INTRODUCTION TO DMR IN NEW ENGLAND

February 2021
By Dom Mallozzi,N1DM with help from Bill Barber,NE1B

Amateur Digital Voice Systems

- **D-STAR (Icom / Flexradio / Kenwood)** [54 in New England]
  - GMSK/AMBE Vocoder
- **P25 Phase 1 (Multi-Vendor COMMERCIAL)** [18 in New England]
  - FDMA/IMBE Vocoder
- **P25 Phase 2 (Multi-Vendor COMMERCIAL)** [None in New England]
  - 2-slot TDMA/FDMA/AMBE+2 Vocoder
- **Yaesu System Fusion known as YSF and C4FM** [44 in New England]
  - FDMA/C4FM/AMBE+2 Vocoder
- **DMR (Multi-Vendor)** [125+ in New England]
  - 2-slot TDMA/AMBE+2 Vocoder
- **NXDN (Kenwood / Icom COMMERCIAL)** [17 in New England]
  - FDMA/4FSK/AMBE+2 Vocoder

Digital Mobile Radio

- An ETSI commercial worldwide standard
- Over a DOZEN manufacturers of radios (Motorola, Connect Systems, Tytera/TYT, Anytone, Hytera, Alinco, etc.)
- Superior voice quality (AMBE+2 vocoder) vs older digital modes (AMBE, IMBE, GMSK)
- Longer battery life!
- Supports multiple talk groups on one freq.
- Supports data applications (txt,email,gps)

Digital Mobile Radio

- **Spectrum Efficient**
- **Network is digital end to end**
- **Supports Large Repeater Networks**
- **Resilient Networks (no servers needed at repeaters like D-STAR and APCO25 Phase 2)**
- **To learn more http://dmr-marc.net**

Digital Mobile Radio

Advantages

- **One repeater can support two simultaneous conversations using time sharing (Each voice path is called a time slot)**

- **Each time slot can support various groups of users (called talk groups)**

- **Battery life is good because when transmitting using TDMA as the radio is only actually transmitting half the time**

DMR Standard - ETSI TS 102 361

- **Tier 1 (Unlicensed)** TIER 1 IS <u>NOT</u> USED FOR AMATEUR RADIO
  - **FDMA, Consumer applications, 0.5 watt**
  - **dPMR (446 MHz European unlicensed service)**
- **Tier 2 (Conventional)**
  - **2-slot TDMA**
  - **IP Site Connect**

  > **THIS IS WHAT AMATEUR DMR NETWORKS USE**

- **Tier 3 (Trunked)**
  - **2-slot TDMA**
  - **Multi-channel, Multi-Site**

The Magic of TDMA

How to get two conversations on one RF channel

The repeater system has two alternating time slots. One user group uses Time Slot 1 while the other uses Time Slot 2.

TIME SLOT 1 USERS ARE IN RED

TIME SLOT 2 USERS ARE IN BLUE

Time Slot is 30 mSec
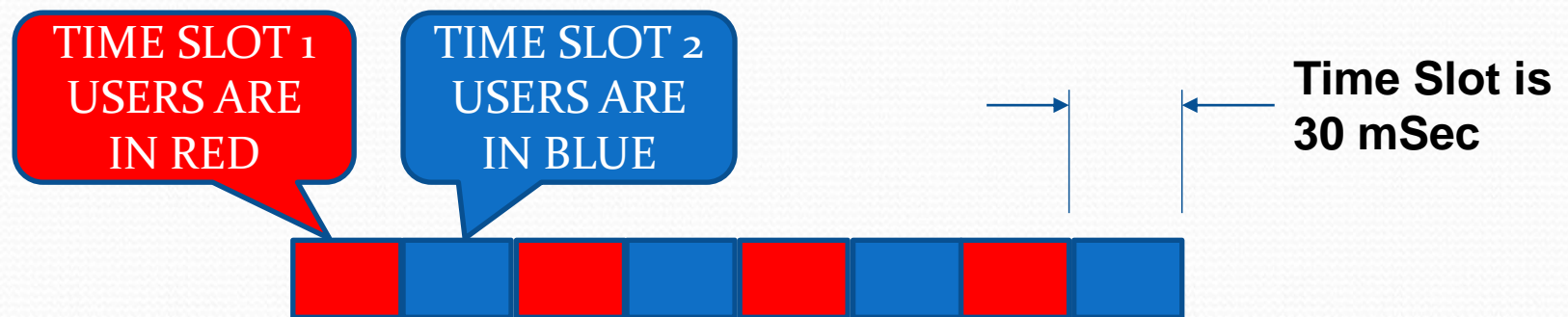
Other than programming the time slot in the radio, the radio and the system figures out how to do this.
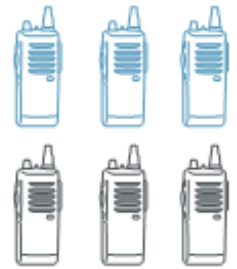
DMR has <u>TWO</u> Repeaters in One!

In FM and other digital systems if you want 2 simultaneous voice channels you needed 2 repeaters.

In DMR one repeater provides 2 simultaneous voice channels using one RF channel & one antenna.

Two-channel Analog or Digital FDMA System

Repeater 1

Repeater 2

Combining Equipment

Frequency 1

Frequency 2
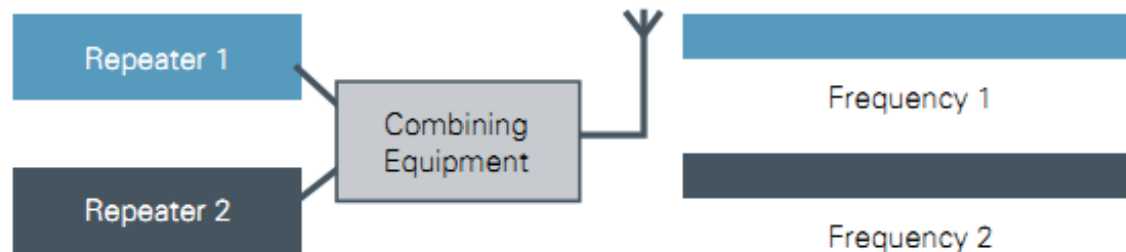
One call per repeater and channel

