You've probably heard about "AM radio" and "FM radio," "VHF" and "UHF" television, "citizens band radio," "short wave radio", Amateur Radio and so on. Have you ever wondered what all of those different names really mean? What's the difference between them?

Radio Frequencies
A radio wave is an electromagnetic wave propagated by an antenna. Radio waves have different frequencies, and by tuning a radio receiver to a specific frequency you can pick up a specific signal.

Radio Spectrum Allocations

In the United States, the FCC (Federal Communications Commission) decides who is able to use which frequencies for which purposes, and it issues licenses to stations for specific frequencies. See How Radio Works for more details on radio waves.

When you listen to a radio station and the announcer says, "You are listening to Majic 105.7 FM WMJI Fun Music from the '60s and '70s!," what the announcer means is that you are listening to a radio station broadcasting an FM radio signal at a frequency of 105.7 megahertz, with FCC assigned call letters of WMJI. Megahertz means "millions of cycles per second," so "105.7 megahertz" means that the transmitter at the radio station is oscillating at a frequency of 105,700,000 cycles per second. Your FM (frequency modulated) radio can tune in to that specific frequency and give you clear reception of that station. All FM radio stations transmit in a band of frequencies between 88 megahertz and 108 megahertz. This band of the radio spectrum is used for no other purpose but FM radio broadcasts.

In the same way, AM radio is confined to a band from 535 kilohertz to 1,700 kilohertz (kilo meaning "thousands," so 535,000 to 1,700,000 cycles per second). So an AM (amplitude modulated) radio station that says, "This is AM 680 WPTF" means that the radio station is broadcasting an AM radio signal at 680 kilohertz and its FCC-assigned call letters are WPTF.

Common frequency bands include the following:

* AM radio - 535 kilohertz to 1.7 megahertz
* Short wave radio - bands from 5.9 megahertz to 26.1 megahertz
* Citizens band (CB) radio - 26.96 megahertz to 27.41 megahertz
* Television stations - 54 to 88 megahertz for channels 2 through 6
* FM radio - 88 megahertz to 108 megahertz
* Television stations - 174 to 220 megahertz for channels 7 through 13

What is funny is that every wireless technology you can imagine has its own little band. There are hundreds of them! For example:

* Garage door openers, alarm systems, etc. - Around 40 megahertz
* Standard cordless phones (not cellphones): Bands from 40 to 50 megahertz
* Baby monitors: 49 megahertz
* Radio controlled airplanes: Around 72 megahertz, which is different from...
* Radio controlled cars: Around 75 megahertz
* Wildlife tracking collars: 215 to 220 megahertz
* International Space Station: 112-145, 621-630, 922 & 2217 megahertz
* Cell phones: 824 to 849 megahertz
* New 900-MHz cordless phones: Obviously around 900 megahertz!
* Radar for Air Traffic control: 960 to 1,215 megahertz
* GPS (Global Positioning System): 1,227 and 1,575 megahertz
* Deep space radio communications: 2290 megahertz to 2300 megahertz

