Ch 14 exercise

1) A waveform travels in space at a rate of approximately 300 million meters per second. The wavelength of sine wave is the actual distance in space that is used by one sine wave as it travels. What is the wavelength of a 100-MHz sine wave? What is the wavelength of a 500-MHz sine wave? Antenna to send and receive electromagnetic waves are often sized to be one-half of the wavelength for the particular wave being used. Compare your previous calculations to the size of VHF and UHF television antennas. How large would be a ½ wavelength antenna have to be to transmit a 60-Hz wave?

1) Wavelength = speed of light / frequency

   Wavelength = (3 * 10^8)/(100*10^6)

   = 3m

2) Wavelength = speed of light / frequency

   Wavelength = (3 * 10^8)/(500*10^6)

   = 0.6m

3) Wavelength = speed of light / frequency

   Wavelength = (3 * 10^8) / 60

   = 5 * 10^6

   Height = Wavelength/2 = 2500KM

2) What is the carrier frequency of your favorite radio station? Is the station amplitude modulated or frequency modulated? How do you know? What is the bandwidth of this station? (Hint: what is the carrier frequency of the next nearest possible station on the dial?

Favorite radio station 94.5MHz. it is Frequency tweaked in light of the fact that FM radio uses recurrence adjustment. The recurrence band for FM radio is around 88 to 108 MHz. The FM stations are appointed focus frequencies at 200 kHz partition.

Next closest Station to 94.5 is 94.7