18 TO 9 – 24 (EVEN)



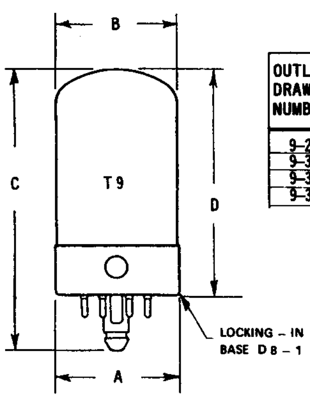
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A	INCHES B		INCHES C	INCHES D		MILLIMETERS A	MILLIMETERS B		MILLIMETERS C	MILLIMETERS D	
	MAX	MIN.	MAX	MAX	MIN.	MAX	MAX	MIN.	MAX	MAX	MIN.	MAX
9 – 25	1.188	1.062	1.188	4.000	3.000	3.375	30.15	27.0	30.15	101.6	76.2	85.7
9 – 26	1.188	1.062	1.188	4.188	3.188	3.562	30.15	27.0	30.15	106.36	81.0	90.4

9–25 TO 9–26



9 – 28

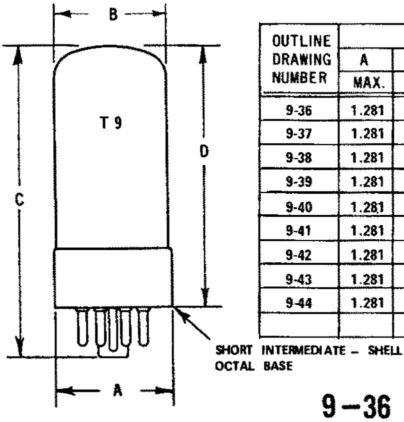


PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A	INCHES B		INCHES C	INCHES D	MILLIMETERS A	MILLIMETERS B		MILLIMETERS C	MILLIMETERS D
	MAX	MIN.	MAX	MAX	MAX	MAX	MIN.	MAX	MAX	MAX
9–29	1.188	1.062	1.188	2.031	1.500	30.16	27.0	30.1	51.59	38.10
9–30	1.188	1.062	1.188	2.781	2.250	30.16	27.0	30.1	70.64	57.15
9–31	1.188	1.062	1.188	3.156	2.625	30.16	27.0	30.1	80.16	66.67
9–32	1.188	1.062	1.188	2.281	1.750	30.16	27.0	30.1	57.94	44.45

9–29 TO 9–32

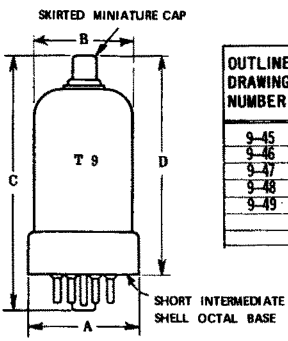
NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURE – 0.250"
SMALL – 0.360"
MEDIUM – 0.566"



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A	INCHES B		INCHES C	INCHES D	MILLIMETERS A	MILLIMETERS B		MILLIMETERS C	MILLIMETERS D
	MAX.	MIN.	MAX.	MAX.	MAX.	MAX.	MIN.	MAX.	MAX.	MAX.
9-36	1.281	1.062	1.188	2.312	1.750	32.54	27.0	30.1	58.73	44.45
9-37	1.281	1.062	1.188	2.875	2.312	32.54	27.0	30.1	73.02	58.73
9-38	1.281	1.062	1.188	3.000	2.438	32.54	27.0	30.1	76.20	61.91
9-39	1.281	1.062	1.188	3.062	2.500	32.54	27.0	30.1	77.78	63.50
9-40	1.281	1.062	1.188	3.250	2.688	32.54	27.0	30.1	82.55	68.26
9-41	1.281	1.062	1.188	3.312	2.750	32.54	27.0	30.1	84.13	69.85
9-42	1.281	1.062	1.188	3.375	2.812	32.54	27.0	30.1	85.72	71.43
9-43	1.281	1.062	1.188	3.438	2.875	32.54	27.0	30.1	87.31	73.02
9-44	1.281	1.062	1.188	3.812	3.250	32.54	27.0	30.1	96.83	82.55

9–36 TO 9–44



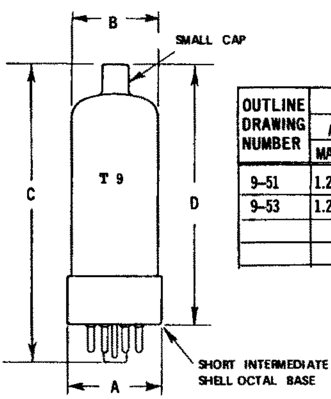
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A	INCHES B		INCHES C	INCHES D		MILLIMETERS A	MILLIMETERS B		MILLIMETERS C	MILLIMETERS D	
	MAX	MIN.	MAX	MAX	MIN.	MAX	MAX	MIN.	MAX	MAX	MIN.	MAX
9-45	1.281	1.062	1.188	3.312	2.312	2.750	32.54	27.0	30.1	84.13	58.8	69.8
9-46	1.281	1.062	1.188	3.438	2.312	2.875	32.54	27.0	30.1	87.31	58.8	73.0
9-47	1.281	1.062	1.188	3.500	2.312	2.938	32.54	27.0	30.1	88.90	58.8	74.6
9-48	1.281	1.062	1.188	3.562	2.312	3.000	32.54	27.0	30.1	90.48	58.8	76.2
9-49	1.281	1.062	1.188	3.875	2.875	3.312	32.54	27.0	30.1	98.42	73.0	84.1

NOTE

ALSO MAY USE C1-2 CAP OR NON-STANDARD C1-33

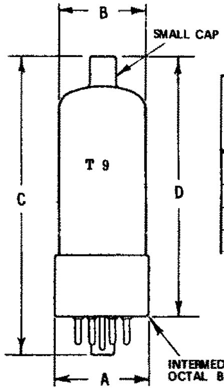
9–45 TO 9–49



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A	INCHES B		INCHES C	INCHES D		MILLIMETERS A	MILLIMETERS		MILLIMETERS C	MILLIMETERS D	
	MAX	MIN.	MAX	MAX	MIN.	MAX	MAX	MIN.	MAX	MAX	MIN.	MAX
9-51	1.281	1.062	1.187	4.062	3.125	3.500	32.543	26.975	30.162	103.187	79.375	88.900
9-53	1.281	1.062	1.187	3.563	2.625	3.000	32.543	26.975	30.162	80.488	66.68	76.2

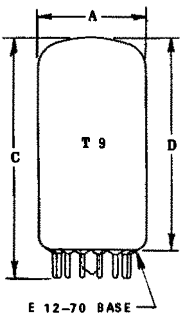
9–51 9–53



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A	B		C	D		A	B		C	D	
	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-52	1.281	1.062	1.187	4.062	3.125	3.500	32.543	26.975	30.162	103.187	79.375	88.900
9-54	1.281	1.062	1.187	3.563	2.625	3.000	32.543	26.975	30.162	80.488	66.68	76.2

9-52 9-54



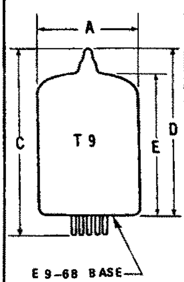
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A*		C	D		A*		C	D	
	MIN.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-55	1.062	1.188	1.625	1.000	1.250	27.0	30.1	41.27	25.4	31.7
9-56	1.062	1.188	1.875	1.250	1.500	27.0	30.1	47.62	31.8	38.1
9-57	1.062	1.188	2.125	1.500	1.750	27.0	30.1	53.97	38.1	44.4
9-58	1.062	1.188	2.375	1.750	2.000	27.0	30.1	60.32	44.5	50.8
9-59	1.062	1.188	2.615	2.000	2.250	27.0	30.1	66.67	50.8	57.1
9-60	1.062	1.188	2.875	2.250	2.500	27.0	30.1	73.02	57.2	63.5
9-61	1.062	1.188	3.125	2.500	2.750	27.0	30.1	79.37	63.5	69.8
9-62	1.062	1.188	3.375	2.750	3.000	27.0	30.1	85.72	69.9	76.2

NOTES:

* Applies to minimum diameter except in the area of the seal.

9-55 TO 9-62



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A*		C	D	E•		A*		C	D	E•	
	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.
9-67	1.062	1.188	2.030	1.720	1.170	1.410	27.0	30.1	51.56	43.68	29.8	35.8
9-68	1.062	1.188	2.330	2.020	1.470	1.710	27.0	30.1	59.18	51.30	37.4	43.4
9-69	1.062	1.188	2.630	2.320	1.770	2.010	27.0	30.1	66.80	58.92	45.0	51.0
9-70	1.062	1.188	2.930	2.620	2.070	2.310	27.0	30.1	74.42	66.54	52.6	58.6
9-71	1.062	1.188	3.230	2.920	2.370	2.610	27.0	30.1	82.04	74.16	60.2	66.2
9-72	1.062	1.188	3.530	3.220	2.670	2.910	27.0	30.1	89.66	81.78	67.9	73.9

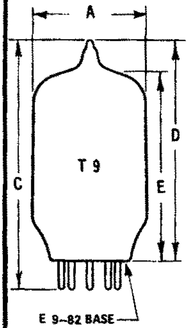
NOTES:

* The minimum applies in zone starting 0.375" (9.52 mm) from base seat.
• Measured from base seat to bulb-top line as determined by a ring gauge of 0.600" (15.24 mm.) I.D.

9-67 TO 9-72

NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURE - 0.250"

SMALL - 0.360"
MEDIUM - 0.566"

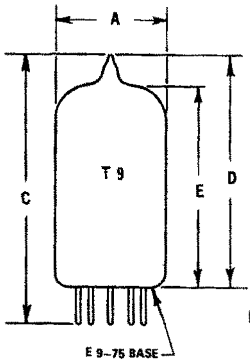


PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A*		C	D	E•		A*		C	D	E•	
	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.
9-73	1.062	1.188	1.990	1.710	1.150	1.400	27.0	30.1	50.54	43.43	29.2	35.5
9-74	1.062	1.188	2.240	1.960	1.400	1.650	27.0	30.1	56.90	49.78	35.6	41.9
9-75	1.062	1.188	2.490	2.210	1.650	1.900	27.0	30.1	63.24	56.13	41.9	48.2
9-76	1.062	1.188	2.740	2.460	1.900	2.150	27.0	30.1	69.59	62.48	48.3	54.6
9-77	1.062	1.188	2.990	2.710	2.150	2.400	27.0	30.1	75.94	68.83	54.6	60.9
9-78	1.062	1.188	3.240	2.960	2.400	2.650	27.0	30.1	82.29	75.18	61.0	67.3
9-79	1.062	1.188	3.490	3.210	2.650	2.900	27.0	30.1	88.64	81.53	67.3	73.6
9-80	1.062	1.188	3.740	3.460	2.900	3.150	27.0	30.1	94.99	87.88	73.7	80.0

NOTES:
- * The minimum applies in zone starting 0.625" (15.88 mm) from base seat.
- • Measured from base seat to bulb-top line as determined by a ring gauge of 0.600" (15.24 mm.) I.D.

9–73 TO 9–80

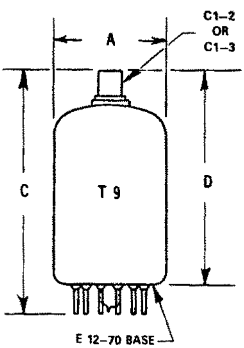


PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A*		C	D	E•		A*		C	D	E•	
	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.
9-82	1.062	1.188	2.210	1.830	1.310	1.490	27.0	30.1	56.13	46.48	33.3	37.8
9-83	1.062	1.188	2.510	2.130	1.610	1.790	27.0	30.1	63.75	54.10	40.9	45.4
9-84	1.062	1.188	2.810	2.430	1.910	2.090	27.0	30.1	71.37	61.72	48.6	53.0
9-85	1.062	1.188	3.110	2.730	2.210	2.390	27.0	30.1	78.99	69.34	56.2	60.7
9-86	1.062	1.188	3.410	3.030	2.510	2.690	27.0	30.1	86.61	76.96	63.8	68.3
9-87	1.062	1.188	3.710	3.330	2.810	2.990	27.0	30.1	94.23	84.58	71.4	75.9

NOTES:
- * The minimum applies in zone starting 0.375" (9.52 mm) from base seat.
- • Measured from base seat to bulb-top line as determined by a ring gauge of 0.600" (15.24 mm.) I.D.

9–82 TO 9–87

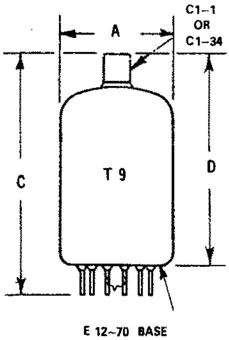


PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A*		C	D		A*		C	D	
	MIN.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-88	1.062	1.188	2.625	2.000	2.250	27.0	30.1	66.67	50.8	57.1
9-89	1.062	1.188	2.875	2.250	2.500	27.0	30.1	73.0	57.2	63.5
9-90	1.062	1.188	3.125	2.500	2.750	27.0	30.1	79.3	63.5	69.8
9-91	1.062	1.188	3.375	2.750	3.000	27.0	30.1	85.7	69.9	76.2
9-92	1.062	1.188	3.625	3.000	3.250	27.0	30.1	92.0	76.2	82.5
9-93	1.062	1.188	3.875	3.250	3.500	27.0	30.1	98.4	82.6	88.9
9-94	1.062	1.188	4.125	3.500	3.750	27.0	30.1	104.77	88.9	95.2
9-95	1.062	1.188	4.375	3.750	4.000	27.0	30.1	111.12	95.3	101.6

NOTES:
- * Applies to minimum diameter except in the area of the seal.

9–88 TO 9–95



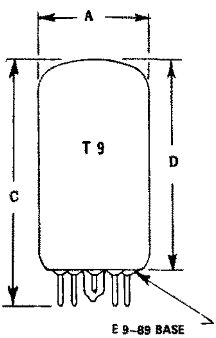
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A* MIN.	INCHES A* MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A* MIN.	MILLIMETERS A* MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
9-96	1.062	1.188	2.625	2.000	2.250	27.0	30.1	66.67	50.8	57.1
9-97	1.062	1.188	2.875	2.250	2.500	27.0	30.1	73.0	57.2	63.5
9-98	1.062	1.188	3.125	2.500	2.750	27.0	30.1	79.30	63.5	69.8
9-99	1.062	1.188	3.375	2.750	3.000	27.0	30.1	85.70	69.9	76.2
9-100	1.062	1.188	3.625	3.000	3.250	27.0	30.1	92.07	76.2	82.5
9-101	1.062	1.188	3.875	3.250	3.500	27.0	30.1	98.42	82.6	88.9
9-102	1.062	1.188	4.125	3.500	3.750	27.0	30.1	104.77	88.9	95.2
9-103	1.062	1.188	4.375	3.750	4.000	27.0	30.1	111.12	95.3	101.6

NOTES:

* Applies to minimum diameter except in the area of the seal.

9–96 TO 9–103



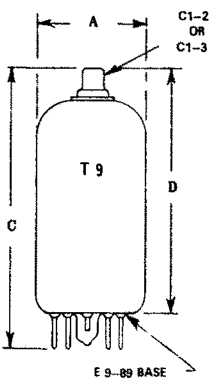
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A* MIN.	INCHES A* MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A* MIN.	MILLIMETERS A* MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
9-104	1.062	1.188	1.630	1.000	1.250	27.0	30.1	41.40	25.4	31.7
9-105	1.062	1.188	1.880	1.250	1.500	27.0	30.1	47.75	31.8	38.1
9-106	1.062	1.188	2.130	1.500	1.750	27.0	30.1	54.10	38.1	44.4
9-107	1.062	1.188	2.380	1.750	2.000	27.0	30.1	60.45	44.5	50.8
9-108	1.062	1.188	2.630	2.000	2.250	27.0	30.1	66.80	50.8	57.1
9-109	1.062	1.188	2.880	2.250	2.500	27.0	30.1	73.15	57.2	63.5
9-110	1.062	1.188	3.130	2.500	2.750	27.0	30.1	79.50	63.5	69.8
9-111	1.062	1.188	3.380	2.750	3.000	27.0	30.1	85.85	69.9	72.6

NOTES:

* Applies to minimum diameter except in the area of the seal.

9–104 TO 9–111



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A* MIN.	INCHES A* MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A* MIN.	MILLIMETERS A* MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
9-112	1.062	1.188	2.630	2.000	2.250	27.0	30.1	66.80	50.8	57.1
9-113	1.062	1.188	2.880	2.250	2.500	27.0	30.1	73.15	57.2	63.5
9-114	1.062	1.188	3.130	2.500	2.750	27.0	30.1	79.50	63.5	69.8
9-115	1.062	1.188	3.380	2.750	3.000	27.0	30.1	85.85	69.9	76.2
9-116	1.062	1.188	3.630	3.000	3.250	27.0	30.1	92.20	76.2	82.5
9-117	1.062	1.188	3.880	3.250	3.500	27.0	30.1	98.55	82.6	88.9
9-118	1.062	1.188	4.130	3.500	3.750	27.0	30.1	104.90	88.9	95.2
9-119	1.062	1.188	4.380	3.750	4.000	27.0	30.1	111.25	95.3	101.6

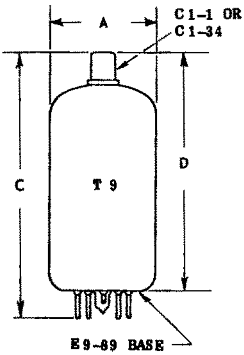
NOTES:

* Applies to minimum diameter except in the area of the seal.

9–112 TO 9–119

NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURE – 0.250"

SMALL – 0.360"
MEDIUM – 0.566"



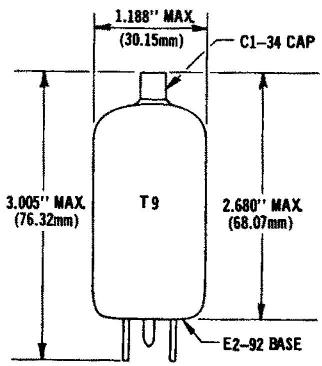
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A*		C	D		A*		C	D	
	MIN.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-120	1.062	1.188	2.630	2.000	2.250	27.0	30.1	66.80	50.8	57.1
9-121	1.062	1.188	2.880	2.250	2.500	27.0	30.1	73.15	57.2	63.5
9-122	1.062	1.188	3.130	2.500	2.750	27.0	30.1	79.50	63.5	69.8
9-123	1.062	1.188	3.380	2.750	3.000	27.0	30.1	85.85	69.9	76.2
9-124	1.062	1.188	3.630	3.000	3.250	27.0	30.1	92.20	76.2	82.5
9-125	1.062	1.188	3.880	3.250	3.500	27.0	30.1	98.55	82.6	88.9
9-126	1.062	1.188	4.130	3.500	3.750	27.0	30.1	104.90	88.9	95.2
9-127	1.062	1.188	4.380	3.750	4.000	27.0	30.1	111.25	95.3	101.6

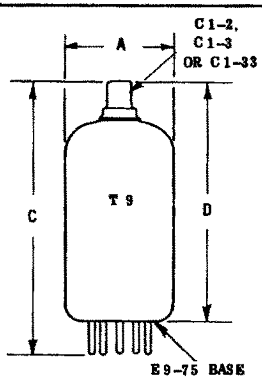
NOTES:

* Applies to minimum diameter except in the area of the seal.

9–120 TO 9–127



9 – 128



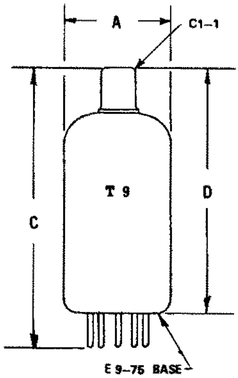
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A*		C	D		A*		C	D	
	MIN.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-130	1.062	1.188	2.350	1.710	1.970	27.0	30.1	59.69	43.4	49.9
9-131	1.062	1.188	2.650	2.010	2.270	27.0	30.1	67.31	51.0	57.5
9-132	1.062	1.188	2.950	2.310	2.570	27.0	30.1	74.93	58.7	65.2
9-133	1.062	1.188	3.250	2.610	2.870	27.0	30.1	82.55	66.3	72.8
9-134	1.062	1.188	3.550	2.910	3.170	27.0	30.1	90.17	74.0	80.5
9-135	1.062	1.188	3.850	3.210	3.470	27.0	30.1	97.79	81.6	88.1

NOTES:

* Applies to minimum diameter except in the area of the seal.

9–130 TO 9–135



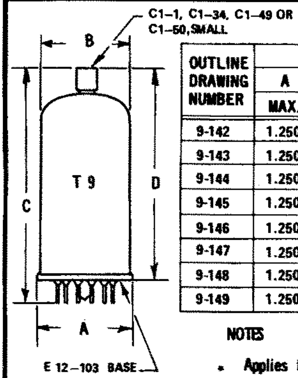
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A*		C	D		A*		C	D	
	MIN.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-136	1.062	1.188	2.350	1.710	1.970	27.0	30.1	59.69	43.4	49.9
9-137	1.062	1.188	2.650	2.010	2.270	27.0	30.1	67.31	51.0	57.5
9-138	1.062	1.188	2.950	2.310	2.570	27.0	30.1	74.93	58.7	65.2
9-139	1.062	1.188	3.250	2.610	2.870	27.0	30.1	82.55	66.3	72.8
9-140	1.062	1.188	3.550	2.910	3.170	27.0	30.1	90.17	74.0	80.5
9-141	1.062	1.188	3.850	3.210	3.470	27.0	30.1	97.79	81.6	88.1

NOTES:

* Applies to minimum diameter except in the area of the seal.

9–136 TO 9–141



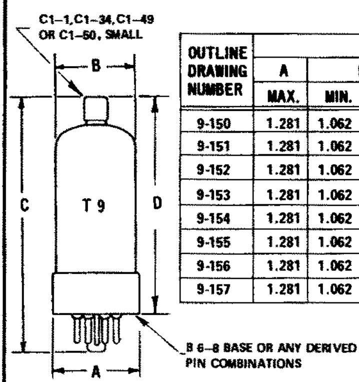
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A	B *		C	D		A	B *		C	D	
	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-142	1.250	1.062	1.188	2.625	2.000	2.250	31.75	27.0	30.1	66.6	50.8	57.1
9-143	1.250	1.062	1.188	2.875	2.250	2.500	31.75	27.0	30.1	73.0	57.2	63.5
9-144	1.250	1.062	1.188	3.125	2.500	2.750	31.75	27.0	30.1	79.3	63.5	69.8
9-145	1.250	1.062	1.188	3.375	2.750	3.000	31.75	27.0	30.1	85.7	69.9	76.2
9-146	1.250	1.062	1.188	3.625	3.000	3.250	31.75	27.0	30.1	92.0	76.2	82.5
9-147	1.250	1.062	1.188	3.875	3.250	3.500	31.75	27.0	30.1	98.4	82.6	88.9
9-148	1.250	1.062	1.188	4.125	3.500	3.750	31.75	27.0	30.1	104.7	88.9	95.2
9-149	1.250	1.062	1.188	4.375	3.750	4.000	31.75	27.0	30.1	111.1	95.3	101.6

NOTES

* Applies to minimum diameter except in the areas of the seal.

9–142 TO 9–149

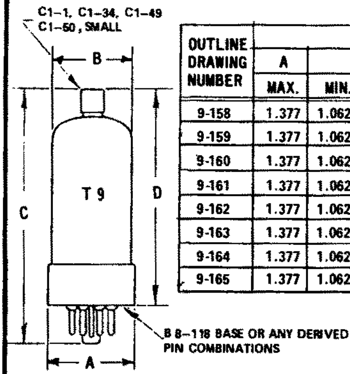


PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A	B		C	D		A	B		C	D	
	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-150	1.281	1.062	1.188	3.062	2.250	2.500	32.53	27.0	30.1	77.7	57.2	63.5
9-151	1.281	1.062	1.188	3.312	2.500	2.750	32.53	27.0	30.1	84.1	63.5	69.8
9-152	1.281	1.062	1.188	3.562	2.750	3.000	32.53	27.0	30.1	90.4	69.9	76.2
9-153	1.281	1.062	1.188	3.812	3.000	3.250	32.53	27.0	30.1	96.8	76.2	82.5
9-154	1.281	1.062	1.188	4.062	3.250	3.500	32.53	27.0	30.1	103.1	82.6	88.9
9-155	1.281	1.062	1.188	4.312	3.500	3.750	32.53	27.0	30.1	109.5	88.9	95.2
9-156	1.281	1.062	1.188	4.562	3.750	4.000	32.53	27.0	30.1	115.8	95.3	101.6
9-157	1.281	1.062	1.188	4.812	4.000	4.250	32.53	27.0	30.1	122.2	101.6	107.9

9–150 TO 9–157

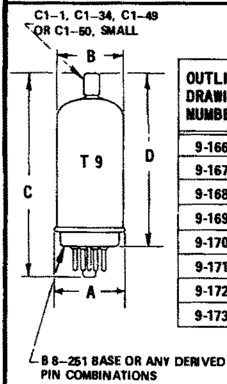
NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURE – 0.250"
SMALL – 0.360"
MEDIUM – 0.566"



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A	B		C	D		MILLIMETERS A	B		C	D	
	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-158	1.377	1.062	1.188	3.062	2.250	2.500	34.97	27.0	30.1	77.7	57.2	63.5
9-159	1.377	1.062	1.188	3.312	2.500	2.750	34.97	27.0	30.1	84.1	63.5	69.8
9-160	1.377	1.062	1.188	3.562	2.750	3.000	34.97	27.0	30.1	90.4	69.9	76.2
9-161	1.377	1.062	1.188	3.812	3.000	3.250	34.97	27.0	30.1	96.8	76.2	82.5
9-162	1.377	1.062	1.188	4.062	3.250	3.500	34.97	27.0	30.1	103.1	82.6	88.9
9-163	1.377	1.062	1.188	4.312	3.500	3.750	34.97	27.0	30.1	109.5	88.9	95.2
9-164	1.377	1.062	1.188	4.562	3.750	4.000	34.97	27.0	30.1	115.8	95.3	101.6
9-165	1.377	1.062	1.188	4.812	4.000	4.250	34.97	27.0	30.1	122.2	101.6	107.9

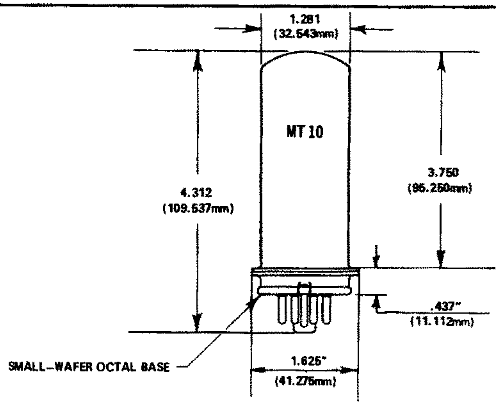
9–158 TO 9–165



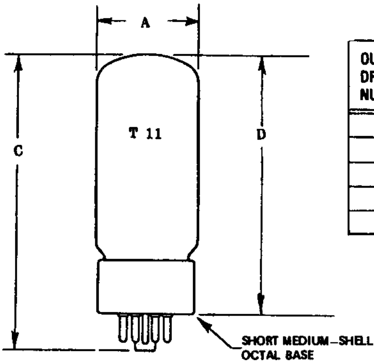
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A	B		C	D		MILLIMETERS A	B		C	D	
	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
9-166	1.250	1.062	1.188	3.062	2.250	2.500	31.75	27.0	30.1	77.7	57.2	63.5
9-167	1.250	1.062	1.188	3.312	2.500	2.750	31.75	27.0	30.1	84.1	63.5	69.8
9-168	1.250	1.062	1.188	3.562	2.750	3.000	31.75	27.0	30.1	90.4	69.9	76.2
9-169	1.250	1.062	1.188	3.812	3.000	3.250	31.75	27.0	30.1	96.8	76.2	85.5
9-170	1.250	1.062	1.188	4.062	3.250	3.500	31.75	27.0	30.1	103.1	85.6	88.9
9-171	1.250	1.062	1.188	4.312	3.500	3.750	31.75	27.0	30.1	109.5	88.9	95.2
9-172	1.250	1.062	1.188	4.562	3.750	4.000	31.75	27.0	30.1	115.8	95.3	101.6
9-173	1.250	1.062	1.188	4.812	4.000	4.250	31.75	27.0	30.1	122.2	101.6	107.9

9–166 TO 9–173



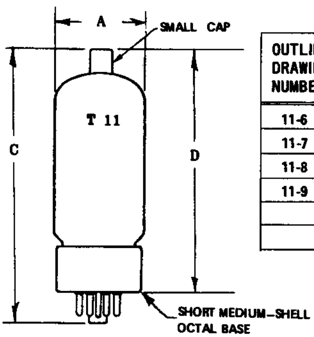
10 – 1



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES				MILLIMETERS			
	A		C	D	A		C	D
	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.	MAX.	MAX.
11-2	1.312	1.438	3.500	2.938	33.4	36.5	88.90	74.61
11-3	1.312	1.438	3.875	3.312	33.4	36.5	98.42	84.13
11-4	1.312	1.438	4.250	3.688	33.4	36.5	107.95	93.66
11-5	1.312	1.438	4.625	4.062	33.4	36.5	117.47	103.18

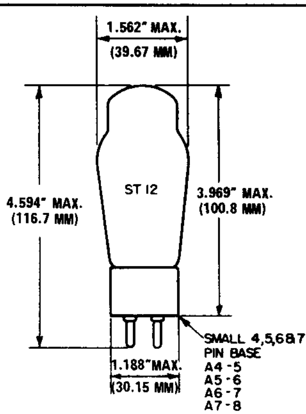
11–2 TO 11–5



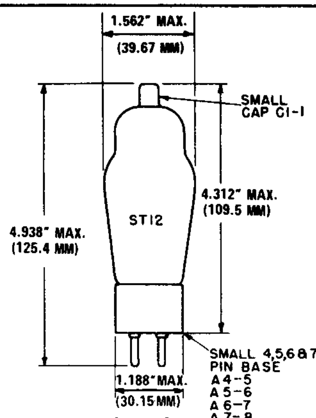
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A		C	D		A		C	D	
	MIN.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
11-6	1.312	1.438	3.875	2.938	3.312	33.4	36.5	98.2	74.7	84.1
11-7	1.312	1.438	4.250	3.312	3.688	33.4	36.5	107.95	84.2	93.6
11-8	1.312	1.438	4.625	3.688	4.062	33.4	36.5	117.47	93.7	103.1
11-9	1.312	1.438	5.000	4.062	4.432	33.4	36.5	127.0	103.2	112.7

11–6 TO 11–9

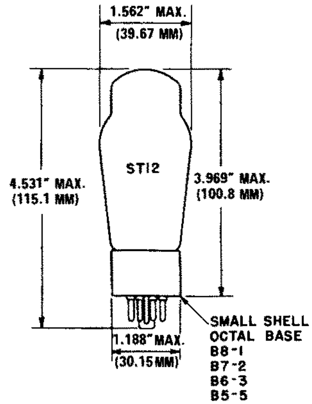


12–1

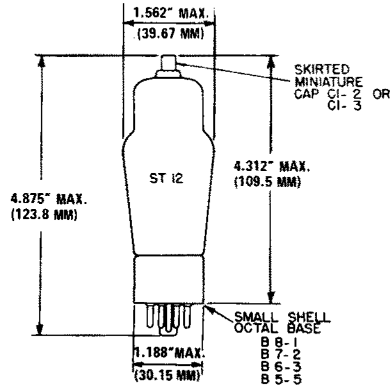


12–2

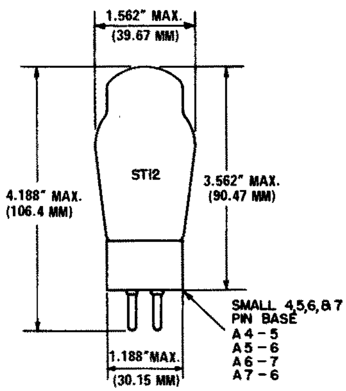
NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURE – 0.250"
SMALL – 0.360"
MEDIUM – 0.566"



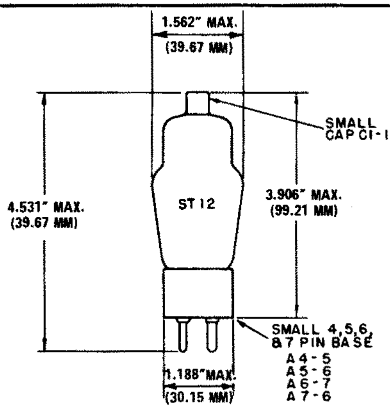
12-3



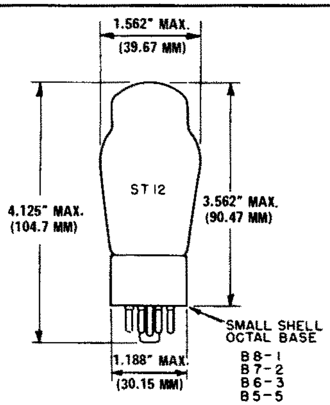
12-4



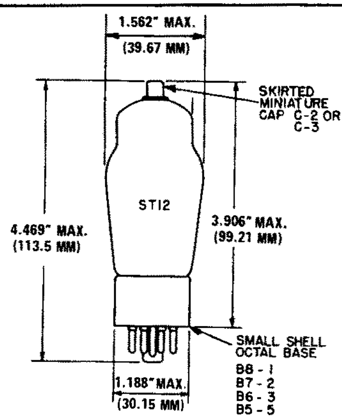
12-5



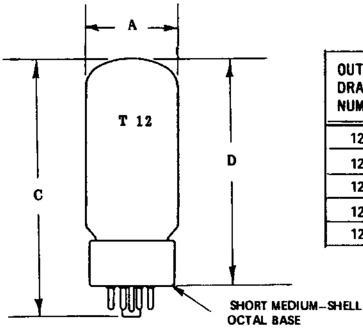
12-6



12-7



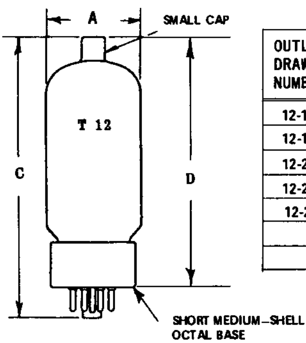
12-8



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A MIN.	INCHES A MAX.	INCHES C MAX.	INCHES D MAX.	MILLIMETERS A MIN.	MILLIMETERS A MAX.	MILLIMETERS C MAX.	MILLIMETERS D MAX.
12-13	1.438	1.562	3.500	2.938	36.6	39.6	88.90	74.61
12-14	1.438	1.562	3.875	3.312	36.6	39.6	98.42	84.13
12-15	1.438	1.562	4.250	3.688	36.6	39.6	107.95	93.66
12-16	1.438	1.562	4.625	4.062	36.6	39.6	117.47	103.18
12-17	1.438	1.562	5.000	4.438	36.6	39.6	127.0	112.71

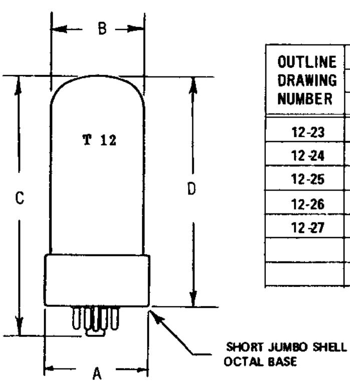
12-13 TO 12-17



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A MIN.	INCHES A MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A MIN.	MILLIMETERS A MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
12-18	1.438	1.562	3.875	2.938	3.312	36.6	39.6	98.42	74.7	84.1
12-19	1.438	1.562	4.125	3.312	3.688	36.6	39.6	107.95	84.2	93.6
12-20	1.438	1.562	4.625	3.688	4.062	36.6	39.6	117.47	93.7	103.1
12-21	1.438	1.562	5.000	4.062	4.438	36.6	39.6	127.0	103.2	112.7
12-22	1.438	1.562	5.375	4.438	4.812	36.6	39.6	136.5	112.8	122.2

12-18 TO 12-22

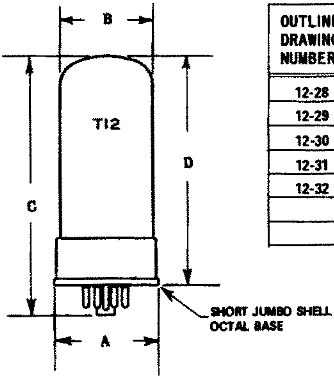


PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A MAX.	INCHES B MIN.	INCHES B MAX.	INCHES C MAX.	INCHES D MAX.	MILLIMETERS A MAX.	MILLIMETERS B MIN.	MILLIMETERS B MAX.	MILLIMETERS C MAX.	MILLIMETERS D MAX.
12-23	1.719	1.438	1.562	3.500	2.938	43.65	36.6	39.6	88.90	74.61
12-24	1.719	1.438	1.562	3.875	3.312	43.65	36.6	39.6	98.42	84.13
12-25	1.719	1.438	1.562	4.250	3.688	43.65	36.6	39.6	107.95	93.66
12-26	1.719	1.438	1.562	4.625	4.062	43.65	36.6	39.6	117.47	103.18
12-27	1.719	1.438	1.562	5.000	4.438	43.65	36.6	39.6	127.0	112.71

12-23 TO 12-27

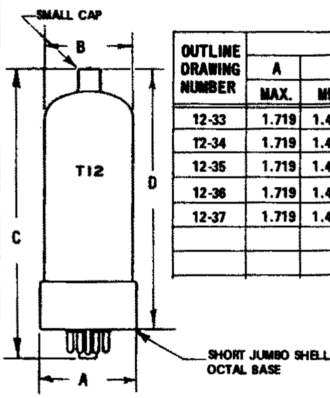
NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURE – 0.250"
SMALL – 0.360"
MEDIUM – 0.566"



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A	B		C	D	A	B		C	D
	MAX.	MIN.	MAX.	MAX.	MAX.	MAX.	MIN.	MAX.	MAX.	MAX.
12-28	1.719	1.438	1.562	3.500	2.938	43.65	36.6	39.6	88.90	74.61
12-29	1.719	1.438	1.562	3.875	3.312	43.65	36.6	39.6	98.42	84.13
12-30	1.719	1.438	1.562	4.250	3.688	43.65	36.6	39.6	107.95	93.66
12-31	1.719	1.438	1.562	4.625	4.062	43.65	36.6	39.6	117.47	103.18
12-32	1.719	1.438	1.562	5.000	4.438	43.65	36.6	39.6	127.0	112.71

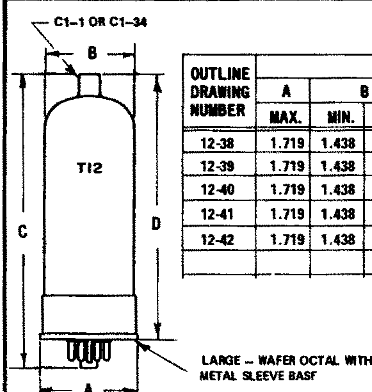
12–28 TO 12–32



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A	B		C	D		A	B		C	D	
	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
12-33	1.719	1.438	1.562	3.875	2.938	3.312	43.65	36.6	39.6	98.42	74.7	84.1
12-34	1.719	1.438	1.562	4.250	3.312	3.688	43.65	36.6	39.6	107.95	84.2	93.6
12-35	1.719	1.438	1.562	4.625	3.688	4.062	43.65	36.6	39.6	117.47	93.7	103.1
12-36	1.719	1.438	1.562	5.000	4.062	4.438	43.65	36.6	39.6	127.0	103.2	112.7
12-37	1.719	1.438	1.562	5.375	4.438	4.812	43.65	36.6	39.6	136.52	112.8	122.2

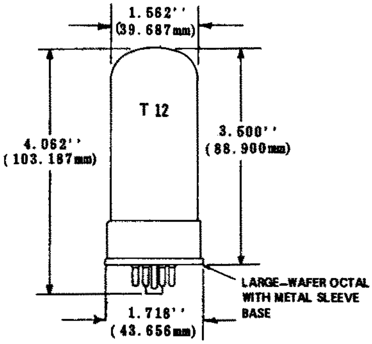
12–33 TO 12–37



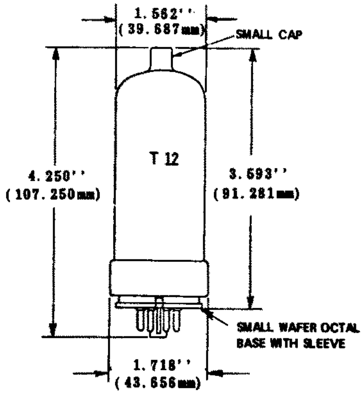
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A	B		C	D		A	B		C	D	
	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
12-38	1.719	1.438	1.562	3.875	2.938	3.312	43.65	36.6	39.6	98.42	74.7	84.1
12-39	1.719	1.438	1.562	4.250	3.312	3.688	43.65	36.6	39.6	107.95	84.2	93.6
12-40	1.719	1.438	1.562	4.625	3.688	4.062	43.65	36.6	39.6	117.47	93.7	103.1
12-41	1.719	1.438	1.562	5.000	4.062	4.438	43.65	36.6	39.6	127.0	103.2	112.7
12-42	1.719	1.438	1.562	5.375	4.438	4.812	43.65	36.6	39.6	136.5	112.8	122.2

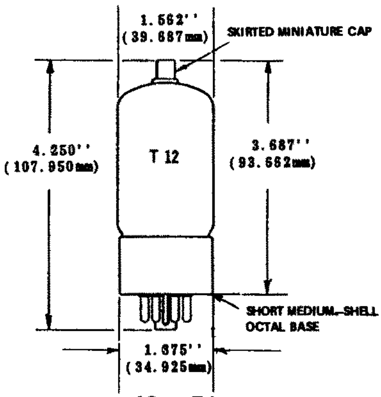
12–38 TO 12–42



12 -43

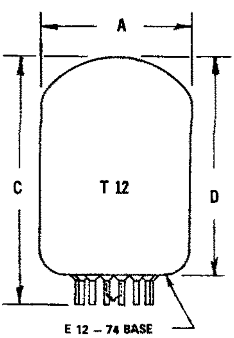


12-44



12 – 51

PHYSICAL DIMENSIONS

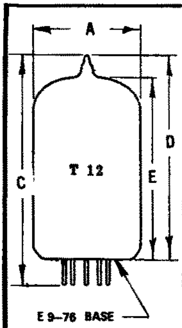


OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A*		C	D		A*		C	D	
	MIN.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
12-52	1.437	1.563	1.875	1.250	1.500	36.5	39.7	47.62	31.8	38.1
12-53	1.437	1.563	2.125	1.500	1.750	36.5	39.7	53.97	38.1	44.4
12-54	1.437	1.563	2.375	1.750	2.000	36.5	39.7	60.32	44.5	50.8
12-55	1.437	1.563	2.625	2.000	2.250	36.5	39.7	66.67	50.8	57.1
12-56	1.437	1.563	2.875	2.250	2.500	36.5	39.7	73.00	57.2	63.5
12-57	1.437	1.563	3.125	2.500	2.750	36.5	39.7	79.3	63.5	69.8
12-58	1.437	1.563	3.375	2.750	3.000	36.5	39.7	85.7	69.9	76.2
12-59	1.437	1.563	3.625	3.000	3.250	36.5	39.7	92.0	76.2	82.5
12-60	1.437	1.563	3.875	3.250	3.500	36.5	39.7	98.4	82.6	88.9
12-61	1.437	1.563	4.125	3.500	3.750	36.5	39.7	104.77	88.9	95.2
12-62	1.437	1.563	4.375	3.750	4.000	36.5	39.7	111.12	95.3	101.6

12–52 TO 12–62

NOTES: * Applies to minimum diameter except in the area of the seal.

NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURE – 0.250"
SMALL – 0.360"
MEDIUM – 0.566"



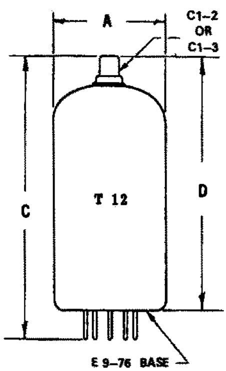
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES						MILLIMETERS					
	A*		C	D	E•		A*		C	D	E•	
	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MAX.	MIN.	MAX.
12-63	1.438	1.562	3.110	2.730	2.210	2.390	36.6	39.6	78.99	69.34	56.2	60.7
12-64	1.438	1.562	3.410	3.030	2.510	2.690	36.6	39.6	86.61	76.96	63.8	68.3
12-65	1.438	1.562	3.710	3.330	2.810	2.990	36.6	39.6	94.23	84.58	71.4	75.9
12-66	1.438	1.562	4.010	3.630	3.110	3.290	36.6	39.6	101.85	92.20	79.0	83.5
12-67	1.438	1.562	4.310	3.930	3.410	3.590	36.6	39.6	109.47	99.82	86.7	99.1
12-68	1.438	1.562	4.610	4.230	3.710	3.890	36.6	39.6	117.09	107.44	94.3	98.8

NOTES:

* The minimum applies in zone starting 0.375" (9.52 mm) from base seat.
• Measured from base seat to bulb-top line as determined by a ring gauge of 0.600" (15.24 mm.) I.D.

12–63 TO 12–68



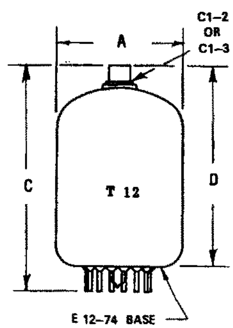
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A*		C	D		A*		C	D	
	MIN.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
12-69	1.438	1.562	3.250	2.610	2.870	36.6	39.6	82.55	63.3	72.8
12-70	1.438	1.562	3.550	2.910	3.170	36.6	39.6	90.17	74.0	80.5
12-71	1.438	1.562	3.850	3.210	3.470	36.6	39.6	97.79	81.6	88.1
12-72	1.438	1.562	4.150	3.510	3.770	36.6	39.6	105.41	89.2	95.7
12-73	1.438	1.562	4.450	3.810	4.070	36.6	39.6	113.03	96.8	103.3
12-74	1.438	1.562	4.750	4.110	4.370	36.6	39.6	120.65	104.4	110.9

NOTES:

* Applies to minimum diameter except in the area of the seal.

12–69 TO 12–74



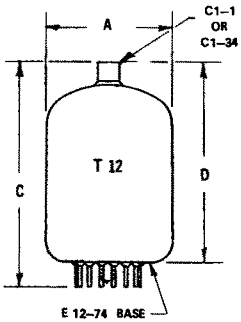
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES					MILLIMETERS				
	A*		C	D		A*		C	D	
	MIN.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.
12-75	1.437	1.563	2.625	2.000	2.250	36.5	39.7	66.67	50.8	57.1
12-76	1.437	1.563	2.875	2.250	2.500	36.5	39.7	73.00	57.2	63.5
12-77	1.437	1.563	3.125	2.500	2.750	36.5	39.7	79.3	63.5	69.8
12-78	1.437	1.563	3.375	2.750	3.000	36.5	39.7	85.7	69.9	76.2
12-79	1.437	1.563	3.625	3.000	3.250	36.5	39.7	92.0	76.2	85.5
12-80	1.437	1.563	3.875	3.250	3.500	36.5	39.7	98.4	82.6	89.9
12-81	1.437	1.563	4.125	3.500	3.750	36.5	39.7	104.77	89.9	95.2
12-82	1.437	1.563	4.375	3.750	4.000	36.5	39.7	111.12	95.3	101.6

NOTES:

* Applies to minimum diameter except in the area of the seal.

