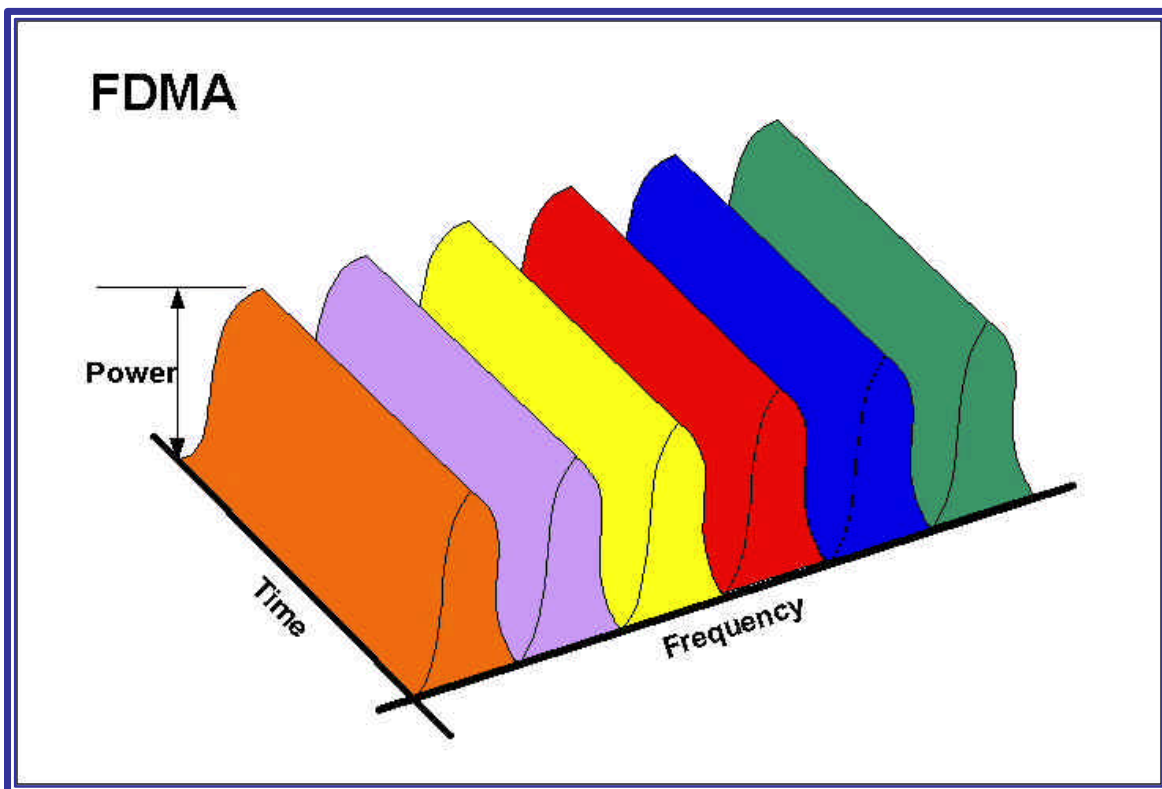
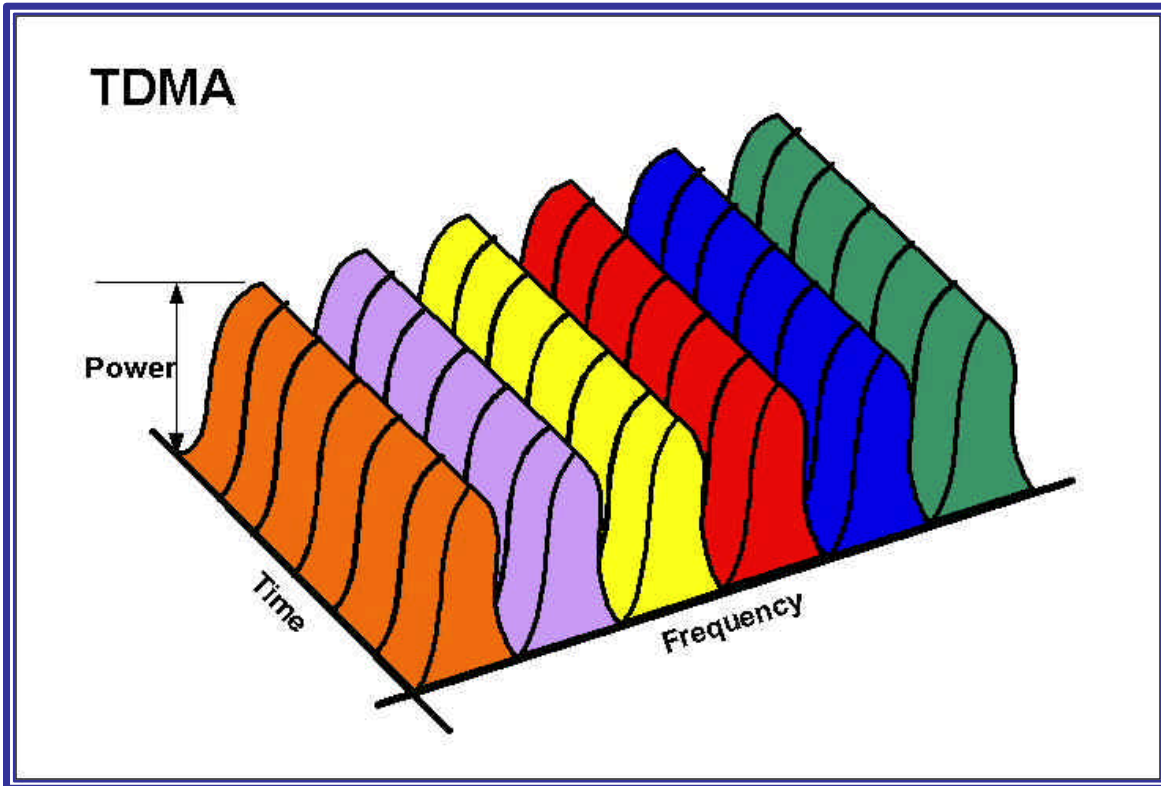


