1 9 RCA 4 5

TUBE REFERENCE BOOK

RCA
RADIO TUBE REFERENCE BOOK

1945 — Price $1.00

Radio Corporation of America
RCA Victor Division - 201 N. Front Street
Camden, N. J.

REGIONAL OFFICES

New York 16, N. Y.	411 Fifth Avenue
Dallas 1, Texas	2010 Jackson Street
Atlanta 3, Ga.	530 Citizens & Southern Bank Bldg.
Cleveland 15, Ohio	718 Keith Bldg.
Chicago 11, Ill.	445 N. Lake Shore Drive
San Francisco 3, Calif.	170 Ninth Street

WAREHOUSES

Chicago 11, Ill.	589 E. Illinois Street
Jersey City 5, N. J.	151 West Side Avenue
San Francisco 3, Calif.	170 Ninth Street

Radio Corporation of America
RCA Victor Division - Camden, N. J.

Form No. 1F8987 Printed in U.S.A.

AS signs of Allied Victory light the sky . . . as liberated European capitals, one after another, exult in their cherished, new-found freedom from Nazi oppression and tyranny . . . as, here at home, American Industry sweeps into one final, triumphant production drive . . . the Radio Corporation of America, together with its tube distributors and dealers, takes pleasure in wishing you a Happy Holiday, a joyous and victorious 1945.

RCA

RADIO CORPORATION OF AMERICA

RCA Victor Division — Camden, N. J.

ELECTRON TUBES . . . KEYS TO PROGRESS IN THE RADIO INDUSTRY

There is a *magic weapon* which is aiding and protecting our men on fighting fronts throughout the world. At the same time, there is a *magic tool* which is helping our men and women at home to achieve unprecedented feats of production in American war plants. Weapon and tool are the same —THE ELECTRON TUBE.

What is an "electron tube," and how does it differ from a "radio tube"? The electron tube is a highly flexible device which takes many forms. It produces electrons (minute charges of electricity), liberates them, harnesses them and puts them to work in many ingenious ways. It has given man infinitely greater control of electricity and of mechanical devices. It has opened up vast new fields in a science that has come to be known as electronics. *The "electron" tube differs from the "radio tube" in name only.* The original conception of the uses of a radio tube has been expanded so far into fields other than radio that engineers have come to regard *electron* tube as a more apt designation for this versatile device.

The electron tube has been rapidly extending its usefulness so that it is helping to solve many problems in industry. For example, in the accurate matching of colors; in testing and inspecting; in making accurate measurements; in providing safety controls; in high-frequency heating equipment; in controlling intricate manufacturing processes with a precision impossible with human or mechanical control alone; and in almost countless other ways.

Electron tubes are the keys to progress in the radio industry because most of the important advances in radio, sound and electronics have been preceded and made possible by successive advances in the design of electron tubes. As RCA scientists have discovered new ways of controlling and utilizing electrons, they have devised new electron tubes. These new tubes, in turn, have opened up many paths to further progress.

For example, the introduction of the AC powered radio tube by RCA made possible all-AC operated radio sets, powered from a convenient electric wall socket. Similarly, the development of the Iconoscope, or electronic eye of the television camera, and the reproducing Kinescope or "screen" of the home television receiver, made possible practicable, all-electronic television. A special development in phototubes—another form of electron tube—made possible the development of RCA's famous ultraviolet method of recording sound-on-film which brought new realism to sound motion pictures.

The advent of miniature tubes first developed by RCA stimulated engineers to re-design and scale down other radio components—condensers, coils, speakers, batteries, and other parts—all of which made possible greater flexibility in the application of electronic devices to the home, to aviation, to shipping, to industry, to the armed services, and wherever space and weight are important considerations. Miniature tubes thus helped to bring about the Army's famous walkie-talkie, and the paratroopers' handy-talkies; ingenious electronic devices for ship, plane, tank, motor transport, and for other war services which may not now be disclosed.

RCA's famous metal tubes, too, are still another example of progress through tube leadership. Some years ago RCA pioneered in the manufacture of metal encased electron tubes to supplant many glass types because of technical, physical and manufacturing advantages. Some members of the industry questioned the wisdom of this pioneering effort, but by a concentration of engineering, manufacturing and sales on a Preferred Type program featuring many of the new metal tubes, the program was carried to such a successful state that metal tubes found wide acceptance in the radio trade and with the public.

Television stands ready to become the billion dollar industry that has been predicted for it. FM (frequency modulation) will pick up where it left off in developing its services to the listening public. Facsimile, for the transmission of still pictures, drawings, maps, and for duplication purposes will go forward. Industrial plant broadcasting has received enormous wartime impetus to help relieve fatigue, improve morale, promote better employee relationships, and for instantaneous communications; it may be expected to find an even wider application in peacetime.

Electronic power generation, made possible by high-frequency power tubes, to heat plastic preforms, solder, harden, anneal, glue, dry, and otherwise treat a variety of materials, is finding ever-widening fields of use in industry. Electronic test and measuring equipment, safety controls, precision selection and automatic control equipment foreshadow the greater "electronization" of industry.

Developments in the field of "electron optics" have not only advanced television, but have produced the famed RCA electron microscope that permits researchers to probe more deeply than ever before into sub-microscopic worlds. Exploration not only of the Ultra-High Frequencies, but also of the Super-High Frequencies, gives promise of providing an almost limitless number of channels for additional services. More extensive use of public address and sound amplifying equipment is being found in every field of human activity.

Measured by even the most severe standards of progress, much has happened to the electron tube since one day in 1904 when Professor J. A. Fleming, an English physicist, found an application for the well-known "Edison Effect"—a detector for wireless telegraphy called the Fleming Valve. Through the years RCA men and women working in laboratories, offices and factories, have acquired a unique "know-how" about electron tubes. This "know-how" has resulted in a remarkable record of successively lowered costs and improved performance which has advanced immeasurably the science of electronics. It has, in effect, placed the United States in a position of world leadership in the design, development and production of radio, sound and electronic equipment.

Leadership in electronics has meant a great deal to the United Nations at war. Communications play a vitally important role in this war, which has no parallel in its geographical spread across the world, and in its mobility. The electron tube is the "Magic Brain" of communications equipment, and of electronic devices and equipment whose miraculous uses are only barely suggested by what is known about Radar, for example. Our country and the United Nations have therefore called upon RCA and other tube manufacturers to produce enormous quantities of electron tubes.

That is why there has been such a shortage of tubes for civilian radios. Despite increased efficiency in manufacturing, despite thousands of additional workers, the truth is that electron tube production up to the present barely covers the enormous and extremely essential requirements of the armed services.

The many electronic devices that one hears about from day-to-day and those that are being planned for tomorrow, all have one thing in common—they all use *electron tubes*. As the "control element" in every piece of electronic equipment, tubes are the nucleus about which the machine or device is created. That is why tubes pace the progress of the electronic era—that, too, is why *tubes are truly the keys to progress in the radio industry.*

Technical Definitions*

"A" Power Supply A power supply device providing heating current for the cathode of a vacuum tube.

Alternating Current A current, the direction of which reverses at regularly recurring intervals, the algebraic average value being zero.

Amplification Factor A measure of the effectiveness of the grid voltage relative to that of the plate voltage in affecting the plate current.

Amplifier A device for increasing the amplitude of electric current, voltage or power, through the control by the input power of a larger amount of power supplied by a local source to the output circuit.

Anode An electrode to which an electron stream flows.

Antenna A conductor or a system of conductors for radiating or receiving radio waves.

Atmospherics Strays produced by atmospheric conditions.

Attenuation The reduction in power of a wave or a current with increasing distance from the source of transmission.

Audio Frequency A frequency corresponding to a normally audible sound wave. The upper limit ordinarily lies between 10,000 and 20,000 cycles.

Audio-Frequency Transformer A transformer for use with audio-frequency currents.

Autodyne Reception A system of heterodyne reception through the use of a device which is both an oscillator and a detector.

Automatic Volume Control A self-acting device which maintains the output constant within relatively narrow limits while the input voltage varies over a wide range.

"B" Power Supply A power supply device connected in the plate circuit of a vacuum tube.

Baffle A partition which may be used with an acoustic radiator to impede circulation between front and back.

Band-Pass Filter A filter designed to pass currents of frequencies within a continuous band limited by an upper and a lower critical or cut-off frequency and substantially reduce the amplitude of currents of all frequencies outside of that band.

Beat A complete cycle of pulsations in the phenomenon of beating.

Beat Frequency The number of beats per second. This frequency is equal to the difference between the frequencies of the combining waves.

Beating A phenomenon in which two or more periodic quantities of different frequencies react to produce a resultant having pulsations of amplitude.

Broadcasting Radio transmission intended for general reception.

By-Pass Condenser A condenser used to provide an alternating-current path of comparatively low impedance around some circuit element.

*Most of these definitions are based on I.R.E Standards.

"C" Power Supply A power supply device connected in the circuit between the cathode and grid of a vacuum tube so as to apply a grid bias.

Capacitive Coupling The association of one circuit with another by means of capacitance common or mutual to both.

Carbon Microphone A microphone which depends for its operation upon the variation in resistance of carbon contacts.

Carrier A term broadly used to designate carrier wave, carrier current, or carrier voltage.

Carrier Frequency The frequency of a carrier wave.

Carrier Suppression That method of operation in which the carrier wave is not transmitted.

Carrier Wave A wave which is modulated by a signal and which enables the signal to be transmitted through a specific physical system.

Cathode The electrode from which the electron stream flows. (See Filament.)

Choke Coil An inductor inserted in a circuit to offer relatively large impedance to alternating current.

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

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

Class B Amplifier A class B amplifier is an amplifier in which the grid bias is approximately equal to the cut-off value so that the plate current is approximately zero when no exciting grid voltage is applied, and so that plate current in a specific tube flows for approximately one-half of each cycle when an alternating grid voltage is applied.

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

Condenser Loud Speaker A loud speaker in which the mechanical forces result from electrostatic reactions.

Condenser Microphone A microphone which depends for its operation upon variations in capacitance.

Continuous Waves Continuous waves are waves in which successive cycles are identical under steady state conditions.

Conversion Transconductance is the ratio of the magnitude of a single beat-frequency component $(f_1 + f_2)$ or $(f_1 - f_2)$ of the output current to the magnitude of the input voltage of frequency f_1 under the conditions that all direct voltages and the magnitude of the second input alternating voltage f_2 must remain constant. As most precisely used, it refers to an infinitesimal magnitude of the voltage of frequency f_1.

Converter (generally, in superheterodyne receivers.) A converter is a vacuum-tube which performs simultaneously the functions of oscillation and mixing (first detection) in a radio receiver.

Coupling The association of two circuits in such a way that energy may be transferred from one to the other.

Cross Modulation A type of intermodulation due to modulation of the carrier of the desired signal in a radio apparatus by an undesired signal.

Current Amplification The ratio of the alternating current produced in the output circuit of an amplifier to the alternating current supplied to the input circuit for specific circuit conditions.

Cycle One complete set of the recurrent values of a periodic phenomenon.

Damped Waves Waves of which the amplitude of successive cycles, at the source, progressively diminishes.

Decibel The common transmission unit of the decimal system, equal to $^1/_{10}$ bel.

$$1 \text{ bel} = 2 \log_{10} \frac{E_1}{E_2} = 2 \log_{10} \frac{I_1}{I_2}$$

(See Transmission Unit)

Detection is any process of operation on a modulated signal wave to obtain the signal imparted to it in the modulation process.

Detector A detector is a device which is used for operation on a signal wave to obtain the signal imparted to it in the modulation process.

Diaphragm A diaphragm is a vibrating surface which produces sound vibrations.

Diode A type of thermionic tube containing two electrodes which passes current wholly or predominantly in one direction.

Direct Capacitance (C) between two conductors—The ratio of the charge produced on one conductor by the voltage between it and the other conductor, divided by this voltage, all other conductors in the neighborhood being at the potential of the first conductor.

Direct Coupling The association of two circuits by having an inductor, a condenser, or a resistor common to both circuits.

Direct Current A unidirectional current. As ordinarily used, the term designates a practically non-pulsating current.

Distortion A change in wave form occurring in a transducer or transmission medium when the output wave form is not a faithful reproduction of the input wave form.

[Continued on Next Page]

Double Modulation The process of modulation in which a carrier wave of one frequency is first modulated by the signal wave and is then made to modulate a second carrier wave of another frequency.

Dynamic Amplifier The RCA Dynamic Amplifier is a variable gain audio amplifier, the gain of which is proportional to the average intensity of the audio signal. Such an amplifier compensates for the contraction of volume range required because of recording or transmission line limitations.

Dynamic Sensitivity of a Phototube The alternating-current response of a phototube to a pulsating light flux at specified values of mean light flux, frequency of pulsation, degree of pulsation, and steady tube voltage.

Electro-Acoustic Transducer A transducer which is actuated by power from an electrical system and supplies power to an acoustic system or vice versa.

Electron Emission The liberation of electrons from an electrode into the surrounding space. In a vacuum tube it is the rate at which the electrons are emitted from a cathode. This is ordinarily measured as the current carried by the electrons under the influence of a voltage sufficient to draw away all the electrons.

Electron Tube A vacuum tube evacuated to such a degree that its electrical characteristics are due essentially to electron emission.

Emission Characteristic A graph plotted between a factor controlling the emission (such as the temperature, voltage, or current of the cathode) as abscissas, and the emission from the cathode as ordinates.

Facsimile Transmission The electrical transmission of a copy or reproduction of a picture, drawing or document. (This is also called picture transmission.)

Fading The variation of the signal intensity received at a given location from a radio transmitting station as a result of changes occurring in the transmission path. (See Distortion.)

Fidelity The degree to which a system, or a portion of a system, accurately reproduces at its output the signal which is impressed upon it.

Filament A cathode in which the heat is supplied by current passing through the cathode.

Filter A selective circuit network, designed to pass currents within a continuous band or bands of frequencies or direct current, and substantially reduce the amplitude of currents of undesired frequencies.

Frequency The number of cycles per second.

Full-Wave Rectifier A double element rectifier arranged so that current is allowed to pass in the same direction to the load circuit during each half cycle of the alternating-current supply, one element functioning during one-half cycle and the other during the next half cycle, and so on.

Fundamental Frequency The lowest component frequency of a periodic wave or quantity.

Fundamental or Natural Frequency (of an antenna). The lowest resonant frequency of an antenna, without added inductance or capacitance.

Gas Phototube A type of phototube in which a quantity of gas has been introduced, usually for the purpose of increasing its sensitivity.

Grid An electrode having openings through which electrons or ions may pass.

Grid Bias The direct component of the grid voltage.

Grid Condenser A series condenser in the grid or control circuit of a vacuum tube.

Grid Leak A resistor in a grid circuit, through which the grid current flows, to affect or determine a grid bias.

Grid-Plate Transconductance The name for the plate current to grid voltage transconductance. (This has also been called mutual conductance.)

Ground System (of an antenna) That portion of the antenna system below the antenna loading devices or generating apparatus most closely associated with the ground and including the ground itself.

Ground Wire A conductive connection to the earth.

Half-Wave Rectifier A rectifier which changes alternating current into pulsating current, utilizing only one-half of each cycle.

Harmonic A component of a periodic quantity having a frequency which is an integral multiple of the fundamental frequency. For example, a component the frequency of which is twice the fundamental frequency is called the second harmonic.

Heater An electrical heating element for supplying heat to an indirectly heated cathode.

Heterodyne Reception The process of receiving radio waves by combining in a detector a received voltage with a locally generated alternating voltage. The frequency of the locally generated voltage is commonly different from that of the received voltage. (Heterodyne reception is sometimes called beat reception.)

Homodyne Reception A system of reception by the aid of a locally generated voltage of carrier frequency. (Homodyne reception is sometimes called zero-beat reception.)

Hot-Wire Ammeter (Expansion Type) An ammeter dependent for its indications on a change in dimensions of an element which is heated by the current to be measured.

Indirectly Heated Cathode A cathode of a thermionic tube, in which heat is supplied from a source other than the cathode itself.

Induction Loud Speaker is a moving coil loud speaker in which the current which reacts with the polarizing field is induced in the moving member.

Inductive Coupling The association of one circuit with another by means of inductance common or mutual to both.

Interelectrode Capacitance The direct capacitance between two electrodes.

Interference Disturbance of reception due to strays, undesired signals, or other causes; also, that which produces the disturbance.

[Continued on Next Page]

Intermediate Frequency (in Superheterodyne Reception) A frequency between that of the carrier and the signal, which results from the combination of the carrier frequency and the locally generated frequency.

Intermodulation The production, in a non-linear circuit element, of frequencies corresponding to the sums and differences of the fundamentals and harmonics of two or more frequencies which are transmitted to that element.

Interrupted Continuous Waves Interrupted continuous waves are waves obtained by interruption at audio frequency in a substantially periodic manner of otherwise continuous waves.

Kilocycle When used as a unit of frequency, is a thousand cycles per second.

Lead-In That portion of an antenna system which completes the electrical connection between the elevated outdoor portion and the instruments or disconnecting switches inside the building.

Linear Detection That form of detection in which the audio output voltage under consideration is substantially proportional to the modulation envelope throughout the useful range of the detecting device.

Loading Coil An inductor inserted in a circuit to increase its inductance but not to provide coupling with any other circuit.

Loudspeaker A telephone receiver designed to radiate acoustic power into a room or open air.

Magnetic Loudspeaker One in which the mechanical forces result from magnetic reactions.

Magnetic Microphone A microphone whose electrical output results from the motion of a coil or conductor in a magnetic field.

Master Oscillator An oscillator of comparatively low power so arranged as to establish the carrier frequency of the output of an amplifier.

Megacycle When used as a unit of frequency, is a million cycles per second.

Mercury-Vapor Rectifier. A mercury-vapor rectifier is a two electrode, vacuum-tube rectifier which contains a small amount of mercury. During operation, the mercury is vaporized. A characteristic of mercury-vapor rectifiers is the low-voltage drop in the tube.

Microphone A microphone is an electro-acoustic transducer actuated by power in an acoustic system and delivering power to an electric system, the wave form in the electric system corresponding to the wave form in the acoustic system. This is also called a telephone transmitter.

Mixer Tube (generally, in superheterodyne receivers.) A mixer tube is one in which a locally generated frequency is combined with the carrier-signal frequency to obtain a desired beat frequency.

Modulated Wave A modulated wave is a wave of which either the amplitude, frequency, or phase is varied in accordance with a signal.

Modulation is the process in which the amplitude, frequency, or phase of a wave is varied in accordance with a signal, or the result of that process.

Modulator A device which performs the process of modulation.

Monochromatic Sensitivity The response of a phototube to light of a given color, or narrow frequency range.

Moving-Armature Speaker A magnetic speaker whose operation involves the vibration of a portion of the ferromagnetic circuit. (This is sometimes called an electromagnetic or a magnetic speaker.)

Moving Coil Loudspeaker A moving coil loudspeaker is a magnetic loudspeaker in which the mechanical forces are developed by the interaction of currents in a conductor and the polarizing field in which it is located. This is sometimes called an Electro-Dynamic or a Dynamic Loudspeaker.

Mu-Factor A measure of the relative effect of the voltages on two electrodes upon the current in the circuit of any specified electrode. It is the ratio of the change in one electrode voltage to a change in the other electrode voltage, under the condition that a specified current remains unchanged.

Mutual Conductance (See Grid-Plate Transconductance.)

Oscillator A non-rotating device for producing alternating current, the output frequency of which is determined by the characteristics of the device.

Oscillatory Circuit A circuit containing inductance and capacitance, such that a voltage impulse will produce a current which periodically reverses.

Pentode A type of thermionic tube containing a plate, a cathode, and three additional electrodes. (Ordinarily the three additional electrodes are of the nature of grids.)

Percentage Modulation The ratio of half the difference between the maximum and minimum amplitudes of a modulated wave to the average amplitude, expressed in per cent.

Phonograph Pickup An electromechanical transducer actuated by a phonograph record and delivering power to an electrical system, the wave form in the electrical system corresponding to the wave form in the phonograph record.

Phototube A vacuum tube in which electron emission is produced by the illumination of an electrode. (This has also been called photo-electric tube.)

Plate A common name for the principal anode in a vacuum tube.

Power Amplification (of an amplifier)—The ratio of the alternating-current power produced in the output circuit to the alternating-current power supplied to the input circuit.

[Continued on Next Page]

Power Detection That form of detection in which the power output of the detecting device is used to supply a substantial amount of power directly to a device such as a loud speaker or recorder.

Pulsating Current A periodic current, that is, current passing through successive cycles, the algebraic average value of which is not zero. A pulsating current is equivalent to the sum of an alternating and a direct current.

Push-Pull Microphone One which makes use of two functioning elements 180 degrees out of phase.

Radio Channel A band of frequencies or wavelengths of a width sufficient to permit of its use for radio communication. The width of a channel depends upon the type of transmission. (See Band of Frequencies.)

Radio Compass A direction finder used for navigational purposes.

Radio Frequency A frequency higher than those corresponding to normally audible sound waves. (See Audio Frequency.)

Radio-Frequency Transformer A transformer for use with radio-frequency currents.

Radio Receiver A device for converting radio waves into perceptible signals.

Radio Transmission The transmission of signals by means of radiated electromagnetic waves originating in a constructed circuit.

Radio Transmitter A device for producing radio-frequency power, with means for producing a signal.

Rectifier A device having an asymmetrical conduction characteristic which is used for the conversion of an alternating current into a pulsating current. Such devices include vacuum-tube rectifiers, gas rectifiers, oxide rectifiers, electrolytic rectifiers, etc.

Reflex Circuit Arrangement A circuit arrangement in which the signal is amplified, both before and after detection, in the same amplifier tube or tubes.

Regeneration The process by which a part of the output power of an amplifying device reacts upon the input circuit in such a manner as to reinforce the initial power, thereby increasing the amplification. (Sometimes called "feedback" or "reaction.")

Resistance Coupling The association of one circuit with another by means of resistance common to both.

Resonance Frequency (of a reactive circuit)—The frequency at which the supply current and supply voltage of the circuit are in phase.

Rheostat A resistor which is provided with means for readily adjusting its resistance.

Screen Grid A screen grid is a grid placed between a control grid and an anode, and maintained at a fixed positive potential, for the purpose of reducing the electrostatic influence of the anode in the space between the screen grid and the cathode.

Secondary Emission Electron emission under the influence of electron or ion bombardment.

Selectivity The degree to which a radio receiver is capable of differentiating between signals of different carrier frequencies.

Sensitivity The degree to which a radio receiver responds to signals of the frequency to which it is tuned.

Sensitivity of a Phototube The electrical current response of a phototube, with no impedance in its external circuit, to a specified amount and kind of light. It is usually expressed in terms of the current for a given radiant flux, or for a given luminous flux. In general the sensitivity depends upon the tube voltage, flux intensity, and spectral distribution of the flux.

Service Band A band of frequencies allocated to a given class of radio communication service.

Side Bands The bands of frequencies, one on either side of the carrier frequency, produced by the process of modulation.

Signal The intelligence, message or effect conveyed in communication.

Single-Side-Band Transmission That method of operation in which one side band is transmitted, and the other side band is suppressed. The carrier wave may be either transmitted or suppressed.

Static Strays produced by atmospheric conditions.

Static Sensitivity of a Phototube The direct current response of a phototube to a light flux of specified value.

Stopping Condenser A condenser used to introduce a comparatively high impedance in some branch of a circuit for the purpose of limiting the flow of low-frequency alternating current or direct current without materially affecting the flow of high frequency alternating current.

Strays Electromagnetic disturbances in radio reception other than those produced by radio transmitting systems.

Superheterodyne Reception—Superheterodyne reception is a method of reception in which the received voltage is combined with the voltage from a local oscillator and converted into voltage of an intermediate frequency which is usually amplified and then detected to reproduce the original signal wave. (This is sometimes called double detection or supersonic reception.)

Swinging The momentary variation in frequency of a received wave.

Telephone Receiver An electro-acoustic transducer actuated by power from an electrical system and supplying power to an acoustic system, the wave form in the acoustic system corresponding to the wave form in the electrical system.

Television The electrical transmission of a succession of images and their reception in such a way as to give a substantially continuous reproduction of the object or scene before the eye of a distant observer.

Tetrode A type of thermionic tube containing a plate, a cathode, and two additional electrodes. (Ordinarily the two additional electrodes are of the nature of grids.)

[Continued on Next Page]

Thermionic Emission Electron or ion emission under the influence of heat.

Thermionic Tube An electron tube in which the electron emission is produced by the heating of an electrode.

Thermocouple Ammeter An ammeter dependent for its indications on the change in thermo-electromotive force set up in a thermo-electric couple which is heated by the current to be measured.

Total Emission The value of the current carried by electrons emitted from a cathode under the influence of a voltage such as will draw away all the electrons emitted.

Transconductance The ratio of the change in the current in the circuit of an electrode to the change in the voltage on another electrode, under the condition that all other voltages remain unchanged.

Transducer A device actuated by power from one system and supplying power to another system. These systems may be electrical, mechanical, or acoustic.

Transmission Unit A unit expressing the logarithmic ratios of powers, voltages, or currents in a transmission system. (See Decibel.)

Triode A type of thermionic tube containing an anode, a cathode, and a third electrode, in which the current flowing between the anode and the cathode may be controlled by the voltage between the third electrode and the cathode.

Tuned Transformer A transformer whose associated circuit elements are adjusted as a whole to be resonant at the frequency of the alternating current supplied to the primary, thereby causing the secondary voltage to build up to higher values than would otherwise be obtained.

Tuning The adjustment of a circuit or system to secure optimum performance in relation to a frequency; commonly, the adjustment of a circuit or circuits to resonance.

Vacuum Phototube A type of phototube which is evacuated to such a degree that the residual gas plays a negligible part in its operation.

Vacuum Tube A device consisting of a number of electrodes contained within an evacuated enclosure.

Vacuum-Tube Transmitter A radio transmitter in which vacuum tubes are utilized to convert the applied electric power into radio-frequency power.

Vacuum-Tube Voltmeter A device utilizing the characteristics of a vacuum tube for measuring alternating voltages.

Voltage Amplification The ratio of the alternating voltage produced at the output terminals of an amplifier to the alternating voltage impressed at the input terminals.

Voltage Divider A resistor provided with fixed or movable contacts and with two fixed terminal contacts.

Grid Bias Resistor Calculations

The radio service man often finds it necessary to replace the grid bias resistor in receivers employing a self-biasing arrangement for obtaining the proper grid voltage. When the resistance value is not known, it may be calculated by dividing the grid voltage required at the plate voltage at which the tube is operating, by the plate current in amperes plus the screen current in amperes times the number of tubes passing current through the resistor.

Under the above rule, the grid bias resistor value is given by the following formula:

$$R = \frac{E_{C1} \times 1{,}000}{(I_B + I_{C2})\, n}$$

where: R = Grid bias resistor value in ohms.

E_{C1} = The grid bias required in volts.

I_B = The plate current of a single tube in *milliamperes*.

I_{C2} = The screen-grid current of a single tube in *milliamperes*.

n = The number of tubes passing current through the resistor.

Example:

It is desired to determine the value of bias resistor used to obtain the proper value of grid bias on three type '35 tubes working in the radio frequency stages of a receiver. First determine the plate and screen voltages employed in this set. Suppose, in this case, it is found that the plate supply voltage is 250 and the screen voltage is 90. Looking in the characteristics chart, it is found that the proper grid bias for the '35 under these conditions is —3.0 volts. In addition, the plate current is 6.5 milliamperes and the screen current is 2.5 milliamperes. Substituting in the formula,

$$R = \frac{3.0 \times 1{,}000}{(6.5 + 2.5)\, 3} = 111 \text{ ohms.}$$

The value of grid bias resistors can be calculated in this manner for any type and any number of tubes. In the case of triodes, the screen current term drops out entirely.

Be sure to determine the plate voltage at which the tubes are working, the number of tubes being supplied from the bias resistor, the screen voltage, (if a tetrode or pentode), the correct value of grid bias voltage required, and the plate and screen current for the given plate voltage.

In the case of resistance-coupled amplifiers which employ high resistance in the plate circuit, it must be remembered that the plate voltage is equal to the plate supply voltage minus the voltage drop in the plate load resistance caused by the plate current. The net plate voltage alone determines the correct value of grid bias.

The foregoing methods of calculations cannot be used in connection with receivers employing a bleeder circuit to obtain grid bias.