Radio Groups

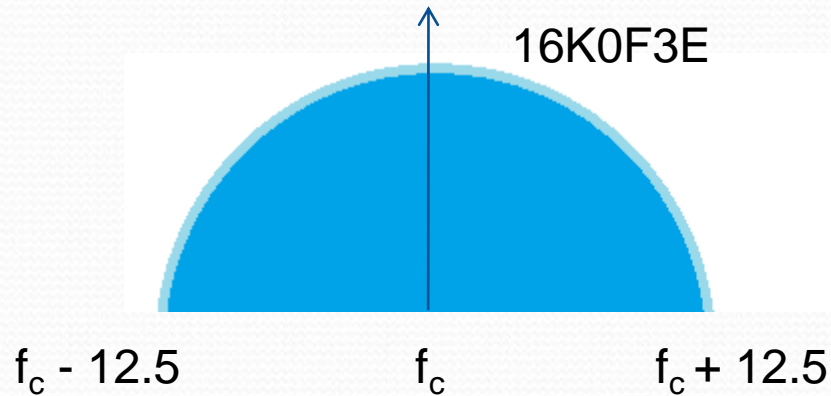Two-channel Digital TDMA System

Repeater

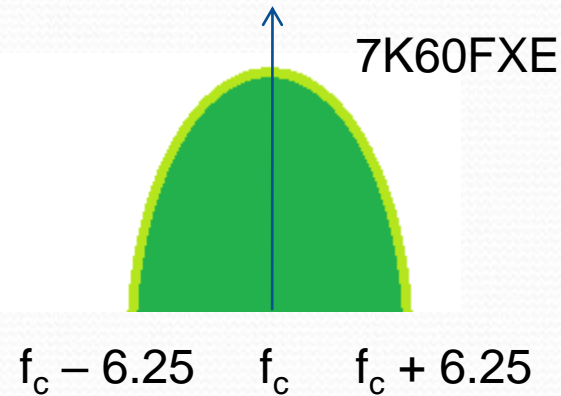Frequency 1

Two calls per repeater and channel

Radio Groups

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

Half the Channel Bandwidth

16K0F3E

7K60FXE

$f_c - 12.5$ f_c $f_c + 12.5$

$f_c - 6.25$ f_c $f_c + 6.25$

Traditional Analog FM
25 kHz
Channel Bandwidth

DMR
12.5 kHz
Channel Bandwidth

1 Voice Channel
1 Repeater

2 Voice Channels
1 Repeater

Longer Battery Life
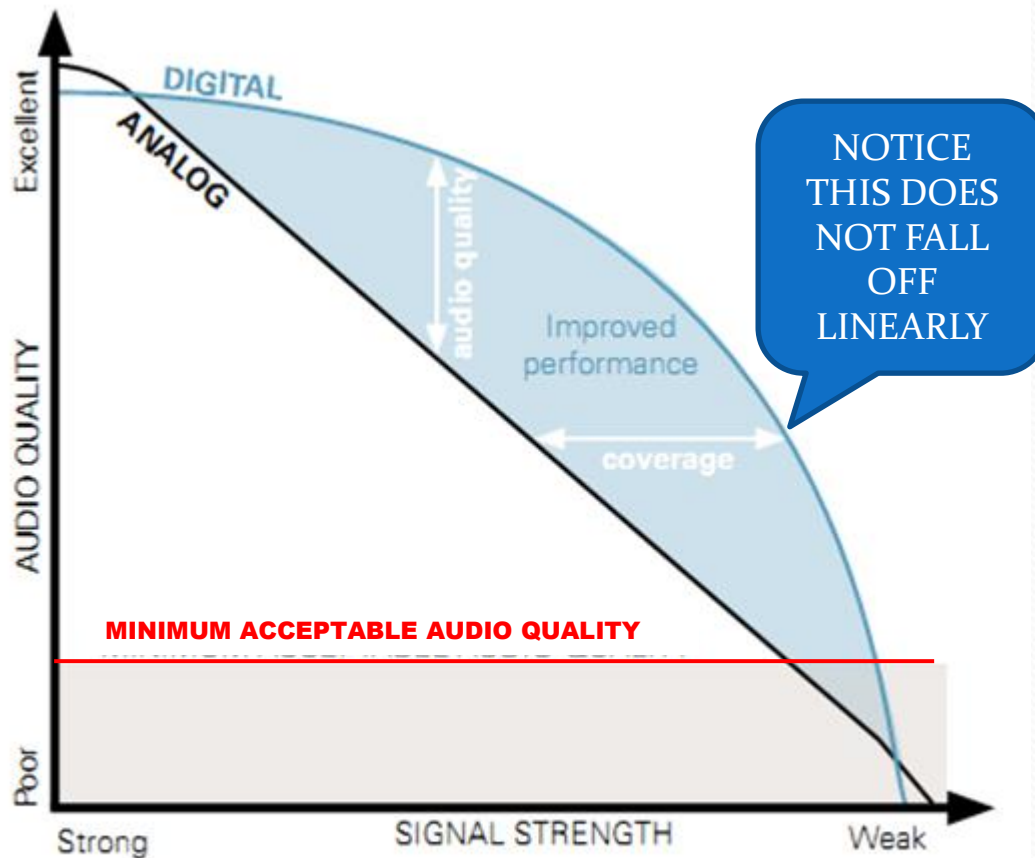
Older Digital Modes (GMSK & FDMA)

DMR (TDMA)

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

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

http://dmrassociation.org

Better Signal Quality

NOTICE THIS DOES NOT FALL OFF LINEARLY

DIGITAL VOICE RETAINS BETTER AUDIO QUALITY AS THE SIGNAL STRENGTH DECREASES

- No hiss, popping, or static
- Better RF range than older digital technologies
- Forward Error Correction and Cyclic Redundancy Check coders

Some DMR Terminology

DMR TERM	WHAT IS IT / HAM TERM	NOTES
TIME SLOT	In DMR each RF channel has two time slots. You must define which one you need to use for a particular application.	Time slots are assigned by repeater system. You must comply with the repeater system assignments.
DIGITAL CONTACT	A DMR talks to a repeater or another user by defining a assigned digit number between 1 and 16776415 that is sent with every transmission.	Every talk group and user has a unique Digital Contact number. The DMR-MARC website explains how they are assigned.
RADIO ID	Every radio in a DMR system MUST HAVE a DIGITAL CONTACT NUMBER. For your radio this is referred to as a radio ID. This is put in general settings in the programming software.	You must get an ID from Radioid.Net before you start programming a radio
CODE PLUG	It is the programming file for a radio.	It includes all settings for that radio
ZONE	Scan Bank	In older radios a Zone can only have 16 entries, more recent radios have unlimited zone list size.
COLOR CODE	Digital PL	Color Code acts like Digital PL
NUISANCE DELETE	Scan Lock Out, Busy Channel Lockout	This locks out a channel in a scan bank that you temporarily don't want to hear. It will reset when the radio is turned off.
SUBSCRIBER	Mobile, portable or base station	Any radio on the system other than the repeater itself is referred to as a subscriber
TOT (Time out timer)	Time out timer	If you transmit for longer than this setting the radio will cut you off and give you an error tone.

Some DMR Terminology

DMR TERM	WHAT IS IT / HAM TERM	NOTES
ENTITLEMENT KEY	A option code that adds a function to the software	Used to allow traditional (wideband) FM on Motorola radios
ROAM LIST	This is the list that establishes the repeaters that are checked in a roaming grouping	This is limited to 16 repeaters for any list for older radios. System only works with Motorola radios.
ALIAS	This is a text assigned to a Digital ID that displays on the radio whenever that ID is received.	

