



DMR PRESENTATION FOR OLD VA HAMS

Kenneth Fowler N4VKF

Trustee:

TGIF DMR Talkgroup 1033
“The Scanner Junkies”

TGIF DMR Talkgroup 14715
“RVARC”

DMR ID: 3151100

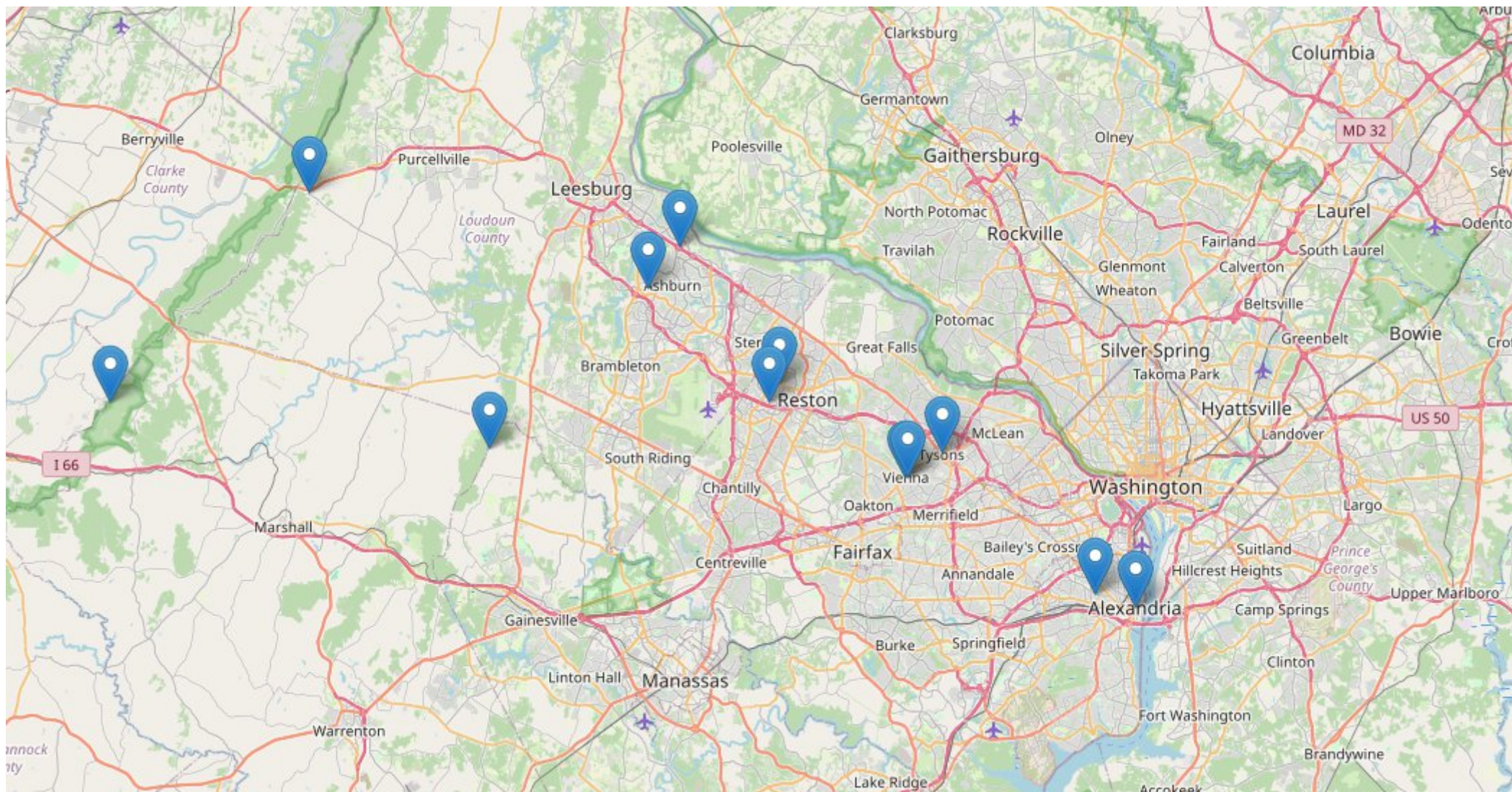
NOVA AREA DMR REPEATERS

442.4375+
CC1
(Herndon)

