

WHAT IS A RADIO FREQUENCY?

The ripples formed by the fall of a pebble on the surface of the water form waves which propagate like concentric circles. The water then oscillates periodically, forming a peak, the top of the wave being followed by a trough, the bottom of the wave.

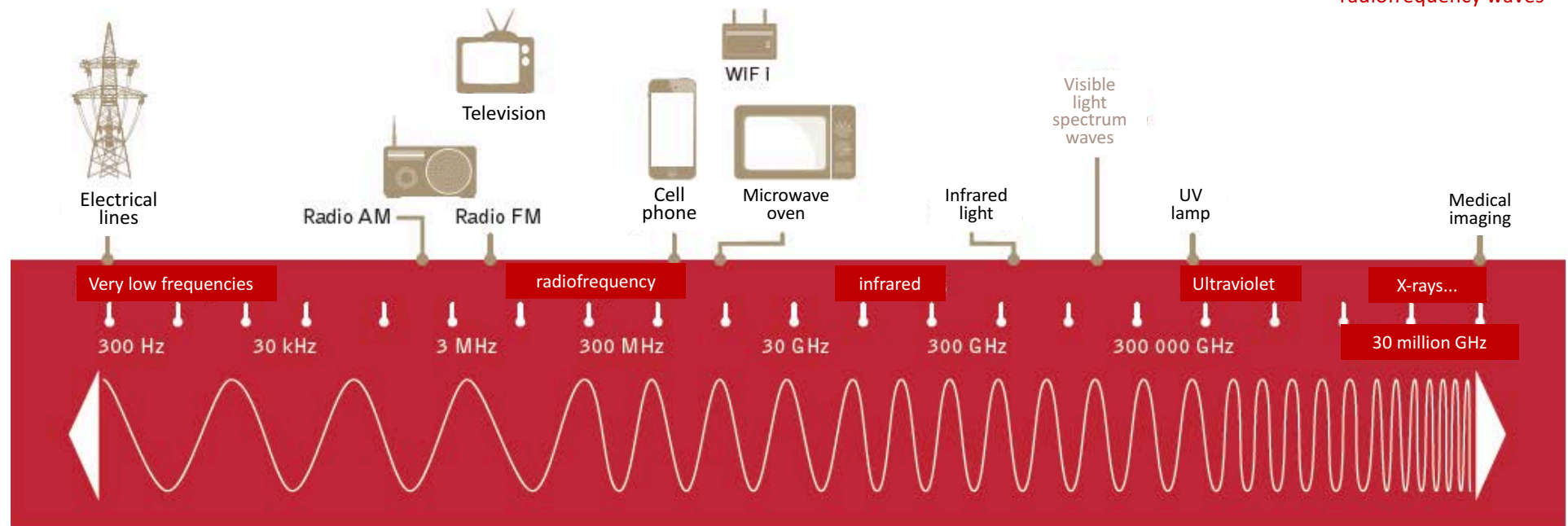
Radio frequencies are also waves with peaks and troughs. However, these do not move in water, but rather in air or vacuum at the speed of light. These are so-called electromagnetic waves: under the influence of moving electric charges, an electric field and a magnetic field are created and they start to oscillate.

Like a pebble in water, a simple antenna produces spherical radio waves that travel 300,000 km every second.

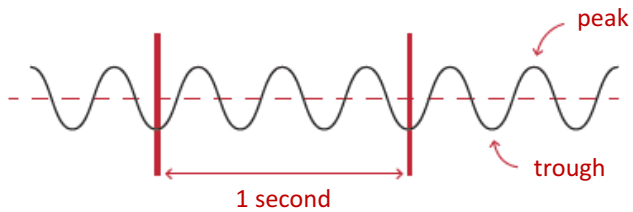
There is a whole spectrum of electromagnetic waves, of which radio waves are part, like UV, X-rays or even the light that we see!



Antenna broadcasting radiofrequency waves



Representation of the electromagnetic spectrum. Light, X-rays or radio frequencies are waves of the same type, but with different frequencies.



To distinguish one wave from another, we count the number of cycles (a cycle = a peak + a trough) that the wave does in the space of a second. If it cycles in one second, it is said to appear at a frequency of 1 time per second, which is noted as 1 Hertz, or 1 Hz. If it does 10 cycles, then it has a frequency of 10 Hz , etc.

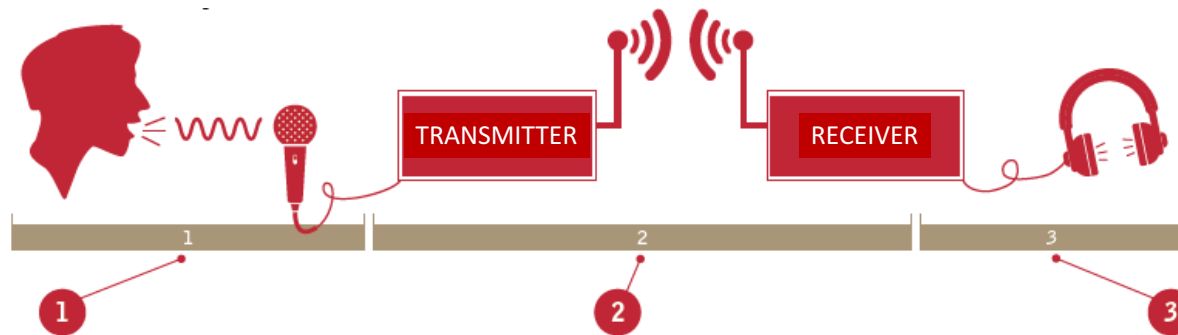
Radio waves have frequencies between 3 kHz and 300 GHz, which means that they make between 3,000 and 300,000,000,000 cycles per second.

In this interval, many means of communication share frequency bands. WiFi uses higher frequencies than the cellular network, which itself uses higher frequencies than so-called AM radio.

HOW CAN A WAVELENGTH TRANSPORT SOUND OVER A LONG DISTANCE?

Would you hear the conversation of people chatting at the other end of a restaurant? Probably not. Our vocal cords produce a sound wave that cannot travel long distances. It fades quickly, until it becomes inaudible. This is not the case for certain radiofrequency waves, which can go around the planet by reflecting on one of the so-called ionized layers of the upper atmosphere.

Radio makes it possible to take advantage of this property of radiofrequency waves to transport voice over great distances. To do this, the sound wave must be transformed and then transported as follows:



The vibration of the air created by the voice is converted into an electrical signal through a microphone.

This signal is itself converted into a radio frequency wave by a process called modulation. This new wave propagates in the air from a radio station (the transmitter) to any receiver in the area of influence of the transmitter ... which can represent very great distances!

Once in the receiver, the radio frequency wave is converted into an electrical signal and then into a sound wave through a speaker.