12–75 TO 12–82



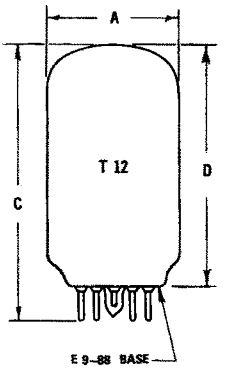
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A* MIN.	INCHES A* MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A* MIN.	MILLIMETERS A* MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
12-83	1.437	1.563	2.625	2.000	2.250	36.5	39.7	66.67	50.8	57.1
12-84	1.437	1.563	2.875	2.250	2.500	36.5	39.7	73.0	57.2	63.5
12-85	1.437	1.563	3.125	2.500	2.750	36.5	39.7	79.30	63.5	69.8
12-86	1.437	1.563	3.375	2.750	3.000	36.5	39.7	85.70	69.9	76.2
12-87	1.437	1.563	3.625	3.000	3.250	36.5	39.7	92.07	76.2	82.5
12-88	1.437	1.563	3.875	3.250	3.500	36.5	39.7	98.42	82.6	88.9
12-89	1.437	1.563	4.125	3.500	3.750	36.5	39.7	104.77	88.9	95.2
12-90	1.437	1.563	4.375	3.750	4.000	36.5	39.7	111.12	95.3	101.6

NOTES:

* Applies to minimum diameter except in the area of the seal.

12–83 TO 12–90



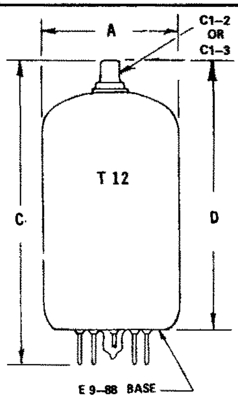
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A* MIN.	INCHES A* MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A* MIN.	MILLIMETERS A* MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
12-91	1.438	1.562	1.880	1.250	1.500	36.6	39.6	47.75	31.8	38.1
12-92	1.438	1.562	2.130	1.500	1.750	36.6	39.6	54.10	38.1	44.4
12-93	1.438	1.562	2.380	1.750	2.000	36.6	39.6	60.45	44.5	50.8
12-94	1.438	1.562	2.630	2.000	2.250	36.6	39.6	66.80	50.8	57.1
12-95	1.438	1.562	2.880	2.250	2.500	36.6	39.6	73.15	57.2	63.5
12-96	1.438	1.562	3.130	2.500	2.750	36.6	39.6	79.50	63.5	69.8
12-97	1.438	1.562	3.380	2.750	3.000	36.6	39.6	85.5	69.9	76.2
12-98	1.438	1.562	3.630	3.000	3.250	36.6	39.6	92.20	76.2	82.5
12-99	1.438	1.562	3.880	3.250	3.500	36.6	39.6	98.55	82.6	88.9
12-100	1.438	1.562	4.130	3.500	3.750	36.6	39.6	104.90	88.9	95.2
12-101	1.438	1.562	4.380	3.750	4.000	36.6	39.6	111.25	95.3	101.6

NOTES:

* Applies to minimum diameter except in the area of the seal.

12–91 TO 12–101



PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A* MIN.	INCHES A* MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A* MIN.	MILLIMETERS A* MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
12-102	1.438	1.562	2.630	2.000	2.250	36.6	39.6	66.80	50.8	57.1
12-103	1.438	1.562	2.880	2.250	2.500	36.6	39.6	73.15	57.2	63.5
12-104	1.438	1.562	3.130	2.500	2.750	36.6	39.6	79.50	63.5	69.8
12-105	1.438	1.562	3.380	2.750	3.000	36.6	39.6	85.50	69.9	76.2
12-106	1.438	1.562	3.630	3.000	3.250	36.6	39.6	92.20	76.2	85.5
12-107	1.438	1.562	3.880	3.250	3.500	36.6	39.6	98.55	82.6	88.9
12-108	1.438	1.562	4.130	3.500	3.750	36.6	39.6	104.90	88.9	95.2
12-109	1.438	1.562	4.380	3.750	4.000	36.6	39.6	111.25	95.3	101.6

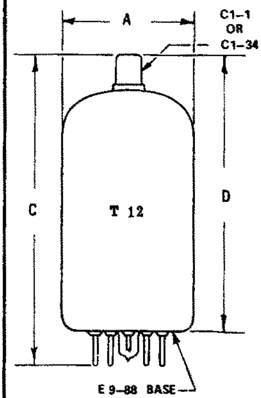
NOTES:

* Applies to minimum diameter except in the area of the seal.

12–102 TO 12–109

NOMINAL CAP DIAMETERS
MININATURE OR SKIRTED MINIATURE – 0.250"

SMALL – 0.360"
MEDIUM – 0.566"



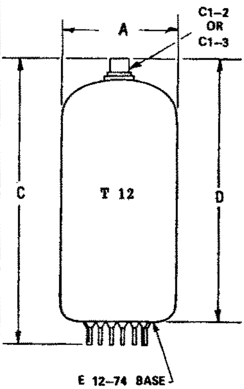
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A* MIN.	INCHES A* MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A* MIN.	MILLIMETERS A* MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
12-110	1.438	1.562	2.630	2.000	2.250	36.6	39.6	66.80	50.8	57.1
12-111	1.438	1.562	2.880	2.250	2.500	36.6	39.6	73.15	57.2	63.5
12-112	1.438	1.562	3.130	2.500	2.750	36.6	39.6	79.50	63.5	69.8
12-113	1.438	1.562	3.380	2.750	3.000	36.6	39.6	85.85	69.9	76.2
12-114	1.438	1.562	3.630	3.000	3.250	36.6	39.6	92.20	76.2	82.5
12-115	1.438	1.562	3.880	3.250	3.500	36.6	39.6	98.55	82.6	88.9
12-116	1.438	1.562	4.130	3.500	3.750	36.6	39.6	104.90	88.9	95.2
12-117	1.438	1.562	4.380	3.750	4.000	36.6	39.6	111.25	95.3	101.6

NOTES:

* Applies to minimum diameter except in the area of the seal.

12–110 TO 12–117



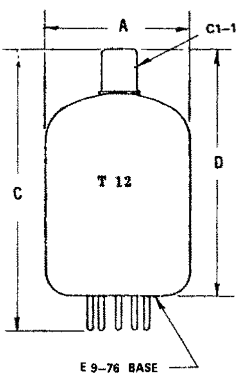
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A* MIN.	INCHES A* MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A* MIN.	MILLIMETERS A* MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
12-118	1.437	1.563	4.625	4.000	4.250	36.5	39.7	117.4	101.6	107.9
12-119	1.437	1.563	4.876	4.250	4.500	36.5	39.7	123.8	108.0	114.3

NOTES:

* Applies to minimum diameter except in the area of the seal.

12–118 TO 12–119



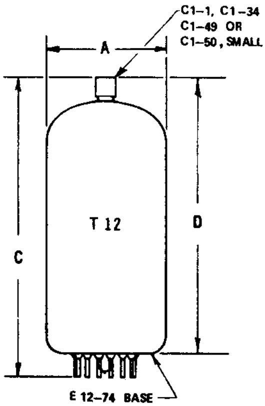
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A* MIN.	INCHES A* MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A* MIN.	MILLIMETERS A* MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
12-121	1.438	1.562	3.250	2.610	2.870	36.6	39.6	82.55	66.3	72.8
12-122	1.438	1.562	3.550	2.910	3.170	36.6	39.6	90.17	74.0	80.5
12-123	1.438	1.562	3.850	3.210	3.470	36.6	39.6	97.79	81.6	88.1
12-124	1.438	1.562	4.150	3.510	3.770	36.6	39.6	105.41	89.2	95.7
12-125	1.438	1.562	4.450	3.810	4.070	36.6	39.6	113.03	96.8	103.3
12-126	1.438	1.562	4.750	4.110	4.370	36.6	39.6	120.65	104.4	110.9

NOTES:

* Applies to minimum diameter except in the area of the seal.

12–121 TO 12–126



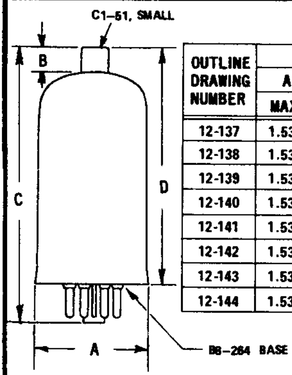
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A• MIN.	INCHES A• MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A• MIN.	MILLIMETERS A• MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
12-127	1.437	1.563	2.625	2.000	2.250	36.5	39.7	66.6	50.8	57.1
12-128	1.437	1.563	2.875	2.250	2.500	36.5	39.7	73.0	57.2	63.5
12-129	1.437	1.563	3.125	2.500	2.750	36.5	39.7	79.3	63.5	69.8
12-130	1.437	1.563	3.375	2.750	3.000	36.5	39.7	85.7	69.9	76.2
12-131	1.437	1.563	3.625	3.000	3.250	36.5	39.7	92.0	76.2	85.2
12-132	1.437	1.563	3.875	3.250	3.500	36.5	39.7	98.4	85.6	88.9
12-133	1.437	1.563	4.125	3.500	3.750	36.5	39.7	104.7	88.9	95.2
12-134	1.437	1.563	4.375	3.750	4.000	36.5	39.7	111.1	95.3	101.6
12-135	1.437	1.563	4.625	4.000	4.250	36.5	39.7	117.4	101.6	107.9
12-136	1.437	1.563	4.875	4.250	4.500	36.5	39.7	123.8	108.0	114.3

NOTES:

• Applies to minimum diameter except in the area of the seal.

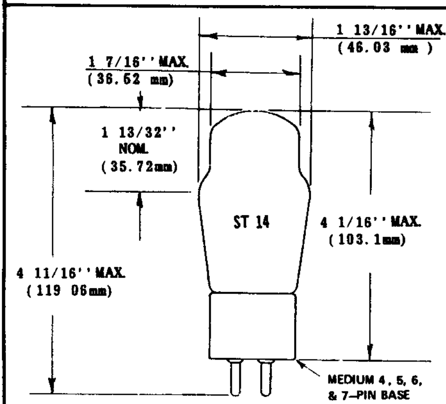
12–127 TO 12–136



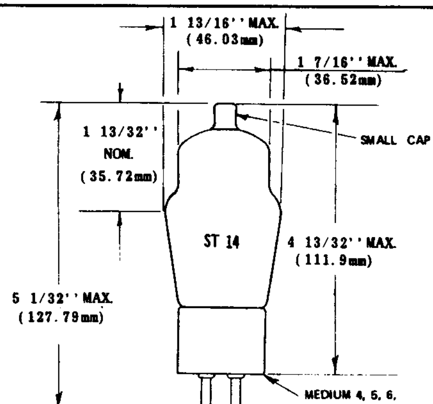
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A MAX.	INCHES B MIN.	INCHES B MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A MAX.	MILLIMETERS B MIN.	MILLIMETERS B MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
12-137	1.530	0.395	0.535	3.062	2.250	2.500	38.9	10.03	13.59	77.8	57.2	63.5
12-138	1.530	0.395	0.535	3.312	2.500	2.750	38.9	10.03	13.59	84.1	63.5	69.8
12-139	1.530	0.395	0.535	3.562	2.750	3.000	38.9	10.03	13.59	90.5	69.9	76.2
12-140	1.530	0.395	0.535	3.812	3.000	3.250	38.9	10.03	13.59	96.8	76.2	82.5
12-141	1.530	0.395	0.535	4.062	3.250	3.500	38.9	10.03	13.59	103.2	82.6	88.9
12-142	1.530	0.395	0.535	4.312	3.500	3.750	38.9	10.03	13.59	109.5	88.9	95.2
12-143	1.530	0.395	0.535	4.562	3.750	4.000	38.9	10.03	13.59	115.9	95.3	101.6
12-144	1.530	0.395	0.535	4.812	4.000	4.250	38.9	10.03	13.59	122.2	101.6	107.9

12 – 137 TO 12 – 144



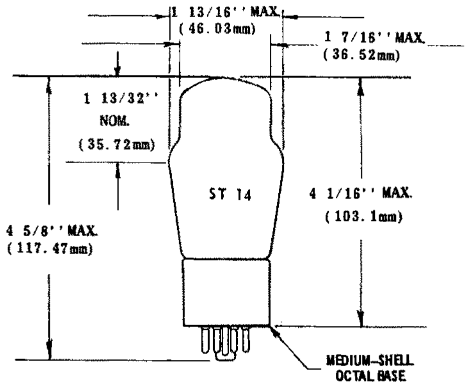
14–1



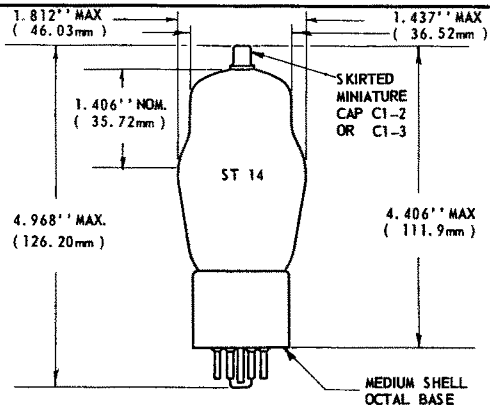
14–2

NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURE – 0.250"

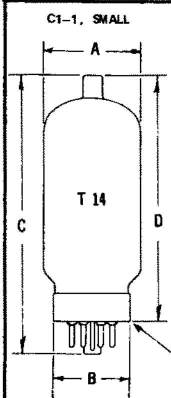
SMALL – 0.360"
MEDIUM – 0.566"



14-3



14-4



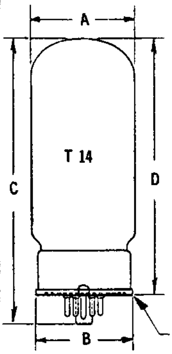
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A MIN.	INCHES A MAX.	INCHES B MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A MIN.	MILLIMETERS A MAX.	MILLIMETERS B MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
14-5	1.687	1.813	1.450	4.812	4.000	4.250	42.9	46.1	36.8	122.2	101.6	107.9
14-6	1.687	1.813	1.450	5.062	4.250	4.500	42.9	46.1	36.8	128.6	108.0	114.3
14-7	1.687	1.813	1.450	5.312	4.500	4.750	42.9	46.1	36.8	135.0	114.3	120.6
14-8	1.687	1.813	1.450	5.562	4.750	5.000	42.9	46.1	36.8	141.3	120.7	127.0
14-9	1.687	1.813	1.450	5.812	5.000	5.250	42.9	46.1	36.8	147.6	127.0	133.3
14-10	1.687	1.813	1.450	6.062	5.250	5.500	42.9	46.1	36.8	154.0	133.4	139.7
14-11	1.687	1.813	1.450	6.312	5.500	5.750	42.9	46.1	36.8	160.3	139.7	146.0

14-5 TO 14-11

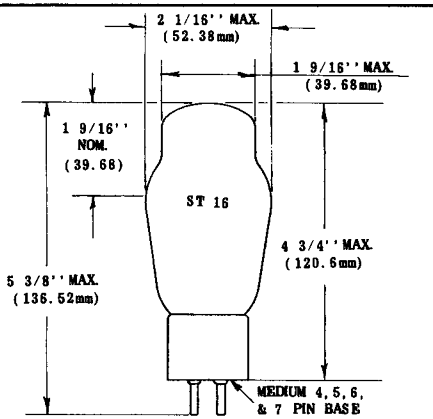
PHYSICAL DIMENSIONS

OUTLINE DRAWING NUMBER	INCHES A MIN.	INCHES A MAX.	INCHES B MAX.	INCHES C MAX.	INCHES D MIN.	INCHES D MAX.	MILLIMETERS A MIN.	MILLIMETERS A MAX.	MILLIMETERS B MAX.	MILLIMETERS C MAX.	MILLIMETERS D MIN.	MILLIMETERS D MAX.
14-12	1.687	1.813	1.718	3.562	2.750	3.000	42.9	46.1	43.6	90.5	69.9	76.2
14-13	1.687	1.813	1.718	3.812	3.000	3.250	42.9	46.1	43.6	98.6	76.2	82.5
14-14	1.687	1.813	1.718	4.062	3.250	3.500	42.9	46.1	43.6	103.2	82.6	88.9
14-15	1.687	1.813	1.718	4.312	3.500	3.750	42.9	46.1	43.6	109.5	88.9	95.2
14-16	1.687	1.813	1.718	4.562	3.750	4.000	42.9	46.1	43.6	115.9	95.3	101.6
14-17	1.687	1.813	1.718	4.812	4.000	4.250	42.9	46.1	43.6	122.2	101.6	107.9
14-18	1.687	1.813	1.718	5.062	4.250	4.500	42.9	46.1	43.6	128.6	108.0	114.3
14-19	1.687	1.813	1.718	5.312	4.500	4.750	42.9	46.1	43.6	134.9	114.3	120.6

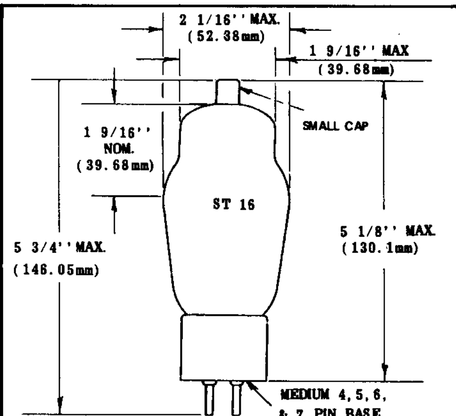


B7–7 BASE OR ANY DERIVED PIN COMBINATIONS

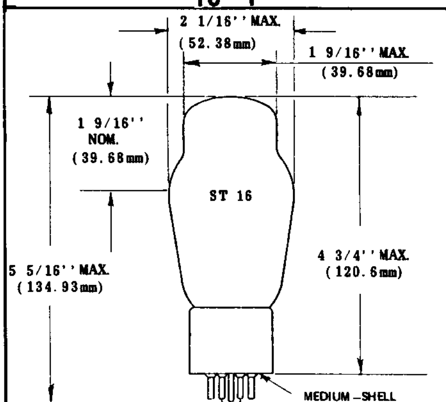
14 – 12 TO 14 – 19



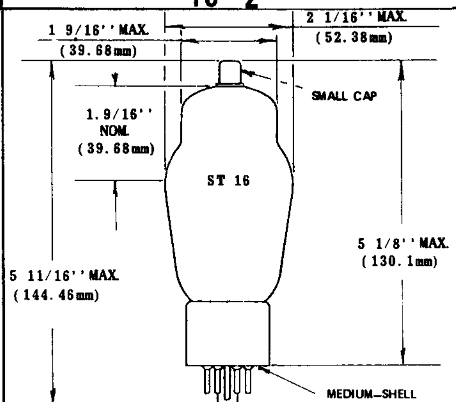
16–1



16–2



16–3



16 – 5

NOMINAL CAP DIAMETERS
MINIATURE OR SKIRTED MINIATURES – 0 250"

SMALL –0.360"
MEDIUM –0.566"

Physical dimensions of tube types not conforming to standard outline drawings appear on the following nine pages.

T-X TABLE

The following footnotes and symbols appear in the T-X Table:

* FL—Flying Leads
SL—Short Leads
† Small Top Cap
‡ Plate terminal extends from top of envelope—dia. 0.031″, length $\frac{5}{32}$″
§ Skirted Miniature Top Cap
¶ Medium Top Cap
# Special Insulated Miniature Top Cap
‖ Plate terminal extends from top of envelope—diameter 0.566″
+ C1-5, Medium Top Cap (with Ceramic Collar) or C1-6, Skirted Medium Top Cap
⁑ Large Top Cap
♦ Solder lugs on filament pins
▲ Flexible Lead with Lug
⊕ Plate Pin(s) on Top

OUTLINE DRAWINGS

T-X TABLE — Physical Characteristics of Types Not Conforming to Standard Outline Drawings

Tube Type	Envelope	Style	Max Dimensions in Inches: Diameter	Over-all Length	Seated Height
OA5	T-5½	7-Pin Miniature	0.750	1.625	1.375
OY4-G	T-7	Octal	1.078	2.625	2.063
OZ4-G	T-7	Octal	1.063	2.625	2.063
1AE5	T-2 x 3	Inline Subm-FL*	0.400 x 0.300	.....	1.500
1BH2	T-6½	9-Pin Miniature ♦†	0.875	2.716	2.250
1BH2A	T-6½	9-Pin Miniature ♦§†	0.875	2.716	2.250
1BV2	T-6½	3-Pin—Solder Lugs ♦§	0.875	2.716	2.250
1G3-GTA	T-9	Glass †	1.377	3.563	3.000
1K3A	T-9	Glass †	1.377	3.563	3.000
1N2A	T-12	Octal †	1.562	3.562	3.000
1N6-G	T-9	Octal	1.188	4.000	3.438
1T2	—	Diode	0.531	1.906	.....
1Y2	ST-12	4-Pin †	1.563	4.594	3.969
1Z2	T-5½	7-Pin Miniature §	0.750	2.700	2.450
2B3	T-9	Octal †	1.281	4.063	3.500
2B22	Special	Glass & Metal	1.313	1.938	.....
2C22	T-9	Octal §	1.313	3.250	2.688
2C39	Special	Metal & Ceramic	1.260	2.750	.....
2C39A	Special	Metal & Ceramic	1.260	2.750	.....
2C39WA	Special	Metal & Ceramic	1.260	2.750	.....
2C39B	Special	Ceramic & Metal	1.266	2.750	.....
2C40	Special	Glass & Metal	1.312	2.563	.....
2C40-A	Special	Glass & Metal	1.312	2.563	.....
2C42	Special	Glass & Metal	1.312	2.688	.....
2C43	Special	Glass & Metal	1.312	2.688	.....
2C46	Special	Glass & Metal	1.312	2.688	.....
2C50	T-9	Octal	1.315	2.750	3.313
2CN3-A	T-9	Octal †	1.281	3.812	3.250
2E24	T-9	Octal †	1.313	3.656	3.094
2E26	T-9	Octal †	1.313	3.656	3.094
2E31	T-2 x 3	Inline Subm-FL *	0.400 x 0.300	.....	1.563
2E32	T-2 x 3	Inline Subm-SL *	0.400 x 0.300	.....	1.563
2E35	T-2 x 3	Inline Subm-FL *	0.390 x 0.290	.....	1.563
2E36	T-2 x 3	Inline Subm-SL *	0.390 x 0.290	.....	1.563
2E41	T-2 x 3	Inline Subm-FL *	0.390 x 0.290	.....	1.563
2E42	T-2 x 3	Inline Subm-SL *	0.390 x 0.290	.....	1.563
2G21	T-2 x 3	Inline Subm-FL *	0.400 x 0.300	.....	1.563
2G22	T-2 x 3	Inline Subm-SL *	0.400 x 0.300	.....	1.563
2J2	T-6½	Noval—9 Pin	0.827	3.000	2.710
2L2	Special	Clear—Wire Leads	0.748	2.284	.....
2V2	T-11	Octal †	1.438	4.500	3.938
3A3-A	T-9	Glass †	1.188	3.812	3.250
3B2	T-12	Octal †	1.719	5.219	4.688
3B28	Special	4-Pin ¶	2.063	6.150	5.530
3C23	ST-16	4-Pin ¶	2.063	6.125	5.500
3CA3A	T-9	Glass—Octal †	1.188	3.812	3.250
3CN3	T-9	Octal †	1.281	3.812	3.250
3CN3-A	T-9	Octal †	1.281	3.812	3.250
3CU3	T-9	Octal †	1.281	3.812	3.250
3CX3	T-9	Octal †	1.281	3.812	3.250
3CZ3	T-9	Glass—Octal †	1.188	4.312	3.750
3CZ3A	T-9	Glass—Octal †	1.188	4.312	3.750
3DA3	T-9	Octal †	1.281	3.812	3.250
3DB3	T-9	Octal †	1.281	3.812	3.250
3DF3A	Special	Glass—Octal †	1.205	3.812	3.250
3DS3	Special	Glass—Octal with Bonded Shield †	1.530	3.937	3.375
3EH7	T-6½	9-Pin Miniature	0.875	2.406	2.156
3EJ7	T-6½	9-Pin Miniature	0.875	2.406	2.156
3FW7	Special	Metal Subm.	0.512	1.969	.....
3FX7	T-3	Special Subm.	0.512	1.969	.....
4EH7	T-6½	9-Pin Miniature	0.875	2.406	2.156

T-X TABLE — Physical Characteristics of Types

Tube Type	Envelope	Style	Max Dimensions in Inches		
			Diameter	Over-all Length	Seated Height
4EJ7	T-6½	9-Pin Miniature	0.875	2.406	2.156
4GJ7	T-6½	9-Pin Miniature	0.875	2.000	1.750
5AR4	Special	Octal	1.500	3.438	2.875
5AT4	ST-16	Octal	2.000	4.750	4.175
5AU4	T-12	Octal	1.688	4.750	4.188
5AW4	T-12	Octal	1.563	5.188	4.625
5GJ7	T-6½	9-Pin Miniature	0.875	2.000	1.750
5R4-GYA	T-12	Octal	1.563	4.938	4.375
5U4-GA	T-11	Octal	1.438	4.750	4.188
6AB9	T-6½	10-Pin Miniature	0.875	2.190	1.660
6AL3	T-6½	9-Pin Miniature §	0.875	3.500	3.250
6AL6-G	ST-16	Octal §	2.063	5.688	5.125
6AR6	T-11	Octal	1.438	3.469	2.906
6AV5-GA	T-11 or T-12	Octal	1.438 1.563	4.000 4.000	3.438 3.438
6AY3-B	T-9	Novar (E9-89) Base	1.188	3.005	2.625
6BA3	T-9	Novar	1.188	3.080	2.700
6BA4	Special	Rocket Type	1.005	2.438	.....
6BD4	T-12	Octal †	1.719	5.125	4.625
6BD4-A	T-12	Octal †	1.719	5.125	4.625
6BD5-GT	T-9	Octal	1.281	3.875	3.313
6BH3-A	T-9	Novar (E9-89) Base	1.188	3.005	2.625
6BQ6-GA	T-11 or T-12	Octal §	1.438 1.563	4.250 4.250	3.688 3.688
6BR3	T-6½	9-Pin Miniature §	0.875	3.500	3.250
6BS3-A	T-9	Novar (E9-89) Base	1.188	3.005	2.625
6BU4	T-12	Octal †	1.719	5.063	4.531
6BU5	T-12	Octal †	1.688	4.875	4.313
6BY4	Special	Ceramic & Metal	0.330	0.438	.....
6CA7	T-10	Octal	1.500	4.438	3.875
6CB5	ST-16	Octal †	2.063	5.125	4.594
6CK3	T-9	Novar (E9-89) Base	1.188	3.005	2.625
6CL3	T-9	Novar (E9-89) Base	1.188	3.005	2.625
6CM3	T-9	Novar (E9-89) Base	1.188	3.005	2.625
6CT3	T-6½	9-Pin Miniature	0.875	3.125	2.875
6CU6	T-11 or T-12	Octal §	1.438 1.563	4.250 4.250	3.688 3.688
6DB5	T-6½	9-Pin Miniature	0.875	2.750	2.500
6DL4	T-6½	9-Pin Miniature	0.875	1.968	1.718
6DQ6	T-12	Octal §	1.563	4.250	3.750
6DW4-A	T-9	Novar	1.188	3.410	3.030
6DW4-B	T-9	Novar (E9-89) Base	1.188	3.005	2.625
6DZ8	T-6½	9-Pin Miniature	0.875	3.125	2.875
6EH7	T-6½	9-Pin Miniature	0.875	2.406	2.156
6EJ7	T-6½	9-Pin Miniature	0.875	2.406	2.156
6FG6	T-6½	9-Pin Miniature	0.875	2.844	2.594
6FW7	Special	Metal Subm.	0.512	1.969	.....
6FX7	T-3	Special Subm.	0.512	1.969	.....
6GB5	T-9	Magnoval (E9-23) Base	1.188	4.109	3.766
6GF7	T-9	Novar	1.188	3.000	2.620
6GJ5	T-12	Novar (E9-76) Base §	1.563	3.550	3.040
6GJ5-A	T-12	Novar (E9-88) Base §	1.563	3.505	3.125
6GJ7	T-6½	9-Pin Miniature	0.875	2.000	1.750
6GK7	T-6½	9-Pin Miniature	0.875	2.406	2.156
6GV7	T-6½	9-Pin Miniature	0.875	2.206	1.930
6HU6	T-6½	9-Pin Miniature	0.875	2.844	2.594
6HV5	T-12	Glass	1.563	4.250	3.875
6HV5A	T-12	Glass	1.563	4.250	3.875
6JB6-A	T-12	Novar (E9-88) Base §	1.563	3.505	3.125
6JD5	T-12	Glass	1.563	4.250	3.875
6JE6	T-12	Novar †	1.563	4.600	4.220
6JF6	T-12	Novar (E9-88) Base §	1.563	3.550	3.170

DRAWINGS

Not Conforming to Standard Outline Drawings

Tube Type	Envelope	Style	Max Dimensions in Inches		
			Diameter	Over-all Length	Seated Height
6JH5	T-12	Glass	1.563	4.250	3.875
6JK5	T-12	Glass	1.563	4.250	3.875
6JT6	T-12	Novar	1.563	3.180	2.800
6JU6	T-12	Novar (E9-76 or E9-88) Base §	1.563	3.550	3.170
6KG6	T-12	Magnoval †	1.563	4.906	4.312
6KM6	T-12	Novar (E9-88) Base §	1.563	3.550	3.170
6LF6	T-12	Compactron	1.563	4.950	4.570
6LV6	T-12	Glass §	1.563	4.950	4.570
6M3	T-12	Octal §	1.563	4.875	4.313
6MB6	T-12	Glass †	1.563	4.750	4.375
6MC6	T-12	Novar †	1.562	4.625	4.250
6MD8	T-9	Novar (E9-75 or E9-89) Base	1.188	2.960	2.580
6V3-A	T-6½	9-Pin Miniature §	0.875	3.063	2.750
7GV7	T-6½	9-Pin Miniature	0.875	2.206	1.930
8GJ7	T-6½	9-Pin Miniature	0.875	2.000	1.750
9DZ8	T-6½	9-Pin Miniature	0.875	3.125	2.875
10	ST-16	4-Pin	2.063	5.375	4.750
12AV5-GA	T-11 or T-12	Octal	1.438 1.563	4.000 4.000	3.438 3.438
12AY3-A	T-9	Novar (E9-89) Base	1.188	3.005	2.625
12BQ6-GA	T-11 or T-12	Octal §	1.438 1.563	4.250 4.250	3.688 3.688
12BR3	T-6½	9-Pin Miniature §	0.875	3.500	3.250
12BS3-A	T-9	Novar (E9-89) Base	1.188	3.005	2.625
12CK3	T-9	Novar (E9-89) Base	1.188	3.005	2.625
12CL3	T-9	Novar (E9-89) Base	1.188	3.005	2.625
12CT3	T-6½	9-Pin Miniature	0.875	3.125	2.875
12CU6	T-11 or T-12	Octal §	1.438 1.563	4.250 4.250	3.688 3.688
12DB5	T-6½	9-Pin Miniature	0.875	2.750	2.500
12DQ6	T-12	Octal §	1.563	4.250	3.750
12DZ8	T-6½	9-Pin Miniature	0.875	3.125	2.875
12GJ5	T-12	Novar (E9-76) Base §	1.563	3.550	3.040
12JB6-A	T-12	Novar (E9-88) Base §	1.563	3.505	3.125
12JT6	T-12	Novar	1.563	3.180	2.800
12MD8	T-9	Novar (E9-75 or E9-89) Base	1.188	2.960	2.580
15AB9	T-6½	10-Pin Miniature	0.875	2.190	1.660
16AQ3	T-6½	9-Pin Miniature †	0.875	3.500	3.250
17AB9	T-6½	10-Pin Miniature	0.875	2.190	1.660
17AV5-GA	T-11 or T-12	Octal	1.438 1.563	4.000 4.000	3.438 3.438
17AY3-A	T-9	Novar (E9-89) Base	1.188	3.005	2.625
17BF11-A	T-9	Compactron	1.188	2.250	1.875
17BH3-A	T-9	Novar (E9-89) Base	1.188	3.005	2.625
17BR3	T-6½	9-Pin Miniature §	0.875	3.500	3.250
17BS3-A	T-9	Novar (E9-89) Base	1.188	3.005	2.625
17CK3	T-9	Novar (E9-89) Base	1.188	3.005	2.625
17CL3	T-9	Novar (E9-89) Base	1.188	3.005	2.625
17CT3	T-6½	9-Pin Miniature	0.875	3.125	2.875
17DQ6	T-12	Octal §	1.563	4.250	3.750
17GJ5	T-12	Novar (E9-76) Base §	1.563	3.550	3.040
17GJ5-A	T-12	Novar (E9-88) Base §	1.563	3.505	3.125
17JB6-A	T-12	Novar (E9-88) Base §	1.563	3.505	3.125
17JT6	T-12	Novar	1.563	3.180	2.800
17LD8	T-9	9T9	1.188	3.110	2.730
18DZ8	T-6½	9-Pin Miniature	0.875	3.125	2.875
18GB5	T-9	Magnoval (E9-23) Base	1.188	4.109	3.766
21KQ6	T-9	Magnoval (E9-23) Base §	1.188	4.133	3.760
22BH3-A	T-9	Novar (E9-89) Base	1.188	3.005	2.625
22JF6	T-12	Novar (E9-88) Base §	1.563	3.550	3.170
22JU6	T-12	Novar (E9-76 or E9-88) Base §	1.563	3.550	3.170
22KM6	T-12	Novar (E9-88) Base §	1.563	3.550	3.170
23MB6	T-12	Glass †	1.563	4.750	4.375

T-X TABLE — Physical Characteristics of Types

Tube Type	Envelope	Style	Max Dimensions in Inches: Diameter	Over-all Length	Seated Height
25AV5-GA	T-11 or T-12	Octal	1.438 1.563	4.000 4.000	3.438 3.438
25BQ6-GA	T-11 or T-12	Octal §	1.438 1.563	4.250 4.250	3.688 3.688
25BR3	T-6½	9-Pin Miniature §	0.875	3.500	3.250
25CM3	T-9	Novar (E9-89) base	1.188	3.005	2.625
25CT3	T-6½	9-Pin Miniature	0.875	3.125	2.875
25CU6	T-11 or T-12	Octal §	1.438 1.563	4.250 4.250	3.688 3.688
25DQ6	T-12	Octal §	1.563	4.250	3.750
25E5	T-9	Octal §	1.281	4.313	3.750
25EC6	T-12	Octal †	1.563	4.750	4.188
25HX5	T-9	Magnoval	1.188	3.511	3.169
26E6-G	T-11	Octal	1.438	3.125	2.563
FG-27-A	Special	4-Pin ¶	3.000	7.250	.....
27GB5	T-9	Magnoval (E9-23) Base	1.188	4.109	3.766
27KG6	T-12	Magnoval †	1.563	4.906	4.312
28GB5	T-9	Magnoval (E9-23) Base	1.188	4.109	3.766
29KQ6	T-9	Magnoval (E9-23) Base §	1.188	4.133	3.760
29LE6	T-9	Magnoval	1.188	4.133	3.760
30MB6	T-12	Glass †	1.563	4.750	4.375
A33	Special	2-Lead	0.375	.....	0.225
34CM3	T-9	Novar (E9-89) base	1.188	3.005	2.625
A35	Special	2-Lead	0.375	.....	0.225
35DZ8	T-6½	9-Pin Miniature	0.875	3.125	2.875
36MC6	T-12	Novar †	1.562	4.625	4.250
40KG6	T-12	Magnoval †	1.563	4.906	4.312
B46	Special	2-Lead	0.650	.....	0.350
50	ST-19	4-Pin	2.438	6.250	5.625
50E5	T-9	Octal §	1.281	4.313	3.750
50JY6	T-9	Octal §	1.281	4.331	3.740
FG57	Special	4-Pin ¶	3.000	7.250	.....
81	ST-19	4-Pin	2.438	6.250	5.625
FG-81-A	Special	4-Pin ¶	2.438	6.625	.....
FG-97	Special	4-Pin ¶	2.438	6.750	.....
FG-98-A	Special	4-Pin ¶	2.438	6.750	.....
V-99	T-8	Special	1.063	3.500	.....
FG-105	Special	Jumbo 4-Pin ‡	3.000	11.250	.....
FG-154	Special	4-Pin ¶	3.000	7.938	.....
FG-172	Special	Metal	2.250	10.843	.....
393-A	ST-16	Octal †	2.063	6.625	.....
GL414	Special	Thyratron	3.125	15.187	.....
B425	Special	2-Lead	0.650	.....	0.350
575-A	Special	4-Pin +	3.125	11.125	.....
627	Special	4-Pin ¶	2.438	7.000	6.594
672-A	Special	4-Pin ¶	2.313	8.125	7.375
673	Special	4-Pin ¶	3.125	11.438	11.625
678	Special	4-Pin ¶	2.563	11.063	.....
816	ST-12	4-Pin †	1.563	4.688	4.063
866-A	ST-19	4-Pin ¶	2.438	6.563	5.938
872-A	Special	4-Pin ¶	2.313	8.500	.....
B1035	Special	2-Lead	1.260	.....	0.365
1629	T-9	Octal	1.188	4.125	3.438
1654	T-5½	7-Pin Miniature ‡	0.750	2.438	2.188
5544	Special	4-Pin ¶	2.625	7.500	6.813
GL5550	Special	Metal ▲	2.140	9.062	.....
GL5551A/ 5551A-PC	Special	Metal ▲	2.750	13.000	.....
GL5552A/ 5552A-PC	Special	Metal ▲	4.250	14.000	.....
GL5553B/ GL5553B-PC	Special	Metal ▲	5.625	19.500	.....
GL5554	Special	Metal ▲	4.125	17.000	.....

DRAWINGS

Not Conforming to Standard Outline Drawings

Tube Type	Envelope	Style	Max Dimensions in Inches		
			Diameter	Over-all Length	Seated Height
GL5555	Special	Metal ▲	5.750	17.937	.....
5557	ST-16	4-Pin ¶	2.063	6.125	5.500
5558	Special	4-Pin ¶	3.000	7.000	.....
5559	Special	4-Pin ¶	3.000	7.250	.....
5560	Special	4-Pin ¶	3.000	7.938	.....
5561	Special	4-Pin ‡	3.813	11.250	.....
5563-A	T-20	4-Pin ¶	2.625	10.531	.....
GL5564	Special	Metal ▲	9.125	25.937	.....
GL5630	Special	Metal ▲	5.750	22.187	.....
5632/C3J	Special	4-Pin ¶	1.578	6.250	.....
5633	T-3	Special Subm-FL*	0.400	.....	1.660
5634	T-3	Special Subm-FL*	0.400	.....	1.660
5642	T-3	Special Subm-FL*	0.400	.....	2.655
5645	T-2	Special Subm-FL*	0.310	.....	1.300
5646	T-2	Special Subm-FL*	0.310	.....	1.300
5647	T-1	Special Subm-FL*	0.215	.....	1.250
5663	T-5½	7-Pin Miniature	0.750	1.500	1.250
5665/C16J	Special	Flexible Leads	2.688	11.250	.....
5675	Special	Pencil Type	0.817	2.280	2.043
5676	T-2 x 3	Inline Subm-FL*	0.400 x 0.300	.....	1.500
5677	T-2 x 3	Inline Subm-FL*	0.400 x 0.300	.....	1.500
5678	T-2 x 3	Inline Subm-FL*	0.400 x 0.300	.....	1.515
5704	T-2	Inline Subm-FL*	0.315	.....	1.500
5720	Special	4-Pin ¶	3.000	7.500	.....
5728	Special	4-Pin ¶	3.000	7.000	.....
5767	Special	Rocket Type	1.005	2.375	.....
5785	T-2 x 3	Inline Subm-FL*	0.400 x 0.300	.....	1.500
GL5822A	Special	Metal ▲	4.250	14.000	.....
5825	ST-16	4-Pin ¶	2.063	5.844	5.219
GL5830	Special	4-Pin, Anode Cap C1-8	5.062	17.687	16.468
5838	T-9	Octal	1.313	3.375	2.875
5839	T-9	Octal	1.313	3.375	2.875
5851	T-3	Button Subm-FL*	0.400	.....	1.600
5852	T-9	Octal	1.313	3.375	2.875
5855	Special	Lug Base	3.625	11.328	.....
5876	Special	Pencil Type	0.817	2.252	2.012
5876-A	Special	Pencil Type	0.817	2.252	2.012
5881	T-11	Octal	1.438	3.938	2.906
5890	T-11	Duodecal †	1.500	6.750	6.250
5894B	Special	7-Pin ⊕	1.937	3.650	4.687
5930	T-12	4-Pin	1.700	4.500	3.875
5931	T-12	Octal	1.700	4.906	4.344
5932	T-12	Octal	1.700	3.844	3.281
5995	T-3	Inline Subm-FL*	0.400	.....	1.750
6000	T-11	Octal	1.438	3.468	2.906
6004	T-9	Octal #	1.313	4.063	.....
6011/710	Special	4-Pin ¶	1.625	6.250	.....
6014/C1K	Special	4-Pin	1.5653	4.250	.....
6051	T-2 x 3	Inline Subm-FL*	0.385 x 0.285	1.500	.....
6094	T-6½	9-Pin Miniature	0.875	3.000	2.750
6098	T-11	Octal	1.438	3.469	2.906
6106	T-9	Octal	1.320	3.375	2.880
6146	T-12	Octal †	1.719	3.813	3.250
6146-A	T-12	Octal †	1.719	3.813	3.250
6146-B	T-12	Octal †	1.656	3.813	3.250
6159-A	T-12	Octal †	1.179	3.813	3.250
6159-B	T-12	Octal †	1.656	3.813	3.250
6173	Special	Pencil Type	.....	1.987	.....
6184	T-3	Button Subm-FL*	0.400	.....	1.250
6195	T-3	Button Subm-FL*	0.400	.....	1.600
6215	T-9	Octal †	1.281	4.063	3.500
GL6228	Special	Metal ▲	9.000	42.000	.....

T-X TABLE — Physical Characteristics of Types

Tube Type	Envelope	Style	Max Dimensions in Inches		
			Diameter	Over-all Length	Seated Height
GL6251	Special	Metal & Ceramic	5.156	13.250	.....
GL6283	Special	Metal & Ceramic	2.313	4.343	.....
6287	T-6½	9-Pin Miniature	0.875	2.470	.....
6299	Special	Ceramic & Metal	0.497	1.040	.....
6320	T-3	Button Subm-FL*	0.400	.....	1.125
6321	T-3	Button Subm-FL*	0.400	.....	1.125
6325	T-9	Octal	1.281	.....	2.375
6327	T-12	Octal †	1.750	4.500	3.938
6336	ST-16	Octal	2.070	4.750	4.175
6336-A	ST-16	Octal	2.070	4.750	4.175
6355	T-5½	7-Pin Miniature	0.750	1.531	1.250
6384	T-11	Octal	1.438	3.469	2.938
6394	T-12	8-Pin Octal	2.070	4.750	4.175
6394-A	T-12	8-Pin Octal	2.070	4.750	4.175
6397	T-3	Button Subm-FL*	0.400	.....	1.600
6418	T-1½ x 2	Inline Subm-FL*	0.290 x 0.235	.....	1.250
6419	T-1½ x 2	Inline Subm-FL*	0.290 x 0.235	.....	1.000
6442	Special	Ceramic & Metal	0.818	2.610	.....
GL6512	Special	Metal ▲	4.125	17.000	.....
GL6513	Special	Metal ▲	17.937	5.750	.....
GL6515	Special	Metal ▲	9.125	26.687	.....
6519	T-1½ x 2	Inline Subm-FL*	0.290 x 0.220	.....	1.250
6528	ST-16	Octal	2.070	4.750	4.175
6550	ST-16	Octal	2.063	4.750	4.188
6690	T-3	Button Subm-FL*	0.400	.....	1.000
6754	T-6½	9-Pin Miniature	0.875	2.750	2.500
6763	T-5½	7-Pin Miniature	0.875	2.375	2.094
6771	Special	Ceramic & Metal	0.818	2.610	.....
6792	T-12	Octal †	1.719	5.063	4.531
6807	Special	4-Pin ‖	2.625	9.000	.....
6808	Special	Flexible Leads ‖	2.625	8.313	.....
6809	Special	Lug Base ‖	2.625	9.000	.....
6842	T-5½	7-Pin Miniature §	0.875	2.250	2.000
6848	Special	Metal & Ceramic	4.000	9.625	.....
6856/740	Special	4-Pin ¶	2.063	9.500	.....
6858/760	Special	4-Pin ¶	2.563	9.500	.....
6859/760P	Special	Flexible Leads ¶	2.563	8.750	.....
6883	T-12	Octal †	1.719	3.813	3.250
6883-B	T-12	Octal †	1.656	3.813	3.250
6889	T-11	Octal †	1.438	3.906	3.375
6897	Special	Ceramic & Metal	1.266	2.750	.....
6942	Special	Metal & Ceramic	3.260	8.500	.....
6999	T-2 x 3	Inline Subm-FL*	0.385 x 0.285	1.750	.....
7027	T-12	Octal	1.630	4.620	4.060
7027-A	T-12	Octal	1.630	4.620	4.060
7038	T-8	8-Pin	1.135	6.500	.....
7038V	T-8	8-Pin	1.135	6.500	.....
7105	T-12	Octal	1.719	4.063	3.563
GL7151	Special	Metal	9.125	23.250	.....
GL7171	Special	Metal	2.156	8.750	.....
7211	Special	Ceramic & Metal	1.264	2.701	.....
7212	T-12	Octal †	1.656	3.813	3.250
7216/C3JL	Special	Lug Type Rectifier, Anode Cap C1-5	2.187	6.750	.....
7234	T-6½	9-Pin Miniature §	0.875	2.750	2.375
7235	T-6½	9-Pin Miniature §	0.875	2.750	2.375
7262A	T-8	8-Pin	1.135	5.250	.....
7263A	T-8	8-Pin	1.135	5.250	.....
7266	Special	Ceramic & Metal	0.335	0.327	.....
7289	Special	Ceramic & Metal	1.264	2.701	.....
7296	Special	Ceramic & Metal	0.510	0.890	.....
7310	T-12	4-Pin †	1.570	5.250	.....