Amateur DMR activity continues Trending Up

ID'S
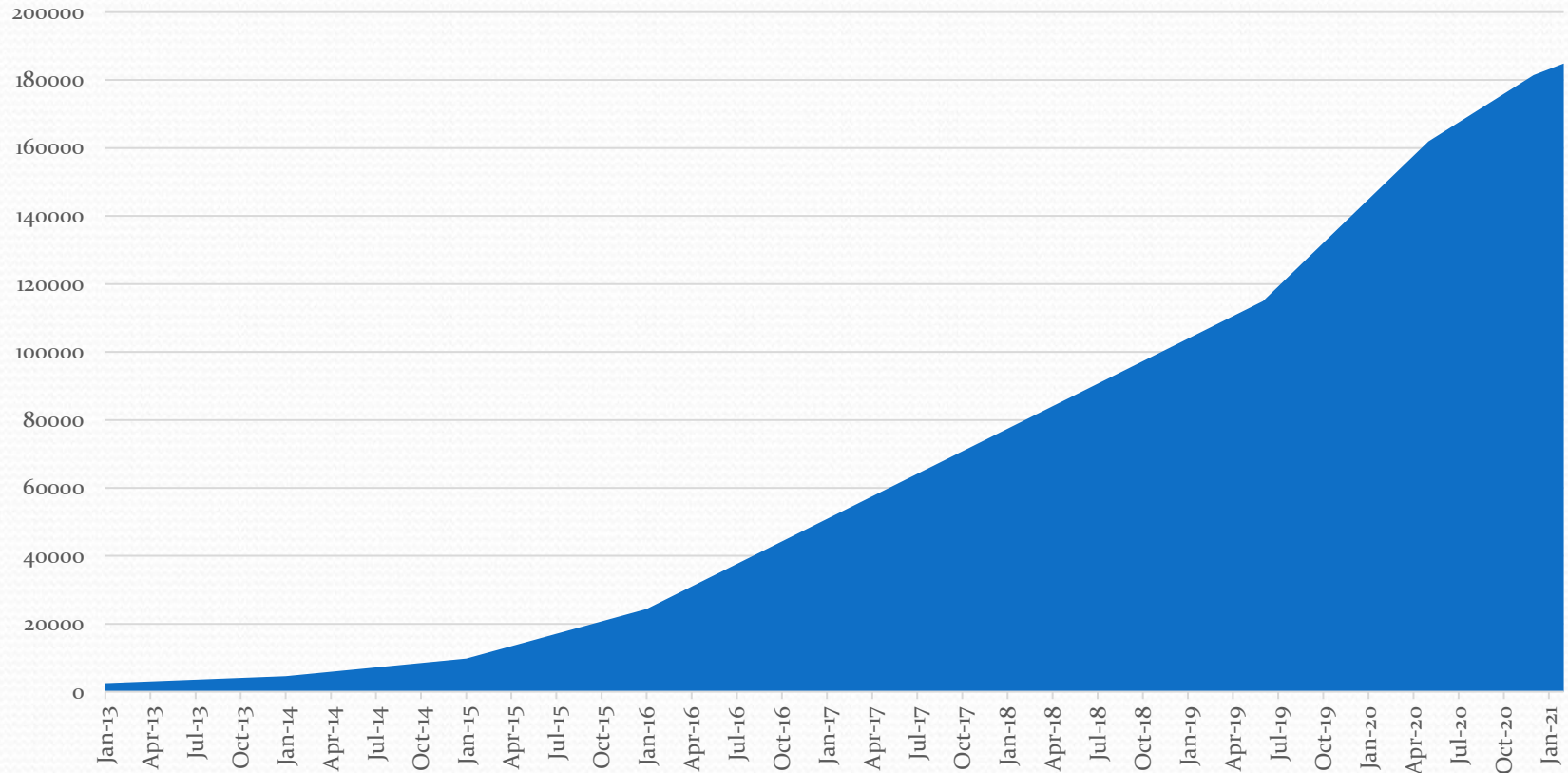
- Jan 2013 = 2,511 ID's
- Jan 2014 = 4,618 ID's
- Jan 2015 = 9,802 ID's
- Jan 2016 = 24,388 ID's
- June 2019 = 115,000+ ID's

May 2020 = 162,000+ ID's
Dec. 19, 2020 = 181,462 ID's
Jan 25, 2021 = 184,876 ID's

These are totals for DMR ID'S issued worldwide.

Amateur DMR activity in New England

Most New England DMR activity is on the New England Digital Emergency Communications Network (NEDECN) which is part of the DMR-MARC system (explained on next slide)

308 of the approx. 38,000 hams in New England used the NEDECN Repeater Network for week ending Dec. 19th.

- **The New England Digital Emergency Communications Network (NEDECN) system is a DMR-MARC system**
- **Servers and repeaters are owned by Motorola Amateur Radio Clubs and other private repeater owners**
- **1500+ site network in more than 47 countries**
- **Also bridged to other networks DCI, NorCal, AZ, NC, MI, KS, CO and Texas DMR networks**
- **100% Pure Digital Network**
- **To learn more   http://dmr-marc.net**

WHAT ARE SOME OF TALK GROUPS AND WHAT TIME SLOTS ARE THEY ON IN THE NEDECN NETWORK

TIME SLOT 1	TIME SLOT 2
SKYWARN	LOCAL (SINGLE REPEATER)
WORLDWIDE (PTT on demand link)	REGION NORTH (MA, ME, NH, VT)
WORLDWIDE ENGLISH (PTT on demand link)	IN-STATE STATEWIDE CHANNEL
NORTH AMERICA	NEW ENGLAND WIDE (PTT on demand link)
NORTHEAST (New England, NY, NJ, PA)	NE TAC 2 (PTT on demand link)
TAC 310 (PTT on demand link)	Other in area sub nets (i.e.: CAPENET)
TAC 311 (PTT on demand link)	
UA 113 (PTT on demand link))	
UA 123 (PTT on demand link)	
PARROT (PTT on demand link that test that repeats your received audio)	
NE TAC1 (PTT on demand link)	