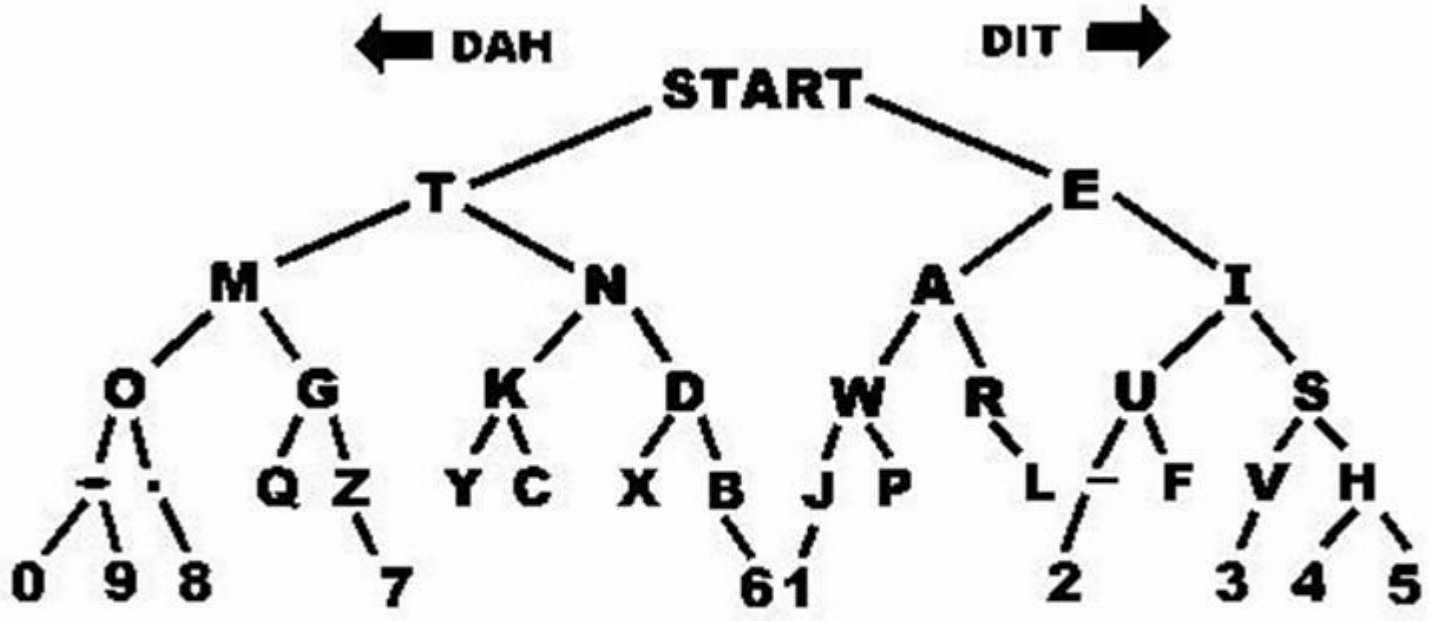
The first radio broadcasts occurred in 1906 or so, and specific frequency allocations began in the 1920's. In the U.S. Federal Radio Commission, which was the predecessor to the present day FCC (Federal Communications Commision, assigned these allocations.

Phonetic Alphabet:

A - Alpha	F - Foxtrot	K - Kilo	P - Papa	U - Uniform
B - Bravo	G - Golf	L - Lima	Q - Quebec	V - Victor
C - Charlie	H - Hotel	M - Mike	R - Romeo	W - Whiskey
D - Delta	I - India	N - November	S - Sierra	X - X-ray
E - Echo	J - Juliet	O - Oscar	T - Tango	Y - Yankee
				Z - Zulu

MORSE CODE

This is a code listening tool. Print it on your printer.
Place your pencil where it says START and listen to morse code.
Move down and to the right every time you hear a DIT (a dot).
Move down and to the left every time you hear a DAH (a dash).
Here's an example: You hear DAH DIT DIT which is a dash then dot then dot.
You start at START and hear a DAH then move down and left to the T and then you hear a DIT so you move down and RIGHT to the N and then you hear another DIT so you move DOWN and RIGHT again and land on the D



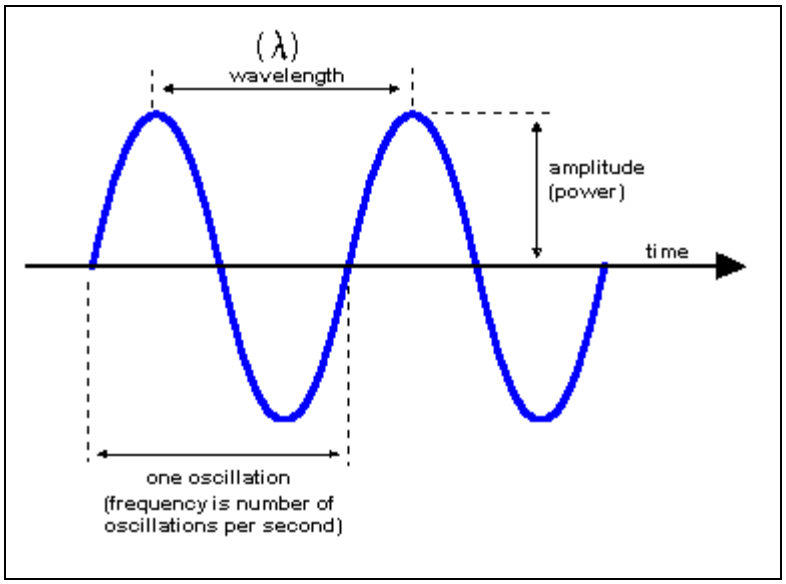
A ·– I ·· Q ––·– Y –·––
B –··· J ·––– R ·–· Z ––··
C –·–· K –·– S ··· Period ·–·–·–
D –·· L ·–·· T – Comma ––··––
E · M –– U ··– ? ··––··
F ··–· N –· V ···– / –··–·
G ––· O ––– W ·–– @ ·––·–·
H ···· P ·––· X –··–

