# DMR ( DIGITAL MOBILE RADIO )

*by Norm VE3LC@rac.ca*

***An Open Standard* Specified *and Published by the European Telecommunications Standards Institute (ETSI) in document series TS 102-361 in 2005. DMR is a 2 Slot TDMA over the air technology.***

***Although the ETSI DMR standards does not specify the voice "vocoder", for compatibility, the manufacturers making DMR radios have standardized on using the AMBE+2 vocoder technology from DVSI ( Digital Voice Systems Inc.) DVSI is the world leader in low-bitrate voice compression technology.***

# Table of comparison of Popular Amateur Radio Digital Voice Modes

| | D-Star | Yaesu-Fusion | DMR |
|---|---|---|---|
| **Vocoder** | DVSI AMBE + | DVSI AMBE+2 | DVSI AMBE+2 |
| **Vocoder Data Rate (Kbps)** | 2.4 voice + 1.2 FEC | 2.4 voice + 2.8 FEC | 2.45 voice + 1.15 FEC |
| **Voice Quality** | Good | Good | Good |
| **Modulation** | GMSK | C4FM | 4FSK |
| **Multiplex Method** | FDMA | FDMA | TDMA |
| **Data Transmission Rate** | 4.8 Kbps | 9.6 Kbps | 4.8 Kbps X 2 |
| **Emission Bandwidth** | 6.25 KHz | 9.36 KHz | 7.60 KHz |
| **Voice paths per RF Channel** | 1 | 1 | 2 |
| **User Radio ID method** | Call Sign | Call Sign | 7 digit ID code |
| **Call Sign Display** | Yes | Yes | Yes – by “Contact List” |
| **Networking** | “Reflectors” | “Wires X Rooms” | “Talkgroups” |
| **Analogue FM Mode Select** | Key Press | Key Press or “AMS” | Radio Memory Selection |
| **Manufacturers** | Icom - Kenwood | Yaesu only | Lots of competition |

For comparison, re **Emission Bandwidth** noted above, FM with +/- 5 kHz deviation occupies 16 KHz.

RadioID.net
Your unique Digital ID

# DMR Radio ID

- 7 digit ID programmed into radio identifies every user radio transmissions
- ID code assigned to amateur radio ops by " radioid.net " on proof you're a ham
- over 100,000 now in amateur radio Radio ID database
- database correlates ID number with your Callsign, Name and QTH
- Some DMR radios can hold entire database to show who you are communicating with on the radio display in real time.
- ID is set by the user so could be easily "impersonated" or spoofed.
- IDs for Canada start with 302.

# Makers of DMR Equipment

**In the Land Mobile Market, DMR Radios are usually applied to the UHF Spectrum space, therefore there are fewer manufactures that make VHF or Dual Band DMR products capable of operating in both the 2 metre and 70 cm ham bands.**

**In the "Commercial" Land Mobile Service, DMR radios including repeaters for the North American market are available from:**

- **Motorola Solutions**
- **Harris Communications**
- **Tait Communications**
- **Hytera**
- **Vertex – Standard**
- **Kenwood**

**For the Amateur Radio Service, inexpensive DMR radios are usually dual band products for 2m & 70 cm from manufactures including:**

- **Anytone**
- **Alinco**
- **Baofeng**
- **Retevis**
- **TYT**
- **Radioddity**
- **Kydera**

One Popular Radio used by Hams is the

**AnyTone D878UV** with the following features:

- VHF/UHF Dual Band – Analogue FM or DMR digital, Portable
- 1, 2.5, 4, or 6 watt setting
- GPS and Analogue APRS beacon operation
- Auto range signalling and display between units with GPS
- Programming up to 4000 channels
- Contact List up to 200,000 entries
- Dual Channel (or TG) monitor within Zones
- BlueTooth audio and wireless PTT
- SMS messaging between radios
- Digital Monitor for any TG
- FM broadcast band
- Programmable Hot Keys
- 256 Bit AES encryption capability (not to be used)
- DTMF auto dial sequences for analogue channels
- Colour Display
- Audio Record and Save
- VOX capable operation
- Alert and Call Tones
- CPS Software and cable for configuration