DIAMETER, WEIGHTS AND RESISTANCE OF COPPER WIRE

No. AWG	Diameter Mils	Area, Circular Mils	Weight, Bare Wire		Resistance at 25°C. (77°F.)		
			Pounds per 1000 Ft.	Pounds per Mile	Ohms per 1000 Ft.	Ohms per Mile	Feet per Ohm
0000	460.	211,600.	641.	3385.	0.0499	0.2638	20,040.
000	410.	167,800.	508.	2683.	0.0630	0.3325	15,870.
00	364.8	133,100.	403.	2126.	0.0794	0.419	12,590.
0	324.9	105,500.	319.5	1687.	0.1003	0.529	9,980.
1	289.3	83,700.	253.3	1337.	0.1262	0.666	7,930.
2	257.6	66,400.	200.9	1061.	0.1591	0.840	6,290.
3	229.4	52,600.	159.3	841.	0.2008	1.062	4,980.
4	204.3	41,700.	126.4	668.	0.2533	1.338	3,950.
5	181.9	33,100.	100.2	529.	0.3193	1.685	3,134.
6	162.0	26,250.	79.5	419.	0.403	2.127	2,485.
7	144.3	20,820.	63.0	332.6	0.507	2.682	1,971.
8	128.5	16,510.	50.0	264.0	0.640	3.382	1,562.
9	114.4	13,090.	39.63	208.3	0.807	4.26	1,238.
10	101.9	10,380.	31.43	165.9	1.017	5.37	983.
11	90.7	8,230.	24.92	131.6	1.284	6.78	779.
12	80.8	6,530.	19.77	104.3	1.618	8.55	618.
13	72.0	5,180.	15.68	82.8	2.040	10.77	490.
14	64.1	4,110.	12.43	65.6	2.575	13.60	388.2
15	57.1	3,257.	9.86	52.1	3.244	17.13	308.4
16	50.8	2,583.	7.82	41.3	4.09	21.62	244.3
17	45.3	2,048.	6.20	32.73	5.16	27.24	193.9
18	40.3	1,624.	4.92	26.00	6.51	34.34	153.7
19	35.89	1,288.	3.899	20.57	8.20	43.3	121.9
20	31.96	1,022.	3.092	16.33	10.34	54.6	96.6
21	28.46	810.	2.452	12.93	13.04	68.9	76.6
22	25.35	642.	1.945	10.27	16.44	86.9	60.8
23	22.57	509.	1.542	8.14	20.75	109.5	48.2
24	20.10	404.	1.223	6.46	26.15	138.1	38.25
25	17.90	320.4	0.970	5.12	33.00	174.3	30.30
26	15.94	254.1	0.769	4.06	41.6	219.5	24.04
27	14.20	201.5	0.610	3.220	52.4	276.8	19.07
28	12.64	159.8	0.484	2.556	66.01	349.2	15.13

[Continued on Next Page]

DIAMETER, WEIGHTS AND RESISTANCE OF COPPER WIRE

No. AWG	Diameter Mils	Area, Circular Mils	Weight, Bare Wire: Pounds per 1000 Ft.	Weight, Bare Wire: Pounds per Mile	Resistance at 25°C. (77°F.): Ohms per 1000 Ft.	Resistance at 25°C. (77°F.): Ohms per Mile	Resistance at 25°C. (77°F.): Feet per Ohm
29	11.26	126.7	0.3836	2.025	83.4	441.	11.98
30	10.03	100.5	0.3042	1.606	105.4	556.	9.48
31	8.93	79.7	0.2413	1.273	132.5	700.	7.55
32	7.95	63.2	0.1913	1.011	167.2	883.	5.98
33	7.08	50.1	0.1517	0.807	210.8	1113.	4.74
34	6.30	39.75	0.1203	0.636	265.8	1403.	3.762
35	5.61	31.52	0.0954	0.504	335.5	1772.	2.980
36	5.00	25.00	0.0757	0.400	423.0	2232.	2.366
37	4.45	19.83	0.0600	0.3168	533.	2814.	1.877
38	3.965	15.72	0.0476	0.2514	673.	3553.	1.487
39	3.531	12.47	0.03774	0.1991	847.	4470.	1.180
40	3.145	9.89	0.02993	0.1579	1068.	5640.	0.936

ALLOWABLE CARRYING CAPACITIES OF COPPER WIRE AND CABLE

(Regulations of the National Board of Fire Underwriters)

No. AWG	Circular Mils	Amperes: Rubber Insulation	Amperes: Other Insulation	Circular Mils	Amperes: Rubber Insulation	Amperes: Other Insulation
18	1,624	3	5	250,000	250	350
16	2,583	6	10	300,000	275	400
14	4,107	15	20	350,000	300	450
12	6,530	20	25	400,000	325	500
10	10,380	25	30	450,000	362	550
8	16,510	35	50	500,000	400	600
6	26,250	50	70	600,000	450	680
4	41,740	70	90	700,000	500	760
2	66,370	90	125	800,000	550	840
1	83,690	100	150	1,000,000	650	1000
0	105,500	125	200	1,250,000	750	1180
00	133,100	150	225	1,500,000	850	1360
000	167,800	175	275	1,750,000	950	1520
0000	211,600	225	325	2,000,000	1050	1670

TEMPERATURE CORRECTIONS FOR COPPER WIRE

(Based on A.I.E.E. Standards)

Temperature Coefficient of Resistance. At a temperature of 25 degrees Centigrade the "constant mass" temperature coefficient of resistance of standard annealed copper, measured between potential points rigidly fixed to the wire is 0.00393 or 1/254.4 per Centigrade degree.

Resistance values of copper wire given in table on preceding pages may be corrected for any temperature by means of the formula given below.

Correction for Change in Temperature

$R_t = R_{25} [1 + 0.00393 (t - 25)]$, where

R_t = the resistance in ohms at a temperature, t.

R_{25} = the resistance in ohms at 25 degrees, Centigrade

t = the temperature of wire in degrees, Centigrade

Temp. C.=5/9 (Temp. F.−32)

Temp. F.=9/5 (Temp. C.)+32

SPECIFIC RESISTANCE OF METALS AND ALLOYS AT ORDINARY TEMPERATURES

SUBSTANCE	Specific Resistance Microhms per Cm. Cube	Relative Conductance	SUBSTANCE	Specific Resistance Microhms per Cm. Cube	Relative Conductance
Aluminum . .	2.83	60.8	Lead . . .	22.	7.8
Brass	6–9	29–19	Manganin .	44.	4.1
Climax	87.	1.97	Mercury . .	95.7	1.8
Cobalt	9.7	17.7	Molybdenum	5.7	29.72
Constantan . .	49.	3.5	Nickel . .	7.8	22.
Copper, U.S. std.	1.78	96.6	Nichrome .	100.	1.7
Copper, annealed	1.72	100.	Platinum .	10.	17.2
Ger. Silver . .	30–40	5.7–4.3	Silver . . .	1.63	105.5
Iron, pure . .	10.	17.2	Superior 23.	86.	2.
Iron, wrought .	13.9	12.4	Tungsten .	5.5	31.2

USEFUL CONVERSION RATIOS

Multiply	by	to obtain
Diam. Circle	3.1416	Circumference Circle
Diam. Circle	0.886	Side Equal Square
U. S. Gallons	0.8333	Imperial Gallons
U. S. Gallons	0.1337	Cubic Feet
Inches Mercury	0.4912	Pounds per Sq. In.
Feet of Water	0.4335	Pounds per Sq. In.
Cubic Feet	62.4	Pounds of Water
U. S. Gallons	8.343	Pounds of Water
U. S. Gallons	3.785	Liters
Knots	1.152	Miles Per Hour
Inches	2.540	Centimeters
Yards	0.9144	Meters
Miles	1.609	Kilometers
Cubic Inches	16.39	Cubic Centimeters
Ounces	28.35	Grams
Pounds	0.4536	Kilograms

Conversion

Factors for Conversions—alphabetically arranged

Ampere	= 1,000,000,000,000 micromicro-amperes
Ampere	= 1,000,000 microamperes
Ampere	= 1,000 milliamperes
Cycle	= 0.000,001 megacycle
Cycle	= 0.001 kilocycle
Farad	= 1,000,000,000,000 micromicrofarads
Farad	= 1,000,000 microfarads
Farad	= 1,000 millifarads
Henry	= 1,000,000 microhenrys
Henry	= 1,000 millihenrys
Kilocycle	= 1,000 cycles
Kilovolt	= 1,000 volts
Kilowatt	= 1,000 watts
Megacycle	= 1,000,000 cycles
Mho	= 1,000,000 micromhos
Mho	= 1,000 millimhos
Microampere	= 0.000,001 ampere
Microfarad	= 0.000,001 farad
Microhenry	= 0.000,001 henry
Micromho	= 0.000,001 mho
Micro-ohm	= 0.000,001 ohm
Microvolt	= 0.000,001 volt
Microwatt	= 0.000,001 watt
Micromicrofarad	= 0.000,000,000,001 farad
Micromicro-ohm	= 0.000,000,000,001 ohm
Milliampere	= 0.001 ampere
Millihenry	= 0.001 henry
Millimho	= 0.001 mho
Milliohm	= 0.001 ohm
Millivolt	= 0.001 volt
Milliwatt	= 0.001 watt
Ohm	= 1,000,000,000,000 micromicro-ohms
Ohm	= 1,000,000 micro-ohms
Ohm	= 1,000 milliohms
Volt	= 1,000,000 microvolts
Volt	= 1,000 millivolts
Watt	= 1,000,000 microwatts
Watt	= 1,000 milliwatts
Watt	= 0.001 kilowatt

U. S. BROADCASTING STATIONS
1000 WATTS OR MORE

Station	Location	Freq. in Kc.
ABR	Aberdeen, S. D.	1420
ALE	Portland, Ore.	1330
ARK	Little Rock, Ark.	920
ARM	Fresno, Cal.	1430
CMO	Kansas City, Mo.	1480
CRC	Enid, Oklahoma	1390
DAL	Duluth, Minn.	610
DFN	Casper, Wyoming	1470
DKA	Pittsburgh, Pa.	1020
DTH	Dubuque, Ia.	1370
DYL	Salt Lake City, Utah	1320
ECA	Los Angeles, Cal.	790
ELA	Centralia, Wash.	1470
ERN	Bakersfield, Cal.	1410
EX	Portland, Ore.	1190
FAB	Lincoln, Neb.	780
FAC	Los Angeles, Cal.	1330
FAR	Fairbanks, Alaska	610
FBB	Great Falls, Mont.	1310
FBI	Wichita, Kan.	1070
FBK	Sacramento, Cal.	1530
FDM	Beaumont, Tex.	560
FEL	Denver, Colo.	950
FEQ	St. Joseph, Mo.	680
FH	Wichita, Kan.	1330
FI	Los Angeles, Cal.	640
FJZ	Fort Worth, Tex.	1270
FKA	Greeley, Colo.	910
FKU	Lawrence, Kan.	1250
FOX	Long Beach, Cal.	1280
FPY	Spokane, Wash.	920
FQD	Anchorage, Alaska	790
FRC	San Francisco, Cal.	610
FRO	Longview, Tex.	1370
FSD	San Diego, Cal.	600
FSG	Los Angeles, Cal.	1150
FUO	St. Louis, Mo.	850
FVD	Los Angeles, Cal.	1020
FWB	Los Angeles, Cal.	980
FYR	Bismarck, N. D.	550
GA	Spokane, Wash.	1510
GB	San Diego, Cal.	1360
GBX	Springfield, Mo.	1260
GCX	Sydney, Mont.	1480
GDM	Stockton, Cal.	1140
GER	Long Beach, Cal.	1390
GGM	Albuquerque, N. M.	1260
GHL	Billings, Mont.	790
GIR	Butte, Mont.	1370
GKO	Fort Worth, Tex.	570
GLO	Mason City, Ia.	1300
GMB	Honolulu, T. H.	590
GNC	Amarillo, Tex.	1440
GO	San Francisco, Cal.	810
GU	Honolulu, T. H.	760
GVO	Missoula, Mont.	1290
GW	Portland, Ore.	620
HJ	Los Angeles, Cal.	930

Station	Location	Freq. in Kc.
KHQ	Spokane, Wash.	590
KHSL	Chico, California	1290
KIDO	Boise, Ida.	1380
KIEM	Eureka, Cal.	1480
KINY	Juneau, Alaska	1460
KIRO	Seattle, Wash.	710
KIT	Yakima, Wash.	1280
KJR	Seattle, Wash.	950
KLCN	Blytheville, Ark	900
KLO	Ogden, Utah	1430
KLPM	Minot, N. D.	1390
KLRA	Little Rock, Ark.	1010
KLS	Oakland, Cal.	1310
KLX	Oakland, Cal.	910
KLZ	Denver, Colo.	560
KMA	Shenandoah, Ia.	960
KMBC	Kansas City, Mo.	980
KMED	Medford, Oregon	1440
KMJ	Fresno, Cal.	580
KMMJ	Grand Island, Neb.	750
KMO	Tacoma, Wash.	1360
KMOX	St. Louis, Mo.	1120
KMPC	Beverly Hills, Cal.	710
KMTR	Los Angeles, Cal.	570
KNX	Los Angeles, Cal.	1070
KOA	Denver, Colo.	850
KOAC	Corvallis, Ore.	550
KOAM	Pittsburg, Kan.	810
KOB	Albuquerque, N. M.	1030
KOH	Reno, Nev.	630
KOIL	Omaha, Neb.	1290
KOIN	Portland, Ore.	970
KOL	Seattle, Wash.	1300
KOMA	Oklahoma City, Okla.	1520
KOMO	Seattle, Wash.	1000
KOY	Phoenix, Ariz.	550
KPAC	Port Arthur, Texas	1250
KPAS	Pasadena, Cal.	1110
KPMC	Bakersfield, Cal.	1560
KPO	San Francisco, Cal.	680
KPOF	Denver, Colo.	910
KPRC	Houston, Tex.	950
KPRO	Riverside, Cal.	1440
KQV	Pittsburgh, Pa.	1410
KQW	San Jose, Cal.	740
KRGV	Weslaco, Tex.	1290
KRIS	Corpus Christi, Tex.	1360
KRKD	Los Angeles, Cal.	1150
KRLD	Dallas, Tex.	1080
KRNT	Des Moines, Ia.	1350
KROW	Oakland, Cal.	960
KRRV	Sherman, Tex.	910
KRSC	Seattle, Wash.	1150
KSAL	Salina, Kan.	1150
KSCJ	Sioux City, Ia.	1360
KSD	St. Louis, Mo.	550
KSFO	San Francisco, Cal.	560
KSKY	Dallas, Texas	660

Station	Location	Freq. in Kc.
KSL	Salt Lake City, Utah	1160
KSLM	Salem, Ore.	1390
KSO	Des Moines, Ia.	1460
KSOO	Sioux Falls, S. D.	1140
KSRO	Santa Rosa, Cal.	1350
KSTP	St. Paul, Minn.	1500
KTAR	Phoenix, Ariz.	620
KTBS	Shreveport, La.	1480
KTFI	Twin Falls, Ida.	1270
KTHS	Hot Springs, Ark.	1090
KTKC	Visalia, Cal.	940
KTKN	Ketchikan, Alaska	930
KTMS	Santa Barbara, Cal.	1250
KTRB	Modesto, Cal.	860
KTRH	Houston, Tex.	740
KTSA	San Antonio, Tex.	550
KTUL	Tulsa, Okla.	1430
KTW	Seattle, Wash.	1250
KUJ	Walla Walla, Wash.	1420
KUOA	Siloam Springs, Ark.	1290
KUTA	Salt Lake City, Utah	570
KVI	Tacoma, Wash.	570
KVOA	Tucson, Ariz.	1290
KVOD	Denver, Colo.	630
KVOO	Tulsa, Okla.	1170
KVOR	Colorado Springs, Colo.	1300
KWBU	Corpus Christi, Tex.	1010
KWFT	Wichita Falls, Tex.	620
KWJJ	Portland, Ore.	1080
KWK	St. Louis, Mo.	1380
KWKH	Shreveport, La.	1130
KWKW	Pasadena, Cal.	1430
KWSC	Pullman, Wash.	1250
KWTO	Springfield, Mo.	560
KXA	Seattle, Wash.	770
KXEL	Waterloo, Ia.	1540
KXL	Portland, Ore.	750
KXOK	St. Louis, Mo.	630
KXYZ	Houston, Tex.	1320
KYA	San Francisco, Cal.	1260
KYW	Philadelphia, Pa.	1060
WAAB	Worcester, Mass.	1440
WAAF	Chicago, Ill.	950
WAAT	Newark, N. J.	970
WABC	New York, N. Y.	880
WADC	Tallmadge, Ohio	1350
WAGA	Atlanta, Ga.	590
WAGE	Syracuse, N. Y.	620
WAIT	Chicago, Ill.	820
WAKR	Akron, O.	1590
WALA	Mobile, Ala.	1410
WALB	Albany, Ga.	1590
WAPI	Birmingham, Ala.	1070
WAPO	Chattanooga, Tenn.	1150
WATR	Waterbury, Conn.	1320
WAVE	Louisville, Ky.	970
WAWZ	Zarephath, N. J.	1380
WAYS	Charlotte, N. C.	610

Station	Location	Freq. in Kc.
WBAA	West Lafayette, Ind.	920
WBAL	Baltimore, Md.	1090
WBAP	Fort Worth, Tex.	820
WBBB	Burlington, N. C.	920
WBBM	Chicago, Ill.	780
WBBR	Brooklyn, N. Y.	1330
WBEN	Buffalo, N. Y.	930
WBIG	Greensboro, N. C.	1470
WBNS	Columbus, O.	1460
WBNX	New York City	1380
WBRC	Birmingham, Ala.	960
WBRY	Waterbury, Conn.	1590
WBT	Charlotte, N. C.	1110
WBZ	Boston, Mass.	1030
WBZA	Boston, Mass.	1030
WCAE	Pittsburgh, Pa.	1250
WCAL	Northfield, Minn.	770
WCAO	Baltimore, Md.	600
WCAR	Pontiac, Mich.	1130
WCAU	Philadelphia, Pa.	1210
WCAX	Burlington, Vt.	620
WCCO	Minneapolis, Minn.	830
WCFL	Chicago, Ill.	1000
WCHS	Charleston, W. Va.	580
WCKY	Cincinnati, O.	1530
WCOC	Meridian, Miss.	910
WCSH	Portland, Me.	970
WDAE	Tampa, Fla.	1250
WDAF	Kansas City, Mo.	610
WDAY	Fargo, N. D.	970
WDBJ	Roanoke, Va.	960
WDBO	Orlando, Fla.	580
WDEL	Wilmington, Del.	1150
WDEV	Waterbury, Vt.	550
WDOD	Chattanooga, Tenn.	1310
WDRC	Hartford, Conn.	1360
WDSU	New Orleans, La.	1280
WDZ	Tuscola, Ill.	1050
WEAF	New York City	660
WEAN	Providence, R. I.	790
WEAU	Eau Claire, Wis.	790
WEBC	Duluth, Minn.	1320
WEEI	Boston, Mass.	590
WEEU	Reading, Pa.	830
WEGO	Concord, N. C.	1410
WENR	Chicago, Ill.	890
WEVD	New York City	1330
WEW	St. Louis, Mo.	770
WFAA	Dallas, Tex.	820
WFBC	Greenville, S. C.	1330
WFBL	Syracuse, N. Y.	1390
WFBM	Indianapolis, Ind.	1260
WFBR	Baltimore, Md.	1300
WFCI	Pawtucket, R. I.	1420
WFDF	Flint, Mich.	910
WFEA	Manchester, N. H.	1370
WFIL	Philadelphia, Pa.	560
WFIN	Findlay, Ohio	1330

U. S. BROADCASTING STATIONS (Continued)

Station	Location	Freq. in Kc.
WFLA	Tampa, Fla.	970
WFTL	Miami, Fla.	710
WGAN	Portland, Me.	560
WGAR	Cleveland, O.	1220
WGBF	Evansville, Ind.	1280
WGBG	Greensboro, N. C.	980
WGES	Chicago, Ill.	1390
WGN	Chicago, Ill.	720
WGNY	Newburgh, N. Y.	1220
WGR	Buffalo, N. Y.	550
WGST	Atlanta, Ga.	920
WGY	Schenectady, N. Y.	810
WHA	Madison, Wis.	970
WHAM	Rochester, N. Y.	1180
WHAS	Louisville, Ky.	840
WHAZ	Troy, N. Y.	1330
WHB	Kansas City, Mo.	880
WHBF	Rock Island, Ill.	1270
WHBI	Newark, N. J.	1280
WHCU	Ithaca, N. Y.	870
WHDH	Boston, Mass.	850
WHEB	Portsmouth, N. H.	750
WHIO	Dayton, O.	1290
WHK	Cleveland, O.	1420
WHKY	Hickory, N. C.	1290
WHLD	Niagara Falls, N. Y.	1290
WHN	New York City	1050
WHO	Des Moines, Ia.	1040
WHP	Harrisburg, Pa.	1460
WIAC	Hato Rey, P. R.	580
WIBA	Madison, Wis.	1310
WIBC	Indianapolis, Ind.	1070
WIBG	Glenside, Pa.	990
WIBW	Topeka, Kan.	580
WICA	Ashtabula, O.	970
WILL	Urbana, Ill.	580
WIND	Gary, Ind.	560
WING	Dayton, Ohio	1410
WINS	New York City	1010
WIOD	Miami, Fla.	610
WIP	Philadelphia, Pa.	610
WIRE	Indianapolis, Ind.	1430
WIS	Columbia, S. C.	560
WISH	Indianapolis, Ind.	1310
WISN	Milwaukee, Wis.	1150
WJAG	Norfolk, Neb.	1090
WJAR	Providence, R. I.	920
WJAS	Pittsburgh, Pa.	1320
WJAX	Jacksonville, Fla.	930
WJBO	Baton Rouge, La.	1150
WJDX	Jackson, Miss.	1300
WJHL	Johnson City, Tenn.	910
WJJD	Chicago, Ill.	1160
WJR	Detroit, Mich.	760
WJW	Cleveland, O.	850
WJZ	New York City	770
WKAQ	San Juan, Puerto Rico	620

Station	Location	Freq. in Kc.
WKAR	East Lansing, Mich.	870
WKAT	Miami Beach, Fla.	1360
WKBH	LaCrosse, Wis.	1410
WKBN	Youngstown, Ohio	570
WKBW	Buffalo, N. Y.	1520
WKNE	Keene, N. H.	1290
WKRC	Cincinnati, O.	550
WKST	New Castle, Pa.	1280
WKY	Oklahoma City, Okla.	930
WKZO	Kalamazoo, Mich.	590
WLAC	Nashville, Tenn.	1510
WLAW	Lawrence, Mass.	680
WLB	Minneapolis, Minn.	770
WLBL	Stevens Point, Wis.	930
WLBZ	Bangor, Me.	620
WLIB	Brooklyn, N. Y.	1190
WLOL	Minneapolis, Minn.	1330
WLS	Chicago, Ill.	890
WLW	Cincinnati, O.	700
WMAL	Washington, D. C.	630
WMAQ	Chicago, Ill.	670
WMAZ	Macon, Ga.	940
WMBD	Peoria, Ill.	1470
WMBG	Richmond, Va.	1380
WMBI	Chicago, Ill.	1110
WMBS	Uniontown, Pa.	590
WMC	Memphis, Tenn.	790
WMCA	New York City	570
WMEX	Boston, Mass.	1510
WMMN	Fairmont, W. Va.	920
WMT	Cedar Rapids, Ia.	600
WMUR	Manchester, N. H.	610
WNAC	Boston, Mass.	1260
WNAD	Norman, Okla.	640
WNAX	Yankton, S. D.	570
WNBC	New Britain, Conn.	1410
WNBF	Binghamton, N. Y.	1290
WNEL	San Juan, Puerto Rico	1320
WNEW	New York City	1130
WNOX	Knoxville, Tenn.	990
WNYC	New York City	830
WOAI	San Antonio, Tex.	1200
WOC	Davenport, Ia.	1420
WOI	Ames, Ia.	640
WOL	Washington, D. C.	1260
WOOD	Grand Rapids, Mich.	1300
WOR	New York, N. Y.	710
WORC	Worcester, Mass.	1310
WORK	York, Pa.	1350
WORL	Boston, Mass.	950
WOSU	Columbus, O.	820
WOV	New York City	1280
WOW	Omaha, Neb.	590
WOWO	Ft. Wayne, Ind.	1190
WPAB	Ponce, Puerto Rico	1370
WPAT	Paterson, N. J.	930
WPDQ	Jacksonville, Fla.	1270

Station	Location	Freq. in Kc.
WPEN	Philadelphia, Pa.	950
WPIC	Sharon, Pa.	790
WPRA	Mayaguez, Puerto Rico	790
WPRO	Providence, R. I.	630
WPTF	Raleigh, N. C.	680
WQAM	Miami, Fla.	560
WQBC	Vicksburg, Miss.	1390
WQXR	New York City	1560
WRC	Washington, D. C.	980
WRDW	Augusta, Ga.	1480
WREC	Memphis, Tenn.	600
WREN	Lawrence, Kan.	1250
WRNL	Richmond, Va.	910
WRR	Dallas, Texas	1310
WRRF	Washington, N. C.	930
WRUF	Gainesville, Fla.	850
WRVA	Richmond, Va.	1140
WSAI	Cincinnati, O.	1360
WSAR	Fall River, Mass.	1480
WSAZ	Huntington, W. Va.	930
WSB	Atlanta, Ga.	750
WSBA	York, Pa.	900
WSBT	South Bend, Ind.	960
WSGN	Birmingham, Ala.	610
WSIX	Nashville, Tenn.	980
WSJS	Winston-Salem, N. C.	600
WSM	Nashville, Tenn.	650
WSMB	New Orleans, La.	1350
WSPA	Spartanburg, S. C.	950
WSPD	Toledo, O.	1370
WSUI	Iowa City, Ia.	910
WSUN	St. Petersburg, Fla.	620
WSVA	Harrisonburg, Va.	550
WSYB	Rutland, Vt.	1380
WSYR	Syracuse, N. Y.	570
WTAD	Quincy, Ill.	930
WTAG	Worcester, Mass.	580
WTAM	Cleveland, O.	1100
WTAQ	Green Bay, Wis.	1360
WTAR	Norfolk, Va.	790
WTAW	College Station, Texas	1150
WTCN	Minneapolis, Minn.	1280
WTIC	Hartford, Conn.	1080
WTJS	Jackson, Tenn.	1390
WTMA	Charleston, S. C.	1250
WTMJ	Milwaukee, Wis.	620
WTOC	Savannah, Ga.	1290
WTOP	Washington, D. C.	1500
WTRY	Troy, N. Y.	980
WTTM	Trenton, N. J.	920
WWJ	Detroit, Mich.	950
WWL	New Orleans, La.	870
WWNC	Asheville, N. C.	570
WWNY	Watertown, N. Y.	790
WWSR	St. Albans, Vt.	1420
WWVA	Wheeling, W. Va.	1170
WXYZ	Detroit, Mich.	1270

PRINCIPAL SHORT WAVE STATIONS AS OF JANUARY 1, 1945

Freq. (meg.)	Call Letters	Location
2.88	GRC	Daventry, England
6.005	CFCX	Montreal, Canada
6.007	ZRH	Johannesburg, South Africa
6.01	CJCX	Sydney, N. S.
6.02	RW96	Moscow, Russia
6.03	CFVP	Calgary, Alberta, Canada
6.03	HP5B	Panama City, Panama
6.03	RW-100	Tachkent, Russia
6.03	XEAR	Oaxaca, Mexico
6.04	WRUW	Boston, Massachusetts
6.05	GSA	Daventry, England
6.06	WCBN	New York, New York
6.07	CFRX	Toronto, Canada
6.07	COCQ	Havana, Cuba
6.08	WLWK	Cincinnati, Ohio
6.09	CBFW	Montreal, Canada
6.10	KROJ	Los Angeles, California
6.10	WNRA	New York, New York
6.11	GSL	Daventry, England
6.11	RW-96	Moscow, Russia
6.11	VUC-2	Calcutta, India
6.12	CXA-4	Montevideo, Uruguay
6.12	HP5H	Panama City, Panama
6.12	WOOC	New York, New York
6.12	XGOY	Chungking, China
6.13	CHNX	Halifax, N. S.
6.13	COCD	Havana, Cuba
6.13	HNV	Baghdad, Iraq
6.14	WRUA	Boston, Massachusetts
6.15	GRW	Daventry, England
6.16	CBRX	Vancouver, B. C., Canada
6.16	CP-39	La Paz, Bolivia
6.17	WCBX	New York, New York
6.19	VUD-2	New Delhi, India
6.19	WGEX	Schenectady, New York
6.20	GRN	Daventry, England
6.37	WLWR	Cincinnati, Ohio
7.00	WGEA	Schenectady, New York
7.12	GRM	Daventry, England
7.17	XGOY	Chungking, China
7.23	KWID	San Francisco, California
7.25	KGEX	San Francisco, California
7.25	WGEO	Schenectady, New York
7.565	WNRX	New York, New York
7.575	WLWO	Cincinnati, Ohio
7.575	WRUA	Boston, Massachusetts
7.805	WRUL	Boston, Massachusetts
7.82	WOOW	New York, New York
7.8325	WLWL	Cincinnati, Ohio
7.8325	WLWR	Cincinnati, Ohio
8.03	CNR	Rabat, French Morocco
8 73	FZN	Noumea New Caledonia
8.96	TPZ-2	Algiers, Algeria
9.465	TAP	Ankara, Turkey

