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Wave engineering generally covers the behavior of waves in the range of 10^3 MHz to 10^9 Hz, or from very high frequency (VHF) to very low frequency (VLF). While the term *microwave* is often used to describe the corresponding electrical signals, *radio waves* are more generally used. Signals with wavelengths in the millimeter range are called *millimeter waves*. Figure 1-1 shows the electromagnetic spectrum in standard *cycles per second* (Hz).

In a sense, wave engineering is a study of electromagnetism, not in greatest detail, but at high RF and microwave frequencies, where the wavelength of the wave is of great importance. At most frequencies, the phase velocity of the wave can be taken as the speed of light in free space, and the dimensions of the wave can be taken as small compared to the wavelength. At millimeter wavelengths, however, the phase velocity can be affected by the dielectric constant of the medium, and the dimensions of the wave are no longer negligible.