**$ 305 Cdn**

Radioworld

# DJ-MD5TGP

**Part #** ALI-DJMD5TGP

**Manufacturer** Alinco

ALINCO

**UPC**

**Availability** ✔ In stock

**Average Rating** ★★★★☆

**4.0/5** from *1* review

**Our Price** $229.00

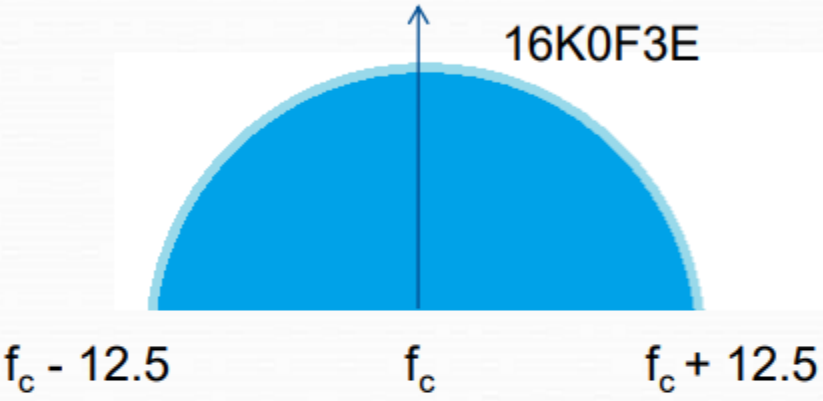
$229.00 | 1 | Buy

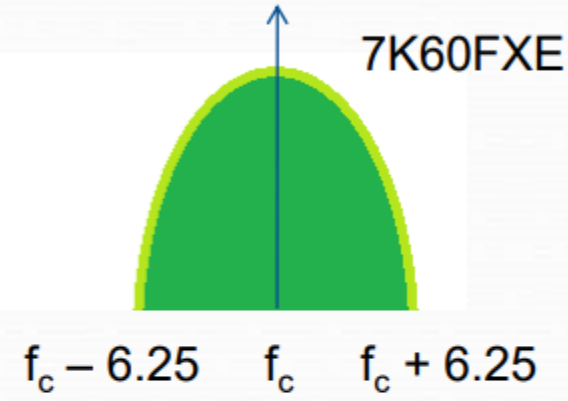
## Key Features

### General

- Selectable output power 5W/2.5W/1W/0.2W
- 4000 channels, 250 zones, 250 scan lists
- Displays DMR ID, Call sign, Name and Geographical info
- Built-in VOX – hands-free voice operated transmission
- Allows CSV export/import of setting parameters
- Easy import of DMR contact database (entire world wide)
- Single or dual channel selectable
- FM Broadcasting receiver with 100 memory channels and VFO
- Manually programmable Side and Hot keys
- Automatic date and time calibration by GPS

# Half the Channel Bandwidth




Traditional Analog
25 kHz
Channel Bandwidth

DMR
**12.5 kHz**
Channel Bandwidth

1 Channel
1 Repeater

**2 Channels**
1 Repeater

# Spectrum Efficiency (Time Slots)

Where the bandwidth of an Analog FM signal is 25.0 kHz, the DMR (TDMA) bandwidth is only 12.5 kHz.

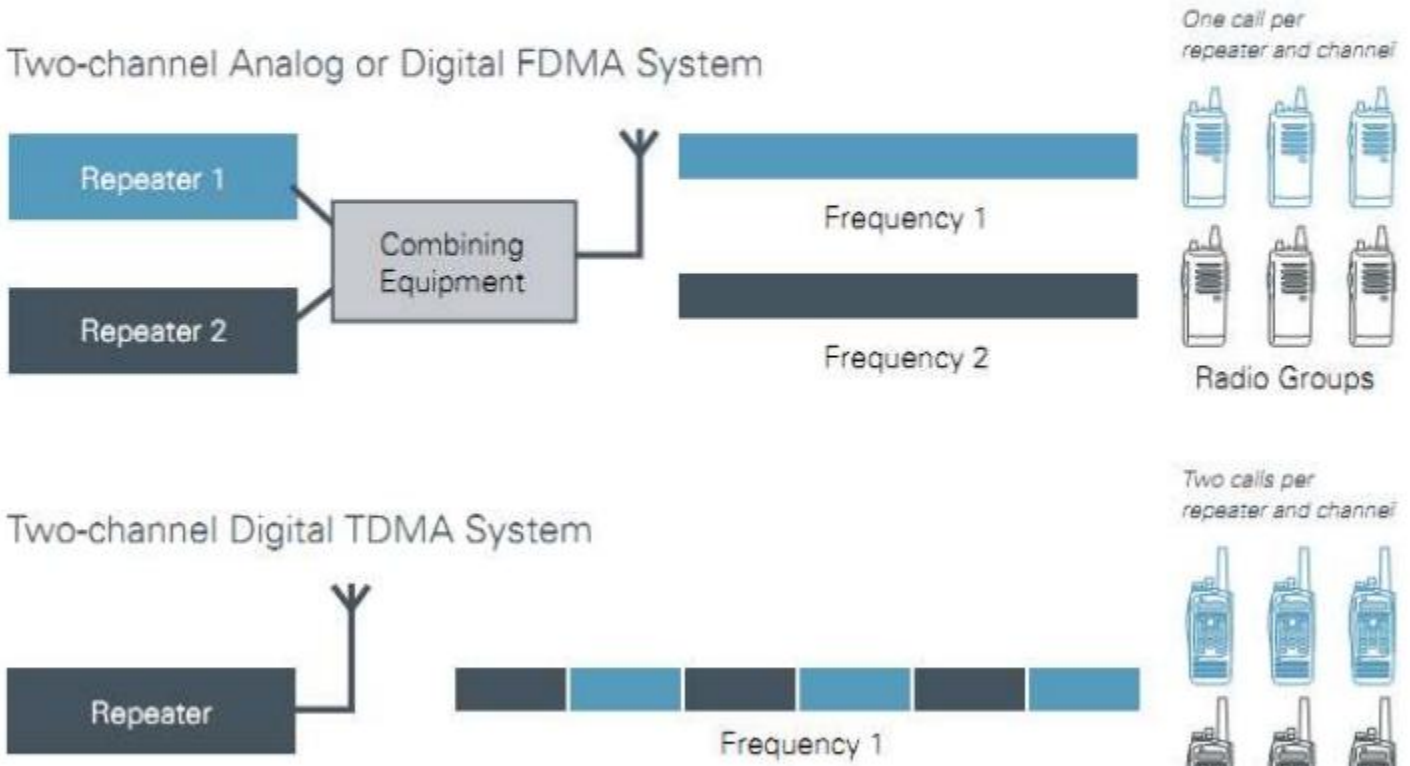
Not only does it occupy half of the required spectrum, but it has the ability to transmit two separate conversations at the same time. This is accomplished by digitally splitting a transmitted signal into alternating 30 millisecond slices referred to as **Time Slots**.