Freq. (meg.)	Call Letters	Location
9.49	KRCA	San Francisco, California
9.49	WCBN	New York, New York
9.49	WCBX	New York, New York
9.50	XEWW	Mexico City, Mexico
9.51	GSB	Daventry, England
9.52	HJ-1-ABJ	Santa Marta, Colombia
9.52	OAX-4I	Lima, Peru
9.52	ZRH	Johannesburg, U. of S. A
9.53	KGEI	San Francisco, California
9.53	SBU	Motala, Sweden
9.53	WGEA	Schenectady, New York
9.53	WGEO	Schenectady, New York
9.535	HER-4	Schwarzenburg, Switzerland
9.54	COCM	Havana, Cuba
9.54	VLG-2	Melbourne, Australia
9.55	WGEX	Schenectady, New York
9.55	XETA	Monterrey, Mexico
9.56	OAX4T	Lima, Peru
9.56	PRL-7	Rio de Janeiro, Brazil
9.57	KWID	San Francisco, California
9.57	KWIX	San Francisco, California
9.57	VUM2	Madras, India
9.57	WBOS	Boston, Massachusetts
9.58	GSC	Daventry, England
9.58	VLR	Lyndhurst, Australia
9.59	VUD-3	Delhi, India
9.59	VUM-5	Madras, India
9.59	WCRC	New York, New York
9.59	WLWO	Cincinnati, Ohio
9.60	GRY	Daventry, England
9.60	HP-5J	Panama City, Panama
9.61	COCQ	Havana, Cuba
9.61	TIPG	San Jose, Costa Rica
9.615	VLQ	Sydney, Australia
9.62	HIG	Dominican Republic
9.63	CBFX	Montreal, Canada
9.63	XGOY	Chungking, China
9.65	VLW-2	Perth, Australia
9.65	WOOC	New York, New York
9.66	VLQ-3	Sydney, Australia
9.67	WNBI	New York, New York
9.67	WRCA	New York, New York
9.68	TGWA	Guatemala City, Guatemala
9.68	VLQ-5	Sydney, Australia
9.68	XEQQ	Mexico City, Mexico
9.69	GRX	Daventry, England
9.69	LRA-1	Buenos Aires, Argentina
9.70	WRUA	Boston, Massachusetts
9.70	WRUS	Boston, Massachusetts
9.70	WRUW	Boston, Massachusetts
9.72	XGOA	Chungking, China
9.83	GRH	Daventry, England
9.855	KWIX	San Francisco, California
9.855	WNRI	New York, New York
9.8975	KROJ	Los Angeles, California

SHORT WAVE STATIONS (Continued)

'req. meg.)	Call Letters	Location
9.8975	WKRX	New York, New York
9.8975	WLWL	New York, New York
9.8975	WLWR	Cincinnati, Ohio
9.94	HCJB	Quito, Ecuador
0.22	PSH	Rio de Janeiro, Brazil
1.145	WCBN	New York, New York
1.65	—	Leopoldville, Belgian Congo
1.68	GRG	Daventry, England
1.69	XGRS	Shanghai, China
1.70	—	Leopoldville, Belgian Congo
1.70	CBFY	Montreal, Canada
1.70	CXA-19	Montevideo, Uruguay
1.70	HP5A	Panama City, Panama
1.70	SBP	Motala, Sweden
1.71	VLG-3	Lyndhurst, Australia
1.71	WLWK	Cincinnati, Ohio
1.71	WLWO	Cincinnati, Ohio
1.72	CKRX	Winnipeg, Canada
1.72	PRL-8	Rio de Janeiro, Brazil
1.73	WRUL	Boston, Massachusetts
1.74	COCY	Havana, Cuba
1.75	GSD	Daventry, England
1.77	COHI	Santa Clara, Cuba
1.78	HP5G	Panama City, Panama
1.79	WRUA	Boston, Massachusetts
1.80	CB-1180	Santiago, Chile
1.82	GSN	Daventry, England
1.82	XEBR	Hermosillade Sonora, Mexico
1.83	VLR6	Melbourne, Australia
1.83	VLW-3	Perth, Australia
1.83	WCRC	New York, New York
1.8475	WGEA	Schenectady, New York
1.8475	WGEX	Schenectady, New York
1.86	GSE	Daventry, England
1.87	KWID	San Francisco, California
1.87	WNBI	New York, New York
1.87	WOOW	New York, New York
1.88	LRR	Buenos Aires, Argentina
1.88	VLQ-7	Sydney, Australia
1.893	WRCA	New York, New York
1.90	KWIX	San Francisco, California
1.91	CD-1190	Valdivia, Chile
1.92	CUG-2	S. Miguel, Azores
11.945	—	Moscow, Russia
1.97	FZI	Brazzaville, F. E. A.
2.04	GRV	Daventry, England
2.46	HCJB	Quito, Ecuador
2.9675	WLWR	Cincinnati, Ohio
13.0225	WLWR	Cincinnati, Ohio
13.05	WNRI	New York, New York
14.56	WNRX	New York, New York
15.07	GWC	Daventry, England
15.11	RYP	Moscow, Russia
15.13	KGEI	San Francisco, California
15.13	WRUS	Boston, Massachusetts

Freq. (meg.)	Call Letters	Location
15.14	GSF	Daventry, England
15.15	WRCA	New York, New York
15.15	WNBI	New York, New York
15.155	SBT	Motala, Sweden
15.16	VLG-7	Lyndhurst, Australia
15.16	XEWW	Mexico City, Mexico
15.165	PRE-9	Rio de Janeiro, Brazil
15.17	TGWA	Guatemala City, Guatemala
15.18	GSO	Daventry, England
15.19	CBFZ	Montreal, Canada
15.19	KROJ	Los Angeles, California
15.19	WOOC	New York, New York
15.20	WLWL-1	Cincinnati, Ohio
15.20	XGOX	Chungking, China
15.21	WBOS	Boston, Massachusetts
15.22	—	New Delhi, India
15.23	RYP	Moscow, Russia
15.23	WLWL-2	Cincinnati, Ohio
15.25	WLWK	Cincinnati, Ohio
15.26	GSI	Daventry, England
15.27	WCBX	New York, New York
15.29	KGEI	San Francisco, California
15.29	KGEX	San Francisco, California
15.31	GSP	Daventry, England
15.315	—	Sydney, Australia
15.33	KGEX	San Francisco, California
15.33	WGEO	Schenectady, New York
15.35	WRUL	Boston, Massachusetts
15.35	WRUW	Boston, Massachusetts
15.39	GRE	Daventry, England
15.42	GWD	Daventry, England
15.43	GWE	Daventry, England
15.45	GRD	Daventry, England
15.52	—	Leopoldville, Belgian Congo
16.026	TPZ	Algiers, Algeria
17.445	HVJ	Vatican City
17.73	GVQ	Daventry, England
17.75	WRUW	Boston, Massachusetts
17.76	KROJ	Los Angeles, California
17.76	KWID	San Francisco, California
17.76	KWIX	San Francisco, California
17.78	WNBI	New York, New York
17.78	WRCA	New York, New York
17.79	GSG	Daventry, England
17.80	WLWO	Cincinnati, Ohio
17.81	GSV	Daventry, England
17.83	WCBN	New York, New York
17.87	GRP	Daventry, England
17.88	WGEX	Schenectady, New York
17.955	WLWL-1	Cincinnati, Ohio
18.03	GRQ	Daventry, England
18.08	GVO	Daventry, England
18.16	WNRA	New York, New York
21.47	GSH	Daventry, England

RCA RADIO TUBE CHART

CHART I. Receiving Tubes

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS		CATHODE TYPE AND RATING			USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) µMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	RCA TYPE
		DIMEN.	S. C.	C. T.	VOLTS	AMP.												
00-A	DETECTOR TRIODE	D12	4D	D.C. F	5.0	0.25	GRID-LEAK DETECTOR	45	Grid Return to (−) Filament			1.5	30000	666	20	——	——	00-A
01-A	DETECTOR★ AMPLIFIER	D12	4D	D.C. F	5.0	0.25	CLASS A AMPLIFIER	90 135	− 4.5 − 9.0	——	——	2.5 3.0	11000 10000	725 800	8.0 8.0	——	——	01-A
0Z4	FULL-WAVE GAS RECTIFIER	B3	4R	Cold	——	——	RECTIFIER	Starting-Supply Voltage per Plate, 300 min. peak volts. Peak Plate Current, 200 max. ma. D-C Output Current, 75 max., 30 min. ma. D-C Output Voltage, 300 max. volts.										0Z4
0Z4-G	FULL-WAVE GAS RECTIFIER	B1	G-4R ◆	Cold	——	——	RECTIFIER											0Z4-G
1A3	H-F DIODE	B0	5AP2	H	1.4	0.15	DETECTOR RECTIFIER	Max. Peak Inverse Volts, 330 Max. Peak Plate Ma., 5					Max. D-C Output Ma., 0.5 Max. D-C Heater-Cathode Potential, 140 Volts					1A3
1A4-P	SUPER-CONTROL R-F AMPLIFIER PENTODE	D9	4M	D.C. F	2.0	0.06	AMPLIFIER	For other characteristics, refer to Type 1D5-GP.										1A4-P
1A5-GT/G	POWER AMPLIFIER PENTODE	C3	G-6X	D.C. F	1.4	0.05	CLASS A AMPLIFIER	85 90	− 4.5 − 4.5	85 90	0.7 0.8	3.5 4.0	300000 300000	800 850	——	25000 25000	0.100 0.115	1A5-GT/G
1A6	PENTAGRID CONVERTER ⊙	D9	6L	D.C. F	2.0	0.06	CONVERTER	135 180	{− 3.0 min.}	67.5 67.5	2.5 2.4	1.2 1.3	400000 500000	Anode-Grid (#2): 180▲ max. volts, 2.3 ma. Oscillator-Grid (#1) Resistor ═. Conversion Transcond., 300 micromhos.				1A6
1A7-G	PENTAGRID CONVERTER ⊙	D6	G-7Z	D.C. F	1.4	0.05	CONVERTER	For other characteristics, refer to Type 1A7-GT.										1A7-G
1A7-GT	PENTAGRID CONVERTER ⊙	C3	GT-7Z✱	D.C. F	1.4	0.05	CONVERTER	90	0	45♣	0.7	0.6	600000	Anode-Grid (#2): 90 max. volts, 1.2 ma. Oscillator-Grid (#1) Resistor, 0.2 meg. Conversion Transcond., 250 micromhos.				1A7-GT
1B4-P	R-F AMPLIFIER PENTODE	D9	4M	D.C. F	2.0	0.06	AMPLIFIER	For other characteristics, refer to Type 1E5-GP.										1B4-P
1B5/25S	DUPLEX-DIODE TRIODE	D5	6M	D.C. F	2.0	0.06	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 1H6-G.										1B5/25S

For explanation of types in light face, see end of CHART I.

1B7-GT/G	PENTAGRID CONVERTER	C3	GT-7Z✱	D.C. F	1.4	0.10	CONVERTER	90	0	45♣	1.3	1.5	350000	Anode-Grid (#2): 90 max. volts, 1.6 ma. Oscillator-Grid (#1) Resistor, 0.2 meg. Conversion Transcond., 350 micromhos.				1B7-GT/G
1C5-GT/G	POWER AMPLIFIER PENTODE	C3	G-6X	D.C. F	1.4	0.10	CLASS A AMPLIFIER	83 90	− 7.0 − 7.5	83 90	1.6 1.6	7.0 7.5	110000 115000	1500 1550	—	9000 8000	0.20 0.24	1C5-GT/G
1C6	PENTAGRID CONVERTER ◘	D9	6L	D.C. F	2.0	0.12	CONVERTER	For other characteristics, refer to Type 1C7-G.										1C6
1C7-G	PENTAGRID CONVERTER◘	D8	G-7Z	D.C. F	2.0	0.12	CONVERTER	135 180	− 3.0 − 3.0	67.5 67.5	2.5 2.0	1.3 1.5	600000 700000	Anode-Grid (#2): 180✱ max. volts, 4.0 ma. Oscillator-Grid (#1) Resistor✱. Conversion Transcond., 325 micromhos.				1C7-G
1D5-GP	SUPER-CONTROL R-F AMPLIFIER PENTODE	D8	G-5Y	D.C. F	2.0	0.06	CLASS A AMPLIFIER	90 180	{− 3.0 min.}	67.5 67.5	0.9 0.8	2.2 2.3	600000 1000000	720 750	—	—	—	1D5-GP
1D5-GT	SUPER-CONTROL R-F AMPLIFIER TETRODE	D8	G-5R	D.C. F	2.0	0.06	CLASS A AMPLIFIER	180	− 3.0	67.5	0.7	2.2	600000	650	—	—	—	1D5-GT
1D7-G	PENTAGRID CONVERTER◘	D8	G-7Z	D.C. F	2.0	0.06	CONVERTER	For other characteristics, refer to Type 1A6.										1D7-G
1D8-GT	DIODE-TRIODE-POWER AMPLIFIER PENTODE	C3	G-8AJ	D.C. F	1.4	0.1	PENTODE UNIT AS CLASS A AMPLIFIER	45 90	− 4.5 − 9.0	45 90	0.3 1.0	1.6 5.0	300000 200000	650 925	—	20000 12000	0.035 0.200	1D8-GT
							TRIODE UNIT AS CLASS A AMPLIFIER	45 90	0 0	—	—	0.3 1.1	77000 43500	325 575	25 25	—	—	
1E5-GP	R-F AMPLIFIER PENTODE	D8	G-5Y	D.C. F	2.0	0.06	CLASS A AMPLIFIER	90 180	− 3.0 − 3.0	67.5 67.5	0.7 0.6	1.6 1.7	1000000 1500000	600 650	—	—	—	1E5-GP
1E7-G	TWIN PENTODE POWER AMPLIFIER	D3	G-8C	D.C. F	2.0	0.24	CLASS A AMPLIFIER	135	− 7.5	135	—	Power Output is for one tube at stated plate-to-plate load.				24000	0.575	1E7-G
1F4	POWER AMPLIFIER PENTODE	D12	5K	D.C. F	2.0	0.12	AMPLIFIER	For other characteristics, refer to Type 1F5-G.										1F4
1F5-G	POWER AMPLIFIER PENTODE	D10	G-6X	D.C. F	2.0	0.12	CLASS A AMPLIFIER	90 135	− 3.0 − 4.5	90 135	1.1 2.4	4.0 8.0	240000 200000	1400 1700	—	20000 16000	0.11 0.31	1F5-G
1F6	DUPLEX-DIODE PENTODE	D9	6W	D.C. F	2.0	0.06	PENTODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 1F7-G.										1F6
1F7-G	DUPLEX-DIODE PENTODE	D8	G-7AF	D.C. F	2.0	0.06	PENTODE UNIT AS R-F AMPLIFIER	180	− 1.5	67.5	0.7	2.2	1000000	650	—	—	—	1F7-G
							PENTODE UNIT AS A-F AMPLIFIER	135✱	− 2.0	Screen Supply, 135 volts applied through 0.8-megohm resistor. Grid Resistor,** 1.0 megohm. Voltage Gain, 46.								
1G4-GT/G	DETECTOR AMPLIFIER TRIODE	C3	G-5S	D.C. F	1.4	0.05	CLASS A AMPLIFIER	90	− 6.0	—	—	2.3	10700	825	8.8	—	—	1G4-GT/G
1G5-G	POWER AMPLIFIER PENTODE	D10	G-6X	D.C. F	2.0	0.12	CLASS A AMPLIFIER	90 135	− 6.0 −13.5	90 135	2.5 2.5	8.5 8.7	133000 160000	1500 1550	—	8500 9000	0.25 0.55	1G5-G
1G6-GT/G	TWIN TRIODE AMPLIFIER	C3	G-7AB	D.C. F	1.4	0.10	CLASS B AMPLIFIER	90	0	—	—	Power Output is for one tube at stated plate-to-plate load.				12000	0.350	1G6-GT/G

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS DIMEN.	DIMENSIONS SOCKET CONNECTIONS S.C.	CATHODE TYPE AND RATING C.T.	CATHODE TYPE AND RATING VOLTS	CATHODE TYPE AND RATING AMP.	USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) µMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	RCA TYPE
1H4-G	DETECTOR★ AMPLIFIER	D3	G-5S₇	D.C. F	2.0	0.06	CLASS A AMPLIFIER	90 135 180	− 4.5 − 9.0 −13.5	——	——	2.5 3.0 3.1	11000 10300 10300	850 900 900	9.3 9.3 9.3	——	——	1H4-G
							CLASS B AMPLIFIER	157.5	−15.0	——	——	1.0♠	——	——	——	8000	2.1†	
1H5-G	DIODE HIGH-MU TRIODE	D8	G-5Z	D.C. F	1.4	0.05	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 1H5-GT.										1H5-G
1H5-GT	DIODE HIGH-MU TRIODE	C3	GT-5Z✶	D.C. F	1.4	0.05	TRIODE UNIT AS CLASS A AMPLIFIER	90	0	——	——	0.15	240000	275	65	——	——	1H5-GT
1H6-G	DUPLEX-DIODE TRIODE	D3	G-7AA	D.C. F	2.0	0.06	TRIODE UNIT AS CLASS A AMPLIFIER	135	− 3.0	——	——	0.8	35000	575	20	——	——	1H6-G
1J5-G	POWER AMPLIFIER PENTODE	D10	G-6X	D.C. F	2.0	0.12	CLASS A AMPLIFIER	135	−16.5	135	2.0	7.0	105000	950	——	135000	0.45	1J5-G
1J6-G	TWIN TRIODE AMPLIFIER	D3	G-7AB	D.C. F	2.0	0.24	CLASS B AMPLIFIER	135 135	0 − 3.0	——	——	Power Output is for one tube at stated plate-to-plate load.				10000 10000	2.1 1.9	1J6-G
1L4	R-F AMPLIFIER PENTODE	B0	6AR	D.C. F	1.4	0.05	CLASS A AMPLIFIER	90 90	0 0	67.5 90	1.2 2.0	2.9 4.5	600000 350000	925 1025	——	——	——	1L4
1LA4	POWER AMPLIFIER PENTODE	B5	5AD₁	D.C. F	1.4	0.05	AMPLIFIER	For other characteristics, refer to Type 1A5-GT/G.										1LA4
1LA6	PENTAGRID CONVERTER	B5	7AK	D.C. F	1.4	0.05	CONVERTER	90	0	45♣	0.6	0.55	750000	Anode-Grid (#2): 90 max. volts, 1.2 ma. Oscillator Grid (#1) Resistor, 0.2 meg. Conversion Transcond., 250 micromhos.				1LA6
1LB4	POWER AMPLIFIER PENTODE	B5	5AD₂	D.C. F	1.4	0.05	CLASS A AMPLIFIER	For other characteristics, refer to Pentode Unit of Type 1D8-GT.										1LB4
1LH4	DIODE HIGH-MU TRIODE	B5	5AG	D.C. F	1.4	0.05	TRIODE UNIT AS CLASS A AMPLIFIER	For other characteristics, refer to Type 1H5-GT.										1LH4
1LN5	R-F AMPLIFIER PENTODE	B5	7AO	D.C. F	1.4	0.05	CLASS A AMPLIFIER	90	0	90	0.35	1.6	1.1 meg.	800	——	——	——	1LN5
1N5-G	R-F AMPLIFIER PENTODE	D8	G-5Y	D.C. F	1.4	0.05	AMPLIFIER	For other characteristics, refer to Type 1N5-GT.										1N5-G
1N5-GT	R-F AMPLIFIER PENTODE	C3	GT-5Y✶	D.C. F	1.4	0.05	CLASS A AMPLIFIER	90	0	90	0.3	1.2	1500000	750	——	——	——	1N5-GT
1N6-G	DIODE—POWER AMPLIFIER PENTODE	D1	G-7AM	D.C. F	1.4	0.05	PENTODE UNIT AS CLASS A AMPLIFIER	90	− 4.5	90	0.7	3.4	300000	800	——	25000	0.1	1N6-G

1P5-GT/G	SUPER-CONTROL R-F AMPLIFIER PENTODE	C3	GT-5Y	D.C. F	1.4	0.05	CLASS A AMPLIFIER	90	0	90	0.7	2.3	800000	750	——	——	——	1P5-GT/G
1Q5-GT/G	BEAM POWER AMPLIFIER	C3	G-6AF	D.C. F	1.4	0.1	CLASS A AMPLIFIER	90	− 4.5	90	1.3	9.5	75000	2200	——	8000	0.27	1Q5-GT/G
1R5	PENTAGRID CONVERTER	B0	7AT	D.C. F	1.4	0.05	CONVERTER	45 90	0 0	45 67.5	1.9 3.2	0.7 1.6	600000 600000	Grid #1 Resistor, 100000 ohms. Conversion Transcond., 300 micromhos.				1R5
1S4	POWER AMPLIFIER PENTODE	B0	7AV	D.C. F	1.4	0.1	CLASS A AMPLIFIER	45 90	− 4.5 − 7.0	45 67.5	0.8 1.4	3.8 7.4	100000 100000	1250 1575	——	8000 8000	0.065 0.27	1S4
1S5	DIODE PENTODE	B0	6AU	D.C. F	1.4	0.05	PENTODE UNIT AS A-F AMPLIFIER	Plate Supply, 90 volts applied through 1 meg. resistor. Screen Supply, 90 volts applied through 3 meg. resistor. Grid Bias, 0 volts. Grid Resistor, 10 megohms. Voltage Gain, 50 approx.										1S5
1T4	SUPER-CONTROL R-F AMPLIFIER PENTODE	B0	6AR	D.C. F	1.4	0.05	CLASS A AMPLIFIER	45 90	0 0	45 67.5	0.7 1.4	1.7 3.5	350000 500000	700 900	——	——	——	1T4
1T5-GT	BEAM POWER AMPLIFIER	C3	G-6X	D.C. F	1.4	0.05	CLASS A AMPLIFIER	90	− 6.0	90	1.4	6.5	——	1150	——	14000	0.17	1T5-GT
1-v	HALF-WAVE RECTIFIER	D5	4G	H	6.3	0.3	WITH CONDENSER-INPUT FILTER	Max. A-C Plate Volts (RMS), 325 Max. D-C Output Ma., 45				Min. Total Effective Plate-Supply Impedance: Up to 117 volts, 0 ohms; at 150 volts, 30 ohms; at 325 volts, 75 ohms.						1-v
2A3	POWER AMPLIFIER TRIODE	E3	4D	F	2.5	2.5	CLASS A AMPLIFIER	250	−45.0	——	——	60.0	800	5250	4.2	2500	3.5	2A3
							PUSH-PULL CLASS AB₁ AMPLIFIER	300 300	Cath. Bias, 780 ohms♣ −62 volts, fixed bias			80.0♣ 80.0♣	——	——	——	5000 3000	10.0† 15.0†	
2A4-G	GAS-TRIODE	D3	G-5S	F	2.5	2.5	RELAY SERVICE	Peak Anode Voltage, 200 max. volts, inverse or forward. Peak Anode Current, 1.25 max. amperes. Average Anode Current, 0.1 max. ampere.										2A4-G
2A5	POWER AMPLIFIER PENTODE	D12	6B	H	2.5	1.75	AMPLIFIER	For other characteristics, refer to Type 6F6-G.										2A5
2A6	DUPLEX-DIODE HIGH-MU TRIODE	D9	6G	H	2.5	0.8	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6SQ7.										2A6
2A7	PENTAGRID CONVERTER ◘	D9	7C	H	2.5	0.8	CONVERTER	For other characteristics, refer to Type 6A8.										2A7
2B7	DUPLEX-DIODE PENTODE	D9	7D	H	2.5	0.8	PENTODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6B8-G.										2B7
2E5	ELECTRON-RAY TUBE	D5	6R	H	2.5	0.8	VISUAL INDICATOR	For other characteristics, refer to Type 6E5.										2E5
3A8-GT	DIODE-TRIODE R-F AMPLIFIER PENTODE	C5a	8AS	D.C. F	1.4	0.1	TRIODE UNIT AS CLASS A AMPLIFIER	90	0	——	——	0.2	200000	325	65	——	——	3A8-GT
					2.8	0.05	PENTODE UNIT AS CLASS A AMPLIFIER	90	0	90	0.5	1.5	800000	750	——	——	——	
3Q4	POWER AMPLIFIER PENTODE	B0	7BA	D.C. F	1.4 2.8	0.1 0.05	CLASS A AMPLIFIER	90 90	− 4.5 − 4.5	90 90	2.1 1.7	9.5 7.7	100000 120000	2150 2000	—— ——	10000 10000	0.27 0.24	3Q4

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS: DIMEN.	S. C.	CATHODE TYPE AND RATING: C. T.	VOLTS	AMP.	USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) μMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	RCA TYPE
3Q5-GT/G	BEAM POWER AMPLIFIER	C3	G-7AP	D.C. F	1.4 2.8	0.1 0.05	CLASS A AMPLIFIER	110 110	− 6.6 − 6.6	110 110	1.4 1.1	10.0 8.5	100000 110000	2200 2000	——	8000 8000	0.40 0.33	3Q5-GT/G
3S4	POWER AMPLIFIER PENTODE	B0	7BA	D.C. F	1.4 2.8	0.1 0.05	CLASS A AMPLIFIER	90 90	− 7 − 7	67.5 67.5	1.4 1.1	7.4 6.1	100000 100000	1575 1425	—— ——	8000 8000	0.27 0.235	3S4
5T4	FULL-WAVE RECTIFIER	D7	5T	F	5.0	2.0	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 450 Max. Peak Inverse Volts, 1550				Max. D-C Output Ma., 225 Max. Peak Plate Ma., 675			Min. Total Effect. Supply Imped. per Plate, 150 ohms			5T4
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 550 Max. Peak Inverse Volts, 1550				Max. D-C Output Ma., 225 Max. Peak Plate Ma., 675			Min. Value of Input Choke, 3 henries			
5U4-G	FULL-WAVE RECTIFIER	E2	G-5T;	F	5.0	3.0	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 450 Max. Peak Inverse Volts, 1550				Max. D-C Output Ma., 225 Max. Peak Plate Ma., 675			Min. Total Effect. Supply Imped. per Plate, 75 ohms			5U4-G
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 550 Max. Peak Inverse Volts, 1550				Max. D-C Output Ma., 225 Max. Peak Plate Ma., 675			Min. Value of Input Choke, 3 henries			
5V4-G	FULL-WAVE RECTIFIER	D10	G-5L;	H	5.0	2.0	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 375 Max. Peak Inverse Volts, 1400				Max. D-C Output Ma., 175 Max. Peak Plate Ma., 525			Min. Total Effect. Supply Imped. per Plate, 100 ohms			5V4-G
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 500 Max. Peak Inverse Volts, 1400				Max. D-C Output Ma., 175 Max. Peak Plate Ma., 525			Min. Value of Input Choke, 4 henries			
5W4	FULL-WAVE RECTIFIER	C2	5T	F	5.0	1.5	For other ratings, refer to Type 5W4-GT/G.											5W4
5W4-GT/G	FULL-WAVE RECTIFIER	C7	G-5T;	F	5.0	1.5	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 350 Max. Peak Inverse Volts, 1400				Max. D-C Output Ma., 100 Max. Peak Plate Ma., 300			Min. Total Effect. Supply Imped. per Plate, 50 ohms			5W4-GT/G
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 500 Max. Peak Inverse Volts, 1400				Max. D-C Output Ma., 100 Max. Peak Plate Ma., 300			Min. Value of Input Choke, 6 henries			
5X4-G	FULL-WAVE RECTIFIER	E2	G-5Q	F	5.0	3.0	For other ratings, refer to Type 5U4-G.											5X4-G
5Y3-GT/G	FULL-WAVE RECTIFIER	D10	G-5T;	F	5.0	2.0	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 350 Max. Peak Inverse Volts, 1400				Max. D-C Output Ma., 125 Max. Peak Plate Ma., 375			Min. Total Effect. Supply Imped. per Plate, 50 ohms			5Y3-GT/G
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 500 Max. Peak Inverse Volts, 1400				Max. D-C Output Ma., 125 Max. Peak Plate Ma., 375			Min. Value of Input Choke, 5 henries			
5Y4-G	FULL-WAVE RECTIFIER	D10	G-5Q	F	5.0	2.0	For other ratings, refer to Type 5Y3-GT/G.											5Y4-G
5Z3	FULL-WAVE RECTIFIER	E3	4C	F	5.0	3.0	For other ratings, refer to Type 5U4-G.											5Z3

