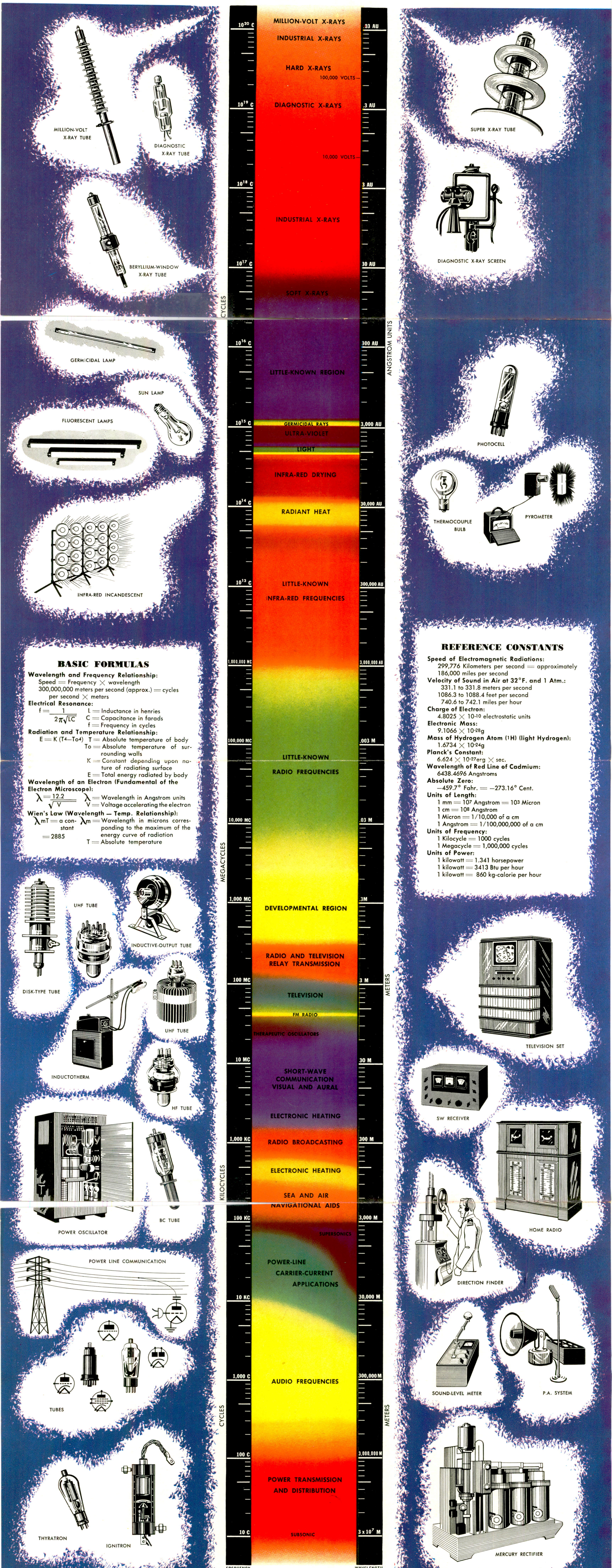


# FREQUENCY SPECTRUM

## of the ELECTRONIC INDUSTRIES

Showing representative electronic tubes and devices that operate at the various frequencies



**BASIC FORMULAS**

**Wavelength and Frequency Relationship:**  
 Speed = Frequency × wavelength  
 300,000,000 meters per second (approx.) = cycles per second × meters

**Electrical Resonance:**  
 $f = \frac{1}{2\pi\sqrt{LC}}$  L = Inductance in henries  
 C = Capacitance in farads  
 f = Frequency in cycles

**Radiation and Temperature Relationship:**  
 $E = K(T^4 - T_0^4)$  T = Absolute temperature of body  
 T<sub>0</sub> = Absolute temperature of surrounding walls  
 K = Constant depending upon nature of radiating surface  
 E = Total energy radiated by body

**Wavelength of an Electron (Fundamental of the Electron Microscope):**  
 $\lambda = \frac{12.2}{\sqrt{V}}$  λ = Wavelength in Angstrom units  
 V = Voltage accelerating the electron

**Wien's Law (Wavelength - Temp. Relationship):**  
 $\lambda_m T = a$  constant  
 λ<sub>m</sub> = Wavelength in microns corresponding to the maximum of the energy curve of radiation  
 T = Absolute temperature  
 = 2885

**REFERENCE CONSTANTS**

**Speed of Electromagnetic Radiations:**  
 299,776 Kilometers per second = approximately 186,000 miles per second

**Velocity of Sound in Air at 32°F. and 1 Atm.:**  
 331.1 to 331.8 meters per second  
 1086.3 to 1088.4 feet per second  
 740.6 to 742.1 miles per hour

**Charge of Electron:**  
 4.8025 × 10<sup>-10</sup> electrostatic units

**Electronic Mass:**  
 9.1066 × 10<sup>-28</sup>g

**Mass of Hydrogen Atom (1H) (light Hydrogen):**  
 1.6734 × 10<sup>-24</sup>g

**Planck's Constant:**  
 6.624 × 10<sup>-27</sup>erg × sec.

**Wavelength of Red Line of Cadmium:**  
 6438.4696 Angstroms

**Absolute Zero:**  
 -459.7° Fahr. = -273.16° Cent.

**Units of Length:**  
 1 mm = 10<sup>7</sup> Angstrom = 10<sup>3</sup> Micron  
 1 cm = 10<sup>8</sup> Angstrom  
 1 Micron = 1/100,000 of a cm  
 1 Angstrom = 1/100,000,000 of a cm

**Units of Frequency:**  
 1 Kilocycle = 1000 cycles  
 1 Megacycle = 1,000,000 cycles

**Units of Power:**  
 1 kilowatt = 1.341 horsepower  
 1 kilowatt = 3413 Btu per hour  
 1 kilowatt = 860 kg-calorie per hour

Compiled by ELECTRONIC INDUSTRIES in collaboration with the engineers of the Electronic Laboratories of the General Electric Co.

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