443.0625 +
CC1 (Tyson's
Corner)

441.3375 +
CC1 (Tyson's
Corner)

441.650 +
CC1 (Tyson's
Corner)



REPEATER AND NETWORK INFORMATION

- www.delmarvadmr.com (Interstate DMR)
- www.dmrva.com (DMR VA)
- www.brandmeister.com (Brandmeister)
- www.repeaterbook.com



DMR: WHAT IS IT?

DEFINING DIGITAL MOBILE RADIO (DMR)

Digital Mobile Radio (DMR) is an international digital radio standard developed by the European Telecommunications Standards Institute (ETSI)

1. Improved voice quality
2. Improved functionality such as Location information)
3. Improved security (i.e. Authentication and Encryption)
4. Improved channel efficiency (2 slot TDMA)
5. AMBE +2 Codec



FCC AUTHORIZ ATION FOR DMR USE BY AMATEURS

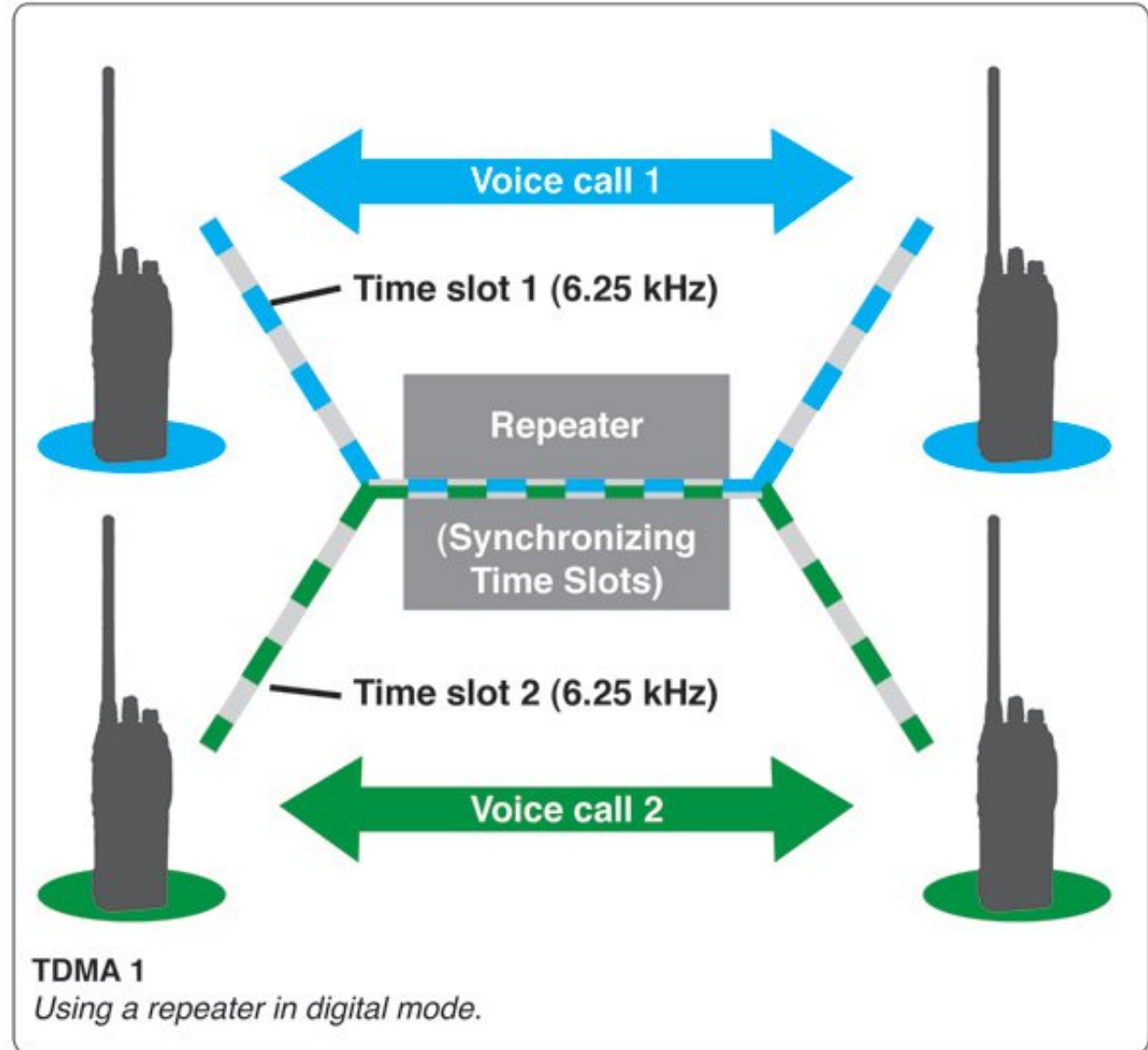
In FCC [Decision FCC 14-74](#) issued on June 9, 2014, the FCC outlined its decision to officially approve TDMA for ham radio use, as in doing so would be “consistent with the basis and purpose of the amateur service”. While this is great news for the nearly 3,600 US hams who are currently using DMR, it will serve more as closure to the longstanding issue of technical non-compliance of TDMA with the FCC’s Part 97 Rules. To address this technical non-compliance, the FCC issued a blanket waiver in 2011 at the request of the Amateur Radio Relay League (ARRL) for ham radio use of TDMA, however speculation within the ham radio community as to whether TDMA and by association, DMR, would officially be permitted in the Part 97 Rules has ranged on until now. With this decision, clarity has now been provided to US hams, which should allow DMR to gain even more traction within the US ham radio community.