5Z4	FULL-WAVE RECTIFIER	C2	5L	H	5.0	2.0	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 350 Max. Peak Inverse Volts, 1400				Max. D-C Output Ma., 125 Max. Peak Plate Ma., 375			Min. Total Effect. Supply Imped. per Plate, 50 ohms			5Z4
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 500 Max. Peak Inverse Volts, 1400				Max. D-C Output Ma., 125 Max. Peak Plate Ma., 375			Min. Value of Input Choke, 5 henries			
6A3	POWER AMPLIFIER TRIODE	E3	4D	F	6.3	1.0	CLASS A AMPLIFIER	250	−45.0	——	——	60.0	800	5250	4.2	2500	3.20	6A3
							PUSH-PULL CLASS AB, AMPLIFIER	325 325	Cath. Bias, 850 ohms♠ −68 volts, fixed bias			80.0♠ 80.0♠	——	——	——	5000 3000	10.0† 15.0†	
6A4/LA	POWER AMPLIFIER PENTODE	D12	5B	F	6.3	0.3	CLASS A AMPLIFIER	100 180	− 6.5 −12.0	100 180	1.6 3.9	9.0 22.0	83250 45500	1200 2200	——	11000 8000	0.31 1.40	6A4/LA
6A6	TWIN TRIODE AMPLIFIER	D12	7B	H	6.3	0.8	AMPLIFIER	For other characteristics, refer to Type 6N7-GT/G.										6A6
6A7	PENTAGRID CONVERTER ◘	D9	7C	H	6.3	0.3	CONVERTER	For other characteristics, refer to Type 6A8.										6A7
6A7S	PENTAGRID CONVERTER ◘	D9	7C	H	6.3	0.3	CONVERTER	For other characteristics, refer to Type 6A8.										6A7S
6A8	PENTAGRID CONVERTER ◘	C1	8A	H	6.3	0.3	CONVERTER	100 250	− 1.5 − 3.0	50 100	1.3 2.7	1.1 3.5	600000 360000	Anode-Grid (#2): 250 max. volts, 4.0 ma. Oscillator-Grid (#1) Resistor. Conversion Transcond., 550 micromhos.				6A8
6A8-G	PENTAGRID CONVERTER◘	D8	G-8A‡	H	6.3	0.3	CONVERTER	For other characteristics, refer to Type 6A8.										6A8-G
6A8-GT	PENTAGRID CONVERTER ◘	C3	GT-8A&	H	6.3	0.3	CONVERTER	For other characteristics, refer to Type 6A8.										6A8-GT
6AB5/ 6N5	ELECTRON-RAY TUBE	D4	6R	H	6.3	0.15	VISUAL INDICATOR	Plate & Target Supply = 135 volts. Triode Plate Resistor = 0.25 meg. Target Current = 2.0 ma. Grid Bias, − 10.0 volts; Shadow Angle, 0°. Bias, 0 volts; Angle, 90°; Plate Current, 0.5 ma.										6AB5/ 6N5
								Plate & Target Supply = 135 volts. Triode Plate Resistor = 1.0 meg. Target Current = 1.9 ma. Grid Bias, −15.5 volts; Shadow Angle, 0°. Bias, 0 volts; Angle 90°; Plate Current, 0.13 ma.										
6AB7/ 1853	TELEVISION AMPLIFIER PENTODE	B3	8N	H	6.3	0.45	CLASS A AMPLIFIER	300	− 3.0	200	3.2	12.5	700000	5000	——	——	——	6AB7/ 1853
6AC5-GT/G	HIGH-MU POWER AMPLIFIER TRIODE	C3	G-6Q‡	H	6.3	0.4	CLASS B AMPLIFIER	250	0	——	——	5.0♠	——	——	——	10000	8.0†	6AC5-GT/G
							DYNAMIC-COUPLED AMPLIFIER WITH 6P5-GT/G DRIVER	250	Bias for both 6AC5-GT/G and 6P5-GT/G is developed in coupling circuit. Average Plate Current of Driver = 5.5 milliamperes. Average Plate Current of 6AC5-GT/G = 32 milliamperes.							7000	3.7	
6AC7/ 1852	TELEVISION AMPLIFIER PENTODE	B3	8N	H	6.3	0.45	CLASS A AMPLIFIER	300	Cath. Bias	150	2.5	10.0	100000	9000	Cathode-Bias Resistor, 160 ohms			6AC7/ 1852
6AD6-G	ELECTRON-RAY TUBE Twin Indicator Type	B5a	7AG	H	6.3	0.15	VISUAL INDICATOR	Target Voltage, 100 volts. Control-Electrode Voltage, −23 volts; Shadow Angle, 135°; Target Current, 0.8 ma. Control-Electrode Voltage, 45 volts; Angle, 0°; Target Current, 1.5 ma.										6AD6-G
								Target Voltage, 150 volts. Control-Electrode Voltage, −50 volts; Shadow Angle, 135°; Target Current, 1.2 ma. Control-Electrode Voltage, 75 volts; Angle, 0°; Target Current, 3 ma.										

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS: DIMEN.	S. C.	CATHODE TYPE AND RATING: C. T.	VOLTS	AMP.	USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) µMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	RCA TYPE
6AD7-G	TRIODE-POWER AMPLIFIER PENTODE	D10	8AY	H	6.3	0.85	TRIODE UNIT AS CLASS A AMPLIFIER	250	−25.0	—	—	4.0	19000	325	6.0	—	—	6AD7-G
							PENTODE UNIT AS CLASS A AMPLIFIER	250	−16.5	250	6.5	34.0	80000	2500	—	7000	3.2	
							PENTODE UNIT WITH 6F6-G AS PUSH-PULL CLASS AB, AMPLIFIER	375	Cath. Bias	250	6.7♠	41.0♠	Cathode-Bias Resistor, 470 ohms♠			16000	9.0†	
6AE5-GT/G	AMPLIFIER TRIODE	C3	G-6Q‡	H	6.3	0.3	CLASS A AMPLIFIER	95	−15.0	—	—	7.0	3500	1200	4.2	—	—	6AE5-GT/G
6AE6-G	TWIN-PLATE CONTROL TUBE	D3	7AH	H	6.3	0.15	REMOTE CUT-OFF TRIODE	250 250	− 1.5 −35.0	— —	— —	6.5 0.01	25000 —	1000 —	25 —	— —	— —	6AE6-G
							SHARP CUT-OFF TRIODE	250 250	− 1.5 − 9.5	— —	— —	4.5 0.01	35000 —	950 —	33 —	— —	— —	
6AE7-GT	TWIN-INPUT TRIODE AMPLIFIER	C3	G-7AX	H	6.3	0.5	CLASS A AMP.▲▲	250	−13.5	—	—	10.0	4650	3000	14	—	—	6AE7-GT
							DRIVER FOR PUSH-PULL 6AC5-GT/G's IN DYNAMIC-COUPLED AMPLIFIER	250	Bias for both 6AC5-GT/G's and 6AE7-GT is developed in coupling circuit. Zero-Signal Plate Current of 6AE7-GT = 10 milliamperes. Zero-Signal Plate Current of 6AC5-GT/G's = 64 milliamperes. Power Output is for two 6AC5-GT/G's at stated plate-to-plate load.							10000	9.5	
6AF6-G	ELECTRON-RAY TUBE Twin Indicator Type	B2	7AG	H	6.3	0.15	VISUAL INDICATOR	Target Voltage, 135 volts. Control-Electrode Voltage, 0 volts; Shadow Angle, 100°; Target Current, 0.9 ma. Control-Electrode Voltage, 81 volts; Angle, 0°.										6AF6-G
								Target Voltage, 250 volts. Control-Electrode Voltage, 0 volts; Shadow Angle, 100°; Target Current, 2.4 ma. Control-Electrode Voltage, 153 volts; Angle, 0°.										
6AG5	R-F AMPLIFIER PENTODE	B0	7BD	H	6.3	0.3	CLASS A AMPLIFIER	100 250	Cath. Bias	100 150	1.6 2.0	5.5 7.0	300000 800000	4750 5000	Cath. Bias Res., 100 ohms Cath. Bias Res., 200 ohms			6AG5
6AG7	VIDEO POWER AMPLIFIER PENTODE	C2	8Y	H	6.3	0.65	CLASS A AMPLIFIER	300	Cath. Bias − 2.0	125	7.0	28.0	Cathode-Bias Resistor, 57 ohms. Load Resistance, 3500 ohms. Peak-to-Peak Volts Output, 140 approx.					6AG7
6B4-G	POWER AMPLIFIER TRIODE	E2	G-5S	F	6.3	1.0	AMPLIFIER	For other characteristics, refer to Type 6A3.										6B4-G
6B5	DIRECT-COUPLED POWER AMPLIFIER	D12	6AS	H	6.3	0.8	CLASS A AMPLIFIER	For other characteristics, refer to Type 6N6-G.										6B5
6B6-G	DUPLEX-DIODE HIGH-MU TRIODE	D8	G-7V‡	H	6.3	0.3	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6SQ7.										6B6-G
6B7	DUPLEX-DIODE PENTODE	D9	7D	H	6.3	0.3	PENTODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6B8-G.										6B7

6B7S	DUPLEX-DIODE PENTODE	D9	7D	H	6.3	0.3	PENTODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6B8-G.										6B7S
6B8	DUPLEX-DIODE PENTODE	C1	8E	H	6.3	0.3	PENTODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 12C8.										6B8
6B8-G	DUPLEX-DIODE PENTODE	D8	G-8E‡	H	6.3	0.3	PENTODE UNIT AS R-F AMPLIFIER	100 250	− 3.0 − 3.0	100 125	1.7 2.3	5.8 9.0	300000 600000	950 1125	—	—	—	6B8-G
							PENTODE UNIT AS A-F AMPLIFIER	90 ✖ 300 ✖	Cath. Bias, 3500 ohms. Screen Resistor = 1.1 meg. Cath. Bias, 1600 ohms. Screen Resistor = 1.2 meg.					Grid Resistor,** 0.5 megohm.		Gain per stage = 55 Gain per stage = 79		
6C5	DETECTOR★ AMPLIFIER TRIODE	B3	6Q	H	6.3	0.3	CLASS A AMPLIFIER	250	− 8.0	—	—	8.0	10000	2000	20	—	—	6C5
								90♥ 300♥	Cath. Bias, 6400 ohms. Cath. Bias, 5300 ohms.			Grid Resistor,** 0.25 megohm.				Gain per stage = 11 Gain per stage = 13		
							BIAS DETECTOR	250	−17.0 approx. Plate current to be adjusted to 0.2 milliampere with no signal.									
6C5-GT/G	DETECTOR★ AMPLIFIER TRIODE	C3	GT-6Q§	H	6.3	0.3	AMPLIFIER DETECTOR	For other characteristics, refer to Type 6C5.										6C5-GT/G
6C6	TRIPLE-GRID DETECTOR AMPLIFIER	D13	6F	H	6.3	0.3	AMPLIFIER DETECTOR	For other characteristics, refer to Type 6J7.										6C6
6C7	DUPLEX-DIODE TRIODE	D9	7G	H	6.3	0.3	TRIODE UNIT AS CLASS A AMPLIFIER	250	− 9.0	—	—	4.5	16000	1250	20	—	—	6C7
6C8-G	TWIN TRIODE AMPLIFIER	D8	G-8G	H	6.3	0.3	EACH UNIT AS AMPLIFIER	250	− 4.5	—	—	3.2	22500	1600	36	—	—	6C8-G
6D6	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	D13	6F	H	6.3	0.3	AMPLIFIER MIXER	For other characteristics, refer to Type 6U7-G.										6D6
6D7	TRIPLE-GRID DETECTOR AMPLIFIER	D13	7H	H	6.3	0.3	AMPLIFIER DETECTOR	For other characteristics, refer to Type 6J7.										6D7
6D8-G	PENTAGRID CONVERTER■	D8	G-8A‡	H	6.3	0.15	CONVERTER	135 250	− 3.0 − 3.0	67.5 100	1.7 2.6	1.5 3.5	600000 400000	Anode-Grid (#2): 250 max. volts, 4.3 ma. Oscillator-Grid (#1) Resistor ●. Conversion Transcond., 550 micromhos.				6D8-G
6E5	ELECTRON-RAY TUBE	D4	6R	H	6.3	0.3	VISUAL INDICATOR	Plate & Target Supply = 200 volts. Triode Plate Resistor = 1.0 meg. Target Current = 3.0 ma. Grid Bias, −6.5 volts; Shadow Angle, 0°. Bias, 0 volts; Angle, 90°; Plate Current, 0.19 ma.										6E5
								Plate & Target Supply = 250 volts. Triode Plate Resistor = 1.0 meg. Target Current = 4.0 ma. Grid Bias, −8.0 volts; Shadow Angle, 0°. Bias, 0 volts; Angle, 90°; Plate Current, 0.24 ma.										
6E6	TWIN TRIODE POWER AMPLIFIER	D12	7B	H	6.3	0.6	PUSH-PULL CLASS A AMPLIFIER	180 250	−20.0 −27.5	—	—	Power Output is for one tube at stated plate-to-plate load.				15000 14000	0.75 1.60	6E6
6E7	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	D13	7H	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6U7-G.										6E7

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS: DIMEN.	S.C.	CATHODE TYPE AND RATING: C.T.	VOLTS	AMP.	USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) µMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	RCA TYPE
6F5	HIGH-MU TRIODE	C1	5M	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6SF5.										6F5
6F5-G	HIGH-MU TRIODE	D8	G-5M‡	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6SF5.										6F5-G
6F5-GT	HIGH-MU TRIODE	C3	G-5M‡	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6SF5.										6F5-GT
6F6	POWER AMPLIFIER PENTODE	C2	7S	H	6.3	0.7	AMPLIFIER	For other characteristics, refer to Type 6F6-G.										6F6
6F6-G	POWER AMPLIFIER PENTODE	D10	G-7S‡	H	6.3	0.7	PENTODE CLASS A AMPLIFIER	250 285	−16.5 −20.0	250 285	6.5 7.0	34.0 38.0	80000 78000	2500 2550	—	7000 7000	3.2 4.8	6F6-G
							TRIODE□ CLASS A AMPLIFIER	250	−20.0	—	—	31.0	2600	2600	6.8	4000	0.85	
							PENTODE PUSH-PULL CLASS A AMPLIFIER	315 315	Cath. Bias −24.0	285 285	12.0♠ 12.0♠	62.0♠ 62.0♠	Cath. Bias Resistor, 320 ohms♠ —	— —	— —	10000 10000	10.5† 11.0†	
							PENTODE PUSH-PULL CLASS AB_2 AMPLIFIER	375 375	Cath. Bias −26.0	250 250	8.0♠ 5.0♠	54.0♠ 34.0♠	Cath. Bias Resistor, 340 ohms♠ —	— —	— —	10000 10000	19.0† 18.5†	
							TRIODE PUSH-PULL□ CLASS AB_1 AMPLIFIER	350 350	Cath. Bias −38.0	—	—	50.0♠ 48.0♠	Cath. Bias Resistor, 730 ohms♠ —	— —	— —	10000 6000	9.0† 13.0†	
6F7	TRIODE-PENTODE	D8	7E	H	6.3	0.3	TRIODE UNIT AS CLASS A AMPLIFIER	100	{− 3.0 min.}	—	—	3.5	16000	500	8	—	—	6F7
							PENTODE UNIT AS CLASS A AMPLIFIER	100 250	{− 3.0 min.}	100 100	1.6 1.5	6.3 6.5	290000 850000	1050 1100	—	—	—	
							PENTODE UNIT AS MIXER	250	−10.0	100	0.6	2.8	Oscillator Peak Volts = 7.0. Conversion Transcond. = 300 micromhos.					
6F8-G	TWIN TRIODE AMPLIFIER	D8	G-8G	H	6.3	0.6	EACH UNIT AS AMPLIFIER	For other characteristics, refer to Type 6J5.										6F8-G
6G6-G	POWER AMPLIFIER PENTODE	D3	G-7S‡	H	6.3	0.15	PENTODE CLASS A AMPLIFIER	135 180	− 6.0 − 9.0	135 180	2.0 2.5	11.5 15.0	170000 175000	2100 2300	—	12000 10000	0.6 1.1	6G6-G
							TRIODE□ CLASS A AMPLIFIER	180	−12.0	—	—	11.0	4750	2000	9.5	12000	0.25	
6H6	TWIN DIODE	A1	7Q	H	6.3	0.3	VOLTAGE DOUBLER	Max. A-C Supply Volts per Plate (RMS), 150 Max. D-C Output Ma., 8. Min. Total Effect. Plate-Supply Imped. per Plate: half-wave, 30 ohms; full-wave, 15 ohms.										6H6
							HALF-WAVE RECTIFIER	Max. A-C Plate Volts (RMS), 150 Max. D-C Output Ma., 8 per Plate					Min. Total Effective Plate-Supply Impedance: up to 117 volts, 15 ohms; at 150 volts, 40 ohms.					

6H6-GT/G	TWIN DIODE	C3	G-7Q‡‡	H	6.3	0.3	DETECTOR RECTIFIER	For other ratings, refer to Type 6H6.										6H6-GT/G
6J5	DETECTOR AMPLIFIER TRIODE	B3	6Q	H	6.3	0.3	CLASS A AMPLIFIER	90 250	0 − 8.0	— —	— —	10.0 9.0	6700 7700	3000 2600	20 20	— —	— —	6J5
6J5-GT/G	DETECTOR AMPLIFIER TRIODE	C3	GT-6Q§	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6J5.										6J5-GT/G
6J7	TRIPLE-GRID DETECTOR AMPLIFIER	C1	7R	H	6.3	0.3	PENTODE CLASS A R-F AMPLIFIER	100 250	− 3.0 − 3.0	100 100	0.5 0.5	2.0 2.0	1000000 1.0 +‡	1185 1225	—	—	—	6J7
							PENTODE CLASS A A-F AMPLIFIER	90 * 300 *	Cath. Bias, 2600 ohms. Screen Resistor = 1.2 meg. Cath. Bias, 1200 ohms. Screen Resistor = 1.2 meg.					Grid Resistor,** 0.5 megohm.		Gain per stage = 85 Gain per stage = 140		
							PENTODE BIAS DETECTOR	250	− 4.3	100	Cathode Current 0.43 ma.		—	Plate Resistor, 500000 ohms. Grid Resistor,** 250000 ohms.				
							TRIODE ✣ CLASS A AMPLIFIER	180 250	− 5.3 − 8.0	—	—	5.3 6.5	11000 10500	1800 1900	20 20	—	—	
6J7-G	TRIPLE-GRID DETECTOR AMPLIFIER	D8	G-7R‡‡	H	6.3	0.3	AMPLIFIER DETECTOR	For other characteristics, refer to Type 6J7.										6J7-G
6J7-GT	TRIPLE-GRID DETECTOR AMPLIFIER	C3	GT-7R§	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6J7.										6J7-GT
6J8-G	TRIODE-HEPTODE CONVERTER	D9	G-8H	H	6.3	0.3	TRIODE UNIT AS OSCILLATOR	100 250 ↘	Triode-Grid Resistor ♠			4.0 5.8	Triode-Grid & Heptode-Grid Current, 0.3 ma. Triode-Grid & Heptode-Grid Current, 0.4 ma.					6J8-G
							HEPTODE UNIT AS MIXER	100 250	− 3.0 − 3.0	100 100	3.2 3.5	1.3 1.3	800000 2500000	Conversion Transcond., 260 micromhos. Conversion Transcond., 290 micromhos.				
6K5-G	HIGH-MU TRIODE	D8	G-5U	H	6.3	0.3	CLASS A AMPLIFIER	100 250	− 1.5 − 3.0	— —	— —	0.35 1.1	78000 50000	900 1400	70 70	— —	— —	6K5-G
6K6-GT/G	POWER AMPLIFIER PENTODE	C3	G-7S‡	H	6.3	0.4	SINGLE-TUBE CLASS A AMPLIFIER	100 250 315	− 7.0 −18.0 −21.0	100 250 250	1.6 5.5 4.0	9.0 32.0 25.5	104000 68000 75000	1500 2300 2100	—	12000 7600 9000	0.35 3.40 4.50	6K6-GT/G
							PUSH-PULL CLASS A AMPLIFIER	285 285	−25.5 Cath. Bias	285 285	9.0♠ 9.0♠	55.0♠ 55.0♠	— — — Cath. Bias Resistor, 400 ohms.♠			12000 12000	10.5† 9.8†	
6K7	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	C1	7R	H	6.3	0.3	CLASS A AMPLIFIER	100 250	− 1.0 − 3.0	100 125	2.7 2.6	9.5 10.5	150000 600000	1650 1650	—	—	—	6K7
							MIXER IN SUPERHETERODYNE	250	−10.0	100	—	—	Oscillator Peak Volts = 7.0					
6K7-G	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	D8	G-7R‡	H	6.3	0.3	AMPLIFIER MIXER	For other characteristics, refer to Type 6K7.										6K7-G

TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS DIMEN.	S. C.	CATHODE TYPE AND RATING C. T.	VOLTS	AMP.	USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) µMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	TYPE
6K7-GT	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	D3	GT-7R⊉	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6K7.										6K7-GT
6K8	TRIODE-HEXODE CONVERTER	C1	8K	H	6.3	0.3	TRIODE UNIT AS OSCILLATOR	100	Triode-Grid Resistor ⚬			3.8	Triode-Grid & Hexode-Grid Current, 0.15 ma.					6K8
							HEXODE UNIT AS MIXER	100 250	− 3.0 − 3.0	100 100	6.2 6.0	2.3 2.5	400000 600000	Conversion Transcond., 325 micromhos. Conversion Transcond., 350 micromhos.				
6K8-G	TRIODE-HEXODE CONVERTER	D8	G-8K‡	H	6.3	0.3	OSCILLATOR AND MIXER	For other characteristics, refer to Type 6K8.										6K8-G
6K8-GT	TRIODE-HEXODE CONVERTER	C7a	GT-8K⊉	H	6.3	0.3	OSCILLATOR AND MIXER	For other characteristics, refer to Type 6K8.										6K8-GT
6L5-G	DETECTOR AMPLIFIER TRIODE	D3	G-6Q‡	H	6.3	0.15	CLASS A AMPLIFIER	135 250	− 5.0 − 9.0	— —	— —	3.5 8.0	11300 9000	1500 1900	17 17	—	—	6L5-G
6L6	BEAM POWER AMPLIFIER	D7	7AC	H	6.3	0.9	SINGLE-TUBE CLASS A AMPLIFIER	250 250	−14.0 Cath. Bias	250 250	5.0 5.4	72.0 75.0	— Cath. Bias Resistor, 170 ohms.	—	—	2500 2500	6.5 6.5	6L6
							PUSH-PULL CLASS A AMPLIFIER	270 270	−17.5 Cath. Bias	270 270	11.0♠ 11.0♠	134.0♠ 134.0♠	— Cath. Bias Resistor, 125 ohms.♠	—	—	5000 5000	17.5† 18.5†	
							PUSH-PULL CLASS AB₁ AMPLIFIER	360 360	−22.5 Cath. Bias	270 270	5.0♠ 5.0♠	88.0♠ 88.0♠	— Cath. Bias Resistor, 250 ohms.♠	—	—	6600 9000	26.5† 24.5†	
							PUSH-PULL CLASS AB₂ AMPLIFIER	360 360	−18.0 −22.5	225 270	3.5♠ 5.0♠	78.0♠ 88.0♠	—	—	—	6000 3800	31.0† 47.0†	
							SINGLE TRIODE□ CLASS A AMPLIFIER	250 250	−20.0 Cath. Bias	—	—	40.0 40.0	1700 Cath. Bias Resistor, 490 ohms.	4700	8.0	5000 6000	1.4 1.3	
6L6-G	BEAM POWER AMPLIFIER	E2	G-7AC‡	H	6.3	0.9	AMPLIFIER	For other characteristics, refer to Type 6L6.										6L6-G
6L7	PENTAGRID MIXER & AMPLIFIER	C1	7T	H	6.3	0.3	MIXER IN SUPERHETERODYNE	250	− 3.0	100	7.1	2.4	Oscillator-Grid (#3) Bias, −10 volts. Grid #3 Peak Swing, 12 volts minimum. Conversion Transcond., 375 micromhos.					6L7
							CLASS A AMPLIFIER	250	− 3.0♦	100	6.5	5.3	600000	1100	—	—	—	
6L7-G	PENTAGRID MIXER & AMPLIFIER	D8	G-7T‡	H	6.3	0.3*	MIXER AMPLIFIER	For other characteristics, refer to Type 6L7.										6L7-G
6N6-G	DIRECT-COUPLED POWER AMPLIFIER	D10	G-7AU	H	6.3	0.8	CLASS A AMPLIFIER	Output Triode: Plate Volts, 300; Plate Ma., 45; Load, 7000 ohms. Input Triode: Plate Volts, 300; Grid Volts, 0; A-F Signal Volts (Peak), 21; Plate Ma., 8.									4.0	6N6-G
6N7	TWIN TRIODE AMPLIFIER	C2	8B	H	6.3	0.8	AMPLIFIER	For other characteristics, refer to Type 6N7-GT/G.										6N7

6N7-GT/G	TWIN TRIODE AMPLIFIER	D10	G-8B‡	H	6.3	0.8	CLASS A AMPLIFIER (As Driver)⊙	250 294	− 5.0 − 6.0	——	——	6.0 7.0	11300 11000	3100 3200	35 35	20800 or more	exceeds 0.4	6N7-GT/G
							CLASS B AMPLIFIER	300	0	——	——	Power Output is for one tube at stated plate-to-plate load.				8000	10.0	
6P5-GT/G	DETECTOR AMPLIFIER TRIODE	C3	G-6Q‡	H	6.3	0.3	CLASS A AMPLIFIER	100 250	− 5.0 −13.5	——	——	2.5 5.0	12000 9500	1150 1450	13.8 13.8	——	——	6P5-GT/G
								90♥ 300♥	Cath. Bias, 6500 ohms. Cath. Bias, 6400 ohms.			Grid Resistor,** 0.25 megohm.				Gain per stage = 9 Gain per stage = 10		
							BIAS DETECTOR	250	− 20.0 approx.	——	——	Plate current to be adjusted to 0.2 milliampere with no signal.						
6P7-G	TRIODE-PENTODE	D8	G-7U	H	6.3	0.3	AMPLIFIER AND CONVERTER	For other characteristics, refer to Type 6F7.										6P7-G
6Q7	DUPLEX-DIODE HIGH-MU TRIODE	C1	7V	H	6.3	0.3	TRIODE UNIT AS CLASS A AMPLIFIER	100 250	− 1.0 − 3.0	——	——	0.8 1.0	58000 58000	1200 1200	70 70	——	——	6Q7
								90✖ 300✖	Cath. Bias, 7600 ohms. Cath. Bias, 3000 ohms.			Grid Resistor,** 0.5 megohm.				Gain per stage = 32 Gain per stage = 45		
6Q7-G	DUPLEX-DIODE HIGH-MU TRIODE	D8	G-7V‡	H	6.3	0.3	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6Q7.										6Q7-G
6Q7-GT	DUPLEX-DIODE HIGH-MU TRIODE	C3	GT-7V	H	6.3	0.3	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6Q7.										6Q7-GT
6R7	DUPLEX-DIODE TRIODE	C1	7V	H	6.3	0.3	TRIODE UNIT AS CLASS A AMPLIFIER	250	− 9.0	——	——	9.5	8500	1900	16	——	——	6R7
								90♥ 300♥	Cath. Bias, 4400 ohms. Cath. Bias, 3800 ohms.			Grid Resistor,** 0.25 megohm.				Gain per stage = 10 Gain per stage = 10		
6R7-G	DUPLEX-DIODE TRIODE	D8	G-7V‡	H	6.3	0.3	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6R7.										6R7-G
6R7-GT	DUPLEX-DIODE TRIODE	C3	G-7V‡	H	6.3	0.3	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6R7.										6R7-GT
6S7	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	C1	7R	H	6.3	0.15	CLASS A AMPLIFIER	135 250	− 3.0 − 3.0	67.5 100	0.9 2.0	3.7 8.5	1000000 1000000	1250 1750	——	——	——	6S7
6S7-G	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	D8	G-7R‡	H	6.3	0.15	AMPLIFIER	For other characteristics, refer to Type 6S7.										6S7-G
6SA7	PENTAGRID CONVERTER▲	B3	8R	H	6.3	0.3	MIXER	100 250	Self-Excited	100 100	8.5 8.5	3.3 3.5	500000 1000000	Grid #1 Resistor, 20000 ohms. Conversion Transcond., 450 micromhos.				6SA7
6SA7-GT/G	PENTAGRID CONVERTER▲	C3	GT-8AD	H	6.3	0.3	MIXER	For other characteristics, refer to Type 6SA7.										6SA7-GT/G
6SC7	TWIN TRIODE AMPLIFIER	B3	8S	H	6.3	0.3	EACH UNIT AS AMPLIFIER	250	− 2.0	——	——	2.0	53000	1325	70	——	——	6SC7
6SF5	HIGH-MU TRIODE	B3	6AB	H	6.3	0.3	CLASS A AMPLIFIER	100 250	− 1.0 − 2.0	——	——	0.4 0.9	85000 66000	1150 1500	100 100	——	——	6SF5
								90✖ 300✖	Cath. Bias, 8800 ohms. Cath. Bias, 3200 ohms.			Grid Resistor,** 0.5 megohm.				Gain per stage = 43 Gain per stage = 63		