Tier II TDMA 30ms Time Slots

TDMA = Time-Division Multiple Access

# 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




*Lower infrastructure cost, 1 box in rack*

*TWO voice/data channels from one repeater*

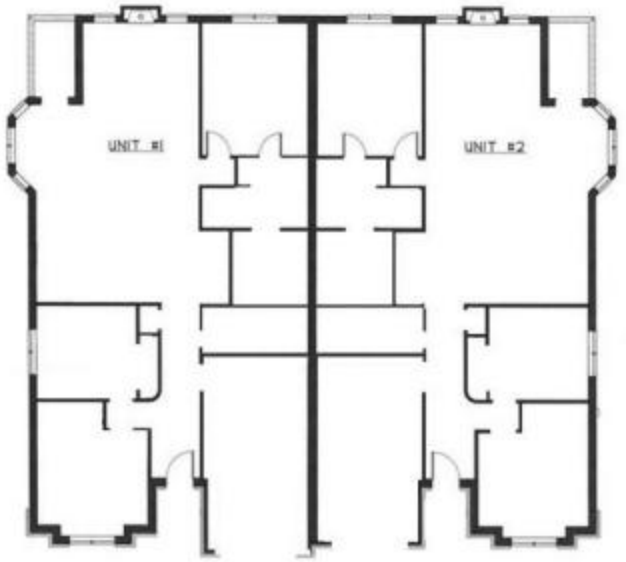
# Time Slots

Much like a Duplex House, two totally separate families can reside in one structure.

These divisions are referred to as Time Slots.

TS1 TS2

Each house has its own set of rooms.
These are referred to as Talk Groups.



# Longer Battery Life

Older Digital Modes (FDMA)

DMR (TDMA)

"For each hour of usage the TDMA radios show between 19% and 34% less battery capacity is required than for the FDMA models."

"40 percent improvement in talk time in comparison with analog radios "

http://dmrassociation.org

# Talk Groups

There are currently over 1500 Talk Groups, ranging from:

- Local Repeater Only
- Local Network Repeaters
- Provincial Groups
- Regional Groups
- Country Specific Groups
- Worldwide Groups
- Special Interest Groups

Examples of these groups include:

- Public Safety
- Outdoor Adventure
- JOTA (Scouting)
- EmComm
- Blind Hams
- etc.

## Groups Calls, Private Calls and All Calls

- Talk Groups are classified as "Group Calls" where everybody set for a particular TG is part of the group conversation.

- There also can be a "Private Call" between specific radios based not on a common TG number but instead based on the ID numbers of the respective radios.

- Private Calls can be made through a network connection. The network server will try to route the private call to and through the access point (repeater or hotspot) where it last-heard a check-in from the called party.

- DMR also provides an "All Call" function. Initiating an "All Call" is a one way transmission that will be heard by all parties on a radio channel independent of their selected Talk Group.

# DMR Networks

**Repeaters and Personal Hotspots connected through the Internet to Network Server(s) computers that manage incoming and out going streams of voice data into logical channels of communications based on DMR Talk Group assignments.**

**Other digital modes that work with Network conferencing Servers call the different paths of communication by other names such as "Reflectors" for D-Star or "Rooms" for Yaesu Wires X.**

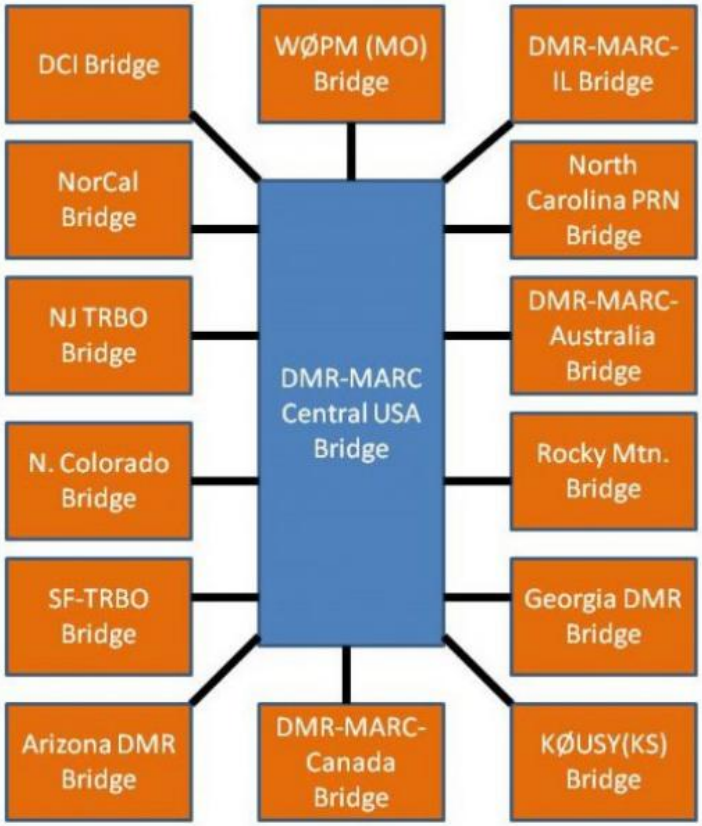
**There are two main DMR Amateur Radio Networks; these are:**

