

A Gentle Introduction to DMR Codeplug Programming

Dave Wickert AE7TD

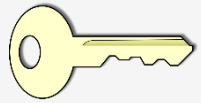
Eric Jarvi AD7F

What is DMR?



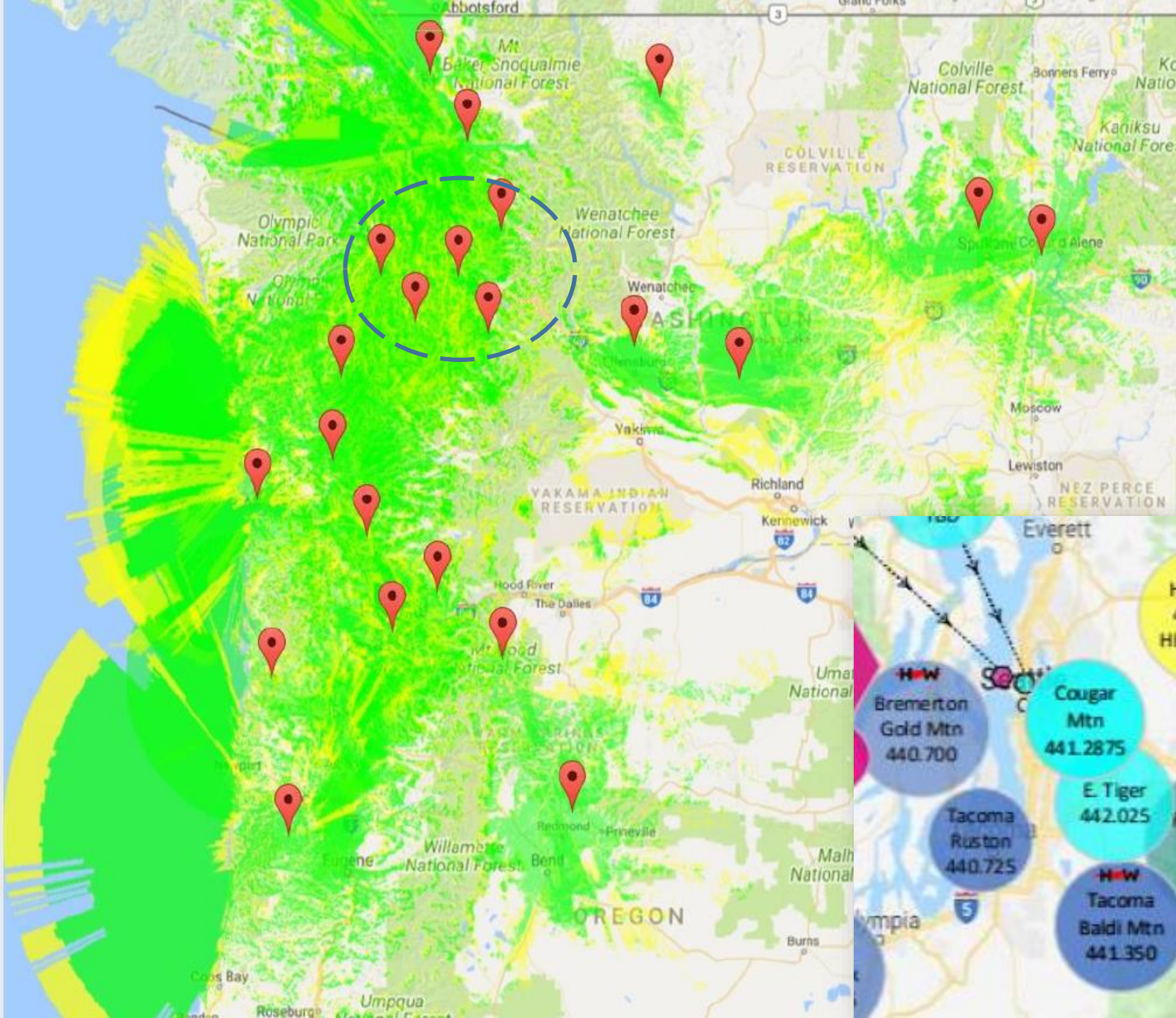
- **D**igital **M**obile **R**adio is an European Telecommunications Standard Institute protocol for transmitting information. Standard support a single 6.25 kHz channel or 2 channels with 12.5 kHz transmission bandwidth.
- Uses the DVSI AMBE+2 voice encoder decoder (vocoder) to digitize audio and compress the data.
- Standard provides for two simultaneous conversations over one repeater frequency.
- Internet Connection allows repeaters over wide areas to link together supporting regional, national or world wide coverage