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS DIMEN.	S. C.	CATHODE TYPE AND RATING C. T.	VOLTS	AMP.	USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) μMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	RCA TYPE
6SF5-GT	HIGH-MU TRIODE	C3	G-6AB1	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6SF5.										6SF5-GT
6SF7	DIODE SUPER-CONTROL AMPLIFIER PENTODE	B3	7AZ	H	6.3	0.3	PENTODE UNIT AS CLASS A AMPLIFIER	100 250	− 1.0 − 1.0	100 100	3.4 3.3	12.0 12.4	200000 700000	1975 2050	—	—	—	6SF7
6SG7	H-F AMPLIFIER PENTODE	B3	8BK	H	6.3	0.3	CLASS A AMPLIFIER	100 250 250	− 1.0 − 1.0 − 2.5	100 125 150	3.2 4.4 3.4	8.2 11.8 9.2	250000 900000 1.0+§	4100 4700 4000	—	—	—	6SG7
6SH7	H-F AMPLIFIER PENTODE	B3	8BK	H	6.3	0.3	CLASS A AMPLIFIER	100 250	− 1.0 − 1.0	100 150	2.1 4.1	5.3 10.8	350000 900000	4000 4900	—	—	—	6SH7
6SJ7	TRIPLE-GRID DETECTOR AMPLIFIER	B3	8N	H	6.3	0.3	CLASS A AMPLIFIER	100 250	− 3.0 − 3.0	100 100	0.9 0.8	2.9 3.0	700000 1.0+§	1575 1650	—	—	—	6SJ7
								90 ✖ 300 ✖	Cath. Bias, 1700 ohms. Cath. Bias, 860 ohms.	Grid Resistor,** 0.5 megohm.						Gain per stage = 93 Gain per stage = 167		
6SJ7-GT	TRIPLE-GRID DETECTOR AMPLIFIER	C3	GT-8N&	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6SJ7.										6SJ7-GT
6SK7	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	B3	8N	H	6.3	0.3	CLASS A AMPLIFIER	100 250	− 1.0 − 3.0	100 100	4.0 2.6	13.0 9.2	120000 800000	2350 2000	—	—	—	6SK7
6SK7-GT/G	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	C3	GT-8N&	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6SK7.										6SK7-GT/G
6SL7-GT	TWIN TRIODE AMPLIFIER	C3	8BD	H	6.3	0.3	EACH UNIT AS AMPLIFIER	250	− 2.0	—	—	2.3	44000	1600	70	—	—	6SL7-GT
6SN7-GT	TWIN TRIODE AMPLIFIER	C3	8BD	H	6.3	0.6	EACH UNIT AS AMPLIFIER	For other characteristics, refer to Type 6J5.										6SN7-GT
6SQ7	DUPLEX-DIODE HIGH-MU TRIODE	B3	8Q	H	6.3	0.3	TRIODE UNIT AS CLASS A AMPLIFIER	100 250	− 1.0 − 2.0	—	—	0.4 0.9	110000 91000	900 1100	100 100	— —	— —	6SQ7
								90 ✖ 300 ✖	Cath. Bias, 11000 ohms. Cath. Bias, 3900 ohms.	Grid Resistor, ** 0.5 megohm.						Gain per stage = 40 Gain per stage = 53		
6SQ7-GT/G	DUPLEX-DIODE HIGH-MU TRIODE	C3	GT-8Q&	H	6.3	0.3	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6SQ7.										6SQ7-GT/G
6SR7	DUPLEX-DIODE TRIODE	B3	8Q	H	6.3	0.3	TRIODE UNIT AS CLASS A AMPLIFIER	250	− 9.0	—	—	9.5	8500	1900	16	10000	0.3	6SR7

6SS7	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	B3	8N	H	6.3	0.15	CLASS A AMPLIFIER	100 250	− 1.0 − 3.0	100 100	3.1 2.0	12.2 9.0	120000 1000000	1930 1850	——	——	——	6SS7
6ST7	DUPLEX-DIODE TRIODE	B3	8Q	H	6.3	0.15	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6SR7.										6ST7
6T7-G	DUPLEX-DIODE HIGH-MU TRIODE	D8	G-7V‡	H	6.3	0.15	TRIODE UNIT AS CLASS A AMPLIFIER	135 250	− 1.5 − 3.0	——	——	0.9 1.2	65000 62000	1000 1050	65 65	——	——	6T7-G
								90 ✖ 300 ✖	Cath. Bias, 8300 ohms. Cath. Bias, 4580 ohms.			Grid Resistor,** 0.5 megohm.				Gain per stage = 30 Gain per stage = 40		
6U5/6G5	ELECTRON-RAY TUBE	D4	6R	H	6.3	0.3	VISUAL INDICATOR	Plate & Target Supply = 100 volts. Triode Plate Resistor = 0.5 meg. Target Current = 1.0 ma. Grid Bias, −8 volts; Shadow Angle, 0°. Bias, 0 volts; Angle, 90°; Plate Current, 0.19 ma.										6U5/6G5
								Plate & Target Supply = 250 volts. Triode Plate Resistor = 1.0 meg. Target Current = 4.0 ma. Grid Bias, −22 volts; Shadow Angle, 0°. Bias, 0 volts, Angle, 90°; Plate Current, 0.24 ma.										
6U7-G	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	D-12a	G-7R‡	H	6.3	0.3	CLASS A AMPLIFIER	100 250	− 3.0 − 3.0	100 100	2.2 2.0	8.0 8.2	250000 800000	1500 1600	——	——	——	6U7-G
							MIXER IN SUPERHETERODYNE	100 250	−10.0 −10.0	100 100	——	——	Oscillator Peak Volts = 7.0					
6V6	BEAM POWER AMPLIFIER	C2	7AC	H	6.3	0.45	AMPLIFIER	For other characteristics, refer to Type 6V6-GT/G.										6V6
6V6-GT/G	BEAM POWER AMPLIFIER	C3	G-7AC‡	H	6.3	0.45	SINGLE-TUBE CLASS A AMPLIFIER	180 250 315	− 8.5 −12.5 −13.0	180 250 225	3.0 4.5 2.2	29.0 45.0 34.0	58000 52000 77000	3700 4100 3750	—— —— ——	5500 5000 8500	2.0 4.5 5.5	6V6-GT/G
							PUSH-PULL CLASS AB₁ AMPLIFIER	250 285	−15.0 −19.0	250 285	5.0♠ 4.0♠	70.0♠ 70.0♠	—— ——	—— ——	—— ——	10000 8000	10.0† 14.0†	
6V7-G	DUPLEX-DIODE TRIODE	D8	G-7V‡	H	6.3	0.3	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 85.										6V7-G
6W7-G	TRIPLE-GRID DETECTOR AMPLIFIER	D8	G-7R‡	H	6.3	0.15	CLASS A AMPLIFIER	250	− 3.0	100	0.5	2.0	1500000	1225	——	——	——	6W7-G
6X5	FULL-WAVE RECTIFIER	C2	6S	H	6.3	0.6	For other ratings, refer to Type 6X5-GT/G.											6X5
6X5-GT/G	FULL-WAVE RECTIFIER	C3	G-6S‡	H	6.3	0.6	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 325 Max. Peak Inverse Volts, 1250				Max. D-C Output Ma., 70 Max. Peak Plate Ma., 210			Min. Total Effect. Supply Imped. per Plate, 150 ohms			6X5-GT/G
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 450 Max. Peak Inverse Volts, 1250				Max. D-C Output Ma., 70 Max. Peak Plate Ma., 210			Min. Value of Input Choke, 8 henries			
6Y5	FULL-WAVE RECTIFIER	D5	6J	H	6.3	0.8	WITH CONDENSER-INPUT FILTER	Max A-C Volts per Plate (RMS), 350 Max. D-C Output Ma., 50										6Y5
6Y6-G	BEAM POWER AMPLIFIER	D10	G-7AC‡	H	6.3	1.25	SINGLE-TUBE CLASS A AMPLIFIER	135 200	−13.5 −14.0	135 135	3.5 2.2	58.0 61.0	9300 18300	7000 7100	—— ——	2000 2600	3.6 6.0	6Y6-G
6Y7-G	TWIN TRIODE AMPLIFIER	D3	G-8B‡	H	6.3	0.6	CLASS B AMPLIFIER	180 250	0 0	——	——	Power Output is for one tube at stated plate-to-plate load.				7000 14000	5.5 8.0	6Y7-G
6Z5	FULL-WAVE RECTIFIER	D5	6K	H	6.3 12.6	0.8 0.4	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 230 Max. D-C Output Ma., 60										6Z5

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS		CATHODE TYPE AND RATING			USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUP-PLY	GRID BIAS ■	SCREEN SUPPLY	SCREEN CUR-RENT	PLATE CUR-RENT	A-C PLATE RESIS-TANCE	TRANS-CONDUC-TANCE (GRID-PLATE)	AMPLIFI-CATION FACTOR	LOAD FOR STATED POWER OUTPUT	POWER OUT-PUT	RCA TYPE
		DIMEN.	S.C.	C.T.	VOLTS	AMP.		VOLTS	VOLTS	VOLTS	MA.	MA.	OHMS	µMHOS		OHMS	WATTS	
6Z7-G	TWIN TRIODE AMPLIFIER	D3	G-8B‡	H	6.3	0.3	CLASS B AMPLIFIER	135 180	0 0	—	—	Power Output is for one tube at stated plate-to-plate load.				9000 12000	2.5 4.2	6Z7-G
6ZY5-G	FULL-WAVE RECTIFIER	D3	G-6S‡	H	6.3	0.3	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 325 Max. Peak Inverse Volts, 1250				Max. D-C Output Ma., 40 Max. Peak Plate Ma., 120			Min. Total Effect. Supply Imped. per Plate, 225 ohms			6ZY5-G
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 450 Max. Peak Inverse Volts, 1250				Max. D-C Output Ma., 40 Max. Peak Plate Ma., 120			Min. Value of Input Choke, 13.5 henries			
7A4	DETECTOR AMPLIFIER TRIODE	B5	5AC₂	H	6.3◆	0.3	AMPLIFIER	For other characteristics, refer to Type 6J5.										7A4
7A5	BEAM POWER AMPLIFIER	C6a	6AA	H	6.3✝	0.7	CLASS A AMPLIFIER	110 125	− 7.5 − 9.0	110 125	3.0 3.3	40.0 44.0	14000 17000	5800 6000	—	2500 2700	1.5 2.2	7A5
7A6	TWIN DIODE	B5	7AJ	H	6.3☒	0.15	DETECTOR RECTIFIER	Maximum A-C Voltage per Plate..........150 Volts, RMS Maximum D-C Output Current per plate.......... 8 Milliamperes										7A6
7A7	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	B5	8V	H	6.3◆	0.3	CLASS A AMPLIFIER	For other characteristics, refer to Type 6SK7.										7A7
7A8	OCTODE CONVERTER	B5	8U	H	6.3☒	0.15	CONVERTER	100 250	− 3.0 − 3.0	75 100	2.7 3.2	1.8 3.0	650000 700000	Anode-Grid (#2): 250■ max. volts, 4.2 ma. Oscillator-Grid (#1) Resistor ■. Conversion Transcond., 550 micromhos.				7A8
7B4	HIGH-MU TRIODE	B5	5AC₁	H	6.3◆	0.3	AMPLIFIER	For other characteristics, refer to Type 6SF5.										7B4
7B5	POWER AMPLIFIER PENTODE	C6	6AE	H	6.3♀	0.4	CLASS A AMPLIFIER	For other characteristics, refer to Type 6K6-GT/G.										7B5
7B6	DUPLEX-DIODE HIGH-MU TRIODE	B5	8W	H	6.3◆	0.3	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6SQ7.										7B6
7B7	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	B5	8V	H	6.3☒	0.15	CLASS A AMPLIFIER	100 250	− 3.0 − 3.0	100 100	1.8 1.7	8.2 8.5	300000 750000	1675 1750	—	—	—	7B7
7B8	PENTAGRID CONVERTER	B5	8X	H	6.3◆	0.3	CONVERTER	For other characteristics, refer to Type 6A8.										7B8
7C5	BEAM POWER AMPLIFIER	C6	6AA	H	6.3♀	0.45	CLASS A AMPLIFIER	For other characteristics, refer to Type 6V6-GT/G.										7C5
7C6	DUPLEX-DIODE HIGH-MU TRIODE	B5	8W	H	6.3☒	0.15	TRIODE UNIT AS CLASS A AMPLIFIER	250	− 1.0	—	—	1.3	100000	1000	100	—	—	7C6
7C7	TRIPLE-GRID DETECTOR AMPLIFIER	B5	8V	H	6.3☒	0.15	CLASS A AMPLIFIER	100 250	− 3.0 − 3.0	100 100	0.4 0.5	1.8 2.0	1.2§ 2.0§	1225 1300	—	—	—	7C7

7E6	DUPLEX-DIODE TRIODE	B5	8W	H	6.3♦	0.3	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6R7.										7E6
7E7	DUPLEX-DIODE PENTODE	B5	8AE	H	6.3♦	0.3	PENTODE UNIT AS CLASS A AMPLIFIER	100 250	− 1.0 − 3.0	100 100	2.7 1.6	10.0 7.5	150000 700000	1600 1300	——	——	——	7E7
7F7	TWIN TRIODE AMPLIFIER	B5	8AC	H	6.3♦	0.3	EACH UNIT AS AMPLIFIER	For other characteristics, refer to Type 6SL7-GT.										7F7
7G7/ 1232	TELEVISION AMPLIFIER PENTODE	B5	8V	H	6.3‡	0.45	CLASS A AMPLIFIER	250	− 2.0	100	2.0	6.0	800000	4500	——	——	——	7G7/ 1232
7H7	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	B5	8V	H	6.3♦	0.3	CLASS A AMPLIFIER	100 250	− 1.0 − 2.5	100 150	3.3 3.5	8.2 9.5	250000 800000	3800 3800	——	——	——	7H7
7J7	TRIODE-HEPTODE CONVERTER	B5	8AR	H	6.3♦	0.3	TRIODE UNIT AS OSCILLATOR	100 250 ◣	Triode-Grid Resistor ●			3.7 5.4	Triode-Grid & Hexode-Grid Current, 0.3 ma. Triode-Grid & Hexode-Grid Current, 0.4 ma.					7J7
							HEXODE UNIT AS MIXER	100 250	− 3.0 − 3.0	100 100	3.1 2.9	1.1 1.3	300000 1.5§	Conversion Transcond., 260 micromhos. Conversion Transcond., 300 micromhos.				
7Q7	PENTAGRID CONVERTER	B5	8AL	H	6.3♦	0.3	CONVERTER	100 250	− 2.0 − 2.0	100 100	8.5 8.5	3.3 3.5	500000 1000000	Grid #1 Resistor, 20000 ohms. Conversion Transcond., 550 micromhos.				7Q7
7Y4	FULL-WAVE RECTIFIER	B5	5AB	H	6.3◆	0.5	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 325 Max. Peak Inverse Volts, 1250			Max. D-C Output Ma., 60 Max. Peak Plate Ma., 180			Min. Total Effect. Supply Imped. per Plate, 150 ohms.				7Y4
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 450 Max. Peak Inverse Volts, 1250			Max. D-C Output Ma., 60 Max. Peak Plate Ma., 180			Min. Value of Input Choke, 10 henries				
10	POWER AMPLIFIER TRIODE	E3	4D	F	7.5	1.25	CLASS A AMPLIFIER	350 425	−32.0 −40.0	——	——	16.0 18.0	5150 5000	1550 1600	8.0 8.0	11000 10200	0.9 1.6	10
11 12	DETECTOR★ AMPLIFIER TRIODE	D2 D11	4F 4D	D.C. F	1.1	0.25	CLASS A AMPLIFIER	90 135	− 4.5 −10.5	——	——	2.5 3.0	15500 15000	425 440	6.6 6.6	——	——	11 12
12A5	POWER AMPLIFIER PENTODE	D5	7F	H	6.3 12.6	0.6 0.3	CLASS A AMPLIFIER	100 180	−15.0 −25.0	100 180	3.0 8.0	17.0 45.0	50000 35000	1700 2400	——	4500 3300	0.8 3.4	12A5
12A7	RECTIFIER-PENTODE	D9	7K	H	12.6	0.3	PENTODE UNIT AS CLASS A AMPLIFIER	135	−13.5	135	2.5	9.0	102000	975	——	13500	0.55	12A7
							HALF-WAVE RECTIFIER	Maximum A-C Plate Voltage........125 Volts, RMS Maximum D-C Output Current........30 Milliamperes										
12A8-GT	PENTAGRID CONVERTER●	C3	GT-8A‡	H	12.6	0.15	CONVERTER	For other characteristics, refer to Type 6A8.										12A8-GT
12AH7-GT	TWIN TRIODE	C0	8BE	H	12.6	0.15	EACH UNIT AS CLASS A AMPLIFIER	100 180	− 3.6 − 6.5	——	——	3.7 7.6	10300 8400	1550 1900	16 16	——	——	12AH7-GT
12B8-GT	TRIODE-PENTODE	C7a	8T	H	12.6	0.3	TRIODE UNIT AS CLASS A AMPLIFIER	90	0	——	——	2.8	37000	2400	90	——	——	12B8-GT
							PENTODE UNIT AS CLASS A AMPLIFIER	90	− 3.0	90	2.0	7.0	200000	1800	——	——	——	
12C8	DUPLEX-DIODE PENTODE	C1	8E	H	12.6	0.15	PENTODE UNIT AS R-F AMPLIFIER	250	− 3.0	125	2.3	10.0	600000	1325	——	——	——	12C8
							PENTODE UNIT AS A-F AMPLIFIER	90✖ 300✖	Cath. Bias, 3500 ohms. Screen Resistor = 1.1 meg. Cath. Bias, 1600 ohms. Screen Resistor = 1.2 meg.					Grid Resistor,** 0.5 megohm.		Gain per stage = 55 Gain per stage = 79		

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS		CATHODE TYPE AND RATING			USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) μMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	RCA TYPE
		DIMEN.	S.C.	C.T.	VOLTS	AMP.												
12F5-GT	HIGH-MU TRIODE	C3	G-5M‡	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6SF5.										12F5-GT
12H6	TWIN DIODE	A1	7Q	H	12.6	0.15	DETECTOR RECTIFIER	For other ratings, refer to Type 6H6.										12H6
12J5-GT	DETECTOR AMPLIFIER TRIODE	C3	GT-6Q‡	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6J5.										12J5-GT
12J7-GT	TRIPLE-GRID DETECTOR AMPLIFIER	C3	GT-7R§	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6J7.										12J7-GT
12K7-GT	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	C3	GT-7R§	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6K7.										12K7-GT
12K8	TRIODE-HEXODE CONVERTER	C1	8K	H	12.6	0.15	OSCILLATOR MIXER	For other characteristics, refer to Type 6K8.										12K8
12Q7-GT	DUPLEX-DIODE HIGH-MU TRIODE	C3	GT-7V§	H	12.6	0.15	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6Q7.										12Q7-GT
12SA7	PENTAGRID CONVERTER▲	B3	8R	H	12.6	0.15	MIXER	For other characteristics, refer to Type 6SA7.										12SA7
12SA7-GT/G	PENTAGRID CONVERTER▲	C3	GT-8AD	H	12.6	0.15	MIXER	For other characteristics, refer to Type 6SA7.										12SA7-GT/G
12SC7	TWIN TRIODE AMPLIFIER	B3	8S	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6SC7.										12SC7
12SF5	HIGH-MU TRIODE	B3	6AB	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6SF5.										12SF5
12SF5-GT	HIGH-MU TRIODE	C3	G-6AB‡	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6SF5.										12SF5-GT
12SF7	DIODE SUPER-CONTROL AMPLIFIER PENTODE	B3	7AZ	H	12.6	0.15	PENTODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6SF7.										12SF7
12SG7	H-F AMPLIFIER PENTODE	B3	8BK	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6SG7.										12SG7
12SH7	H-F AMPLIFIER PENTODE	B3	8BK	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6SH7.										12SH7
12SJ7	TRIPLE-GRID DETECTOR AMPLIFIER	B3	8N	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6SJ7.										12SJ7

12SJ7-GT	TRIPLE-GRID DETECTOR AMPLIFIER	C3	GT-8N∆	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6SJ7.										12SJ7-GT
12SK7	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	B3	8N	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6SK7.										12SK7
12SK7-GT/G	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	C3	GT-8N∆	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 6SK7.										12SK7-GT/G
12SL7-GT	TWIN TRIODE AMPLIFIER	C3	8BD	H	12.6	0.15	EACH UNIT AS AMPLIFIER	For other characteristics, refer to Type 6SL7-GT.										12SL7-GT
12SN7-GT	TWIN TRIODE AMPLIFIER	C3	8BD	H	12.6	0.3	EACH UNIT AS AMPLIFIER	For other characteristics, refer to Type 6J5.										12SN7-GT
12SQ7	DUPLEX-DIODE HIGH-MU TRIODE	B3	8Q	H	12.6	0.15	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6SQ7.										12SQ7
12SQ7-GT/G	DUPLEX-DIODE HIGH-MU TRIODE	C3	GT-8Q∆	H	12.6	0.15	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6SQ7.										12SQ7-GT/G
12SR7	DUPLEX DIODE TRIODE	B3	8Q	H	12.6	0.15	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 6SR7.										12SR7
12Z3	HALF-WAVE RECTIFIER	D5	4G	H	12.6	0.3	WITH CONDENSER-INPUT FILTER	Max. A-C Plate Volts (RMS), 235 Max. D-C Output Ma., 55				Min. Total Effective Plate-Supply Impedance: Up to 117 volts, 0 ohms; at 150 volts, 30 ohms; at 235 volts, 75 ohms.						12Z3
14A7/12B7	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	B5	8V	H	12.6	0.15	CLASS A AMPLIFIER	100 250	− 1.0 − 3.0	100 100	4.0 2.6	13.0 9.2	120000 800000	2350 2000	—	—	—	14A7/12B7
15	R-F AMPLIFIER PENTODE	D9	5F	D.C. H	2.0	0.22	CLASS A AMPLIFIER	67.5 135	− 1.5 − 1.5	67.5 67.5	0.3 0.3	1.85 1.85	630000 800000	710 750	—	—	—	15
19	TWIN TRIODE AMPLIFIER	D5	6C	D.C. F	2.0	0.26	AMPLIFIER	For other characteristics, refer to Type 1J6-G.										19
20	POWER AMPLIFIER TRIODE	D1	4D	D.C. F	3.3	0.132	CLASS A AMPLIFIER	90 135	−16.5 −22.5	—	—	3.0 6.5	8000 6300	415 525	3.3 3.3	9600 6500	0.045 0.110	20
22	R-F AMPLIFIER TETRODE	E1	4K	D.C. F	3.3	0.132	SCREEN-GRID R-F AMPLIFIER	135 135	− 1.5 − 1.5	45 67.5	0.6• 1.3•	1.7 3.7	725000 325000	375 500	—	—	—	22
24-A	R-F AMPLIFIER TETRODE	E1	5E	H	2.5	1.75	SCREEN-GRID R-F AMPLIFIER	180 250	− 3.0 − 3.0	90 90	1.7• 1.7•	4.0 4.0	400000 600000	1000 1050	—	—	—	24-A
							BIAS DETECTOR	250●	− 5.0 approx.	20 to 45	—	Plate current to be adjusted to 0.1 milliampere with no signal.						
25A6	POWER AMPLIFIER PENTODE	C2	7S	H	25.0	0.3	AMPLIFIER	For other characteristics, refer to Type 25A6-GT/G.										25A6
25A6-GT/G	POWER AMPLIFIER PENTODE	C3	G-7S‡	H	25.0	0.3	CLASS A AMPLIFIER	95 160	−15.0 −18.0	95 120	4.0 6.5	20.0 33.0	45000 42000	2000 2375	—	4500 5000	0.9 2.2	25A6-GT/G
25A7-GT/G	RECTIFIER PENTODE	C3	8F	H	25.0	0.3	PENTODE UNIT AS CLASS A AMPLIFIER	100	−15.0	100	4.0	20.5	50000	1800	—	4500	0.77	25A7-GT/G
							HALF-WAVE RECTIFIER	Max. A-C Plate Volts (RMS), 117 Max. Peak Inverse Volts, 350				Max. D-C Output Ma., 75 Max. Peak Plate Ma., 450			Min. Total Effect. Supply Impedance, 15 ohms.			

