DMR OPERATING BASICS & BEST PRACTICES

KØNGA MIKE

ROCKY MOUNTAIN HAM RADIO

MIKE'S DMR DOCTRINE

If something about using DMR for Amateur Radio doesn't make sense, remember that DMR was created for commercial use, and was never designed nor intended for Amateur Radio use.
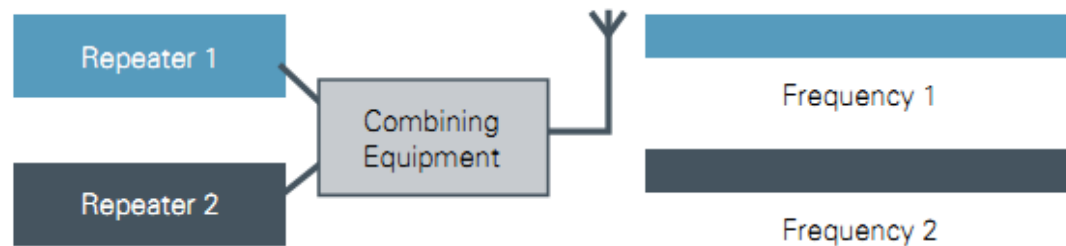
WHAT IS DMR/TRBO?

- DMR (Digital Mobile Radio) is an international commercial digital radio standard that originated in Europe

- TRBO refers to MotoTRBO which is Motorola's implementation of the DMR standard

- Many Amateur Radio repeater networks use MotoTRBO equipment, which is why they are commonly referred to as "TRBO" networks

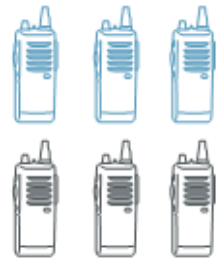- You do not need to use a Motorola MotoTRBO radio to use these networks

TWO REPEATERS IN ONE!

TDMA saves licensing and equipment costs by enabling the equivalent of two 6.25 kHz channels within a single licensed 12.5 kHz channel

Two-channel Analog or Digital FDMA System

Repeater 1

Combining Equipment

Repeater 2

Frequency 1

Frequency 2

One call per repeater and channel

Radio Groups

Two-channel Digital TDMA System

Repeater

Frequency 1

Two calls per repeater and channel

Radio Groups

Lower infrastructure cost, 1 box in rack
TWO voice channels from one repeater

NEW CONCEPTS

- Frequency Pair – not new

- Color Code – Functions similar to a CTCSS or DCS access tone

- Repeater Slot – Each DMR Repeater has two, you must specify which one to use

- Talk Group – Each repeater slot can be logically segmented further into talk groups

- Receive Group – List of talk groups to monitor on the channel's assigned repeater slot
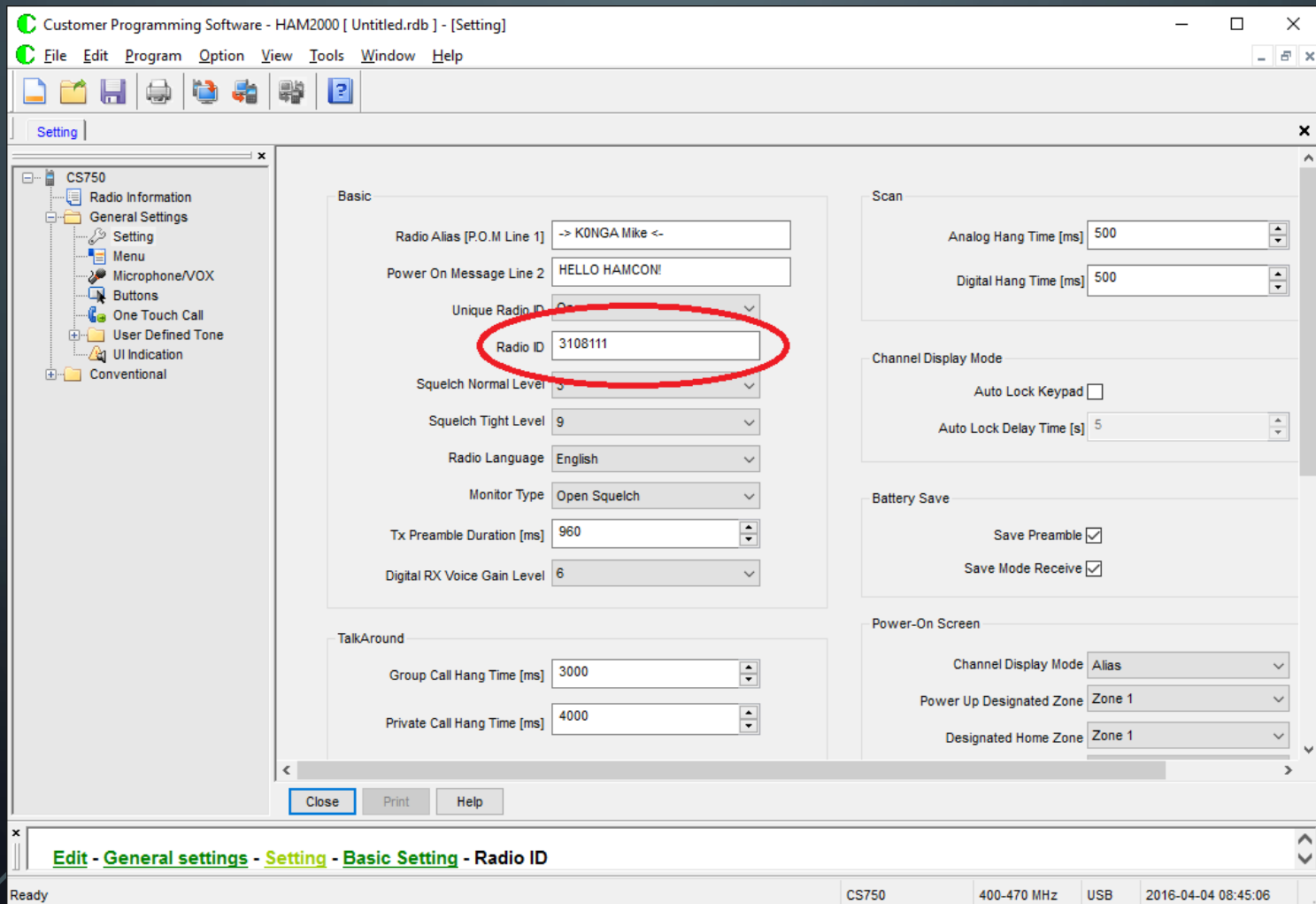
GET A RADIO