DRAWINGS

Not Conforming to Standard Outline Drawings

Tube Type	Envelope	Style	Max Dimensions in Inches		
			Diameter	Over-all Length	Seated Height
7311	Special	Metal Miniature	0.875	2.188	2.094
7312	Special	Metal Miniature	0.875	2.188	2.094
7313	Special	Metal Miniature	0.875	2.938	2.688
7314	Special	Metal Miniature	0.875	2.188	2.094
7357	T-12	Octal †	1.656	3.813	3.250
7358	T-12	Octal †	1.656	3.813	3.250
7391	Special	Ceramic & Metal	0.497	1.040	.....
7399	Special	Metal & Ceramic	2.291	4.281	.....
7403	T-12	Octal §	1.719	4.281	3.750
7430	Special	Glass	0.875 x 1.188 x 0.5001, exclusive of leads		
7462	Special	Ceramic & Metal	0.330	0.490	.....
7518/710L	Special	Lug Base ¶	1.625	6.625	.....
7588	Special	Ceramic & Metal	0.565	0.890	.....
7623	Special	Glass ¶	2.047	5.157	4.567
7624	Special	Glass ¶	2.047	5.157	4.567
7625	Special	Ceramic & Metal	0.330	0.490	.....
7644	Special	Ceramic & Metal	0.497	1.040	.....
GL7669/ GL7669-PC	Special	Metal ▲	3.250	9.875	.....
GL7671/ GL7671-PC	Special	Metal ▲	4.625	11.875	.....
GL7673/ GL7673-PC	Special	Metal ▲	7.125	.....	.....
GL7681/ GL7681-PC	Special	Metal ▲	4.125	17.500	.....
7695	T-9	9-Pin	1.188	3.170	2.920
GL7703	Special	Metal-Threaded Anode Terminal	2.250	7.625	.....
7720	Special	Ceramic & Metal	0.330	0.490	.....
7725	Special	4-Pin ¶	1.625	6.250	.....
7726	Special	Lug Base ¶	1.625	6.625	.....
7735A	T-8	8-Pin	1.135	6.500	.....
7735B	T-8	8-Pin	1.135	6.500	.....
7735BX	T-8	8-Pin	1.135	6.500	.....
7751	Special	Octal	1.300	4.140	3.380
7754	T-9	9-Pin	1.188	3.170	2.920
7757	T-6½	9-Pin Miniature §	0.875	3.000	2.750
7768	Special	Ceramic & Metal	0.758	0.959	.....
7784	Special	Ceramic & Metal	0.497	1.040	.....
7815	Special	Ceramic & Metal	1.195	2.701	.....
7815R	Special	Ceramic & Metal	1.264	2.701	.....
7841	Special	Ceramic & Metal	0.335	0.327	.....
7851	T-5½	7-Pin Miniature §	0.750	1.880	1.600
7855	Special	Ceramic & Metal	1.264	2.386	.....
7894	Special	Special Subm-FL*	0.500	2.500	.....
7910	Special	Ceramic & Metal	0.484	0.677	.....
7911	Special	Ceramic & Metal	0.758	0.959	.....
Z7911	T-8	8-Pin	1.135	6.500	.....
Z7912	T-8	8-Pin	1.135	5.250	.....
7913	Special	Ceramic & Metal	0.758	0.959	.....
Z7919	T-8	8-Pin	1.135	6.500	.....
Z7927B	T-8	7-Pin	0.767	3.650	.....
Z7927HRB	T-8	7-Pin	0.767	3.650	.....
Z7929R,B,G	T-8	8-Pin	1.135	6.350	.....
Z7975HRB	T-8	8-Pin	1.135	6.500	.....
Z7975B	T-8	8-Pin	1.135	6.500	.....
7979	T-2	Special Subm-FL*	0.315	.....	1.250
7985	Special	Metal & Ceramic	2.766	8.562	.....
Z7996B	T-8	Special	1.135	5.250	.....
Z7996HRB	T-8	Special	1.135	5.250	.....
GL7998/ GL7998-PC	Special	Metal ▲	5.312	26.500	.....
8008	Special	4-Pin ¶	2.313	8.750	8.000
8032	T-12	Octal †	1.719	3.813	3.250

T-X TABLE — Physical Characteristics of Types

Tube Type	Envelope	Style	Max Dimensions in Inches: Diameter	Over-all Length	Seated Height
8032-A	T-12	Octal †	1.656	3.813	3.250
8042	T-12	Octal †	1.750	3.844	3.281
8100	Special	Glass, 2-Lead	0.500	0.550	.....
8108	Special	Glass & Metal	1.291	2.362	.....
8116	Special	Dual Tetrode ⊕	1.740	4.094	3.000
8116A	Special	Twin Tetrode ⊕	1.740	4.031	2.938
8117	Special	Dual Tetrode ⊕	1.756	4.031	2.938
8117A	Special	Twin Tetrode ⊕	1.756	4.031	2.938
8118	Special	Double Tetrode ⊕	1.811	3.375	2.894
8134	T-8	8-Pin	1.135	6.350	.....
8134V	T-8	8-Pin	1.135	6.350	.....
8142	Special	Glass, 2-Lead	0.500	0.550	.....
8143	Special	Glass, 2-Lead	0.500	0.550	.....
8156	T-9	Compactron	1.188	2.313	1.938
GL8205	Special	Metal ▲	9.125	23.000	.....
8210	T-3	Special Subm-FL*	0.400	.....	1.795
8217	Special	Glass, 2-Lead	0.875	1.500	.....
8223	T-6½	9-Pin Miniature	0.875	2.430	2.154
8228	T-2	2-Lead Subminiature	0.240	1.200	.....
8233	T-9	Magnoval (E9-23) Base	1.094	3.000	2.625
8236	T-12	Octal †	1.719	4.750	4.200
8254	T-3	8-Pin Subminiature (E8-10 base)	0.400	.....	1.730
8255	T-6½	9-Pin Miniature	0.875	1.970	1.730
8278	T-9	Novar	1.188	3.380	3.000
8298	T-12	Octal †	1.719	3.813	3.250
8298-A	T-12	Octal †	1.656	3.813	2.350
8318	Special	Glass, 2-Lead	0.250	.....	0.550
8318-A	Special	Glass, 2-Lead	0.260	.....	0.545
8345	Special	Glass, 2-Lead	0.500	0.550	.....
8346	Special	Glass, 2-Lead	0.500	0.550	.....
8347	Special	Glass, 2-Lead	0.500	0.550	.....
8403	Special	Ceramic & Metal	1.264	2.386	.....
8408	T-6½	9-Pin Miniature	0.875	2.875	2.594
8412	Special	Ceramic & Metal	0.921	2.413	.....
8413	Special	Ceramic & Metal	0.553	1.905	.....
8417	T-12	Octal	1.563	4.500	3.875
8458	T-9	Novar	1.188	3.250	2.813
8474	Special	Glass, 2-Lead	0.250	.....	0.550
8475	Special	Glass, 2-Lead	0.250	.....	0.550
8475-A	Special	Glass, 2-Lead	0.260	.....	0.545
8476	Special	Glass, 2-Lead	0.250	.....	0.550
8477	Special	Glass, 2-Lead	0.250	.....	0.550
8477-A	Special	Glass, 2-Lead	0.260	.....	0.545
8484H	T-8	8-Pin	1.135	6.500	.....
8500	Special	Metal & Ceramic	2.323	3.453	.....
8506	Special	Ceramic & Metal	0.756	0.882	.....
8507A	T-8	8-Pin	1.135	6.500	.....
8513	Special	Metal & Ceramic	6.031	9.625	.....
8524	Special	Metal Shell	0.434	1.082	0.867
8525	Special	Metal Shell	0.434	1.082	0.867
8526	Special	Metal Shell	0.434	1.082	0.867
8527	Special	Metal Shell	0.434	1.082	0.867
8528	Special	Metal Shell	0.434	1.436	1.221
8529	Special	Metal Shell	0.434	1.082	0.867
8530	Special	Metal Shell	0.434	1.082	0.867
8533	Special	Metal & Ceramic	1.195	2.701	.....
8534	Special	Metal & Ceramic	0.950	1.305	.....
8535	Special	Metal & Ceramic	1.265	2.040	.....
8536	Special	Metal & Ceramic	0.950	1.305	.....
8537	Special	Metal & Ceramic	1.265	1.565	.....
8538	Special	Metal & Ceramic	0.950	1.159	.....

DRAWINGS

Not Conforming to Standard Outline Drawings

Tube Type	Envelope	Style	Max Dimensions in Inches		
			Diameter	Over-all Length	Seated Height
8539	Special	Metal & Ceramic	1.265	1.794	.....
8541A	T-8	8-Pin	1.135	6.500	.....
8541X	T-8	8-Pin	1.135	6.500	.....
8552	T-12	Octal †	1.656	3.813	3.250
8572	T-8	8-Pin	1.135	6.500	.....
8572V	T-8	8-Pin	1.135	6.500	.....
8573A	T-8	8-Pin	1.135	5.250	.....
8573X	T-8	8-Pin	1.135	5.250	.....
8582	Special	Glass, 2-Lead	0.250	.....	0.550
8582-A	Special	Glass, 2-Lead	0.260	.....	0.545
8595	T-6½	9-Pin Miniature··	0.875	2.625	2.375
8604	T-8	8-Pin	1.135	6.500	.....
8632	T-9	8-Pin Octal †	1.187	4.000	3.500
8639	Special	8-Pin Octal ⊕	1.811	5.090	4.560
8643	Special	7-Pin Septar ⊕	1.785	4.031	3.531
8727	Special	Pencil Type	0.557	1.485	.....
8745	Special	Ceramic & Metal	1.264	2.701	.....
8751	Special	Metal & Ceramic	0.758	1.054	.....
8755	Special	Metal & Ceramic	0.830	1.470	.....
8755A	Special	Metal & Ceramic	0.785	1.370	.....
8760	Special	Glass, 2-Lead	0.500	.....	0.550
8797	T-5½	Miniature §	0.750	2.750	2.500
8808	Special	Nuvistor	0.435	0.985	0.780
8847	Special	Metal & Ceramic	0.785	1.370	.....
8847A	Special	Metal & Ceramic	0.785	1.370	.....
8859	Special	Ceramic & Metal	0.520	1.920	.....
8866	Special	Metal & Ceramic	1.760	3.125	.....
8892	Special	Metal & Ceramic	0.758	1.099	.....
8893	Special	Metal & Ceramic	0.758	0.974	.....
8906	Special	Metal & Ceramic	1.195	1.701	.....
8907	Special	Metal & Ceramic	1.264	1.701	.....
8917	Special	Metal & Ceramic	1.988	3.489	.....
GE12661	Special	Metal & Ceramic	0.483	0.686·	.....
GE13971	Special	Metal & Ceramic	0.758	0.959	.....
GE14501	Special	Metal & Ceramic	0.483	0.617	.....
GE14811	Special	Metal & Ceramic	0.758	0.959	.....
GE15371	Special	Metal & Ceramic	0.608	1.009	.....
GE16231	Special	Metal & Ceramic	0.758	0.959	.....
GE16841	Special	Metal & Ceramic	0.484	0.677	.....
GE17241	Special	Metal & Ceramic	0.800	2.025	.....
GE17701	Special	Metal & Ceramic	0.758	1.054	.....
GE18651	Special	Metal & Ceramic	0.753	1.084	.....
GL37207	Special	Metal ▲	5.750	20.000	.....
GL37248	Special	Metal ▲	2.250	7.625	.....
GL37250/ GL37250-PC	Special	Metal ▲	2.750	13.000	.....
GL37251/ GL37251-PC	Special	Metal ▲	2.750	13.000	.....
GL37252/ GL37252-PC	Special	Metal ▲	4.250	14.250	.....
GL37253/ GL37253-PC	Special	Metal ▲	4.625	14.250	.....
GL37254/ GL37254-PC	Special	Metal ▲	5.625	19.500	.....
GL37255/ GL37255-PC	Special	Metal ▲	5.625	19.500	.....
GL51025	Special	Metal & Ceramic	1.230	2.338	.....
GL51038	Special	Metal & Ceramic	2.109	3.338	.....
GL51064	Special	Metal & Ceramic	4.096	7.500	.....
GL51065	Special	Metal & Ceramic	3.109	3.198	.....

REED SWITCH CONDENSED DATA

Physical Characteristics								Electrical Parameters							
		Dimensions Inches			Construction			Initial Characteristics					Contact Ratings		
Basic Type No. (New)	Previous Type No.	Glass Diameter Maximum	Glass Length Maximum	Over-All Length Nominal	Contact Material (1)	Contact Arrangement	Resonant Frequency of Single Reed Hz—Min	Full Range Available Ampere Turns	Normally Stocked in Ranges of (2)	Contact Resistance Milliohms—Max	Breakdown Voltages DC Voltage Min (3)	Insulation Resistance Megohms—Min	Resistive Load Maximum (4)	Current Amperes, Max	Voltage, Volts—Max
SUBMINIATURE															
DR300	DR159	0.090	0.560	2.000	RH	Form A (5)	3000	10-60	10A.T.	250	100VDC	10^4	5VA	0.25	50
DR301	DR157	0.090	0.750	2.250	RH	"	2000	10-60	10A.T.	150	200VDC	10^4	10VA	0.50	100
DR302	DR162	0.108	0.670	2.010	AU-AG Alloy	"	2000	10-60	10A.T.	100	100VDC	10^4	5VA	0.25	50
DR303	DR164	0.070	0.500	2.010	RH	"	3000	10-50	10A.T.	200	100VDC	10^4	5VA	0.20	50
MINIATURE															
DR401	DR145	0.108	0.840	2.530	RH	Form A (5)	2000	15-55	10A.T.	150	300VDC	10^4	10VA	0.50	250
INTERMEDIATE															
DR540	DR163	0.173	1.200	1.750	AU-AG Alloy	Form A (5)	1500	25-70	10A.T.	100	600VDC	10^4	10VA	0.50	250
DP541	DRP160	0.173	1.200	1.750	RH	"	1500	25-70	10A.T.	150	600VDC	10^4	15VA	1.00	250
INTERMEDIATE FORM C															
DR570	DR158	0.215	1.600	2.935	RH	Form C (6)	1200	40-130	30A.T.	100	250VDC	10^4	10VA	0.50	250
STANDARD 2″															
DR600	DR101	0.215	2.100	3.200	DIF. AU	Form A (5)	800	20-130	20A.T.	50	500VDC	5×10^5	15VA	1.00	250
DR601	DR113	0.215	2.100	3.200	RH	"	750	30-130	20A.T.	50	500VDC	5×10^5	50VA	3.00	250
** DR602	DR146	0.215	2.100	3.200	RH	"	750	40-100	20A.T.	50	500VDC	5×10^5	50VA	3.00	250
HIGH VOLTAGE 2″															
DR680	DRV120	0.215	2.100	3.230	AG-W Alloy	Form A (5)	750	100-250	30A.T.	50	7000VDC	5×10^5	50VA	3.00	5000
DR681	DRV161	0.215	2.100	3.230	AG-W Alloy	Form A (5)	750	150-300	30A.T.	50	10000VDC	5×10^5	50VA	3.00	7500

(1) Except for types DR540, DR541, and DR570, leads may be trimmed to a length shorter than that shown, if required. Intermediate and 2″ types shown have tin-plated leads. All others shown have gold-plated leads.

(2) Types DR300, DR301, DR302 and DR401 are tested in a coil of 10,000 turns of No. 48 wire on a 0.75″ long bobbin of 0.17″ diameter. Types DR540 and DR541 are tested in a coil of 10,000 turns of No. 41 wire on a 1.00″ long bobbin of 0.30″ diameter.

Types DR570, DR600, DR601 and DR602 are tested in a coil of 10,000 turns of No. 39 wire on a 2.0″ long bobbin of 0.25″ diameter. Types DR680 and DR681 are tested on a coil of 5700 turns of No. 36 wire on a 2.0″ long bobbin having an oval cross-section of approximately 0.5″ x 0.28″.

(3) Will vary, depending on sensitivity range chosen (pull-in ampere turns).

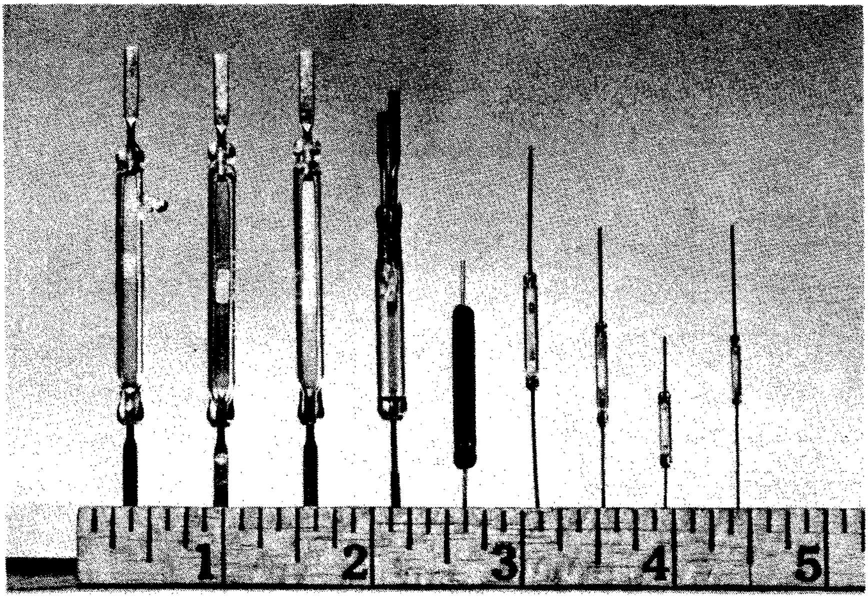
(4) Some degradation or improvement in performance may be expected as operating voltages and currents are varied.

(5) Form A, single-pole, single-throw, normally open switch.

(6) Form C, single-pole, double-throw switch in which the reed is maintained against the normally-closed contact by mechanical bias.

** A close-differential design where drop-out is typically 75%-85% of pull-in.

REED SWITCH CONDENSED DATA (Cont'd)



GE REED SWITCHES SHOWN ARE:

(A) DR-681, 2 in. High Voltage
(B) DR-600, 2 in. Standard; Diffused Gold Contacts
(C) DR-601, 2 in. Standard; Rhodium Contacts
(D) DR-570, Intermediate Form C (SPDT)
(E) DR-540, Intermediate
(F) DR-401, Miniature
(G) DR-301, Sub-miniature
(H) DR-300, Sub-miniature
(I) DR-303, Sub-miniature

DESCRIPTION

The heart of the GE reed switch is a set (two) of flat, metal reeds which are plated with a selected precious metal. These reeds are cantilever supported so that their free ends overlap and are separated by a small gap. The reeds are contained in a glass capsule which supports and holds the reeds in alignment. The capsule is hermetically sealed with dry gas; since the contacts are totally encapsulated, GE reed switches are ideal for environments containing explosive or corrosive gases or liquids.

OPERATION

GE Reed Switches can be actuated by moving a permanent magnet close to the switch or by energizing an electromagnetic coil located near the switch. With either method, the switch actuates when the magnet flux is strong enough to overcome the tension over the blade containing the normally-open "SPST" contacts.

APPLICATIONS

Reed Switches can be used in counters, instruments, key switches, limit switches, position indicators, flow meters, reed relays, toys, appliances, automobiles, cross-point switch systems, alarm devices, or any application where a small, simple, high-speed switching device is required.

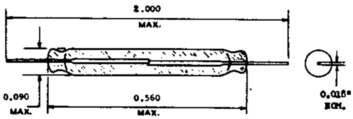
FEATURES

- Rugged — The compact package is built to withstand mechanical shock, vibration, and other adverse environmental conditions.
- Fast Operation — Quicker to respond than "heavier" conventional relays, GE reed switches are ideal for applications which require high-speed switching operation.
- Wide Selection — Sizes available range from sub-miniature to standard which are designed to switch dry circuit to 50 watts; breakdown voltages range from 100 volts to 15KV; also available as SPST; SPDT (one form only).
- Long, Reliable Life — The basic GE switch design — plus customized plating of reed surfaces for your specification application — assures dependability, millions of trouble-free operations.
- High Quality Assured — GE provides 100% in-process quality control to assure that only switches built and designed to the customer's specifications leave the line.

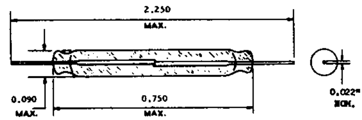
REED SWITCH CONDENSED DATA (Cont'd)

OUTLINE DRAWINGS

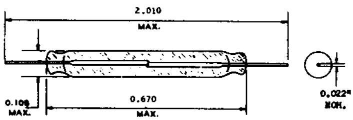
DR300



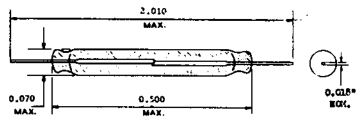
DR301



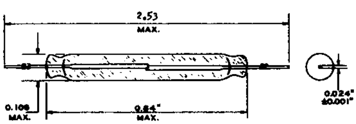
DR302



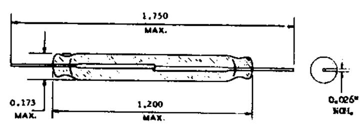
DR303



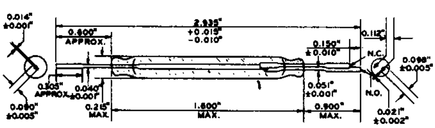
DR401



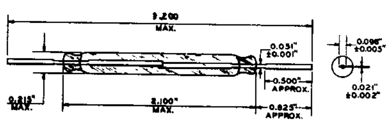
DR540 — DR541



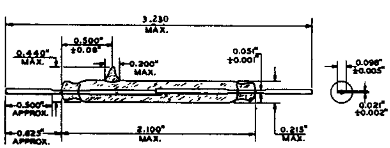
DR570



DR600 — DR601 — DR602



DR680 — DR681



Entertainment Semiconductor Components

Meet your repair needs quickly and economically with . . .

GE UNIVERSAL REPLACEMENT TRANSISTORS

APPLICATION: General Electric Universal Replacement Transistors are specifically designed as general replacements for most types of transistors used in radios, TV and other entertainment applications where normal voltages exist. They are not recommended for use in critical high voltage applications. If the application is such that characteristic curves or design ratings are needed on the unit, it is recommended that the exact JEDEC replacement type be used.

TECHNICAL INFORMATION: Remembering a few general rules in the care and handling of solid-state components can very often mean the difference between success and failure in completing a repair job.

1) VOLTAGES: Observe voltage specifications. Watch for stray transient voltages which might come in on the power line, or which could be induced from adjacent circuits such as an automobile ignition system. (Use a thyrector or zener diode to protect semiconductors from these stray transients.) Check power-line voltage to make sure it is neither too high (above 120 volts) nor too low (below 110 volts).

No semiconductor should ever be connected or disconnected from a circuit with the power on. High transient currents may cause permanent damage to the semiconductor.

2) CURRENT: Do not overload semiconductors, even momentarily—an "arc-over" destroys them immediately. Double check circuits, polarities, component sizes, and wiring BEFORE closing the switch.

3) HEAT SINKS: Carefully observe the recommended heat sinks for stud-mounted devices. If heat can't get out of a semiconductor, damage is likely to result. Be sure air can circulate around lead mounted devices.

The stud end of a stud-mounted unit normally forms part of the electrical circuitry. Therefore, the heat sink to which the stud is mounted is electrically "live." If a "live" heat sink presents any safety hazard or might conceivably create a short circuit, the unit should be electrically insulated from the heat sink by mica and teflon® washers, or the best sink itself must be electrically insulated from the chassis.

Lead-mounted devices may be secured by soldering their leads to a terminal strip. This fastening point of the lead should be no less than 1/8 inch away from the body of the device. Avoid bending the lead too near the component body. Do not try to bend the top terminals of stud-mounted devices.

4) SOLDERING: Use a small, hot soldering iron and high quality resincore solder. If a wire is tarnished or enameled, clean it with fine emery paper before soldering. Wrap the clean wire around the other wire or terminal once to hold it in place, then apply the tip of the iron and the solder to the joint together.

Solder as quickly as possible, then blow on the joint to cool it quickly. If possible, with lead mounted devices, use pliers to hold the lead between the body and the joint in order to avoid overheating the device. This is particularly important when soldering germanium devices.

Do not use acid flux.

5) MODIFICATIONS: Compare the base or lead arrangement of the GE Universal Replacement Transistor (see diagrams below) with the base or lead arrangement of the unit being replaced. If these are different it will be necessary to "bend and trim" to match up to the equipment.

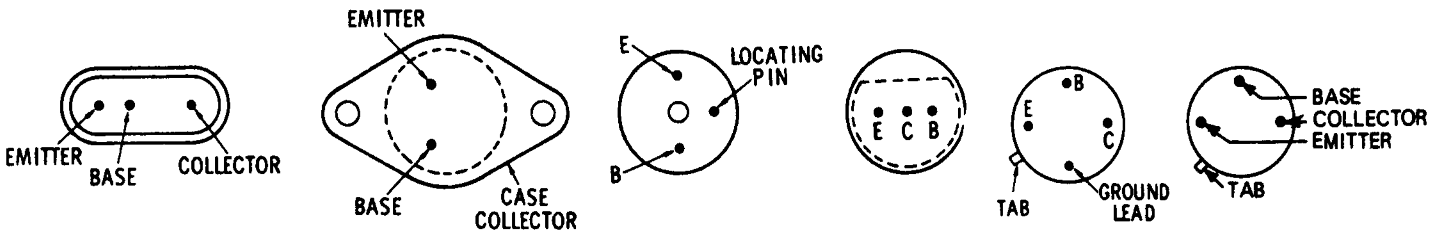
6) CIRCUIT CHECKS: Anytime replacement of a transistor is made in equipment (even if it is a so called "exact" replacement), it is always good practice to check out the alignment of the associated tuned circuits to insure proper operation and achieve the required gain without loss of stability. If replacements are made in high power stages, the transistor bias should always be checked and adjusted in order to protect the replacement transistor against excessive dissipation and minimize distortion.

7) GERMANIUM OR SILICON? As an aid to determining whether you are working with a germanium or a silicon unit, a good indication is the bias between base and emitter. Germanium normally has less than .5 volts bias, and silicon normally has .5 volts or more bias between base and emitter.

APPLICATION AND TECHNICAL DATA CHART FOR UNIVERSAL TRANSISTORS

GE Type	Description	Applications	Power Dissipation (Watts)	Max. Collector Current (IC)	Breakdown Voltage: Collector to Base (BVCBO)	Breakdown Voltage: Collector to Emitter (BVCEO)	Breakdown Voltage: Emitter to Base (BVEBO)	Freq. (Band Width Prod.)	Typical Current Gain	Outline Drawing (On Pages 394-400)	Base Drawing (On Page 389)
GE-1	PNP Germanium	Mixer/Oscillator Converter, RF & IF Amplifier (AM Radio)	150 MW	200 MA	30	12 (CER) Min.	20	5 MHz Min.	70	Fig. 6 TO-5	** H
GE-2	PNP Germanium	AF Amplifier	200 MW	200 MA	20	20	5	3 MHz Typ.	60	Fig. 6 TO-5	** H
GE-3	PNP Germanium	AF Power Amplifier	25*	3 A	50	40	15	400 KHz Typ.	60	Fig. 5 TO-3	C
GE-4	PNP Germanium	AF High Power Amplifier	50*	12 A	50	30	30	500 KHz Min.	55	Fig. 8 TO-36	D
GE-5	NPN Germanium	Mixer/Oscillator Converter, RF & IF Amplifier (AM Radio)	150 MW	100 MA	25	12	25	5 MHz Min.	165	Fig. 6 TO-5	H
GE-6	NPN Germanium	Mixer/Oscillator Converter, RF Amplifier (AM Radio)	65 MW	20 MA	20	9 (CER)	10	9 MHz Min.	110	Fig. 1 OV-5	A
GE-7	NPN Germanium	IF Amplifier (AM Radio)	65 MW	20 MA	15	15 (CER)	10	8 MHz Min.	35	Fig. 1 OV-5	A
GE-8	NPN Germanium	AF Amplifier	150 MW	200 MA	25	20 (CER)	25	5 MHz Min.	130	Fig. 6 TO-5	H
GE-9	PNP Germanium	Mixer/Oscillator Converter, RF & IF Amplifier (AM-FM Radio)	70 MW	10 MA	30	20 (CER)	2.5	108 MHz Typ.	140	Fig. 10 TO-72	F

GE-10	NPN Silicon	Mixer/Oscillator Converter, RF & IF Amplifier (AM Radio), AF Amplifier	200 MW	100 MA	25	25	5	200 MHz Typ.	150	Fig. 12 TO-98	E
GE-11	NPN Silicon	Mixer/Oscillator Converter, RF & IF Amplifier (FM Radio) VHF Tuner, UHF Oscillator	200 MW	25 MA	30	12	3	700 MHz Min.	75	Fig. 12 TO-98	E
GE-12	NPN Silicon	AF Power Amplifier for 120V Line Operated Stereo Phonographs, Television, Etc. – High Voltage	10*	400 MA	300	300	5	30 MHz Min.	140	Fig. 9 TO-66	C
GE-13MP	PNP Germanium	Matched Pairs of GE-3, AF Power Amplifier	25*	3 A	50	40	15	400 KHz Typ.	60	Fig. 5 TO-3	C
GE-14	NPN Silicon	AF Power Amplifier – High Power	115*	15 A	100	60	7	800 KHz Typ.	45	Fig. 5 TO-3	C
GE-15MP	NPN Silicon	Matched Pairs of GE-14 for AF Power Amplifier	115*	15 A	100	60	7	800 KHz Min.	45	Fig. 5 TO-3	C



A C D E F H

*With heat sink.

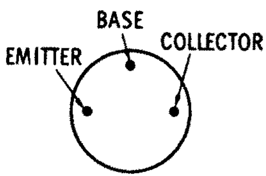
***Collector may be tied to case.

**Base tied to case.

APPLICATION AND TECHNICAL DATA CHART FOR UNIVERSAL TRANSISTORS

GE Type	Description	Applications	Power Dissipation (Watts)	Max. Collector Current (IC)	Breakdown Voltage: Collector to Base (BVCBO)	Breakdown Voltage: Collector to Emitter (BVCEO)	Breakdown Voltage: Emitter to Base (BVEBO)	Freq. (Band Width Prod.)	Typical Current Gain	Outline Drawing (On Pages 394-400)	Base Drawing (On Page 391)
GE-16	PNP Germanium	AF High Power Amplifiers, Switching	90*	10 A	60	45	30	500 MHz Min.	60	Fig. 5 TO-3	C
GE-17	NPN Silicon	FM RF & Oscillator, TV and Other Low Noise Circuits	500 MW	100 MA	60	30	5	250 MHz Min.	80	Fig. 2 RO-97A	B
GE-18	NPN Silicon	AF Amplifier, Output or Oscillator	800 MW	500 MA	120	80	7	50 MHz Min.	80	Fig. 6 TO-5	*** H
GE-19	NPN Silicon	High Power AF Amplifier, Output Oscillator, Medium Current	90*	4 A	50	50	5	800 KHz Min.	40	Fig. 5 TO-3	C
GE-20	NPN Silicon	Medium AF Amplifier, RF & IF Amplifier, Oscillator	500 MW	500 MA	75	40	6	300 MHz Min.	100	Fig. 7 TO-18	H
GE-21	PNP Silicon	AF Amplifier, RF & IF Amplifier, Oscillator	500 MW	500 MA	60	60	5	200 MHz Min.	65	Fig. 6 TO-5	H
GE-22	PNP Silicon	AF Amplifier, RF & IF Amplifier, Oscillator (AM & FM)	500 MW	500 MA	25	25	4	200 MHz Min.	50	Fig. 3 RO-110	B
GE-23	NPN Silicon	AF Power Amplifier for use in class A and B AF Power Amplifiers, Communications, Hi-Fi	15*	2 A	60	40	8	50 MHz Min.	125	Fig. 9 TO-66	C

GE-24MP	NPN Silicon	Matched Pairs of GE-23	15*	2 A	60	40	8	50 MHz Min.	125	Fig. 9 TO-66	C
GE-25	PNP Germanium	Horizontal and Vertical TV Sweep Circuits & Other High Voltage, High Current Amplifier Application	56*	10 A	320	320	2	1 MHz Min.	60	Fig. 5 TO-3	C
GE-26	PNP Silicon	AF Power Amplifier — Stereo Tape Players, Communications and Hi-Fi	20*	2 A	60	50	7	10 MHz Min.	100	Fig. 9 TO-66	C
GE-27	NPN Silicon	Color/BW video output Amplifier, High Voltage	6* 1	100 MA	300	300 (CER)	5	80 MHz	60	Fig. 15 Plastic Pak GE-27	I
GE-28	NPN Silicon	AF Power Amplifier	12* 2	3 A		60 (CES) 45 (CEO)	5	50 MHz	80	Fig. 16 Plastic Pak GE-28	J
GE-29	PNP Silicon	AF Power Amplifier	12* 2	3 A		60 (CES) 45 (CEO)	5	40 MHz	80	Fig. 16 Plastic Pak GE-29	J



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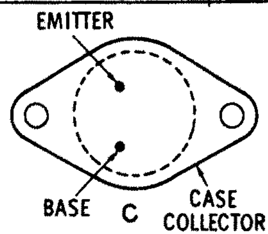

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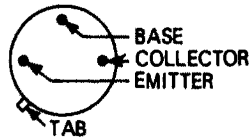

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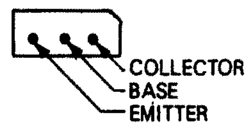

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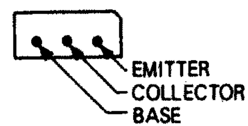


J

**Base tied to case.

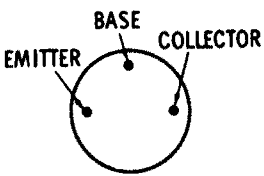
***Collector may be tied to case.

*With heat sink

APPLICATION AND TECHNICAL DATA CHART FOR UNIVERSAL TRANSISTORS

GE Type	Description	Applications	Power Dissipation (Watts)	Max. Collector Current (IC)	Breakdown Voltage: Collector to Base (BVCBO)	Breakdown Voltage: Collector to Emitter (BVCEO)	Breakdown Voltage: Emitter to Base (BVEBO)	Freq. (Band Width Prod.)	Typical Current Gain	Outline Drawing (On Pages 394-400)	Base Drawing (On Page 393)
GE-30	PNP Germanium	Audio Power Output for Stereo Tape Players and Radios, Tape Recorders, CB Transceivers, etc.	6*	3 A	60	60	12	1 MHz	110	Fig. 9 TO-66	C
GE-31MP	PNP Germanium	Audio Power Output Matched Pair of GE-30's	6*	3 A	60	60	12	1 MHz	110	Fig. 9 TO-66	C
GE-32	NPN Silicon	AC Line Operated AF Amplifier	30* 1.5	1 A		500 (CES) 300 (CEO)	5	40 MH_z	125	Fig. 17 Power Pac	L
GE-50	PNP Germanium	FM, RF Amplifier TV, IF Amplifier	140 MW	15 MA	25	25 (CER)		250 MHz (Typ.)	75	R-90 (See Page 9)	O
GE-51	PNP Germanium	AM, RF Amplifier AM, FM, IF Amplifier	60 MW	10 MA	32	32 (CER)		75 MHz (Typ.)	150	Fig. 10 TO-72	O
GE-52	PNP Germanium	Low Noise AF Amplifier	150 MW	150 MA	30	20 (CER)	12	2 MHz (Typ.)	125	Fig. 4 TO-1	M
GE-53	PNP Germanium	AF Amplifier, Output	1* 220 MW	1 A	32	32	6	1.4 MH_z	110	Fig. 4 TO-1	M
GE-60	NPN Silicon	RF, IF to 200 MHz; TV 1st or 2nd IF Amplifier	180 MW	25 MA	40	40	4	500 MHz	70	Fig. 3 RO-110	B
GE-61	NPN Silicon	TV 3rd IF Amplifier	300 MW	85 MA	50	40	4	500 MHz	90	Fig. 11 TO-92	P

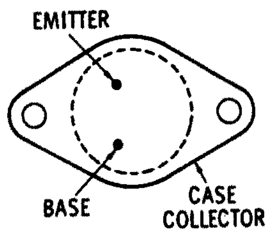
GE-62	NPN Silicon	High Gain, Low Noise Amplifier	350 MW	100 '/A	65	50	5	150 MH_z	350	Fig. 12 TO-98	E
GE-63	NPN Silicon	AF Amplifier Output	1* 500 MW	1 A	65	60	5	160 MH_z	150	Fig. 13 X-103	N
GE-64	NPN Silicon (DARLINGTON)	Very High Gain, Low Noise Amplifier	360 MW	275 MA	40	40	12	90 MH_z	20,000	Fig. 12 TO-98	E
GE-66	NPN Silicon	AF Power Output	28* 1.5	4 A		70 (CES) 60 (CEO)	5	50 MH_z	70	Fig. 17 Power Pac	L
GE-67	PNP Silicon	AF Amplifier Output	1* 500 MW	1 A	65	60	5	160 MH_z	150	Fig. 13 X-103	N
GE-69	PNP Silicon	AF Power Output	28* 1.3	4 A		70 (CES) 60 (CEO)	5	40 MH_z	70	Fig. 17 Power Pac	L



B

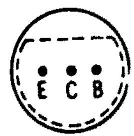
**Base tied to case.

*With heat sink



C

***Collector may be tied to case.



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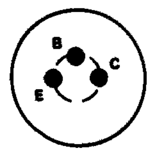

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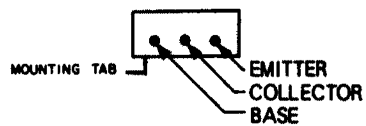

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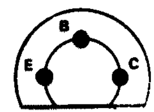

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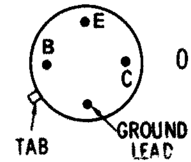

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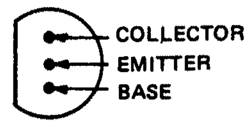
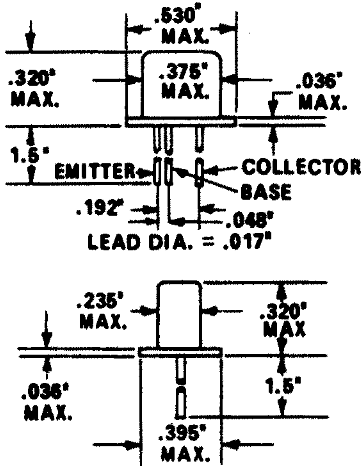


P

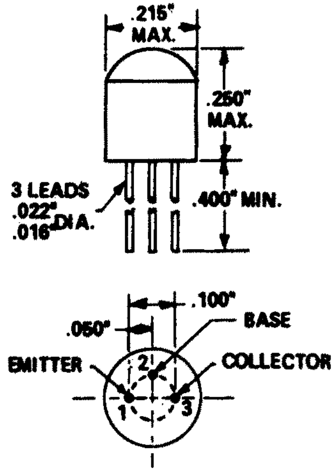
Outline Drawings . . . all dimensions in inches.

FIG. 1



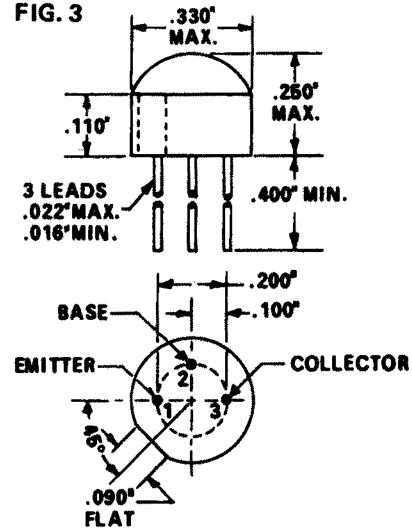
OV-5

FIG. 2



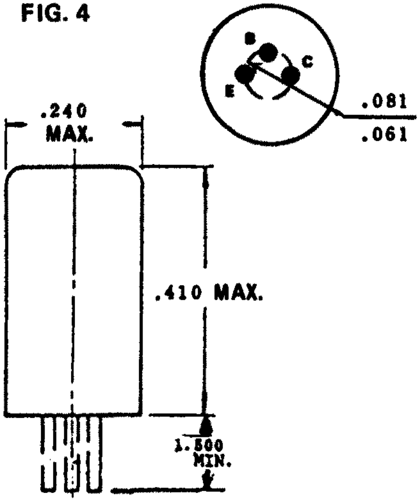
RO-97A

FIG. 3



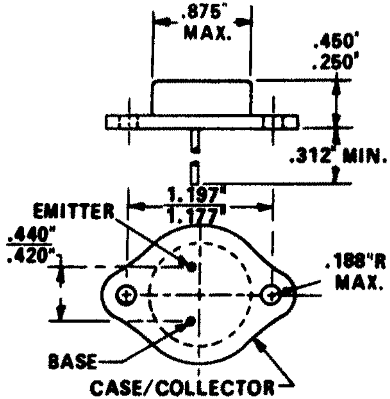
RO-110

FIG. 4



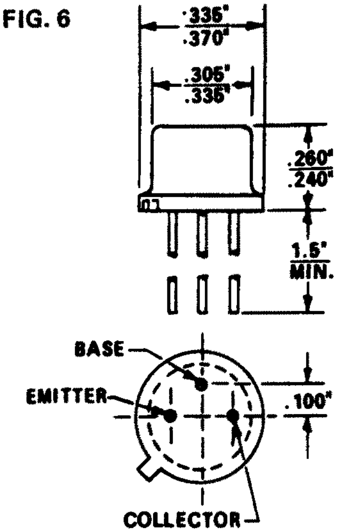
TO-1

FIG. 5



TO-3

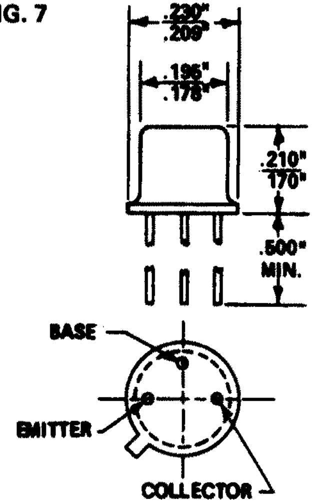
FIG. 6



TO-5

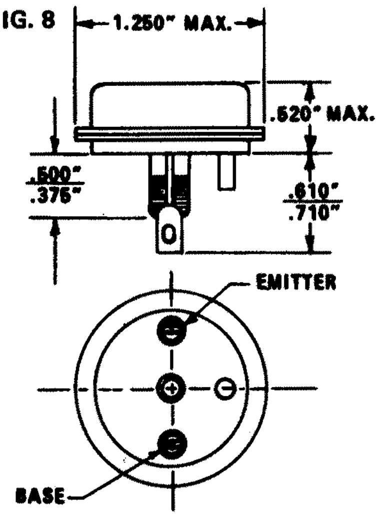
Outline Drawings . . . all dimensions in inches.

FIG. 7



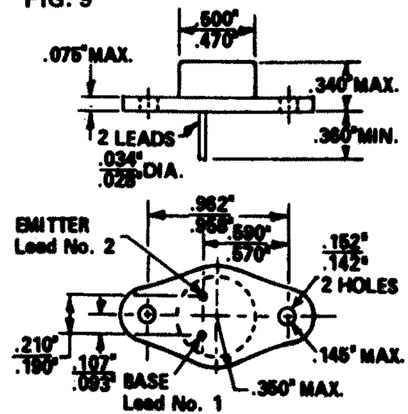
TO-18

FIG. 8



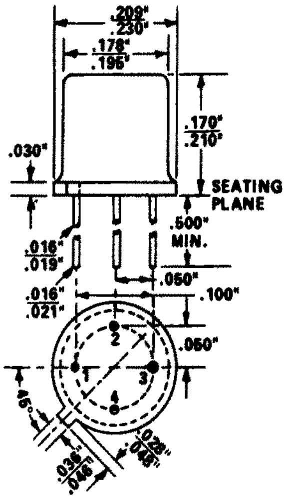
TO-36

FIG. 9



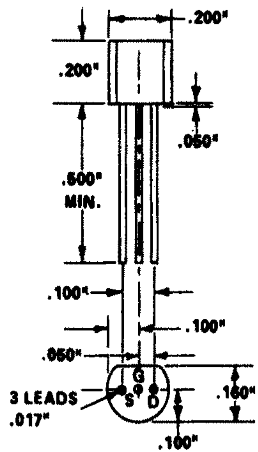
TO-66

FIG. 10



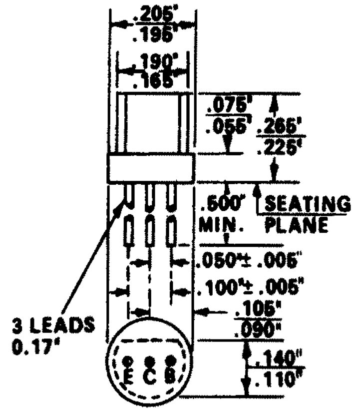
TO-72

FIG. 11



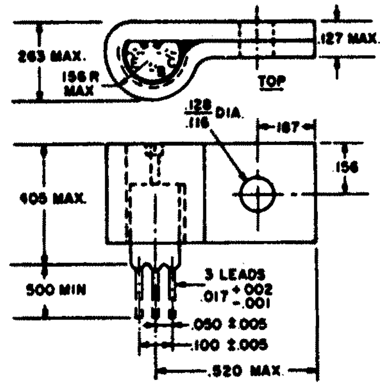
TO-92

FIG. 12



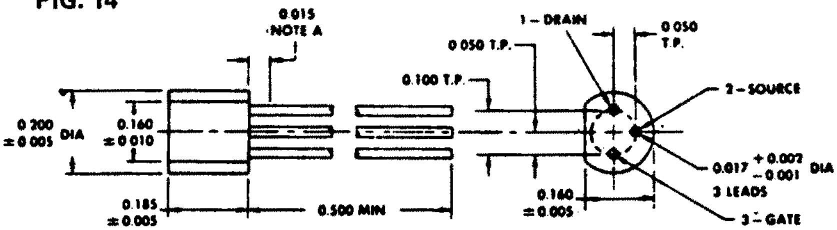
TO - 98

FIG. 13



X-103

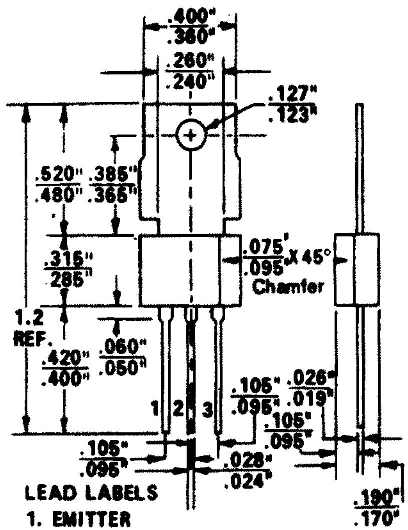
FIG. 14



NOTES:
A. Lead diameter is not controlled in this area.
B. Leads having maximum diameter 0.019 shall be within 0.007 of their true positions measured in the gaging plane 0.054 below the seating plane of the device relative to a maximum-diameter package.
C. All dimensions are in inches.

