How do I?

An occasional series

This week: More fun with DMR–Do I Need a Hotspot?

## What is a hotspot?   Do I need one?

Digital Mobile Radio or DMR has been one of the major players in the VHF/UHF world for a few years now.

Digital radio entered the amateur world about 20 years ago. The first main stream entry was from the Japanese Amateur Radio League (JARL) and is known as D-Star or Digital Smart Technologies for Amateur Radio. D-Star was offered commercially by Icom, and Kenwood has also offered it.

About the same time, Yaesu created its own entry, with similar features but using analog technology instead of digital, called WIRES. WIRES became WIRES II , WIRES-X, and in its current form it is known as System Fusion or C4FM, which is completely incompatible with the original format.

Both Fusion and D-Star have their adherents. There are D-Star repeaters and there are Fusion repeaters. Both of these systems offer the ability for long distance communication on VHF and /or UHF frequencies by using an internet bridge between users. For additional information on both, please follow the trail to https://www.radioclub-carc.com/resources/.

At its simplest, the internet bridge is simply VoIP or Voice over Internet Protocol. For more on VoIP follow the trail to https://www.radioclub-carc.com/resources or see the ARRL publication:
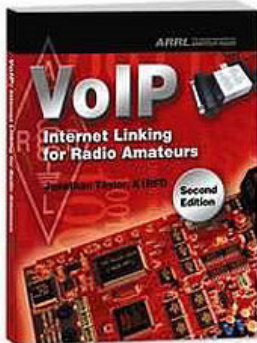
Available at booksellers including:
www.abebooks.com

ISBN 978-0-87259-143-1

Don't overpay for your purchase.
The cover price is $21.95

This is a valuable work explaining the principles of VoIP. In a nutshell, D-Star and Fusion are simply proprietary ways of using VoIP without having to reinvent the wheel.

EchoLink implements the same VoIP concept and it is an analog technology. The original WIRES system from Yaesu was analog as well. This writer believes that one reason WIRES never became more popular was that buyers were not sure why initially only Icom offered D-Star and why did Yaesu offer WIRES instead of offering their own line of D-Star products. Most likely, buyers in the market were afraid of backing the technology-loser similar to what happened in the VHS vs. Betamax videocassette recorder scenario. EchoLink is fairly easy to set up and use. Please see https://www.radioclub-carc.com/resources for more information.

DMR technology is derived from commercial radios. In some ways it is not as user friendly, but has a very large worldwide user base. Users can communicate locally using FM simplex or through digital DMR repeaters. In that sense DMR is no different than analog or D-Star. What I think draws people to DMR is that the radios offered under various brand names are manufactured by fewer firms and sold at prices usually lower than a D-Star or Fusion radio. While many users are perfectly content with local communications, a DMR hotspot or gateway allows the radio to have internet access and can connect users to other continents using a 2 meter or 70cm radio. The hotspot is simply a USB device, typically equipped with a very short UHF antenna. The radio communicates to the hot spot, and the hot spot transfers the radio signal to the internet.
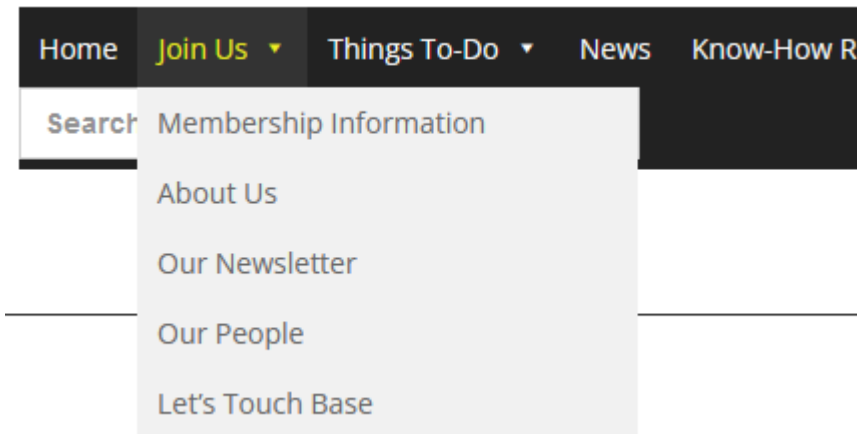

Above Left: ZUMspot D-Star HotSpot   Above Center and Right: MMDVM Generic HotSpots

Many of the hotspots, regardless of brand, appear to be nearly identical. While some use Windows 10 or Linux operating systems, many of the most popular hotspots work with a Raspberry Pi microcomputer. It appears that if you already own a Pi device, and if you are familiar with its operation, that adding the hotspot maybe a fairly low-cost and straight forward solution. If you do not already own a Pi device you may want to acquire one that plugs into a Windows or Linux computer.

The basic operation is the same and many hotspots work with DMR, D-Star, Fusion and less common modes such as NXDN, P25 and others. None of the hotspots can help a Fusion radio operate D-Star, but they will expand the operating potential of your digital radio. For me, maximizing play value is a key factor in whether or not a particular piece of hardware gets invited into the shack.

There are numerous videos and websites that can assist you in programming your hotspot. If you watch this space, in the not too distant future we hope to offer some **How To Tips** on getting a ZUMspot hotspot to play with either DMR or System Fusion.

Hopefully you have enjoyed today's look at digital modes and hotspots.
If you have questions or suggestions, please contact us via the webform that can be found under the **Let's Touch Base** tab at https://www.RadioClub-CARC.com/touch-base

Catch 'ya on the air!