DMR TIERS

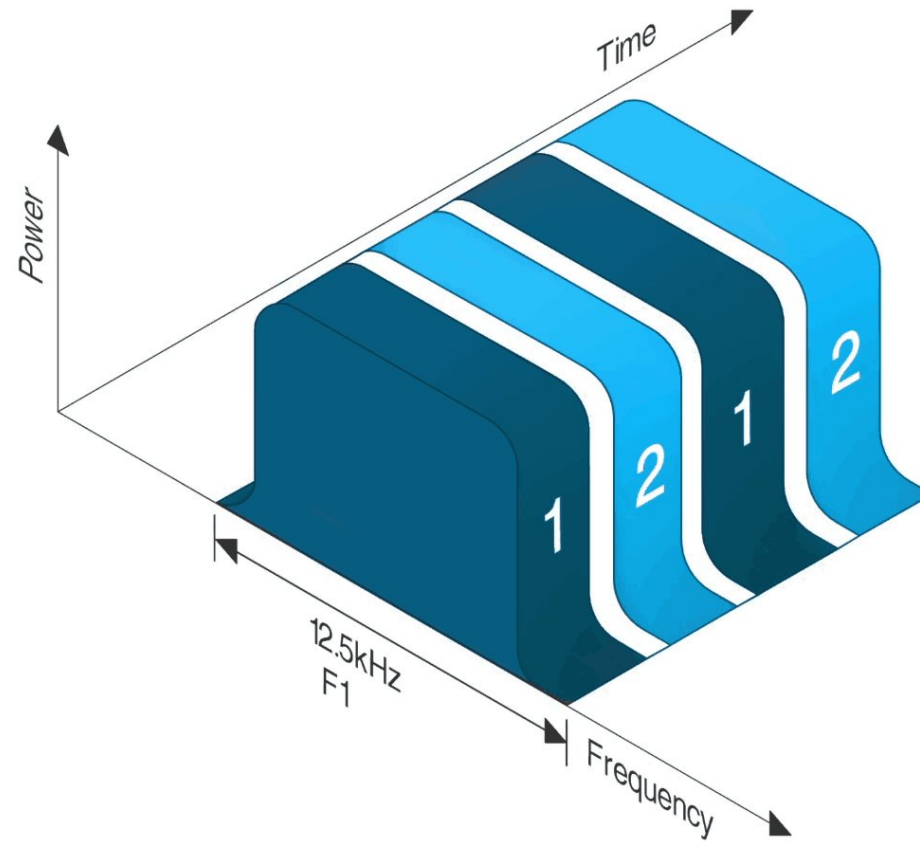
Tier	Tier I: Unlicensed Digital Radio (DPMR446)
Tier	Tier II: Licensed Conventional Radio Systems
Tier	Tier III: License Trunking Radio Systems.

