JYOTHISHMATHI INSTITUTE OF TECHNOLOGY & SCIENCE

PPT ON FREQUENCY DIVISION MULTIPLEXING

PRESENTED BY

Dr. SVS RK Raju

ECE Dept.

Outline

- **Frequency division multiplexing**
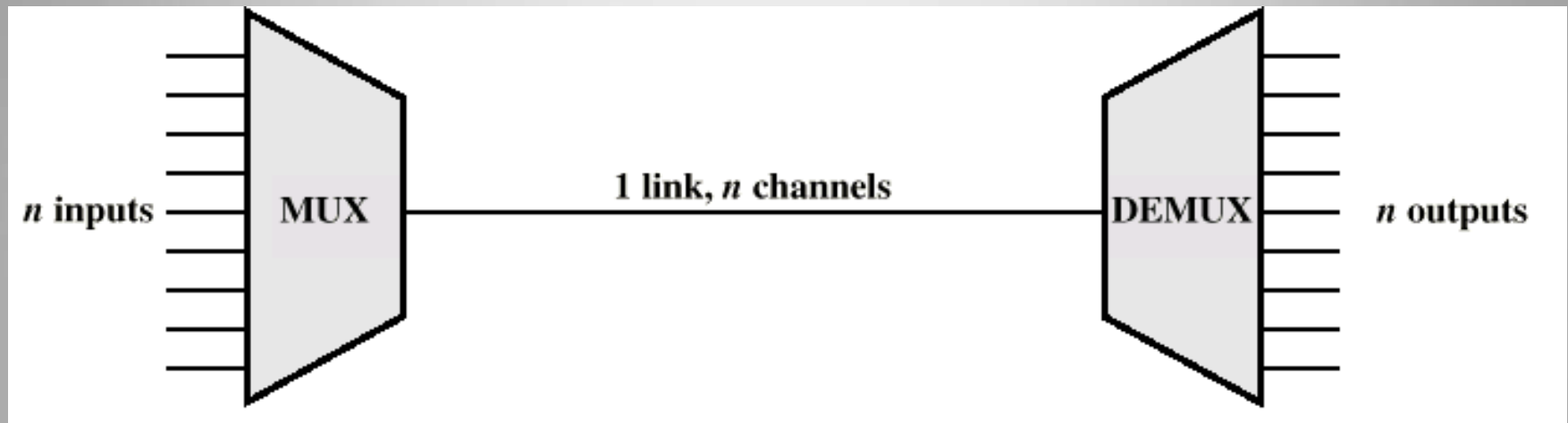
  can be used with analog signals.

- **Synchronous time division multiplexing**

  can be used with both digital signals and analog signals.

- **Statistical time division multiplexing**

  can be used with both digital signals and analog signals.

Multiplexing

How to share the capacity of a data link?

- FDM: Frequency Division Multiplexing

- TDM: Time Division Multiplexing

 - Synchronous TDM

  - Statistical TDM

Frequency Division Multiplexing

- FDM: A number of signals can be carried simultaneously.
    - —Each signal is modulated to a different carrier frequency
    - —Carrier frequencies are sufficiently separated so signals do not overlap (guard bands)
- Available bandwidth of medium exceeds the sum of all channels
- Examples: broadcast radio, cable TV
- Channel allocated even if no data

Terminologies

- Channel (FDM): each modulated signal requires a certain bandwidth centered on its carrier frequency, referred to as a **channel**.

- Subcarrier: each of the multiple carriers is referred to as a **subcarrier**. Its frequency is denoted by f_i. f_i must be chosen so that the bandwidths of various signals do not significantly overlap.

Frequency Division Multiplexing Diagram
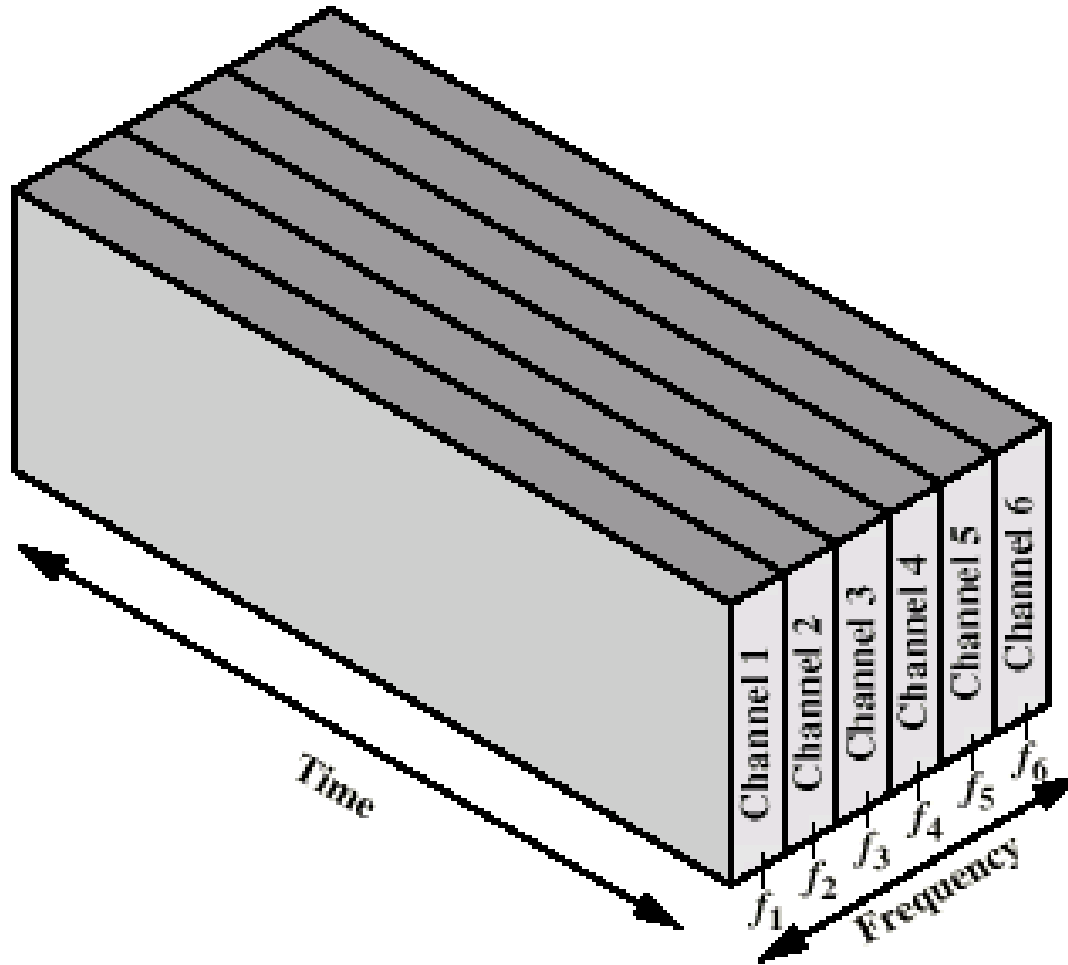
FDM System

