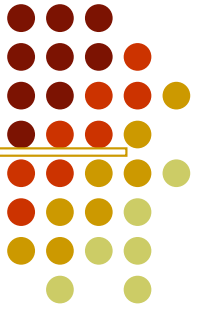


Types of Analog Modulation

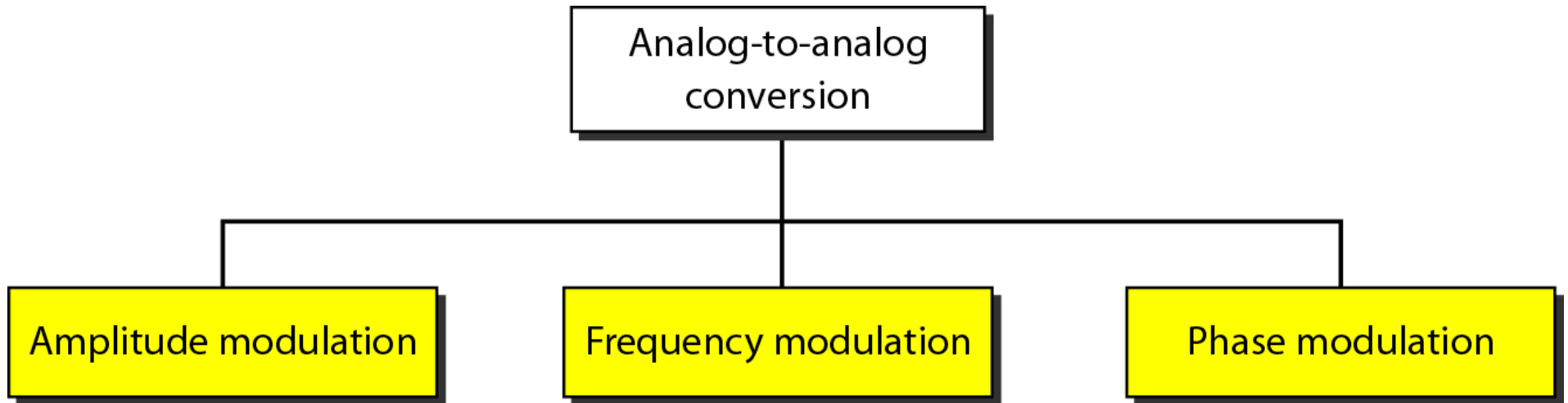


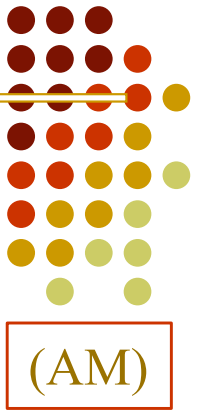
Analog-to-analog
conversion

Amplitude modulation

Frequency modulation

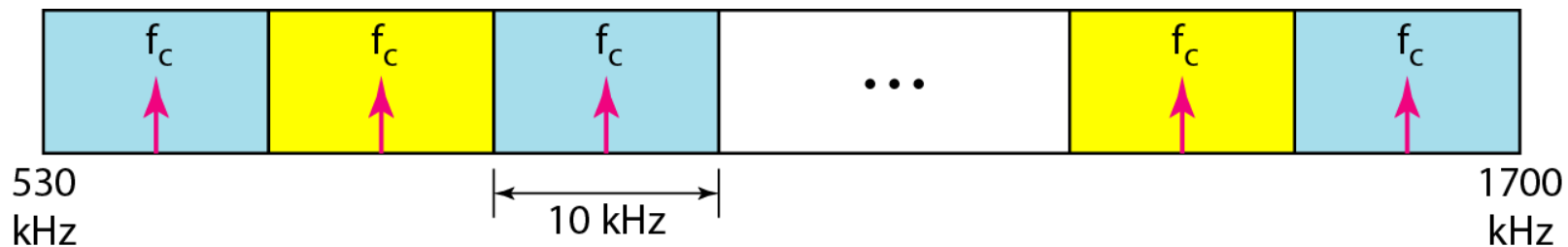
Phase modulation

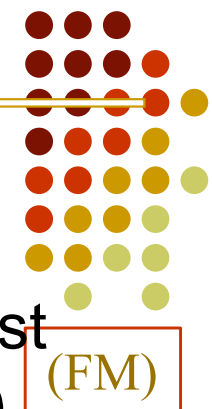




AM band allocation

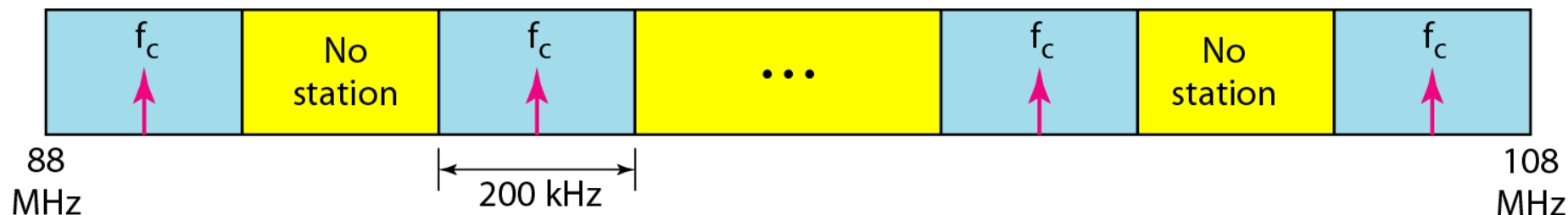
AM stations are allowed carrier frequencies anywhere between 530 and 1700 kHz (1.7 MHz). However, each station's carrier frequency must be separated from those on either side of it by at least 10 kHz (one AM bandwidth) to avoid interference. If one station uses a carrier frequency of 1100 kHz, the next station's carrier frequency cannot be lower than 1110 kHz.