TWO LOGICAL CHANNELS

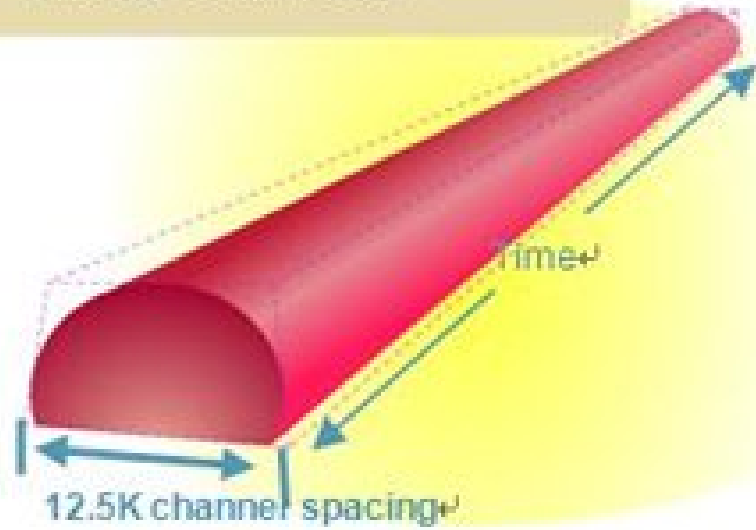
The DMR standard also specifies the use of TDMA technology. TDMA stands for Time Division Multiple Access. TDMA provides two logical channels and each 12.5-kilohertz channel space (see diagram below). This provides a useful doubling of capacity within the same analog channel space.