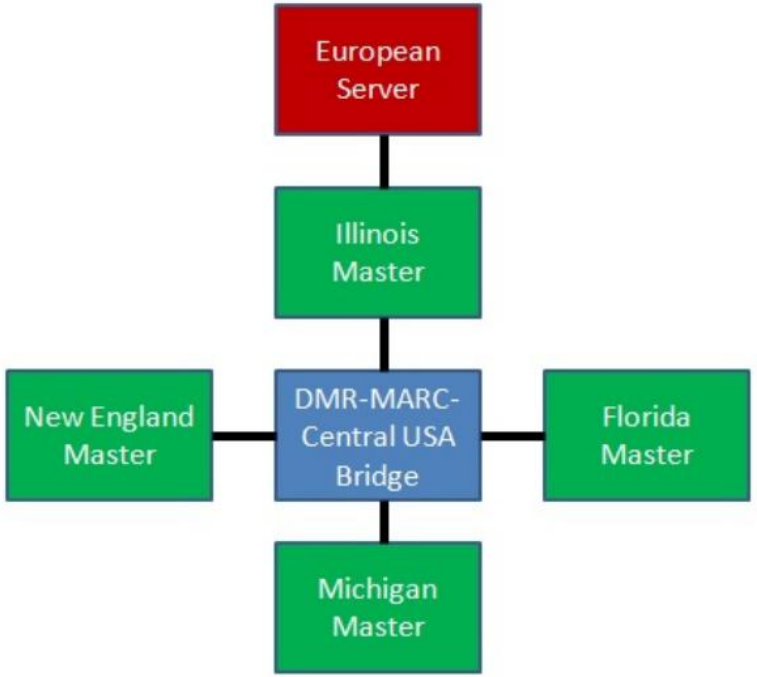
1. **The DMR-MARC Worldwide Network sponsored and run by the Motorola Amateur Radio Club largely leveraging the technology developed by Motorola.**

2. **The Brandmeister Worldwide Network was born by collaboration of hams and software engineers over the world several years ago.**

# DMR-MARC System

**The DMR-MARC Network is connected around the world by master servers which in turn connect repeaters to each other in over 74 countries through more than 500 repeaters.**

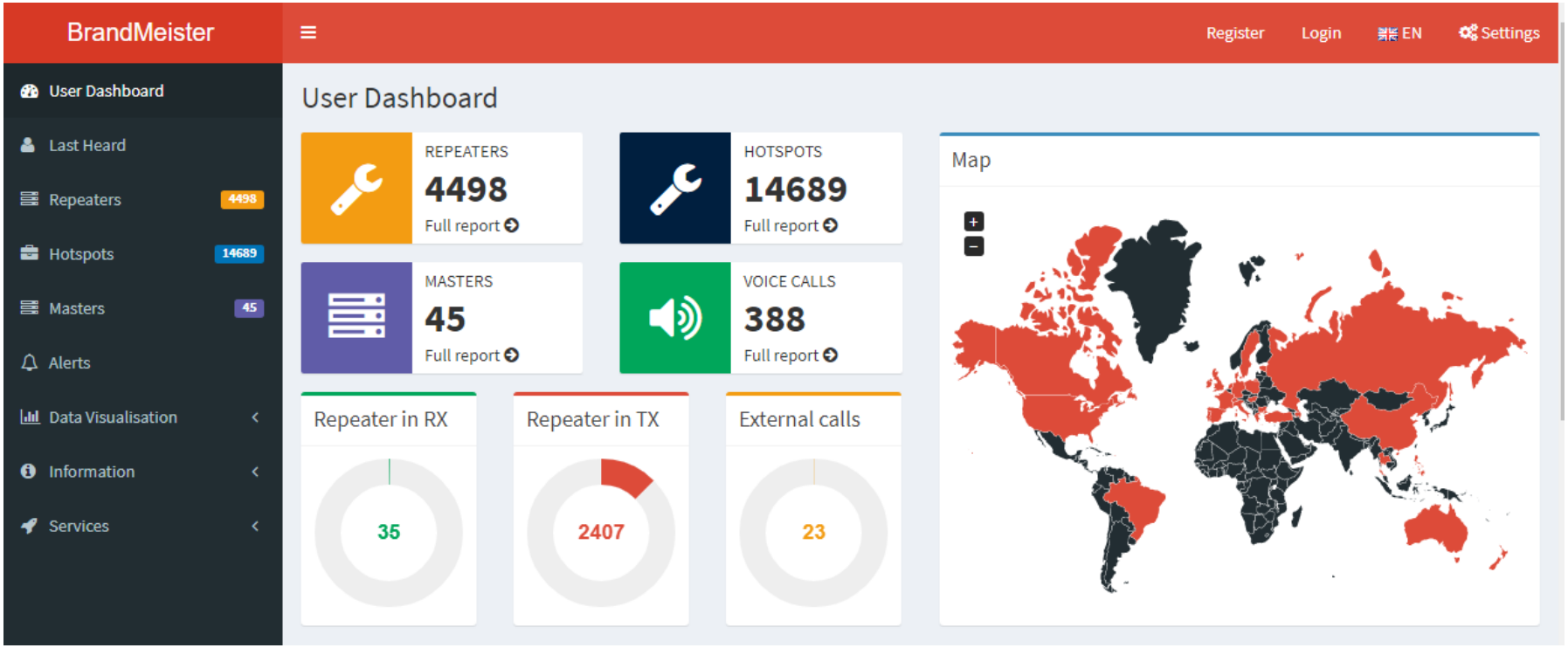



**In the MARC network, all TGs and Time Slot assignments to a repeater are "Static"**

# **The Brandmeister Network** seems to be the Network of Choice these days.

- **Has over 1500 Talk Groups Available**
- **Based on 45 Master Servers Worldwide**
- **Over 4000 repeaters and 14000 Hotspots connected at a time**
- **Most Ottawa area DMR repeaters networked to the Brandmeister System**
- **Supports Static and Dymanic Talkgroup Assignments to Repeaters**
- **Brandmeister Canada:** https://wiki.brandmeister.network/index.php/Canada