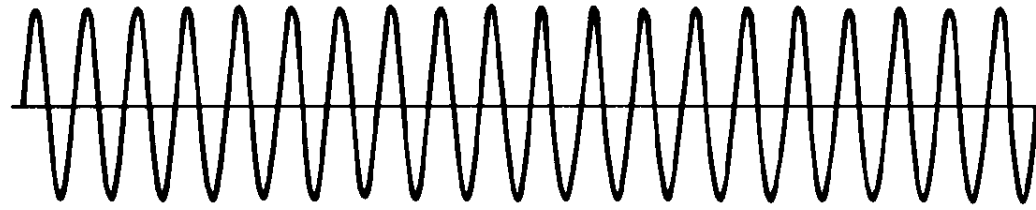


FM band allocation

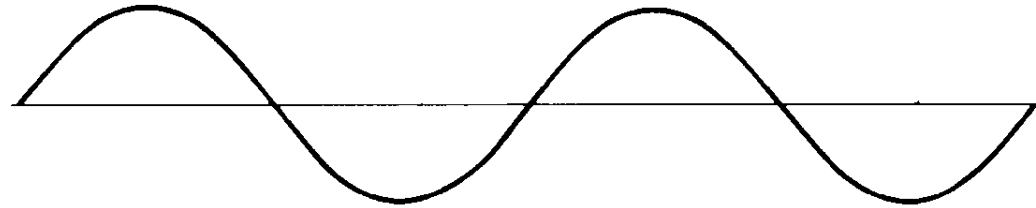
The bandwidth of an audio signal (speech and music) broadcast in stereo is almost 15 kHz. The FCC allows 200 kHz (0.2 MHz) for each station. This means $\beta = 4$ with some extra guard band. FM stations are allowed carrier frequencies anywhere between 88 and 108 MHz. Stations must be separated by at least 200 kHz to keep their bandwidths from overlapping. To create even more privacy, the FCC requires that in a given area, only alternate bandwidth allocations may be used. The others remain unused to prevent any possibility of two stations interfering with each other. Given 88 to 108 MHz as a range, there are 100 potential FM bandwidths in an area, of which 50 can operate at any one time.



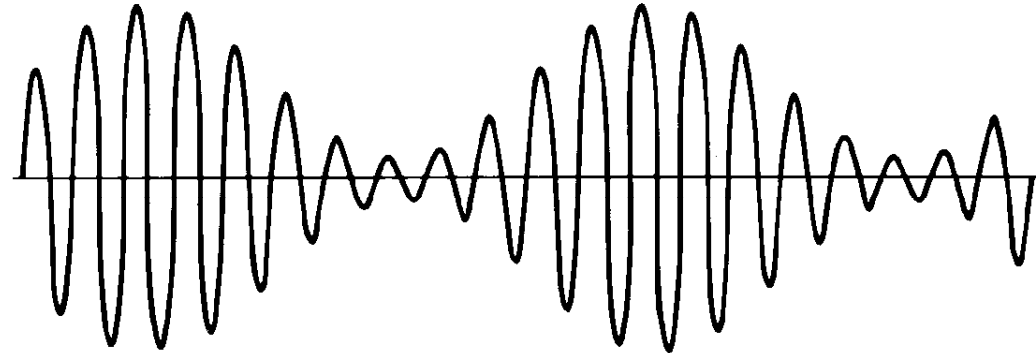
Analog Modulation Techniques



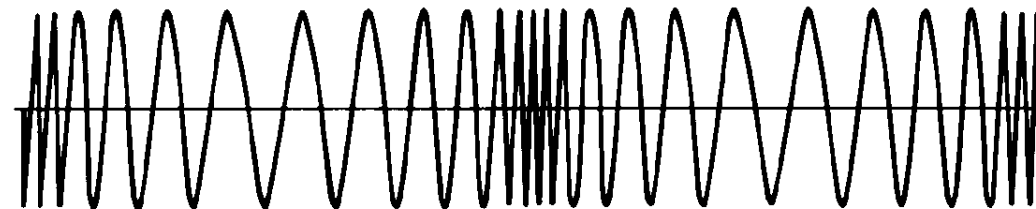
Carrier



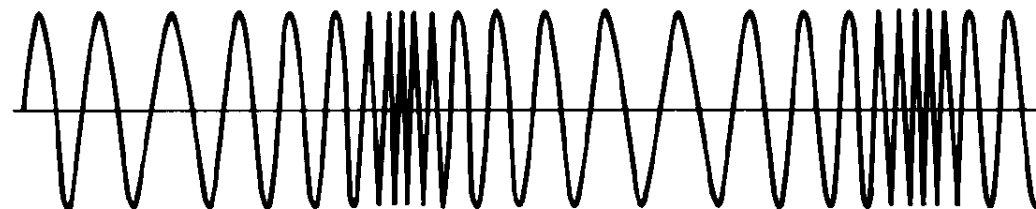
Modulating sine-wave signal



Amplitude-modulated (DSB-TC) wave



Phase-modulated wave



Frequency-modulated wave

- Amplitude Modulation
- Frequency Modulation
- Phase Modulation