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS DIMEN.	S.C.	CATHODE TYPE AND RATING C.T.	VOLTS	AMP.	USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) μMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	RCA TYPE
25AC5-GT/G	HIGH-MU POWER AMPLIFIER TRIODE	C3	G-6Q‡	H	25.0	0.3	CLASS B AMPLIFIER	180	0	—	—	4.0♠	—	—	—	4800	6.0	25AC5-GT/G
							DYNAMIC-COUPLED AMP. WITH TYPE 6AE5-GT DRIVER	110	Bias for both 25AC5-GT/G and 6AE5-GT/G developed in circuit. Average Plate Current of Driver = 7 milliamperes. Average Plate Current of 25AC5-GT/G = 45 milliamperes.							2000	2.0	
25B5	DIRECT-COUPLED POWER AMPLIFIER	D9a	6D	H	25.0	0.3	AMPLIFIER	For other characteristics, refer to Type 25N6-G.										25B5
25B6-G	POWER AMPLIFIER PENTODE	D10	G-7S‡	H	25.0	0.3	CLASS A AMPLIFIER	105 200	−16.0 −23.0	105 135	2.0 1.8	48.0 62.0	15500 18000	4800 5000	—	1700 2500	2.4 7.1	25B6-G
25B8-GT	TRIODE-PENTODE	C3	8T	H	25.0	0.15	TRIODE UNIT AS CLASS A AMPLIFIER	100	− 1.0	—	—	0.6	75000	1500	112	—	—	25B8-GT
							PENTODE UNIT AS CLASS A AMPLIFIER	100	− 3.0	100	2.0	7.6	185000	2000	—	—	—	
25C6-G	BEAM POWER AMPLIFIER	D10	G-7AC‡	H	25.0	0.3	CLASS A AMPLIFIER	For other characteristics, refer to Type 6Y6-G.										25C6-G
25L6	BEAM POWER AMPLIFIER	C2	7AC	H	25.0	0.3	AMPLIFIER	For other characteristics, refer to Type 50L6-GT.										25L6
25L6-GT/G	BEAM POWER AMPLIFIER	C3	G-7AC‡	H	25.0	0.3	AMPLIFIER	For other characteristics, refer to Type 50L6-GT.										25L6-GT/G
25N6-G	DIRECT-COUPLED POWER AMPLIFIER	D8	G-7W	H	25.0	0.3	CLASS A AMPLIFIER	Output Triode: Plate Volts, 180; Plate Ma., 46; Load, 4000 ohms. Input Triode: Plate Volts, 100; Grid Volts, 0; A-F Signal Volts (Peak), 29.7; Plate Ma., 5.8.									3.8	25N6-G
25Y5	RECTIFIER-DOUBLER	D5	6E	H	25.0	0.3	HALF-WAVE RECTIFIER	Max. A-C Volts per Plate (RMS), 235 Max. D-C Output Ma. per Plate, 75				Min. Total Effective Plate-Supply Impedance per Plate, 0 ohms.						25Y5
25Z5	RECTIFIER-DOUBLER	D5	6E	H	25.0	0.3	RECTIFIER-DOUBLER	For other ratings, refer to Type 25Z6.										25Z5
25Z6	RECTIFIER-DOUBLER	C2	7Q	H	25.0	0.3	VOLTAGE DOUBLER	Max. A-C Volts per Plate (RMS), 117 Max. D-C Output Ma., 75				Min. Total Effective Plate-Supply Impedance: Half-Wave, 30 ohms; Full-Wave, 15 ohms.						25Z6
							HALF-WAVE RECTIFIER	Max. A-C Volts per Plate (RMS), 235 Max. D-C Output Ma. per Plate, 75				Min. Total Effect. Supply Imped. per Plate: Up to 117 volts, 15 ohms; at 150 volts, 40 ohms; at 235 volts, 100 ohms.						
25Z6-GT/G	RECTIFIER-DOUBLER	C3	G-7Q‡	H	25.0	0.3	RECTIFIER-DOUBLER	For other ratings, refer to Type 25Z6.										25Z6-GT/G
26	AMPLIFIER TRIODE	D12	4D	F	1.5	1.05	CLASS A AMPLIFIER	90 180	− 7.0 −14.5	—	—	2.9 6.2	8900 7300	935 1150	8.3 8.3	—	—	26

27	DETECTOR★ AMPLIFIER TRIODE	D5	5A	H	2.5	1.75	CLASS A AMPLIFIER	135 250	− 9.0 −21.0	—	—	4.5 5.2	9000 9250	1000 975	9.0 9.0	—	—	27
							BIAS DETECTOR	250	−30.0 approx.	—	—	Plate current to be adjusted to 0.2 milliampere with no signal.						
30	DETECTOR★ AMPLIFIER TRIODE	D5	4D	D.C. F	2.0	0.06	AMPLIFIER	For other characteristics, refer to Type 1H4-G.										30
31	POWER AMPLIFIER TRIODE	D5	4D	D.C. F	2.0	0.13	CLASS A AMPLIFIER	135 180	−22.5 −30.0	—	—	8.0 12.3	4100 3600	925 1050	3.8 3.8	7000 5700	0.185 0.375	31
32	R-F AMPLIFIER TETRODE	E1	4K	D.C. F	2.0	0.06	SCREEN-GRID R-F AMPLIFIER	135 180	− 3.0 − 3.0	67.5 67.5	0.4* 0.4*	1.7 1.7	950000 1200000	640 650	—	—	—	32
							BIAS DETECTOR	180♥	− 6.0 approx.	67.5	—	Plate current to be adjusted to 0.2 milliampere with no signal.						
32L7-GT	RECTIFIER-BEAM POWER AMPLIFIER	C3	8Z	H	32.5	0.3	AMPLIFIER UNIT AS CLASS A AMPLIFIER	90 90	− 5.0 − 7.0	90 90	3.0 2.0	38.0 27.0	15000 17000	6000 4800	—	2600 2600	0.8 1.0	32L7-GT
							HALF-WAVE RECTIFIER	Maximum A-C Plate Voltage.....125 Volts, RMS Maximum D-C Output Current..... 60 Milliamperes.										
33	POWER AMPLIFIER PENTODE	D12	5K	D.C. F	2.0	0.26	CLASS A AMPLIFIER	180	−18.0	180	5.0	22.0	55000	1700	—	6000	1.5	33
34	SUPER-CONTROL R-F AMPLIFIER PENTODE	E1	4M	D.C. F	2.0	0.06	SCREEN-GRID R-F AMPLIFIER	135 180	− 3.0 min.	67.5 67.5	1.0 1.0	2.8 2.8	600000 1000000	600 620	—	—	—	34
35	SUPER-CONTROL R-F AMPLIFIER TETRODE	E1	5E	H	2.5	1.75	SCREEN-GRID R-F AMPLIFIER	180 250	− 3.0 min.	90 90	2.5* 2.5*	6.3 6.5	300000 400000	1020 1050	—	—	—	35
35A5	BEAM POWER AMPLIFIER	C6	6AA	H	35.0	0.15	SINGLE-TUBE CLASS A AMPLIFIER	For other characteristics, refer to Type 35L6-GT/G.										35A5
35L6-GT/G	BEAM POWER AMPLIFIER	C3	G-7AC‡	H	35.0	0.15	SINGLE-TUBE CLASS A AMPLIFIER	110 200	− 7.5 − 8.0	110 110	3.0 2.0	40.0 41.0	14000 40000	5800 5900	—	2500 4500	1.5 3.3	35L6-GT/G
35Z3	HALF-WAVE RECTIFIER	C6	4Z	H	35.0	0.15	WITH CONDENSER-INPUT FILTER	For other ratings, refer to Type 35Z4-GT.										35Z3
35Z4-GT	HALF-WAVE RECTIFIER	C3	G-5AA	H	35.0	0.15	WITH CONDENSER-INPUT FILTER	Max. A-C Plate Volts (RMS), 235 Max. D-C Output Ma., 100				Min. Total Effective Plate-Supply Impedance: Up to 117 volts, 15 ohms; at 235 volts, 100 ohms.						35Z4-GT
35Z5-GT/G	HALF-WAVE RECTIFIER Heater Tap for Pilot	C3	G-6AD	H	35.0	0.15	WITH CONDENSER-INPUT FILTER	Max. A-C Plate Volts (RMS), 235 Min. Total Effect. Plate-Supply Imped.: Up to 117 volts, 15 ohms; at 235 volts, 100 ohms. Max. D-C Output Ma.: With Pilot and No Shunt Res., 60; With Pilot and Shunt Res., 90; Without Pilot, 100.										35Z5-GT/G
36	R-F AMPLIFIER TETRODE	D9	5E	H	6.3	0.3	SCREEN-GRID R-F AMPLIFIER	100 250	− 1.5 − 3.0	55 90	— 1.7*	1.8 3.2	550000 550000	850 1080	—	—	—	36
							BIAS DETECTOR	100● 250●	− 5.0 − 8.0	55 90	—	Grid-bias values are approximate. Plate current to be adjusted to 0.1 milliampere with no signal.						

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS DIMEN.	S.C.	CATHODE TYPE AND RATING C.T.	VOLTS	AMP.	USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) μMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	RCA TYPE
37	DETECTOR★ AMPLIFIER TRIODE	D5	5A	H	6.3	0.3	CLASS A AMPLIFIER	90 250	− 6.0 −18.0	—	—	2.5 7.5	11500 8400	800 1100	9.2 9.2	—	—	37
							BIAS DETECTOR	90 250	−10.0 −28.0	—	—	Grid-bias values are approximate. Plate current to be adjusted to 0.2 milliampere with no signal.						
38	POWER AMPLIFIER PENTODE	D9	5F	H	6.3	0.3	CLASS A AMPLIFIER	100 250	− 9.0 −25.0	100 250	1.2 3.8	7.0 22.0	140000 100000	875 1200	—	15000 10000	0.27 2.50	38
39/44	SUPER-CONTROL R-F AMPLIFIER PENTODE	D9	5F	H	6.3	0.3	CLASS A AMPLIFIER	90 250	(− 3.0 min.)	90 90	1.6 1.4	5.6 5.8	300000 800000	1000 1050	—	—	—	39/44
40	VOLTAGE AMPLIFIER TRIODE	D12	4D	D.C. F	5.0	0.25	CLASS A AMPLIFIER	135✖ 180✖	− 1.5 − 3.0	—	—	0.2 0.2	150000 150000	200 200	30 30	—	—	40
41	POWER AMPLIFIER PENTODE	D5	6B	H	6.3	0.4	AMPLIFIER	For other characteristics, refer to Type 6K6-GT/G.										41
42	POWER AMPLIFIER PENTODE	D12	6B	H	6.3	0.7	AMPLIFIER	For other characteristics, refer to Type 6F6-G.										42
43	POWER AMPLIFIER PENTODE	D12	6B	H	25.0	0.3	AMPLIFIER	For other characteristics, refer to Type 25A6-GT/G.										43
45	POWER AMPLIFIER TRIODE	D12	4D	F	2.5	1.5	CLASS A AMPLIFIER	180 275	−31.5 −56.0	—	—	31.0 36.0	1650 1700	2125 2050	3.5 3.5	2700 4600	0.82 2.00	45
							PUSH-PULL CLASS AB_2 AMPLIFIER	275 275	Cath. Bias, 775 ohms♠ −68.0 volts, fixed bias			36.0♠ 28.0♠	—	—	—	5060 3200	12.0† 18.0†	
45Z3	HALF-WAVE RECTIFIER	B0	5AM	H	45.0	0.075	HALF-WAVE RECTIFIER	Max. A-C Plate Volts (RMS), 117 Max. Peak Inverse Volts, 350				Max. D-C Output Ma., 65 Max. Peak Plate Ma., 390			Min. Total Effect. Plate-Supply Imped., 15 ohms.			45Z3
45Z5-GT	HALF-WAVE RECTIFIER Heater Tap for Pilot	C3	G-6AD	H	45.0	0.15	WITH CONDENSER-INPUT FILTER	For other ratings, refer to Type 35Z5-GT/G.										45Z5-GT
46	DUAL-GRID POWER AMPLIFIER	E3	5C	F	2.5	1.75	CLASS A AMPLIFIER☐	250	−33.0	—	—	22.0	2380	2350	5.6	6400	1.25	46
							CLASS B AMPLIFIER♦	300 400	0 0	—	—	8.0♠ 12.0♠	—	—	—	5200 5800	16.0† 20.0†	
47	POWER AMPLIFIER PENTODE	E3	5B	F	2.5	1.75	CLASS A AMPLIFIER	250	−16.5	250	6.0	31.0	60000	2500	—	7000	2.7	47
48	POWER AMPLIFIER TETRODE	E3	6A	D.C. H	30.0	0.4	TETRODE CLASS A AMPLIFIER	96 125	−19.0 −20.0	96 100	9.0 9.5	52.0 56.0	— —	3800 3900	— —	1500 1500	2.0 [illegible]	48
							TETRODE PUSH-PULL CLASS A AMPLIFIER	125	−20.0	100	—	100.0♠	—	—	—	3000	[illegible]	

49	DUAL-GRID POWER AMPLIFIER	D12	5C	D.C. F	2.0	0.12	CLASS A AMPLIFIER □	135	−20.0	—	—	6.0	4175	1125	4.7	11000		49
							CLASS B AMPLIFIER ♦	180	0	—	—	4.0♠	—	—	—	12000	3.5†	
50	POWER AMPLIFIER TRIODE	F1	4D	F	7.5	1.25	CLASS A AMPLIFIER	300 400 450	−54.0 −70.0 −84.0	—	—	35.0 55.0 55.0	2000 1800 1800	1900 2100 2100	3.8 3.8 3.8	4600 3670 4350	1.6 3.4 4.6	50
50L6-GT	BEAM POWER AMPLIFIER	C3	G-7AC‡	H	50.0	0.15	SINGLE-TUBE CLASS A AMPLIFIER	110 200	− 7.5 − 8.0	110 110	4.0 2.0	49.0 50.0	13000 30000	9000 9500	—	2000 3000	2.1 4.3	50L6-GT
50Y6-GT/G	RECTIFIER-DOUBLER	C3	G-7Q‡	H	50.0	0.15	RECTIFIER-DOUBLER	For other ratings, refer to Type 25Z6.										50Y6-GT/G
50Z7-G	RECTIFIER-DOUBLER Heater Tap for Pilot	D3	G-8AN	H	50.0	0.15	VOLTAGE DOUBLER	Max. A-C Volts per Plate (RMS), 117 Max. D-C Output Ma., 65					Min. Total Effective Plate-Supply Impedance: 15 ohms.					50Z7-G
							HALF-WAVE RECTIFIER	Max. A-C Volts per Plate (RMS), 235 Max. D-C Output Ma. per Plate, 65					Min. Total Effective Plate-Supply Impedance per Plate: Up to 117 volts, 15 ohms; at 235 volts, 100 ohms.					
53	TWIN TRIODE AMPLIFIER	D12'	7B	H	2.5	2.0	AMPLIFIER	For other characteristics, refer to Type 6N7-GT/G.										53
55	DUPLEX-DIODE TRIODE	D9	6G	H	2.5	1.0	TRIODE UNIT AS AMPLIFIER	For other characteristics, refer to Type 85.										55
56	DETECTOR AMPLIFIER TRIODE★	D5	5A	H	2.5	1.0	AMPLIFIER DETECTOR	For other characteristics, refer to Type 6P5-GT/G.										56
57	TRIPLE-GRID DETECTOR AMPLIFIER	D13	6F	H	2.5	1.0	AMPLIFIER DETECTOR	For other characteristics, refer to Type 6J7.										57
58	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	D13	6F	H	2.5	1.0	AMPLIFIER MIXER	For other characteristics, refer to Type 6U7-G.										58
59	TRIPLE-GRID POWER AMPLIFIER	E3	7A	H	2.5	2.0	TRIODE ¶ CLASS A AMPLIFIER	250	−28.0	—	—	26.0	2300	2600	6.0	5000	1.25	59
							PENTODE•■ CLASS A AMPLIFIER	250	−18.0	250	9.0	35.0	40000	2500	—	6000	3.0	
							TRIODE● CLASS B AMPLIFIER	300 400	0 0	—	—	20.0♠ 26.0♠	—	—	—	4600 6000	15.0† 20.0†	
70L7-GT	RECTIFIER-BEAM POWER AMPLIFIER	C5b	8AA	H	70.0	0.15	AMPLIFIER UNIT AS CLASS A AMPLIFIER	110	− 7.5	110	3.0	40.0	15000	7500	—	2000	1.8	70L7-GT
							HALF-WAVE RECTIFIER	Max. A-C Plate Volts (RMS), 117 Max. Peak Inverse Volts, 350				Max. D-C Output Ma., 70 Max. Peak Plate Ma., 420			Min. Total Effect. Plate-Supply Imped., 15 ohms			
	POWER AMPLIFIER TRIODE	D12	4D	F	5.0	0.25	CLASS A AMPLIFIER	90 180	−19.0 −43.0	—	—	10.0 20.0	2170 1750	1400 1700	3.0 3.0	3000 4800	0.125 0.790	71-A
	DUPLEX-DIODE HIGH-MU TRIODE	D9	6G	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6SQ7.										75
	DETECTOR AMPLIFIER TRIODE★	D5	5A	H	6.3	0.3	AMPLIFIER DETECTOR	For other characteristics, refer to Type 6P5-GT/G.										76

TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS: DIMEN.	S.C.	CATHODE TYPE AND RATING: C.T.	VOLTS	AMP.	USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	PLATE RESISTANCE OHMS	CONDUCTANCE (GRID-PLATE) µMHOS	AMPLIFICATION FACTOR	FOR STATED POWER OUTPUT OHMS	OUTPUT WATTS	TYPE
77	TRIPLE-GRID DETECTOR AMPLIFIER	D9	6F	H	6.3	0.3	CLASS A AMPLIFIER	100 250	− 1.5 − 3.0	60 100	0.4 0.5	1.7 2.3	600000 1.0+§	1100 1250	—	—	—	77
							BIAS DETECTOR	250	− 1.95	50	Cathode current 0.65 ma.		—	Plate Resistor, 250000 ohms. Grid Resistor,** 250000 ohms.				
78	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	D9	6F	H	6.3	0.3	AMPLIFIER MIXER	For other characteristics, refer to Type 6K7.										78
79	TWIN TRIODE AMPLIFIER	D9	6H	H	6.3	0.6	CLASS B AMPLIFIER	For other characteristics, refer to Type 6Y7-G.										79
80	FULL-WAVE RECTIFIER	D12	4C	F	5.0	2.0	For other ratings, refer to Type 5Y3-GT/G.											80
81	HALF-WAVE RECTIFIER	F1	4B	F	7.5	1.25	WITH CONDENSER-INPUT FILTER	Max. A-C Plate Volts (RMS), 700 Max. Peak Inverse Volts, 2000					Max. D-C Output Ma., 85 Max. Peak Plate Ma., 500					81
82	FULL-WAVE ▶ RECTIFIER	D12	4C	F	2.5	3.0	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 450 Max. Peak Inverse Volts, 1550				Max. D-C Output Ma., 115 Max. Peak Plate Ma., 600			Min. Total Effect. Supply Imped. per Plate, 50 ohms.			82
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 550 Max. Peak Inverse Volts, 1550				Max. D-C Output Ma., 115 Max. Peak Plate Ma., 600			Min. Value of Input Choke, 6 henries			
83	FULL-WAVE ▶ RECTIFIER	E3	4C	F	5.0	3.0	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 450 Max. Peak Inverse Volts, 1550				Max. D-C Output Ma., 225 Max. Peak Plate Ma., 1000			Min. Total Effect. Supply Imped. per Plate, 50 ohms.			83
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 550 Max. Peak Inverse Volts, 1550				Max. D-C Output Ma., 225 Max. Peak Plate Ma., 1000			Min. Value of Input Choke, 3 henries			
83-V	FULL-WAVE RECTIFIER	D12	4AD	H	5.0	2.0	For other ratings, refer to Type 5V4-G.											83-V
84/6Z4	FULL-WAVE RECTIFIER	D8	5D	H	6.3	0.5	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 325 Max. Peak Inverse Volts, 1250				Max. D-C Output Ma., 60 Max. Peak Plate Ma., 180			Min. Total Effect. Supply Imped. per Plate, 150 ohms.			84/6Z4
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 450 Max. Peak Inverse Volts, 1250				Max. D-C Output Ma., 60 Max. Peak Plate Ma., 180			Min. Value of Input Choke, 10 henries			
85	DUPLEX-DIODE TRIODE	D9	6G	H	6.3	0.3	TRIODE UNIT AS CLASS A AMPLIFIER	135 250	−10.5 −20.0	—	—	3.7 8.0	11000 7500	750 1100	8.3 8.3	25000 20000	0.075 0.350	85
89	TRIPLE-GRID POWER AMPLIFIER	D9	6F	H	6.3	0.4	AS TRIODE ¶ CLASS A AMPLIFIER	160 250	−20.0 −31.0	—	—	17.0 32.0	3300 2600	1425 1800	4.7 4.7	7000 5500	0.30 0.90	89
							AS PENTODE ** CLASS A AMPLIFIER	100 250	−10.0 −25.0	100 250	1.6 5.5	9.5 32.0	104000 70000	1200 1800	—	10700 6750	0.33 3.40	
							AS TRIODE ⊕ CLASS B AMPLIFIER	180	0	—	—	6.0♠	—	—	—	13600 9400	2.50† 3.50†	

V-99 X-99	DETECTOR★ AMPLIFIER TRIODE	C4 D1	4E 4D	D.C. F	3.3	0.063	CLASS A AMPLIFIER	90	− 4.5	——	——	2.5	15500	425	6.6	——	——	V-99 X-99
112-A	DETECTOR★ AMPLIFIER TRIODE	D12	4D	D.C. F	5.0	0.25	CLASS A AMPLIFIER	90 180	− 4.5 −13.5	——	——	5.0 7.7	5400 4700	1575 1800	8.5 8.5	——	——	112-A
117L/M7-GT	RECTIFIER-BEAM POWER AMPLIFIER	C5b	8AO	H	117	0.09	AMPLIFIER UNIT AS CLASS A AMPLIFIER	105	− 5.2	105	4.0	43.0	17000	5300	——	4000	0.85	117L/M7-GT
							HALF-WAVE RECTIFIER	Max. A-C Plate Volts (RMS), 117 Max. Peak Inverse Volts, 350				Max. D-C Output Ma., 75 Max. Peak Plate Ma., 450			Min. Total Effect. Plate-Supply Imped., 15 ohms.			
117N7-GT	RECTIFIER-BEAM POWER AMPLIFIER	C5b	8AV	H	117	0.09	AMPLIFIER UNIT AS CLASS A AMPLIFIER	100	− 6.0	100	5.0	51.0	16000	7000	——	3000	1.2	117N7-GT
							HALF-WAVE RECTIFIER	Max. A-C Plate Volts (RMS), 117 Max. Peak Inverse Volts, 350				Max. D-C Output Ma., 75 Max. Peak Plate Ma., 450			Min. Total Effect. Plate-Supply Impedance, 15 ohms.			
117P7-GT	RECTIFIER-BEAM POWER AMPLIFIER	C5b	8AV	H	117	0.09	AMPLIFIER UNIT AS CLASS A AMPLIFIER	For other characteristics, refer to Type 117L/M7-GT.										117P7-GT
							HALF-WAVE RECTIFIER	For other ratings, refer to Type 117L/M7-GT.										
117Z6-GT/G	RECTIFIER-DOUBLER	C3	G-7Q‡	H	117	0.075	VOLTAGE DOUBLER	Max. A-C Volts per Plate (RMS), 117 Max. D-C Output Ma., 60				Min. Total Effective Plate-Supply Impedance per Plate: Half-Wave, 30 ohms; Full-Wave, 15 ohms.						117Z6-GT/G
							HALF-WAVE RECTIFIER	Max. A-C Volts per Plate (RMS), 235 Max. D-C Output Ma. per Plate, 60				Min. Total Effect. Supply Imped. per Plate: Up to 117 volts, 15 ohms; at 150 volts, 40 ohms; at 235 volts, 100 ohms.						
183/ 483	POWER AMPLIFIER TRIODE	D12	4D	F	5.0	1.25	CLASS A AMPLIFIER	250	−60.0	——	——	30.0	1750	1700	3.0	5000	1.8	183/ 483
485	DETECTOR AMPLIFIER TRIODE	D5	5A	H	3.0	1.25	CLASS A AMPLIFIER	180	− 9.0	——	——	5.8	8900	1400	12.5	——	——	485
876	CURRENT REGULATOR	G1	——	F	——	——	Voltage Range........40 to 60 Volts					Operating Current........1.7 Amperes						876
886	CURRENT REGULATOR	G1	——	F	——	——	Voltage Range........40 to 60 Volts					Operating Current........2.05 Amperes						886

The type numbers shown in light face are included in the War Production Board's Limitation Order L-76 discontinuing the manufacture of certain receiving tubes for general civilian use.

★ For Grid-leak Detection—plate volts 45, grid return to + filament or to cathode.

■ Either A. C. or D. C. may be used on filament or heater, except as specifically noted. For use of D.C. on A-C filament types, decrease stated grid volts by ½ (approx.) of filament voltage.

↘ Supply voltage applied through 20000-ohm voltage-dropping resistor.

➤ Mercury-Vapor Type.

▪▪ Grid #1 is control grid. Grid #2 is screen. Grid #3 tied to cathode.

¶ Grid #1 is control grid. Grids #2 and #3 tied to plate.

● Grids #1 and #2 connected together. Grid #3 tied to plate.

& This diagram is like the one having the same designation without the prefix GT, except that the base sleeve is connected to Pin No. 1.

● Applied through plate resistor of 250000 ohms or 500-henry choke shunted by 0.25-megohm resistor.

♥ Applied through plate resistor of 100000 ohms.

✖ Applied through plate resistor of 250000 ohms.

• 50000 ohms.

Requires different socket from small 7-pin.

*Maximum.

§ Megohms.

● Grids #3 and #5 are screen. Grid #4 is signal-input control grid.
▲ Grids #2 and #4 are screen. Grid #1 is signal-input control grid.
** For grid of following tube.
° Both grids connected together; likewise, both plates.
† Power output is for two tubes at stated plate-to-plate load.
♠ For two tubes.
‡ This diagram is like the one having the same designation without the prefix G, except that Pin No. 1 has no connection.
◆ This diagram is like the one having the same designation without the prefix G, except that Pin No. 2 is omitted and Pin No. 1 has no connection.
♣ Obtained preferably by using 70000-ohm voltage-dropping resistor in series with a 90-volt supply.
⁎ This diagram is like the one having the same designation with the prefix G, except that base sleeve is connected to Pin No. 1.
‡‡ This diagram is like the one having the same designation without the prefix G, except that Pin No. 1 is connected to internal shield.
✣ Grids #2 and #3 tied to plate.
▲▲ Both grids connected together; likewise both cathodes.

□ Grid #2 tied to plate.
♦ Grids #1 and #2 tied together.
¶ Plate voltages greater than 125 volts RMS require 100-ohm (minimum) series-plate resistor.
°° Applied through plate resistor of 150000 ohms.
§ For signal-input control-grid (#1); control-grid #3 bias, −3 volts.
▣ Applied through 200000-ohm plate resistor.
▲ Grids #2 and #4 are screen. Grid #3 is signal-input control grid.
☒ Nominal voltage: 7.0 volts; current: 0.16 ampere.
♠ Nominal voltage: 7.0 volts; current: 0.32 ampere.
◆ Nominal voltage: 7.0 volts; current: 0.53 ampere.
♠ Nominal voltage: 7.0 volts; current: 0.75 ampere.
♣ Nominal voltage: 7.0 volts; current: 0.43 ampere.
♦ Nominal voltage: 7.0 volts; current: 0.48 ampere.
✓ Nominal voltage: 14.0 volts; current: 0.16 ampere.

Note 1: Types with octal bases have *Miniature Metal Cap*; all others have *Small Metal Cap*.

Note 2: Subscript 1 on class of amplifier service (as AB_1) indicates that grid current does not flow during any part of input cycle.
Subscript 2 on class of amplifier service (as AB_2) indicates that grid current flows during some part of the input cycle.

