

Chapter 3-2

RECEIVERS

ACMA Foundation Syllabus 4.1 and 4.11

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Receivers

A radio receiver is an electronic device that receives radio waves through an antenna and converts the information to a usable form. The desired information is extracted from the carrier wave by demodulation. A **detector** is used to extract information from an AM signal and a **discriminator** is used to extract information from a FM signal.

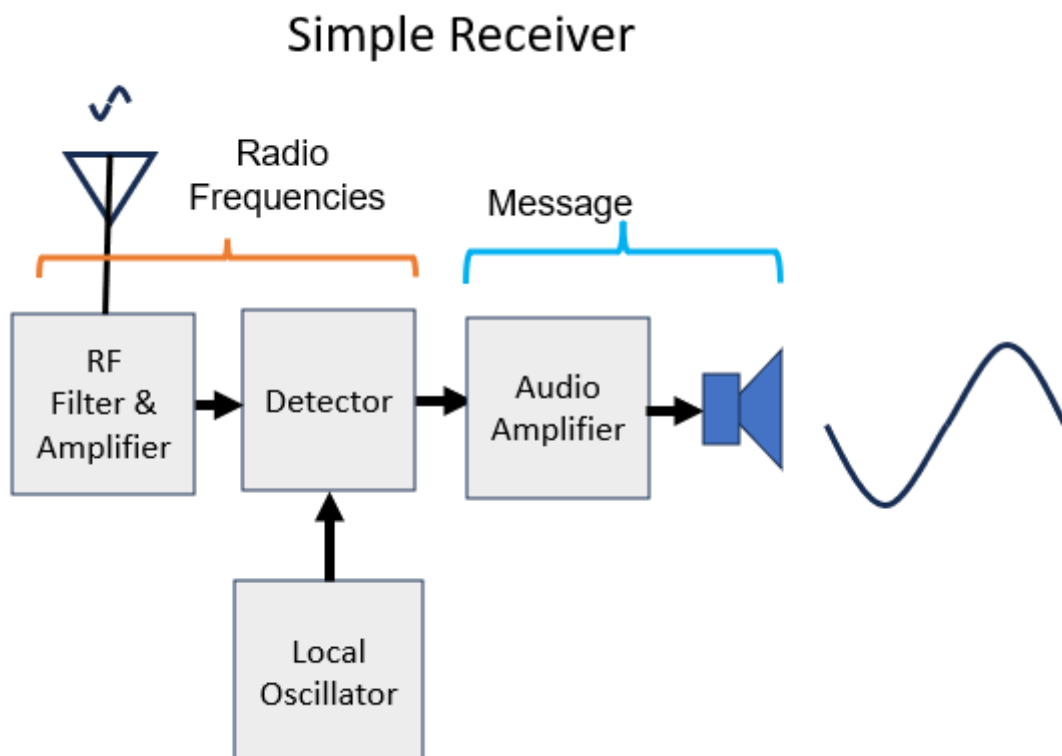
A simple receiver is the Tuned Radio Frequency Receiver (TRF). This receiver has a series of filters tuned to one carrier frequency.

The *mode of operation* for a receiver defines the type of signals the receiver processes: e.g. AM, FM, SSB or CW (Morse code).

A modern receiver is referred to as a superheterodyne receiver. A superheterodyne receiver, often shortened to superhet, is a type of radio receiver that uses frequency mixing to convert a received signal to a fixed intermediate frequency (IF) which can be more conveniently processed than the original carrier frequency.

Block Diagram

A simple audio receiver is shown below.



Receivers are rated on three criteria (the three Ss), their sensitivity, selectivity and stability,

Sensitivity

Receiver sensitivity indicates how faint an input signal can be to be successfully received by the receiver. Sensitivity is defined as the receiver's ability to detect a signal at the input and give a signal-plus-noise ratio 10dB above the noise output of the receiver.

Selectivity

Selectivity is an important parameter in any radio receiver. Selectivity is necessary for the receiver to be able to select the wanted signal from the unwanted adjacent signal.

Stability

Frequency stability means the receiver must stay "tuned" to the incoming radio signal and must not "drift" with time or temperature.

The overall receiver gain must be carefully controlled so that spurious emissions are not produced within the receiver.

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Have fun and stay safe.