X-55

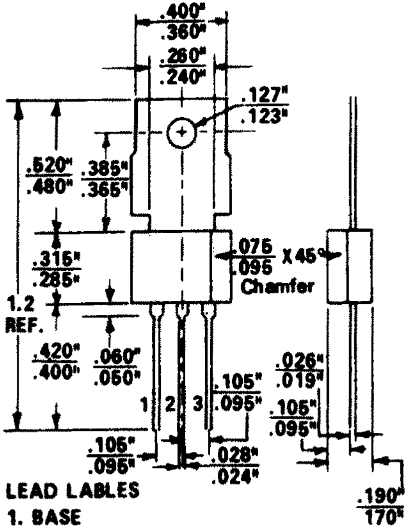
FIG. 15



LEAD LABELS
1. EMITTER
2. BASE
3. COLLECTOR

PLASTIC PAK
CAN BE FORMED TO TO-5

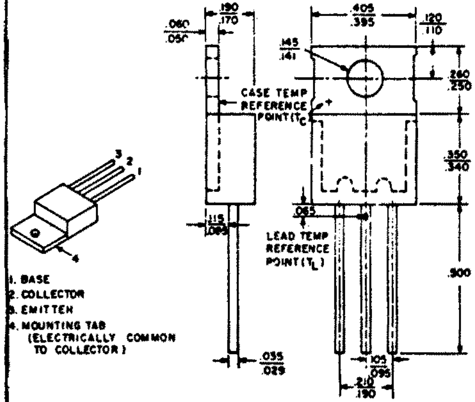
FIG. 16



LEAD LABLES
1. BASE
2. COLLECTOR
(Common with tab)
3. EMITTER

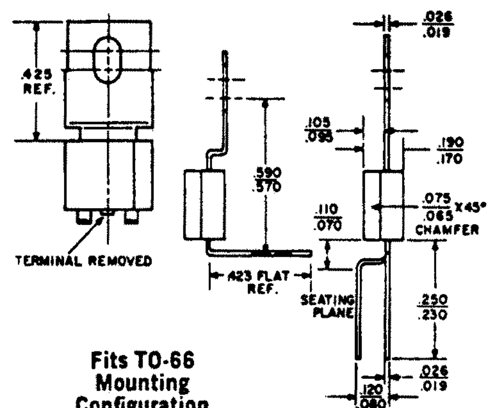
PLASTIC PAK
CAN BE FORMED TO TO-5 OR TO-66

FIG. 17



POWER PAC

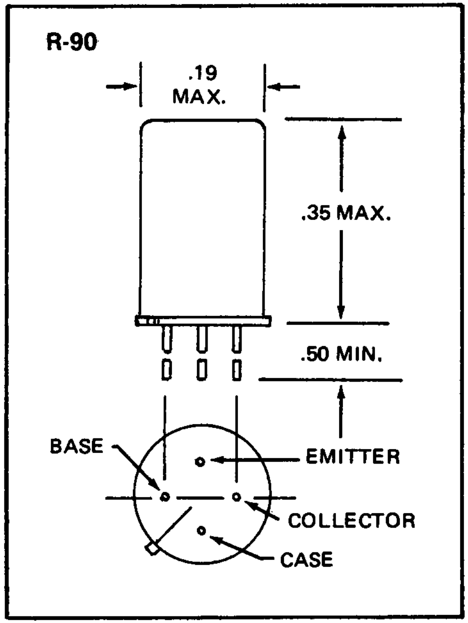
Mounting Suggestions for POWER PAC



Fits TO-66
Mounting
Configuration

Fits TO-5
Printed Circuit
Board Mounting
Configuration

Outline Drawing



SILICON AND GERMANIUM RECTIFIERS

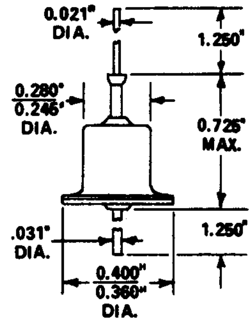
GE-504A AND GE-509 Universal replacement types GE-504A and GE-509 with a 60 amp surge rating, are recommended as a replacement for silicon rectifiers used in radio, black and white and color TV receivers, plus many other circuits.

The GE-504A and GE-509 have dual heatsink design. The pellet is securely sandwiched between two heavy thermally-matched slugs. These slugs provide rugged mechanical support for the pellet and leads. There are no potentially troublesome "S" springs or whisker contacts to fail or to increase thermal resistance.

The temperature coefficient of the glass is carefully matched to that of silicon for stress-free operation over a wide temperature range. Due to the inherent low OHMIC resistance of the GE-504A and GE-509 package, the devices can withstand current surges up to 100 amps.

The 1N91 is a germanium rectifier in a hermetic sealed package and has low forward voltage and other characteristics normally associated with germanium rectifiers. The GEBR-600 is a silicon rectifier utilizing GE-504A type units connected in full-wave bridge configuration: the total bridge is encapsulated in plastic.

Type	Diagram	PIV	Max. Ipc MA	Suggested List Price
1N91	A	100	150	$1.55
GE-504A	B	600	1 AMP	1.10
GE-509	B	1000	1 AMP	1.25
GE-510	D	1000	2.5 AMP	1.30
GEBR-600	C	600	1.5 AMP	5.10



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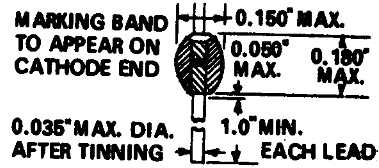

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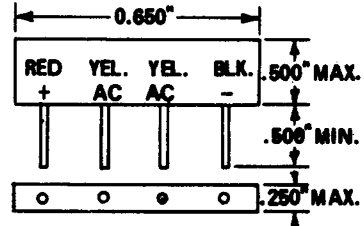
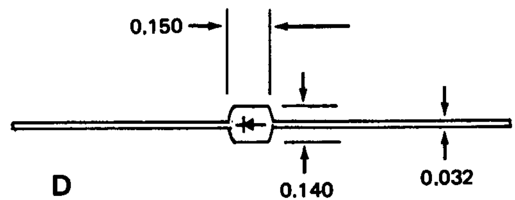


C



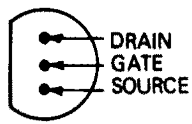
D

FIELD EFFECT TRANSISTORS

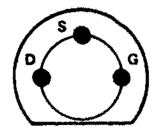
GE Type	Description	Applications	Common Source Forward Transfer Admittance (MNHOS)	Power Dissipation @25°C Free Air	Gate Current (IG) (MADC)	Zero Gate Voltage Drain Current (IDSS)	Drain Gate Voltage	Drain Source Voltage VDS (VDC)	Gate Source Breakdown Voltage V (BR) GSS	Case Package (On Pages 397-398)	Terminal Drawing
GE-FET-1	N Channel Silicon FET	General Pupose Amplifier to 100 MH_z	6500 Max.	200 MW	10 MA	2 to 20 MA**	25	25	−25	Fig. 11 TO-92	G
GE-FET-2	N. Channel Silicon FET	FM-TV RF Mixer VHF to 400 MH_z	5500 Typical	350 MW	50 MA	5 to 15 MA**	30		−30	Fig. 14 X-55	K

** Pulse Test: Pulse Width = 100 MSEC, Duty Cycle ≤ 10% (FET)

* With heat sink



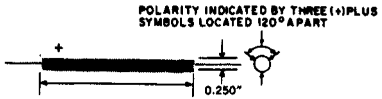
G



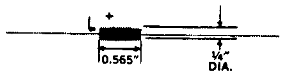
K

SELENIUM RECTIFIERS FOR USE IN COLOR TV SETS

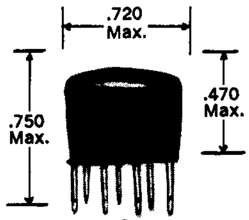
Catalog No.	Diagram	Type	Suggested List Price
GECR-1	1	Focus Rect.	$ 3.75
GECR-2	2	Boosted Boost	1.65
GECR-3	3	Convergence	1.43



1



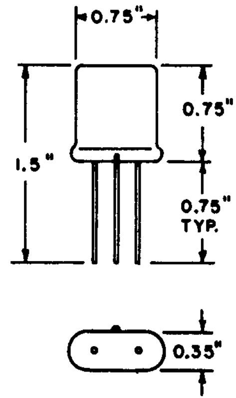
2

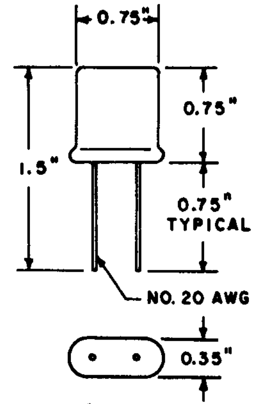


3

GE QUARTZ CRYSTALS

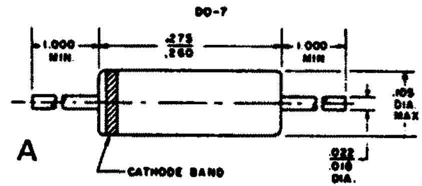
Catalog No.	Resonant Frequency	Use	Suggested List Price
GE-41	3579.545 kc	Color burst filter	5.60
GE-42	3579.545 kc	Color subcarrier oscillators	3.80

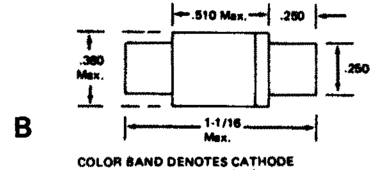




VARIABLE CAPACITANCE DIODES

GE Type	Material	Reverse Voltage Vr Volts	Reverse Current UA	Capacitance AT Vr = 4 V pF	Tuning Ratio	Case
GE-90	Silicon	20	2	30	2.6	A
GE-305	Silicon Damper Diode 5000 PRV					B



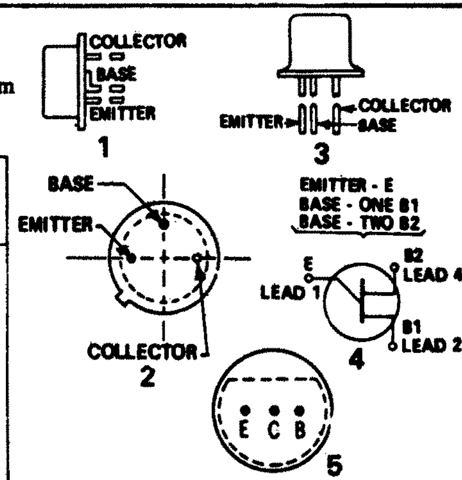


In application requiring the use of two (2) of the GE-305's in parallel, use paring clips, as illustrated  otherwise discard. One paring clip is packaged with each GE-305.

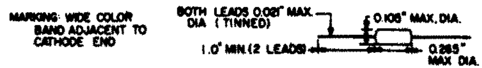
GE ENTERTAINMENT TRANSISTORS REGISTERED JEDEC TYPES

These types supplement the Universal Line of GE Transistors. Characteristics conform to JEDEC specifications.

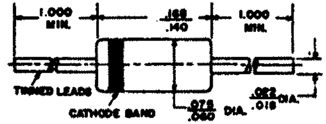
Type or JEDEC No.	Type	Use	Drawing No.	P_C MW @25°C	BV_{CE}	I_C ma	T_J°C	Suggested List Price
2N107	PNP	AF	1	50	−6	−10	60	$1.25
2N170	NPN	IF	3	25	6	20	50	1.70
2N188A	PNP	AF OUT	1	200	−25	−200	85	3.05
2N190	PNP	AF	1	75	−25	−50	85	1.40
2N324	PNP	AF	2	140	−16	−100	60	1.20
2N404	PNP	SW	2	120	−24	−100	85	.90
2N508	PNP	AF OUT	2	140	−16	−100	86	1.30
2N2160	{SILICON UNIJUNCTION}	OSC	4	450	30	50	85	2.75
2N5308A	NPN	Amplifier	5	350	36	200	100	1.25



GERMANIUM AND SILICON DIODES



A

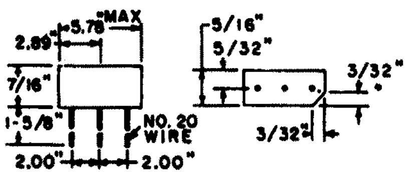


B

Type	Description	Out-line (see above)	Temp. Range °C	Reverse Working Voltage (dc-volts)	Recurrent Peak Forward Current (ma)	Average Forward Current (ma)	Surge Current 1 sec.-max. (ma)	Peak Reverse Voltage (Volts)	CHARACTERISTICS Forward Current (ma) at + 1 volt Min	Max	CHARACTERISTICS Reverse Current (μa max)	Suggested List Price
1N34AS	General Purposes	A	–50 to +90	60	150	50	500	75	5	25	500 at –50V	$ .55
1N60	Video Detector	A	–50 to +90	25	150	50	500	30	–	–	–	.55
1N82A	Silicon UHF Mixer	A	–50 to +120	3	25	–	–	5	5	15 (.5v)	500 at – 3v	1.45
1N295	50 MC Detector	A	–59 to +100	40	125	30	300	50	–	–	180 at – 10v	.55
GE-300	General Purpose 50 NANO sec	B	–65 to +150	200	–	250	2 A	200	200 Min.	–	1 at – 200v	1.35

Vac-u-Sel® SELENIUM DUAL-DIODE RECTIFIERS

APPLICATION: The principal application for the Dual-Diode is as a discriminator or phase detector in television receivers. They also can be used in other types of low power circuits where maximum dependability is required at minimum cost.



Catalog No.	Type	Suggested List Price	
6GC1	Common Cathode	$ .90	AC AC
6GD1	Series Connected	.90	– +
6GX1	Common Anode	.90	AC AC

Forward current (min.) 1.1 ma at 2.5VDC
Reverse current (nominal) .4 ma at 20VDC

ZENER DIODES

ZENER DIODES A Zener diode is a two-layer device that above a certain reverse voltage (the zener value) has a sudden rise in current. If forward-biased, the diode is an ordinary rectifier. But when reversed-biased, the diode exhibits a typical knee, or sharp break, in its current-voltage graph. The voltage across the device remains essentially constant for any further increase of reverse current up to the allowable dissipation rating. The zener diode is a good voltage regulator, over-voltage protector, and voltage reference.

Zener diodes may be connected in a series to achieve desired zener voltage plus or minus tolerances. For best zener performance, specified IZT should be maintained during normal circuit conditions.

GE Type	Material	Power Dissipation @ 25°C (Watts)	Breakdown Voltage V_Z @ I_{ZT} (Volts)	Test Current I_{ZT} (MA)	Zener Impedence Z_Z @ I_{ZT} (OHMS)	DC Zener Current I_{ZM} (MA)	Suggested Retail
GE ZD-10-4	Silicon	400 MW	10	20	17	20	$1.55
GE ZD-3.6	Silicon	1 Watt	3.6	69	10	253	1.99
GE ZD-5.1	Silicon	1 Watt	5.1	49	7	178	1.99
GE ZD-5.6	Silicon	1 Watt	5.6	45	5	162	1.99
GE ZD-6.2	Silicon	1 Watt	6.2	41	2	146	1.99
GE ZD-7.5	Silicon	1 Watt	7.5	34	4	121	1.99
GE ZD-9.1	Silicon	1 Watt	9.1	28	5	100	1.99
GE ZD-12	Silicon	1 Watt	12	21	9	76	1.99
GE ZD-15	Silicon	1 Watt	15	17	14	61	1.99
GE ZD-18	Silicon	1 Watt	18	14	20	50	1.99
GE ZD-20	Silicon	1 Watt	20	12.5	22	46	1.99
GE ZD-27	Silicon	1 Watt	27	9.5	35	34	1.99
GE ZD-33	Silicon	1 Watt	33	7.5	45	27	1.99
GE ZD-39	Silicon	1 Watt	39	6.5	60	23	1.99
GE ZD-47	Silicon	1 Watt	47	5.5	80	19	1.99

All Zeners ±10% tolerance in Voltage.

Junction operating and storage temperature — 65° to 200°C.

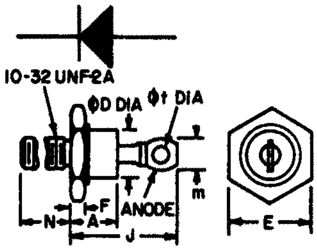
MAINTENANCE INDUSTRIAL REPLACEMENT SEMICONDUCTORS

Catalog No.	Description	Repetitive PRV	Transient PRV	Max. I_{DC} Stud Single Phase	Peak 1 Cycle Surge	Max. Rev. Cur. (Full Cycle Av @ Full Load)	Max. Full Load Voltage Drop	Max. Oper. °C	Outline Dwg.	Suggested User Price
GEMR-1	Silicon Rectifier	200	350	12 A	240 A	2.0 mA	0.55 V	200°	A	$ 4.80
GEMR-2	Silicon Rectifier	400	–	35*A	500 A	10*mAdc	0.65*V	200°	B	6.90
		PRV and V (BO)	Max. I_{DC} @ Temp. °C		Max. Temp. °C Oper.	Max. Temp. °C Stor.	Max. Req'd. Gate Signal @ 25°C T_J			
GEMR-3	Silicon Controlled Rectifier	400	35 A @ 19°C case		125°	150°	3 V, 40 mA		C	8.60
GEMR-4	Silicon Controlled Rectifier	400	7.4 A @ 80°C case		100°	100°	3 V, 25 mA		D	3.80
GEMR-5	Silicon Controlled Rectifier Economy Flat Pack Design	200	4 A @ 75°C anode tab		110°	150°	0.8 V, 200 uAdc		E	1.40
		h_{FE} V_{CE} = 1V I_C = 1A		V_{CEO} I_C = 1 mA	V_{CE}(sat) I_C = 1A I_B° = 50 mA		P_T 70° Tab			
GEMR-6	Silicon Power Tab Transistor	20 min.		40 V	1.0 V (Max.)		8 W		F	1.42

*@140°C

MAINTENANCE INDUSTRIAL REPLACEMENT SEMICONDUCTORS Outline Drawings

A

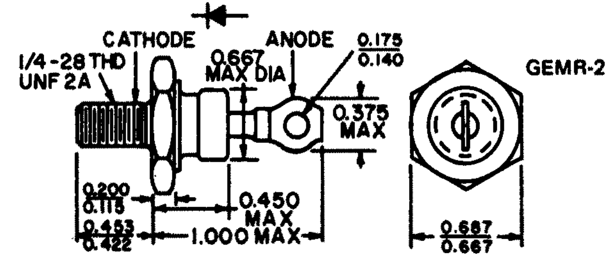


GEMR-1

COMPLIES WITH
EIA REGISTERED OUTLINE DO-4

SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A		.405		10.29
ΦD		.424		10.77
E	.424	.437	10.77	11.10
F	.075	.175	1.91	4.45
J		.800		20.32
m		.250		6.35
N	.422	.453	10.72	11.51
Φt	.060		1.52	
W				

B



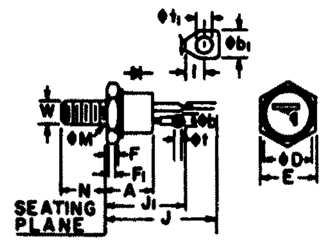
GEMR-2

NOTES: 1. COMPLIES WITH EIA REGISTERED OUTLINE DO-5
2. ALL DIMENSIONS IN INCHES

C

GEMR-3

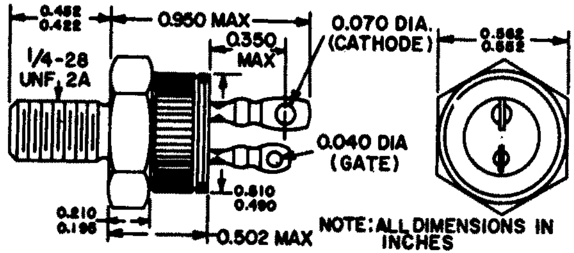
(COMPLIES WITH JEDEC TO-48)



SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.330	.505	8.38	12.83
Φb	.115	.140	2.92	3.56
Φb₁	.210	.300	5.33	7.62
ΦD		.544		13.82
E	.544	.562	13.82	14.27
F	.113	.200	2.87	5.08
F₁	.060		1.52	
J		1.193		30.30
J₁		.875		22.23
l	.120		3.05	
ΦM				
N	.422	.453	10.72	11.51
Φt	.060	.075	1.52	1.91
Φt₁	.125	.165	3.18	1.19
W				

D

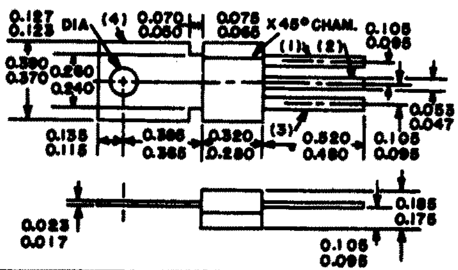
GEMR-4



NOTE: ALL DIMENSIONS IN INCHES

E

GEMR-5



NOTES

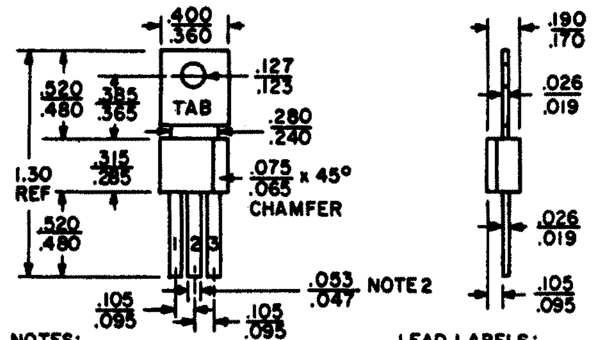
(1) GATE LEAD IS ADJACENT TO CHAMFER

(2) ANODE

(3) CATHODE

(4) TAB IS DIRECTLY CONNECTED TO CENTER LEAD (ANODE INTERNALLY)

F



NOTES:
1. ALL DIMENSIONS ARE IN INCHES AND ARE REFERENCE UNLESS TOLERENCED.
2. .043-.053 LEAD WIDTH WITHIN 0.100 OF BODY.

LEAD LABELS:
1 - BASE
2 - COLLECTOR (COMMON WITH TAB)
3 - EMITTER

GEMR-6

"INTEGRATED CIRCUITS"

Type	Description
GEIC-1 Audio Amplifier	Audio amplifier designed to deliver 2 watts of continuous power to a 16-ohm load. This integrated circuit is used in project A2 as described in Electronics Experimenters Circuit Manual ETRM-3960A.
GEIC-2 TV/FM Sound, IF, Detector (Figure No. 1 Below)	Suitable for a wide variety of applications including TV sound channels, line operated and automobile FM radios and mobile communications equipment. Features electronic attenuator. Max. supply voltage: 9V; Zener regulating voltage (V_5): 11.2V typ.; Supply current: 16MA Typ; T_A = 25°C. Replacement for Zenith 221-48; Sears 13-29-6; Sylvania 15-33201-1 and UA3065.
GEIC-3 Color TV Chroma Demodulator (Figure No. 2 Below)	Demodulates the chroma subcarrier information contained in a color television video signal and provides color difference signals at the outputs. Low voltage drift of the DC output insures excellent performance in direct-coupled chrominance output circuitry. Max. supply voltage: 28VDC; minimum load resistance: 3K ohm; peak to peak reference input voltage: 5V; peak to peak chroma input voltage: 5V; internal power dissipation: 450MW; operating temperature range: 0°C to +70°C. Electrical characteristics (T_A = 25°C, V^+ = 24V) as follows: Supply current (e_c = 0, R_L = 1M ohm) 9.0 MA Typ.; (e_c = 0) 22 MA typ.; DC Voltage at any output terminal (e_c = 0) 14.5V typ.; DC voltage at either reference terminal ($e_a = e_b = e_c$ = 0) 5.8V typ.; DC voltage at either chroma terminal (e_c = 0) 3.2V typ. Replacement for Zenith 221-37 and 221-39; also replaces UA746.
GEIC-4 Color TV Subcarrier Regenerator (Figure No. 3 Below)	Replacement for Zenith 221-42 and UA780. Maximum ratings, supply current: 40MA; gate input current; 5MA; peak to peak voltage at either APC or ACC detector input terminals; 5V; internal power dissipation; 600MW. Electrical characteristics (T_A = 25°C, Gate "ON"); supply current: 26MA typ.; voltage at supply terminal: 12V typ.; supply regulation (V^+ = 21V to V^+ = 27V): 40MV typ.

"INTEGRATED CIRCUITS"

Type	Description
GEIC-5 **Color TV Chroma Demodulator** **(Figure No. 4 Below)**	Demodulates the chroma subcarrier information contained in a color TV video signal and provides color difference signals at the outputs. The low voltage drift of the DC output insures excellent performance in direct coupled chrominance output circuitry. Max. supply voltage: 28VDC; minimum load resistance: 3K ohm; peak to peak reference input voltage: 5V; peak to peak chroma input voltage: 5V; internal power dissipation; 450MW; operating temperature range: 0°C to +70°C. Electrical characteristics (T_A = 25°C, V^+ = 24V) as follows: Supply current (e_c = 0, R_L = 1M ohm) 9.0 MA typ.; (e_c = 0) 22MA typ.; DC voltage at any output terminal (e_c = 0) 14.5 V Typ.; DC voltage at either reference terminal ($e_a = e_b = e_c$ = 0) 5.8V typ; DC voltage at either chroma terminal (e_c = 0) 3.2V typ. Replacement for Zenith 221-46 and UA746 (DIP).
GEIC-6 **Gain Controlled IF Amplifier** **(Figure No. 4 Below)**	Dual gain controlled IF amplifier designed for use as a color TV chroma IF amplifier. The first section is a gain controlled chroma signal amplifier whose output is used to drive a sub carrier regenerator circuit. The gain of the second section is controlled by means of an external DC voltage to set chroma level. In addition the second stage may be gated off to provide "color killing" action in the absence of a color signal with the trip point of the gate adjusted externally. Maximum ratings, supply voltage: 30V; internal power dissipation: 600MW; storage temperature range: -65°C to +150°C. Replacement for Zenith 221-43 and UA 781.
GEIC-7 **FM Stereo Multiplex Decoder** **(Figure No. 4 Below)**	Used to accomplish the demodulation of a stereo multiplex signal into the right and left audio channels while inherently suppressing SCA frequency components. Suitable for all line-operated and automotive FM stereo multiplex applications: Maximum ratings, supply voltage: 15V; voltage at stereo lamp driver terminal: 22V; current into stereo lamp driver terminal: 100MA; internal power dissipation: 400MW. Electrical characteristics (T_A = 25°C, V^+ = +12V, 200 mV RMS standard stereo multiplex signal applied to input). Supply current: 10mA typ.; input resistance: 20K ohms typ.; stereo separation (adjusted) f = 100H_Z: 45dB typ.; f = 1kH_Z: 55dB typ.; f = 10kH_Z: 50dB typ.; total harmonic distortion: .5% typ.; 67kH_Z storecast rejection: 55dB typ.; 19kH_Z pilot level required at input for stereo indicator lamp on: 12 mVRMS typ.; stereo indicator lamp off: 8mVRMS typ. Replacement for Heath 442-9 and UA729.

GEIC-8 **FM Stereo Multiplex Decoder** **(Figure No. 1 Below)**	Used to accomplish the demodulation of a stereo multiplex signal into the right and left audio channels while inherently suppressing SCA frequency components. Suitable for all line-operated and automotive FM stereo multiplex applications. Maximum ratings, supply voltage: 15V; voltage at stereo lamp driver terminal: 22V; current into stereo lamp driver terminal: 100MA; internal power dissipation: 400MW. Electrical characteristics (T_A = 25°C, V^+ = +12V, 200 mV RMS standard stereo multiplex signal applied to input). Supply current: 11mA typ.; input resistance: 20K ohms typ.; stereo separation f = 100H_Z: 40dB typ.; f = 1kH_Z: 45dB typ.; f = 10kH_Z: 40dB typ.; total harmonic distortion: .5% typ.; 67kH_Z storecast rejection: 55dB typ.; 19kH_Z pilot level required at input for stereo indicator lamp on: 12 mV RMS typ.; stereo indicator lamp off: 8 mV RMS typ. Replacement for 21B1M, UA732 and TIJ.
GEIC-9 **FM Stereo Multiplex Decoder** **(Figure No. 1 Below)**	Used to accomplish the demodulation of a stereo multiplex signal into the right and left audio channels while inherently suppressing SCA frequency components. Suitable for all line-operated and automotive FM stereo multiplex applications. Maximum ratings, supply voltage: 15V; voltage at stereo lamp driver terminal: 22V; current into stereo lamp driver terminal: 100MA; internal power dissipation: 500MW. Electrical characteristics (T_A = 25°C, V^+ = +12V, 200 mV RMS standard stereo multiplex signal applied to input). Supply current: 12mA typ.; input resistance: 20K ohms typ.; stereo separation f = 100 H_Z: 40 dB typ.; f = 1kH_Z: 45 dB typ.; f = 10kH_Z: 40dB typ.; total harmonic distortion: .5% typ.; 67kH_Z storecast rejection: 55dB typ.; 19kH_Z pilot level required at input for stereo indicator lamp on: 12mV RMS typ.; stereo indicator lamp off: 8 mV RMS typ. Replacement for 006B2M, UA767 and MC1307.

FIGURE 1

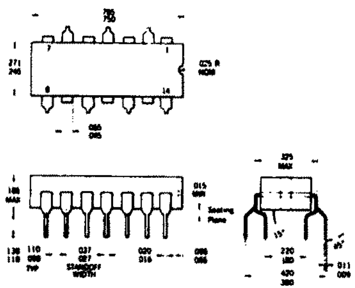


FIGURE 2

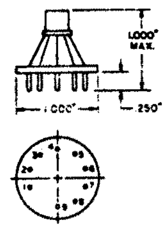
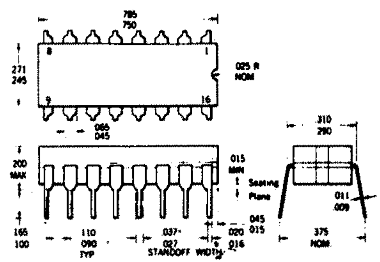


FIGURE 3



GEIC-10 **FM Detector Limiter and TV Sound** **(Figure No. 5 Below)**	Comprises a three-state limiter and a balanced product detector. Applications include TV sound channels, FM receivers, automatic frequency control systems and communication receivers. $5KH_Z$ to $50\ MH_Z$ frequency range permits use in a variety of communication receivers. Max. power supply: 16Vdc; Max. input voltage (pin4): 3.5Vp, Max. power dissipation: 625MW; derate above $T_A = 25^oC$: 5.0 mW/^oC. Electrical characteristics ($T_A = 25^oC$) as follows: drain current (V+ = 12V) 15mA typ.; Detector output voltage (V+ = 12V) 5.4 Vdc typ. Replacement for Zenith 221-34 and MC1357.
GEIC-11 **FM and TV Sound IF—Detector and Limiter** **(Figure No. 6 Below)**	Operation of this device on 8.0 Vdc supply makes it suitable to portable and vehicular use for FM and TV sound/IF detector and limiter stages. Max. power supply: 16Vdc; Max. input voltage (pin 4): 3.5Vp. Electrical characteristics ($T_A = 25^oC$) as follows: Drain current (V+ = 8V) 12 mA typ.; detector output voltage (V+ = 8V) 3.7 Vdc typ. Replacement for Delco DM-11.

FIGURE 4

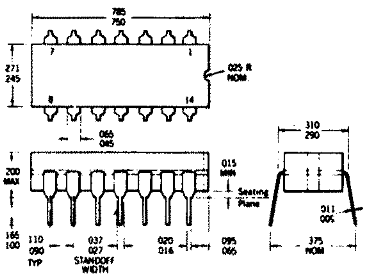


FIGURE 5

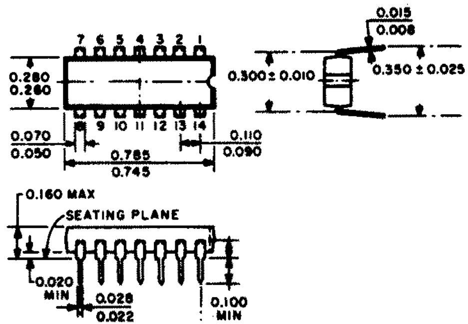
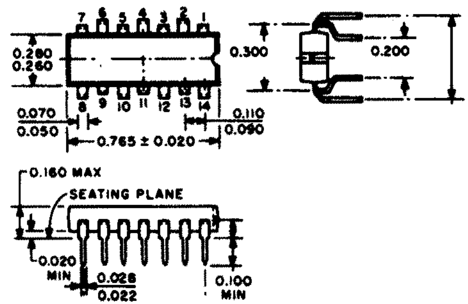


FIGURE 6



INDEX of BASING DIAGRAMS by TUBE TYPE

Tube Type	Basing	Tube Type	Basing	Tube Type	Basing	Tube Type	Basing
OOA	4D	1G3-GT	3C	2C39A	2C39A	3B28	4P
O1-A	4D	1G3GTA	3C	2C39-B	2C39-B	3BA6	7BK
OA2	5BO	1G4-GT	5S	2C39WA	2C39WA	3BC5	7BD
OA3	4AJ	1G5-G	6X	2C40	2C40	3BE6	7CH
OA3-A	4AJ	1G6-GT	7AB	2C40-A	2C40	3BF2	12GQ
OA4-G	4V	1H2	9LX	2C42	2C40	3BL2	12HK
OA5	6CB	1H4-GT	5S	2C43	2C43	3BL2A	12HK
OB2	5BO	1H5-GT	5Z	2C46	2C40	3BM2	12HK
OB3	4AJ	1H6-GT	7AA	2C50	8BD	3BM2A	12HK
OB3-A	4AJ	1J3	3C	2C51	8CJ	3BN2	12FV
OC2	5BO	1J3-A	3C	2C52	8BD	3BN2A	12FV
OC3	4AJ	1J5-G	6X	2CN3-A	8MU	3BN4	7EG
OC3-A	4AJ	1J6-GT	7AB	2CN3B	8MU	3BN4-A	7EG
OD3	4AJ	1K3	3C	2CW4	12AQ	3BN6	7DF
OD3-A	4AJ	1L4	6AR	2CY5	7EW	3BS2	12HY
OY4-G	4BU	1L6	7DC	2D21	7BN	3BS2A	12HY
OZ4-G	4R	1LA4	5AD	2DF4	9JL	3BS2B	12HY
1A3	5AP	1LA6	7AK	2DS4	12AQ	3BT2	12HY
1A4-p	4M	1LB4	5AD	2DV4	12EA	3BT2A	12HY
1A4-t	4K	1LB6	8AX	2DX4	7DK	3BU8	9FG
1A5-GT	6X	1LC5	7AO	2DY4	7DK	3BU8-A	9FG
1A6	6L	1LC6	7AK	2DY4-A	7DK	3BW2	12HY
1A7-GT	7Z	1LD5	6AX	2DZ4	7DK	3BY6	7CH
1AB5	5BF	1LE3	4AA	2E5	6R	3BZ6	7CM
1AC5	8CP	1LF3	4AA	2E24	7CL	3C2	8FV
1AD2	12GV	1LG5	7AO	2E26	7CK	3C5-GT	7AQ
1AD2A	12GV	1LH4	5AG	2E30	7CQ	3C6	7BW
1AD4	1AD4	1LN5	7AO	2E31	2E31	3C23	3G
1AD5	8CP	1N2	3C	2E32	2E31	3CA3	8MH
1AE4	6AR	1N2A	3C	2E35	2E31	3CA3A	8EZ
1AE5	1AE5	1N5-GT	5Y	2E36	2E31	3CB6	7CM
1AF4	6AR	1N6-GT	7AM	2E41	2E41	3CE5	7BD
1AF5	6AU	1P5-GT	5Y	2E42	2E41	3CF6	7CM
1AG4	512-AX	1Q5-GT	6AF	2EA5	7EW	3CN3	8MU
1AG5	1AG5	1Q6	8CO	2EG4	12AQ	3CN3-A	8MU
1AH4	1AD4	1R4	4AH	2EN5	7FL	3CN3B	8MU
1AJ2	12EL	1R5	7AT	2ER5	7FP	3CS6	7CH
1AJ5	1AG5	1S2	9DT	2ES5	7FP	3CU3	8MK
1AK4	1AD4	1S2-A	9DT	2EV5	7EW	3CU3A	8MK
1AK5	1AG5	1S4	7AV	2FH5	7FP	3CV3	8EZ
1AM4	6AR	1S5	6AU	2FQ5	7FP	3CV3A	8EZ
1AQ5	7AT	1S6	8DA	2FQ5-A	7FP	3CX3	8MT
1AR5	6AU	1SA6-GT	6BD	2FS5	7GA	3CY3	8MX
1AS5	6BW	1SB6-GT	6BE	2FV6	7FQ	3CY5	7EW
1AU2	9U	1T2	1AY2	2FY5	7FP	3CZ3	8EZ
1AU3	3C	1T4	6AR	2G21	2G21	3CZ3A	8EZ
1AX2	9Y	1T5-GT	6X	2G22	2G21	3D6	6BA
1AY2	1AY2	1T6	8DA	2GK5	7FP	3DA3	8MY
1AY2A	1AY2	1U4	6AR	2GU5	7GA	3DB3	8MX
1B3-GT	3C	1U5	6BW	2GW5	7GK	3DC3	8MZ
1B4-p	4M	1U6	7DC	2HA5	7GM	3DF3	8MT
1B5	6M	1-V	4G	2HK5	7GM	3DF3A	8MT
1B7-GT	7Z	1V2	9U	2HM5	7GM	3DG4	5DE
1B8-GT	8AW	1V5	8CP	2HQ5-	7GM	3DH3	8NM
1BC2	9RG	1V6	1V6	2HR8	9BJ	3DJ3	8MX
1BC2A	9RG	1W4	5BZ	2J2	9DT	3DK6	7CM
IBC2B	9RG	1W5	8CP	2L2	2L2	3DR3	8NL
1BH2	9RG	1X2	9Y	2T4	7DK	3DS3	8NL
1BH2A	9RG	1X2-A	9Y	2V2	8FV	3DT6	7EN
1BK2	9Y	1X2-B	9Y	2V3-G	4Y	3DT6-A	7EN
1BL2	1AY2	1X2C	9Y	2W3-GT	4X	3DX4	7DK
1BV2	1BV2	1Y2	4P	2X2	4AB	3DY4	7DK
1BX2	9Y	1Z2	7CB	2Y2	4P	3DY4-A	7DK
1BY2	12HZ	2A3	4D	3A2	9DT	3DZ4	7DK
1BY2A	12HZ	2A4-G	5S	3A2A	9RT	3E5	6BX
1C3	5CF	2A5	6B	3A3	8EZ	3E6	7CJ
1C5-GT	6X	2A6	6G	3A3-A	8EZ	3EA5	7EW
1C6	6L	2A7	7C	3A3B	8EZ	3EH7	9AQ
1C7-G	7Z	2AF4	7DK	3A3C	8EZ	3EJ7	9AQ
1C8	8CN	2AF4-A	7DK	3A4	7BB	3ER5	7FP
1D3	8DN	2AF4-B	7DK	3A5	7BC	3ES5	7FP
1D5-Gp	5Y	2AH2	12DG	3A8-GT	8AS	3EV5	7EW
1D5-Gt	5R	2AS2	12EW	3AF4-A	7DK	3FH5	7FP
1D7-G	7Z	2AS2A	12EW	3AF4-B	7DK	3FQ5	7FP
1D8-GT	8AJ	2AV2	9U	3AL5	6BT	3FQ5-A	7FP
1DG3	8ND	2AZ2	9Y	3AT2	12FV	3FS5	7GA
1DG3A	8ND	2B3	8HC	3AT2A	12FV	3FW7	8LM
1DN5	6BW	2B7	7D	3AT2B	12FV	3FX7	8LK
1DY4	7DK	2B22	2B22	3AU6	7BK	3GK5	7FP
1DY4-A	7DK	2BA2	9U	3AV6	7BT	3GS8	9LW
1E4-G	5S-	2BJ2	9RT	3AW2	12HA	3GU5	7GA
1E5-Gp	5Y	2BJ2A	9RT	3AW2A	12HA	3GW5	7GK
1E7-GT	8C	2BN4	7EG	3AW3	8EZ	3HA5	7GM
1E8	8CN	2BN4-A	7EG	3B2	8GH	3HK5	7GM
1F4	5K	2BU2	12HS	3B4	7CY	3HM5	7GM
1F5-G	6X	2C21	7BH	3B5-GT	7AQ	3HM6	9PM
1F6	6W	2C22	4AM	3B7	7BE	3HQ5	7GM
1F7-GH	7AF	2C39	2C39			3HS8	9FG

Tube Type	Basing	Tube Type	Basing	Tube Type	Basing	Tube Type	Basing
3HT6	9PM	5AW4	5T	6A6	7B	6AV5-GT	6CK
3JC6	9PM	5AX4-GT	5T	6A7	7C	6AV6	7BT
3JC6-A	9PM	5AZ3	12BR	6A8-G	8A	6AV11	12BY
3JD6	9PM	5AZ4	5T	6A8-GT	8A	6AW7-GT	8CQ
3KF8	9FG	5B8	9EC	6AB4	5CE	6AW8	9DX
3KT6	9PM	5BC3	9QJ	6AB5	6R	6AW8-A	9DX
3LE4	6BA	5BC3-A	9QJ	6AB7	8N	6AX3	12BL
3LF4	6BB	5BE8	9EG	6AB9	10N	6AX4-GT	4CG
3Q4	7BA	5BK7-A	9AJ	6AC5-GT	6Q	6AX4-GTA	4CG
3Q5-GT	7AP	5BQ7-A	9AJ	6AC6-GT	7W	6AX4-GTB	4CG
3S4	7BA	5BR8	9FA	6AC7	8N	6AX5-GT	6S
3V4	6BX	5BS8	9AJ	6AC9	12GN	6AX6-G	7Q
3W4	7BA	5BT8	9FE	6AC10	12FE	6AX7	9A
4A6-G	8L	5BW8	9HK	6AD4	8DK	6AX8	9AE
4AU6	7BK	5BZ7	9AJ	6AD6-G	7AG	6AY3	9HP
4AV6	7BT	5CG4	5L	6AD7-G	8AY	6AY3-A	9HP
4BA6	7BK	5CG8	9GF	6AD10	12EZ	6AY3-B	9HP
4BC5	7BD	5CL8	9FX	6AD10A	12EZ	6AY11	12DA
4BC8	9AJ	5CL8-A	9FX	6AE5-GT	6Q	6AZ5	8DF
4BE6	7CH	5CM6	9CK	6AE6-G	7AH	6AZ6	8EH
4BL8	9AE	5CM8	9FZ	6AE7-GT	7AX	6AZ8	9ED
4BN4	7EG	5CQ8	9GE	6AF3	9CB	6B4-G	5S
4BN6	7DF	5CR8	9GJ	6AF4	7DK	6B5	6AS
4BQ7-A	9AJ	5CU4	8KD	6AF4-A	7DK	6B6-G	7V
4BS8	9AJ	5CZ5	9HN	6AF5-G	6Q	6B7	7D
4BU8	9FG	5DH8	9EG	6AF6-G	7AG	6B8-G	8E
4BX8	9AJ	5DJ4	8KS	6AF10	12GX	6B8-GT	8E
4BZ6	7CM	5EA8	9AE	6AF11	12DP	6B10	12BF
4BZ7	9AJ	5EH8	9JG	6AG5	7BD	6BA3	9HP
4BZ8	9AJ	5EU8	9JF	6AG7	8Y	6BA4	6BA4
4CB6	7CM	5EW6	7CM	6AG9	12HE	6BA5	8DY
4CE5	7BD	5FG7	9GF	6AG10	12GT	6BA6	7BK
4CS6	7CH	5FV8	9FA	6AG11	12DA	6BA7	8CT
4CX7	9FC	5GH8	9AE	6AH4-GT	8EL	6BA8	9DX
4CY5	7EW	5GH8-A	9AE	6AH6	7BK	6BA8-A	9DX
4DE6	7CM	5GJ7	9QA	6AH7-GT	8BE	6BA11	12ER
4DK6	7CM	5GM6	7CM	6AH9	12HJ	6BC4	9DR
4DT6	7EN	5GS7	9GF	6AJ4	9BX	6BC5	7BD
4DT6-A	7EN	5GX6	7EN	6AJ5	7BD	6BC7	9AX
4EH7	9AQ	5GX7	9QA	6AJ7	8N	6BC8	9AJ
4EJ7	9AQ	5HA7	12FQ	6AK4	8DK	6BD4	8FU
4ES8	9DE	5HB7	9QA	6AK5	7BD	6BD4-A	8FU
4EW6	7CM	5HC7	12FR	6AK6	7BK	6BD5-GT	6CK
4FS7	9MP	5HG8	9MP	6AK7	8Y	6BD6	7BK
4GJ7	9QA	5HZ6	7EN	6AK9	12GZ	6BD11	12DP
4GK5	7FP	5J6	7BF	6AK10	12FE	6BE3	12GA
4GM6	7CM	5JK6	7CM	6AL3	9CB	6BE3-A	12GA
4GS7	9GF	5JL6	7CM	6AL5	6BT	6BE6	7CH
4GS8	9LW	5JW8	9DC	6AL6-G	6AM	6BE8	9EG
4GW5	7GK	5KD8	9AE	6AL7-GT	8CH	6BE8-A	9EG
4GX7	9QA	5KE8	9DC	6AL9	12HE	6BF5	7BZ
4GZ5	7CV	5KZ8	9FZ	6AL11	12BU	6BF6	7BT
4HA5	7GM	5LJ8	9GF	6AM4	9BX	6BF7	8DG
4HA7	12FQ	5BM8	9FA	6AM8	9CY	6BF7-A	8DG
4HC7	12FR	5MB8	9FA	6AM8-A	9CY	6BF8	9NX
4HG8	9MP	5MQ8	9AE	6AN4	7DK	6BF11	12EZ
4HK5	7GM	5R4-G	5T	6AN5	7BD	6BG6-G	5BT
4HM5	7GM	5RA-4-GY	5T	6AN6	7BJ	6BG6-GA	5BT
4HM6	9PM	5R4-GYA	5T	6AN8	9DA	6BG7	8DG
4HQ5	7GM	5R4-GYB	5T	6AN8-A	9DA	6BH3	9HP
4HR8	9BJ	5T4	5T	6AQ5	7BZ	6BH3-A	9HP
4HS8	9FG	5T8	9E	6AQ5-A	7BZ	6BH6	7CM
4HT6	9PM	5U4-G	5T	6AQ6	7BT	6BH8	9DX
4JC6	9PM	5U4-GA	5T	6AQ7-GT	8CK	6BH11	12FP
4JC6-A	9PM	5U4-GB	5T	6AQ8	9AJ	6BJ3	12BL
4JD6	9PM	5U8	9AE	6AR5	6CC	6BJ6	7CM
4JH6	7CM	5U9	10K	6AR6	6BQ	6BJ6-A	7CM
4JK6	7CM	5V3	5T	6AR8	9DP	6BJ7	9AX
4JL6	7CM	5V3-A	5T	6AR11	12DM	6BJ8	9ER
4JW8	9DC	5V4-G	5L	6AS5	7CV	6BK4	8GC
4KE8	9DC	5V4-GA	5L	6AS6	7CM	6BK4-A	8GC
4KF8	9FG	5V6-GT	7AC	6AS7-G	8BD	6BK4-B	8GC
4KN8	9AJ	5W4-GT	5T	6AS7-GA	8BD	6BK4C	8GC
4KT6	9PM	5X4-G	5Q	6AS7-GYB	8BD	6BK5	9BQ
4LJ8	9GF	5X4-GA	5Q	6AS8	9DS	6BK6	7BT
4LU6	7CM	5X8	9AK	6AS11	12DP	6BK7	9AJ
4MK8	9GF	5X9	10K	6AT6	7BT	6BK7-A	9AJ
5AF4-A	7DK	5Y3-G	5T	6AT8	9DW	6BK7-B	9AJ
5AM8	9CY	5Y3-GA	5T	6AT8-A	9DW	6BK11	12BY
5AN8	9DA	5Y3-GT	5T	6AU4-GT	4CG	6BL4	8GB
5AQ5	7BZ	5Y4-G	5Q	6AU4-GTA	4CG	6BL7-GT	8BD
5AR4	5DA	5Y4-GA	5Q	6AU5-GT	6CK	6BL7-GTA	8BD
5AS4-A	5T	5Y4-GT	5Q	6AU6	7BK	6BL8	9AE
5AS8	9DS	5Z3	4C	6AU6-A	7BK	6BM8	9EX
5AT4	5L	5Z4-GT	5L	6AU7	9A	6BN4	7EG
5AT8	9DW	6A3	4D	6AU8	9DX	6BN4-A	7EG
5AU4	5T	6A4/LA	5B	6AU8-A	9DX	6BN6	7DF
5AV8	9DZ	6A5-G	6T	6AV5-GA	6CK	6BN7	9BT

