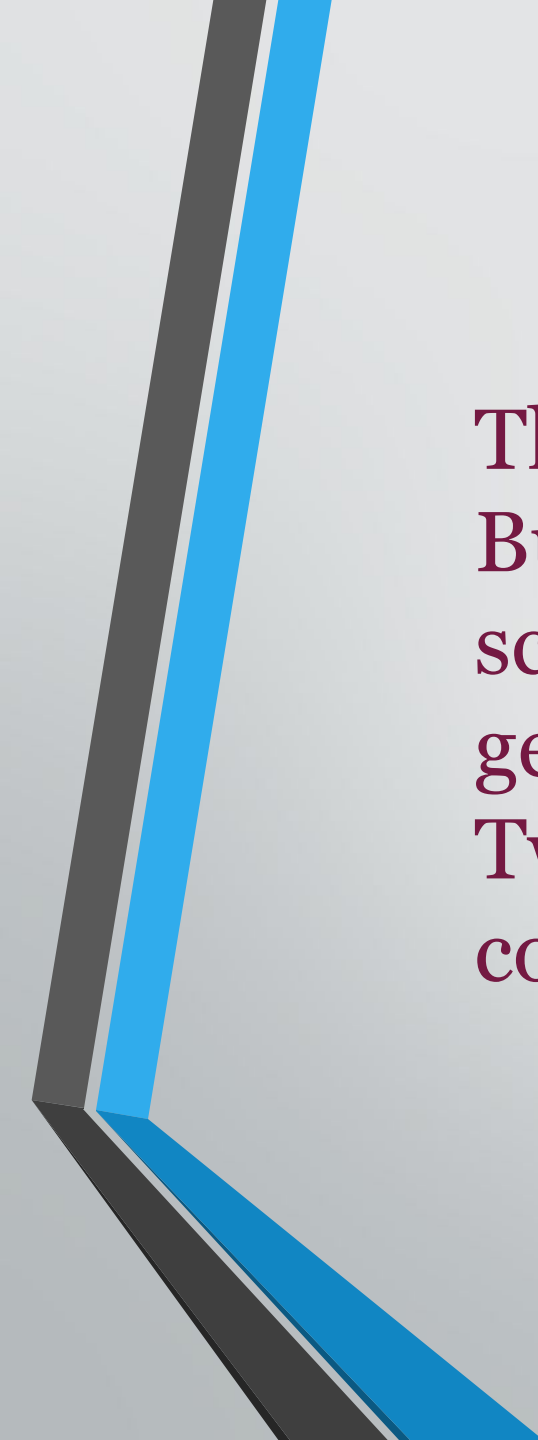




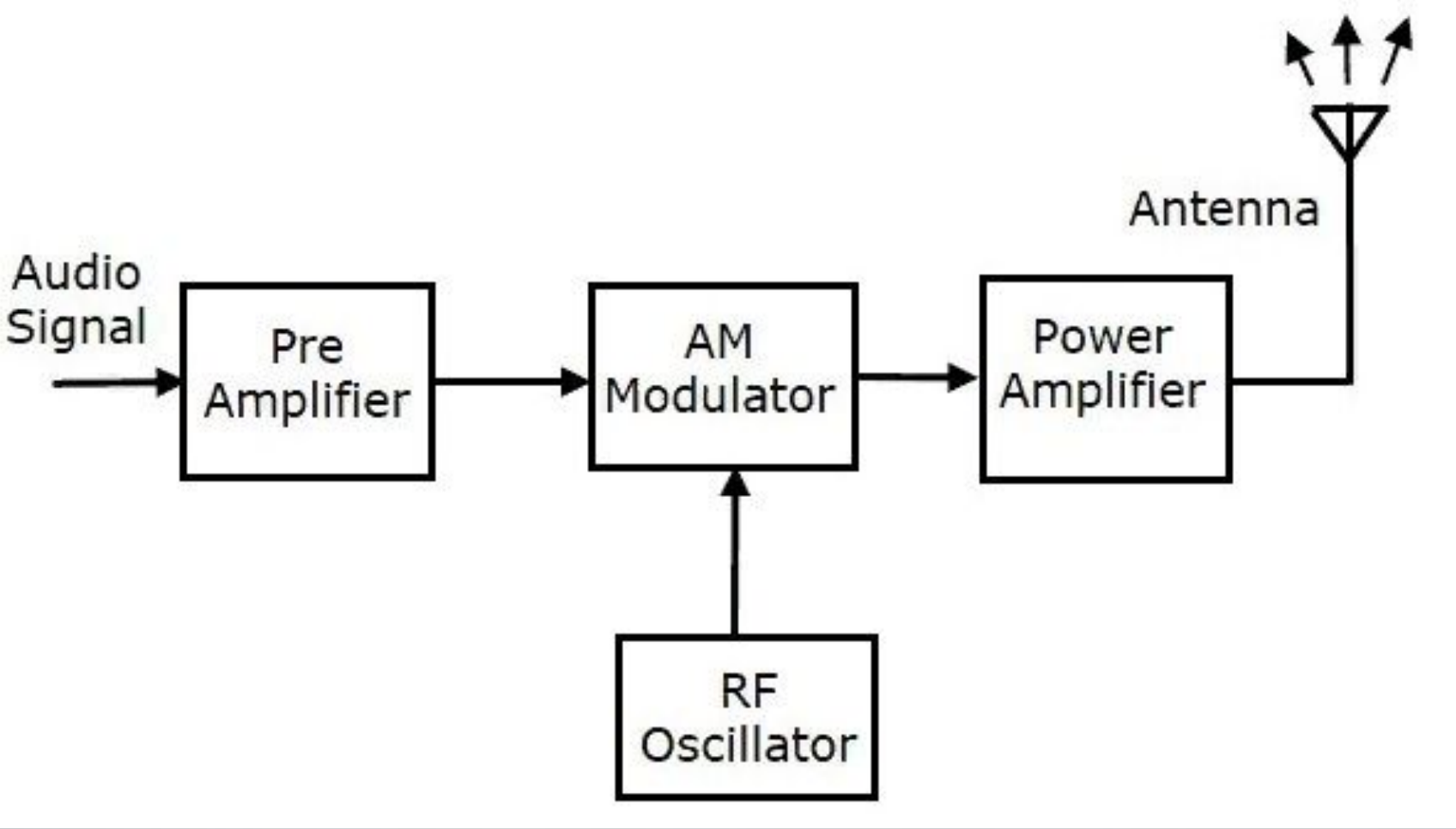
# Transmitters and receivers

A simple radio system

**To travel** – распространяться  
**transmitting range** – дальность передачи  
**a receiver** – приемник  
**a transmitter** – передатчик  
**a high-frequency oscillator** – высокочастотный генератор колебаний  
**an oscillatory circuit** – колебательный контур  
**a capacitor** – конденсатор  
**an amplifier** – усилитель  
**a detector** – детектор, следящий механизм  
**a rectifier** – выпрямитель, детонатор  
**the audio frequency** – звуковая частота  
**to couple together** – соединять, спаривать  
**by means of a switch** – с помощью переключателя (коммутатора)  
**means of communication** – средства связи  
**telegraph sending key** – телеграфный ключ  
**dots and dashes** – точки и тире  
**the mirror galvanometer** – зеркальный гальванометр  
**powdered carbon** – порошковый углерод  
**a far sensitive receiver** – гораздо более чувствительный приемник  
**wireless communication** – беспроводная связь  
**a transmitting / receiving coil** – передающая / приемная катушка



There are many natural sources of radio waves. But in the later part of the 19th century, scientists figured out how to electronically generate radio waves using electric currents. Two components are required for radio communication: a *transmitter* and a *receiver*.



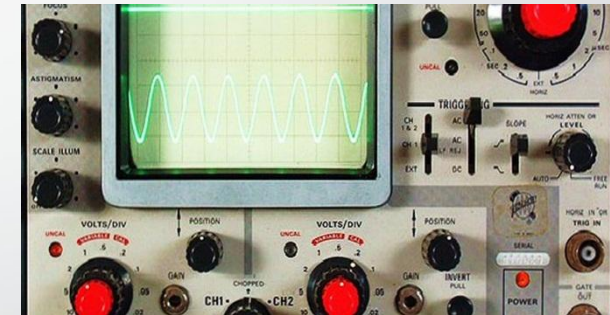
A radio transmitter consists of several elements that *work* together to generate radio waves that contain useful information such as audio, video, or digital data.

## Radio transmitters

Power supply:



Oscillator:



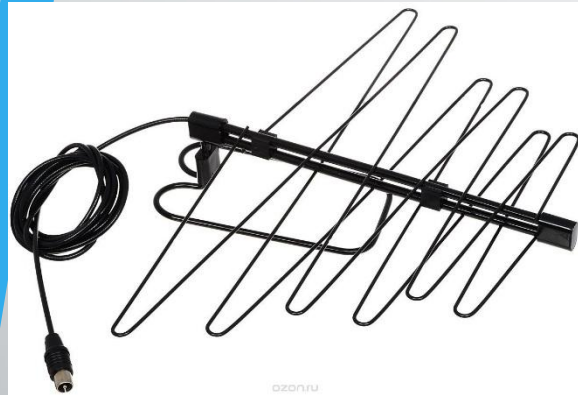
Modulator



Amplifier:



Antenna::



Power supply:

- Provides the necessary electrical power to operate the transmitter.

Oscillator:

- Creates alternating *current* at the frequency on which the transmitter will transmit. The oscillator usually creates a sine wave which is referred to as a *carrier wave*.

Modulator:

- Adds useful information to the carrier wave. There are two main ways to add this information. The first, amplitude modulation or AM, makes slight increases or decreases to the intensity of the carrier wave. The second, frequency modulation or FM, makes slight increases or decreases the frequency of the carrier wave.

Amplifier::

- Amplifies the modulated carrier wave to increase its power. The more powerful the amplifier, the more power it can handle.

Antenna::

- Converts the amplified signal to radio waves.

## Radio receivers

A radio receiver is the opposite of a radio transmitter. It uses an antenna to capture radio waves, processes those waves to extract only those waves that are vibrating at the desired frequency, extracts the audio signals that were added to those waves, amplifies the audio signals, and finally plays them on a speaker.

**Antenna:**



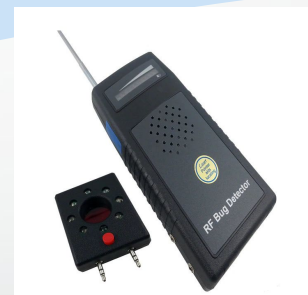
**RF  
amplifier:**



**Tuner:**



**Detector:**




**Audio  
amplifier:**









Of course, there are many variations on this basic radio receiver design. Many receivers include additional filtering and tuning circuits to better lock on to the intended frequency — or to produce better-quality audio output — and exclude other signals. Still, these basic elements are found in most receiver circuits.