- You must have a Tier 2 DMR Radio (very common)

- You get what you pay for

  - Low cost radios on the market are not created equal

  - Ask around about user experience

  - Check the radio list at rmham.org

- Feature sets vary widely among manufacturers

GET A DMR-MARC RADIO ID

- dmr-marc.net -> Contact Us -> "I'd like a USER ID"

- Everything works best when each radio has a unique ID

- Put your Radio ID in the codeplug and upload to the radio

- Radio ID is **<u>NOT</u>** a replacement for ID'ing. You must still ID vocally every 10 minutes per FCC regulations.

RADIO ID

LEVERAGE THE SAMPLE CODEPLUGS

- Available on the RMHAM Website
    - www.rmham.org
    - MotoTRBO/DMR -> Sample Codeplugs

- All RMHAM TRBO repeaters programmed in

- Quickest way to get on the air

- Use as a foundation for your own codeplug

AUDIO LEVELS

- Many radios allow you to increase the gain on the radio's microphone (internal and external)

- Some radios (early CS700s) needed the mic gain increased

- Don't overdo it; increase in small increments and test. Use your best judgement to increase further based on feedback from other Hams.

ID YOUR TALK GROUP

- When calling, identify which talk group you are transmitting on.

- "This is K-0-N-G-A on Rocky Mountain"

- Many Hams scan various channels and may want or need to turn scan off and tune to your channel to respond.

- If you don't ID the talk group, the responding ham may not know which channel to tune to.

TALK GROUPS AND REPEATER SLOTS

- Each repeater has 2 repeater slots (time slots)

- Each slot can handle 1 conversation at a time. Thus, each repeater can handle 2 simultaneous separate conversations

- Some networks allow multiple talk groups on the same repeater slot

- Only one talk group can be transmitting at a time on a single repeater slot

- It may be necessary to monitor the other talk groups on a repeater slot to determine if the slot is free to operate on

DMR NETS

- RMHAM TRBO Tech Net
    - First Saturday of the Month, 7:00 PM, Rocky Mountain talk group

- World Wide DMR-MARC Net
    - World Wide talk group, Saturdays, 16:00 UTC Summer, 17:00 UTC Winter

- DMR-MARC Tech Net
    - North America talk group, Thursdays, 01:00 UTC Summer, 02:00 UTC Winter (This translates to Wednesday Night in the States)

STUFF AND THINGS

- RMHAM Website – http://www.rmham.org
  - Interactive DMR repeater map: http://bit.ly/rmham-trbo-map

- DMR-MARC Website – http://www.dmr-marc.net

- Brandmeister
  - Dashboard: https://brandmeister.network/
  - Audio Feeds: http://hose.brandmeister.network/
  - Wiki: https://wiki.brandmeister.network

- Contact Me: K0NGA@arrl.net

QUESTIONS?