# A Review:

## What defines a Channel of Operation?

- **Frequency of Operation: (Frequency Pair in case of a Repeater)**
- **Time Slot: 1 or 2**
- **Talk Group Type: Group Call or Private ID or All Call)**
- **Talk Group: Number or Radio ID (for a private call)**
- **Colour Code: (Number between 0 and 15)**

  ***This channel parameter must be specified and must match both ends of the radio circuit. It is much like a CTCSS tone on a FM channel.***

# Special Talk Group Numbers that Work with Repeaters and Hot Spots on Network Servers

*These Functions are normally setup as a Private Call*

- **TG 9990 - The Parrot Function (to record and playback your Voice Audio)**
- **TG 4000 – Disconnect Function (from an active TG)**
- **TG 5000 – Repeater Status (to check what TGs may connected to a Repeater)**

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**For SIMPLEX Operation between two radios, by convention, set channel to: TG 99, TS 1 on Colour Code 1**

# Brandmeister Canada Main Settings

•ARS/RRS/GPS ID: 302999 (to configure APRS)

•Hand-Off Timer: 15 seconds

•On-Demand Timer: 600 seconds

•Parrot Max Recording Time: 90 seconds

## The Server / Le serveur

Master Server 3021 Status: Twitter @bm_3021

The BrandMeister Canada team is comprised of:

Benoit **VE2VB** president and administrator / email: **brandmeistercanada@gmail.com**
Pierre **VE2PF** sysop and admin / courriel: **brandmeistercanada@gmail.com**
Daniel **VA2DG** Net manager, support & Social Media **brandmeistercanada@gmail.com**
Robert **VE2FPD** record & Talk Group manager / courriel: **brandmeistercanada@gmail.com**
Olivier **F4BWG** administrator support team BrandMeister / email: **bm.ca{o}f4bwg.com**
Rudy **PD0ZRY** master system support BrandMeister / email: **zarya@gigafreak.net**

A complete mapping of the Canadian Talkgroups can be found at the address:
http://brandmeister.network/?page=talkgroups

**On a Network Repeater,**

**Static Talk Groups vs Dynamic Talk Groups**

**A Static Talk Group is:**

- **Always connected and broadcasting traffic from the network for the TG involved.**

**A Dynamic Talk Group is:**

- **Is not always connected and broadcasting traffic from the network. Instead, it only becomes live by transmitting into the repeater on the TG involved and then it is connector for a certain period of time reset only my successive PTTs on the TG.**

# Talk Groups Assignment for Networked Repeaters

**Not all repeaters carry all Talk Groups (TG) depending on their network connection. The repeater's sysop assigns the TG and TS structure to give priority to certain paths of communications.**

Association des Radio Amateurs Indépendants
VE2REH: Gatineau, QC, 442.6500 MHz + 5, Colour Code 1, Hytera RD982
VE2REH: Mont-Laurier, QC, 444.1500 MHz +5, Colour Code 1, MMDVM
VE2REH:L'Ange-Gardien, QC, 442.5500 MHz + 5, Colour Code 1, Motorola XPR8300
VE3PRV:Hammond, ON, 442.8500, MHz + 5, Colour Code 1

| Talk Group | Time Slot | Description & Purpose | Remarks |
|---|---|---|---|
| 2 | 2 | Local | Cluster Outaouais – all repeaters |
| 9 | 2 | Local | Repeater only |
| 3022 | 1 | Quebec | Static on TS1 by itself |
| 3023 | 2 | Ontario | |
| 302 | 2 | Canada | |
| 93 | 2 | North America | |
| 91 | 2 | Worldwide | |
| 310 | 2 | TAC310 | Tech Talk net |
| 302310 | 2 | Canada Tac310 | |
| 302050 | 2 | DSTAR/DMR/YSF | |
| 3023354 | 2 | ARAI | Static |
| 30239 | 2 | SBO/OVSSAR | Static for SAR Group |

# Programming your Radio

- Most DMR radios need to be programmed via software.
- This is known as the "CPS" (Customer Programming Software).
- The file you create and upload to the radio is called a "Code Plug".
- The code plug contains all the information the radio needs such as channel frequencies, talk group number, colour code number, time slot 1 or 2 your 7 digit DMR ID number and your desired Zone organization of channels.
- Each radio manufacturer produces it's own CPS for the model of Radio involved.
- Most CPS have mechanisms to import .CSV (comma separated value) formated files for bulk loading of TG lists, Contract lists, Scan lists, etc.