Tube Type	Basing	Tube Type	Basing	Tube Type	Basing	Tube Type	Basing
6BN8	9ER	6CS7	9EF	6EL4	8MW	6GV5	12DR
6BN11	12GF	6CS8	9FZ	6EL4A	8MW	6GV7	9KN
6BQ5	9CV	6CT3	9RX	6EM5	9HN	6GV8	9LY
6BQ6-G	6AM	6CU5	7CV	6EM7	8BD	6GW5	7GK
6BQ6-GTA	6AM	6CU6	6AM	6EN4	8NJ	6GW6	6AM
6BQ6-GTB	6AM	6CU8	9GM	6EQ7	9LQ	6GW8	9LZ
6BQ7	9AJ	6CW4	12AQ	6ER5	7FP	6GX6	7EN
6BQ7-A	9AJ	6CW5	9CV	6ES5	7FP	6GX7	9QA
6BR3	9CB	6CX7	9FC	6ES8	9DE	6GY5	12DR
6BR8	9FA	6CX8	9DX	6ET7	9LT	6GY6	7EN
6BR8-A	9FA	6CY5	7EW	6EU7	9LS	6GY8	9MB
6BS3	9HP	6CY7	9LG	6EU8	9JF	6GZ5	7CV
6BS3-A	9HP	6CZ5	9HN	6EV5	7EW	6H4-GT	5AF
6BS8	9AJ	6D4	5AY	6EV7	9LP	6H6-GT	7Q
6BT6	7BT	6D6	6F	6EW6	7CM	6HA5	7GM
6BT8	9FE	6D7	7H	6EW7	9HF	6HA6	9NW
6BU4	8GC	6D8-G	8A	6EX6	5BT	6HB5	12BJ
6BU5	6BU5	6D10	12BY	6EY6	7AC	6HB6	9NW
6BU6	7BT	6DA4	4CG	6EZ5	7AC	6HB7	9QA
6BU8	9FG	6DA4-A	4CG	6EZ8	9KA	6HC8	9EX
6BU8-A	9FG	6DA5	9DB	6F4	7BR	6HD5	12ES
6BV8	9FJ	6DA7	9EF	6F5-G	5M	6HD7	9QA
6BV11	12HB	6DB5	9GR	6F5-GT	5M	6HE5	12EY
6BW3	12FX	6DB6	7CM	6F6-G	7S	6HE7	12FS
6BW4	9DJ	6DC6	7CM	6F6-GT	7S	6HF5	12FB
6BW6	9AM	6DC8	9HE	6F7	7E	6HF8	9DX
6BW8	9HK	6DE4	4CG	6F8-G	8G	6HG5	7BZ
6BW11	12HD	6DE6	7CM	6FA7	9MR	6HG8	9MP
6BX7-GT	8BD	6DE7	9HF	6FD6	7BK	6HJ5	12FL
6BX8	9AJ	6DG6-GT	7S	6FD7	9HF	6HJ7	9QA
6BY4	6BY4	6DJ8	9DE	6FE5	8KB	6HJ8	9CY
6BY5-G	6CN	6DK3	9SG	6FG5	7GA	6HK5	7GM
6BY5-GA	6CN	6DK6	7CM	6FG6	9GA	6HL5	9QW
6BY6	7CH	6DL3	9GD	6FG7	9GF	6HL8	9AE
6BY8	9FN	6DL4	9NY	6FH5	7FP	6HM5	7GM
6BY11	12EZ	6DM4	4CG	6FH6	6AM	6HM6	9PM
6BZ3	12FX	6DM4-A	4CG	6FH8	9KP	6HQ5	7GM
6BZ6	7CM	6DN3	9HP	6FJ7	12BM	6HQ6	7CM
6BZ7	9AJ	6DN6	5BT	6FM7	12EJ	6HR5	7BZ
6BZ8	9AJ	6DN7	8BD	6FM8	9KR	6HR6	7BK
6C4	6BG	6DQ3	12HF	6FQ5	7FP	6HS5	12GY
6C5-GT	6Q	6DQ3A	12HF	6FQ5-A	7FP	6HS6	7BK
6C6	6F	6DQ4	4CG	6FQ7	9LP	6HS8	9FG
6C7	7G	6DQ5	8JC	6FR7	9HF	6HT6	9PM
6C8-G	8G	6DQ6	6AM	6FS5	7GA	6HU6	9GA
6C9	10F	6DQ6-A	6AM	6FV6	7FQ	6HV5	12GY
6C10	12BQ	6DQ6-B	6AM	6FV8	9FA	6HV5A	12GY
6CA4	9M	6DR4	6BG	6FV8-A	9FA	6HW8	9NQ
6CA5	7CV	6DR7	9HF	6FW5	6CK	6HZ5	12GY
6CA7	8EP	6DS4	12AQ	6FW7	8LM	6HZ6	7EN
6CA11	12HN	6DS5	7BZ	6FW8	9AJ	6HZ8	9DX
6CB5	8GD	6DT3	12HF	6FX7	8LK	6J4	7BQ
6CB5-A	8GD	6DT4	4CG	6FY5	7FP	6J5-GT	6Q
6CB6	7CM	6DT5	9HN	6FY7	12EO	6J6	7BF
6CB6-A	7CM	6DT6	7EN	6FY8	9EX	6J6-A	7BF
6CD3	12FX	6DT6-A	7EN	6G6-G	7S	6J7-G	7R
6CD6-G	5BT	6DT8	9DE	6G6-GT	7S	6J7-GT	7R
6CD6-GA	5BT	6DW4	9HP	6G11	12BU	6J8-G	8H
6CE3	12GK	6DW4-A	9HP	6GA7	12EB	6J9	10G
6CE5	7BD	6DW4-B	9HP	6GB5	9NH	6J10	12BT
6CF6	7CM	6DW5	9CK	6GC5	9EU	6J11	12BW
6CG3	12HF	6DX4	7DK	6GC6	8JX	6JA5	12EY
6CG6	7BK	6DX8	9HX	6GD7	9GF	6JA8	9DX
6CG7	9AJ	6DY4	7DK	6GE5	12BJ	6JB5	12EY
6CG8	9GF	6DY4-A	7DK	6GE8	9LC	6JB6	9QL
6CG8-A	9GF	6DY7	8JP	6GF5	12BJ	6JB6-A	9QL
6CH3	9HP	6DZ4	7DK	6GF7	9QD	6JC5	12EY
6CH7	9FC	6DZ7	8JP	6GF7-A	9QD	6JC6	9PM
6CH8	9FT	6DZ8	9JE	6GH8	9AE	6JC6-A	9PM
6CJ3	9SD	6E5	6R	6GH8-A	9AE	6JC8	9PA
6CK3	9HP	6E6	7B	6GJ5	9QK	6JD5	12GY
6CK4	8JB	6E7	7H	6GJ5-A	9QK	6JD6	9PM
6CL3	9HP	6EA4	12FA	6GJ7	9QA	6JE6	9QL
6CL5	8GD	6EA5	7EW	6GJ8	9AE	6JE6-A	9QL
6CL6	9BV	6EA7	8BD	6GK5	7FP	6JE6-B	9QL
6CL8	9FX	6EA8	9AE	6GK6	9GK	6JE6-C	9QL
6CL8-A	9FX	6EB5	6BT	6GK7	9AQ	6JE8	9DX
6CM3	9HP	6EB8	9DX	6GL7	8BD	6JF6	9QL
6CM6	9CK	6EF4	12HC	6GM5	9MQ	6JG5	9SF
6CM7	9ES	6EF6	7S	6GM6	7CM	6JG6	9QU
6CM8	9FZ	6EH4	12FA	6GM8	9DE	6JG6-A	9QU
6CN7	9EN	6EH4A	12FA	6GN8	9DX	6JH5	12JE
6CQ4	4CG	6EH5	7CV	6GQ7	9QM	6JH6	7CM
6CQ8	9GE	6EH7	9AQ	6GS8	9LW	6JH8	9DP
6CR6	7EA	6EH8	9JG	6GT5	9NZ	6JK5	12JE
6CR8	9GJ	6EJ4	12HC	6GT5-A	9NZ	6JK6	7CM
6CS5	9GR	6EJ4A	12HC	6GU5	7GA	6JK8	9AJ
6CS6	7CH	6EJ7	9AQ	6GU7	9LP	6JL6	7CM

INDEX of BASING DIAGRAMS by TUBE TYPE

Tube Type	Basing	Tube Type	Basing	Tube Type	Basing	Tube Type	Basing
6JL8	9DX	6LV6	12GW	6V7-G	7V	8BN11	12GF
6JM6	12FJ	6LW6	8NC	6V8	9AH	8BQ5	9CV
6JM6-A	12FJ	6LX6	12JA	6W4-GT	4CG	8BQ11	12DM
6JN6	12FK	6LX8	9DC	6W4-GTA	4CG	8BU11	12FP
6JN6-A	12FK	6LY8	9DX	6W5-G	6S	8CB11	12DM
6JN8	9FA	6LZ6	9QL	6W6-GT	7AC	8CG7	9AJ
6JQ6	9RA	6M3	8GV	6W7-G	7R	8CM7	9ES
6JR6	9QU	6M11	12CA	6X4	5BS	8CN7	9EN
6JS6	12FY	6MA6	8NP	6X5-GT	6S	8CS7	9EF
6JS6-A	12FY	6MB6	12FY	6X8	9AK	8CW5	9CV
6JS6-B	12FY	6MB8	9FA	6X8-A	9AK	8CW5-A	9CV
6JS6C	12FY	6MC6	9QL	6X9	10K	8CX8	9DX
6JT6	9QU	6MD8	9RQ	6Y3-G	4AC	8CY7	9LG
6JT6-A	9QU	6ME6	9QL	6Y6-G	7AC	8EB8	9DX
6JT8	9DX	6ME8	9RU	6Y6-GA	7AC	8EM5	9HN
6JU6	9QL	6MF8	12DZ	6Y6-GT	7AC	8ET7	9LT
6JU8	9PQ	6MG8	9DC	6Y7-G	8B	8FQ7	9LP
6JU8-A	9PQ	6MJ8	12HG	6Y9	10L	8GJ7	9QA
6JV8	9DX	6MK8	9FG	6Y10	12EZ	8GN8	9DX
6JW6	9PU	6MK8A	9FG	6Z5	6K	8GU7	9LP
6JW8	9DC	6ML8	9RQ	6Z7-G	8B	8GX7	9QA
6JZ6	12GD	6MN8	12HU	6Z10	12BT	8HA6	9NW
6JZ8	12DZ	6MQ8	9AE	6ZY5-G	6S	8HG8	9MP
6K4	6K4	6MU8	9AE	7A4	5AC	8JE8	9DX
6K5-G	5U	6MV8	9DX	7A5	6AA	8JK8	9AJ
6K5-GT	5U	6MY8	12DZ	7A6	7AJ	8JL8	9DX
6K6-GT	7S	6N4	7CA	7A7	8V	8JT8	9DX
6K7-G	7R	6N6-G	7AU	7A8	8U	8JU8-A	9PQ
6K7-GT	7R	6N7-G	8B	7AB7	8BQ	8JV8	9DX
6K8-G	8K	6M7-GT	8B	7AD7	8V	8KA8	9PV
6K8-GT	8K	6P5-GT	6Q	7AF7	8AC	8KR8	9DX
6K11	12BY	6P7-G	7U	7AG7	8V	8KS8	9DX
6KA8	9PV	6Q7-G	7V	7AH7	8V	8LC8	9QY
6KD6	12GW	6Q7-GT	7V	7AJ7	8V	8LE8	9QZ
6KD8	9AE	6Q11	12BY	7AK7	8V	8LS6	9GK
6KE6	12GM	6R3	9CB	7AU7	9A	8LT8	9RL
6KE8	9DC	6R7-G	7V	7B4	5AC	8MU8	9AE
6KF8	9FG	6R7-GT	7V	7B5	6AE	8SN7-GTB	8BD
6KG6	9RJ	6R8	9E	7B6	8W	8U9	10K
6KL8	9LQ	6S4	9AC	7B7	8V	8X9	10K
6KM6	9QL	6S4-A	9AC	7B8	8X	9A8	9DC
6KM8	9QG	6S7-G	7R	7C4	4AH	9AH9	12HJ
6KN6	12GU	6S8-GT	8CB	7C5	6AA	9AK10	12FE
6KN8	9AJ	6SA7	8R	7C6	8W	9AU7	9A
6KR8	9DX	6SA7-GT	8AD	7C7	8V	9BJ11	12FU
6KR8-A	9DX	6SB7-Y	8R	7E5	8BN	9BR7	9CF
6KS6	7DF	6SC7-GT	8S	7E6	8W	9CG8-A	9GF
6KS8	9DX	6SD7-GT	8N	7E7	8AE	9CL8	9FX
6KT6	9PM	6SE7-GT	8N	7EY6	7AC	9DZ8	9JE
6KT8	9QP	6SF5-GT	6AB	7F7	8AC	9EA8	9AE
6KU8	9LT	6SF7	7AZ	7F8	8BW	9EF6	7S
6KV6	9QU	6SG7-GT	8BK	7G7	8V	9GH8-A	9AE
6KV6A	9QU	6SH7-GT	8BK	7G8	8BV	9GV8	9LY
6KV8	9DX	6SJ7-GT	8N	7GS7	9GF	9JW8	9DC
6KY6	9GK	6SK7-GT	8N	7GV7	9KN	9KC6	9RF
6KY8	9QT	6SL7-GT	8BD	7H7	8V	9KX6	9GK
6KY8-A	9QT	6SN7-GT	8BD	7HG8	9MP	9KZ8	9FZ
6KZ8	9FZ	6SN7-GTA	8BD	7J7	8BL	9LA6	9GK
6L4	7BR	6SN7-GTB	8BD	7K7	8BF	9ML8	9RQ
6L5-G	6Q	6SQ7-GT	8Q	7KY6	9GK	9MN8	12HU
6L6-G	7AC	6SR7-GT	8Q	7KZ6	9GK	9U8-A	9AE
6L6-GA	7AC	6SS7	8N	7L7	8V	9X8	9AK
6L6-GB	7AC	6ST7	8Q	7N7	8AC	10	4D
6L6-GC	7AC	6SU7-GTY	8BD	7Q7	8AL	10AL11	12BU
6L7-G	7T	6SV7	7AZ	7R7	8AE	10BQ5	9CV
6LB6	12GJ	6SZ7	8Q	7S7	8BL	10C8	9DA
6LB8	9DX	6T4	7DK	7T7	8V	10CW5	9CV
6LC6	8ML	6T5	6R	7V7	8V	10DA7	9EF
6LC8	9QY	6T7-G	7V	7W7	8BJ	10DE7	9HF
6LE8	9QZ	6T8	9E	7X6	7AJ	10DR7	9HF
6LF6	12GW	6T8-A	9E	7X7	8BZ	10DX8	9HX
6LF8	9DX	6T9	12FM	7Y4	5AB	10EB8	9DX
6LG6	12HL	6T10	12EZ	7Z4	5AB	10EG7	8DB
6LH6	8ML	6U4-GT	4CG	8A8	9DC	10EM7	8BD
6LH6-A	8ML	6U5	6R	8AC9	12GN	10EW7	9HF
6LJ6	8MQ	6U6-GT	7AC	8AC10	12FE	10FD7	9HF
6LJ6-A	8MQ	6U7-G	7R	8AC10A	12FE	10FR7	9HF
6LJ8	9GF	6U8	9AE	8AL9	12HE	10GF7	9QD
6LM8	9AE	6U8-A	9AE	8AR11	12DM	10GF7-A	9QD
6LM8A	9AE	6U9	10K	8AU8	9DX	10GK6	9GK
6LN8	9AE	6U10	12FE	8AU8-A	9DX	10GN8	9DX
6LQ6	9QL	6V3	9BD	8AW8-A	9DX	10HA6	9NW
6LQ8	9DX	6V3-A	9BD	8B10	12BF	10HF8	9DX
6LR6	12FY	6V4	9M	8BA8-A	9DX	10JA5	12EY
6LR8	9QT	6V5-GT	6AO	8BA11	12ER	10JA8	9DX
6LT8	9RL	6V6	7AC	8BH8	9DX	10JT8	9DX
6LU6	7CM	6V6-GT	7AC	8BM11	12FU	10JY8	9DX
6LU8	12DZ	6V6-GTA	7AC	8BN8	9ER		

INDEX of BASING DIAGRAMS by TUBE TYPE

Tube Type	Basing	Tube Type	Basing	Tube Type	Basing	Tube Type	Basing
10KR8	9DX	12BE6-A	7CH	12EL6	7FB	13FM7	12EJ
10KU8	9LT	12BF6	7BT	12EM6	9HV	13FR7	9HF
10LB8	9DX	12BF11	12EZ	12EN6	7AC	13GB5	9NH
10LE8	9QZ	12BH7	9A	12EQ7	9LQ	13GF7	9QD
10LW8	9DX	12BH7-A	9A	12EZ6	7BK	13GF7-A	9QD
10LY8	9DX	12BK5	9BQ	12F5-GT	5M	13J10	12BT
10LZ8	9DX	12BK6	7BT	12F8	9FH	13JZ8	12DZ
10T10	12EZ	12BL6	7BK	12FA6	7CH	13JZ8A	12DZ
10Z10	12BJ	12BN6	7DF	12FK6	7BT	13V10	12EZ
11AR11	12DM	12BN6-A	7DF	12FM6	7BT	13Z10	12BT
11BM8	9EX	12BQ6-GTA	6AM	12FQ7	9LP	14A4	5AC
11BQ11	12DM	12BQ6-GTB	6AM	12FQ8	9KT	14A5	6AA
11BT11	12GS	12BR3	9CB	12FR8	9KU	14A7	8V
11C5	7CV	12BR7	9CF	12FT6	7BT	14AF7	8AC
11CA11	12HN	12BR7-A	9CF	12FV7	9A	14B6	8W
11CF11	12HW	12BS3	9HP	12FX5	7CV	14B8	8X
11CH11	12GS	12BS3-A	9HP	12FX8	9KV	14BL11	12GC
11CY7	9LG	12BT3	12BL	12FX8-A	9KV	14BR11	12GL
11DS5	7BZ	12BT6	7BT	12FY8	9EX	14C5	6AA
11FY7	12EO	12BU6	7BT	12G4	6BG	14C7	8V
11HM7	9BF	12BV7	9BF	12G8	9CZ	14E6	8W
11JE8	9DX	12BV11	12HB	12G11	12BU	14E7	8AE
11KV8	9DX	12BW4	9DJ	12GA6	7CH	14F7	8AC
11LQ8	9DX	12BY3	9CB	12GC6	8JX	14F8	8BW
11LT8	9RL	12BY7	9BF	12GE5	12BJ	14GT8	9KR
11LY6	9GK	12BY7-A	9BF	12GJ5	9QK	14GT8-A	9KR
11MS8	9LY	12BZ6	7CM	12GN7	9BF	14H7	8V
11Y9	10L	12BZ7	9A	12GN7-A	9BF	14J7	8BL
12A	4D	12C5	7CV	12GT5	9NZ	14JG8	9KR
12A4	9AG	12C8	8E	12GT5-A	9NZ	14N7	8AC
12A5	7F	12CA5	7CV	12GW6	6AM	14Q7	8AL
12A6-GT	7AC	12CK3	9HP	12H4	7DW	14R7	8AE
12A7	7K	12CL3	9HP	12H6	7Q	14S7	8BL
12A8-G	8A	12CM6	9CK	12HE7	12FS	14W7	8BJ
12A8-GT	8A	12CN5	7CV	12HG7	9BF	14X7	8BZ
12AB5	9EU	12CR6	7EA	12HL5	9QW	14Y4	5AB
12AC6	7BK	12CS5	9GR	12J5-GT	6Q	14	5F
12AC10	12FE	12CS6	7CH	12J7-GT	7R	15A8	8GS
12AD6	7CH	12CT3	9RX	12J8	9GC	15AB9	10N
12AD7	9A	12CT8	9DA	12JB6	9QL	15AF11	12DP
12AE6	7BT	12CU5	7CV	12JB6-A	9QL	15BD11	12DP
12AE6-A	7BT	12CU6	6AM	12JF5	12JH	15BD11-A	12DP
12AE7	9A	12CX6	7BK	12JN6	12FK	15CW5	9CV
12AE10	12EZ	12CY6	7BK	12JN6-A	12FK	15DQ8	9HX
12AF3	9CB	12D4	4CG	12JN8	9FA	15EA7	8BD
12AF6	7BK	12D4-A	4CG	12JQ6	9RA	15EW6	7CM
12AG6	7CH	12DB5	9GR	12JS6	12FY	15EW7	9HF
12AH7-GT	8BE	12DE8	9HG	12JT6	9QU	15FM7	12EJ
12AJ6	7BT	12DF5	9BS	12JT6-A	9QU	15FY7	12EO
12AL5	6BT	12DF7	9A	12K5	7FD	15HA6	9NW
12AL8	9GS	12DJ8	9DE	12K7-GT	7R	15HB6	9NW
12AL11	12BU	12DK5	9GT	12K8-GT	8K	15KY8	9QT
12AQ5	7BZ	12DK6	7CM	12KL8	9LQ	15KY8-A	9QT
12AS5	7CV	12DK7	9HZ	12L6-GT	7AC	15LE8	9QZ
12AT6	7BT	12DL8	9HR	12L8-GT	8BU	15MF8	12DZ
12AT6-A	7BT	12DM4	4CG	12MD8	9RQ	15MX8	9QT
12AT7	9A	12DM4-A	4CG	12Q7-GT	7V	16A8	9EX
12AU6	7BK	12DM5	7CV	12R5	7CV	16AK9	12GZ
12AU6-A	7BK	12DM7	9A	12S8-GT	8CB	16AQ3	9CB
12AU7	9A	12DQ4	4CG	12SA7	8R	16BQ11	12DM
12AU7-A	9A	12DQ6	6AM	12SA7-GT	8AD	16BX11	12CA
12AU8	9DX	12DQ6-A	6AM	12SC7	8S	16GK6	9GK
12AV5-GA	6CK	12DQ6-B	6AM	12SF5-GT	6AB	16GY5	12DR
12AV6	7BT	12DQ7	9BF	12SF7-GT	7AZ	16KA6	12GH
12AV6-A	7BT	12DS7	9JU	12SG7	8BK	16LU8	12DZ
12AV7	9A	12DS7-A	9JU	12SH7	8BK	16LU8A	12DZ
12AW6	7CM	12DT5	9HN	12SJ7-GT	8N	16MY8	12DZ
12AX3	12BL	12DT6	7EN	12SK7-GT	8N	16Y9	10L
12AX4-GT	4CG	12DT7	9A	12SL7-GT	8BD	17A8	9DC
12AX4-GTA	4CG	12DT8	9DE	12SN7-GT	8BD	17AB9	10N
12AX4-GTB	4CG	12DU7	9JX	12SN7-GTA	8BD	17AB10	12BT
12AX7	9A	12DV7	9JY	12SQ7-GT	8Q	17AV5-GA	6CK
12AX7-A	9A	12DV8	9HR	12SR7-GT	8Q	17AX3	12BL
12AY3	9HP	12DW4-A	9HP	12SW7	8Q	17AX4-GT	4CG
12AY3-A	9HP	12DW5	9CK	12SX7-GT	8BD	17AX4-GTA	4CG
12AY7	9A	12DW7	9A	12SY7	8R	17AY3	9HP
12AZ7	9A	12DW8	9JC	12SY7-GT	8AD	17AY3-A	9HP
12AZ7-A	9A	12DY8	9JD	12T10	12EZ	17BE3	12GA
12B4	9AG	12DZ6	7BK	12U7	9A	17BE3-A	12GA
12B4-A	9AG	12DZ8	9JE	12V6-GT	7AC	17BF11	12EZ
12B8-GT	8T	12E5-GT	6Q	12W6-GT	7AC	17BF11-A	12EZ
12BA6	7BK	12EA6	7BK	12X4	5BS	17BH3	9HP
12BA6-A	7BK	12EC8	9FA	12Z3	4G	17BH3-A	9HP
12BA7	8CT	12ED5	7CV	13CW4	12AQ	17BQ6-GTB	6AM
12BD6	7BK	12EF6	7S	13DE7	9HF	17BR3	9CB
12BE3	12GA	12EG6	7CH	13DR7	9HF	17BS3	9HP
12BE3-A	12GA	12EH5	7CV	13EM7	8BD	17BS3-A	9HP
12BE6	7CH	12EK6	7BK	13FD7	9HF	17BW3	12FX

INDEX of BASING DIAGRAMS by TUBE TYPE

Tube Type	Basing
17BZ3	12FX
17C5	7CV
17C9	10F
17C9-A	10F
17CA5	7CV
17CK3	9HP
17CL3	9HP
17CT3	9RX
17CU5	7CV
17D4	4CG
17D4-A	4CG
17DE4	4CG
17DM4	4CG
17DM4-A	4CG
17DQ4	4CG
17DQ6	6AM
17DQ6-A	6AM
17DQ6-B	6AM
17DW4-A	9HP
17EW8	9AJ
17GE5	12BJ
17GJ5	9QK
17GJ5-A	9QK
17GT5	9NZ
17GT5-A	9NZ
17GV5	12DR
17GW6	6AM
17H3	9FK
17HC8	9EX
17JB6	9QL
17JB6-A	9QL
17JF6	9QL
17JG6	9QU
17JG6-A	9QU
17JK8	9AJ
17JM6	12FJ
17JM6-A	12FJ
17JN6	12FK
17JN6-A	12FK
17JQ6	9RA
17JR6	9QU
17JT6	9QU
17JT6-A	9QU
17JZ8	12DZ
17JZ8A	12DZ
17KV6	9QU
17KV6A	9QU
17L6-GT	7AC
17LD8	9QT
17R5	7CV
17W6-GT	7AC
17X10	12BT
18A5	6CK
18AJ10	12EZ
18DZ8	9JE
18FW6	7CC
18FW6-A	7CC
18FX6	7CH
18FX6-A	7CH
18FY6	7BT
18FY6-A	7BT
18GB5	9NH
18GD6	7BK
18GD6-A	7BK
18GE6	7BT
18GE6-A	7BT
18GV8	9LY
18HB8	9ME
19	6C
19AU4	4CG
19AU4-GTA	4CG
19BG6-G	5BT
19BG6-GA	5BT
19C8	9E
19CG3	12HF
19CL8-A	9FX
19CL8-B	9FX
19DE3	12HX
19DE7	9HF
19DK3	9SG
19DQ3	12HF
19DQ3A	12HF
19EA8	9AE
19EA8-A	9AE
19EW7	9HF
19EZ8	9KA
19FX5	7CV
19GQ7	9QM
19HR6	7BK
19HS6	7BK
19HV8	9FA
19J6	7BF
19JN8	9FA
19KG8	9LY
19Q9	10H
19T8	9E
19T8-A	9E
19V8	9AH
19X8	9AK
20	4D
20EQ7	9LQ
20EW7	9HF
20EZ7	9PG
21EX6	5BT
21GY5	12DR
21HB5	12BJ
21HB5-A	12BJ
21HD5	12ES
21HJ5	12FL
21JS6A	12FY
21JV6	12FK
21JZ6	12GD
21KA6	12GH
21KQ6	9RJ
21LG6	12HL
21LG6A	12HL
21LR8	9QT
21LU8	12DZ
21MY8	12DZ
22	4K
22BH3	9HP
22BH3-A	9HP
22BW3	12FX
22DE4	4CG
22JF6	9QL
22JG6	9QU
22JG6-A	9QU
22JR6	9QU
22JU6	9QL
22KM6	9QL
22KV6A	9QU
23JS6-A	12FY
23MB6	12FY
23Z9	12GZ
24A	5E
24BF11	12EZ
24JE6-A	9QL
24JZ8	12DZ
24LQ6	9QL
24LZ6	9QL
25A6-GT	7S
25A7-GT	8F
25AC5-GT	6Q
25AV5-GA	6CK
25AV5-GT	6CK
25AX4-GT	4CG
25B5	6D
25B6-G	7S
25B8-GT	8T
25BK5	9BQ
25BQ6-GA	6AM
25BQ6-GT	6AM
25BQ6-GTB	6AM
25BR3	9CB
25C5	7CV
25C6-G	7AC
25C6-GA	7AC
25CA5	7CV
25CD6-G	5BT
25CD6-GA	5BT
25CD6-GB	5BT
25CG3	12HF
25CK3	9HP
25CM3	9HP
25CT3	9RX
25CU6	6AM
25D4	4CG
25D8-GT	8AF
25DK3	9SG
25DK4	5BQ
25DN6	5BT
25DQ6	6AM
25DQ6-A	6AM
25DT5	9HN
25E5	8GT
25EC6	5BT
25EH5	7CV
25F5	7CV
25F5-A	7CV
25FY8	9EX
25HX5	9SB
25JQ6	9RA
25JZ8	12DZ
25L6	7AC
25L6-GT	7AC
25N6-G	7W
25W4-GT	4CG
25W6-GT	7AC
25X6-GT	7Q
25Y5	6E
25Z4	5AA
25Z5	6E
25Z6-GT	7Q
26	4D
26A6	7BK
26A7-GT	8BU
26C6	7BT
26CG6	7BK
26D6	7CH
26E6-G	7S
26HU5	8NB
26LW6	8NC
26Z5	9BS
27	5A
FG-27-A	FG-27-A
27GB5	9NH
27KG6	9RJ
28D7	8BS
28GB5	9NH
28HA6	9NW
28HD5	12ES
28Z5	6BJ
29LE6	9RJ
29GK6	9GK
29KQ6	9RJ
30	4D
30AG11	12DA
30CW5	9CV
30HJ5	12FL
30JZ6	12GD
30KD6	12GW
30MB6	12FY
31	4D
31AL10	12HR
31JS6-A	12FY
31JS6C	12FY
31LQ6	9QL
31LR8	9QT
31LZ6	9QL
32	4K
32ET5	7CV
32ET5-A	7CV
32HQ7	12HT
32L7-GT	8Z
33	5K
33GT7	12FC
33GY7	12FN
33GY7-A	12FN
33HE7	12FS
33JR6	9QU
33JV6	12FK
34	4M
34CD3	12FX
34CE3	12GK
34CM3	9HP
34GD5	7CV
34GD5-A	7CV
34R3	9CB
35/51	5E
35A5	6AA
35B5	7BZ
35C5	7CV
35C5-A	7CV
35CD6-GA	5BT
35DZ8	9JE
35EH5	7CV
35EH5-A	7CV
35GL6	7FZ
35HB8	9ME
35L6-GT	7AC
35LR6	12FY
35W4	5BQ
35W4-A	5BQ
35Y4	5AL
35Z3	4Z
35Z4-GT	5AA
35Z5-GT	6AD
35Z6-G	7Q
36	5E
36AM3	5BQ
36AM3-A	5BQ
36AM3-B	5BQ
36KD6	12GW
36MC6	9QL
37	5A
38	5F
38HE7	12FS
38HK7	12FS
39/44	5F
40	4D
40FR5	7CV
40KD6	12GW
40KG6	9RJ
41	6B
42	6B
42KN6	12GU
43	6B
45	4D
45B5	9CV
45Z3	5AM
45Z5-GT	6AD
46	5C
47	5B
48	6A
49	5C
50	4D
50A5	6AA
50AX6-G	7Q
50B5	7BZ
50BK5	9BQ
50BM8	9EX
50C5	7CV
50C5-A	7CV
50C6-G	7AC
50C6-GA	7AC
50CA5	7CV
50DC4	5BQ
50E5	8GT
50EH5	7CV
50EH5-A	7CV
50FA5	7CV
50FE5	8KB
50FK5	7CV
50FY8	9EX
50GY7	12FN
50GY7A	12FN
50HC6	7FZ
50HK6	7FZ
50HN5	9QW
50JY6	8MG
50L6-GT	7AC
50X6	7AJ
50Y6-GT	7Q
50Y7-GT	8AN
50Z6-G	7Q
50Z7-G	8AN
53	7B
53HK7	12FS
55	6G
56	5A
56R9	12EN
57	6F
58	6F
58HE7	12FS
59	7A
60FX5	7CV
60HL5	9QW
70A7-GT	8AB
70L7-GT	8AA
71-A	4D
75	6G
76	5A
77	6F
78	6F
79	6H
80	4C
81	4B
FG-81-A	3G
82	4C
83	4C
83-V	4AD
84/6Z4	5D

INDEX of BASING DIAGRAMS by TUBE TYPE

Tube Type	Basing
85	6G
89	6F
FG-97	FG-97
FG-98-A	FG-97
V99	4E
X99	4D
FG-105	FG-105
117L7-GT	8AO
117M7-GT	8AO
117N7-GT	8AV
117P7-GT	8AV
117Z3	4CB
117Z4-GT	5AA
117Z6-GT	7Q
FG-154	FG-154
FG-172	FG172
182-B	4D
183	4D
393-A	5AV
407-A	407-A
408-A	7BD
414	414
485	5A
502-A	6BS
512-AX	512-AX
575-A	575-A
627	4BZ
672-A	672-A
673	2P
678	678
807	5AW
816	4P
866-A	4P
872-A	4AT
884	6Q
950	5K
954	5BB
955	5BC
956	5BB
957	5BD
958-A	5BD
959	5BE
1612	7T
1614	7AC
1620	7R
1621	7S
1622	7AC
1625	5AZ
1629	7AL
1631	7AC
1632	7AC
1633	8BD
1634	8S
1635	8B
1644	8BU
1654	2Z
2050	6BS
2050-A	6BS
5544	4BZ
GL5550	GL5550
GL5551A/ GL5551A-PC	GL5551A
GL5551A	GL5551A
GL5551A-PC	GL5551A
GL5552A/ GL5552A-PC	GL5552A
GL5553B/ GL5553B-PC	GL5553B
GL5553B	GL5553B
GL5553B-PC	GL5553B
GL5554	GL5554
GL5555	GL5555
5557	3G
5558	5558
5559	4BL
5560	4CD
5561	5561
5563-A	5563-A
GL5564	GL5564
5590	7BD
5591	7BD
5608-A	7B
5610	6CG
GL5630	GL5630
5632	FG-27-A
5633	5633
5634	5633
5635	8DB

Tube Type	Basing
5636	8DC
5637	5637
5638	5638
5639	8DL
5640	5640
5641	6CJ
5642	5642
5645	5645
5646	5645
5647	5647
5651	5BO
5651-A	5BO
5654	7BD
5663	6CE
5665	5665
5670	8CJ
5672	2E31
5675	5675
5676	5676
5677	5676
5678	1AD4
5679	7CX
5686	9G
5687	9H
5690	5690
5691	8BD
5692	8BD
5693	8N
5694	8CS
5696	7BN
5696-A	7BN
5702	5702
5703	5703
5704	5704
5718	8DK
5719	8DK
5720	5559
5725	7CM
5726	6BT
5727	7BN
5728	5559
5731	5BC
5744	5744
5749	7BK
5750	7CH
5751	9A
5763	9K
5767	5767
5784	5702
5785	5785
5797	8CY
5798	8CZ
5814	9A
5814-A	9A
GL5822A	GL5822A
GL5822A-PC	GL5822A
5823	4CK
5824	7AC
5825	4P
5829	5829
5830	5830
5838	6S
5839	6S
5840	8DE
5842	9V
5844	7BF
5847	9X
5847-A	9X
5851	6CL
5852	6S
5854	2E31
5855	5855
5873	5873
5875	1AD4
5876	5675
5876-A	5675
5879	9AD
5881	7AC
5885	5885
5586	5886
5890	12J
5894B	5894B
5896	8DJ
5897	8DK
5898	8DK
5899	8DL
5900	8DL
5901	8DL

Tube Type	Basing
5902	8DL
5903	8DJ
5904	8DK
5905	8DL
5906	8DL
5907	8DL
5908	8DC
5910	6AR
5915	7CH
5915-A	7CH
5916	8DC
5930	4D
5931	5T
5932	7AC
5963	9A
5964	7BF
5965	9A
5965-A	9A
5967	8DQ
5968	8DQ
5969	8DR
5970	8DS
5971	5971
5972	1AD4
5975	5975
5977	8DK
5987	8DM
5992	7AC
5993	5993
5995	5995
5998	8BD
5998-A	8BD
6000	6CK
6004	2AJ
6005	7BZ
6011/710	FG-27-A
6012	6CO
6014/C1K	4AX
6021	8DG
6028	7BD
6029	5676
6045	7BF
6046	7AC
6049	8DL
6050	5676
6051	6051
6072	9A
6072-A	9A
6080	8BD
6082	8BD
6082-A	8BD
6087	5L
6088	512-AX
6092	2E31
6094	9DH
6095	7BZ
6096	7DB
6097	6BT
6098	6BQ
6100	6BG
6101	7BF
6106	5L
6110	8DJ
6111	8DG
6112	8DG
6113	8BD
6121	5676
6134	8N
6135	6BG
6136	7BK
6137	8N
6145	8V
6146	7CK
6146-A	7CK
6146-B	7CK
6147	6CL
6152	5975
6159-A	7CK
6159-B	7CK
6169	8EE
6173	6173
6184	8EH
6186	7BD
6187	7CM
6188	8BD
6189	9A
6193	6193
6195	6CL

Tube Type	Basing
6197	9BV
6201	9A
6202	5BS
6203	9CD
6205	8DC
6206	8DC
6211	9A
6211-A	9A
6215	3C
6216	9CE
6221	8HF
6222	8HF
6223	8DL
6224	8DL
6225	8DL
GL6228	GL6228
6245	5702
6247	8FO
GL-6251	GL6251
6265	7CM
6267	9CQ
6281	2E31
GL-6283	GL6283
6286	5676
6287	9CT
6299	6299
6320	8DG
6321	8DG
6325	6325
6327	6327
6336	8BD
6336-A	8BD
6350	9CZ
6352	8EY
6355	6355
6360	9PW
6384	6BQ
6385	8CJ
6386	8CJ
6394	8BD
6394-A	8BD
6397	6CL
6414	9A
6418	512-AX
6419	512-AX
6442	6442
6463	9CZ
6485	7BK
6486	9DV
6486-A	9DV
GL6512	GL6512
GL6513	GL6513
GL6515	GL6515
6519	512-AX
6520	8BD
6525	7BN
6526	512-AX
6528	8BD
6533	8FY
6540	5702
6550	7AC
6582	9EJ
6582-A	9EJ
6611	512-AX
6612	512-AX
6660	7BK
6661	7CM
6662	7CM
6663	6BT
6664	5CE
6669	7BZ
6676	7CM
6677	9BV
6678	9AE
6679	9A
6680	9A
6681	9A
6688	9EQ
6690	8GQ
6754	9ET
6763	6763
6771	6442
6788	8DL
6792	8GL
6807	6807
6808	6808
6809	6807
6814	8DK

Tube Type	Basing
6829	9A
6832	8DG
6840	9CZ
6842	7EQ
GL-6848	GL6848
6851	9A
6853	8HE
6854	8CJ
6856/740	6856
6858/760	6807
6859/760-P	6808
6872	5702
6877	9GB
6883	7CK
6883-A	7CK
6883-B	7CK
6887	6BT
6888	8N
6889	8HG
6897	2C39-B
6900	9H
6913	9A
6919	6BT
6922	9AJ
GL-6942	GL6942
6943	8DC
6944	8DC
6945	8DL
6946	8DK
6947	8DG
6948	8DG
6954	7CM
6955	9A
6968	7BD
6973	9EU
6999	6999
7025	9A
7027	8HY
7027-A	8HY
7036	7CH
7044	9H
7054	9GT
7055	6BT
7056	7CM
7057	9AJ
7058	9AJ
7059	9AE
7060	9DA
7061	9EU
7077	7077
7079	8DG
7083	5702
7105	8BD
7137	7BQ
GL7151	GL7151
7167	7EW
GL7171	GL7171
7189	9CV
7189-A	9LE
7199	9JT
7211	7815-R
7212	7CK
7216/C3JL	7216/C3JL
7233	9FR
7234	9KD
7235	9KE
7236	8BD
7239	9KH
7244	7BF
7244-A	7BF
7245	7BQ
7245-A	7BQ
7246	5676
7247	9A
7258	9DA
7266	7266
7289	7289
7296	7296
7310	4P
7311	7311
7312	7312
7313	7313
7314	7314
7318	9A
7327	8DG
7355	8KN
7357	7CK
7358	7CK
7360	9KS
7370	9H
7391	6299
GL-7399	GL7399
7403	8JU
7408	7AC
7427	9LN
7430	7430
7462	7462
7486	7077
7518/710L	7518/710L
7543	7BK
7548	9LJ
7550	8DG
7551	9LK
7558	9LK
7576	8KM
7581	7AC
7581-A	7AC
7586	12AQ
7587	12AS
7588	7296
7591	8KQ
7591-A	8KQ
7607	7CK
7623	6AM
7624	6AM
7625	7462
7626	7626
7644	6299
7645	9HL
GL7669/ GL7669-PC	GL7669
GL7669	GL7669
GL7669-PC	GL7669
GL7671/ GL7671-PC	GL7671
GL7672	GL7672
GL7672-PC	GL7672
GL7673/ GL7673-PC	GL7673
GL7673	GL7673
GL7673-PC	GL7673
GL7681/ GL7681-PC	GL7681
GL7681	GL7681
GL7681-PC	GL7681
7683	9MN
7687	9AE
7688	12BA
7689	12BA
7690	12BA
7695	9PX
7701	9MS
GL7703	GL7703
7716	9DX
7717	7EW
7719	9MX
7720	7462
7721	9EQ
7722	9EQ
7724	9KR
7725	FG-27-A
7726	7518/710L
7728	9A
7729	9A
7730	9A
7731	9AE
7732	7CM
7733	9BF
7734	9LC
7737	9MZ
7738	7DK
7751	8KB
7754	9PX
7757	9NE
7759	8DG
7760	8DG
7761	8DL
7762	8DL
7763	9NF
7768	7768
7784	7784
7788	9NK
7802	8BD
7803	9AJ
7815	7815
7815-R	7815-R
7841	7266
7851	7GE
7855	7815-R
7861	8CJ
7867	5BT
7868	9RW
7887	8DG
7888	8DK
7889	8DG
7892	9H
7894	7894
7895	12AQ
7898	9EP
7905	9PB
7910	7910
7911	7911
7913	7768
7962	8DG
7963	8DG
7979	7979
7983	9PS
7984	12EU
GL-7985	GL7985
7994	8KM
7995	8KZ
GL7998/ GL7998-PC	GL7998
GL7998	GL7998
GL7998-PC	GL7998
8008	2P
8032	7CK
8032-A	7CK
8042	8LJ
8056	12AQ
8058	12CT
8064	8DL
8068	8LC
8070	8LD
8071	8LE
8077	9GK
8081	8081
8082	8081
8083	8081
8084	7CM
8096	8FY
8100	8100
8102	9PJ
8103	8DG
8106	9PL
8108	8108
8113	7EW
8116	8116
8116A	8116
8117	8116
8117A	8116
8118	8118
8136	7CM
8142	8100
8143	8100
8149	12DT
8150	12DU
8156	12EU
8185	8KM
8186	8KM
8203	12AQ
GL8205	GL8205
8210	8LS
8211	8DL
8212	9PY
8213	8LT
8217	8100
8318-A	8100
8223	9AJ
8228	7894
8233	9PZ
8236	8JC
8254	8LW
8255	9NY
8278	9QB
8298	7CK
8298-A	7CK
8318	8100
8319	8LD
8327	9CV
8334	7DK
8345	8100
8346	8100
8347	8100
8348	9QN
8358	9QR
8380	12AS
8382	12AQ
8393	12AQ
8403	7815-R
8408	9QV
8412	8412
8413	8413
8414	8DC
8417	7S
8425	7BK
8425-A	7BK
8426	7BK
8426-A	7BK
8431	9AJ
8441	12AQ
8444	8DC
8445	9AE
8446	9FA
8447	9CF
8448	9BF
8456	12AQ
8457	9PW
8458	9PW
8463	9QX
8474	8100
8475	8100
8475-A	8100
8477	8100
8477-A	8100
8478	8100
8489	9DA
GL-8500	GL8500
8506	8506
GL-8513	GL8513
8517	8DC
8522	8DC
8524	8DC
8525	8DG
8526	8DG
8527	8DK
8528	8DE
8529	8DE
8530	8DE
8532	7BQ
8533	8533
8534	8534
8535	8535
8536	8536
8537	8537
8538	8538
8539	8539
8552	7CK
8582	8100
8582-A	8100
8595	8595
8627	12CT
8628	12AQ
8632	8632
8639	8639
8643	8643
8727	5675
8745	7815-R
GL-8751	GL8751
8755	8755
8755A	8755A
8760	8100
8808	8808
8847	8847
8847A	8847A
8859	8413
GL-8866	GL8866
8892	8892
8893	8893
8906	8906
8907	8907
8917	8917
9001	7BD
9002	7BS
9003	7BD
9004	4BJ
9005	5BG
9006	6BH
GE12661	GE12661
GE13971	GE13971
GE14501	GE14501
GE14811	GE14811