KEY TO TUBE DIMENSIONS

Symbol	Maximum Overall Length x Diameter	Symbol	Maximum Overall Length x Diameter	Symbol	Maximum Overall Length x Diameter	Symbol	Maximum Overall Length x Diameter	Symbol	Maximum Overall Length x Diameter
A0a	1 3/8" x 1 5/32"	B4	2 17/32" x 1 5/16"	C5b	3 7/16" x 1 5/16"	D5	4 3/16" x 1 9/16"	D12a	4 7/8" x 1 9/16"
A0b	1 9/16" x 5/8"	B5	2 25/32" x 1 3/16"	C6	3 5/32" x 1 3/16"	D6	4 5/16" x 1 3/16"	D13	4 15/16" x 1 9/16"
A1	1 3/4" x 1 5/16"	B5a	2 7/8" x 1 5/16"	C7	3 3/8" x 1 5/16"	D7	4 3/16" x 1 5/8"	E1	5 1/32" x 1 13/16"
A2	1 13/16" x 3/4"	C0	3 1/16" x 1 5/16"	C7a	3 9/16" x 1 5/16"	D8	4 15/32" x 1 9/16"	E2	5 5/16" x 2 1/16"
A3	1 7/8" x 1 5/32"	C1	3 1/8" x 1 5/16"	C8	3 3/4" x 1 3/16"	D9	4 17/32" x 1 9/16"	E3	5 3/8" x 2 1/16"
B0	2 1/8" x 3/4"	C2	3 1/4" x 1 5/16"	D1	4" x 1 3/16"	D9a	4 19/32" x 1 9/16"	E4	5 5/8" x 2 3/16"
B1	2 5/8" x 1 1/16"	C3	3 5/16" x 1 5/16"	D2	4 1/8" x 1 3/16"	D10	4 5/8" x 1 13/16"	F1	6 1/4" x 2 7/16"
B2	2 5/16" x 1 5/16"	C4	3 1/2" x 1 1/16"	D3	4 1/8" x 1 9/16"	D11	4 11/16" x 1 7/16"	G1	8" x 2 1/16"
B3	2 5/8" x 1 5/16"	C5a	3 1/2" x 1 5/16"	D4	4 3/16" x 1 3/16"	D12	4 11/16" x 1 13/16"		

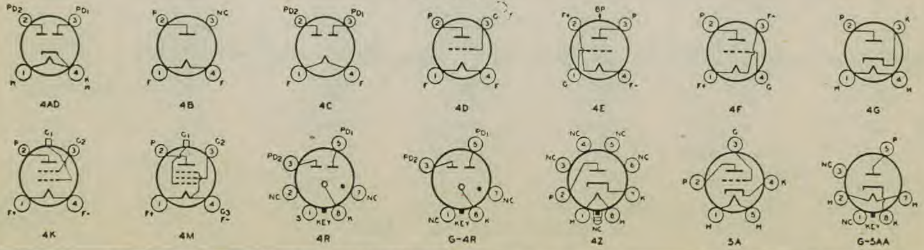
Socket Connections

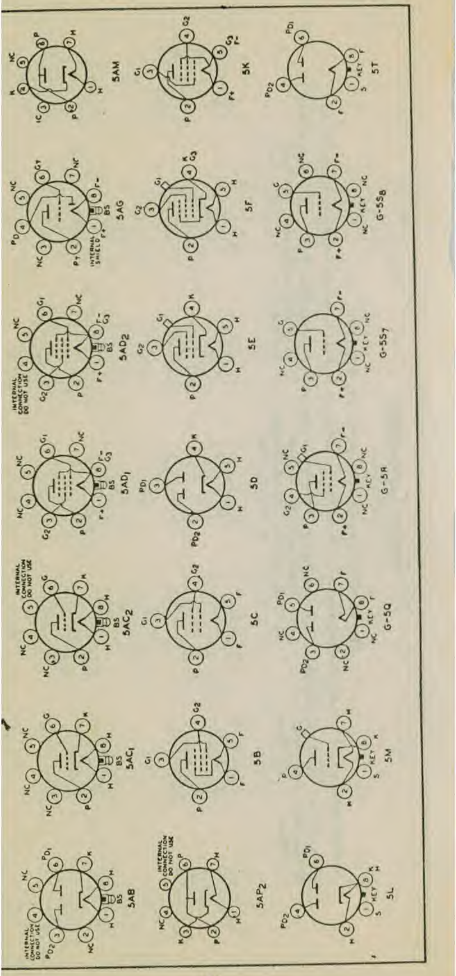
Bottom Views

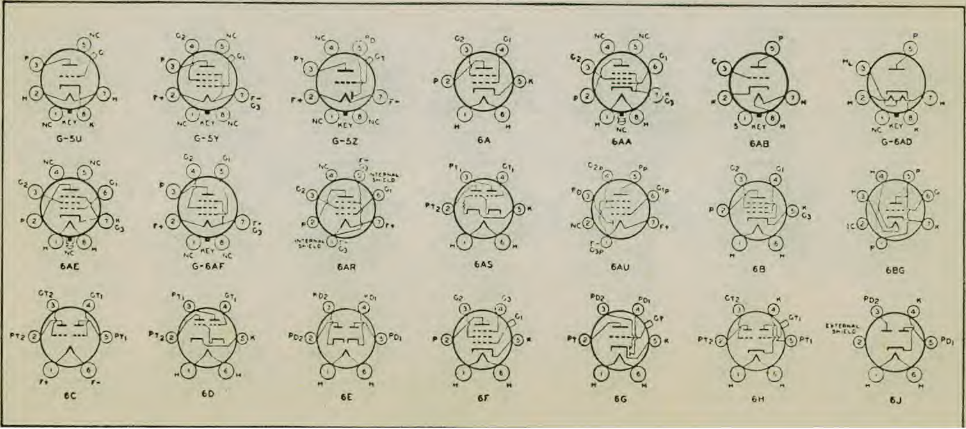
KEY TO TERMINAL DESIGNATIONS OF SOCKETS

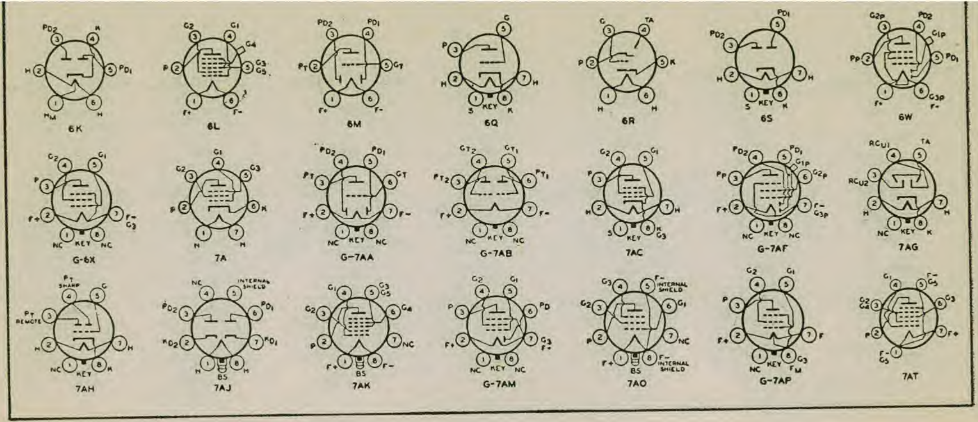
Alphabetical subscripts B, D, P, T, HP, and HX indicate, respectively, beam unit, diode unit, pentode unit, triode unit, heptode unit, and hexode unit in multi-unit types.

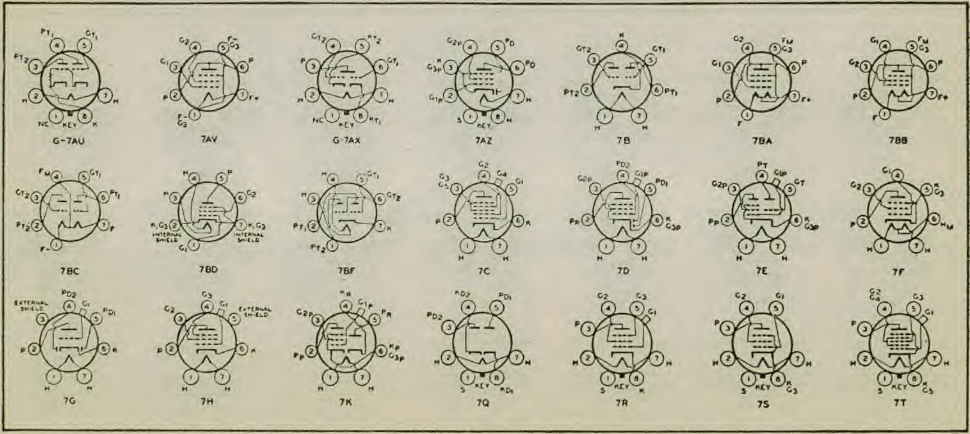
BP = Bayonet Pin
BS = Base Shell
F = Filament
F_M = Filament Mid-Tap
G = Grid
H = Heater
H_L = Heater Tap for Panel Lamp
H_M = Heater Mid-Tap
IC = Internal Connection
K = Cathode
NC = No Connection
● = Gas-Type Tube
P = Plate (Anode)
RC = Ray-Control Electrode
S = Shell
S_I = Interlead Shield
TA = Target
U = Unit

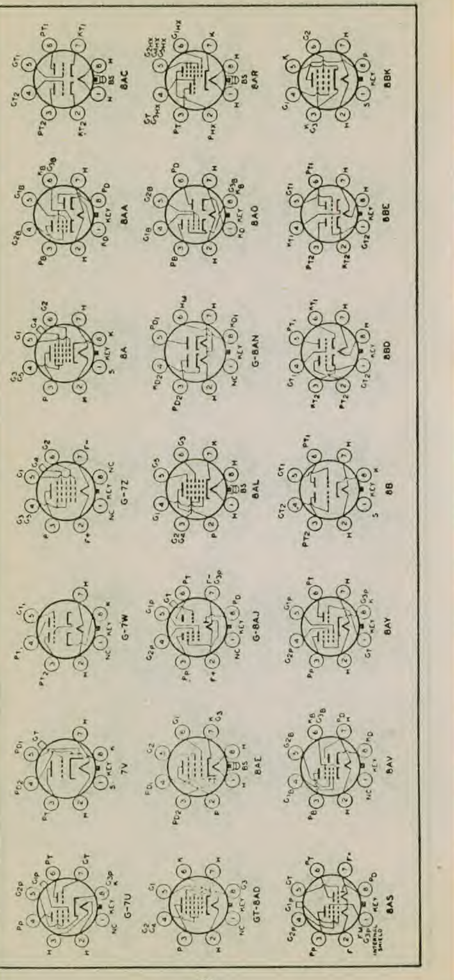


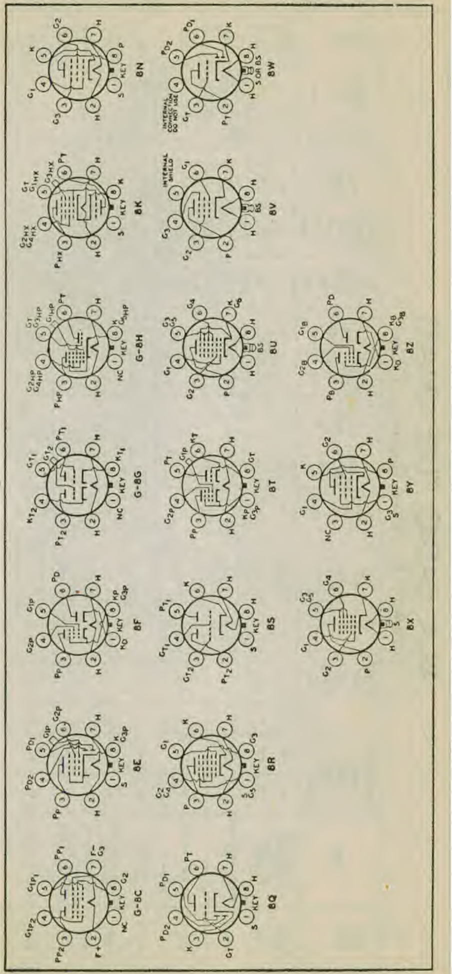

5AB
5AC1
5AC2
5AD1
5AD2
5AG
5AM
5AP2
5B
5C
5D
5E
5F
5K
5L
5M
G-5Q
G-5R
G-5S7
G-5S8
5T
INTERNAL CONNECTION DO NOT USE
INTERNAL SHIELD


G-5U
G-5Y
G-5Z
6A
6AA
6AB
G-6AD
6AE
G-6AF
6AR
6AS
6AU
6B
6BG
6C
6D
6E
6F
6G
6H
6J


6K
6L
6M
6Q
6R
6S
6W
G-6X
7A
G-7AA
G-7AB
7AC
G-7AF
7AG
7AH
7AJ
7AK
G-7AM
7AO
G-7AP
7AT


G-7AU
7AV
G-7AX
7AZ
7B
7BA
7BB
7BC
7BD
7BF
7C
7D
7E
7F
7G
7H
7K
7Q
7R
7S
7T


8AC
8AA
8A
G-7Z
G-7W
7V
G-7U
8AR
8AO
G-8AN
8AL
G-8AJ
8AE
GT-8AD
8BK
8BE
8BD
8B
8AY
8AV
8AS


G-8C
8E
8F
G-8G
G-8H
8K
8N
8Q
8R
8S
8T
8U
8V
8W
8X
8Y
8Z
INTERNAL SHIELD
INTERNAL CONNECTION DO NOT USE

RCA RADIO TUBE CHART

CHART II. Allied Receiving Tubes

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS		CATHODE TYPE AND RATING			USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) μMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	RCA TYPE
		DIMEN.	S. C.	C. T.	VOLTS	AMP.												
2C21/1642	TWIN-TRIODE AMPLIFIER	D9	7BH	H	6.3	0.6	EACH UNIT AS AMPLIFIER	250	−16.5	—	—	8.3	7600	1375	10.4	—	—	2C21/1642
2C22	AMPLIFIER TRIODE	C2	4AM	H	6.3	0.3	CLASS A AMPLIFIER	300	−10.5	—	—	11.0	6600	3000	20	—	—	2C22
3A4	POWER AMPLIFIER PENTODE	B0	7BB	D.C. F	1.4 2.8	0.2 0.1	CLASS A AMPLIFIER	135 150	− 7.5 − 8.4	90 90	2.6 2.2	14.8 13.3	90000 100000	1900 1900	—	8000 8000	0.6 0.7	3A4
							R-F POWER AMPLIFIER	150	—	135	6.5	18.3	Grid Resistor, 0.2 megohm. Grid Current, 0.13 ma.			—	1.2 at 10 Mc	
3A5	H-F TWIN TRIODE	B0	7BC	D.C. F	1.4 2.8	0.22 0.11	EACH UNIT AS CLASS A AMPLIFIER	90	− 2.5	—	—	3.7	8300	1800	15	—	—	3A5
							PUSH-PULL CLASS C AMPLIFIER	135	−20.0	from grid resistor, 4000 ohms		30.0	Grid Current, 5 ma. Driving Power, 0.2 watt.			—	2.0 at 40 Mc	
5R4-GY	FULL-WAVE RECTIFIER	E2	G-5T‡	F	5.0	2.0	WITH CONDENSER-INPUT FILTER	Max. A-C Volts per Plate (RMS), 900 Max. Peak Inverse Volts, 2800				Max. D-C Output Ma., 150 Max. Peak Plate Ma., 650			Min. Total Effect. Supply Imped. per Plate, 575 ohms			5R4-GY
							WITH CHOKE-INPUT FILTER	Max. A-C Volts per Plate (RMS), 950 Max. Peak Inverse Volts, 2800				Max. D-C Output Ma., 175 Max. Peak Plate Ma., 650			Min. Value of Input Choke, 10 henries			
6AK6	POWER AMPLIFIER PENTODE	B0	7BK	H	6.3	0.15	CLASS A AMPLIFIER	180	− 9.0	180	2.5	15	200000	2300	—	10000	1.1	6AK6
6AL5	H-F TWIN DIODE	A2	6BT	H	6.3	0.3	DETECTOR RECTIFIER	Max. Peak Inverse Volts, 420 Max. Peak Plate Ma. per Plate, 54				Max. D-C Output Ma. per Plate, 9 Max. D-C Heater-Cathode Potential, 330 Volts						6AL5
6AQ6	DUPLEX-DIODE HIGH-MU TRIODE	B0	7BT	H	6.3	0.15	TRIODE UNIT AS CLASS A AMPLIFIER	100 250	− 1.0 − 3.0	—	—	0.8 1.0	61000 58000	1150 1200	70 70	—	—	6AQ6
6C4	H-F POWER TRIODE	B0	6BG	H	6.3	0.15	CLASS A AMPLIFIER	100 250	0 − 8.5	—	—	11.8 10.5	6250 7700	3100 2200	19.5 17	—	—	6C4
							CLASS C AMPLIFIER	300	−27.0	—	—	25.0	Grid Current, 7 ma. Driving Power, 0.35 watt.			—	5.5	

6F4	OSCILLATOR TRIODE Acorn Type	A0a	7BR	H	6.3	0.225	CLASS A AMPLIFIER	80	Cathode-Bias Resistor, 150 ohms			13.0	2900	5800	17	——	——	6F4
							CLASS C AMPLIFIER	150	−15.0	——	——	20.0	Grid Current, 7.5 ma. Driving Power, 0.2 watt.			——	1.8	
6J4	U-H-F AMPLIFIER TRIODE	B0	7BQ	H	6.3	0.4	GROUNDED GRID CLASS A AMPLIFIER	100 150	Cathode-Bias Resistor, 100 ohms			10.0 15.0	5000 4500	11000 12000	55 55	——	——	6J4
6J6	TWIN TRIODE	B0	7BF	H	6.3	0.45	EACH UNIT AS CLASS A AMPLIFIER	100	Cathode Resistor, for both units, 50 ohms			8.5	7100	5300	38	——	——	6J6
							PUSH-PULL CLASS C AMPLIFIER	150	−10.0	Cath. Res., 220 ohms, both units		30.0	Grid Current, 16 ma. Driving Power, 0.35 watt.			——	3.5	
12A6	BEAM POWER AMPLIFIER	C2	7AC	H	12.6	0.15	CLASS A AMPLIFIER	250	−12.5	250	3.5	30	70000	3000	——	7500	3.4	12A6
12L8-GT	TWIN-PENTODE POWER AMPLIFIER	C3	8BU	H	12.6	0.15	EACH UNIT AS CLASS A AMPLIFIER	180	− 9.0	180	2.8	13.0	160000	2150	——	10000	1.0	12L8-GT
864	AMPLIFIER TRIODE See Note A	C8	4D	F	1.1	0.25	CLASS A AMPLIFIER	135	− 9.0	——	——	3.5	12700	645	8.2	——	——	864
954	SHARP CUT-OFF PENTODE Acorn Type	A3	5BB	H	6.3	0.15	CLASS A AMPLIFIER	90 250	− 3.0 − 3.0	90 100	0.5 0.7	1.2 2.0	1§ 1+§	1100 1400	——	——	——	954
							BIAS DETECTOR	250✖	− 6.0	100	Plate current to be adjusted to 0.1 ma. with no signal.							
955	AMPLIFIER TRIODE Acorn Type	A0a	5BC	H	6.3	0.15	CLASS A AMPLIFIER	90 250	− 2.5 − 7.0	——	——	2.5 6.3	14700 11400	1700 2200	25 25	——	——	955
							CLASS C AMPLIFIER OSCILLATOR	180	−35.0 approx.	——	——	7.0	Grid Current, 1.5 ma.			——	0.5 at 60 Mc	
956	REMOTE CUT-OFF PENTODE Acorn Type	A3	5BB	H	6.3	0.15	CLASS A AMPLIFIER	250	− 3.0	100	2.7	6.7	700000	1800	——	——	——	956
							MIXER IN SUPERHETERODYNE	250	−10.0	100	——	——	Oscillator Peak Volts = 7.0					
957	AMPLIFIER TRIODE Acorn Type	A0a	5BD	F	1.25	0.05	CLASS A AMPLIFIER	135	− 5.0	——	——	2.0	20800	650	13.5	——	——	957
958	AMPLIFIER TRIODE Acorn Type	A0a	5BD	F	1.25	0.10	CLASS A AMPLIFIER	135	− 7.5	——	——	3.0	10000	1200	12	——	——	958
								Now used in military equipment, the 958-A is expected to supersede the 958 in all other applications.										
958-A	AMPLIFIER TRIODE Acorn Type	A0a	5BD	F	1.25	0.10	CLASS C AMPLIFIER OSCILLATOR	135	−20.0	——	——	7.0	Grid Current, 1.0 ma. Driving Power, 0.035 watt.			——	0.6	958-A
959	SHARP CUT-OFF PENTODE Acorn Type	A3	5BE	F	1.25	0.05	CLASS A AMPLIFIER	135	− 3.0	67.5	0.4	1.7	800000	600	——	——	——	959
1603	SHARP CUT-OFF PENTODE See Note A	D13	6F	H	6.3	0.3	AMPLIFIER DETECTOR	For other characteristics, refer to Type 6J7 in Chart I.										1603

RCA TYPE	NAME	DIMENSIONS SOCKET CONNECTIONS		CATHODE TYPE AND RATING			USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID BIAS ■ VOLTS	SCREEN SUPPLY VOLTS	SCREEN CURRENT MA.	PLATE CURRENT MA.	A-C PLATE RESISTANCE OHMS	TRANSCONDUCTANCE (GRID-PLATE) µMHOS	AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	RCA TYPE
		DIMEN.	S.C.	C.T.	VOLTS	AMP.												
1609	AMPLIFIER PENTODE See Note A	D5	5K	F	1.1	0.25	CLASS A AMPLIFIER	135	− 1.5	67.5	0.65	2.5	400000	725	—	—	—	1609
1612	PENTAGRID AMPLIFIER See Note A	C1	7T	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6L7 in Chart I.										1612
1620	SHARP CUT-OFF PENTODE See Note A	C1	7R	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 6J7 in Chart I.										1620
1621	POWER AMPLIFIER PENTODE See Note B	C2	7S	H	6.3	0.7	PUSH-PULL TRIODE □ CLASS A AMPLIFIER	327.5	Cath. Resistor, 500 Ohms			55.0♠	—	—	—	5000	2.0†	1621
							PUSH-PULL PENTODE CLASS A AMPLIFIER	300'	−30.0	300	6.5♠	38.0♠	—	—	—	4000	5.0†	
1622	BEAM POWER AMPLIFIER See Note B	D7	7AC	H	6.3	0.9	PUSH-PULL CLASS A AMPLIFIER	300	−20.0	250	4.0♠	86.0♠	—	—	—	4000	10.0†	1622
1629	ELECTRON-RAY TUBE	D2	7AL	H	12.6	0.15	VISUAL INDICATOR	For other characteristics, refer to Type 6E5 in Chart I.										1629
1631	BEAM POWER AMPLIFIER See Note C	D7	7AC	H	12.6	0.45	AMPLIFIER	Max. Plate Dissipation = 16 watts. For other characteristics, refer to Type 6L6 in Chart I.										1631
1632	BEAM POWER AMPLIFIER See Note C	C2	7AC	H	12.6	0.6	AMPLIFIER	Characteristics are the same as those of the 25L6-GT/G (see Chart I) within the following ratings of the 1632: Plate Volts, 117; Screen Volts, 117; Plate Dissipation, 5.5 watts.										1632
1633	TWIN-TRIODE AMPLIFIER See Note D	C3	8BD	H	25.0	0.15	EACH UNIT AS CLASS A AMPLIFIER	250	− 8.8	—	—	11.5	6900	2600	18	—	—	1633
1634	TWIN-TRIODE AMPLIFIER See Note D	B3	8S	H	12.6	0.15	AMPLIFIER	For other characteristics, refer to Type 12SC7 in Chart I.										1634
1635	CLASS B TWIN-TRIODE AMPLIFIER	C3	G-8B‡	H	6.3	0.6	CLASS B AMPLIFIER Sustained Signal	300	0	—	—	Power Output is for one tube at stated plate-to-plate load.				12000	10.4	1635
							CLASS B AMPLIFIER Variable Signal	400	0	—	—	Power Output is for one tube at stated plate-to-plate load.				14000	17.0	

1644	TWIN-PENTODE POWER AMPLIFIER See Note D	C3	8BU	H	12.6	0.15	EACH UNIT AS AMPLIFIER	For other characteristics, refer to Type 12L8-GT in this chart.										1644
1851	TELEVISION AMPLIFIER PENTODE	C7	7R	H	6.3	0.45	AMPLIFIER	For other characteristics, refer to Type 6AC7/1852 in Chart I.										1851
7193	AMPLIFIER TRIODE See Note C	C2	4AM	H	6.3	0.3	AMPLIFIER	For other characteristics, refer to Type 2C22 in this chart.										7193
9001	SHARP CUT-OFF H-F PENTODE	A2	7BD	H	6.3	0.15	CLASS A AMPLIFIER	90 250	− 3.0 − 3.0	90 100	0.5 0.7	1.2 2.0	1§ 1+§	1100 1400	——	——	——	9001
							MIXER IN SUPERHETERODYNE	100 250	− 5.0 − 5.0	100 100	——	——	Oscillator Peak Volts = 4. Conversion Transconductance = 550 micromhos.					
9002	H-F TRIODE	A2	7BS	H	6.3	0.15	CLASS A AMPLIFIER	90 250	− 2.5 − 7.0	——	——	2.5 6.3	14700 11400	1700 2200	25 25	——	——	9002
9003	REMOTE CUT-OFF H-F PENTODE	A2	7BD	H	6.3	0.15	CLASS A AMPLIFIER	250	− 3.0	100	2.7	6.7	700000	1800	——	——	——	9003
							MIXER IN SUPERHETERODYNE	100 250	−10.0 −10.0	100 100	——	——	Oscillator Peak Volts = 9. Conversion Transconductance = 600 micromhos.					
9004	U-H-F DIODE Acorn Type	A0a	4BJ	H	6.3	0.15	DETECTOR RECTIFIER	Maximum A-C PLATE Voltage....117 Volts, RMS Maximum D-C Output Current.... 5 Milliamperes Resonant Frequency....850 Megacycles, Approx.										9004
9005	U-H-F DIODE Acorn Type	A0a	5BG	H	3.6	0.165	DETECTOR RECTIFIER	Maximum A-C PLATE Voltage.... 117 Volts, RMS Maximum D-C Output Current.... 1 Milliampere Resonant Frequency....1500 Megacycles, Approx.										9005
9006	U-H-F DIODE	A2	6BH	H	6.3	0.15	DETECTOR RECTIFIER	Max. Peak Inverse Volts, 750 Max. Peak Plate Ma., 15				Max. D-C Output Ma., 5 Max. D-C Heater-Cath. Volts, 100				Min. Total Effect. Supply Imped., 100 ohms		9006

Note A: For applications critical as to microphonics.
Note B: For applications requiring continuity of service.
Note C: For applications critical as to uniformity of characteristics.

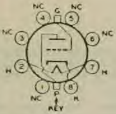
Note D: For applications critical as to matching of the two units.
♤ For two tubes.
□ Grid #2 tied to plate.

§ Megohms.
| Power output is for two tubes at stated plate-to-plate load.
✖ Applied through plate resistor of 250000 ohms.

NOTE: KEY TO TUBE DIMENSIONS IS GIVEN AT END OF NOTES FOR CHART I.

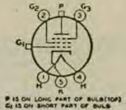
Additional Socket Connections for Chart II

Bottom views are shown. For explanation of terminal designations, see page 55.



4AM

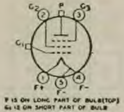
4BJ



5BB

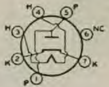
5BC

5BD

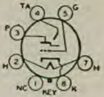


5BE

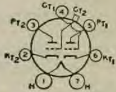
5BG

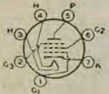

6BH

6BT

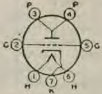


7AL


7BH

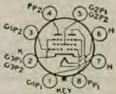

7BK


7BQ


7BR


7BS


7BT



8BU


VANCOUVER I.
Victoria
Seattle
Olympia
WASHINGTON
Tacoma
Astoria
Portland
Columbia R.
Salem
Albany
Eugene
Roseburg
OREGON
Baker
Spokane
Helena
Butte
Boise
Idaho City
Pocatello
Salt Lake City
Ogden
Provo
UTAH
Virginia City
Carson City
Sacramento
San Francisco
Oakland
Stockton
YOSEMITE NAT. PARK
Visalia
Bakersfield
Santa Barbara
Los Angeles
San Bernardino
San Jacinto
San Diego
Needles
ARIZONA
Kingman
Prescott
Flagstaff
Phoenix
Globe
Yuma
Tucson
Tombstone
Nogales
Hermosillo
Guaymas
ALASKA
Nome
St. Michael
Fairbanks
Dawson
Juneau
Bering Sea
PRIBILOF IS.
PACIFIC OCEAN

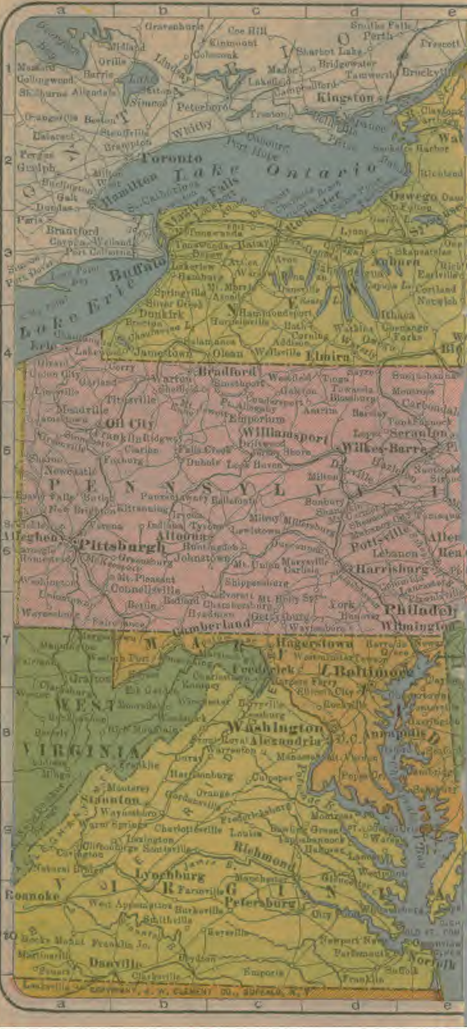
THE WORLD
Mercator Projection
Steamship Lines
Distances in Nautical Miles
International Date Line
ARCTIC CIRCLE
TROPIC OF CANCER
EQUATOR
TROPIC OF CAPRICORN
ASIA
Yakutsk
Irkutsk
Vladivostok
Peiping
Tokyo
Yokohama
Shanghai
Nanking
Canton
Hong Kong
Calcutta
Manila
PHILIPPINE ISLANDS
Singapore
Sea of Okhotsk
SAKHALIN I.
Bering Sea
ALEUTIAN IS.
ALASKA
Juneau
DOMINION OF CANADA
NORTH AMERICA
Hudson Bay
Winnipeg
Seattle
Montreal
Ottawa
Halifax
St. Johns
NEWFOUNDLAND
Chicago
UNITED STATES
St. Louis
New York
Washington
San Francisco
Los Angeles
New Orleans
MEXICO
Mexico
Gulf of Mexico
WEST INDIES
CENTRAL AMERICA
Panama Canal
MIDWAY I. (U. S.)
HAWAIIAN IS. (U. S.)
Honolulu
WAKE I. (U. S.)
GUAM (U. S.)
PACIFIC
OCEAN
SAMOA IS.
FIJI IS.
Coral Sea
AUSTRALIA
Perth
Sydney
Melbourne
TASMANIA
NEW ZEALAND
NEW GUINEA
NETH. INDIA
JAVA
Guayaquil
Lima
SOUTH AMERICA
Belem
Recife
Sao Paulo
Rio de Janeiro
Valparaiso
Santiago
Montevideo
Buenos Aires
FALKLAND IS.
ATLANTIC
ICELAND
Denmark Str.
BRITISH ISLES
London
Stockholm
Leningrad
Moskva
Arkhangelsk
Omsk
EUROPE
Berlin
Paris
Madrid
Istanbul
Baku
Aral Sea
Str. of Gibraltar
Algiers
Marrakesh
Cairo
Suez Canal
Red Sea
SAHARA
AFRICA
Khartoum
Aden
Lagos
Arabian Sea
Delhi
Calcutta
Bombay
Madras
CEYLON
ZANZIBAR
INDIAN OCEAN
MADAGASCAR
Johannesburg
Durban
Capetown

Port Arthur
Duluth
St. Paul
Minneapolis
WISCONSIN
Eau Claire
La Crosse
Madison
Milwaukee
Sioux Falls
Sioux Cy.
Dubuque
Des Moines
Davenport
Council Bluffs
Burlington
Omaha
Lincoln
Chicago
Peoria
ILLINOIS
Springfield
Ft. Wayne
INDIANA
Indianapolis
Detroit
Lansing
Toledo
St. Joseph
Hannibal
Quincy
Keokuk
Topeka
KAN.
Kansas Cy.
St. Louis
Jefferson City
Springfield
Joplin
Poplarbluff
Evansville
Louisville
Nashville
TENNESSEE
Memphis
Chattanooga
OKLA.
Oklahoma City
Little Rock
Hot Springs
ARKANSAS
Pine Bluff
Camden
MISSISSIPPI
Jackson
Vicksburg
Natchez
ALABAMA
Montgomery
Birmingham
Mobile
Pensacola
Dallas
Waco
TEXAS
Houston
Galveston
Shreveport
Alexandria
LOUISIANA
Baton Rouge
New Orleans
Havana
CUBA.


