EECS306
Amplications

Submitted To:

Eng. Hussein Ahmed

Submitted By:

Youssef Ahmed Abdelbar 1210090

1-AM Two-Way Radio

What Exactly Is A Two-Way Radio?

A two-way radio can transmit and receive audio signals. It offers two-way communication between two people or a group of people. For the two-way radio to work both parties should have a radio that uses the same frequency.

Two-way radios come in a variety of different styles. Some two-way radios are stationary while others may be handheld or mobile.

Most of them give the operator the ability to listen and talk. However, you cannot listen and talk at the same time.

Two-way radios have a push-to-talk button that allows the person that is using it to transmit their message by pressing the button.

How Do Two-Way Radios Work?

The main way that two-way radios work is by having a similar frequency. When people are talking to each other they must tune their devices so that they are on the same frequency.

This is often referred to as a channel. A radio frequency describes the number of oscillations of a radio wave. The radio waves are electromagnetic forces that allow communication to take place between the devices.

The Main Parts Of A Two Way Radio

Two-way radio devices consist of three main parts, these are the receiver, the antenna, and the transmitter.

The job of the transmitter is to send radio messages over a specified frequency. The antenna on the device helps the transmitter to create radio waves. Once the receiver gets the radio waves it interprets the information.

Other Important Two-Way Radio Parts

Two-way radios have several other parts that help them to function. There is a loudspeaker that helps to relay the messages to the operator. The push-to-talk button allows the operator to speak whenever the button is pushed.

There may also be a separate microphone that allows you to record your messages. Some devices integrate the microphone and the loudspeaker.

When it is time to purchase your two-way radio make sure you ask about each of these parts so that your choices may be more informed.

The Benefits Are Endless

Now that you know exactly how two-way radio works, you will now be able to make better decisions about which one you want to buy.

Two-way radios are a good choice because they offer instant communication. In an organization instant communication on critical matters is important.

If you would like more informative tips, please visit the useful tips section of the website

2-FM broadcasting

FM Radio, short for Frequency Modulation Radio, is a technology and broadcasting system used to transmit audio content, including music, talk shows, news, and more, over the airwaves. FM radio operates by varying the frequency of a carrier wave in response to the amplitude (intensity) of the audio signal. This modulation process allows for the transmission of audio signals through electromagnetic waves.

- **Frequency Modulation:** Unlike AM (Amplitude Modulation) radio, which varies the amplitude of the carrier wave to transmit information, FM radio varies the frequency of the carrier wave. This frequency modulation encodes the audio signal.

- **FM Band:** The FM broadcast band typically spans from 88 to 108 megahertz (MHz) on the radio frequency spectrum

- **Station Tuning:** Listeners use FM radio receivers, such as car radios or home stereos, to tune in to specific stations. Tuning to a particular station involves selecting the corresponding frequency on the receiver.

How do FM radios work?

FM (Frequency Modulation) radios work by receiving, demodulating, and reproducing audio signals that have been transmitted using frequency modulation. Here's a step-by-step explanation of how FM radios work:

1. **Reception:** The process begins with the radio's antenna. The antenna captures electromagnetic radio waves that have been broadcast by FM radio stations. These waves travel through the air and carry the encoded audio signal.
2. **Tuning:** FM radios have a tuner, typically controlled by the user. When you tune to a specific station, you adjust the tuner to select a particular FM frequency. Each FM station broadcasts its signal on a specific frequency within the FM band.
3. **Demodulation:** Once you've tuned to a specific frequency, the radio receiver captures the carrier wave associated with that station. The carrier wave has been frequency-modulated to encode the audio signal.
4. Inside the radio, the incoming carrier wave is passed through a demodulator. The demodulator's job is to detect changes in the frequency of the carrier wave.
5. **Audio Signal Extraction:** As the demodulator detects these frequency changes, it converts them back into the original audio signal. Essentially, it's reversing the modulation process that was applied during transmission.
6. The recovered audio signal now contains the music, speech, or other content that was originally broadcast.
7. **Amplification:** The demodulated audio signal is usually quite weak at this stage. To make it strong enough to drive a speaker and produce sound, it's passed through an amplifier.
8. **Audio Output:** The amplified audio signal is then sent to a speaker or headphones, where it is converted into sound waves that you can hear.

References:

https://www.lateet.com/the-complete-guide-to-understanding-how-two-way-radios-work/

https://www.tvradiotips.com/what-is-fm-radio-work/#:~:text=FM%20radio%20operates%20by%20varying%20the%20frequency%20of,has%20been%20widely%20used%20since%20the%20mid-20th%20century.