INDEX of BASING DIAGRAMS by TUBE TYPE

INDEX of BASING DIAGRAMS by TUBE TYPE

Monochrome Picture Tubes

Tube Type	Basing	Tube Type	Basing	Tube Type	Basing	Tube Type	Basing
2EP4	8JK	12CTP4	7GR	16BNP4	8HR	17CP4A	12D
5AXP4	12S	12CVP4	7GR	16BRP4	8HR	17CAP4	8HR
7DP4	12C	12CWP4	7GR	16BSP4	8HR	17CBP4	12L
7RP4	12D	12CZP4	7GR	16BUP4	8HR	17CDP4	8HR
8AP4	12H	12DEP4	7GR	16BVP4	8HR	17CEP4	12L
8AP4A	12H	12DFP4	7GR	16BWP4	8HR	17CFP4	12L
8DP4	12AB	12DGP4	7GR	16BXP4	7FA	17CGP4	12L
8JP4	8JL	12DHP4	8HR	16BYP4	8HR	17CKP4	8HR
8LP4	7FA	12DKP4	7GR	16CP4	12D	SG-17CKP4	8HR
8MP4	12L	12DMP4	8HR	16CAP4	8HR	17CLP4	12L
8XP4	12S	12DQP4	8HR	16CEP4	8HR	17CMP4	12L
8YP4	7FG	12KP4	12N	16CFP4	7GR	17CNP4	12L
9ACP4	7GR	12KP4A	12N	16CHP4	8HR	17CRP4	12L
9AGP4	7GR	SG-12KP4A	12N	16CHP4A	8HR	17CSP4	7FA
9QP4	12AD	12LP4	12N	16CJP4	8HR	17CTP4	8HR
9QP4A	12AD	12LP4A	12N	16CKP4	8HR	17CUP4	12L
9SP4	8HR	12LP4C	12N	16CMP4	8HR	17CVP4	8HR
9TP4	8HR	12TP4	12D	16CNP4	7GR	17CWP4	8HR
9UP4	7GR	12UP4	12D	16CQP4	7GR	17CXP4	12L
9VP4	7GR	12UP4A	12D	16TP4	8HR	17CYP4	12L
9WP4	7GR	12UP4B	12D	16CUP4	8HR	17CZP4	12L
9YP4	7GR	12VABP4	8HR	16CWP4	7GR	17DAP4	8JK
10ABP4	12L	12VP4	12G	16CXP4	7GR	17DBP4	12L
10ABP4A	12L	12VP4A	12G	16DP4	12D	17DCP4	12L
10ABP4B	12L	12YP4	12P	16DP4A	12D	17DEP4	8JN
10ABP4C	12L	12ZP4	12N	16DCP4	7GR	17DHP4	8HR
10ADP4	12L	12ZP4A	12N	16DCP4A	7GR	17DJP4	12L
10AEP4	12L	13AP4	8HR	16EP4	12D	17DKP4	8JR
10ARP4	7GR	13DP4	8HR	16EP4A	12D	17DLP4	8HR
10ASP4	7GR	14ACP4	12L	16EP4B	12D	17DQP4	7FA
10BP4	12N	14AEP4	12L	16GP4	12D	17DRP4	8JK
10BP4A	12N	14AJP4	8HR	16GP4A	12D	17DSP4	8HR
10BP4C	12N	SG-14AJP4	8HR	16GP4B	12D	17DTP4	8HR
10BP4D	12N	14ARP4	12L	16GP4C	12D	17DWP4	12L
10DP4	12M	14ASP4	8HR	16HP4	12N	17DXP4	8JR
10FP4	12N	14ATP4	12L	16HP4A	12N	17DZP4	8HR
10FP4A	12N	14AUP4	12L	16JP4	12N	17EAP4	12AT
SG-10FP4A	12N	14AVP4	8HR	16JP4A	12N	17EBP4	8HR
10MP4	12G	14AWP4	12L	16KP4	12N	17EFP4	8HR
10MP4A	12G	14BP4	12N	16KP4A	12N	17EHP4	8HR
10RP4	12L	14BP4A	12N	SG-16KP4A	12N	17EKP4	12L
11AP4	8HR	14BDP4	12L	16LP4	12N	17ELP4	8HR
11BP4	8HR	14CP4	12N	16LP4A	12N	17EMP4	8HR
11CP4	8HR	14CP4A	12N	16MP4	12N	17EQP4	8HR
11DP4	8HR	SG-14CP4A	12N	16MP4A	12N	17ESP4	8HR
11EP4	8HR	14CP4B	12N	16QP4	12D	17FCP4	8HR
11FP4	8HR	14DP4	12D	16RP4	12N	17FDP4	8HR
11GP4	8HR	14EP4	12N	16RP4A	12N	17FP4	12L
11HP4	8HR	14GP4	12L	16RP4B	12N	17FP4A	12L
11HP4A	8HR	14HP4	12L	16SP4	12N	17GP4	12M
11JP4	8HR	14NP4	12L	16SP4A	12N	12HP4	12L
11KP4	8HR	14NP4A	12L	16TP4	12N	17HP4A	12L
11LP4	8HR	14QP4	12L	16UP4	12D	17HP4B	12L
11MP4	8HR	14QP4A	12L	16VAUP4	8HR	SG-17HP4B	12L
11QP4	7GR	14QP4B	12L	16VP4	12D	17HP4C	12L
11RP4	7GR	SG-14QP4A	12L	16WP4	12D	17JP4	12N
11TP4	8HR	14RP4	12L	16WP4A	12N	17KP4	12P
11UP4	7GR	14RP4A	12L	16WP4B	12N	17KP4A	12P
12AYP4	8HR	14SP4	12L	16XP4	12D	17LP4	12L
12AZP4	8HR	14UP4	12D	16YP4	12N	17LP4A	12L
12BAP4	8HR	14WP4	12L	16ZP4	12N	SG-17LP4A	12L
12BEP4	7FA	SG-14WP4	12L	17AP4	12N	17LP4B	12L
12BFP4	7GR	14XP4	12L	17ATP4	12L	17QP4	12N
12BGP4	8HR	14XP4A	12L	17ATP4A	12L	17QP4A	12N
12BJP4	8HR	14ZP4	12L	17AVP4	12L	SG-17QP4A	12N
12BKP4	8HR	15ADP4	8HR	17AVP4A	12L	17QP4B	12N
12BLP4	8HR	15JP4	8HR	17BP4	12D	17RP4	12L
12BMP4	7GR	16AP4	12D	17BP4A	12N	17RP4C	12L
12BNP4	8HR	16AP4A	12D	17BP4B	12N	17SP4	12P
12BNP4A	8HR	16ABP4	12P	SG-17BP4B	12N	17TP4	12M
12BQP4	8HR	16ACP4	12P	17BP4C	12N	17UP4	12N
12BSP4	8HR	16AEP4	12L	17BP4D	12N	17VP4	12L
12BTP4	8HR	16ANP4	8HR	17BJP4	12L	17VP4B	12L
12BUP4	8HR	16AQP4	8HR	SG-17BJP4	12L	17YP4	12N
12BUP4A	8HR	16ASP4	8HR	17BKP4	12L	18VAGP4	8HR
12BUP4B	8HR	16ATP4	8HR	17BKP4A	12L	19AP4	12D
12BUP4C	8HR	16AUP4	8HR	17BMP4	12L	19AP4A	12D
12BVP4	7GR	16AVP4	7FA	17BNP4	12L	19AP4B	12D
12BZP4	7GR	16AWP4	8HR	17BRP4	8HR	19AP4C	12D
12CBP4	7FA	16AXP4	8HR	17BSP4	12L	19AP4D	12D
12CDP4	7GR	16AYP4	8HR	17BTP4	12AJ	19ABP4	8JK
12CEP4	7GR	16AZP4	8HR	17BUP4	12L	19ACP4	8HR
12CFP4	7GR	16BAP4	8HR	17BVP4	7FA	19AEP4	8HR
12CHP4	7GR	16BDP4	8HR	17BWP4	7FA	19AFP4	8HR
12CNP4	7GR	16BEP4	8HR	SG-17BWP4	7FA	19AHP4	8HR
12CNP4A	7GR	16BFP4	8HR	17BYP4	7FA	19AJP4	7FA
12CQP4	8HR	16BGP4	8HR	17BZP4	8HR	19ALP4	8HR
12CSP4	7GR	16BMP4	8HR	17CP4	12D	19ANP4	8JR

INDEX of BASING DIAGRAMS by TUBE TYPE

Monochrome Picture Tubes

Tube Type	Basing	Tube Type	Basing	Tube Type	Basing	Tube Type	Basing
19AQP4	8HR	19FHP4	8HR	SG-21AUP4B	12L	21GBP4	8HR
19ARP4	8HR	19FJP4	8HR	21AUP4C	12L	21GCP4	8HR
19ASP4	8HR	19FJP4A	8HR	21AVP4	12L	21GEP4	8HR
19ATP4	8JR	19FKP4	8HR	21AVP4A	12L	21GHP4	8HR
19AUP4	8HR	19FLP4	8HR	21AVP4B	12L	21GJP4	8HR
19AVP4	8HR	19FNP4	8HR	21AVP4C	12L	21GKP4	8HR
19AXP4	8HR	19FRP4	8HR	21AWP4	12N	21GTP4	8HR
19AYP4	8HR	19FTP4	8HR	21AWP4A	12N	21JP4	12N
19BAP4	8HR	19FWP4	8HR	SG-21AWP4	12N	21JP4A	12N
19BCP4	8HR	19GP4	12D	SG-21AWP4A	12N	21KP4	12S
19BDP4	12L	12GAP4	8HR	21AYP4	12L	21KP4A	12P
19BEP4	8HR	19GBP4	8HR	21BAP4	12L	21MP4	12M
19BFP4	12L	19GEP4	8HR	21BCP4	12L	21VASP4	8HR
19BHP4	8HR	19GFP4	8HR	21BDP4	12L	21VATP4	8HR
19BLP4	8HR	19GHP4	8HR	21BNP4	12L	21WP4	12N
19BMP4	8HR	19GJP4	8HR	21BSP4	12N	21WP4A	12N
19BNP4	8HR	19GJP4A	8HR	21BTP4	12L	SG-21WP4A	12N
19BQP4	8HR	19GKP4	8HR	21CBP4	12L	21WP4B	12N
19BRP4	8HR	19GMP4	8HR	21CBP4A	12L	21XP4	12L
19BSP4	8HR	19HAP4	8HR	21CBP4B	12L	21XP4A	12L
19BTP4	8JR	19HGP4	8HR	21CDP4	12L	SG-21XP4A	12L
19BUP4	8HR	19JP4	12D	21CDP4A	12L	21XP4B	12L
19BVP4	8HR	19QP4	12L	21CEP4	8HR	21YP4	12L
19BWP4	8HR	19VAHP4	8HR	21CEP4A	8HR	21YP4A	12L
19CAP4	8JR	19VAJP4	8HR	21CGP4	12L	SG-21YP4A	12L
19CDP4	7FA	19VBNP4	8HR	21CHP4	12L	21YP4B	12L
19CEP4	8HR	19XP4	8HR	21CKP4	12L	21ZP4	12D
19CFP4	8HR	19YP4	8JR	21CLP4	12AJ	21ZP4A	12N
19CGP4	12L	19ZP4	8HR	21CMP4	12L	21ZP4B	12N
19CHP4	8HR	20ABP4	8HR	21CQP4	7FA	SG-21ZP4B	12N
19CJP4	8HR	20ADP4	8HR	21CSP4	7FA	21ZP4C	12N
19CKP4	8HR	20AEP4	8HR	21CUP4	12N	22AFP4	8HR
19CLP4	12L	20AHP4	8HR	21CVP4	12L	22TP4	8HR
19CMP4	8HR	20CP4	12D	21CWP4	12L	22VABP4	8HR
19CMP4A	8HR	20CP4A	12N	21CXP4	12L	22VACP4	8HR
19CQP4	7FA	20CP4B	12D	21CZP4	8HR	22VAMP4	8HR
19CRP4	12L	20CP4C	12D	21DP4	12M	22VANP4	8HR
19CUP4	8HR	20CP4D	12N	21DAP4	8HR	22VARP4	8HR
19CVP4	8HR	SG-20CP4D	12N	21DEP4	8HR	22VASP4	8HR
19CXP4	7FA	20DP4	12D	21DEP4A	8HR	22VATP4	8HR
19CYP4	8HR	20DP4A	12N	SG-21DEP4A	8HR	22ZP4	8HR
19CZP4	8HR	20DP4B	12D	21DFP4	8HR	23ACP4	12L
19DP4	12N	20DP4C	12N	21DHP4	8HR	23AFP4	12L
19DP4A	12N	20DP4D	12N	21DJP4	12L	23AHP4	12L
19DAP4	8HR	20FP4	12M	21DKP4	8HR	23AKP4	8JR
19DBP4	7FA	20GP4	12L	21DKP4A	8HR	23ALP4	8HR
19DCP4	8HR	20HP4	12M	21DLP4	12L	23AMP4	8HR
19DEP4	8HR	20HP4A	12L	21DMP4	8HR	23ANP4	12L
19DFP4	8HR	20HP4B	12M	21DNP4	12L	23AQP4	8HR
19DHP4	8HR	20HP4C	12M	21DQP4	12L	23ARP4	8HR
19DJP4	8HR	20HP4D	12L	21DRP4	12L	23ASP4	12L
19DKP4	8HR	SG-20HP4D	12L	21DSP4	12L	23ATP4	12L
19DLP4	8HR	20HP4E	12L	21DVP4	12L	23AUP4	12L
19DNP4	8HR	20JP4	12P	21DWP4	8HR	23AVP4	8HR
19DQP4	8HR	20LP4	12L	21EP4	12D	23AWP4	12L
19DRP4	8HR	20MP4	12L	21EP4A	12N	23AXP4	8HR
19DSP4	8HR	20RP4	8HR	21EP4B	12N	23AYP4	8HR
19DUP4	8HR	20SP4	8HR	SG-21EP4B	12N	23AZP4	12L
19DVP4	8HR	20TP4	8HR	21EP4C	12N	23BP4	8HR
19DWP4	8HR	20UP4	8HR	21EAP4	8JK	23BAP4	8HR
19DYP4	8HR	20WP4	8HR	21ELP4	12L	23BCP4	8HR
19DZP4	8HR	20XP4	8HR	21EMP4	8HR	23BDP4	12L
19EP4	12D	20YP4	8HR	21ENP4	12L	23BEP4	8HR
19EAP4	8HR	20ZP4	8HR	21EQP4	8JR	23BEP4A	8HR
19EBP4	8HR	21AP4	12D	21ERP4	8JR	23BGP4	8HR
19ECP4	8HR	21ACP4	12N	21ESP4	8JS	23BHP4	8HR
19EDP4	8HR	21ACP4A	12N	21EVP4	8JK	23BJP4	12L
19EFP4	8HR	SG-21ACP4A	12N	21EXP4	8JR	23BKP4	12L
19EGP4	8HR	21AFP4	12M	21EZP4	8JR	23BLP4	12L
19EHP4	8HR	21ALP4	12L	21FP4	12M	23BMP4	12L
19EHP4A	8HR	21ALP4A	12L	21FP4A	12L	23BNP4	8HR
19EJP4	8HR	21ALP4B	12L	21FP4C	12L	23BQP4	8HR
19EKP4	7FA	21AMP4	12L	SG-21FP4C	12L	23BRP4	8JR
19ELP4	8HR	21AMP4A	12L	21FP4D	12L	23BSP4	8HR
19ENP4	8HR	21AMP4B	12N	21FAP4	8JR	23BTP4	12L
19ENP4A	8HR	21ANP4	12M	21FCP4	8HR	23BVP4	12L
19ESP4	8HR	21ANP4A	12M	21FDP4	8KW	23BXP4	12L
19ETP4	8HR	21AQP4	12D	21FLP4	12L	23BYP4	8JR
19EUP4	8HR	21AQP4A	12D	SG-21FLP4	12L	23BZP4	12L
19EZP4	7FA	21ARP4	12N	21FMP4	8HR	23CP4	8HR
19FP4	12D	21ARP4A	12N	21FUP4	8HR	23CP4A	8HR
19FBP4	8HR	21ASP4	12M	21FVP4	8HR	23CAP4	12L
19FCP4	8HR	21ATP4	12L	21FWP4	8HR	23CBP4	8HR
19FDP4	8HR	21ATP4A	12L	21FXP4	8HR	23CDP4	12L
19FEP4	8HR	21ATP4B	12L	21FYP4	8HR	23CEP4	8HR
19FEP4A	8HR	21AUP4	12L	21FZP4	8HR	23CGP4	12L
19FEP4B	8HR	21AUP4A	12L	21GAP4	8HR	23CMP4	8HR
19FGP4	8JR	21AUP4B	12L	21GAP4A	8HR	23CQP4	8HR

INDEX of BASING DIAGRAMS by TUBE TYPE

Monochrome Picture Tubes

Tube Type	Basing	Tube Type	Basing	Tube Type	Basing	Tube Type	Basing
23CSP4	8JR	23FP4A	8HR	23HZP4	8HR	24CP4A	12N
23CTP4	12L	23FAP4	8HR	23JP4	7FA	SG-24CP4A	12N
23CUP4	8JR	23FBP4	12L	23JAP4	8HR	24CP4B	12N
23CVP4	8JR	23FCP4	8HR	23JBP4	8HR	24DP4	12L
23CWP4	8JR	23FDP4	8HR	23JEP4	8HR	24DP4A	12L
23CXP4	8JR	23FHP4	8HR	23JFP4	8HR	24QP4	12N
23CZP4	12L	23FKP4	8HR	23JGP4	8HR	24TP4	12N
23DP4	8JR	23FLP4	12L	23JLP4	8HR	24VP4	12N
23DAP4	8HR	23FMP4	8HR	23KP4	8HR	24VP4A	12N
23DBP4	8HR	23FNP4	12L	23KP4A	8HR	24XP4	12D
23DCP4	8HR	23FRP4	8HR	23MP4	8HR	24YP4	12L
23DEP4	8HR	23FSP4	8HR	23MP4A	8HR	24ZP4	12L
23DFP4	8HR	23FVP4	8HR	23NP4	8HR	25DP4	8HR
23DHP4	8HR	23FVP4A	8HR	23RP4	8JR	25EP4	8HR
23DJP4	8HR	23FWP4	12L	23SP4	8HR	25HP4	8HR
23DKP4	12L	23FWP4A	12L	23TP4	12L	25JP4	8HR
23DLP4	12L	23GP4	8HR	23UP4	8HR	25KP4	8HR
23DLP4A	12L	23GBP4	8HR	23VP4	8HR	25LP4	8HR
23DNP4	12L	23GDP4	8HR	23WP4	8HR	25TP4	8HR
23DQP4	8HR	23GEP4	12L	23XP4	12L	27AP4	12M
23DRP4	8HR	23GHP4	8HR	23YP4	12L	27ABP4	8HR
23DSP4	8HR	23GJP4	8HR	23ZP4	12L	27ACP4	12L
23DSP4A	8HR	23GJP4A	8HR	24AP4	12D	27ADP4	8HR
23DTP4	12L	23GKP4	12L	24AP4A	12D	27AEP4	8HR
23DVP4	8HR	23GRP4	12L	23AP4B	12D	27AFP4	8HR
23DVP4A	8HR	23GSP4	8HR	24ADP4	12N	27AGP4	8HR
23DWP4	8HR	23GTP4	8HR	24AEP4	12L	27EP4	12D
23DYP4	8HR	23GVP4	8HR	SG-24AEP4	12L	27GP4	12D
23DZP4	8HR	23GWP4	8HR	24AHP4	8HR	27LP4	12N
23EP4	8KP	23GXP4	8HR	24AJP4	12L	27MP4	12D
23EAP4	12L	23HP4	8HR	24ALP4	8HR	27NP4	12N
23ECP4	12L	23HBP4	8HR	24AMP4	7FA	27RP4	12N
23EDP4	12L	23HFP4	8HR	24ANP4	12L	27RP4A	12N
23EFP4	8HR	23HFP4A	8HR	24AQP4	8HR	SG-27RP4	12N
23EKP4	12L	23HGP4	8HR	24ASP4	12L	27SP4	12L
23ENP4	12L	23HKP4	8HR	24ATP4	12L	27UP4	12L
23EQP4	8HR	23HLP4	8HR	24AUP4	12L	27VP4	12L
23ERP4	8HR	23HMP4	8HR	24AVP4	8JK	27WP4	12AJ
23ESP4	8HR	23HQP4	8HR	24AWP4	8HR	27XP4	12L
23ETP4	8HR	23HRP4	8HR	24AXP4	8HR	27YP4	12L
23EWP4	8HR	23HUP4	8HR	24BP4	12M	27ZP4	8HR
23EWP4A	8HR	23HUP4A	8HR	24BAP4	8HR	30BP4	12D
23EYP4	12L	23HWP4	8HR	24BCP4	12L		
23EZP4	8HR	23HWP4A	8HR	24BEP4	8KW		
23FP4	8HR	23HXP4	8HR	24CP4	12N		

Vidicons

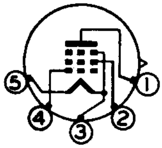
Tube Type	Basing	Tube Type	Basing	Tube Type	Basing	Tube Type	Basing
7038	8HM	Z7911	8HM	Z7975HRB	8ME	8541A	8ME
7038V	8HM	Z7912	8ME	Z7996B	8ME	8541X	8ME
7262A	8HM	Z7919	8ME	Z7996HRB	8ME	8572	8ME
7263A	8HM	Z7927B	Z7927B	8134	8LN	8572V	8ME
7735A	8HM	Z7927HRB	Z7927HRB	8134V	8LN	8573A	8ME
7735B	8HM	Z7929R,B,G	8LN	8484H	8HM	8573X	8ME
7735BX	8HM	Z7975B	8ME	8507A	8ME	8604	8ME

ESSENTIAL CHARACTERISTICS
BASING DIAGRAMS

Basing diagrams on the following pages are schematic representations of the terminal connections for tube types shown on pages 22 thru 275 and pages 306 thru 347.

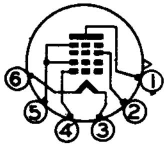
The diagrams are arranged in numerical-alphabetical order with a listing of all tube types having that particular basing arrangement. This listing is useful as a preliminary search for interchangeable tube types.

Basing diagrams for Color Picture Tubes, listed on pages 306 thru 317, appear on page 471. Basing diagrams for Monochrome Picture Tubes, listed on pages 318 thru 345, appear on page 472. Basing diagrams for Vidicons, listed on pages 346, and 347 appear on page 473.



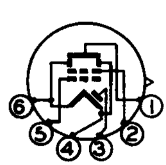
1AD4

1AD4, 1AH4, 1AK4, 5678, 5875, 5972



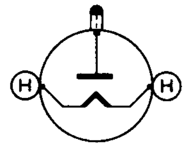
1AE5

1AE5



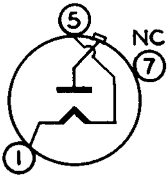
1AG5

1AG5, 1AJ5, 1AK5



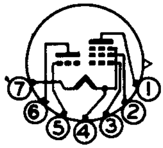
1AY2

1AY2, 1AY2-A, 1BL2, 1T2



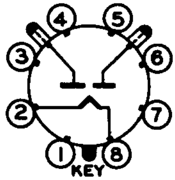
1BV2

1BV2



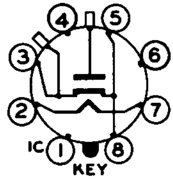
1V6

1V6



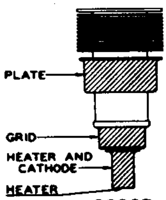
2AJ

6004



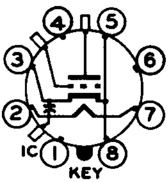
2B22

2B22



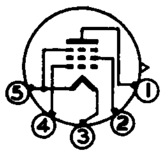
2C39B

2C39, 2C39A, 2C39B
2C39WA, 6897



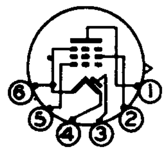
2C40

2C40, 2C40-A, 2C42, 2C43, 2C46



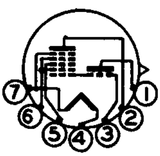
2E31

2E31, 2E32, 2E35, 2E36, 5672, 5854, 6092, 6281



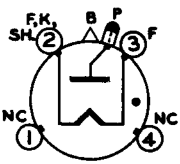
2E41

2E41, 2E42



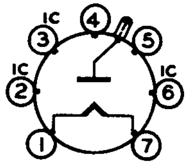
2G21

2G21, 2G22



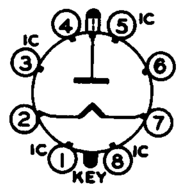
2P

673, 8008



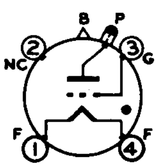
2Z

1654



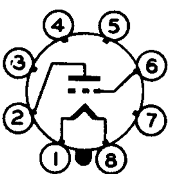
3C

1AU3, 1B3-GT, 1G3-GT, 1G3-GTA, 1J3, 1J3A, 1K3, 1N2, 1N2-A, 6215



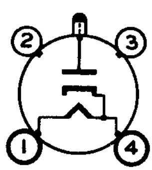
3G

3C23, FG-81-A, 5557



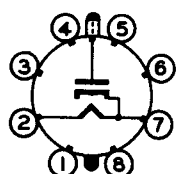
4AA

1LE3, 1LF3



4AB

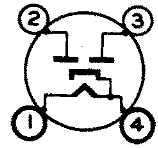
2X2, 2X2-A



4AC

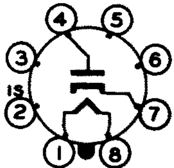
6Y3-G

RECEIVING TUBES



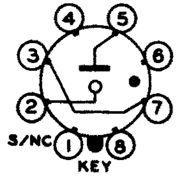
4AD

83-V



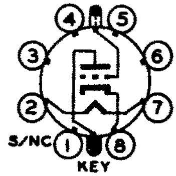
4AH

1R4, 7C4



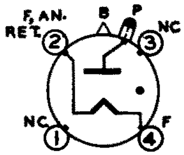
4AJ

OA3, OA3-A, OB3, OB3-A, OC3, OC3-A, OD3, OD3-A



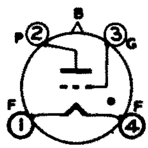
4AM

2C22



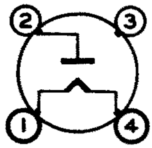
4AT

872-A



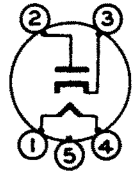
4AX

6014/C1K



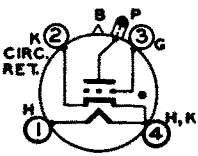
4B

81



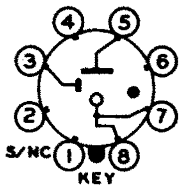
4BJ

9004



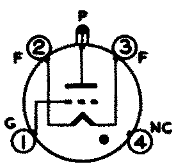
4BL

5559, 5720, 5728, 5830



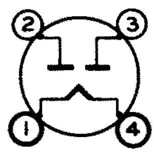
4BU

OY4, OY4-G



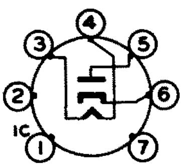
4BZ

627, 5544



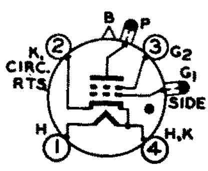
4C

5Z3, 80, 82, 83



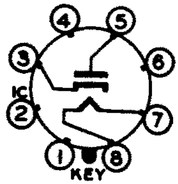
4CB

117Z3



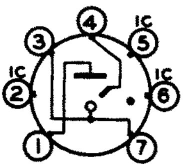
4CD

5560



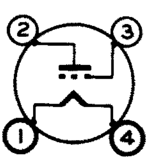
4CG

6AU4-GT, 6AU4-GTA, 6AX4-GT, 6AX4-GTA, 6AX4-GTB, 6CQ4, 6DA4, 6DA4-A, 6DE4, 6DM4, 6DM4-A, 6DQ4, 6DT4, 6U4-GT, 6W4-GT, 6W4-GTA, 12AX4-GT, 12AX4-GTA, 12AX4-GTB, 12D4, 12D4-A, 12DM4, 12DM4-A, 12DQ4, 17AX4-GT, 17AX4-GTA, 17D4, 17D4-A, 17DE4, 17DM4, 17DM4-A, 17DQ4, 19AU4, 19AU4-GTA, 22DE4, 25AX4-GT, 25D4, 25W4-GT



4CK

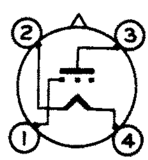
5823



4D

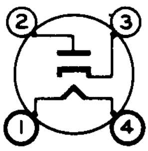
00A, 01-A, 2A3, 6A3, 10, 12A, 20, (Cont'd)

4D (Cont'd) 26, 30, 31, 40, 45, 50, 71-A, X99, 182-B/482B, 183/483, 5930

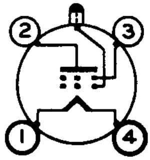


4E

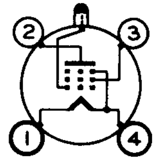
V99


4G

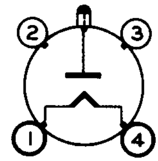
1-V, 12Z3


4K

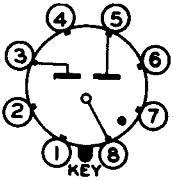
1A4-t, 22, 32


4M

1A4-p, 1B4-p, 34

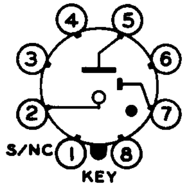

4P

1Y2, 2Y2, 3B28, 816, 866-A, 5825, 7310



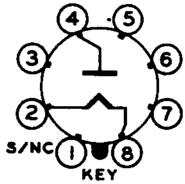
4R

0Z4, 0Z4-A, 0Z4-G



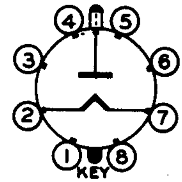
4V

0A4-G



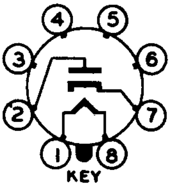
4X

2W3, 2W3-GT



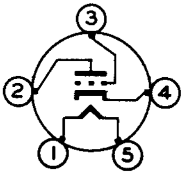
4Y

2V3-G

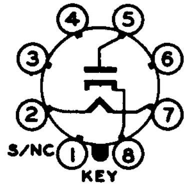


4Z

35Z3

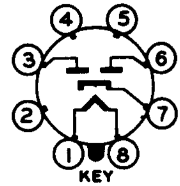

5A

27, 37, 56, 76, 485



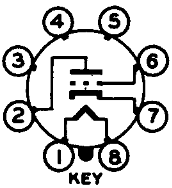
5AA

25Z4, 35Z4-GT, 117Z4-GT



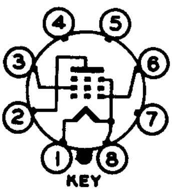
5AB

7Y4, 7Z4, 14Y4, 28Z5



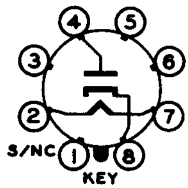
5AC

7A4, 7B4, 14A4



5AD

1LA4, 1LB4



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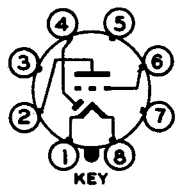

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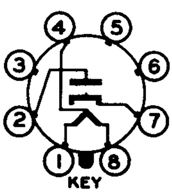

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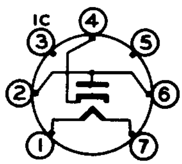

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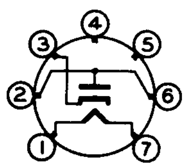
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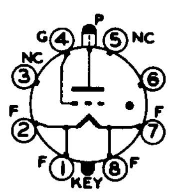

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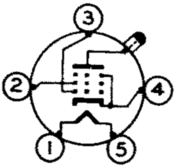
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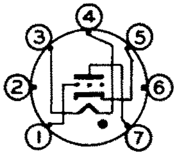
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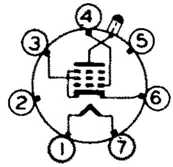
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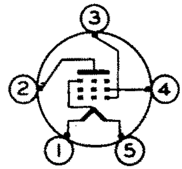
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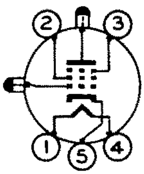
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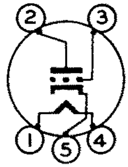
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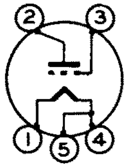
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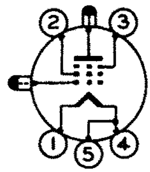
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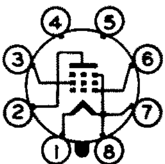

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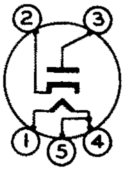
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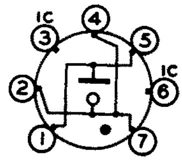

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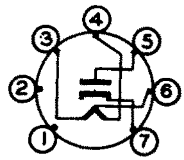
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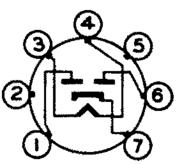
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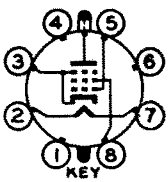

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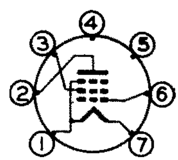
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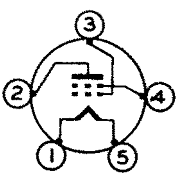
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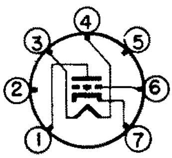
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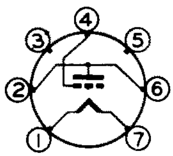
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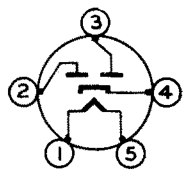
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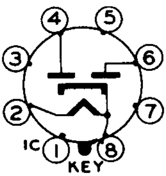

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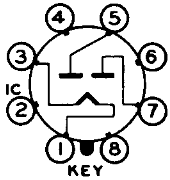

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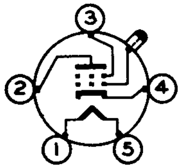

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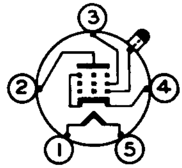

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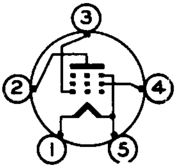

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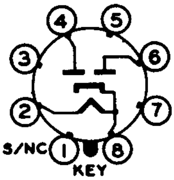

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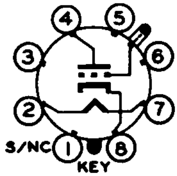

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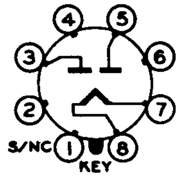

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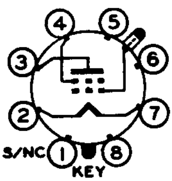

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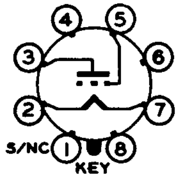

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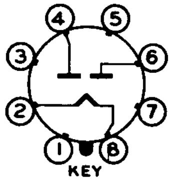

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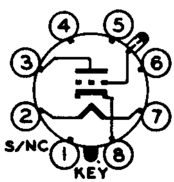

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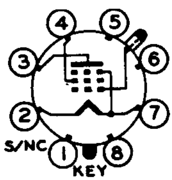

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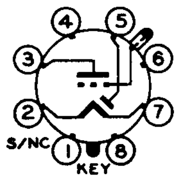

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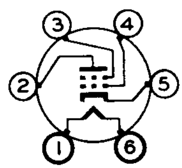

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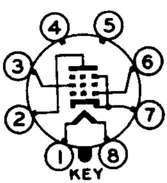

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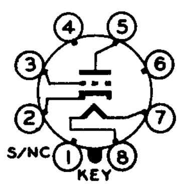

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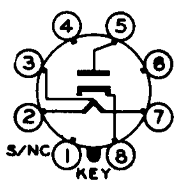

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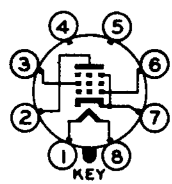

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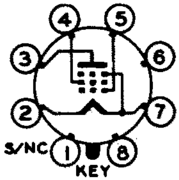

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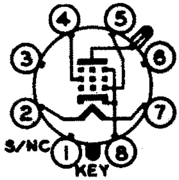

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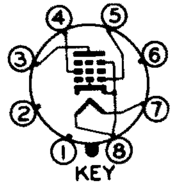

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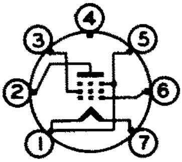

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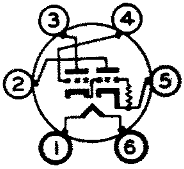

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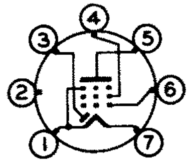

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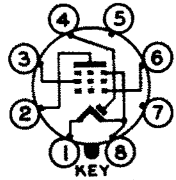

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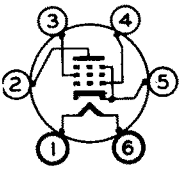

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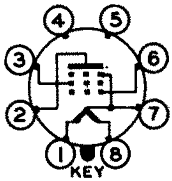

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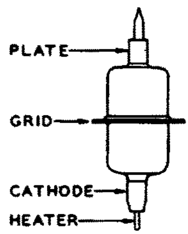

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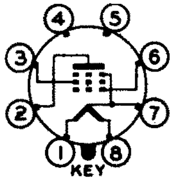

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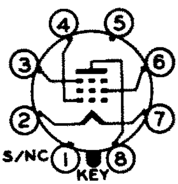

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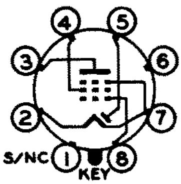

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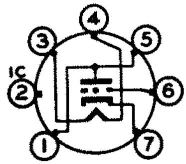

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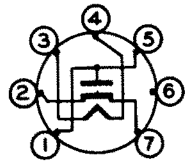

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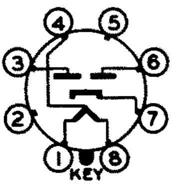

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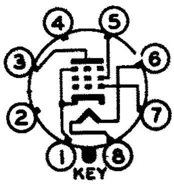

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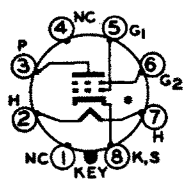

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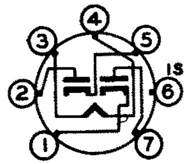

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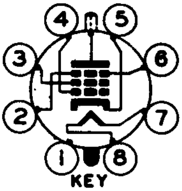

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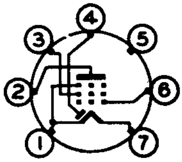
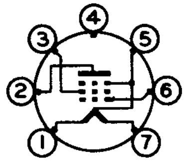
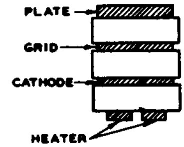

6BW

1AS5, 1DN5, 1U5

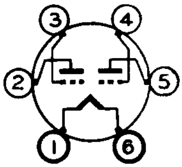

6BX

3E4, 3V4



6BY4

6BY4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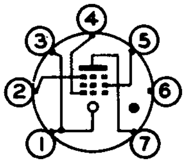
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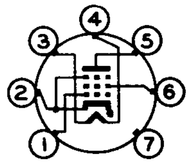
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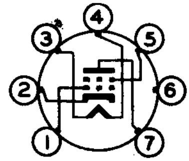
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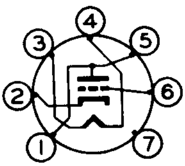
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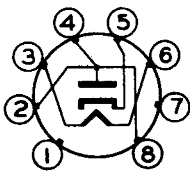
5610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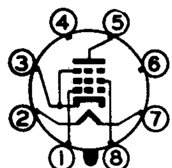
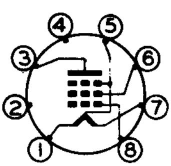
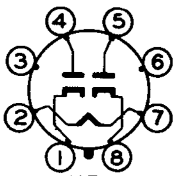


6CK

6AU5-GT, 6AV5-GA, 6AV5-GT, 6BD5-GT, 6FW5, 12AV5-GA, 17AV5-GA, 18A5, 25AV5-GA, 25AV5-GT, 6000

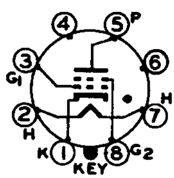

6CL

5851, 6147, 6195, 6397



6CN

6BY5-G, 6BY5-GA



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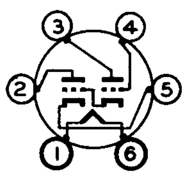
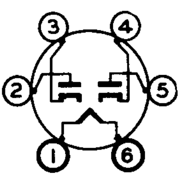
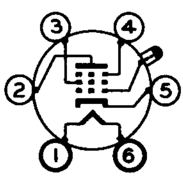

6D

25B5


6E

25Y5, 25Z5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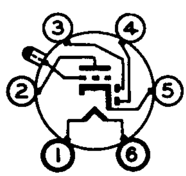
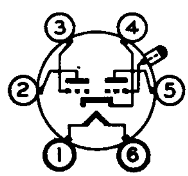
6C6, 6D6, 57, 58, 77, 78, 89

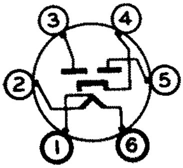

6G

2A6, 55, 75, 85


6H

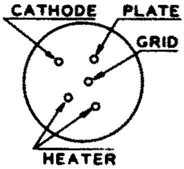
79

RECEIVING TUBES



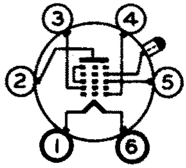
6K

6Z5



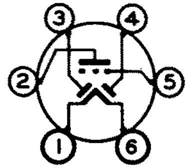
6K4

6K4



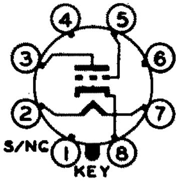
6L

1A6, 1C6



6M

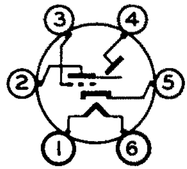
1B5/25-S



6Q

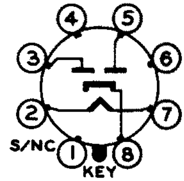
6AC5-GT, 6AE5-GT, 6AF5-G, 6C5, (Cont'd)

6Q (Cont'd) 6C5-GT, 6J5, 6J5-GT, 6L5-G, 6P5-GT, 12E5-GT, 12J5, 12J5-GT, 25AC5-GT, 884



6R

2E5, 6AB5/6N5, 6E5, 6T5, 6U5



6S

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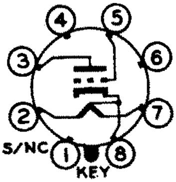
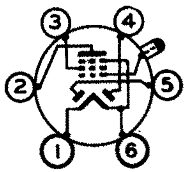


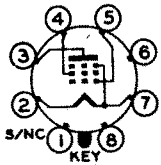
6T

6A5-G



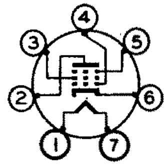
6W

1F6



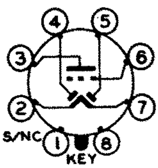
6X

1A5-GT, 1C5-GT, 1F5-G, 1G5-G, 1J5-G, 1T5-GT



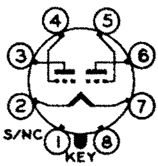
7A

59



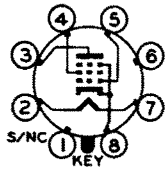
7AA

1H6-G, 1H6-GT



7AB

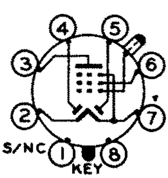
1G6-GT, 1J6-G, 1J6-GT



7AC

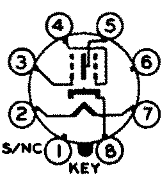
5V6-GT, 6EY6, 6EZ5, 6L6, 6L6-G, 6L6-GA, 6L6-GC, 6U6-GT,

6V6, 6V6-GT, 6V6-GTA, 6W6-GT, 6Y6-G, 6Y6-GA, 6Y6-GT, 7EY6, 12A6, 12A6-GT, 12EN6, 12L6-GT, 12V6-GT, 12W6-GT, 17L6-GT, 17W6-GT, 25C6-G, 25C6-GA, 25L6, 25L6-GT, 25W6-GT, 35L6-GT, 50C6-G, 50C6-GA, 50L7-GT, 1614, 1622, 1631, 1632, 5824, 5881, 5932, 5992, 6046, 7408, 7581, 7581-A



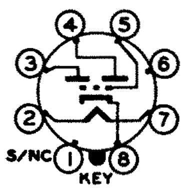
7AF

1F7-GH, 1F7-GV



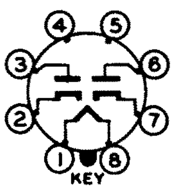
7AG

6AD6-G, 6AF6-G



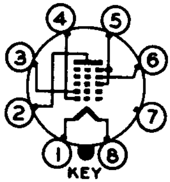
7AH

6AE6-G



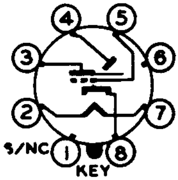
7AJ

7A6, 7X6, 50X6



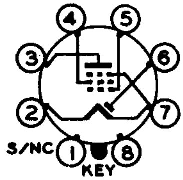
7AK

1LA6, 1LC6



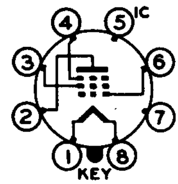
7AL

1629



7AM

1N6-G, 1N6-GT

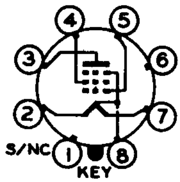


7AO

1LC5, 1LG5, 1LN5

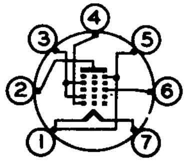
7AP
(SEE 7AQ)

3Q5-GT



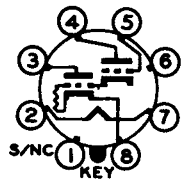
7AQ

3B5-GT, 3C5-GT



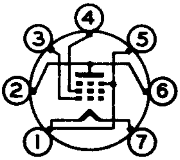
7AT

1AQ5, 1R5



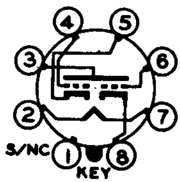
7AU

6N6-G



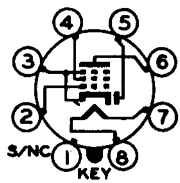
7AV

1S4



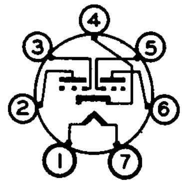
7AX

6AE7-GT



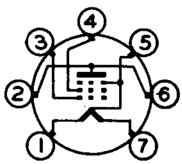
7AZ

6SF7, 6SV7, 12SF7,
12SF7-GT



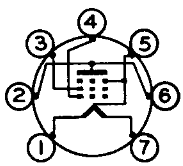
7B

6A6, 6E6, 53, 5608-A



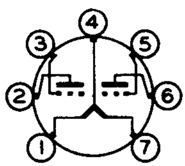
7BA

3Q4, 3S4, 3W4



7BB

3A4



7BC

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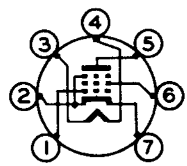
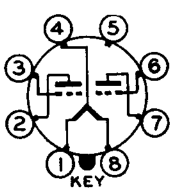


7BD

3BC5, 3CE5, 4BC5,
4CE5, 6AG5, 6AJ5,
6AK5, 6AN5, 6BC5,
6CE5, 408A, 5590,
5591, 5654, 6028,
6096, 6186, 6968,
9001, 9003



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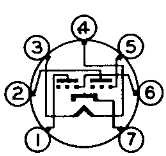
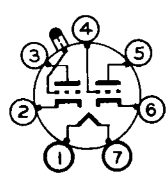
3B7



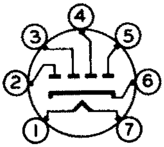
7BF

5J6, 6J6, 6J6-A,
19J6, 5844, 5964,
6045, 6101, 7244,
7244-A



7BH

2C21/1642



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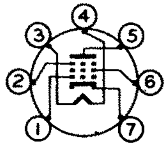
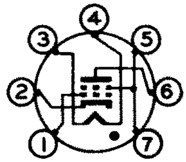


7BK

3AU6, 3BA6, 4AU6, 4BA6,

6AH6, 6AK6, 6AU6, 6AU6-A, 6BA6, 6BD6, 6CG6, 6FD6, 6HR6, 6HS6, 12AC6, 12AF6, 12AU6, 12BA6, 12BD6, 12BL6, 12CX6, 12CY6, 12DZ6, 12EA6, 12EK6, 12EZ6, 18GD6, 18GD6-A, 19HR6, 19HS6, 26A6, 26CG6, 5749, 6136, 6485, 6660, 7543, 8425, 8425-A, 8426, 8426-A



7BN

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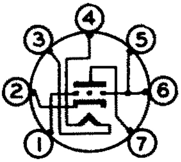
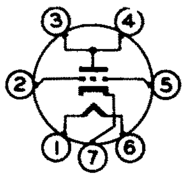


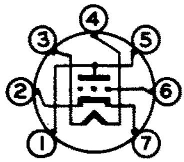
7BQ

6J4, 7137, 7245, 7245-A, 8532



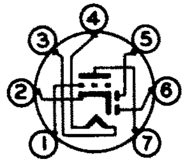
7BR

6F4, 6L4



7BS

9002



7BT

3AV6, 4AV6, 6AQ6, 6AT6, 6AV6, 6BF6,

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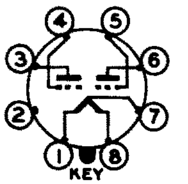
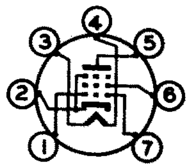


