Welcome
to
DMR 101

BIARC meeting

Hawaii DMR

By: Blake Stene

Hawaii DMR network

DMR 101

What is DMR?

DMR Terms

What is DMR?

Where should we start?

What is DMR?

Where should we start?

MODES

What is DMR?

Digital Mobile Radio

Name some Modes

What is DMR?

MODES

D-Star, C4FM, P25 & DMR

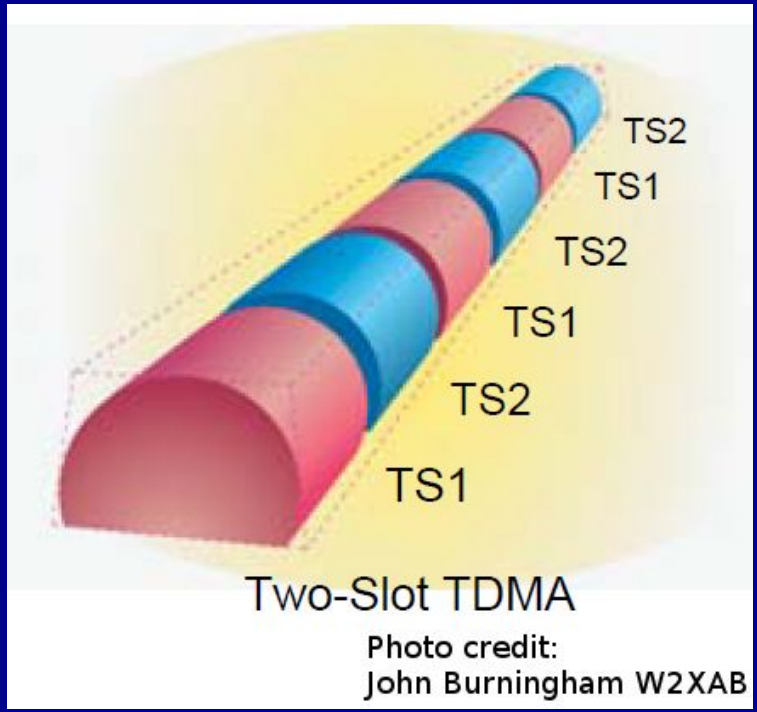
VHF/UHF Digital Modes

So… DMR is not FM?

DMR signals occupy a 12.5 kHz bandwidth shared by two “channels” (Time Slots) using Time-Division Multiple Access (TDMA), this results in a spectrum efficiency of 6.25 kHz per channel.

Each Time Slot can carry either voice and/or data depending on system design.

The two time slots are called Time Slot 1 (TS1) and Time Slot 2 (TS2).



Remember that “Time Slot” thing…

DMR is divided into three “Tiers”

Tier I (single channel)

Tier II (2-slot TDMA– the standard for Amateur Radio)

Tier III (trunking protocol)

When you purchase a DMR radio, whether HT or Base/Mobile, make certain that it is a Tier II unit!

Tier I radios will NOT WORK on our Hawaii DMR system.

If the “Product Description” does not specify that it is a Tier II unit, DO NOT BUY IT!

Terminology…

DMR Terminology

- Talk Groups (TG for short) (TG 3115 Hawaii-1 Hawaii Statewide)
- Zones
- Color Codes
- Code Plugs
- Scanning
- Simplex
- Admit Criteria

Talk Groups (TG)

- Think of a Talk Group as a repeater or as a group of repeaters that are activated when you key them up.
- Only one talk group can be using on a local repeater's Time Slot at a time. (Two time slots)
- If your radio is not programmed to listen to a talk group, you will not hear that talk group traffic.

Talk Groups (TG)

I like to think of a TG as an *Internet Access Instruction for a repeater.*

When I transmit to the (KH6KL) Repeater and I want to use TG 3115 (HAWAII TG 3115), the repeater connects via the Internet to all the Repeaters that are part of the 3115 network. (My radio tells the repeater what talkgroup I want to go on.

So, when I 'key up' my voice is sent to ALL of those repeaters. And they are ALL listening for a response!

Channels

- A Channel is a specific Talk Group on a specific repeater.

  For example: On the KH6KL Repeater, a Channel could be defined as:
- "Hawaii County"
  …which uses TG 31153 on the KH6KL Repeater frequency with appropriate related information.

Zones

- A Zone is a grouping of individual channels
- The TYT MD380 supports up to 1000 Channels
- Each Zone may have up to 16 Channels
- A Channel may be used in more than one Zone

Color Codes (CC)

- DMR repeaters use Color Codes (CC) much like analog repeaters use CTCSS or DCS
- There are 16 different CCs (CC0-CC15).
- The use of Color Codes is NOT optional on DMR systems

Code Plugs

- A code plug is simply a radio's configuration file.
- Building a code plug can take many hours, especially if you want to program hundreds of channels.

Scanning

- All DMR radios allow you to configure scanning of channels.
- You will only hear traffic on the frequency, time slot, and talk groups you have programmed on a channel.
- You can scan analog channels mixed with the digital channels.
- Scanning will decrease the battery life on your radio.

Simplex

- Amateurs typically use dedicated simplex channels so as not to interfere with repeater traffic.
- Long QSOs should be moved to either a County talkgroup, TG 9 on a repeater or Simplex Channel.
- County/TG9 ‘ties up’ the local repeater
- Simplex Channels do not use a repeater

Admit Criteria

- The Admit Criteria determines when your radio is allowed to transmit.

Long QSOs, Many Repeaters…

- Remember that, except for Simplex, any DMR QSO involves at least one repeater.
- The Talk Group you select determines how many other repeaters are tied up during your QSO.
- Some TGs (NA = North America; WW= World Wide) tie up hundreds of repeaters!
- Move “long” QSOs to a TAC TG.

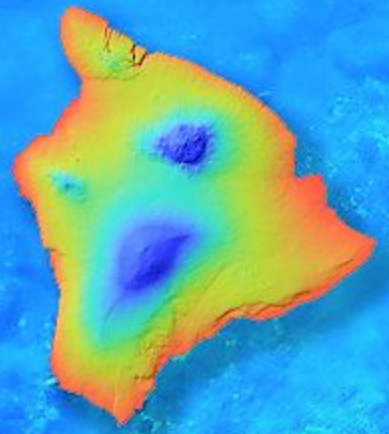
KH7MS
BLAKE STEVE
MOTOROLA
TxA RxA TxB RxB

OK, that's DMR 101

Any Questions?

Hawaii Talk Net

7:00 pm HST
Every Saturday



DMR Ham Radio TG: 3115

MOTOROLA
MOTOROLA
TEKPOWER
TP350
POWER
ON
OFF