Just What is this DMR Mode you've been hearing about?

HOPEFULLY AFTER THIS SHORT PRESENTATION YOU WILL HAVE A BETTER HANDLE ON JUST WHAT DMR IS AS IT IS USED BY THE AMATEUR RADIO COMMUNITY.

Without getting too technical DMR simply stands for "DIGITAL MOBILE RADIO" and is used commercially and by Hams world wide.

Right now the DMR mode is being used in the FM portions of the 2 meter and 70 centimeter United States Amateur bands as well as worldwide. **However, in this general area most of the DMR action is confined to 70 centimeter band.**

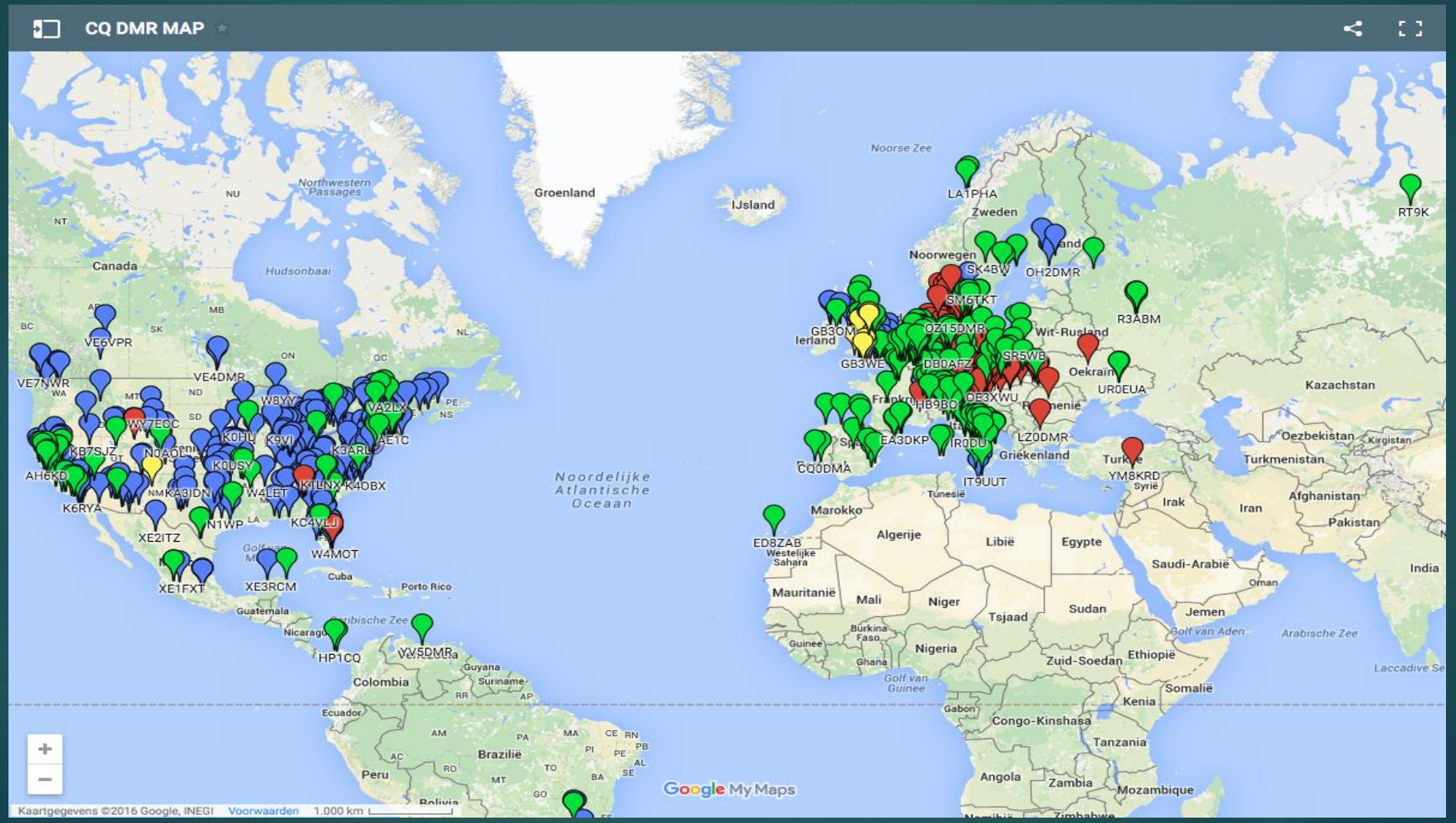
A very helpful guide to all things DMR by W2XAB

This 20 page document in pdf format can be found on the internet. In the 20 pages you will probably find answers to many questions you might have about DMR. Best of all its free! (www.trbo.org/docs/amateur_radio-guide_to_DMR.pdf)

We have all heard of D-Star and System Fusion, but DMR is coming on strong worldwide in the Amateur community.