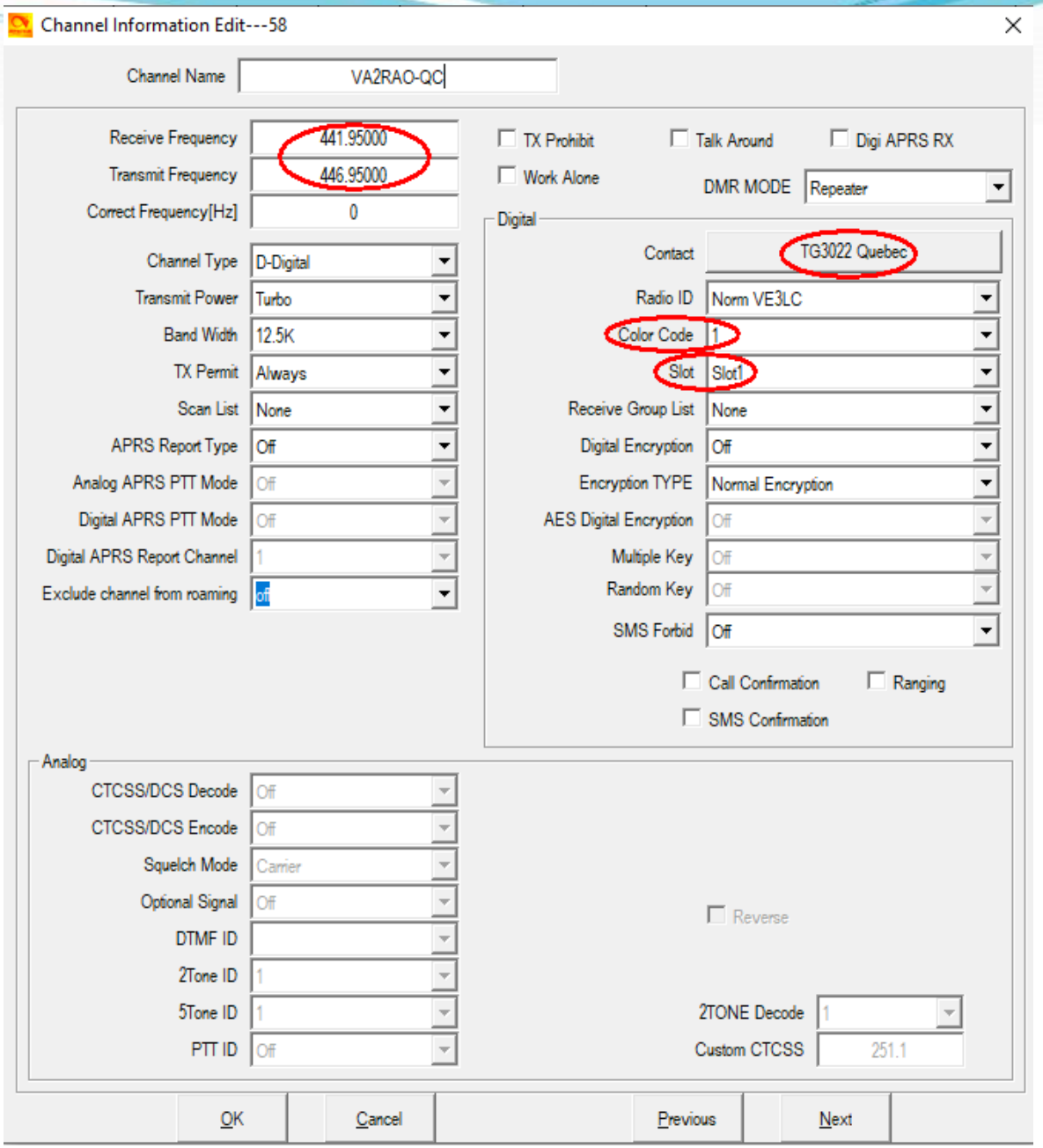
**From the AnyTone D878UV CPS screen capture**

# Setting up the Channel Information on a DMR Digital Channel.

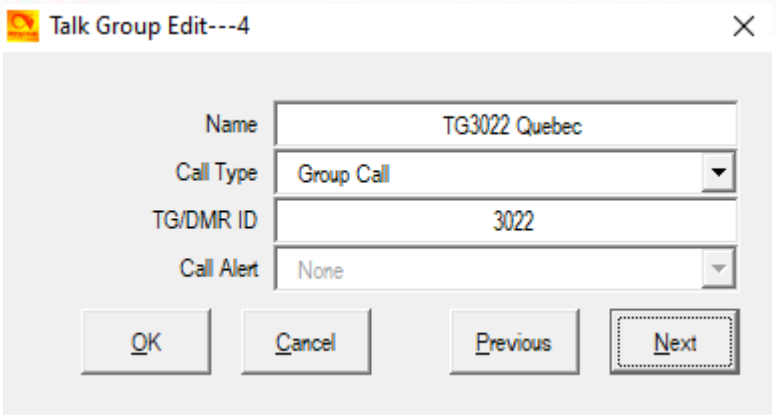
Note Selection of:

- Channel Frequencies
- TG number
- Colour Code number **
- Time Slot 1 or 2

** Colour Code number can be a number 0 to 15. It's like encoding the transmission for DMR like CTCSS is to analogue FM.



# From the AnyTone D878UV CPS screen captures




**Setting up a Talk Group Name and Number in the CPS**

Creating a Talk Group with above info creates this entry in the TG list available to define the TG for a channel.

| No. | TG/DMR ID | Call Alert | Name | Call Type |
|---|---|---|---|---|
| 1 | 2 | None | TG2 Local | Group Call |
| 2 | 6 | None | TG6 Local Cluste | Group Call |
| 3 | 9 | None | TG9 Local | Group Call |
| 4 | 3022 | None | TG3022 Quebec | Group Call |
| 5 | 3023 | None | TG3023 Ontario | Group Call |
| 6 | 302 | None | TG302 Canada | Group Call |
| 7 | 93 | None | TG93 NA | Group Call |
| 8 | 91 | None | TG91 World Wide | Group Call |
| 9 | 310 | None | TG310 TAC 310 | Group Call |
| 10 | 302310 | None | Canada TAC 310 | Group Call |
| 11 | 302050 | None | DSTAR/DMR/YSF | Group Call |
| 12 | 9990 | None | Parrot 9990 | Private Call |
| 13 | 4000 | None | Disconnect | Private Call |
| 14 | 5000 | None | Repeater Status | Private Call |
| 15 | 99 | None | Simplex | Group Call |
| 16 | 3021842 | Ring | VE3NA | Private Call |

# Encryption

Because DMR radios are made for the Land Mobile Service, most makes include encryption capability. I have suggested we should not use encryption. However there seems there may be permission by the Canadian Rules for Canadian Hams.