FDMA vs. TDMA vs. CDMA

As one of the major problems facing the development of telecommunications, bandwidth demand has driven the search for protocols that could be used to maximize bandwidth efficiency. Multiple access ("multiplexing" for short) enables multiple signals to occupy a single communications channel. There are three basic types of division-based protocols used to do this: frequency division multiple access (FDMA), time division multiple access (TDMA) and code division multiple access (CDMA).

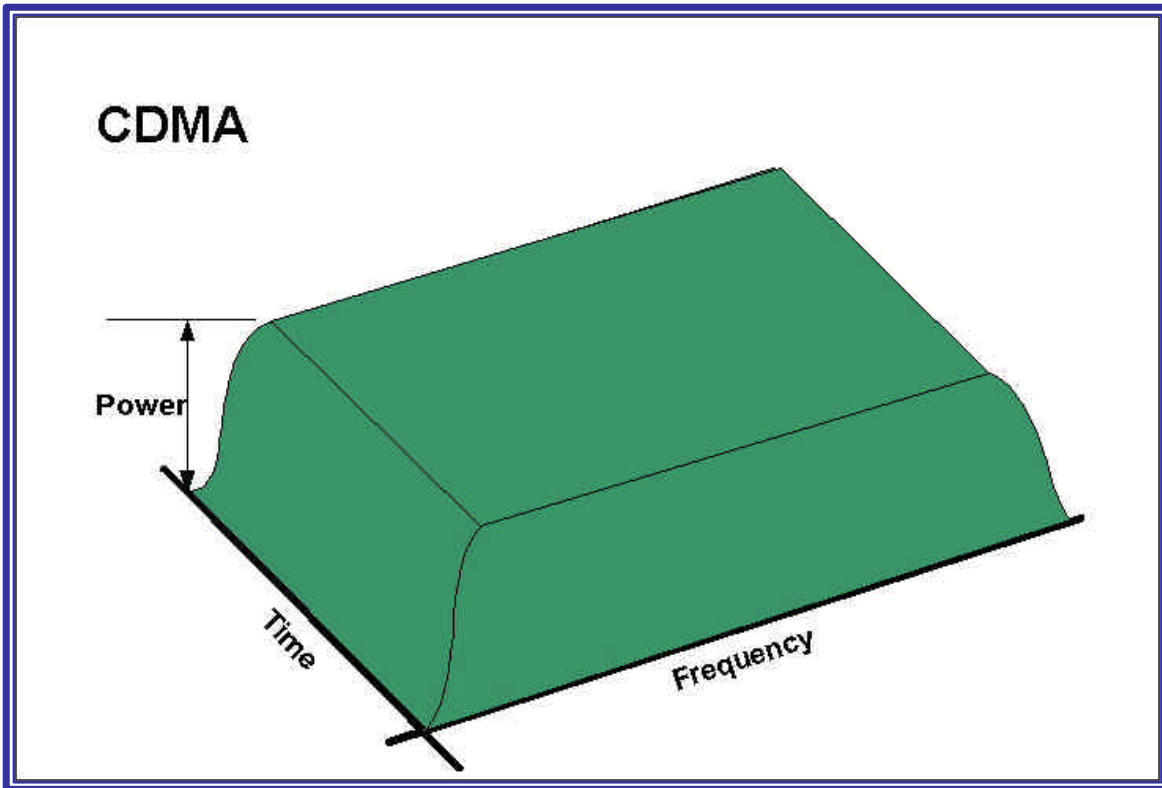


With **Frequency Division Multiple Access (FDMA)**, different signals are assigned frequency channels. A channel is a frequency. FDMA is a basic technology in the analog Advanced Mobile Phone System (AMPS). With FDMA, each channel can be assigned to only one user at a time. FDMA is also used in the Total Access Communication System (TACS).



In **Time Division Multiple Access (TDMA)**, it makes use of the same frequency spectrum but allows more users on the same band of frequencies by dividing the time into “slots” and shares the channel between users by assigning them different time slots.

TDMA is utilized by Digital-Advanced Mobile Phone System (D-AMPS) and Global System for Mobile communications (GSM). However, each of these systems implements TDMA in a somewhat different and incompatible way.



In **Code Division Multiple Access (CDMA)**, each user is assigned a different pseudorandom binary sequence that modulates the carrier, spreading the spectrum of the waveform and giving each user a unique code pattern.

This technology is used in ultra-high-frequency (UHF) cellular telephone systems in the 800-MHz and 1.9-GHz bands.

Reference:

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