**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?**

*Answer:*

Wavelength formula is 

 is the speed of light

f is the frequency of the wave

:So, the frequency is 

So, the wavelength is



Again wavelength is 

The frequency of the wave give is



So, the wavelength is



Calculating the wavelength of a wave with frequency f=60 Hz:



Therefore, size of the antenna should be 1/2 of the wavelength, so:



**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?)**

*Answer:*

My Favorite Radio station Carrier frequency is 93.5 and Its a Frequency Modulated as it’s an 93.5 FM where FM stands for Frequency Modulation. While its Bandwidth is 101 – 93.5 = 7.5 bits/sec. FM radio works the same way that AM radio works. The difference is in how the carrier wave is modulated, or altered. With AM radio, the amplitude, or overall strength, of the signal is varied to incorporate the sound information. ... FM signals have a great advantage over AM signals.