Statewide channels for some adjacent states are typically on Time Slot 1

WHAT ARE SOME OF TALK GROUPS AND WHAT TIME SLOTS ARE THEY ON IN THE NEDECN NETWORK

TALK Group Name	TG #	Time Slot	Description	Usage	Priority	Timer(s)
Local	9	2	Local - Single Site only	When users are on same repeater	Over State & RGNs	No
Coos Net	8803	2	Coos County, NH Net	Ben Young Hill, Mt. Washington sites	Over State & RGNs	No
Cape Net	8804	2	Cape Cod, MA Net	Eastham, Bourne and Martha's Vineyard sites	Over State & RGNs	No
CT Statewide (SNE)	3109	2	CT-Eastern LI, NY QSOs	When all users are in CT, E-LI and bordering MA	Over N-E-W	No
ME Statewide	3123	2	ME QSOs	When all users are in Maine	Over RGN & N-E-W	No
MA Statewide	3125	2	Massachusetts QSOs	When all users are in Massachusetts	Over N-E-W	No
NH Statewide	3133	2	NH QSOs	When all users are in New Hampshire	Over RGN & N-E-W	No
RI Statewide	3144	2	RI QSOs	When all users are in Rhode Island	Over RGN & N-E-W	No
VT Statewide	3150	2	VT QSOs	When all users are in Vermont	Over RGN & N-E-W	No
REGION North	8	2	Northern New England (VT, NH, MA, ME, RI)	When all users are in VT, NH, MA, ME, RI	Over N-E-W	No
N-E-W	3181	2	New England Wide plus New Brunswick	When all users are spread across a wide area	None	No-Courtesy
NETAC2	8802	2	New England TAC2	When two or more users are within New England	PTT on Demand	PTT 5
Alternate state(s)	A/R	1	Usually for neighboring states	When traffic on TS2 from neighboring states is high	PTT on Demand	PTT 5
Northeast	3172	1	New England plus NY, NJ and PA	When all users are spread across Northeast	Over NA & WW	No-Courtesy
NA	3	1	North America	When all users are spread across the US+CA	Over WW	No-Courtesy
WW English	13	1	World Wide English	When users are spread across the English world	Over WW	No-Courtesy
WW Call	1	1	World Wide all languages	Calling and short QSOs + Weekly Net	PTT on Demand	Saturday, PTT 3
WW Spanish	14	1	WW Spanish/Latin Sites	South America, Dominican Rep., Mexico, US, Spain	PTT on Demand	PTT 3
WW German	10	1	WW German	Germany, Austria, Switzerland, US	PTT on Demand	PTT 3
NETAC1	8801	1	New England TAC1	When 2 or more users are within New England	PTT on Demand	PTT 5
TAC310	310	1	TAC 310; a reflector	When 2 or more users are scattered in US/CA	PTT on Demand	PTT 5
TAC311	311	1	TAC 311; a reflector	When 2 or more users are scattered in US/CA	PTT on Demand	PTT 5
UA 113	113	1	User Activated English 1	When 2 or more users are scattered International	PTT on Demand	PTT 5
UA123	123	1	User Activated English 2	When 2 or more users are scattered International	PTT on Demand	PTT 5
UA119	119	1	User Activated Any Language	When 2 or more users are scattered International	PTT on Demand	PTT 5
UA129	129	1	User Activated Any Language	When 2 or more users are scattered International	PTT on Demand	PTT 5
Parrot	9998	1	Listen to your audio	Audio Quality and Coverage testing	None	PTT 1
DMR+ USA	133	1	New dongle access Reflector	When users are out-of-range of repeater sites	PTT on Demand	PTT 3
DMR+ UK	143	1	New dongle access Reflector	When users are out-of-range of repeater sites	PTT on Demand	PTT 3
DMR+ Pacific	153	1	New dongle access Reflector	When users are out-of-range of repeater sites	PTT on Demand	PTT 3

THIS TABLE IS FROM WWW.NEDECN.ORG

WHAT TALK GROUPS ARE ON MY LOCAL REPEATERS (https://www.radioid.net/map#!)

WHAT TALK GROUPS ARE ON MY LOCAL REPEATERS (https://www.radioid.net/map#!)

WHAT TALK GROUPS ARE ON MY LOCAL REPEATERS (http://www.dmr-marc.net/repeaters.html)

WHAT TALK GROUPS ARE ON MY LOCAL REPEATERS (https://www.radioid.net/map#!)

Callsign: AE1C
Frequency: 145.27000
Offset: -0.600
ColorCode: 7

NEDECN
Southboro, Massachusetts

Time Slot #1 - Group Call 759 = SKYWARN
Time Slot #1 - Group Call 1 = World Wide*
Time Slot #1 - Group Call 13 = WW English*
Time Slot #1 - Group Call 3 = North America
Time Slot #1 - Group Call 3172 = Northeast
Time Slot #1 - Group Call 8801 = NETAC1*
Time Slot #1 - Group Call 8804 = CapeNet
Time Slot #1 - Group Call 3109 = CT Statewide*
Time Slot #1 - Group Call 3133 = NH Statewide*
Time Slot #1 - Group Call 113 = UA113*
Time Slot #1 - Group Call 123 = UA123*
Time Slot #1 - Group Call 310 = TAC310*
Time Slot #1 - Group Call 311 = TAC311*
Time Slot #1 - Group Call 9998 = Parrot*
Time Slot #2 - Group Call 3181 = New England Wide
Time Slot #2 - Group Call 8 = Region North
Time Slot #2 - Group Call 3125 = MA Statewide
Time Slot #2 - Group Call 8802 = NETAC2*
Time Slot #2 - Group Call 9 = Local Site

Entries with an asterisk (*) after them only stay available for 3 or so minutes after they are kerchunked and there is no activity.

What are TAC, UA and NE TAC channels

The TAC, UA (user activated) and NE TAC Channels allow two or more users to perform an ad hoc tie of multiple repeaters together. This allows users spread over a wide area to talk without tying up wide area channels and 100's of repeaters like "Northeast". They all have timers which drop the link after a few minutes of no use.

Talk Group (Time Slot)	Coverage Area	Notes
TAC310 (1) <NEDECN only>	New England	On other systems this is a US wide talk group.
TAC311 (1)	US	
UA113 (1) <Also known as UA English 1>	Worldwide	For English speakers
UA123 (1) <Also known as UA English 2>	Worldwide	For English speakers
New England TAC 1 (1)	New England	aka "NE TAC1"
New England TAC 2 (2)	New England	aka "NE TAC2"

Top 5 Talkgroups on NEDECN by order of activity for week ending Jan. 24

LOCAL (by repeater)

MAINE STATEWIDE (not on MA repeaters)

NEW ENGLAND WIDE

MASSACHUSETTS STATEWIDE

NETAC1

What is the PARROT

THE **PARROT** IS A VOICE RECORDER THAT ALLOWS YOU TO HEAR HOW YOU SOUND <u>THROUGH THE SYSTEM</u>. A LOT OF PEOPLE USE IT TO MAKE SURE THAT THEIR SIGNAL IS MAKING THE REPEATER WITHOUT PROBLEMS.

YOU ANNOUNCE ON THE **PARROT** TALKGROUP SOMETHING LIKE;

"N1DM TESTING ON THE PARROT ON SOUTHBORO".