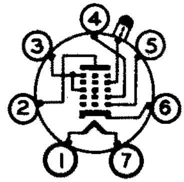
7BW

3C6



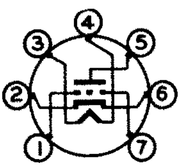
7BZ

5AQ5, 6AQ5, 6AQ5-A, 6BF5, 6DS5, 6HG5, 6HR5, 11DS5, 12AQ5, 35B5, 50B5, 6005, 6095, 6669



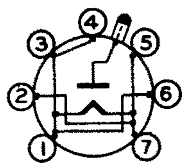
7C

2A7, 6A7



7CA

6N4

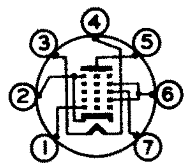


7CB

1Z2

7CC
(See 7BK)

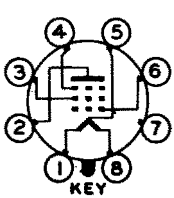
18FW6, 18FW6-A



7CH

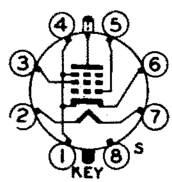
3BE6, 3BY6, 3CS6, 4BE6, 4CS6, 6BE6,

6BY6, 6CS6, 12AD6, 12AG6, 12BE6, 12CS6, 12EG6, 12FA6, 12GA6, 18FX6, 18FX6-A, 26D6, 5750, 5915, 5915-A, 7036



7CJ

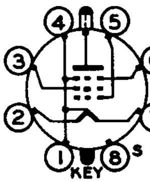
3E6



7CK

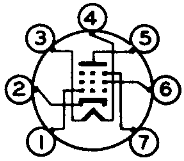
2E26, 6146, 6146-A, 6146-B, 6159-A, 6159-B,

6883, 6883-A, 6883-B, 8032-A, 8552, 7212, 7357, 7358, 7607, 8032, 8298, 8298-A



7CL

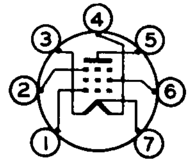
2E24



7CM

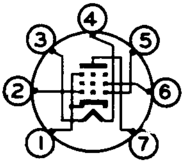
3BZ6, 3CB6, 3CF6, 3DK6, 4BZ6,

4CB6, 4DE6, 4DK6, 4EW6, 4GM6, 4JK6, 4JL6, 4LU6, 5EW6, 5GM6, 5JK6, 5JL6, 6AS6, 6BH6, 6BJ6, 6BJ6-A, 6BZ6, 6CB6, 6CB6-A, 6CF6 6DB6, 6DC6, 6DE6, 6DK6, 6EW6, 6GM6, 6HQ6, 6JH6, 6JK6, 6JL6, 6LU6 12AW6, 12BZ6, 12DK6, 15EW6, 5725, 6187, 6265, 6661, 6662, 6676, 6954, 7056, 7732, 8084, 8136



7CQ

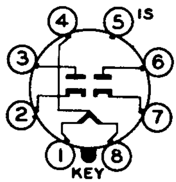
2E30



7CV

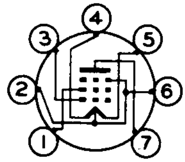
4GZ5, 6AS5, 6CA5, 6CU5, 6EH5, (Cont'd)

7CV (Cont'd)
6GZ5, 11C5
12AS5, 12C5, 12CA5, 12CN5, 12CU5, 12DM5, 12ED5, 12EH5, 12FX5, 12R5, 17C5, 17CA5, 17CU5, 17R5, 19FX5 25C5, 25CA5, 25EH5, 25F5, 25F5-A, 32ET5, 32ET5-A, 34GD5, 35C5, 35EH5, 40FR5, 50C5, 50CA5, 50EH5, 50FA5, 50FK5, 60FX5



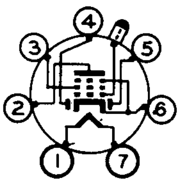
7CX

5679



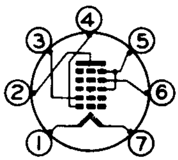
7CY

3B4



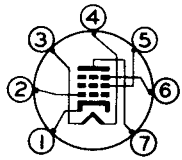
7D

2B7, 6B7



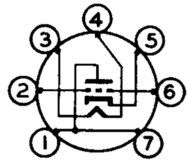
7DC

1L6, 1U6



7DF

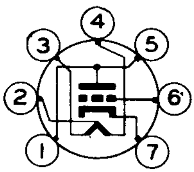
3BN6, 4BN6, 6BN6, 6KS6, 12BN6



7DK

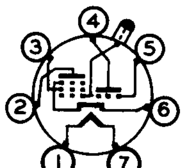
1DY4, 1DY4-A, 2AF4, 2AF4-A,

2AF4-B, 2DX4, 2DY4, 2DY4-A, 2DZ4, 2T4, 3AF4-A, 3AF4-B, 3DX4, 3DY4, 3DY4-A, 3DZ4, 5AF4-A, 6AF4, 6AF4-A, 6AN4, 6DX4, 6DY4, 6DY4-A, 6DZ4, 6T4, 7738, 8334



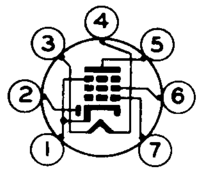
7DW

12H4



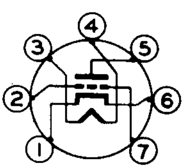
7E

6F7



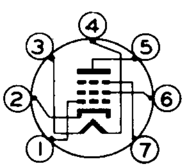
7EA

6CR6, 12CR6



7EG

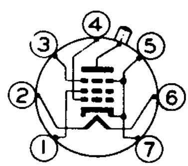
2BN4, 2BN4-A, 3BN4, 3BN4-A, 4BN4, 6BN4, 6BN4-A



7EN

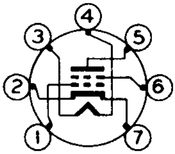
3DT6, 3DT6-A, 4DT6, 4DT6-A, 5GX6,

5HZ6, 6DT6, 6DT6-A, 6GX6, 6GY6, 6HZ6, 12DT6



7EQ

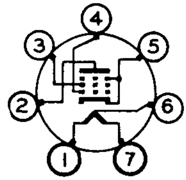
6842



7EW

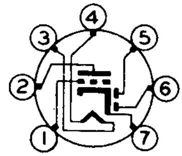
2CY5, 2EA5, 2EV5,
3CY5, 3EA5, (Cont'd)

7EW (Cont'd)
3EV5,
4CY5, 6CY5, 6EA5,
6EV5, 7167, 7717,
8113



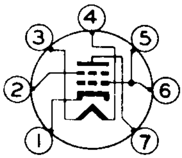
7F

12A5



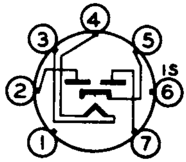
7FB

12EL6



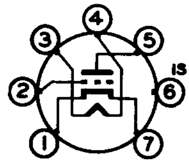
7FD

12K5



7FL

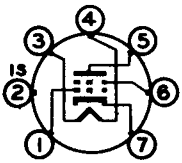
2EN5



7FP

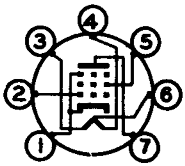
2ER5, 2ES5, 2FH5,
2FQ5, 2FQ5-A, 2FY5,

2GK5, 3ER5, 3ES5,
3FH5, 3FQ5, 3FQ5-A,
3GK5, 4GK5, 6ER5,
6ES5, 6FH5, 6FQ5,
6FQ5-A, 6FY5, 6GK5



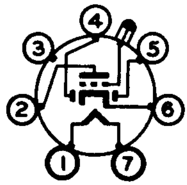
7FQ

2FV6, 6FV6



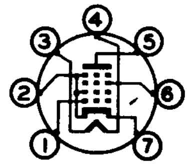
7FZ

35GL6, 50HC6,
50HK6



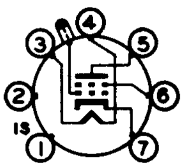
7G

6C7



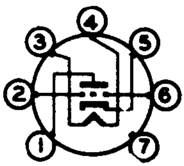
7GA

2FS5, 2GU5, 3FS5,
3GU5, 6FG5, 6FS5,
6GU5



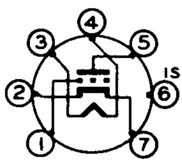
7GE

7851



7GK

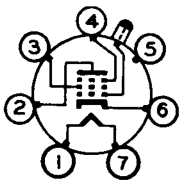
2GW5, 3GW5,
4GW5, 6GW5



7GM

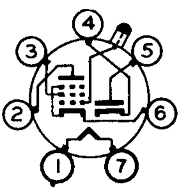
2HA5, 2HK5, 2HM5,
2HQ5, 3HA5, 3HK5,

3HM5, 3HQ5, 4HA5,
4HK5, 4HM5, 4HQ5,
6HA5, 6HK5, 6HM5,
6HQ5



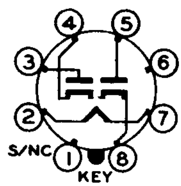
7H

6D7, 6E7



7K

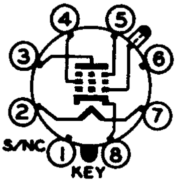
12A7



7Q

6AX6-G, 6H6,
6H6-GT, 12H6,

25X6-GT, 25Z6,
25Z6-GT, 35Z6-G,
50AX6-G, 50Y6-GT,
50Z6-G, 117Z6-GT



7R

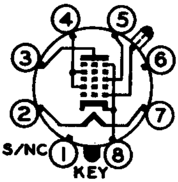
6J7, 6J7-G, 6J7-GT, 6K7, 6K7-G, (Cont'd)

7R (Cont'd) 6K7-GT, 6S7, 6S7-G, 6U7-G, 6W7-G, 12J7-GT, 12K7-GT, 1620

7S (See 7AC)

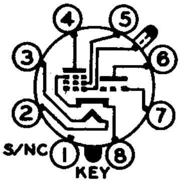
6DG6-GT, 6EF6, 6F6, 6F6-G, 6F6-GT,

6G6-G, 6G6-GT, 6K6-GT, 9EF6, 12EF6, 25A6, 25A6-GT, 25B6-G, 26E6-G, 1621, 6550 8417



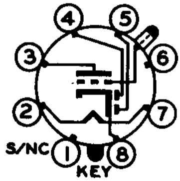
7T

6L7, 6L7-G, 1612



7U

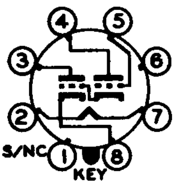
6P7-G



7V

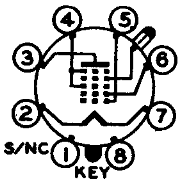
6B6-G, 6Q7, 6Q7-G, 6Q7-GT,

6R7, 6R7-G, 6R7-GT, 6T7-G, 6V7-G, 12Q7-GT



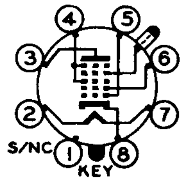
7W

6AC6-GT, 25N6-G



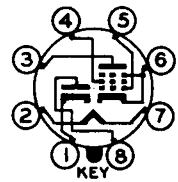
7Z

1A7-G, 1A7-GT, 1B7-G, 1B7-GT, 1C7-G, 1D7-G



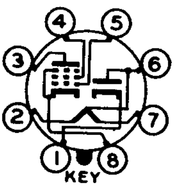
8A

6A8, 6A8-G, 6A8-GT, 6D8-G, 12A8-G, 12A8-GT



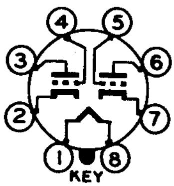
8AA

70L7-GT



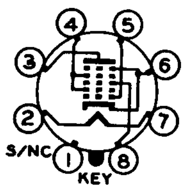
8AB

70A7-GT



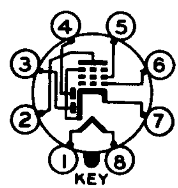
8AC

7AF7, 7F7, 7N7, 14AF7, 14F7, 14N7



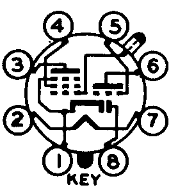
8AD

6SA7-GT, 12SA7-GT, 12SY7-GT



8AE

7E7, 7R7, 14E7, 14R7

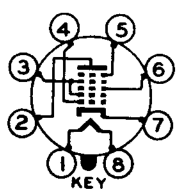


8AF

25D8-GT

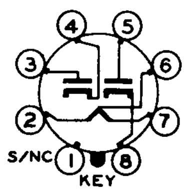
8AJ (See 8AW)

1D8-GT



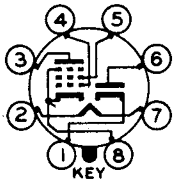
8AL

7Q7, 14Q7

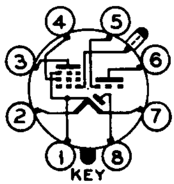


8AN

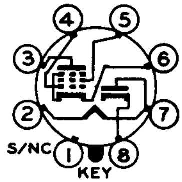
50Y7-GT, 50Z7-G



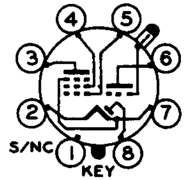
8AO
117L7/M7-GT



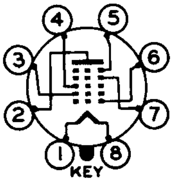
8AS
3A8-GT



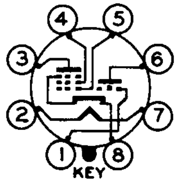
8AV
117N7-GT, 117P7-GT



8AW
1B8-GT



8AX
1LB6



8AY
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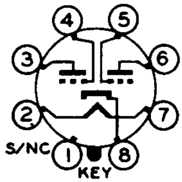
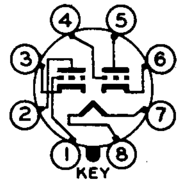


8B
6N7, 6N7-G, 6N7-GT, 6Y7-G, 6Z7-G, 1635



8BD
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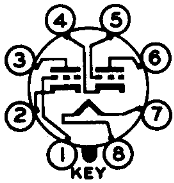

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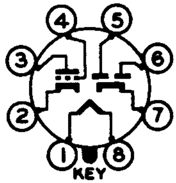
6AH7-GT, 12AH7-GT



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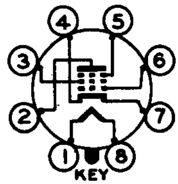

8BJ
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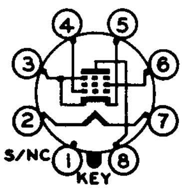
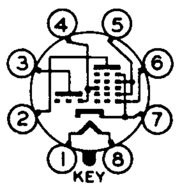


8BK
6SG7, 6SG7-GT, 6SH7, 6SH7-GT, 12SG7, 12SH7



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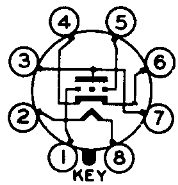
7J7, 7S7, 14J7, 14S7



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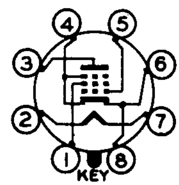

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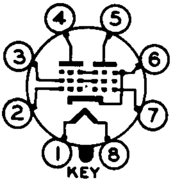

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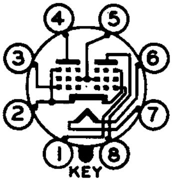
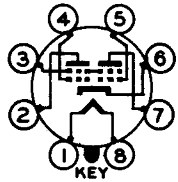


8BU
12L8-GT, 26A7-GT, 1644



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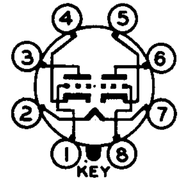

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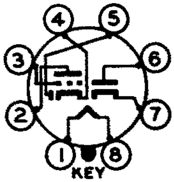
7F8, 14F8



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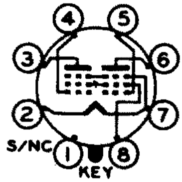

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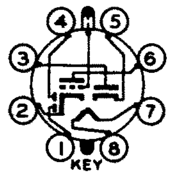

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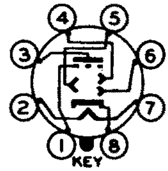

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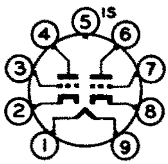
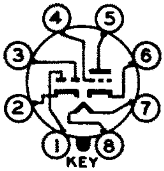


8CJ

2C51, 5670, 6385, 6386, 6854, 7861



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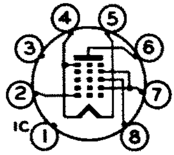

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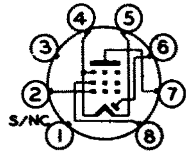

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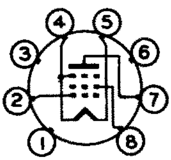

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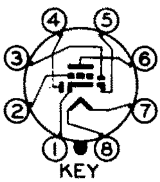
1AC5, 1AD5, 1V5, 1W5



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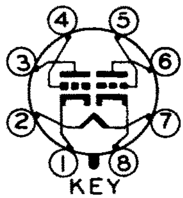

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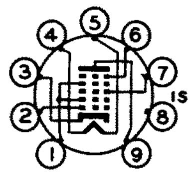

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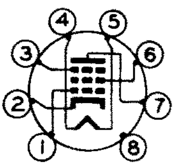

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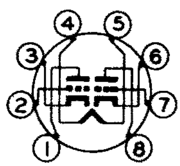

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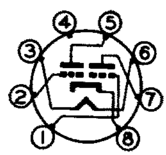

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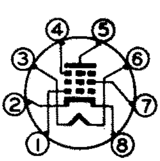

8DC

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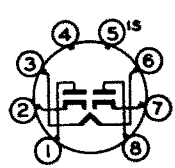

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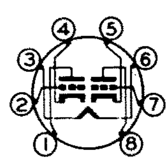

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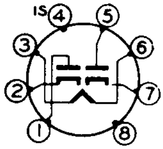

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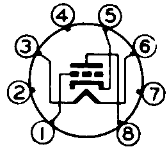
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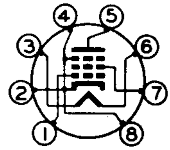
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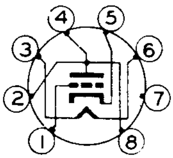
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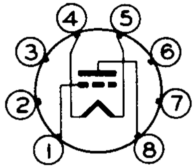
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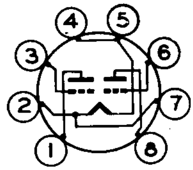
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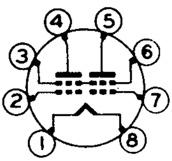
5967, 5968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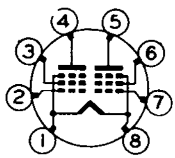
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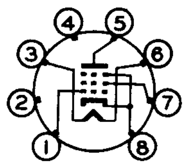
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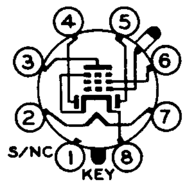

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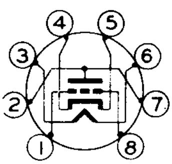
6B8, 6B8-G, 6B8-GT, 12C8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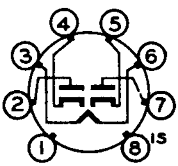

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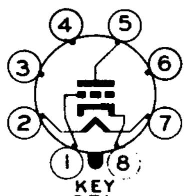

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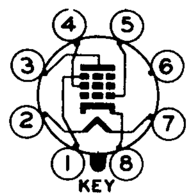

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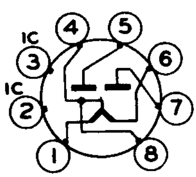

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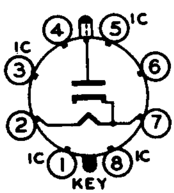

8EZ

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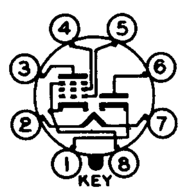

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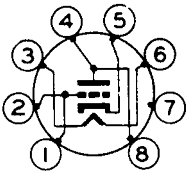

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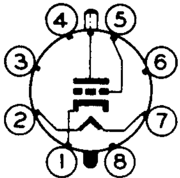

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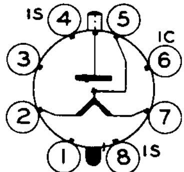

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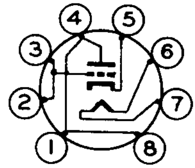

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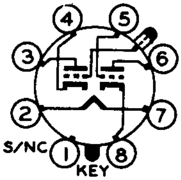

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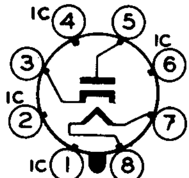
6C8-G, 6F8-G



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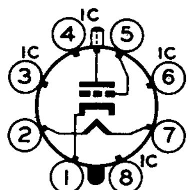

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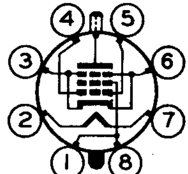
6BK4-C, 6BU4



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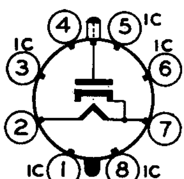
6CB5, 6CB5-A, 6CL5



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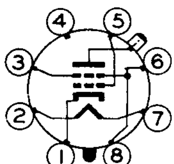

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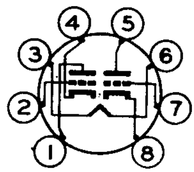

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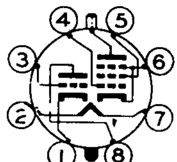

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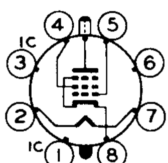
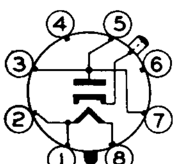


8GT
25E5, 50E5



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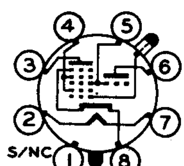

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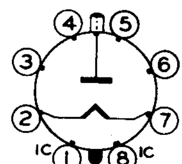

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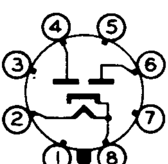

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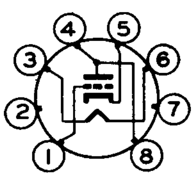

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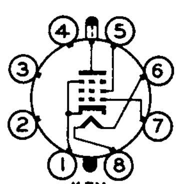

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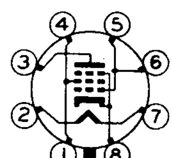

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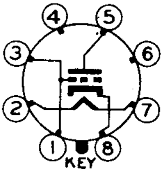

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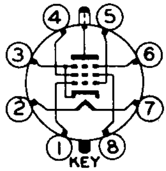

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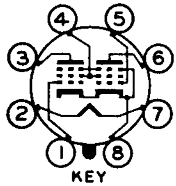

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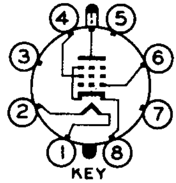

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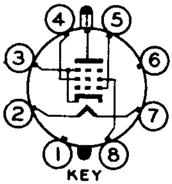

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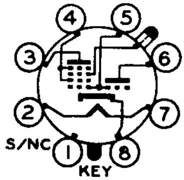

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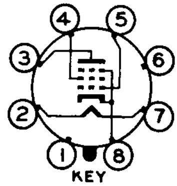

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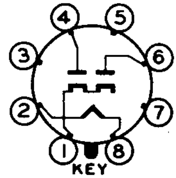

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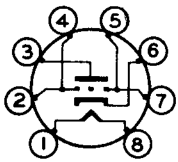
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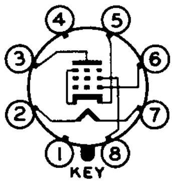

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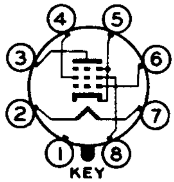

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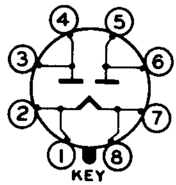

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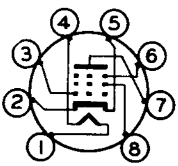
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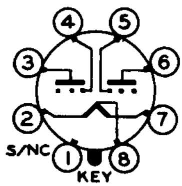

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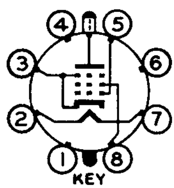

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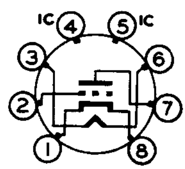

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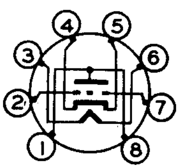
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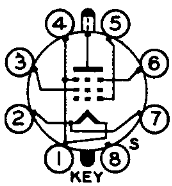

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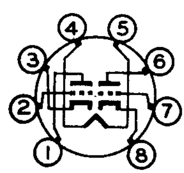
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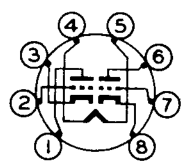
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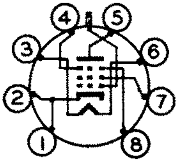

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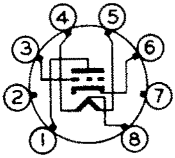

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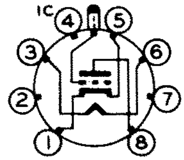

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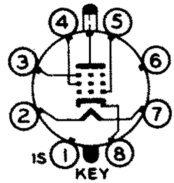

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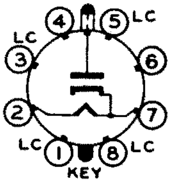

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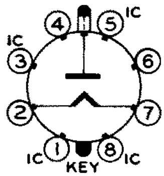

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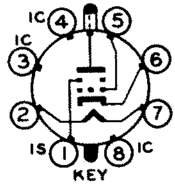

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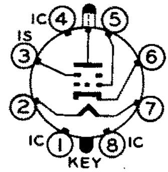
6LC6, 6LH6, 6LH6-A



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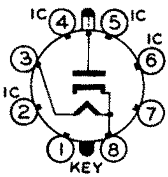

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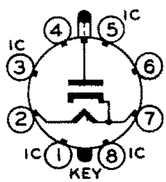

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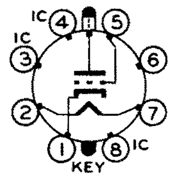

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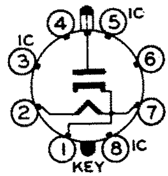

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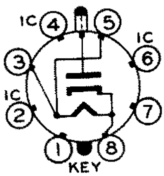

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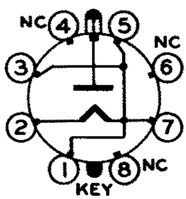

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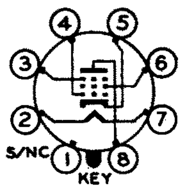

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6AB7/1853, 6AC7, 6AJ7, 6SD7-GT,

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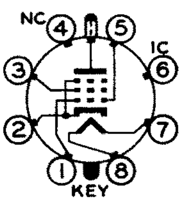

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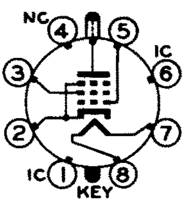

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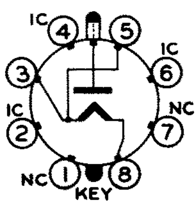

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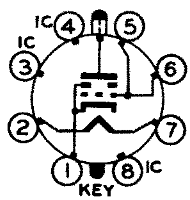

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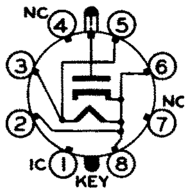

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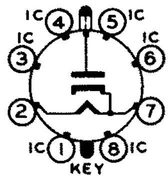

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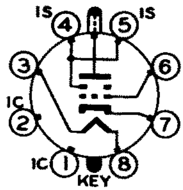

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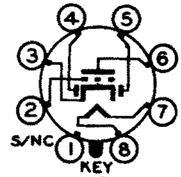

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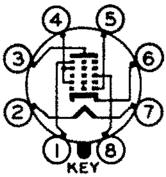

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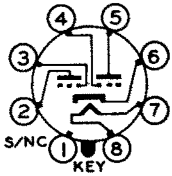

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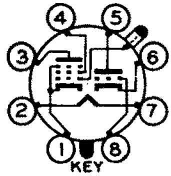

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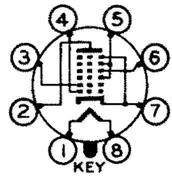
12B8-GT, 25B8-GT



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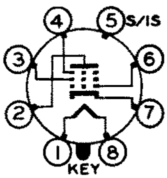

8V

7A7, 7AD7, 7AH7, 7AJ7, 7AK7, 7B7,

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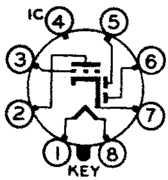

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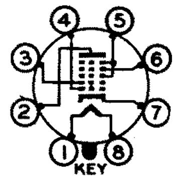

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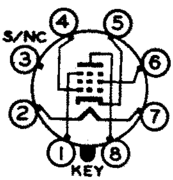

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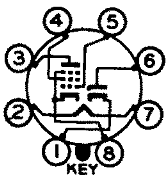
6AG7, 6AK7



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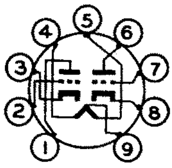
9A

6AU7, 6AX7, 7AU7, 9AU7, 12AD7, (Cont'd)

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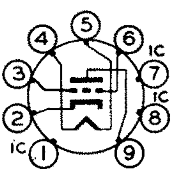
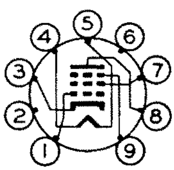


9AC

6S4, 6S4-A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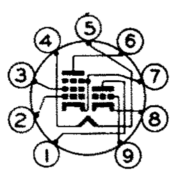
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9AE (Cont'd)
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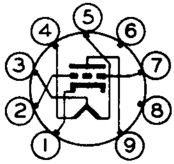
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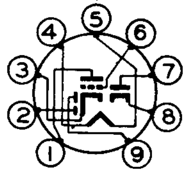
12A4, 12B4, 12B4-A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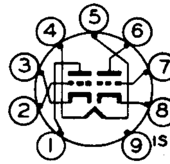

9AJ

4BC8, 4BQ7-A, 4BS8, 4BX8, 4BZ7, 4BZ8, (Cont'd)

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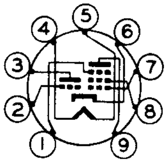
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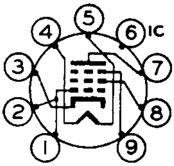
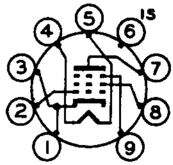


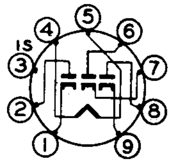
9AM

6BW6



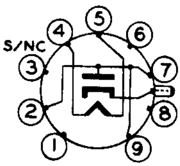
9AQ

3EH7, 3EJ7, 4EH7, 4EJ7, 6EH7, 6EJ7, 6GK7



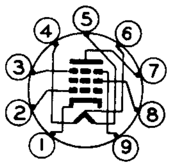
9AX

6BC7, 6BJ7

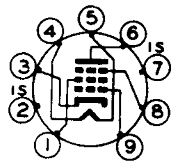


9BD

6V3, 6V3-A

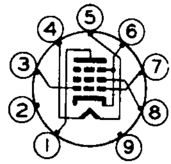

9BF

11HM7, 12BV7, 12BY7, 12BY7-A, 12DQ7, 12GN7, 12GN7-A, 12HG7, 7733, 8448

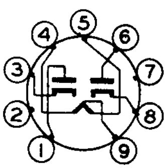


9BJ

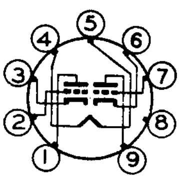
2HR8, 4HR8


9BQ

6BK5, 12BK5, 25BK5, 50BK5


9BS

12DF5, 26Z5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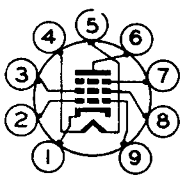
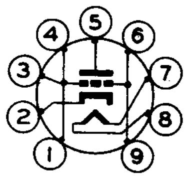
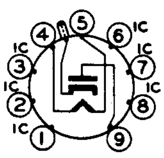

9BV

6CL6, 6197, 6677

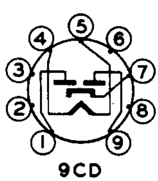

9BX

6AJ4, 6AM4



9CB

6AF3, 6AL3, 6BR3, 6R3, 12AF3, 12BR3, 12BY3, 16AQ3, 17BR3, 25BR3, 34R3


9CD

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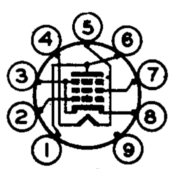
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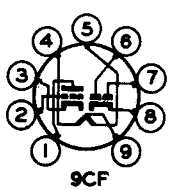
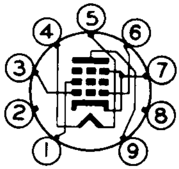
6216

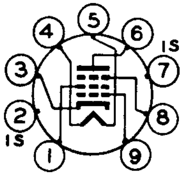

9CF

9BR7, 12BR7, 12BR7-A 8447



9CK

5CM6, 6CM6, 6DW5, 12CM6, 12DW5



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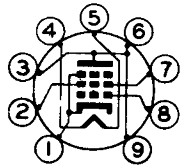

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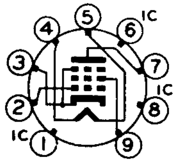
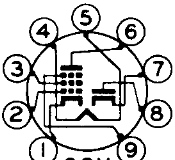


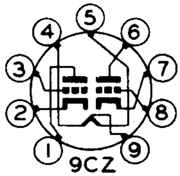
9CV

6BQ5, 6CW5, 8BQ5, 8CW5, 8CW5-A, 10BQ5, 10CW5, 15CW5, 30CW5, 45B5, 7189, 8327



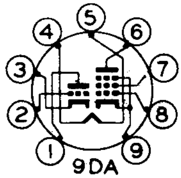
9CY

5AM8, 6AM8, 6AM8-A, 6HJ8



9CZ

12G8, 6350, 6463, 6840



9DA

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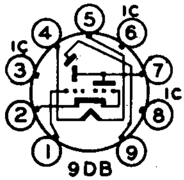

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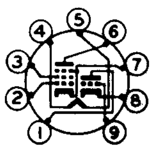

9DC

4JW8 5JW8 5KE8, 6JW8, 6KE8, 6LX8, 6MG8, 8A8, 9A8 9JW8 17A8

9DE (SEE 9AJ)

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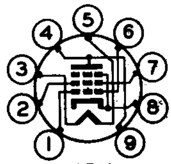

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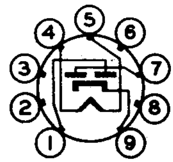
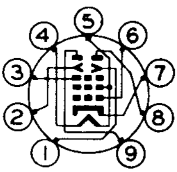
6094



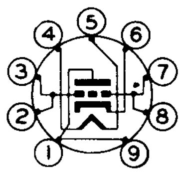
9DJ

6BW4, 12BW4



9DP

6AR8, 6JH8



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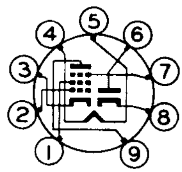
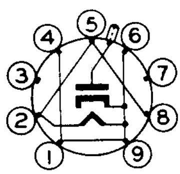
6BC4



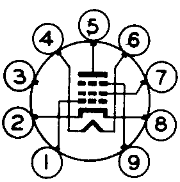
9DS

5AS8, 6AS8



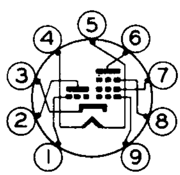
9DT

1S2, 1S2-A, 2J2, 3A2



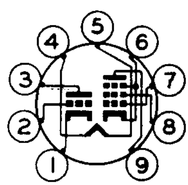
9DV

6486, 6486-A



9DW

5AT8, 6AT8, 6AT8-A

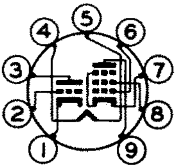


9DX

6AU8, 6AU8-A, 6AW8, 6AW8-A, 6BA8, 6BA8-A, (Cont'd)

9DX (Cont'd)

6BH8, 6CX8, 6EB8, 6GN8, 6HF8, 6HZ8, 6JE8, 6JL8, 6JT8, 6JV8, 6KR8, 6KR8-A, 6KS8, 6KV8, 6LB8, 6LF8, 6LQ8, 6LY8, 6MV8 8AU8, 8AU8-A. 8AW8-A, 8BA8-A, 8BH8, 8CX8, 8EB8, 8GN8, 8JE8, 8JL8, 8JT8, 8JV8, 8KR8, 8KS8, 10EB8, 10GN8, 10HF8, 10JT8, 10JY8, 10KR8, 10LB8, 10LW8, 10LY8 10LZ8, 11JE8, 11KV8, 11LQ8, 12AU8, 7716



9DZ
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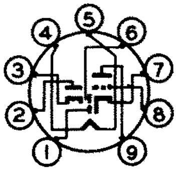

9E
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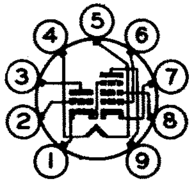

9EC
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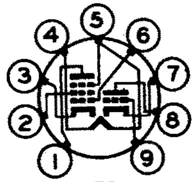

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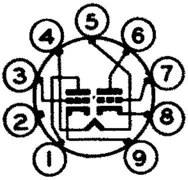
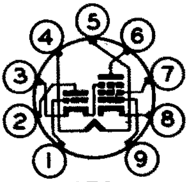
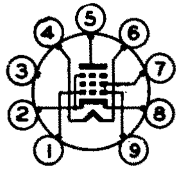


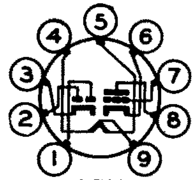
9EF
6CS7, 6DA7, 8CS7, 10DA7



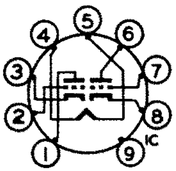
9EG
5BE8, 5DH8, 6BE8, 6BE8-A



9EJ
6582, 6582-A



9EN
6CN7, 8CN7



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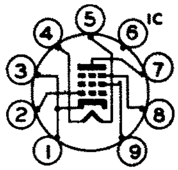

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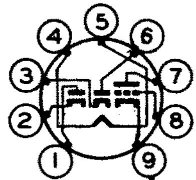
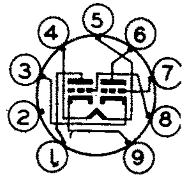
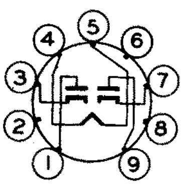


9ER
6BJ8, 6BN8, 8BN8



9ES
6CM7, 8CM7



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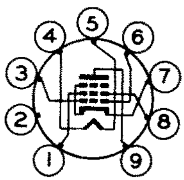
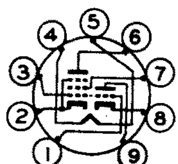
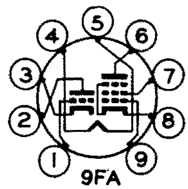


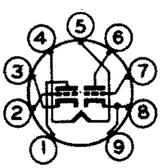
9EU
6GC5, 12AB5, 6973, 7061



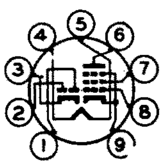
9EX
6BM8, 6FY8, 6HC8, 11BM8, 12FY8, 16A8, 17HC8, 25FY8, 50BM8, 50FY8



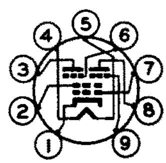
9FA
5BR8, 5FV8, 5MB8, 6BR8, 6BR8-A, 6FV8, 6FV8-A, 6JN8, 6MB8, 12EC8, 12JN8, 19HV8, 19JN8, 8446



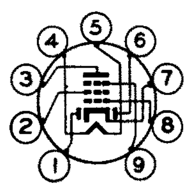
9FC
4CX7, 6CH7, 6CX7



9FE
5BT8, 6BT8



9FG
3BU8, 3BU8-A, 3KF8, 4BU8, 4KF8, 6BU8, 6BU8-A, 6KF8, 6MK8 6MK8-A



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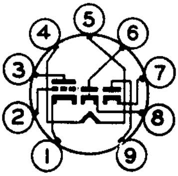
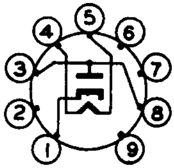


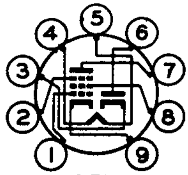
9FJ

6BV8



9FK

17H3



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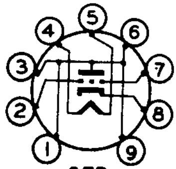

9FR
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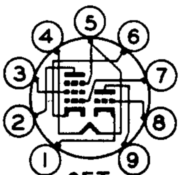
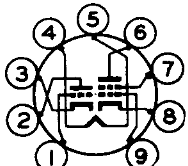
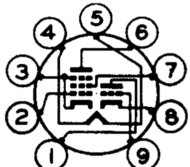


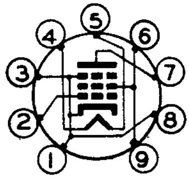
9FT
6CH8



9FX
5CL8, 5CL8-A, 6CL8, 6CL8-A, 9CL8, 19CL8-A



9FZ
5CM8, 5KZ8, 6CM8, 6CS8, 6KZ8, 9KZ8



9G

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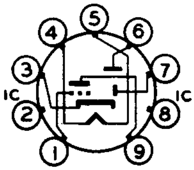
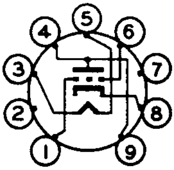


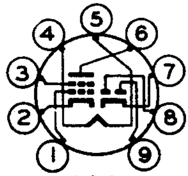
9GA

6FG6, 6HU6



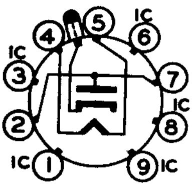
9GB

6877



9GC

12J8



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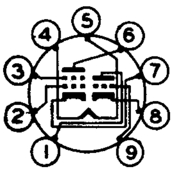

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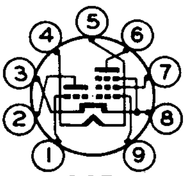

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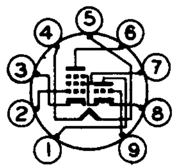

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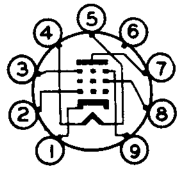

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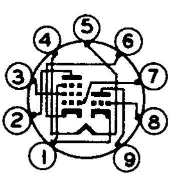

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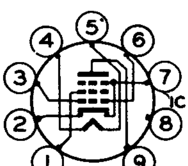

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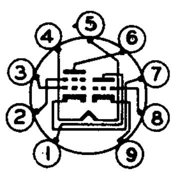

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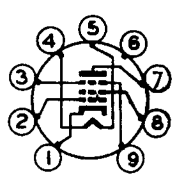

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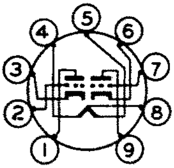

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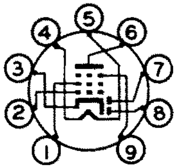

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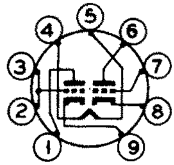

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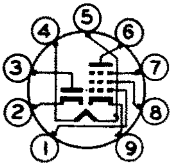

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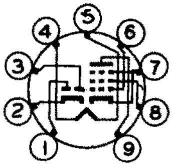

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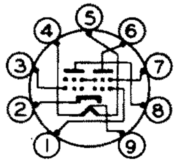

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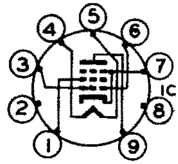

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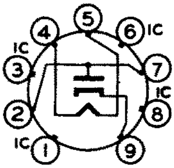

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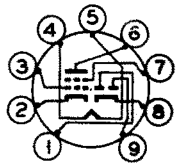

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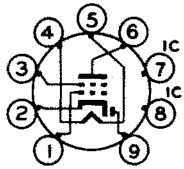

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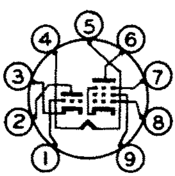

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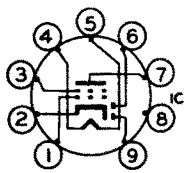

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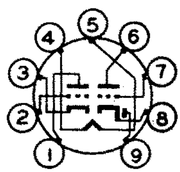

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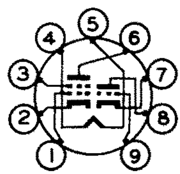

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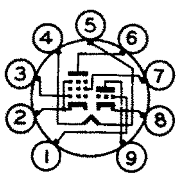

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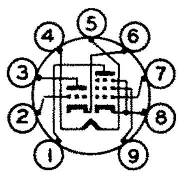

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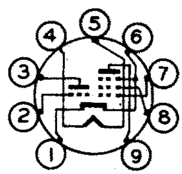

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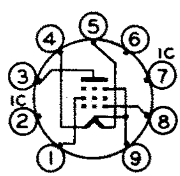

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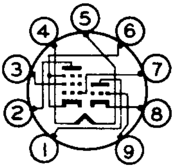

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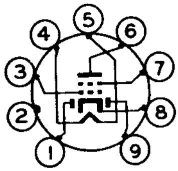

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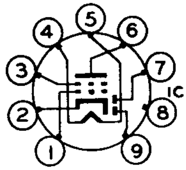

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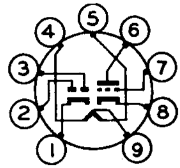

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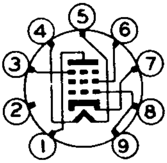

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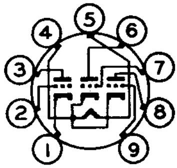

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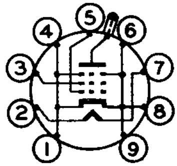

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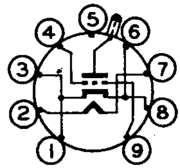

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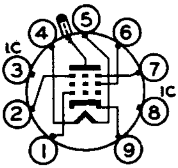

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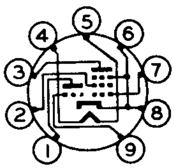

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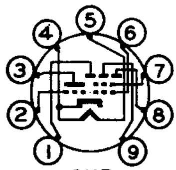

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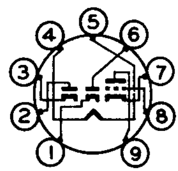

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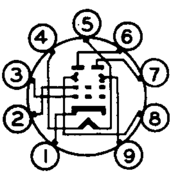

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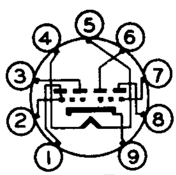

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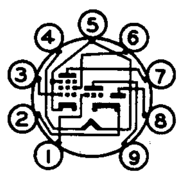

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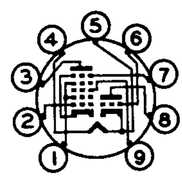

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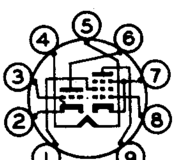

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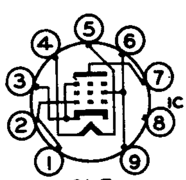

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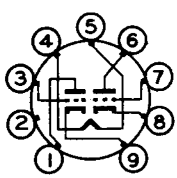

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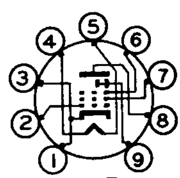

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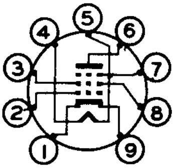

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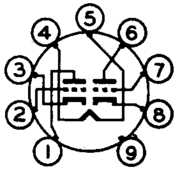

