What is DMR Ham Radio?

Source: Excerpts from John Draper
https://www.savenetradio.org/what-is-dmr-ham-radio/

DMR ham radio users are the fastest growing network of amateur radio enthusiasts. Digital Mobile Radio, on the surface, is a radio that's connected through the internet. However, as we dig into the layers of DMR ham radio, you'll discover there's a lot more to it.

DMR ham radio is an open standard radio network optimized through efficient bandwidth use via Time-Division Multiple Access. TDMA divides communication into time slots, which ensures the senders and receivers can communicate uninterrupted in two separate conversations without changing the frequency.

DMR is an open standard which means any company can manufacture a compatible product. This increases DMR radio market competition for better hardware and lower consumer prices, making the DMR ham radio community super accessible. Follow along to learn the basics and get started in the DMR Ham Radio world.

What is DMR Ham Radio and Why Use It?

DMR was developed to provide easy and inexpensive access to a public radio network. Produced by the European Telecommunications standard Institute (ETSI) in the mid-1980s, DMR soon became the global preference of many radio enthusiasts.
Although there are a few other radio modes (some you can connect with through the DMR network), DMR remains the largest and fastest growing radio network.

Other radio modes include:

- P25 (Police Scanner)
- Yaesu System Fusion
- D-Star
- NXDN4800
- POCSAG

How Do I Get Started in DMR Ham Radio?

Before you get started with DMR you'll need to get a DMR ID and to do that you'll need to be a licensed amateur radio operator or licensed ham. You can listen in on certain DMR broadcasts online, but to access the DMR network you'll have to connect to a DMR ID programmed radio.

Attempting to use an unregistered device or tampering can result in sanctions from the FCC so make sure to follow this protocol.

What is a DMR network?

The main access point of a DMR ham radio is through the DMR network. Imagine a network of radios connected through the internet.
Now imagine that your internet service provider has its own network, and you can still communicate with other ISPs, **but** you can also communicate solely within that network as well, almost like Xbox and Playstation standalone games and/or the inclusion of cross-platform games.

There are two ways to connect to a DMR Network

- Repeater network/Multimedia Digital Voice Modem (MMDVM)
- Stand-alone repeater/Simplex (one to one correspondence)

Repeaters and Hotspots communicate through a digital networking interface called TCP/IP, commonly associated with the internet. This interface transfers encoded information between two points, either privately or publicly. This includes the transmission of text, email, and GPS functionality. Your radio must have an AMBE +2 Vocoder to transmit the encoded signal.

What is an AMBE +2 Vocoder and How Does it Work?

The AMBE +2 Vocoder is a DMR standard. With the vocoder, your analog voice is encoded into a digital signal, where a radio with a matching digital signal can decode it back into analog sound. This step ensures a higher audio quality than a plain old voice transmission through FM.

What is a Hotspot?

Hotspots in DMR are similar to the cellular hotspots that most of us are already familiar with. You would use it in a pinch or for lack of service. Radio hotspots work the same way, if you lack repeater access, you can use a hotspot to access a specific DMR network.

Which DMR Network Should I Use?

There are many DMR Networks to choose from, the three most common being DMR-Marc, DMR+, and Brandmeister. These networks have worldwide availability. However, you may only have limited access to international networks depending on your license.

What is a Codeplug?

Codeplugs contains the information used to program your radio on the DMR network. This information will vary from radio to radio and specifies information like frequency and accessible Talkgroups. A Codeplug is essentially access software that you “plug” in manually.

What is a Talkgroup?

Talkgroups are chat rooms where you can send out a signal via a DMR Network and other users linked to that Talkgroup can reply to your message from that same channel. You can select from over 1500 Talkgroups manually from all over the world. Some of these Talkgroups include:

- Local Repeater Talkgroups
- Statewide
- Regional
- Country Specific
- Special Interests Groups ie, Public Safety.
- General Amateur Radio Groups

Tier I, Tier II, and Tier III Explained

Tier I is the lowest tier of communication and certain products can be purchased specifically for each tier. Tier I products operate under 446Mhz and cannot use repeaters; they are simplex only.

Tier II allows for normal DMR processes and is used by all amateur DMR networks. They are not limited to any frequency. Allows for use of repeaters.

Tier III has all the functionality of Tier II plus trunking. Tier III optimizes the transmission of voice, text, and data messaging.

What is Trunking?

A trunked radio system allows for the connectivity of multiple users on the same frequency and is most commonly used for business and P25 (Police Scanner). Users do not select the specific channel and as a result, there are multiple users designated to channels by a computer for efficiency.

What DMR Radio should I buy?

You have two choices here, either a DMR Portable or a DMR Mobile. The DMR Portable is a low-power device and resembles a walkie-talkie. The DMR Mobile is a high power device, but since DMR operates so efficiently, these models are generally reserved for use in commercial radio and look much like the radios police cars have in them.
Below is a list of popular radios for each type.

DMR Radios Brands.

- Anytone
- Baofeng
- Motorola
- Connect Systems
- Hytera
- Ailunce
- Btech

DMR Mobile Radios

- Kenwood
- Kydera
- Anytone
- Vertex
- Motorola
- Yeasu
- Whistler