Key Concept: DMR derives from commercial radio systems



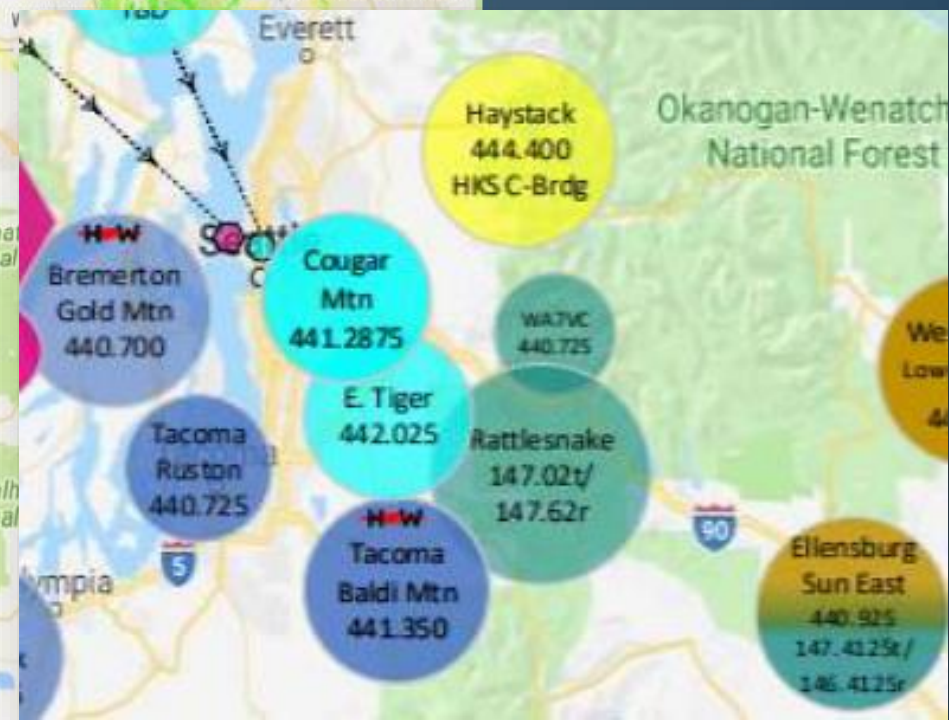
Whenever you see something unusual or unexpected in DMR, e.g. “separate transmit and receive frequencies” rather than a “receive frequency + an offset”, always remember that DMR was developed to support commercial Land Mobile and public services; not ham radio.

This covers everything from terminology (e.g. a color code), to its core functions (separate timeslots). Never forget this key concept.



PNW DMR COVERAGE

2017-11-14



DMR Brandmeister Nets

* Example of a statewide nets (lots more available)

** Our PNW area talkgroups on BrandMeister

<u>Name</u>	<u>Day</u>	<u>Time</u>	<u>Talkgroup</u>
PAPA DMR Roundtable	Mon	20:00 PST	California 3106 *
RVing Hams	Mon	21:00 EST (18:00 PST)	KC2RC WIRESEX 31653
Pennsylvania Statewide	Tue	20:00 EST (17:00 PST)	Pennsylvania 3142 *
DMR Information Net	Tue	19:30 CEN (17:30 PST)	DMR Info Network 31648
North Star Digital Net	Tue	21:00 EST (18:00 PST)	STEM 31630
North American Astronomy Net	Wed	20:00 CST (18:00 PST)	TAC 312 312
North America Tech Net	Wed	18:00 PST	North America 93
After Ham Nation Net	Wed	19:10 PST	TAC-311 311
Pacific NW	Wed	19:00 PST	PNWR 31771 **
Oregon Statewide	Wed	20:00 PST	Oregon 3141 **
Arkansas Skywarn	Thu	20:00 EST (17:00 PST)	Arkansas 3105
PAPA Technical Round Table	Thu	20:00 PST	PAPA Bridge 31078
BM Worldwide Net	Sat	14:00 UTC (07:00 PST)	Worldwide 91
Outdoor Adventure Net	Sat	10:00 PST	OAG 31772
Outdoor 4x4 Net	Sat	12:30 PST	OAG 31772
DigiComm Breakfast	Sat	06:00 PST	The Guild 31674
TAC-310 Net	Sun	00:00 UTC (Sat 17:00 PST)	TAC-310 310
DMRTrack Net	Sun	18:00 CEN (16:00 PST)	DMR Track 31489
Midnight Net	Sun	21:00 PST	TAC-310 310