1 ·––––
2 ··–––
3 ···––
4 ····–
5 ·····
6 –····
7 ––···
8 –––··
9 ––––·
0 –––––

Prefix	Abbr	Exponent	Digits	Name
kilo	k	10^3	1,000	Thousand
mega	M	10^6	1,000,000	Million
giga	G	10^9	1,000,000,000	Billion
tera	T	10^{12}	1,000,000,000,000	Trillion

1,000,000 Hertz = 1000 kilohertz = 1 megahertz = 0.001 gigahertz

1 Hertz = 1 Cycle per Second

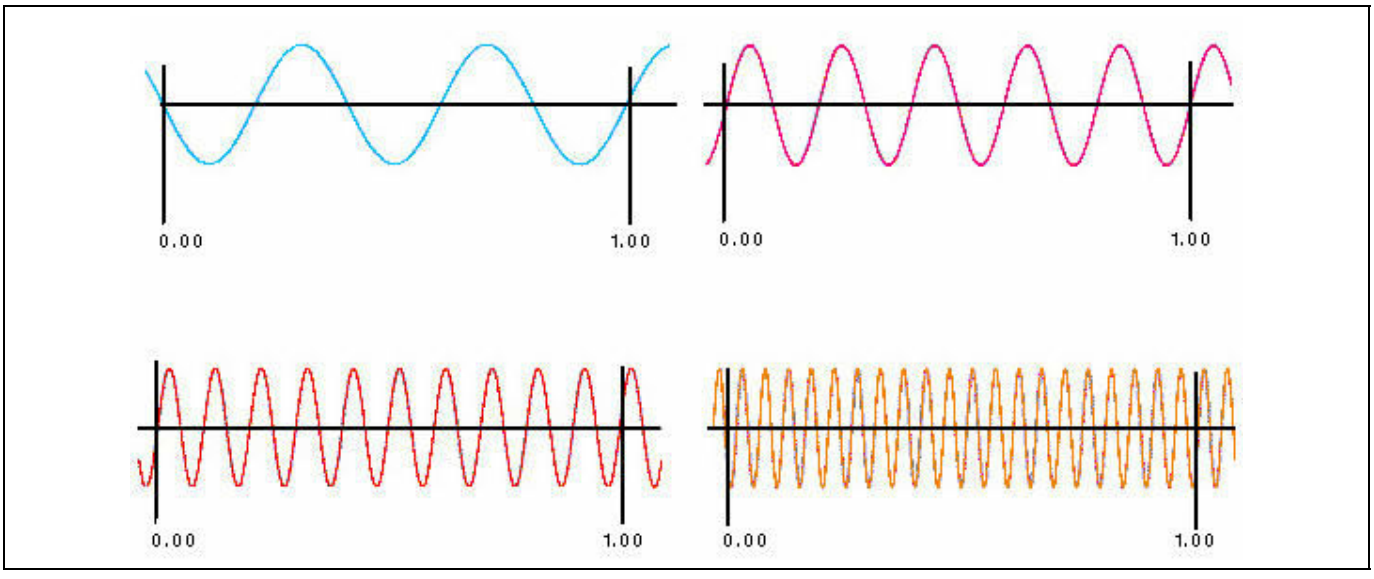


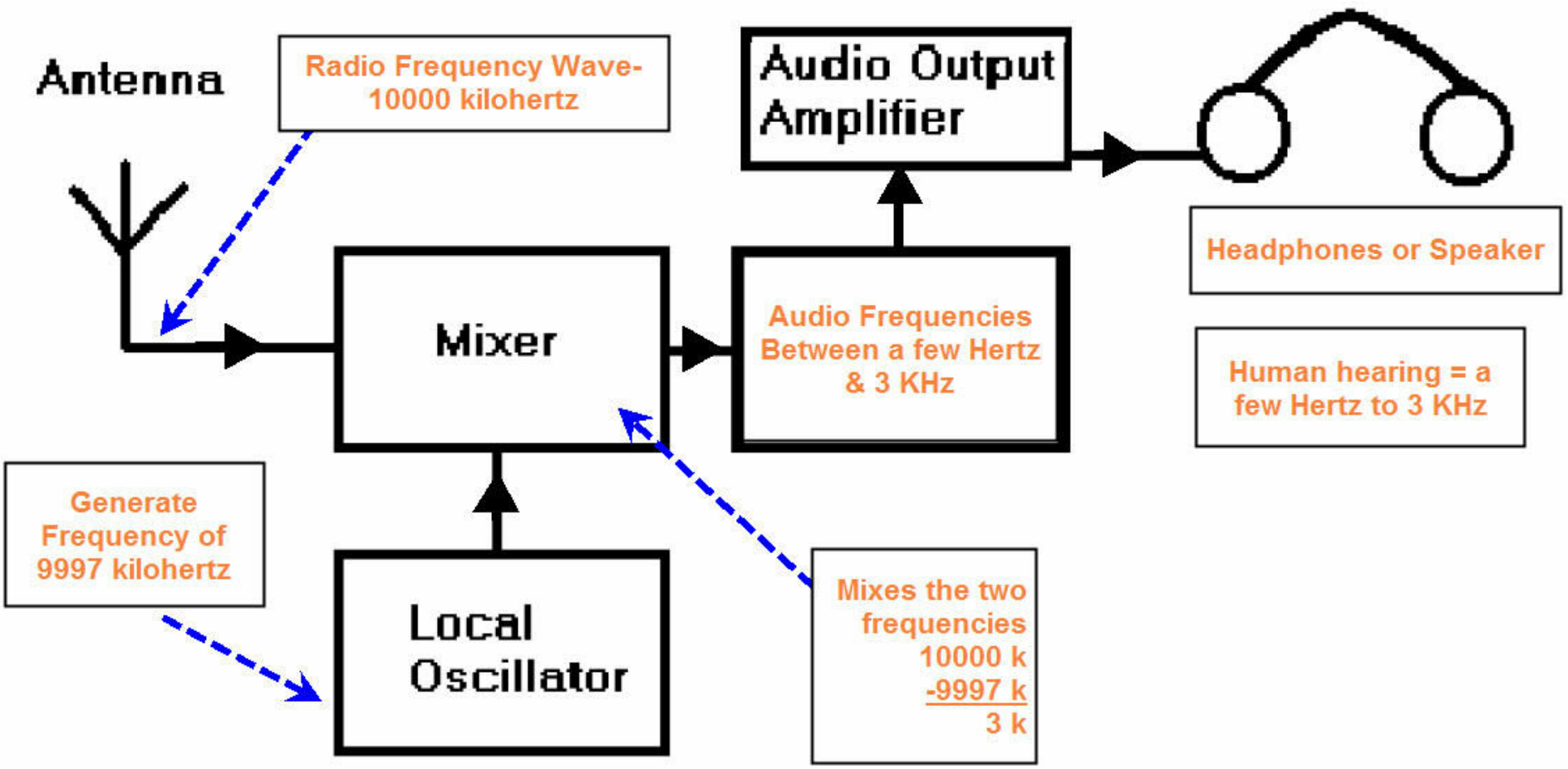
Formulas for Frequency & Wavelength

Wavelength (in meters) = 300 / frequency (in Mhz)

Wavelength (in meters) = 300000 / frequency (in kHz)

1 meter = 3.28 feet (or approximately 1 yard)




Antenna
Radio Frequency Wave-
10000 kilohertz
Audio Output
Amplifier
Headphones or Speaker
Mixer
Audio Frequencies
Between a few Hertz
& 3 KHz
Human hearing = a
few Hertz to 3 KHz
Generate
Frequency of
9997 kilohertz
Local
Oscillator
Mixes the two
frequencies
10000 k
-9997 k
3 k