- According to a 2015 article in QST "Amateurs have implemented DMR with over 1400 repeaters and 16,600 user radios registered worldwide."
- Further QST states that "a majority of the repeaters are interconnected over the internet. There are a number of US regional and state networks, and most are interconnected with the DMR-MARC (Motorola Amateur Radio Club)."

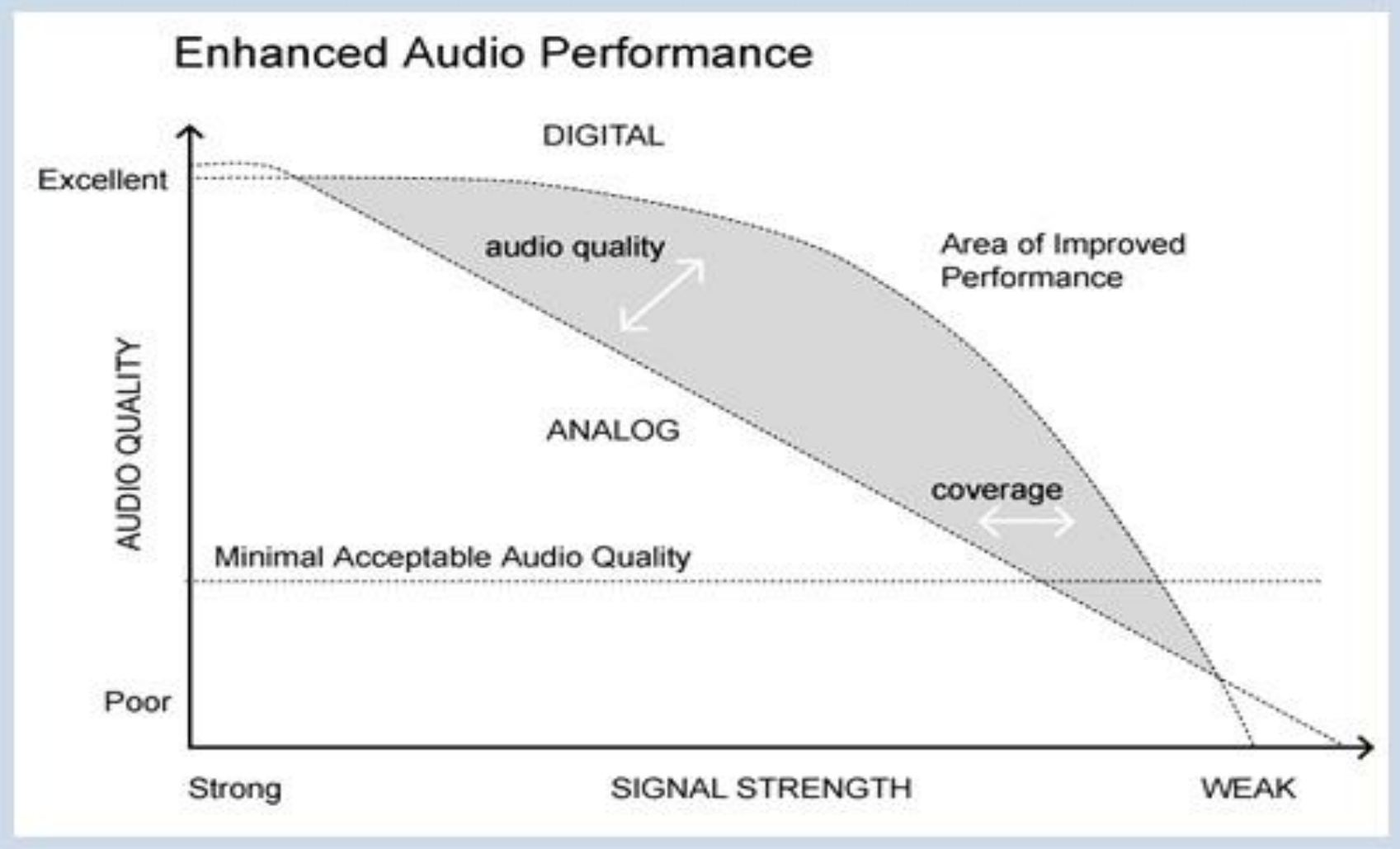
DMR Repeaters are now spreading worldwide and expected to continue to greatly increase.