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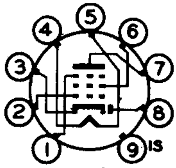

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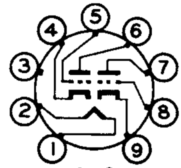

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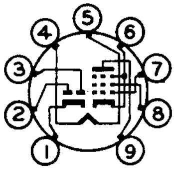

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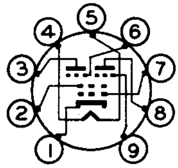

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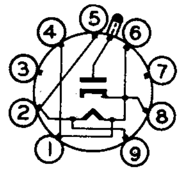

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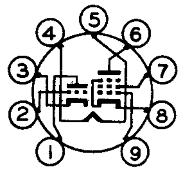

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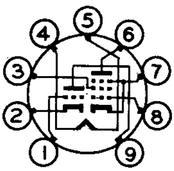

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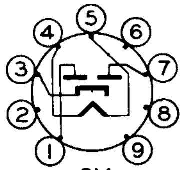

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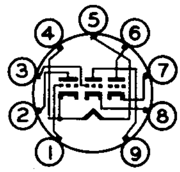

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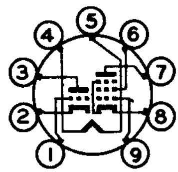

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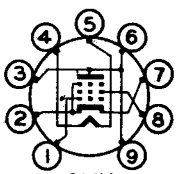

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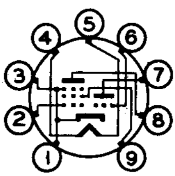

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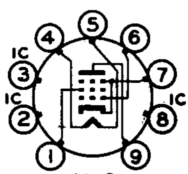

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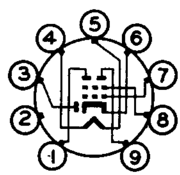

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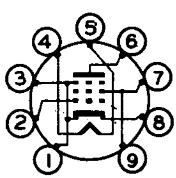

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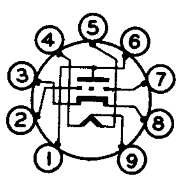

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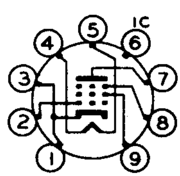

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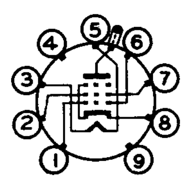

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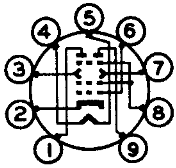
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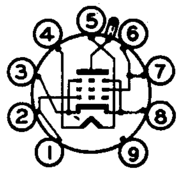
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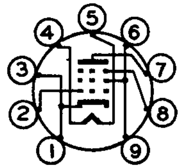
6GB5, 13GB5, 18GB5, 27GB5, 28GB5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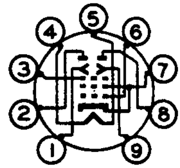
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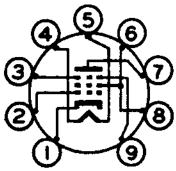
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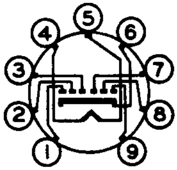
6HA6, 6HB6, 8HA6, 10HA6, 15HA6, 15HB6, 28HA6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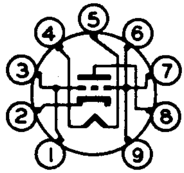
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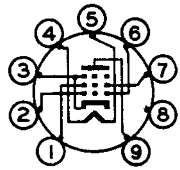
6DL4, 8255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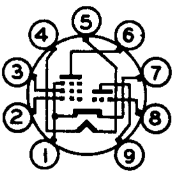
6GT5, 6GT5-A, 12GT5, 12GT5-A, 17GT5, 17GT5-A, 7868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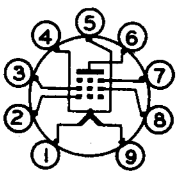
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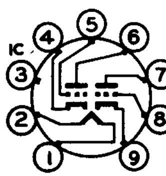
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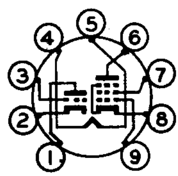
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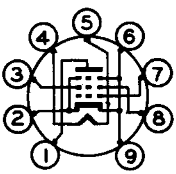
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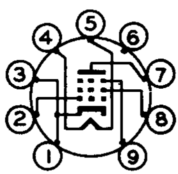
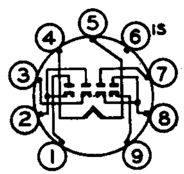

9PM

3HM6, 3HT6, 3JC6, (Cont'd)

9PM (Cont'd)
3JC6-A, 3JD6, 3KT6, 4HM6, 4HT6, 4JC6, 4JC6-A, 4JD6, 4KT6, 6HM6, 6HT6, 6JC6, 6JC6-A, 6JD6, 6KT6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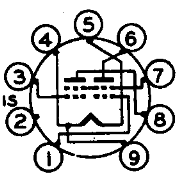
6JU8, 6JU8-A, 8JU8-A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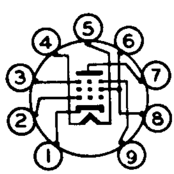
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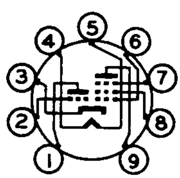
6JW6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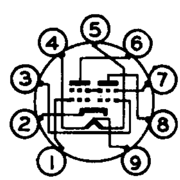
6KA8, 8KA8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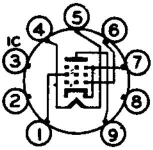
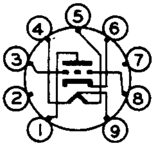
6360, 8457, 8458



9PX

7695, 7754



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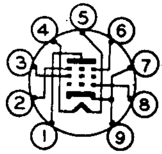

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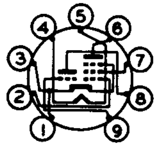
8233



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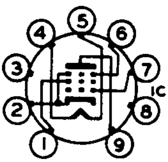
4GJ7, 4GX7, 5GJ7, 5GX7, 5HB7, 6GJ7, 6GX7, 6HB7, 6HD7, 6HJ7, 8GJ7, 8GX7



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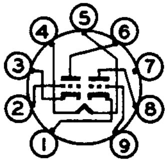

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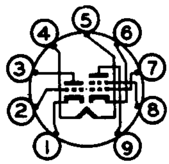
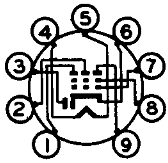


9QF

6JA8, 10JA8



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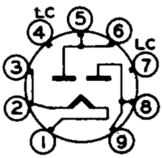
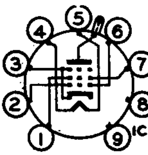


9QJ

5BC3, 5BC3-A



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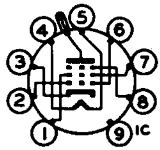
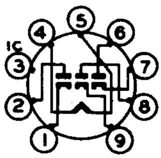
6GJ5, 6GJ5-A, 12GJ5, 17GJ5, 17GJ5-A



9QL

6JB6, 6JB6-A, 6JE6, 6JE6-A, 6JE6-B, 6JE6-C, 6JF6, 6JU6

6KM6, 6LQ6, 6MC6 6ME6 6LZ6 12JB6-A, 17JB6, , 17JB6-A, 17JF6 22JF6, 22JU6, 22KM6, 24JE6-A, 24LQ6 24LZ6 31LQ6 31LZ6 36MC6



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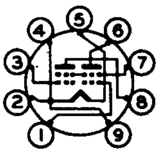
6GQ7, 19GQ7



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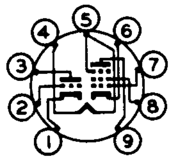

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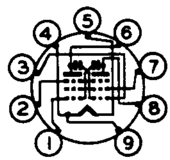

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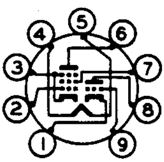
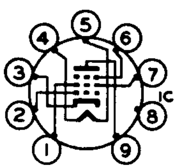


9QT

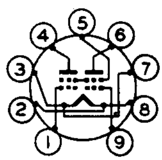
6KY8, 6KY8-A, 6LR8, 15KY8, 15KY8-A, 15MX8 , 17LD8, 21LR8 31LR8



9QU

6JG6, 6JG6-A, 6JR6, 6JT6, 6JT6-A, 6KV6, 6KV6-A, 12JT6, 12JT6-A, 17JG6.

9QU (Cont'd)
17JG6-A, 17JR6
17JT6, 17JT6-A,
17KV6, 17KV6-A
22JG6, 22JG6-A, 22JR6
22KV6-A 33JR6



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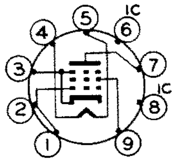
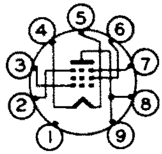


9QW

6HL5, 12HL5, 50HN5, 60HL5



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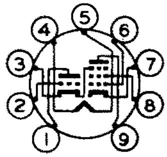

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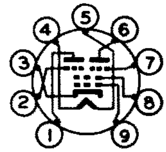
6LC8, 8LC8



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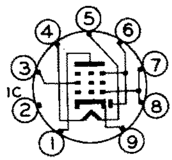
6LE8, 8LE8, 10LE8, 15LE8



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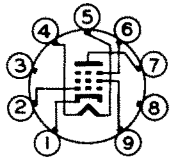
6JQ6, 12JQ6, 17JQ6, 25JQ6



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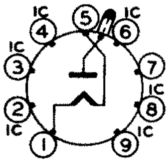
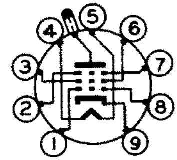
9KC6



9RG

1BC2, 1BC2-A, 1BC2-B 1BH2, 1BH2-A



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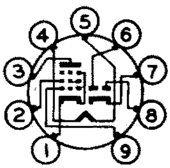
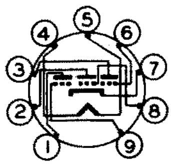
6KG6, 21KQ6, 27KG6, 29KQ6, 29LE6, 40KG6



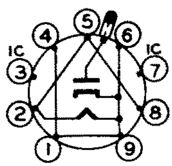
9RL

6LT8, 8LT8, 11LT8



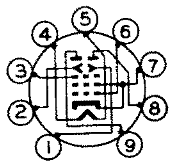
9RQ

6MD8, 6ML8, 9ML8, 12MD8



9RT

2BJ2, 2BJ2-A, 3A2-A



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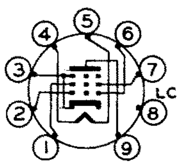
6ME8



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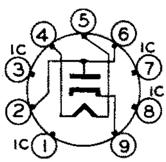
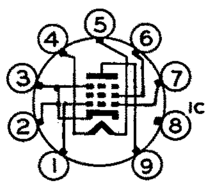


9RX

6CT3, 12CT3, 17CT3 25CT3



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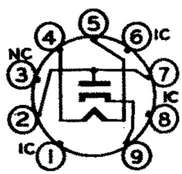
25HX5



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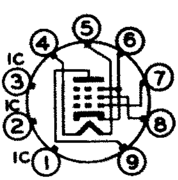
6CJ3



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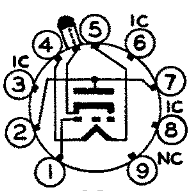
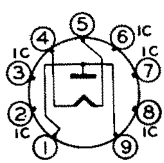


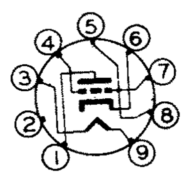
9SG

6DK3, 19DK3, 25DK3



9U

1AU2, 1V2, 2AV2, 2BA2



9V

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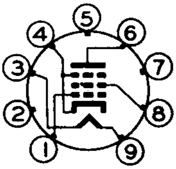
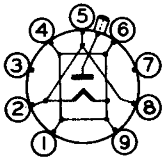


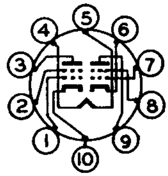
9X

5847, 5847-A



9Y

1AX2, 1BK2, 1BX2, 1X2
1X2-A, 1X2-B, 1X2-C
2AZ2



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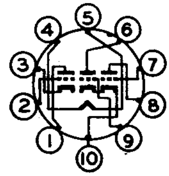
6C9, 17C9



10G

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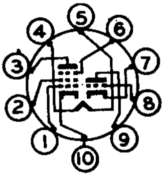
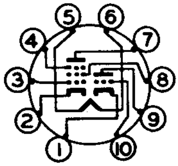


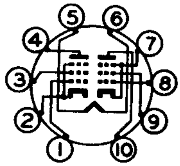
10H

19Q9



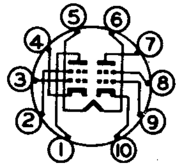
10K

5U9, 5X9, 6U9, 6X9,
8U9, 8X9



10L

6Y9, 11Y9, 16Y9



10N

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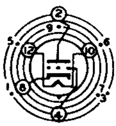

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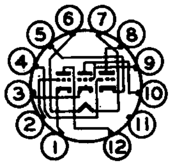

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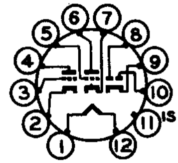

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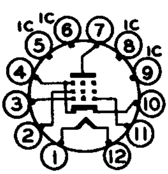

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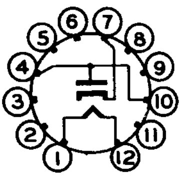
21HB5, 21HB5-A



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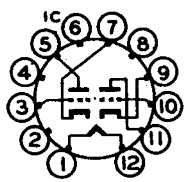

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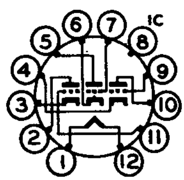

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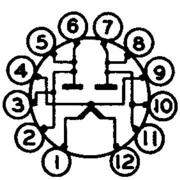

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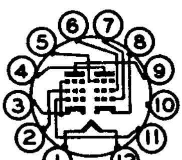

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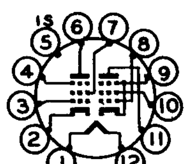

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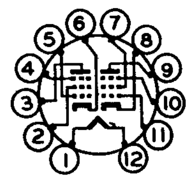
12AL11, 12G11



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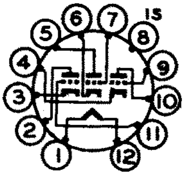

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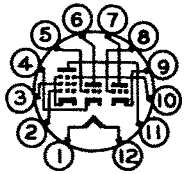

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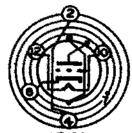

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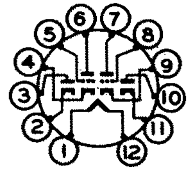

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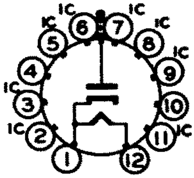

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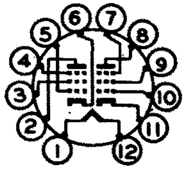

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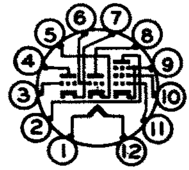

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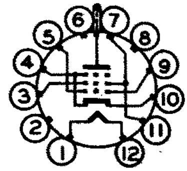

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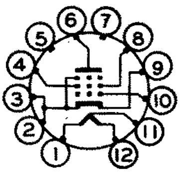

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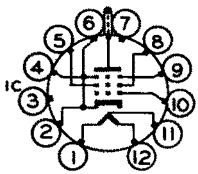

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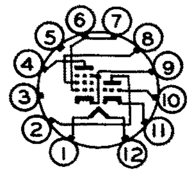

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6JZ8, 6LU8. 6MF8, 6MY8 13JZ8 15MF8

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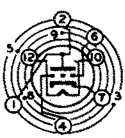

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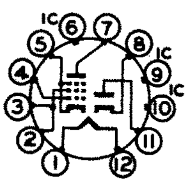

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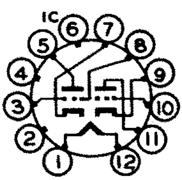

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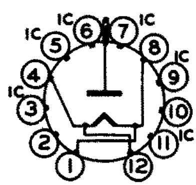

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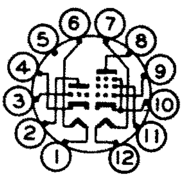

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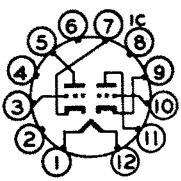

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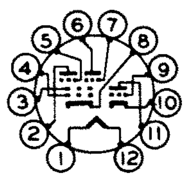

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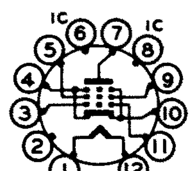

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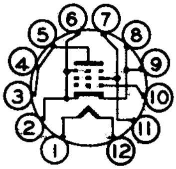
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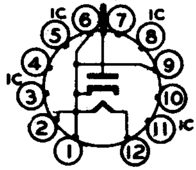
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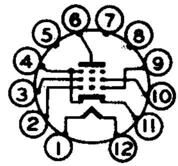
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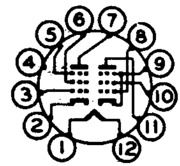
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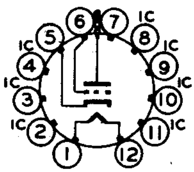
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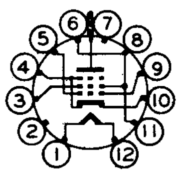
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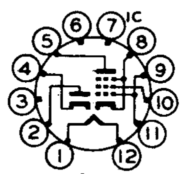
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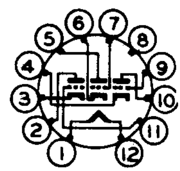
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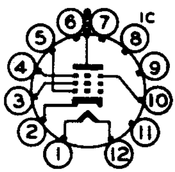
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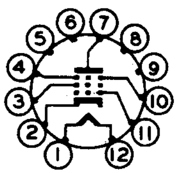
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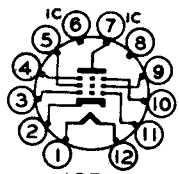
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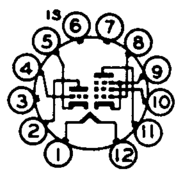
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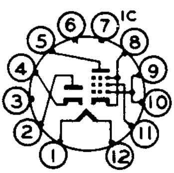
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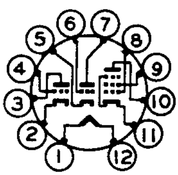
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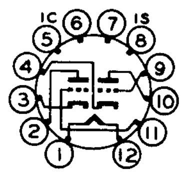
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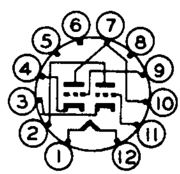
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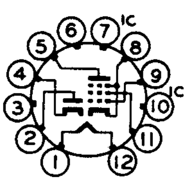
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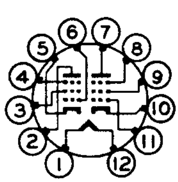
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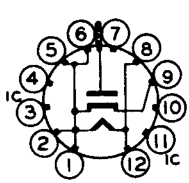
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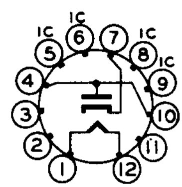
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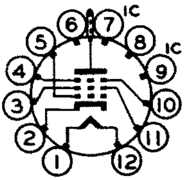

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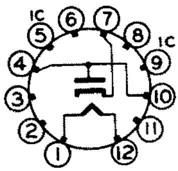
6JS6, 6JS6-A, 6JS6-B, 6JS6-C 6LR6, 6MB6 12JS6, 21JS6-A 23JS6-A, 23MB6 30MB6 31JS6-A, 31JS6-C

35LR6



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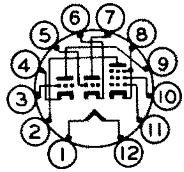

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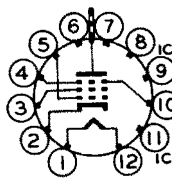

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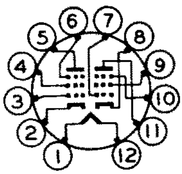

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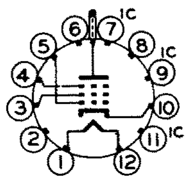

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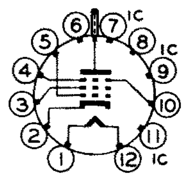
16KA6, 21KA6



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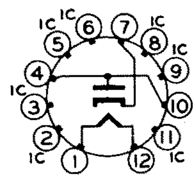

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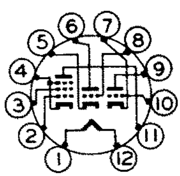

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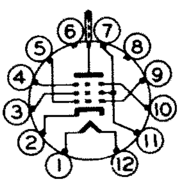

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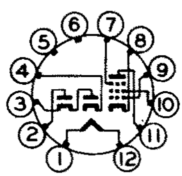

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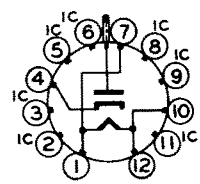

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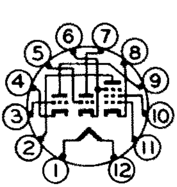

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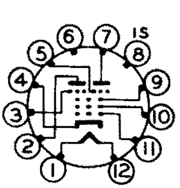

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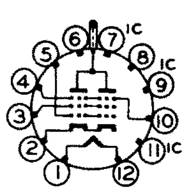

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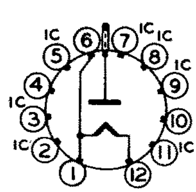

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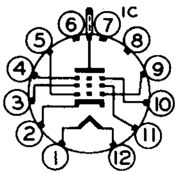
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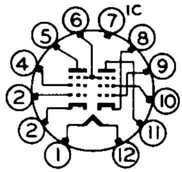
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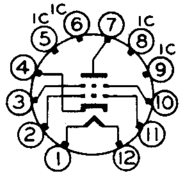
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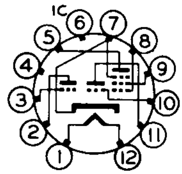
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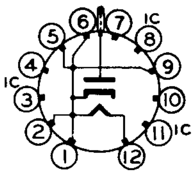
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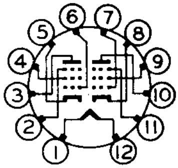
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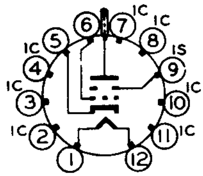
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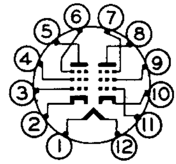
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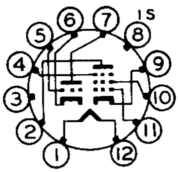
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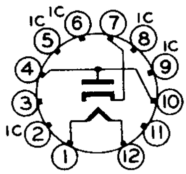
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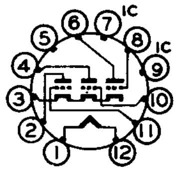
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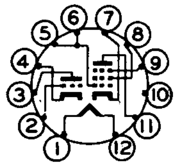
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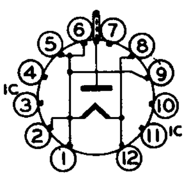
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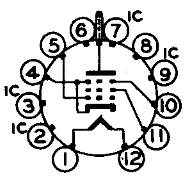
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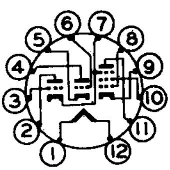
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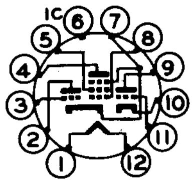
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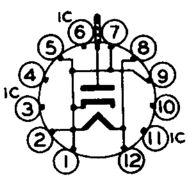
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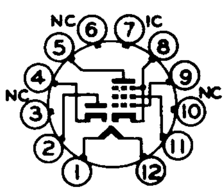
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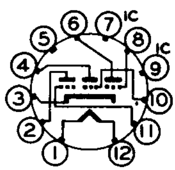
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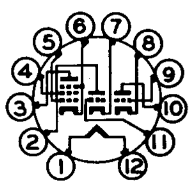
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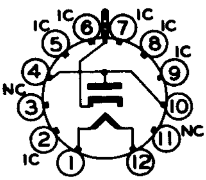

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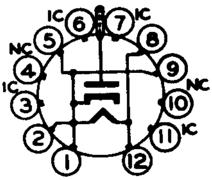

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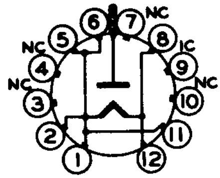

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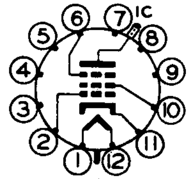

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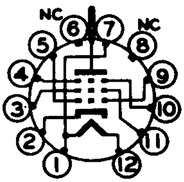

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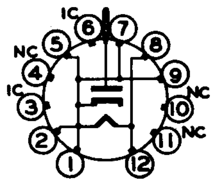

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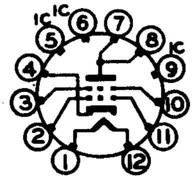

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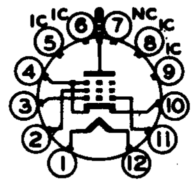

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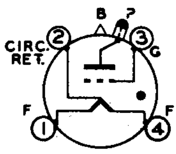

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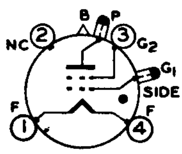
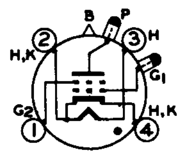
6011/710, 7725



FG-97

FG-97, FG-98-A



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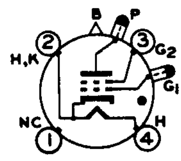

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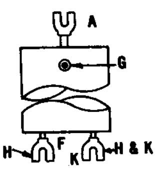

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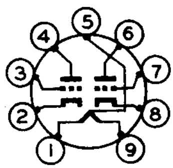

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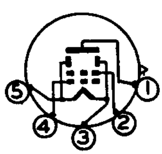

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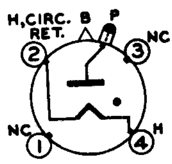

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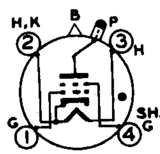
575-A



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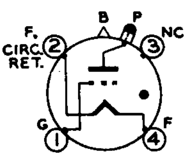

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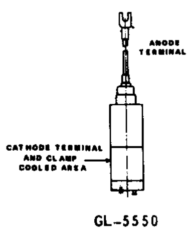

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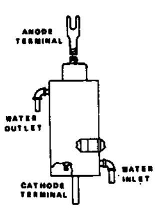

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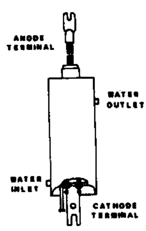
GL-5553-B, GL-5822-A
GL-7681



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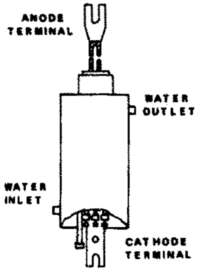

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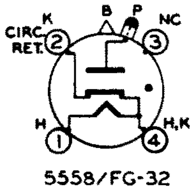

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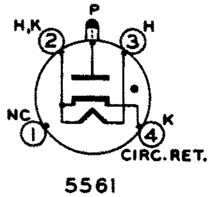

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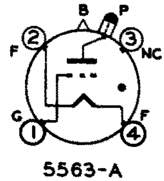

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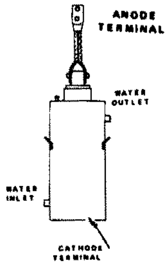

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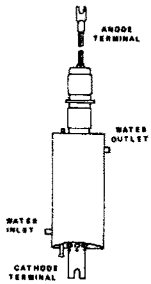

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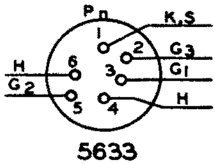

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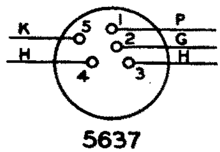

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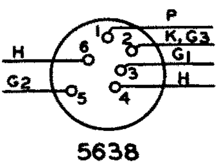

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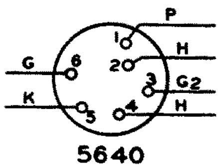

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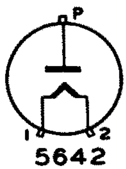

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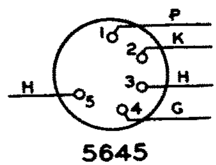

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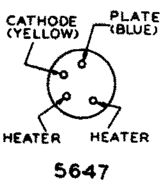

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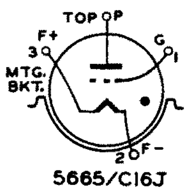

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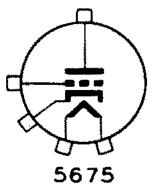

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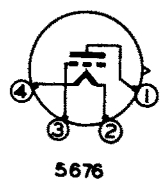

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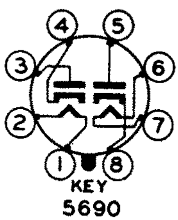

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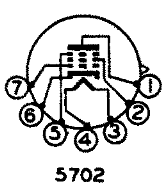

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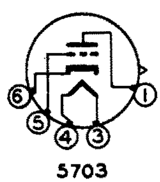

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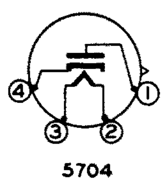

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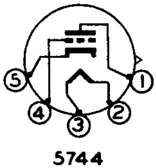

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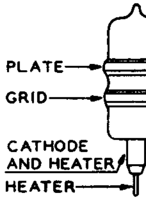

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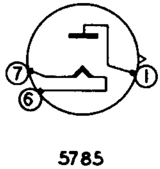

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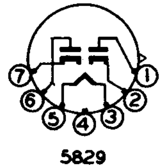

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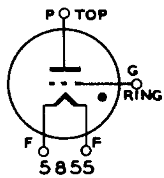

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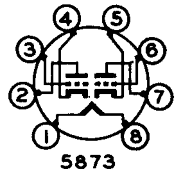

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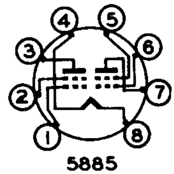

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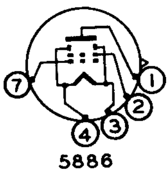

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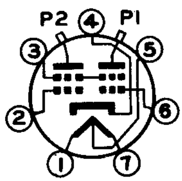

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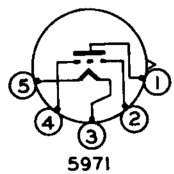

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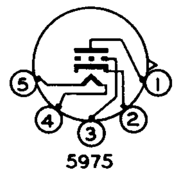

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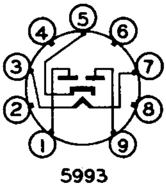

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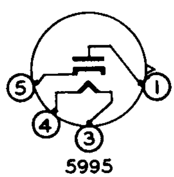

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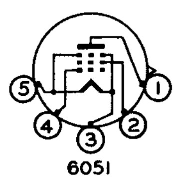

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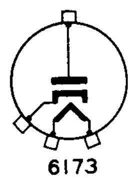

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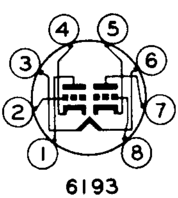

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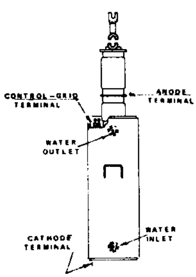

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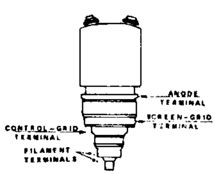

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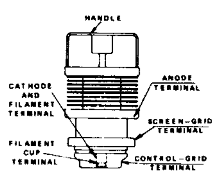

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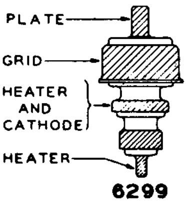

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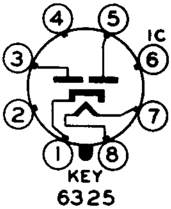

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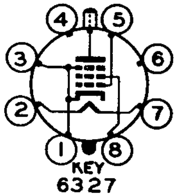

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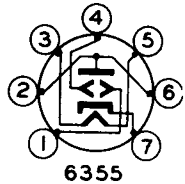

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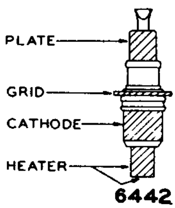

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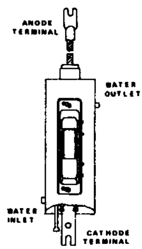

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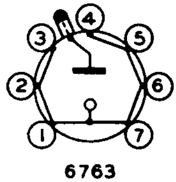

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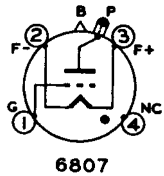

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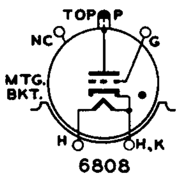
6858/760



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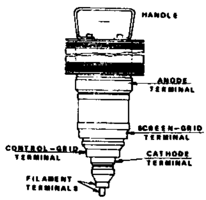

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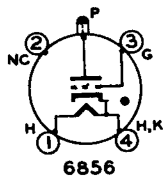

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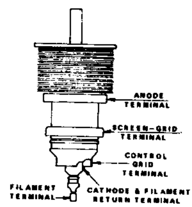

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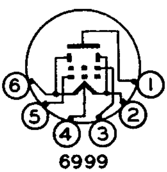

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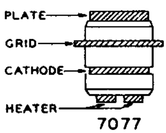

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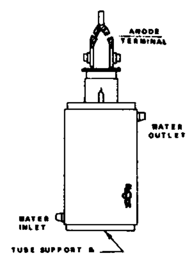

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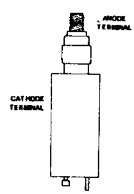

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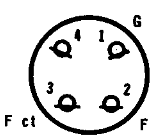

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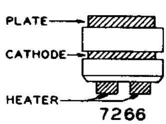

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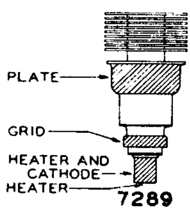

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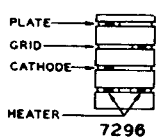

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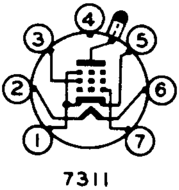

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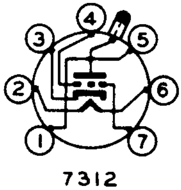

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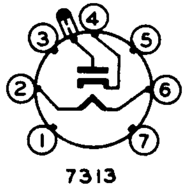

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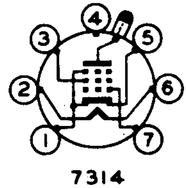

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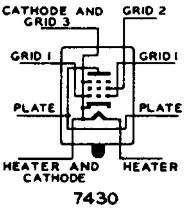

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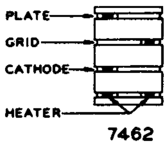

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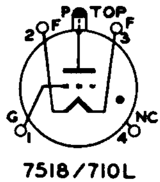

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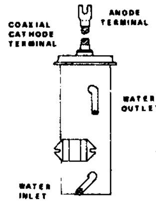

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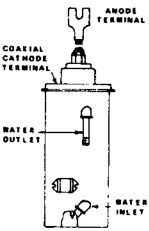
GL-7972, GL-7998



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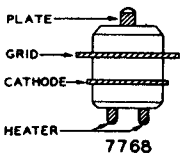

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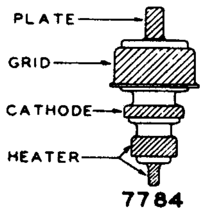

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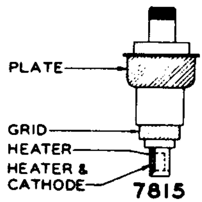

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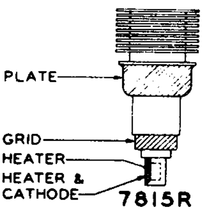

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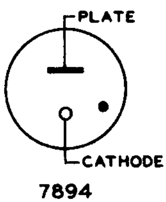

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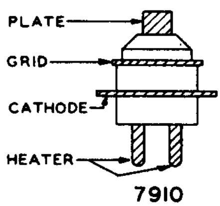

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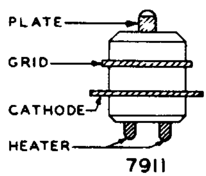

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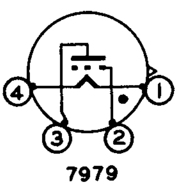

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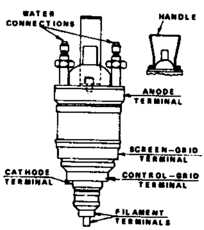

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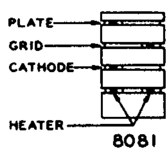

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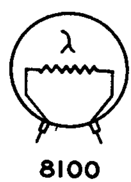

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8318, 8318-A, 8345,

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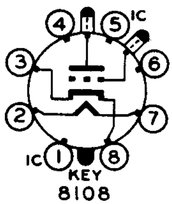

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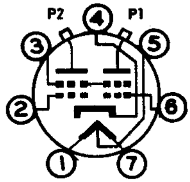

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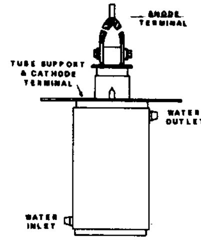

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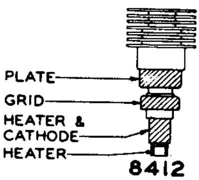

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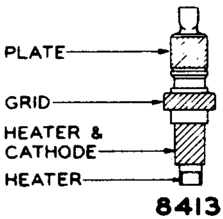

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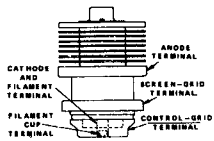

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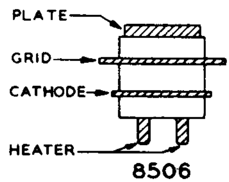

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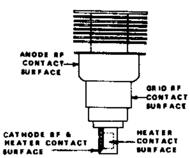

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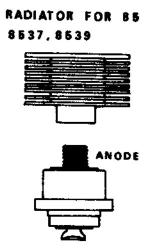

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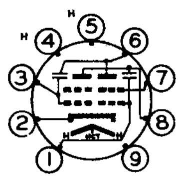

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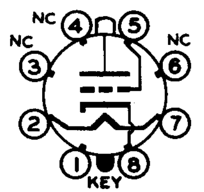

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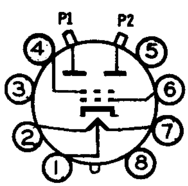

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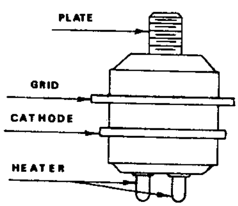

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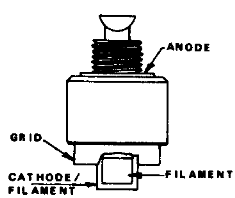

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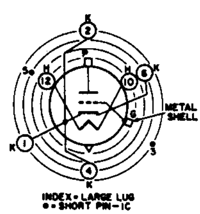

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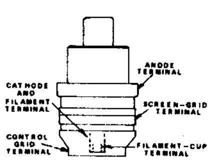

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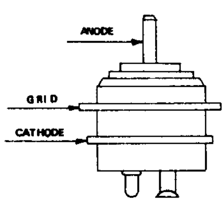

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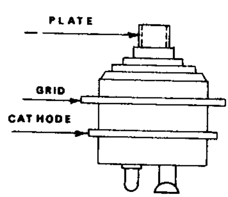

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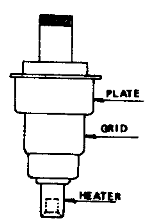

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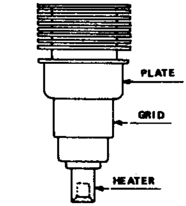

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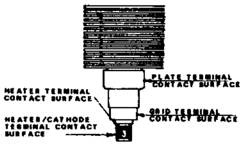

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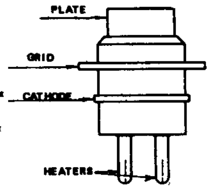

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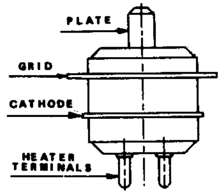

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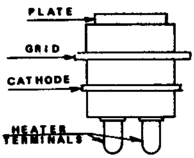

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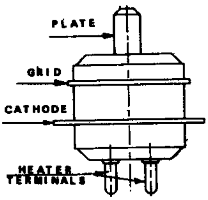

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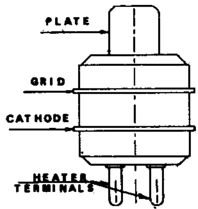

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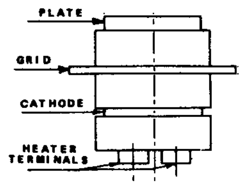

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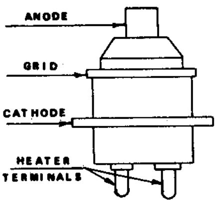

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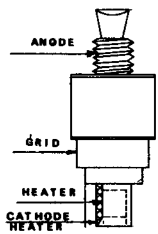

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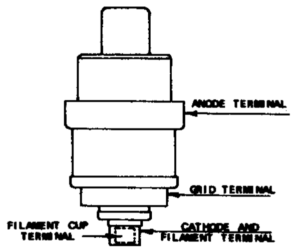

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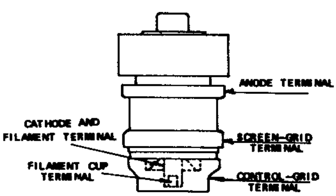

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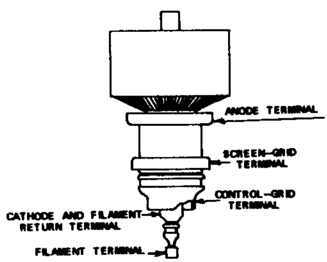

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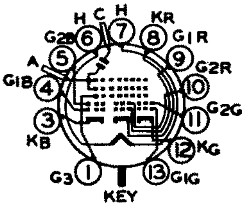

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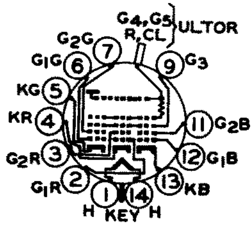

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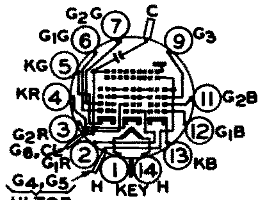

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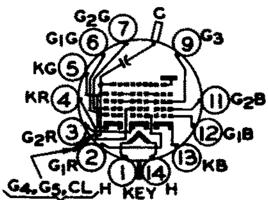

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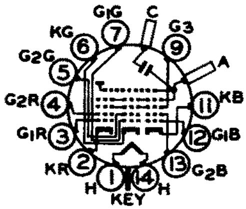

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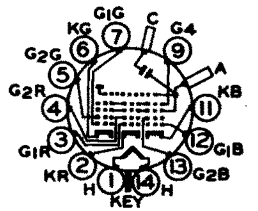

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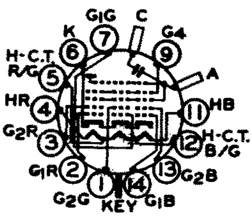

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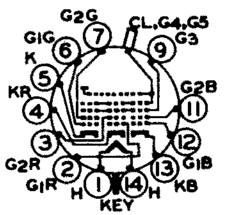

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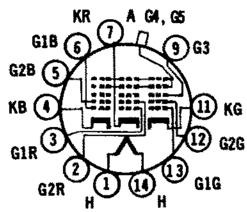

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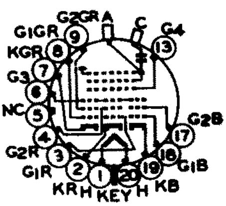

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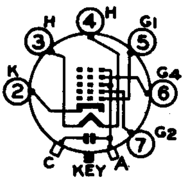

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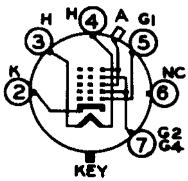

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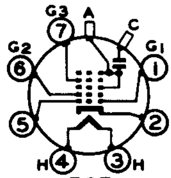

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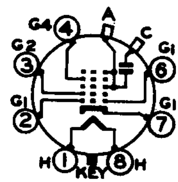

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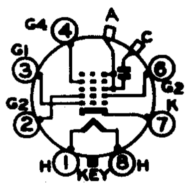

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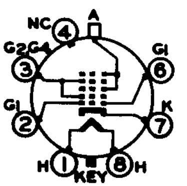

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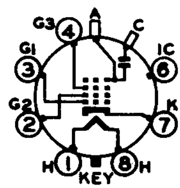

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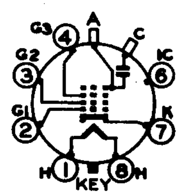

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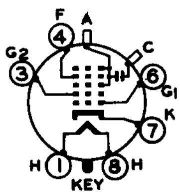

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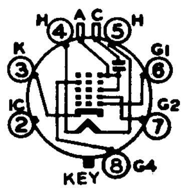

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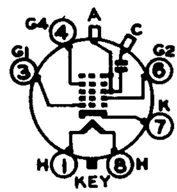

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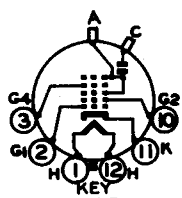

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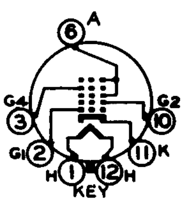

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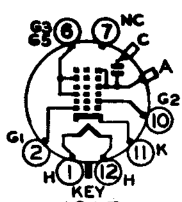

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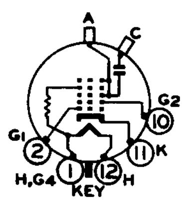

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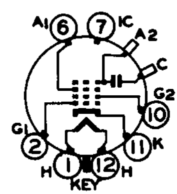

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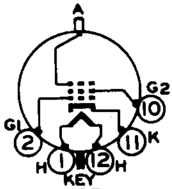

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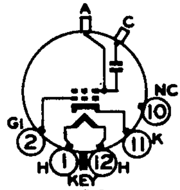

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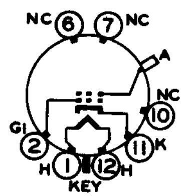

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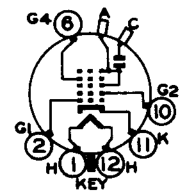

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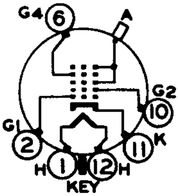
MONOCHROME PICTURE TUBES



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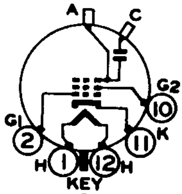

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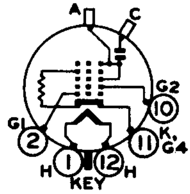

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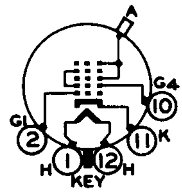

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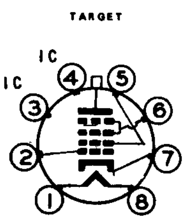

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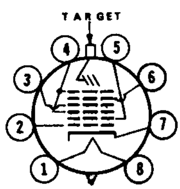

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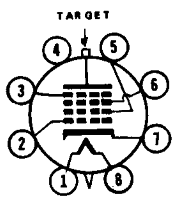

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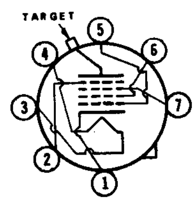

Z 7927B, Z 7927HRB