Section 47 of the Canadian Radiocommunications Regulations states (in part) :

**"A person who operates radio apparatus in the amateur radio service may only:**
**(b) use a code or cipher that is not secret"**

***In other words, if you publish and make known the encryption key, then the cipher is not secret. The question becomes, make known to whom?***

In the case of the International Radiocommunications Regulations, Article 25, Section 25.2A with respect to encoded communications it says:

**"Transmissions between amateur stations of different countries shall not be encoded for the purpose of obscuring their meaning, except for control signals exchanged between command stations and space stations in the amateur-satellite service"**

**US FCC Part 97 takes this ITU wording almost verbatim.**

# DMR Repeaters with Coverage in the Ottawa Area

https://ve2reh.com/wp/repeteur-dmr/

Static Assignment TGs:
- TG 3022, TS1 Quebec Channel
- TG 2, TS2 Common Local
- TG 30239 TS2 Ottawa SAR

All others are Dynamic

VE2REH Partner Repeater
VE3PRV Hammond, ON
442.850+5, CC 1
Same TG Plan

- **Callsign:** VE2REH
- **Location:** Gatineau, Quebec
- **DMR ID:** 302354
- **Frequency:** 442.650Mhz -5Mhz
- **Color code:** 1
- **Network:** Brandmeister


*Hytera RD982*

- **Callsign:** VE2REH
- **Location:** Mont-Laurier, Quebec
- **DMR ID:** 302043
- **Frequency:** 444.150Mhz -5Mhz
- **Color code:** 1
- **Network:** Brandmeister

*MMDVM repeater*

- **Callsign:** VE2REH
- **Location:** L'Ange-Gardien, Quebec
- **DMR ID:** 302046
- **Frequency:** 442.550Mhz -5Mhz
- **Color code:** 1
- **Network:** Brandmeister

*Motorola XPR8300*

## DMR Repeaters with Coverage in the Ottawa Area (cont')

VA2CRO DMR Repeater, (Hull Sector Hospital)
Network Brandmeister
441.950 MHz +, Colour Code 1
TG 3022 on TS1 – Static
TG 2 Local Cluster on TS 2 Static
All other Brandmeister TGs on TS2 Dynamic

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## The Ottawa Amateur Radio Digital Group (OARDG)

VA3ODG DMR Repeater, (YMCA Building, Argyle Ottawa)
Network Brandmeister and XLX196 Local Cluster
444.850 MHz +, Colour Code 1
TG 3023 on TS1 – Static (Ontario)
TG 6 Local Cluster on TS 2 through XLX196
All other Brandmeister TGs on TS2 Dynamic
MMDVM Repeater - Dashboard at: http://va3odg.ddns.net:380/

# DMR Repeaters with Coverage in the Ottawa Area (cont')

## VE3TST

**VE3TST DMR Repeater, (Antenna atop of North Tower, CFRA AM Station)**
**Keeper : Sean Huntley VE3HXP**
**Network: This Repeater has NO NETWORK CONNECTION**
**444.125 MHz +, Colour Code 13**
**TG 2 is to be used by all users for local communications.**

## VE3STP

**VE3STP DMR Repeater (under development)**
**Sponsor : Champlain Regional Repeater Association**
**Network: Brandmeister**
**443.600 MHz +, Colour Code 1**

## VE2CRA

**VE3STP DMR Repeater (under development in Perth at the moment**
**Sponsor : Ottawa Amateur Radio Club**
**Network: Brandmeister**
**444.400 MHz +, Colour Code 1**

# OVMRC DMR Repeater in the works!

We are engaging in a project to leverage an existing Yaesu DR1X repeater owned by the OVMRC that is currently not in service.

A “STM32-DVM board has been bought along with an interface cable for the Yaesu Fusion Repeater.

This will be yet another MMDVM (multi-digital-voice mode) repeater for the area with inherent linking to the Brandmeister Network.


**Repeater-Builder's Digital Voice Modem Mate with a Raspberry Pi-3 Board and plug into a Yaesu DR-1X Repeater and**

**Bingo, you have a DMR Repeater!**


WATTS
448.700
443.700
System Fusion
VE3RAM DMR Repeater
443.7000 +
Colour Code 1
Brandmeister Canada