An advantage of DMR over analog FM that adds to its growing popularity:

- Unlike using conventional analog FM repeaters the audio quality of a DMR repeater **does not as easily degrade as the distance from the repeater increases**.
- DMR signal audio only starts to degrade at the **extreme edge of the repeater coverage area**.

DMR Digital vs Analog FM



DMR Audio Quality

- All the digital modes such D-Star, Fusion and DMR have some level of robotic sounding speech at times.
- DMR has no more or less of the sometimes objectionable robotic sound of the other two digital modes.
- One of the big advantages of DMR is that **it takes up less than half the band width of the other two modes.**

Summary of DMR advantages over analog FM

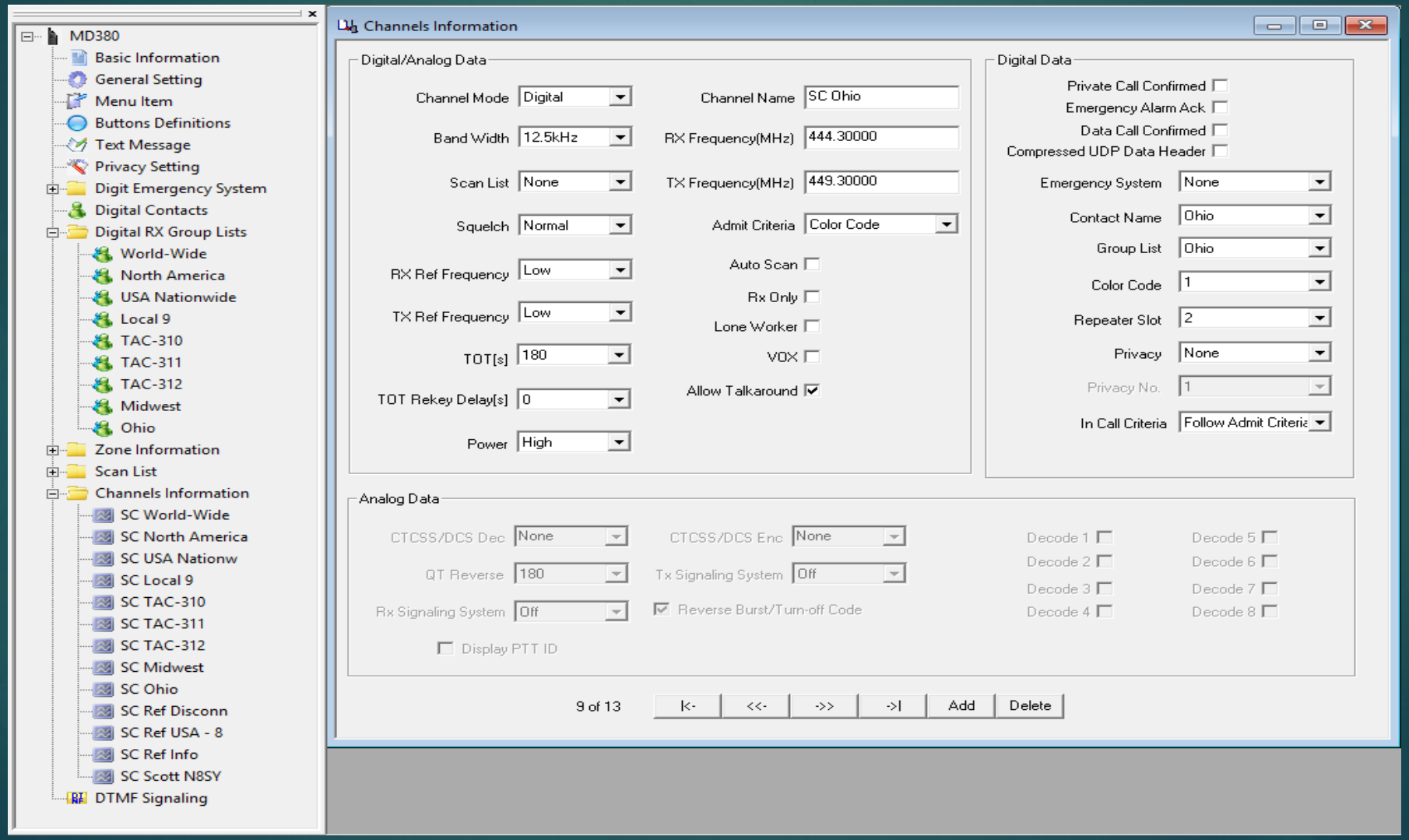
- Allows **two** simultaneous voice transmissions on one repeater.
- **Lower prices** for DMR radios because there are more than a dozen manufacturers.
- **Longer battery life**, up to **40%** more, than a conventional analog FM radio. Really makes a difference with HT's.
- **Better spectrum** use than analog FM. DMR channels are **12.5 kHz wide** while analog channels are **25kHz wide**.
- Improved **signal range** over analog.

