Orthogonal Frequency Division Multiplexing (**OFDM**) is a technique for transmitting large amounts of digital data over a radio wave The technology **works** by splitting the radio signal into multiple smaller sub-signals that are then transmitted simultaneously at different frequencies to the receiver to reduce interference and crosstalk

Data on OFDM

The traditional format for sending data over a radio channel is to send it serially, one bit after another. This relies on a single channel and any interference on that single frequency can disrupt the whole transmission.

OFDM adopts a different approach. The data is transmitted in parallel across the various carriers within the overall OFDM signal. Being split into a number of parallel "substreams" the overall data rate is that of the original stream, but that of each of the substreams is much lower, and the symbols are spaced further apart in time.

This reduces interference among symbols and makes it easier to receive each symbol accurately while maintaining the same throughput.

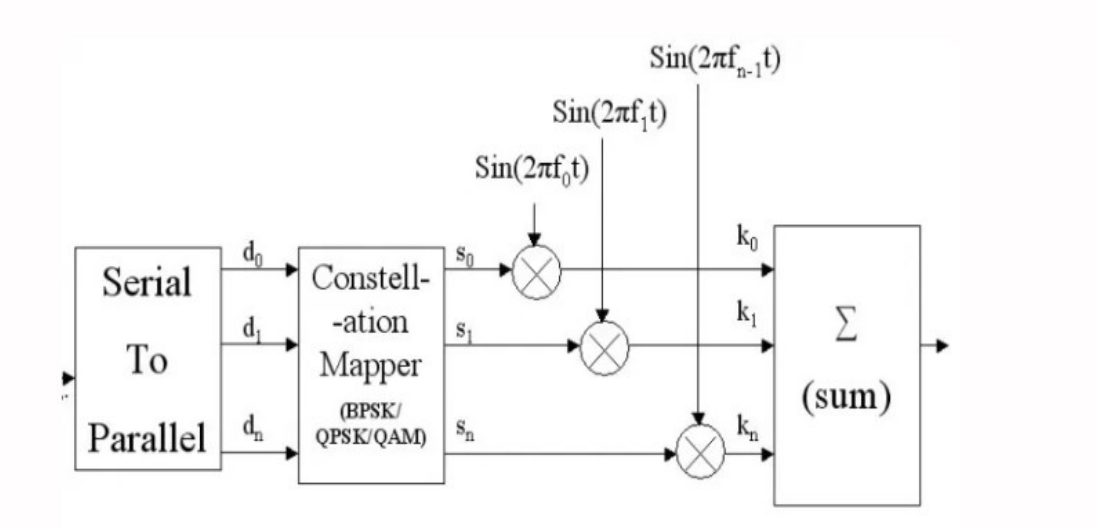
OFDM USE

OFDM has developed into a popular scheme for wideband digital communication, **used in** applications such as digital television and audio broadcasting, DSL internet access, wireless networks, power line networks, and 4G mobile communications.

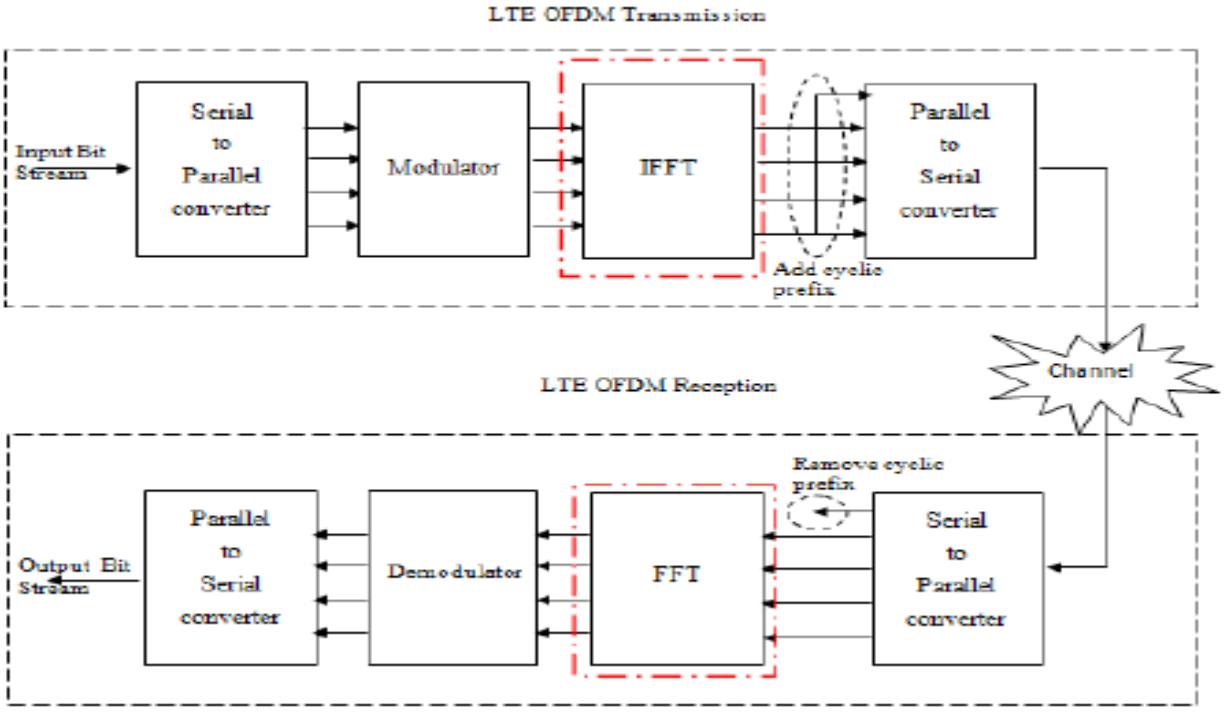
Simple Analog OFDM system Implementation

We will use a simple analog based implementation to show the basic principles of generating an OFDM signal. In this simple OFDM system there are N sinusoidal input signals. Each subcarrier transmits one bit of information (N bits total) as indicated by its presence or absence in the output spectrum. The frequency of each subcarrier is selected to form an orthogonal signal set. These frequencies are also known at the receiver for signal recovery. Note that the output is updated at a periodic interval T that forms the symbol period. To maintain orthogonality, T must

be the reciprocal of the subcarrier spac



MATHEMATICAL MODAL OF OFDM TRANMITER



OFDM BLOCK DIAGRAM