UNITED STATES
Western Half
0 50 100 150 200 250 300
320 MILES TO ONE INCH
COPYRIGHT,
J. W. CLEMENT CO., BUFFALO, N. Y.
f
g
h
i
k
1
2
3
4
6
7
8
9
11
SASKATCHEWAN
MANITOBA
Regina
Winnipeg
Moose Jaw
Brandon
NORTH DAKOTA
Grand Forks
Bismarck
Minot
Fargo
Jamestown
Mandan
Washburn
Devils Lake
SOUTH DAKOTA
Pierre
Deadwood
Aberdeen
Redfield
Huron
Mitchell
Sioux Falls
Yankton
Chamberlain
Hot Springs
Edgemont
Watertown
MONTANA
Great Falls
Billings
Miles City
WYOMING
Lander
Casper
Douglas
Rawlins
Rock Spgs.
Laramie
Cheyenne
Sheridan
Sundance
Newcastle
YELLOWSTONE NATIONAL PARK
NEBRASKA
Omaha
Lincoln
Sioux City
Kearney
North Platte
Grand Island
Hastings
Beatrice
Fremont
Alliance
Ainsworth
O'Neill
Broken Bow
Sidney
COLORADO
Denver
Leadville
Pueblo
Greeley
Fort Collins
Akron
Trinidad
Alamosa
Grand Jc.
KANSAS
Topeka
Wichita
Salina
Beloit
Junction City
Emporia
Newton
Hutchinson
Larned
Colby
Dodge City
Medicine Lodge
Winfield
OKLAHOMA
Guthrie
Oklahoma City
NEW MEXICO
Santa Fe
Las Vegas
Albuquerque
Socorro
Lincoln
Roswell
Silver City
Las Cruces
Deming
Tularosa
Carlsbad
Raton
Ft. Wingate
Magdalena
Canadian R.
Amarillo
Panhandle
Clarendon
Childress
Quanah
Wichita Falls
Seymour
Henrietta
Gainesville
Plainview
Lubbock
Fort Worth
Dallas
Corsicana
Waco
Temple
Austin
San Antonio
Abilene
Sweetwater
Colorado
Big Spring
Midland
Coleman
Dublin
San Angelo
Lampasas
Menard
Junction
Burnet
Kerrville
Del Rio
Eagle Pass
Laredo
San Diego
Cotulla
Pearsall
Victoria
Columbus
Port Lavaca
Ft. Stockton
Alpine
Pecos
El Paso
Ciudad Juarez
Rio Grande
TEXAS
MEXICO
Casas Grandes
Porfirio Diaz
Llano Estacado

a
b
c
d
e
1
2
3
4
5
6
7
8
Grand Rapids
Two Harbors
Duluth
West Duluth
Superior
West Superior
Ashland
Hurley
Bayfield
Ironwood
Bessemer
Ewen
Baraga
Champion
Crystal Falls
Iron River
Eagle River
Hayward
Spooner
Shell Lake
Phillips
Rice Lake
Rhinelander
Pembine
Tomahawk
Cameron
Merrill
Antigo
Marinette
Peshtigo
Oconto
Medford
Chippewa Falls
Wausau
Eau Claire
Marshfield
St. Paul
Minneapolis
Hinckley
WISCONSIN
Durand
Augusta
Merrillan
Green Bay
Appleton
Black River Falls
Fountain City
Winona
Oshkosh
Manitowoc
Tomah
La Crosse
Sparta
Portage
Fond du Lac
Sheboygan
Viroqua
Baraboo
Milwaukee
Prairie du Chien
Madison
Dodgeville
Janesville
Racine
Kenosha
Monroe
Beloit
Forest City
Mason City
Decorah
Algona
Humboldt
Clarion
Hampton
Dubuque
Fort Dodge
Webster City
Iowa Falls
Independence
IOWA
Boone
Marshalltown
Tama
Cedar Rapids
Clinton
Perry
Grinnell
Davenport
Des Moines
Iowa City
Oskaloosa
Muscatine
Creston
Knoxville
Washington
Ottumwa
Albia
Centerville
Burlington
Ft. Madison
Keokuk
Rockford
Elgin
Aurora
Peoria
Bloomington
ILLINOIS
Springfield
Princeton
Bethany
Milan
Kirksville
Memphis
Unionville
Trenton
Chillicothe
Macon
Hannibal
Brunswick
Moberly
Louisiana
Mexico
Independence
Kansas City
Fulton
Sedalia
Boonville
Warrensburg
Tipton
Jefferson City
Harrisonville
Clinton
St. Louis
Cuba
Osceola
Rolla
Nevada
Bolivar
Lebanon
Salem
Perryville
Lamar
Greenfield
Houston
Jackson
Cape Girardeau
Carthage
Springfield
Piedmont
Aurora
Willow Spgs.
Vanburen
Charleston
Cairo
Paducah
Pierce City
Forsyth
Poplarbluff
Fulton
Mayfield


UNITED STATES
Eastern Half
0 50 100 150 200 250
320 MILES TO ONE INCH
COPYRIGHT
J. W. CLEMENT CO., BUFFALO, N.Y.
ATLANTIC OCEAN
Quebec
Three Rivers
Montreal
Sherbrooke
Ottawa
Kingston
Toronto
Hamilton
Lake Ontario
Buffalo
Schenectady
Albany
Syracuse
Utica
Elmira
Binghamton
Hartford
Boston
Portland
Augusta
Bangor
MAINE
N. H.
Concord
Manchester
MASS.
CONN.
Newport
New Haven
LONG ISLAND
New York
PENNSYLVANIA
Williamsport
Scranton
Allentown
Altoona
Harrisburg
Reading
Pittsburgh
Philadelphia
Trenton
N. J.
Camden
Wilmington
Atlantic City
C. MAY
DEL.
Erie
Cleveland
Akron
Canton
Columbus
Marietta
Wheeling
Cumberland
Hagerstown
Baltimore
Washington
Annapolis
Alexandria
MD.
WEST VA.
Charleston
Parkersburg
VIRGINIA
Richmond
Staunton
Petersburg
Lynchburg
Danville
Roanoke
C. CHARLES
Newport News
Norfolk
Henderson
Durham
Raleigh
Greensboro
Winston
Salisbury
N. CAROLINA
Charlotte
Goldsboro
Newbern
Fayetteville
Asheville
Hot Springs
CAPE HATTERAS
Morehead City
CAPE LOOKOUT
Wilmington
CAPE FEAR
Spartanburg
Columbia
Sumter
S. CAROLINA
Aiken
Georgetown
Charleston
Beaufort
Atlanta
Augusta
Macon
GEORGIA
Columbus
Lyons
Savannah
Brunswick
Waycross
Thomasville
Albany
Fernandina
Jacksonville
St. Augustine
Ormond
Daytona Beach
C. CANAVERAL
Cedar Keys
Tampa
St. Petersburg
Sarasota
Punta Gorda
Ft. Myers
C. ROMANO
C. SABLE
Key West
Lake Worth
Miami
C. FLORIDA
BAHAMA ISLANDS
Nassau
ANDROS IS.
SAN SALVADOR (Columbus 1492)
GEOGRAPHICALLY, C. AL TEX DIRECTLY SOUTH ABOUT 100 MILES BELOW THIS LINE.



Gravenhurst
Coe Hill
Kinmount
Midland
Orillia
Bobcaygeon
Meaford
Collingwood
Barrie
Lake Simcoe
Lindsay
Madoc
Sharbot Lake
Smiths Falls
Perth
Prescott
Bridgewater
Tamworth
Brockville
Kingston
Peterboro
Trenton
Belleville
Whitby
Brampton
Toronto
Cobourg
Port Hope
Guelph
Lake Ontario
Hamilton
St. Catharines
Niagara Falls
Galt
Dundas
Paris
Brantford
Welland
Port Colborne
Port Dover
Long Point Bay
Lake Erie
Buffalo
Lockport
Rochester
Oswego
Tonawanda
Batavia
Lyons
Auburn
Skaneateles
Cortland
Norwich
Lakeview
Hamburg
Springville
Silver Creek
Dunkirk
Hornellsville
Bath
Ithaca
Watkins
Elmira
Corning
Addison
Wellsville
Olean
Salamanca
Jamestown
Chautauqua L.
Brocton
Erie
Corry
Bradford
Warren
Sheffield
Union City
Titusville
Meadville
Oil City
Franklin
Ridgway
Emporium
Williamsport
Wilkes-Barre
Scranton
Carbondale
Susquehanna
Montrose
Towanda
Sayre
Tioga
Wellsboro
Coudersport
Clarion
DuBois
Lock Haven
Hazleton
Milton
Danville
Sunbury
Bellefonte
P E N N S Y L V A N I A
Punxsutawney
Kittanning
Butler
New Brighton
Beaver Falls
Allegheny
Pittsburgh
Altoona
Tyrone
Huntingdon
Johnstown
Lewistown
Mifflinburg
Pottsville
Shenandoah
Lebanon
Harrisburg
Greensburg
McKeesport
Homestead
Mt. Pleasant
Connellsville
Washington
Uniontown
Waynesburg
Bedford
Chambersburg
Carlisle
Shippensburg
Gettysburg
York
Hanover
Lancaster
Columbia
Philadelphia
Wilmington
Cumberland
Hagerstown
Frederick
Baltimore
Westminster
Annapolis
Washington
D.C.
Alexandria
Harpers Ferry
Ellicott City
Rockville
Manassas
Mt. Vernon
Morgantown
Fairmont
Grafton
Clarksburg
Weston
W E S T
V I R G I N I A
Winchester
Berryville
Leesburg
Warrenton
Front Royal
Luray
Harrisonburg
Culpeper
Staunton
Waynesboro
Charlottesville
Gordonsville
Orange
Fredericksburg
Louisa
Bowling Green
Lexington
Covington
Natural Bridge
Lynchburg
Farmville
Richmond
Manchester
Petersburg
Roanoke
Burkeville
Williamsburg
Norfolk
Portsmouth
Newport News
Suffolk
Franklin
Emporia
Danville
Clarksville
Franklin Jc.
Rocky Mount
Martinsville
Cape Charles
COPYRIGHT, G. W. CLEMENT CO., BUFFALO, N.Y.


CENTRAL STATES.
150 MILES TO ONE INCH.
COPYRIGHT, J. W. CLEMENT CO., BUFFALO, N. Y.
Lake Huron
Lake Michigan
L. Erie
Georgian Bay
Saginaw Bay
North Channel
MANITOULIN I.
L. Nipissing
Mackinac Island
Sault Ste. Marie
Newberry
Manistique
Cheboygan
Alpena
Gaylord
Mancelona
Kalkaska
Harrisville
Traverse City
Grayling
Roscommon
Oscoda
Tawas Cy.
West Branch
Cadillac
Manistee
Frankfort
Ludington
Big Rapids
Clare
Coleman
W. Bay Cy.
Bay City
Saginaw
Flint
Lapeer
Port Huron
Grand Rapids
Lansing
Jackson
Ann Arbor
Battle Creek
Kalamazoo
Detroit
Ypsilanti
Pontiac
Muskegon
Grand Haven
Holland
Allegan
Coldwater
Adrian
Dundee
Monroe
Sturgis
Niles
St. Joseph
Benton Harbor
Chicago
Wiarton
Owen Sound
Harriston
Goderich
Stratford
Woodstock
London
St. Thomas
Chatham
Toledo
Fremont
Sandusky
Lorain
Elyria
Cleveland
Norwalk
Akron
Youngstown
Alliance
Salem
Canton
Massillon
Wooster
Tiffin
Fostoria
Findlay
Bucyrus
Mansfield
Napoleon
Defiance
Van Wert
Lima
Kenton
Marion
Celina
Delaware
Mt. Vernon
Coshocton
New Philadelphia
Newark
Zanesville
Cambridge
Urbana
Piqua
Greenville
Springfield
Dayton
Xenia
Columbus
Lancaster
Circleville
Wilmington
Chillicothe
Marietta
Athens
Parkersburg
Hamilton
Middletown
Cincinnati
Gallipolis
Portsmouth
Ironton
OHIO
Wheeling
Fort Wayne
South Bend
Goshen
Elkhart
Auburn
Huntington
Wabash
Peru
Logansport
Marion
Muncie
Anderson
Elwood
Frankfort
Crawfordsville
Indianapolis
Richmond
Rushville
Shelbyville
Greencastle
Terre Haute
Columbus
Seymour
Bloomington
Sullivan
Vincennes
Washington
Mitchell
Madison
N. Vernon
Lawrenceburg
Jeffersonville
New Albany
Evansville
Louisville
Frankfort
Lexington
Covington
Newport
Cynthiana
Maysville
Ashland
Paris
Winchester
Mt. Sterling
Richmond
Lawrenceburg
Harrodsburg
Burgin
Kentucky R.
Ohio R.
Pikeville
Livingston
Corbin
Barbourville
Somerset
Bowling Green
Russellville
Franklin
Henderson
Elizabethtown
Owensboro
Hopkinsville
Williamsburg
Middlesboro
Guthrie
KENTUCKY
Charleston
Huntington
W. VA.
VIRGINIA
Bristol
Johnson City
Knoxville
Nashville
Clarksville
TENNESSEE
N. C.


MEXICO, CENTRAL AMERICA AND THE WEST INDIES
Statute Miles
0
500
© J. W. CLEMENT CO., BUFFALO, N. Y.
UNITED STATES
El Paso
Dallas
Savannah
Mobile
Jacksonville
Houston
San Antonio
Galveston
New Orleans
Tampa
Miami
Key West
Gulf of Mexico
ATLANTIC OCEAN
BAHAMA ISLANDS
Nassau
ANDROS
WATLING
Havana
CUBA
WEST INDIES
GREATER ANTILLES
Santiago
HAITI
DOM. REP.
Ciudad Trujillo
Port au Prince
San Juan
PUERTO RICO (U.S.)
JAMAICA (Br.)
Kingston
Caribbean Sea
LESSER ANTILLES
Caracas
Port of Spain
Barranquilla
SOUTH AMERICA
Panama Canal
Colon
Panama
COSTA RICA
San José
NICARAGUA
Managua
CENTRAL AMERICA
SALVADOR
San Salvador
Guatemala
GUATEMALA
HONDURAS
Tegucigalpa
Salina Cruz
Oaxaca
Orizaba
Puerto Mexico
Campeche
Bay of Campeche
Progreso
Merida
México
Veracruz
Pachuca
Puebla
Queretaro
Leon
Morelia
Manzanillo
Guadalajara
Aguascalientes
Zacatecas
San Luis Potosi
Tampico
Mazatlan
Durango
Torreon
Saltillo
Monterrey
Matamoros
Nuevo Laredo
Piedras Negras
Parral
Chihuahua
Hermosillo
Guaymas
Nogales
Ciudad Juarez
Mexicali
Gulf of California
Acapulco
PACIFIC OCEAN
REVILLA GIGEDO IS.
Longitude West from Greenwich


EASTERN STATES.
NEW YORK CITY
(Greater New York)
Showing Boroughs


EUROPE
Boundaries as of Sept. 1, 1939
Statute Miles
0 50 100 200 300
⊛ Capitals of Countries
Copyright, J. W. CLEMENT CO.,
Matthews-Northrup Works., Buffalo, N.Y.
NORWAY
Bergen
Haugesund
Stavanger
Kristiansand
Drammen
Skien
Arendal
Aalesund
Molde
Sognefjord
Hardangerfjord
Skagerrak
NORTH SEA
BRITISH ISLES
LEWIS
HEBRIDES
ORKNEY ISLANDS
Pentland Firth
Moray Firth
Inverness
Aberdeen
Dundee
Firth of Forth
Edinburgh
Perth
Glasgow
SCOTLAND
GREAT BRITAIN
Newcastle
NORTHERN IRELAND
Belfast
Irish Sea
Liverpool
Leeds
Hull
Bradford
Manchester
Sheffield
Nottingham
Birmingham
ENGLAND
London
Cardiff
Bristol
Bristol Channel
St. George's Chan.
Southampton
Plymouth
Portsmouth
Dover
Thames
Lands End
SCILLY IS.
English Channel
Strait of Dover
The Wash
IRELAND
EIRE
Baile Atha Cliath (Dublin)
Cobh (Queenstown)
DENMARK
København (Copenhagen)
Aarhus
Kiel
Lübeck
Hamburg
Altona
Bremen
Elbe
HELGOLAND
FRISIAN IS.
NETHERLANDS
Amsterdam
Rotterdam
Gravenhage (The Hague)
BELGIUM
Bruxelles (Brussels)
Lille
Calais
GERMANY
Hannover
Essen
Dortmund
Duesseldorf
Köln (Cologne)
Frankfurt
Rhine
Erfurt
Dresden
Plauen
Halle
Magdeburg
Mannheim
Nürnberg
Stuttgart
Strasbourg
Augsburg
München (Munich)
Passau
Danube
LUXEMBOURG
FRANCE
CHANNEL IS. (Br.)
Cherbourg
Le Havre
Caen
Rouen
Amiens
Seine
St. Denis
Reims
Metz
Nancy
Versailles
Paris
Brest
Rennes
Le Mans
Troyes
Orléans
Mulhouse
Angers
St. Nazaire
Loire
Nantes
Tours
Dijon
Besançon
Nevers
La Rochelle
Clermont Ferrand
Geneva
Lyon
Mt. Blanc
Limoges
St. Étienne
Angoulême
Grenoble
Bordeaux
Valence
Rhône
Agen
Nîmes
Bayonne
Toulouse
Montpellier
Béziers
Marseille
Nice
Toulon
Perpignan
ANDORRA
Gulf of the Lion
BAY OF BISCAY
SWITZERLAND
Bern
Zürich
LIECHTENSTEIN
ITALY
Milano (Milan)
Torino (Turin)
Po
Genova (Genoa)
Brescia
Verona
Padova
Udine
Ferrara
Bologna
SAN MARINO
Lucca
Firenze (Florence)
Livorno (Leghorn)
Siena
Spezia
MONACO
LIGURIAN SEA
Elba
CORSE (CORSICA) (Fr.)
Bastia
Ajaccio
Strait of Bonifacio
SARDEGNA (SARDINIA) (It.)
Sassari
Oristano
Cagliari
TYRRHENIAN SEA
Trapani
PANTELLARIA (It.)
SPAIN
Gijón
Santander
Bilbao
Vitoria
S. Sebastian
León
Burgos
Pamplona
PYRENEES
Valladolid
Zaragoza (Saragossa)
Lérida
Salamanca
Madrid
Barcelona
Tortosa
Toledo
Castellón
Valencia
Albacete
Alcoy
Alicante
Linares
Murcia
Lorca
Cartagena
Almeria
MENORCA
MALLORCA
Palma
ISLAS BALEARES (BALEARIC ISLANDS)
MEDITERRANEAN
Alger (Algiers)
Oran
Constantine
Philippeville
Bône
Tunis
Longitude East from Greenwich
0
10
40
50
60


SOUTH AMERICA
Statute Miles
0
1000
New York
Washington
UNITED STATES
Charleston
Jacksonville
BERMUDA (Br.)
Miami
BAHAMA IS (Br.)
CUBA
WEST INDIES
HISPANIOLA
LESSER ANTILLES
TROPIC OF CANCER
ATLANTIC
OCEAN
Caribbean Sea
Barranquilla
Maracaibo
CURACAO
Caracas
TRINIDAD
Valencia
VENEZUELA
Orinoco R.
Georgetown
Paramaribo
Cayenne
GUIANA
Medellin
Bogota
Cali
COLOMBIA
Quito
Guayaquil
ECUADOR
EQUATOR
Manaos
Rio Negro
Amazon
Belem (Para)
Fortaleza
Recife (Pernambuco)
Macein
B R A Z I L
Sao Salvador (Bahia)
PERU
Lima
Callao
Cuzco
Cuyaba
La Paz
Mt Illimani
BOLIVIA
Sucre
Arequipa
Arica
Iquique
TROPIC OF CAPRICORN
Antofagasta
PARAGUAY
Asuncion
Bello Horizonte
Rio de Janeiro
Sao Paulo
Santos
Curitiba
Tucuman
Porto Alegre
Cordoba
Santa Fe
URUGUAY
Montevideo
Plata R.
Valparaiso
Santiago
Rosario
Buenos Aires
La Plata
Concepcion
Temuco
Bahia Blanca
ARGENTINA
CHILE
PACIFIC OCEAN
CHILOE I.
CHONOS ARCHIPELAGO
Gulf of St George
C. Blanco
FALKLAND IS. (Br.)
Magallanes
Str. of Magellan
TIERRA DEL FUEGO
C. Horn
Longitude West from Greenwich
© J. W. CLEMENT CO., BUFFALO, N. Y.

20
30
FINLAND
Leningrad
SOVIET
Moskva
LITHUANIA
WHITE RUSSIA
UNION
Warszawa
POLAND
Lodz
Kiev
UKRAINE
BESSARABIA
Wien
Budapest
HUNGARY
RUMANIA
TRANSYLVANIA
Bucureşti
BLACK SEA
YUGOSLAVIA
Sarajevo
Split
BULGARIA
ALBANIA
Roma
Napoli
Salerno
Istanbul
TURKEY
Aydin
GREECE
IONIAN SEA
AEGEAN SEA
Sea of Candia
SICILIA
MALTA (Br.)
50
40

THE FAEROES (Den.)
SHETLAND IS. (Br.)
HEBRIDES
Glasgow
N. I.
EIRE
GREAT BRITAIN
London
North Sea
NOR.
Oslo
SWED.
Stockholm
FIN.
Helsinki
Tallinn
EST.
Riga
LAT.
LITH.
Kaunas
DEN.
Danzig
Baltic Sea
Berlin
Warsaw
POLAND
Dnepr
Kiev
NETH.
BEL.
GERMANY
Eng. Chan.
Paris
FRANCE
Marseille
Bay of Biscay
Vienna
AUST.
CZECH
Budapest
HUN.
SW.
Milan
Y.S.
RUM.
Danube
Belgrade
BULG.
ITALY
ALB.
GREECE
Athens
Rome
C. Finisterre
Madrid
SPAIN
PORTUGAL
Lisboa
Barcelona
C. St. Vincent
Gibraltar (Br.)
Str. of Gibraltar
MEDITERRANEAN SEA
Alger
Tunis
TUNISIA
Alexandria
Bengasi
Cairo
EGYPT
Tripoli
LIBYA (It.)
MADEIRA IS. (Port.)
Rabat
MOROCCO
CANARY IS. (Sp.)
IFNI (Sp.)
RIO DE ORO (Sp.)
Cisneros
ALGERIA
SAHARA
Tropic of Cancer
C. Blanco
AFRICA
FRENCH WEST AFRICA
FRENCH SUDAN
Tombouctou
L. Chad
ANGLO EGYPTIAN SUDAN
Khartoum
C. Verde
Dakar
SEN.
GAM.
Bathurst
PORT. GUINEA
FR. GUINEA
Niger R.
IVORY COAST
SIERRA LEONE
Monrovia
LIBERIA
TOGO
G.C.
Accra
Lagos
NIGERIA (Br.)
CAMEROON (Fr. M.)
FRENCH EQUAT. AFRICA
Gulf of Guinea
RIO MUNI
Yaounde
SÃO THOME (Port.)
Brazzaville
Congo R.
BELGIAN CONGO
Leopoldville
UGANDA
Cabinda (Port.)
Tanganyika
. ASCENSION I. (Br.)
Benguela
ANGOLA (Port.)
Nova Lisboa
NOR. RHO.
Lusaka
ST. HELENA I. (Br.)
C. Frio
SOUTHWEST AFRICA
Windhoek
Salisbury
SOU. RHO.
BECH.
Walvis Bay
(U. of S. A.)
Johannesburg
SOUTH AFRICA
BASU.
ATLANTIC OCEAN
Capetown
C. of Good Hope
© J. W. CLEMENT, CO.
0
20
60
40
0
20

AFRICA
and parts of
EUROPE AND ASIA


120
140
U. S. S. R.
Lake Baikal
Irkutsk
Ulan Ude
Urga
MONGOLIA
THE GOBI DESERT
Nikolaevsk on-Amur
Amur
R.
SEA OF OKHOTSK
Kamchatka
SAKHALIN
KARAFUTO (Jap.)
KURILE ISLANDS
MANCHUKUO (MANCHURIA)
Hsinking
Mukden
Kirin
Vladivostok
HOKKAIDO
Hakodate
Sea of Japan
Peiping
Tientsin
Tsinan
Huang Ho
C H I N A
Chengtu
Chungking
Nanking
Hankow
Yangtze Kiang
Shanghai
Hangchow
Changsha
Wenchow
E. China Sea
Yellow Sea
CHOSEN
Keijo
Tokyo
HONSHU
Kobe
Yokohama
Osaka
JAPAN
PACIFIC
RYUKYU IS.
OGASAWARA IS (Jap.)
Canton
TAIWAN
HONG KONG (Br.)
Tropic of Cancer
Hanoi
HAINAN
SIAM
FRENCH INDO-CHINA
China Sea
LUZON
Manila
PHILIPPINE ISLANDS
MARIANAS IS. (Jap. Mand.)
GUAM (U. S.)
PALAWAN
Cambodia Pt.
MINDANAO
OCEAN
PALAU IS (Jap. Mand.)
CAROLINE ISLANDS (Jap. Mand.)
FED. MALAY STATES
Brunei
Singapore
SUMATRA
BORNEO
Equator
CELEBES
NETHERLAND INDIA
BISMARCK ARCH. (Aust.)
TER. OF N. G.
NEW GUINEA
TER. OF PAPUA
Batavia
JAVA
ISLANDS
Arafura Sea
TIMOR
CHRISTMAS I. (Br.)
Timor Sea
Darwin
C. York
CORAL SEA
INDIAN
North West Cape
Tropic of Capricorn
AUSTRALIA
GREAT VICTORIA DESERT
Darling R.
Brisbane
OCEAN
Perth
Fremantle
C. Leeuwin
Great Australian Bight
Adelaide
Sydney
Canberra
Melbourne
TASMAN SEA
Bass Str.
TASMANIA
Hobart
North Cape
Auckland
180
NEW ZEALAND (Br.)
NORTH I.
Wellington
SOUTH I.
BOUNTY IS. (N. Z.)
40
20
0
EASTERN ASIA AND AUSTRALIA