Programming a DMR Radio

- Like any other digital radio these radios must be programed. DMR radios require a **CODEPLUG** to program them.
- A **CODEPLUG** is simply a configuration file for your radio. The **CODEPLUG** includes memory channels, scan lists, user preferences, menus options and other settings.
- It is possible to go on the internet to find **completed CODEPLUGS for local regions**; many hams share CODEPLUGS.
- An easily obtained **User ID number** is also required to be programed in the radio before using it.

Before you use a DMR radio on any of the many repeaters or Zones you **must first register** your request with the following organization. This easy task can be done on their website (www.dmr-marc.net) and you will receive your "**User ID**" number **within 24 hours or less**.

Screen Shot of one component of CODE PLUG for the TYT MD-380 and MD-9600.



The Miklor Website

This website (www. Miklor.com) is an invaluable source of information for all ham radio VHF and UHF radios and modes. It has FM programing software, **CODEPLUGS** and radio reviews. Plus lots of other useful VHF/UHF topics.

A SharkRF openSPOT gives the DMR operator flexibility to go anywhere through a connection to an internet router.

When a SharkRF openSPOT is connected to an inexpensive portable router (tp-link) and smart phone Hot Spot, a Ham can use their HT literally anywhere in the world through the internet.

An HT, like this TYT MD-380 can be connected to the internet, in this manner, and then thru DMR repeaters around the world.

The DMR HT can be a good distance away from the openSPOT, with a set up like this one, and still get a signal into the internet and then out to anywhere.

A neat set up to allow one to take their openSPOT anywhere they go!

A sturdy plastic water proof case protects this set up.

This box contains the heart of portable/mobile setup.

- 20 Ah lithium 5 Volt rechargeable battery power source.
- SharkRF openSPOT.
- Tp-Link small portable router.
- Mobile Hotspot (takes the place of a smart phone or iphone). Of course a smart phone or iphone works just as well.
- The tiny remote in the lower right corner is only used as a spacer.

Another complete portable/mobile in a sturdy, waterproof PELICAN case. On the right the MD-380 is stored safely in a felt bag.

DMR HT's and a Mobile rig by TYT

Rig Descriptions

- The TYT MD-380 on the left is programed with a CODE PLUG for a **BrandMeister** repeater or Zone in Newtown Square, PA.
- The TYT MD-380 on the right has a CODE PLUG with many repeaters or Zones in the Tri-State area.
- The 50 Watt Mobile rig is the TYT MD-9600, which has just been brought out for DMR
- The TYT MD-9600 uses a CODE PLUG that also works in the MD-380!

DMR-MARC vs BRANDMEISTER

DMR-MARC and BRANDMEISTER are competing operating software packages for master internet servers participating in a worldwide infrastructure network of amateur digital voice systems. **In simple terms it is like comparing the computer operation systems of WINDOWS, LINUX and IOS for MAC. Some people like chocolate and some like vanilla. It all comes down to personal preference.**

One last point worth mention about DMR!

- The newer digital modes are frequently criticized as not being real Amateur Radio because they rely on the Internet for linking.
- Many in the Amateur Radio Community feel that if our modern digital communications infrastructure were to be somehow compromised the newer digital modes would be as well due to their reliance on the internet for linking.
- The above scenario would not apply to DMR repeaters as they would continue to function as stand alone repeaters.
- The DMR repeater, as mentioned earlier, has a big advantage over the analog repeater because of its two available channels and talkgroups.

We hope this presentation has given you an introduction to DMR

This presentation was brought to you through the collaborative efforts of the following amateurs:

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LOONEY TUNES
"That's all Folks!"