Last time – we did a conceptual introduction

From:

[Kevin Loughin](#) KB9RLW

“The Old Tech Guy”

Published on Aug 2, 2017

“Ham Radio - DMR radio discussion How it works”

<https://www.youtube.com/watch?v=5ZawJek5z9c>

Now . . . Let’s see how this is reflected in a DMR radio’s programming, i.e. its “codeplug”

Terms

- **Codeplug:** This is the term used for the program that is loaded into the radio which will define its operational “personality”, in terms of Zones, Channels, Scanning, etc.
- **CPS** (Customer Programming Software): This is the term used for the Software that is used to create, load and maintain the “Codeplug”.

Sourced from:

- Your hardware vendor, or
- (if you are lucky) <http://n0gsg.com/contact-manager/>

Key components

- **Channels**

- Digital: Frequency, Color Code, Talk Group
- Analog: Frequency, PL Tone/DCSS

- **Contacts**

- Private Call: DMR ID or CALL SIGN
- Group Call: TG NAME or TG ID
- Broadcast Call: Receiving parties cannot transmit (not used in ham radio)
- All Call: Calls anyone (not used in ham radio)

- **Zones:** aka “folders of channels” typically representing either: a repeater or a geographic location

- **Scan lists** (we will leave this for a later “reloaded” presentation)

Let's dive right in !



We will reverse-engineer my current MD390

Codeplug . . .

What's next for us?

1. Done:

- Introduction to DMR video (Apr '19)
- A Gentle Introduction to DMR Codeplug Programming (May '19)

2. Upcoming series of 20-min LWHC Tech Talks in the months to come on:

- DMR Radio Selection Criterion: "Best-in-Class" DMR radios
- Using Local PNW DMR repeaters, e.g. Cougar Mtn covers the general Seattle area (including us)
- Revisiting DMR Radio programming, aka "Codeplug Reloaded"
- Using a DMR Hotspot as your part of your DMR solution: installation and configuration

3. Upcoming 1st Annual DMR Gathering at Valley Camp, North Bend, May 18th (Saturday); 9am-5pm

- Web site at: <http://www.pnwdigital.net/dmrgathering-2019/index.html>
- A flyer is available at: <http://www.pnwdigital.net/dmrgathering-2019/brochure.pdf>
- Latest Proposed Agenda: <http://www.pnwdigital.net/dmrgathering-2019/ProposedAgenda.pdf>

Additional resources

Our handouts are from:

- <https://www.qsl.net/kb9mwr/projects/dv/dmr/Introduction%20to%20Digital%20Mobile%20Radio.pdf>
- [http://noveltyhill.net/Amateur-Radio/PSRG Wiki MAINTAIN 2019/DMR/DMR Cheat Sheet WT1IM.pdf](http://noveltyhill.net/Amateur-Radio/PSRG%20Wiki%20MAINTAIN%202019/DMR/DMR%20Cheat%20Sheet%20WT1IM.pdf)

Other great resources for PNW include:

- <http://www.pnwdigital.net/> -- PNW DMR Network is a collection of 40+ open-use MotoTRBO repeaters throughout the Pacific Northwest (Washington, Oregon, Idaho). Their site includes locations, coverage maps, configuration, programming hints and sample code plugs for popular DMR radios.
- <https://web.psrq.org/dmr/> -- Puget Sound Repeater Group's DMR site contains many of the maps, graphics, and information used throughout this presentation.

*As always ... **you**Tube is your friend – abuse it!*