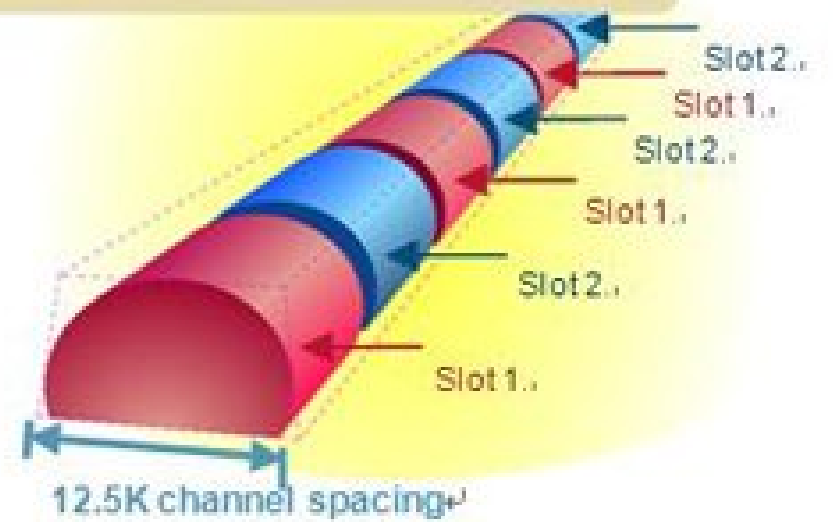
TDMA



Analog Technology

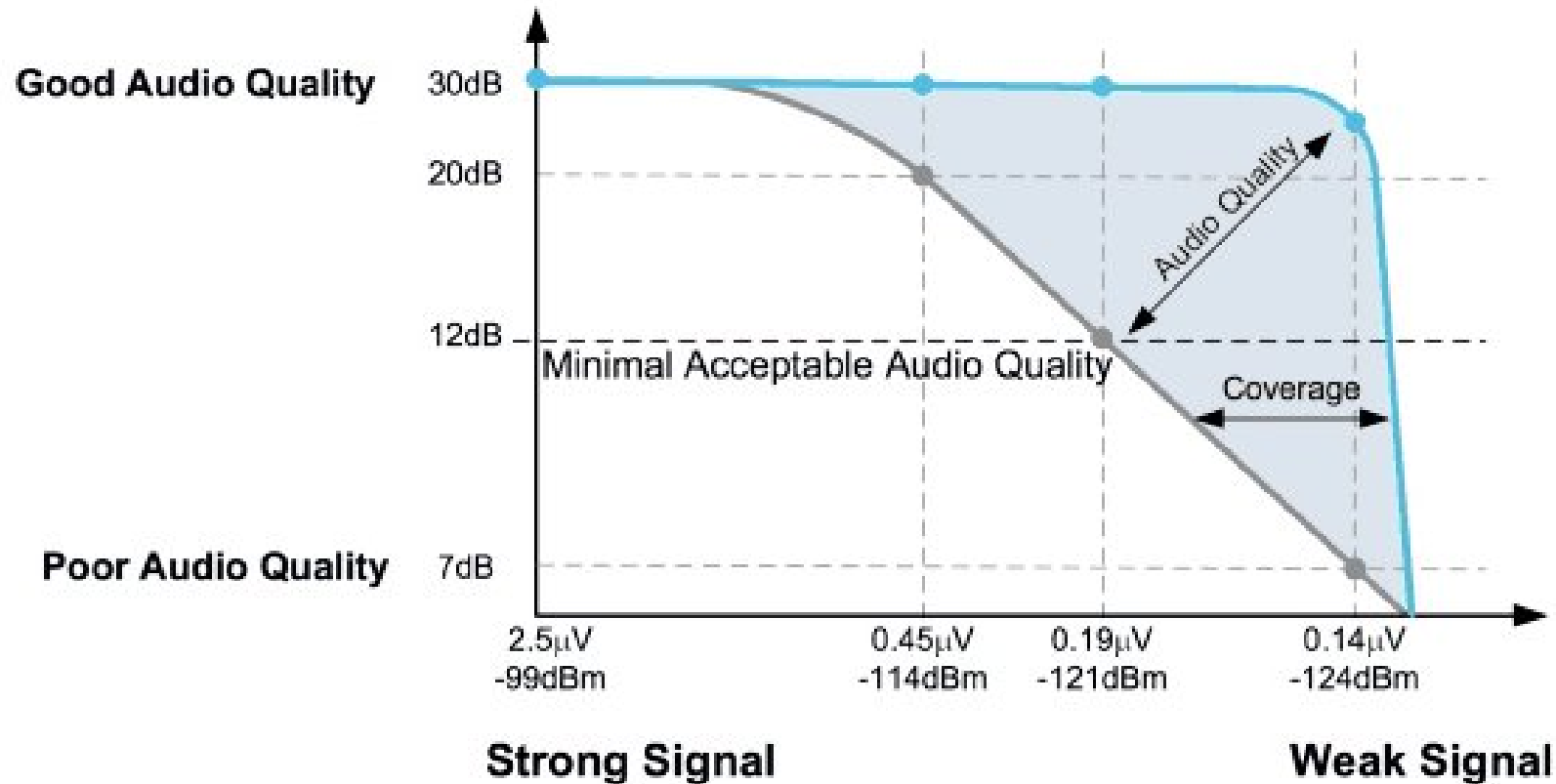


DMR TDMA Technology



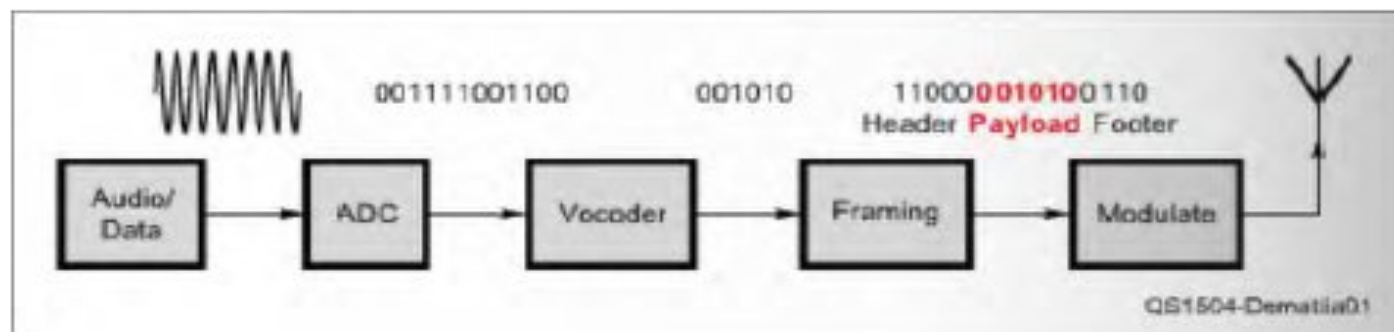
DIGITAL VS ANALOG AUDIO QUALITY

Key: ● Digital ● Analog ▲ Digital Advantage



Digital Voice Mode Comparison

	D-STAR	DMR	Fusion	APCO25
Vocoder	AMBE+	AMBE+2	AMBE+2	AMBE+2
FEC	Voice	Voice	Voice	Voice
Modulation	GMSK	4FSK	C4FM	C4FM
Multiplex	FDMA	TDMA	FDMA	TDMA
Data Rate	4.8 kbps	4.8 kbps (x2)	9.6 kbps	9.6 kbps
Bandwidth	6.25 kHz	12.5 kHz	12.5 kHz	12.5 kHz
Channels	1	2	1	1



DMR Simplex Frequencies

Below are the recommended simplex frequencies to be used with DMR in United States and Canada. In addition to this information, please note the following radio configuration items:

Admit Criteria: Please set this to “Always”

In Call Criteria: Please set to “TXI” or “Always”

CC = 1

TS = 2 (for most radios this does not matter) The more expensive radios can accommodate 2 TSs on simplex.

However, to negotiate a time slot all the radios must be within simplex range of each other.

FREQUENCY	BAND	TALKGROUP ID	TIMESLOT *	COLOR CODE
441.0000	UHF	99	2	1
446.5000	UHF	99	2	1
446.0750	UHF	99	2	1
433.4500	UHF	99	2	1
145.7900	VHF	99	2	1
145.5100	VHF	99	2	1



DMR JARGON

Timeslots (1 or 2)

Color Codes (Think of CTCSS or DCS)

Talk groups - What group am I talking too?

Digital Contacts - List of DMR IDs/Licensee Info

DMR JARGON



Zones - Group of DMR Channels in your radio



RX Groups - List of Talk groups I wish to monitor



Scan Lists - List of Channels I want to monitor



CPS (Customer Programming Software)

WHAT IS A CODEPLUG ?

Channels

Zones

RX groups

Scan Lists

Digital Contacts - Both Talkgroup and Individual
IDs

DMR ID

DYNAMIC VS. STATIC TALKGROUPS

A ***dynamic talk group***, or sometimes referred to PTT of a talk group, is a temporary activation of a particular talk group by the end user either being through a repeater or hotspot device.