7 SECONDS OR SO LATER YOU SHOULD HEAR YOUR VOICE REPEATED IF YOU ARE WITHIN THE REPEATERS RECEIVE RANGE.

The <u>Simplified</u> DMR Network
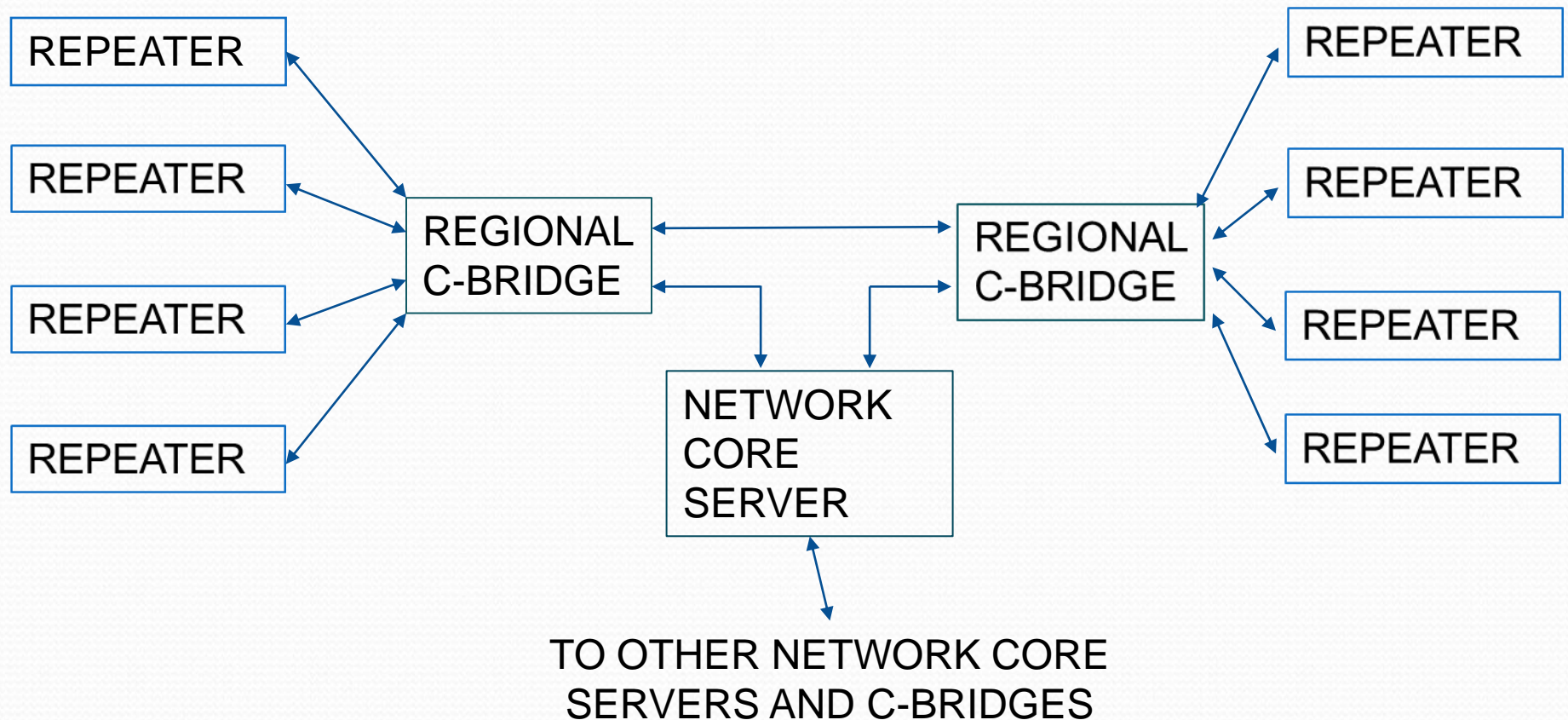
The NEDECN DMR Network

C-BRIDGES CONTROL THE TRAFFIC BETWEEN REPEATERS AND LINK THEM TOGETHER

THE NETWORK ALSO VALIDATES THAT USERS ARE LEGITIMATE (REGISTERED WITH RADIOID.NET). IF YOU DO NOT GET AN ID YOU WILL ONLY BE BALE TO TALK ON THE LOCAL TALK GROUP ON THE REPEATER YOU ARE TUNED TO.

THERE ARE MULTIPLE C-BRIDGES IN THE NEDECN NETWORK:
NEDECN (ORIGINAL)
AUGUSTA (ME)
BASS HILL (ME)
VT
CTDARN (CT)

THE USER DOES NOT NEED TO BE CONCERNED WHICH SERVER THEY ARE ON. THESE ARE WORKING IN THE BACKROUND AND ARE USER TRANSPARENT.

Predominant New England DMR Networks

Network	New England Repeaters	MA Repeaters
DMR-MARC (NEDECN)	95	17
CT ARES	32 (all in CT)	0
BRANDMEISTER	18	5
	YOUR ID WILL WORK	*ON ALL THESE*

The New England DMR-MARC network has additional repeaters in New Brunswick, Quebec and New York.

"Brandmeister" is an 'on demand' system with a choice of 1300 talk groups. Kind of like D-STAR.

Local DMR Repeaters

- **NEDECN (DMR-MARC) Network**
  - **Southboro MA-Both VHF and UHF**
  - **Sudbury, MA-VHF (local use)**
  - **Boston, MA-UHF**
- **DMR-MARC**
  - **Acton-Both VHF and UHF (limited talk groups)**
- **BRANDMEISTER**
  - **Cumberland, RI-VHF You can bring up with a outside antenna and 25 watts in West Natick**
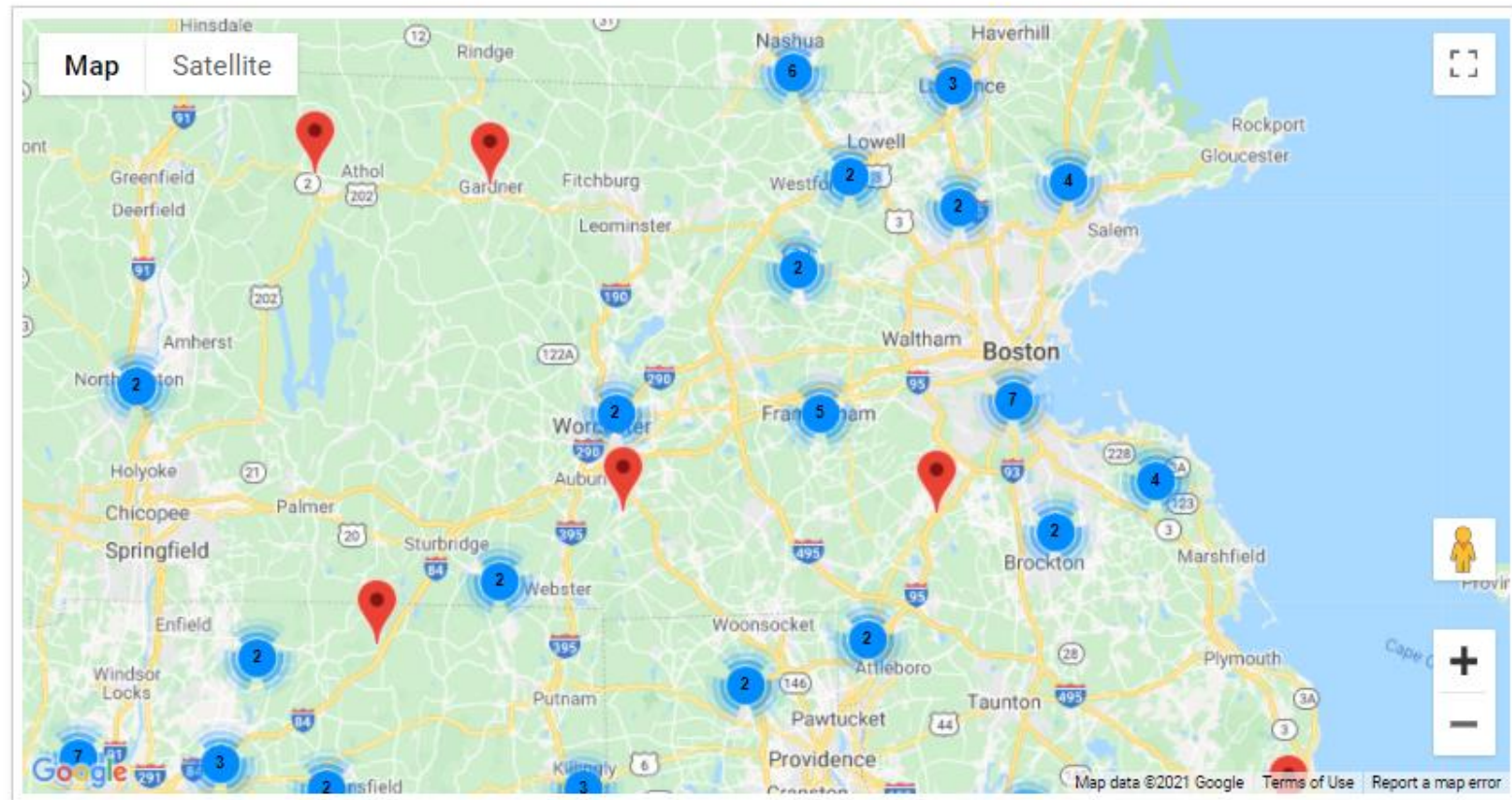
Local DMR Repeaters

