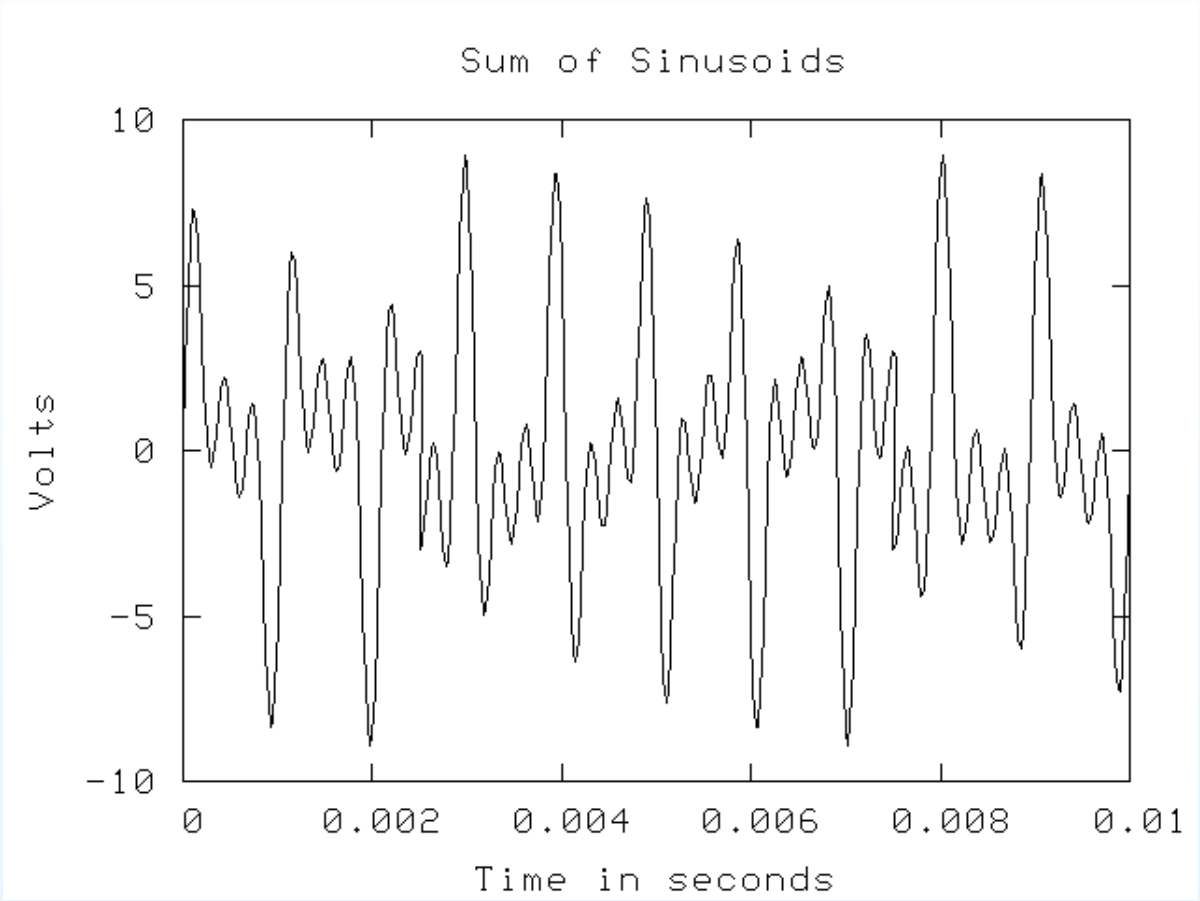
Bandwidth

- All media have a bandwidth which is the range of frequencies they can transmit successfully.
- A signal has a certain bandwidth or range of frequencies required to transmit the signal.
- A perfect digital signal has infinite bandwidth.
- Sinusoids can be combined and the bandwidth is the range of frequencies required for all channels of the signal.
- The bandwidth of a signal helps determine the type anD quality of the medium that must be used.

A Mixed Signal



Broadband

- Broadband is a generic name for signaling methods that multiplex more than one signal on a single medium simultaneously.
- Examples are cable modem traffic, Digital Subscriber Line (DSL) and 802.11.
- Similar methods are used in transmitting radio through the airwaves, or television channels through a cable.
- Broadband is commonly accomplished by using Frequency Shift Keying and Frequency Division Multiplexing.

Example,

Band	Bandwidth	Use
1000 - 11,000 Hz	10,000 Hz	User 1 Data
13,000 - 23,000 Hz	10,000 Hz	User 2 Data
25,000 - 35,000 Hz	10,000 Hz	User 3 Data
40,000 - 100,000 Hz	60,000 Hz	DSL Traffic
120,000 - 1 MHz	880 KHz	Compressed Video
2 MHz - 8 MHz	6 MHz	Standard TV
10 MHz - 16 MHz	6 MHz	Standard TV
20 MHz - 40 MHz	20 MHz	Ethernet Bridge
44 MHz - 144 MHz	100 MHz	Wireless Bridge

How Broadband Works

- Each signal is encoded and transmitted on the medium.
- The combined signal has all components.
- Receivers are tuned to extract a particular component and decode it.
- Guard bands are usually needed.