

2) Spread Spectrum - Frequency hopping ss:-

Spread spectrum

→ is used to increase the bandwidth of the transmission.

→ used in radio signals transmission because it can easily reduce noise and other signal issues.

→ to provide secure communications by spreading the signal over a large frequency band.

There are two predominant techniques to spread the spectrum.

i) Direct spread sequence

ii) Frequency Hopping

i) Direct Sequence Spread Spectrum

* Used to reduce overall signal interference in

telecommunication.

* the message bits are modulated by a ^{bit} sequencing

process known as Spreading Sequence.

*) Spreading - sequence bit is known as a chip.

*) The data that needs to be transmitted is split into smaller blocks.

*) Each data block is attached with a high data rate bit sequence and is transmitted from the sender end to the receiver end.

ii) FHSS - Frequency Hopping Spread Spectrum

*) The information is divided into slices and transmitted at different frequency channel in random manner.

*) Frequency slots are selected randomly, and frequency signals are transmitted according to their occupancy.

*) The transmitters and receivers keep on hopping on channels available for a particular amount of time in milliseconds.

FHSS can also be classified into two types,

(i) Slow hopping →

Multiple bits are transmitted on a specific frequency (or) same frequency.

(ii) Fast hopping →

Individual bits are split and then transmitted on different frequencies.

Main 3 elements of FHSS:-

- * receives lesser bandwidth
- * This bandwidth is respected code not to the data.
- * The receiver should synchronize properly recover the data.

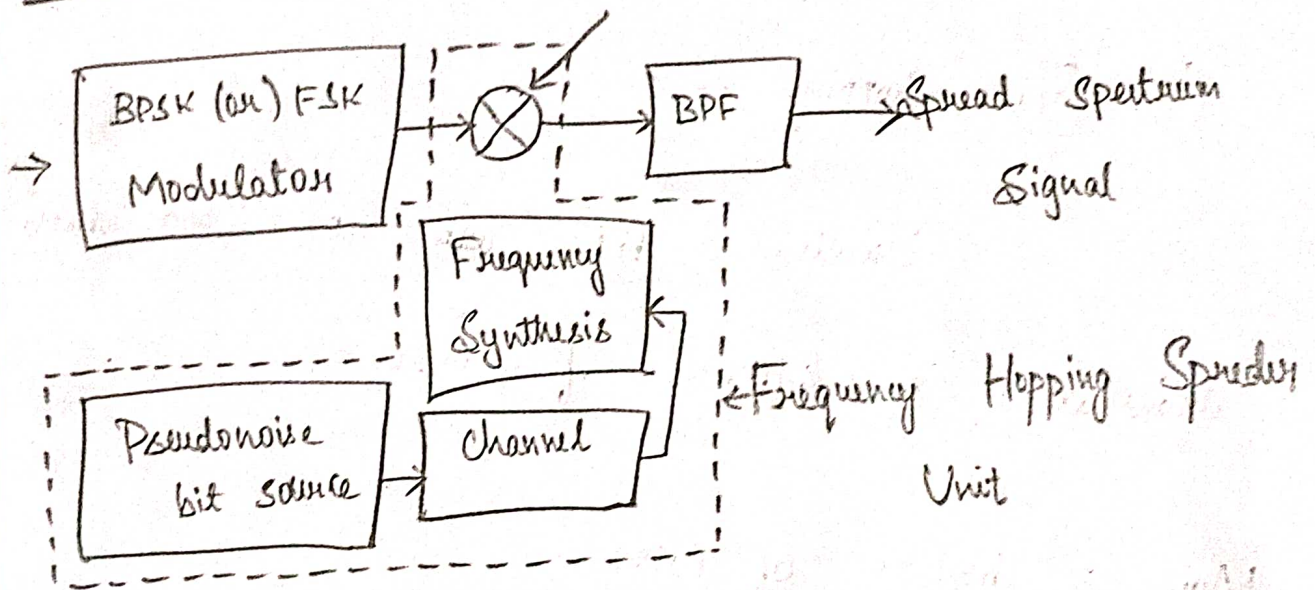
Advantages:-

- * Reduces different types of noises
- * provides immunity with multipath distortion and jamming.

* It applies in code division multiple access (CDMA).

* Has high efficiency.

FHSS (Transmitter)



FHSS (Receiver)