# Pi-Star Digital Voice Dashboard for VE3RAM



| Modes Enabled | |
|---|---|
| D-Star | DMR |
| YSF | P25 |
| YSF XMode | NXDN |
| DMR XMode | POCSAG |

| Network Status | |
|---|---|
| D-Star Net | DMR Net |
| YSF Net | P25 Net |
| YSF2DMR | NXDN Net |
| YSF2NXDN | YSF2P25 |
| DMR2NXDN | DMR2YSF |

| Radio Info | |
|---|---|
| Trx | Listening |
| Tx | 443.700000 MHz |
| Rx | 448.700000 MHz |
| FW | MMDVM:20190130 |
| TCXO | 12.0000 MHz |

| D-Star Repeater | |
|---|---|
| RPT1 | VE3RAM B |
| RPT2 | VE3RAM G |
| **D-Star Network** | |
| APRS | noam.aprs2.net |
| IRC | rr.openquad.net |
| Not Linked | |

| DMR Repeater | |
|---|---|
| DMR ID | 302117 |
| DMR CC | 1 |
| TS1 | enabled |
| TS2 | enabled |
| **DMR Master** | |
| XLX196 B | |
| 158.69.203.89 | |

## Gateway Activity

| Time (EDT) | Mode | Callsign | Target | Src | Dur(s) | Loss | BER |
|---|---|---|---|---|---|---|---|
| 10:14:39 Mar 22nd | DMR TS2 | VA3JPX (GPS) | TG 6 | Net | 0.5 | 12% | 0.0% |
| 10:00:04 Mar 22nd | D-Star | VE3RAM/TIME (GPS) | CQCQCQ | Net | 4.1 | 0% | 0.0% |
| 08:39:57 Mar 22nd | DMR TS2 | VE3EFF (GPS) | TG 6 | Net | 0.8 | 0% | 0.0% |
| 03:52:38 Mar 22nd | D-Star | VE3RAM/INFO (GPS) | CQCQCQ | Net | 2.5 | 0% | 0.0% |
| 21:13:34 Mar 21st | DMR TS2 | VE3LBU (GPS) | TG 6 | Net | 0.4 | 57% | 0.0% |
| 20:58:14 Mar 21st | DMR TS2 | VE3ZZU (GPS) | TG 6 | Net | 6.2 | 18% | 0.0% |
| 20:58:04 Mar 21st | DMR TS2 | VE3PM (GPS) | TG 6 | Net | 18.1 | 0% | 0.0% |
| 16:53:59 Mar 21st | DMR TS2 | VE3LC (GPS) | TG 6 | RF | 1.8 | 0% | 0.0% |
| 16:47:55 Mar 21st | DMR TS1 | VE3LC (GPS) | 302999 | RF | DMR Data | | |
| 15:32:15 Mar 21st | DMR TS2 | VE3AKV (GPS) | TG 6 | Net | 3.6 | 1% | 0.0% |
| 14:56:26 Mar 21st | DMR TS2 | VE3XZT (GPS) | TG 6 | Net | 3.4 | 10% | 0.0% |
| 14:07:10 Mar 21st | DMR TS2 | VE6AMC (GPS) | TG 6 | Net | 0.7 | 50% | 0.0% |
| 12:21:08 Mar 21st | DMR TS2 | VE3QC (GPS) | TG 6 | Net | 38.3 | 0% | 0.0% |
| 10:27:22 Mar 21st | DMR TS2 | VE6EN (GPS) | TG 6 | Net | 1.0 | 6% | 0.0% |
| 03:52:58 Mar 21st | DMR TS2 | 302117 | TG 6 | Net | 5.3 | 0% | 0.0% |
| 20:33:42 Mar 20th | DMR TS2 | VA3SMM (GPS) | TG 6 | Net | 13.0 | 0% | 0.0% |

## Local RF Activity

| Time (EDT) | Mode | Callsign | Target | Src | Dur(s) | BER | RSSI |
|---|---|---|---|---|---|---|---|
| 16:53:59 Mar 21st | DMR TS2 | VE3LC (GPS) | TG 6 | RF | 1.8 | 0.0% | S9+50dB (-43 dBm) |
| 16:47:55 Mar 21st | DMR TS1 | VE3LC (GPS) | 302999 | RF | DMR Data | | |

# Available Hot Spot Kits

Walmart
Save money. Live better.

Duplex MMDVM Hotspot Support P25 DMR YSF for Raspberry Pi with Antenna

Departments | Deals | Back to School | Thanksgiving | Clothing | Electronics | Halloween | Shop grocery | Store finder

DUPLEX MMDVM RX TX UHF VHF Hotspot Support P25 DMR YSF NXDN DMR...

$86.99

Almost sold out!

Add to cart


Assembled MMDVM Hotspot Support P25 DMR YSF + Raspberry pi +OLED...

$107.56 ~~$129.07~~

Online only

Add to cart

Duplex MMDVM Hotspot Support P25 DMR YSF for Raspberry Pi with Antenna

$48.99

Almost sold out!

Add to cart

Antenna + Case + OLED + MMDVM Hotspot Support P25 DMR YSF for Raspberr...

$57.73

Online only

Add to cart


**Duplex MMDVM Board Bought from Walmart.ca On-Line Market Place for $48 Cdn, all charges in.**

**MMDVM Board Working With a Raspberry Pi2 Board and Running Pi-Star Software**

**Packaged into a Raspberry Pi case**

## When using DMR into a repeater or a Duplex HotSpot

**After selecting a DMR repeater "Channel" and transmitting by holding the PTT active, the following happens:**

1. **The radio transmits at 1st a momentary data transmission to the repeater then listens and if not busy on the Time Slot involved, sends a data burst back to the user radio causing the radio to beep as a go ahead signal and the user can start talking.**
2. **If the Time Slot is busy with other traffic on another Talk Group, the acknowledge will not take place and there will be no go ahead beep and the user radio will not transmit.**
3. **Speaking before the go-ahead beep sounds, the user's talking may be initially truncated.**

# DMR, More to Come

# For Now

# The End

# Questions?