Getting Started

- REGISTER FOR A DMR ID ON THE RADIOID WEBSITE (http://www.radioid.net)
- BUY A TIER 2 RADIO
- GET IT PROGRAMMED
- TALK

WHY DO I NEED A DMR ID ?

THE NETWORK <u>REQUIRES</u> YOU TO HAVE A DIGITAL ID TO ALLOW ALL THE C-BRIDGES AND MASTERS TO PROPERLY DIRECT YOUR CONVERSATION BETWEEN REPEATERS AND TALK GROUPS.

Things to think about when buying a radio

- ALL DMR RADIOS (EXCEPT SOME VERSIONS OF MOTOROLA SL SERIES) WILL DO TRADITIONAL ANALOG FM

- RADIOS MUST BE PROGRAMMED WITH SOFTWARE

- <u>MOST</u> RADIOS CANNOT BE REPROGRAMMED ON THE FLY (I.E.: VIA THE RADIO KEYPAD)

- RADIOS ARE SPREAD OVER A LARGE PRICE RANGE FROM $55 TO $3000 (WOW) FOR A WALKIE

- SOME DMR RADIOS HAVE LESS THAN 125 CHANNELS, AVOID THEM (EACH USER CHANNEL HAS A RF CHANNEL, TIME SLOT, COLOR CODE AND TALK GROUP).

Programming your radio

YOU NEED THE CUSTOMER PROGRAMMING SOFTWARE (CPS) <u>FOR YOUR PARTICULAR RADIO</u>

AT THE MINIMUM YOU NEED TO KNOW THE FOLLOWING TO PROGRAM A RADIO:

- YOUR <u>DMR RADIO ID</u>
- THE <u>TALK GROUP</u> YOU WANT TO TALK ON AND PUT THAT IN THE DIGITAL CONTACTS LIST AS A GROUP CALL
- THE <u>TIME SLOT</u> BEING USED FOR THE TALK GROUP YOU ARE PROGRAMMING
- YOU NEED TO KNOW THE <u>INPUT AND OUTPUT</u> <u>FREQUENCIES FOR THE REPEATER</u> YOU WILL USE.
(ON 2 M THIS IS NOT ALWAYS A 600 KHZ DIFFERENCE)
- YOU NEED TO KNOW THE <u>COLOR CODE</u> FOR THE REPEATER YOU ARE USING. (COLOR CODE IS LIKE PL TONE)

RBO Customer Programming Software - [aa9vi-mobile.ctb]

Edit   View   Device   Features   Remote   Window   Help

Save   Delete   Cut   Copy   Paste   Search   Read   Write   Clone   Reports   About

XPR 4550
- General Settings
- Accessories
- Buttons
- Text Messages
- Telemetry
- Menu
- Privacy
- Network
- Signaling Systems
  - MDC
    - FISHFAR
  - Quik-Call II
    - Sys1
  - Digital Emergency
    - Sys1
  - Capacity Plus Eme
    - Sys1
- Contacts
  - MDC
    - Call1
  - Quik-Call II
    - Call1
  - Digital
    - ALL CALL
    - PC CALL
    - AA9VI Mike
    - AA9VI Mike L
    - AA9VI Mike M
    - AB3AC Bruce
    - D02DPK Phil
    - D03FG Fran
    - D03YWR Wo
    - D04DO Pete
    - D05APR Anc
    - D05APR Anc
    - D05DS Diete
    - DB9PF Augu
    - DC1TJH Tho
    - DD0IZ Micha
    - DC5AJ Alexa
    - DD2JU Rudo

K9MOT S1

Top   RX   TX

Option Board Trunking ☐
Lone Worker ☐
Allow Talkaround ☐
IP Site Connect ☑
Messaging Delay (ms) [90]
Compressed UDP Data Header ☑
RX Only ☐

THIS IS ONE OF 4+ SCREENS YOU NEED TO USE TO PROGRAM A DMR RADIO

RX

Frequency (MHz) [444.793750]
Ref Frequency (MHz) [Default]
Group List [DMR-MARC1]
Emergency Alarm Indication ☐
Emergency Alarm Ack
Emergency Call Indication ☐

Offset (MHz) [5.000000]
Copy

TX

Frequency (MHz) [449.793750]
Ref Frequency (MHz) [Default]
Contact Name [DMR-MARC1]
Emergency System [None]
VOX ☐
Power Level [Low]
TOT (sec) [180]
TOT Rekey Delay (sec) [0]
Allow Interruption ☐
TX Interruptible Frequencies ☐
Admit Criteria [Color Code Free]
In Call Criteria [Follow Admit Criteria]

Expert View   19.96% Used   NUM

Programming your radio

BRINGING 180,000 ID'S INTO A RADIO IS AN ISSUE, BUT LUCKILY THE N0GSG.COM WEBSITE HAS PROVIDED A SOFTWARE TOOL CALLED 'CONTACT MANAGER' TO HELP WITH THIS. IT WORKS VERY WELL.

IT CAN BE FOUND AT:

http://n0gsg.com/contact-manager/

A SIMILAR TOOL IS AVAILABLE ON RADIOID.NET

Programming your radio

WHAT IS THE DIFFERENCE BETWEEN A SCAN LIST AND A RECEIVE GROUP LIST ?