A ***static talk group*** is set by either the repeater owner/trustee or hotspot user on a particular timeslot and is set to permanently allow traffic to be sent. This means all traffic will pass through the repeater/hotspot to the end user radio when there is active traffic or communications.

Dynamic Talkgroups





REPEATER NETWORKS IN VIRGINIA

N4HRS

DMR Virginia

K4USD

Interstate Repeater System

Brandmeister

DMR ETIQUETTE

IDing every 10 minutes during a conversation is essential.

- Before you can listen to a conversation's progress to connect to a talkgroup, you must first "Kerchunk" the mic by giving it a quick press, unlike a regular repeater or conversation.
- This is for PTT activated talkgroups or using a hotspot
- After tuning your desired talkgroup and once you've Kerchunked, you're going to want to listen first because you'll almost immediately hear activity on a busy talkgroup. So, once you kerchunk, you're going to want to listen first before you ID.

DMR ETIQUETT E

Remember that even if you're accessing a home hotspot, it is somebody else's talkgroup that you are talking on, and courtesy is of the utmost importance on the ham band.

We want to avoid using wide area talkgroups to carry out lengthy conversations. Suppose you're in North America, the USA worldwide, or even on a busy statewide talkgroup. Talkgroups exist for offloading long QSOs to lesser used talkgroups.

Select the appropriate talkgroup before transmitting and consider the impact of your transmissions.

- For example - if two users are on the same repeater and want to speak to each other, the best talkgroup to use is Local.

DMR ETIQUETT E

When using a talkgroup it is a good idea to ID your station and state the following: ex. N4VKF listening on “Spotsy Local”, Rappahannock Regional” or “Virginia Statewide”

When identifying yourself, especially in international talkgroups, make sure to use the proper phonetic alphabet.

Leaving the TG or ending the QSO, give your call sign and say “clear”.

CURRENT DMR RADIOS

Manufacturer	HT/Mobile	Model	Band	Note
Alinco	HT	DJ-MD5	Dual	3 different versions
Alinco	Mobile	MD-500T		
Alinco	Mobile	MD-500T		
Anytone	HT	AT-D878UVII	Dual	Plus Model also available
Anytone	HT	AT-D168UV	Dual	
Anytone	Mobile	AT-D578UVII	Dual	Plus Model also available
Baofeng	HT	DM-1701		
Baofeng	HT	DM-1701A		
Baofeng	HT	DM-1702		
Baofeng	HT	DR-1801UV	Dual	
Baofeng	HT	DM-UV32	Dual	
Btech	HT	DMR-6X2 pro	Dual	
Connect Systems	HT	CS-750	UHF	
Connect Systems	HT	CS-751	VHF	
Connect Systems	Mobile	CS-800D	Dual	
Connect Systems	Mobile	CS-801	VHF	
Radioddity	HT	GD-88	Dual	
Radioddity	HT	GD-168	Dual	
Radioddity	HT	GD-AT10G	UHF	
Radioddity	Mobile	DB25-D	Dual	
TYT	HT	MD-UV380	Dual	
TYT	HT	MD-UV390	Dual	
TYT	HT	MD-UV390+	Dual	
TYT	Mobile	MD-9600	Dual	
Retevis/Ailuanace	HT	RT-3S	Dual	
Retevis/Ailuanace	HT	HD2	Dual	
Retevis/Ailuanace	HT	H1	Dual	
Retevis/Ailuanace	HT	RB-22	UHF	
Retevis/Ailuanace	Mobile	RT-90	Dual	
Motorola	Many			
Hytera	Many			
Rfinder	HT		Dual	Combo Radio/Roip Device
Comjot	HT	CJ-1	Dual	Combo Radio/Roip Device

Thank You! – Any Questions?