$$B > \sum_{i=1}^{n} B_i$$
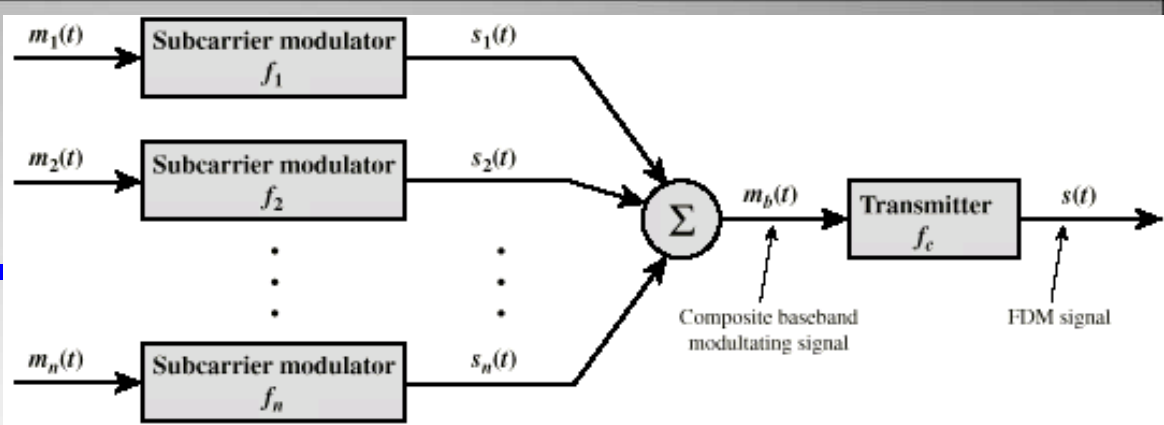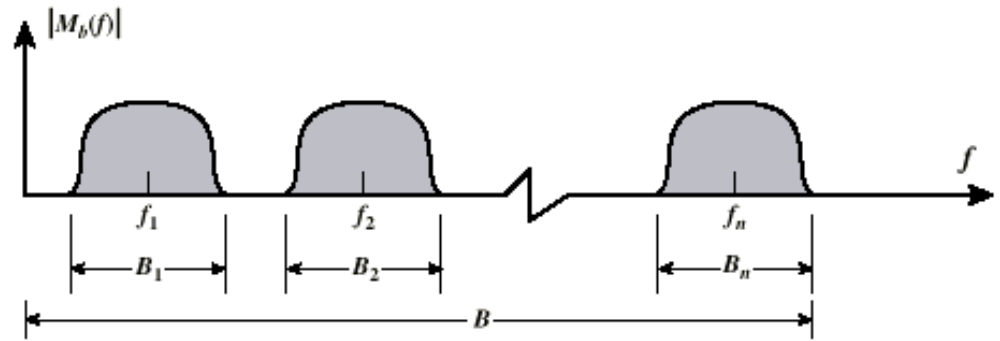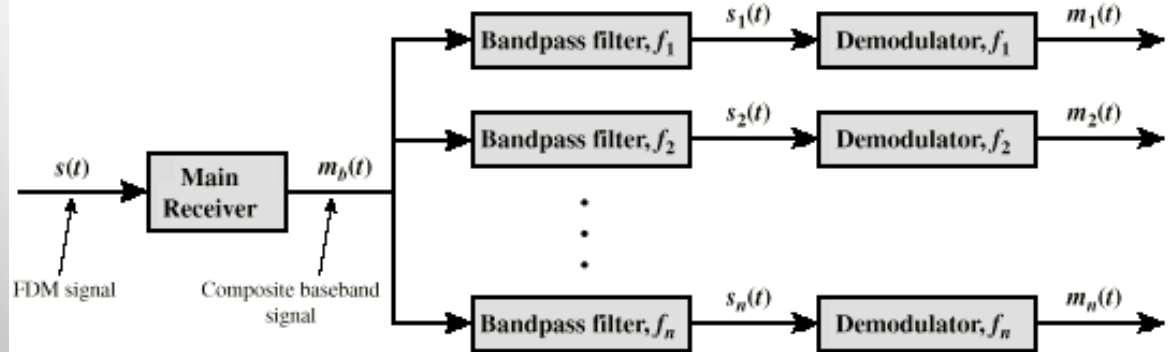

(a) Transmitter

(b) Spectrum of composite baseband modulating signal

(c) Receiver