A <u>SCAN LIST</u> DOES WHAT IT DOES ON EVERY HAM HT IT ALLOWS YOU TO SCAN A PRESELECTED LIST OF CHANNELS. YOU CAN TURN IT ON AND OFF FROM A BUTTON ON THE RADIO

A <u>RECEIVE GROUP</u> IS A LIST FOR A CHANNEL THAT IS IMBEDDED IN THE PROGRAMMING FOR THE CHANNEL SO WHEN EVER YOU LISTEN TO THAT CHANNEL YOU ALSO HERE THE THE TALK GROUPS IN THE <u>RECEIVE GROUP LIST</u>. IT CANNOT BE TURNED OFF BY THE USER.

Programming your radio

WHY USE A RECEIVE GROUP LIST ?

RECEIVE GROUP LISTS WERE MADE FOR COMMERCIAL USERS SO THAT A GROUP OF USERS COULD BE PAGED WHILE THEY WERE ON THEIR OWN TALK GROUPS.

IN HAM RADIO IT IS TYPICALLY USED SO WHEN YOU ARE ON A TIME SLOT YOU HEAR EVERYONE ELSE ON THAT TIME SLOT SO YOU DO NOT BREAK UP OTHER USERS CONVERSATIONS.

Hotspots

HOTSPOTS **ARE A VERY LOW POWER (<10 MW) RADIO THAT USES YOUR INTERNET CONNECTION TO TALK ON THE NETWORK. IT ALLOWS YOU TO USE YOUR HT OR MOBILE WHEN OUT OF RANGE OF A REPEATER.**

OTHER THAN THE BRANDMEISTER NETWORK, HOTSPOTS ARE LIMITED IN WHAT TALK GROUPS THEY CAN ACCESS ON NETWORK REFLECTORS (SERVERS).

Hotspots

THE EASIEST REFLECTOR (SERVER) TO USE TO ACCESS NEDECN TALK GROUPS IS THE CAN-TRBO SYSTEM (ALSO KNOWN AS IPSC2-CAN-TRBO OR DMR+). SEE www.VE2TAX.com FOR INFO.

CAN-TRBO CURRENTLY HAS CONNECTION TO THE FOLLOWING DMR-MARC (NEDECN) TALK GROUPS; *WORLDWIDE, WORLDWIDE ENGLISH, NORTH AMERICA, TAC311, CT STATE, MASS STATE, NH STATE, REGION NORTH, MAINE STATE, VT STATE, NEW ENGLAND WIDE, NE TAC1, AND CAPENET*

Hotspots

KNOWN GOOD HOTSPOTS FOR CAN-TRBO SYSTEM

- SHARK OPEN SPOT 3 (NOTE: OLD OPEN SPOT 1 DOES NOT HAVE WIFI CAPABILITY AND OPEN SPOT 2 HAD WIFI BUT IS DISCONTINUED)

- JUMBOSPOT (CHINESE) - CONFIGURATION IS A BIT DIFFICULT

- ZUMSPOT

FAQ

- **WHAT ARE REPEATER TIME OUT TIMERS SET FOR ?** IT VARIES BY REPEATER AND TALK GROUP FROM 2 MINUTES (120 SEC) TO 3 MINUTES (180 SEC) IS THE NORM. THE <u>TOT</u> IN YOUR RADIOS SHOULD BE SET TO 120 SECONDS SO YOU DO NOT TIME OUT THE REPEATERS OR TALK GROUPS.

- **I LOOKED AT THE CPS FOR MY RADIO AND I SEE THINGS LIKE "LONE WORKER" AS AVAILABLE FUNCTIONS, WHAT ARE THESE?** THEY ARE COMMERCIAL FUNCTIONS THAT ARE NOT USED IN HAM RADIO. ESPECIALLY *DO NOT TURN ON ENCRYPTION*, IT IS ILLEGAL TO USE ON HAM RADIO.

FAQ

- **I SEE REFERENCES TO MOTOTRBO WHAT IS THAT?** IT IS MOTOROLA'S TRADE NAME FOR THEIR VERSION OF DMR. IT HAS SOME PROPRIETARY FEATURES. THE NEDECN NETWORK IS A MOTOTRBO SYSTEM. YOU *CAN* USE NON-MOTOROLA RADIOS ON IT.

- **CAN I ADD AN AMPLIFIER TO MY RADIO?** NOT EASILY, THE AMPLIFIER NEEDS TO BE ABLE TO SWITCH ON AND OFF VERY QUICKLY AND THAT IS HARD TO DO FOR MANY AMPLIFIERS. ONE COMPANY CURRENTLY MARKETS ONE, BUT I HAVE NO EXPERIENCE WITH IT.

- **WHY ARE THERE MULTIPLE NETWORKS?** GROUPS LIKE NEDECN, BRANDMEISTER AND CT-ARES SET UP NETWORKS THAT MET THEIR SPECIFIC NEEDS.

FAQ

- **<u>WHAT HAPPENS WHEN THE REPEATER LOOSES ITS NETWORK CONNECTION?</u> THE LOCAL CHANNEL ON THE REPEATER ALWAYS WORKS.**

- **<u>WHAT IS AN EASY WAY TO CHECK IF THE REPEATER IS ON THE NETWORK?</u> THERE ARE 2, GO TO THE PARROT AND TRY IT, IF THE PARROT IS WORKING THE REPEATER IS ON THE NETWORK. THE SECOND IS TO GO TO NEDECN AND CHECK NETWATCH AS YOU TRANSMIT. IF YOU SEE YOUR CALL COME UP THE REPEATER IS ON THE NETWORK.**

- **<u>HOW MUCH ACTIVITY IS THERE?</u> THE BUSIER REPEATERS ON THE SYSTEM (LIKE SOUTHBOROUGH) ARE SHOWING ABOUT 30 TO 45 MINUTES *PER DAY*.**

What Radios will do DMR

THERE ARE A VARIETY OF RADIOS AVAILABLE AND THEY ALL WORK ON THE NEDECN NETWORK.

REMEMBER WHEN YOU BUY A RADIO TO <u>BUY THE PROGRAMMING CABLE</u> FOR IT.

IN BUYING OTHER THAN A MOTOROLA RADIO THE VENDORS PROVIDE CPS SOFTWARE FOR FREE. MOTOROLA CHARGES A <u>HEFTY FEE</u> FOR THEIR PROGRAMMING SOFTWARE. IF YOU WANT TO BUY A MOTOROLA RADIO FIND A FRIEND OR CLUB THAT HAS THE CPS SOFTWARE BEFORE YOU BUY.
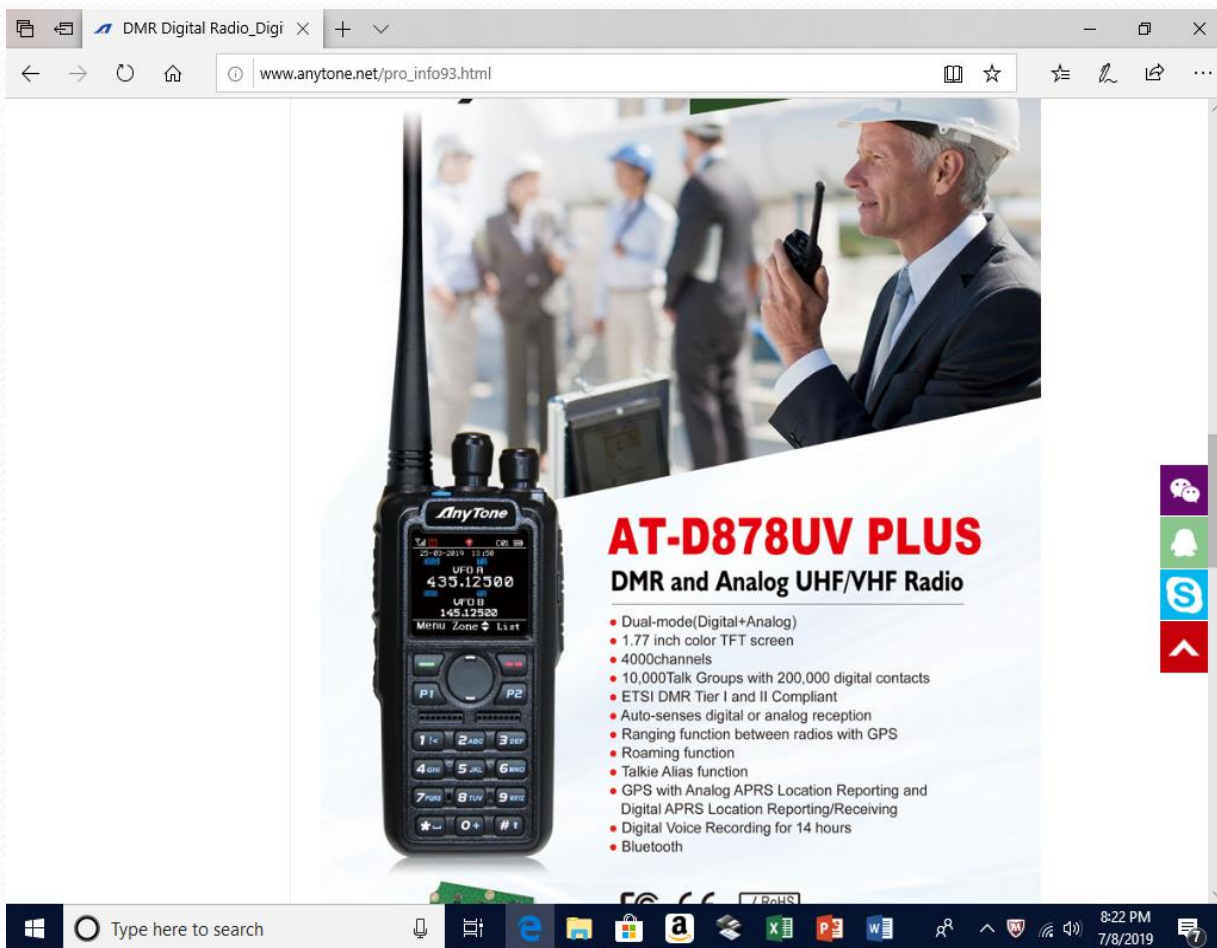
If I have two radios in the room it seems there is a delay between when I talk and the other radio hears me.
What is going on?

Simply it takes time for the radio to digitize your voice and synchronize with a time slot. Once you get the network for repeaters involved this gets even longer as the network processes your call. This is called 'latency'.

Anytone AT-D878UV Plus

AnyTone

25-03-2019 13:150
UFO A
435.12500
UFO B
145.12500
Menu Zone ♦ List

P1   P2

AT-D878UV PLUS
DMR and Analog UHF/VHF Radio

- Dual-mode(Digital+Analog)
- 1.77 inch color TFT screen
- 4000channels
- 10,000Talk Groups with 200,000 digital contacts
- ETSI DMR Tier I and II Compliant
- Auto-senses digital or analog reception
- Ranging function between radios with GPS
- Roaming function
- Talkie Alias function
- GPS with Analog APRS Location Reporting and Digital APRS Location Reporting/Receiving
- Digital Voice Recording for 14 hours
- Bluetooth

DUAL BAND (2/440) WITH A LOT OF CHANNELS AND ID SPACE

Available from Bridgecom and Ham Radio Outlet

Anytone AT-D578UV PRO

THREE BAND (2/220/440) WITH A LOT OF CHANNELS AND ID SPACE.
Note: 220 is low power <10 watts

Available from Bridgecom and Ham Radio Outlet.

Alinco DJ-MD5

**DUAL BAND (2/440) WITH A LOT OF CHANNELS AND ID SPACE
Available from Ham Radio Outlet**

Connect Systems CS800 Mobile

A LOT OF CHANNELS AND ID SPACE

I own one of these

This radio is available in single (CS800) and dual band (CS800D) versions. Buy the CS800 and CS800D available directly from Connect Systems

Motorola XPR7550

Only available in single band versions with very limited number of Private Call ID's

Tytera MD380

Very limited number of Private Call ID's

Both single and dual band versions available

Some Local DMR Nets

DAY	NAME	TIME	TALK GROUP
SUNDAY	PROVIDENCE RA NET	8 PM	NE TAC1
MONDAY	NEW ENGLAND DMR NET	8 PM	NEW ENGLAND WIDE
TUESDAY	VERMONT STATE NET	8 PM	VT STATEWIDE
WEDNESDAY	YCCC DX & CONTEST NET	8 PM	NE TAC1
THURSDAY	NEW HAMPSHIRE NET	8 PM	NH STATEWIDE

ALL TIMES ARE LOCAL TIMES
ALL NETS WELCOME EVERYONE

Problem Children

HYTERA HAS LOST A MAJOR COURT BATTLE WITH MOTOROLA REGARDING DMR RADIOS. IT IS UNCLEAR IF HYTERA WILL CONTINUE TO OPERATE IN THE US IN THE FUTURE.

I SUGGEST YOU STAY AWAY FROM HYTERA RADIOS FOR THE TIME BEING.

Some DMR Web Sites
(check out the links below)

- http://dmr-marc.net/ (THE GRANDDADDY OF DMR SITES)

- http://nedecn.org (NEW ENGLAND)

- http://www.maine-dmr.org/ (MAINE DMR… VERY GOOD INTRODUCTORY MATERIAL)

- https://www.radioid.net THIS IS WHERE YOU GET YOUR RADIO ID

Ham Friendly DMR Dealers

- Sandy's Comm., contact Jeff
  - 866.993.9011 (for Motorola radios)
- TwoWayDigitalRadio.com, contact Ken
  - 706.896.0000 (for Motorola radios)
- Connect Systems http://csi-radios.com/
- Ham Radio Outlet sells Alinco and Anytone DMR radios and Zumspot Hotspots
- Bridgecom sells Anytone and Hotspots

*WARNING: MOTOROLA AND HYTERA DMR radios are DMR–and-Analog **SINGLE BAND ONLY***