## <u>Digital Mobile Radio (DMR) Primer</u>

#### April 14, 2023

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- <u>https://dmrtechnet.net/</u>

To begin with DMR, you need an **FCC license for Amateur Radio** (**HAM**) --and to get that you will need an **FRN number** as that is the way that the FCC looks at individuals. <u>https://www.fcc.gov/wireless/support/universal-licensing-system-uls-resources/getting-fcc-registration-number-frn</u>

Then you will need to **study for** and **take 1-3 test**(**s**) for your License (Tech, General, Extra) <u>www.HamExam.org</u> <u>www.HamStudy.org</u>

You may take all the exams at once or progressively over time. Volunteer Examiners who already are HAMs (VE's) administer the tests. After passing the test(s), a **Call Sign is assigned** to you within 1-3 weeks.

Once you have a license (DMR is fully available to a Technician or above), then you will need to **register for a DMR ID** (can be issued the same day or take up to 3 days to receive) at <u>www.RadioID.net</u>

With your **CallSign** and **DMRid** in hand, you can then go out to the **BrandMeister** (**BM**) website and sign up for an account there. <u>https://brandmeister.network/</u>

Once you are notified that you are active (this is a voluntary organization and so it is not necessarily quick, although it usually is same day), you will want to go to the **SelfCare** tab and turn **ON** your HotSpot security and **create a HotSpot Security Password** (different from your BM password -- think simple, ie., all uppercase, or all lowercase. or all numeric -one or the other/not mixed).

## DIGITAL MOBILE RADIO NETWORKS

This is one area where DMR is a bit different from D-STAR. Just as in the D-STAR playground, some DMR repeaters are standalone and used for local communication only; however, DMR and D-STAR diverge in how they handle it when repeaters are interconnected.

In D-STAR, repeaters can be linked to reflectors. In DMR, repeaters using static talk groups are linked together in network configurations that are decided by the system administrations, which can't be changed by individual hams. Some repeaters also allow hams to temporarily subscribe to specified dynamic talk groups.

#### DMR-MARC and DMRPlus (DMR+)

Initially, there were two main worldwide umbrella networks for amateur radio, <u>DMR-MARC</u> (which years ago was the largest), built on MotoTRBO products, and DMRPlus (DMR+), built on Hytera products. The two networks didn't interconnect initially. Eventually, the two teams started collaborating on building some interconnectivity, but the use of these two networks hasn't been growing as much as some of the other newer networks in recent years.

#### Brandmeister

More recently, a new worldwide network, <u>Brandmeister</u>, was launched. It grew to be the largest amateur radio <u>DMR</u> network in the world. Brandmeister users can key up to (a.k.a., temporarily subscribe to) and use any talk group. It's also a very friendly network for hotspot users.

On the Brandmeister wiki, they say:

"If you are an amateur radio operator working in digital voice modes like D-Star, DMR, C4FM, APCO25 or others (not all are supported yet!), you do not need to know much about Brandmeister, and it's very easy to operate on its infrastructure."– Brandmeister Network Admins

"Brandmeister" is a play (in German) on the words "brand new master server."

It's a decentralized, worldwide, community-driven network being developed by an international team:

Master	Domain	Location
3102	3102.repeater.net	Dallas, Texas
3103	3103.repeater.net	San Jose, California
3104	3104.repeater.net	Chicago, Illinois

They are joined by teams in countries worldwide that are bringing master servers online, as well as by other teams putting repeaters online. As of July 2019, there are 47 BrandMeister DMR Servers deployed, connecting hundreds of repeaters in more than 43 countries.

As of early 2017, BrandMeister was just a bit more than a year old: development work began in 2014, and the first master servers went online in November of 2015. It's spreading as fast as a wildfire, which I guess is appropriate since, in German, "Brandmeister" (little "m") means fire chief.

From the Brandmeister wiki:

BrandMeister is an operating software for master servers participating in a worldwide infrastructure network of amateur radio digital voice systems.... Brandmeister allows you to connect to MOTOROLA DMR-MARC and Hytera DMRplus networks, this means you can operate with other DMR amateur radio operators on both infrastructures at the same time.

Brandmeister has a really nice, robust <u>User Dashboard</u> that includes activity meters and a real-time "last heard" page.



#### TGIF Network

Another relatively new network is the <u>TGIF network</u>. It has a small but loyal following with hams around the United States.

## TIME SLOTS

When there are so many puzzle pieces that need to be fitted together to set up a DMR radio successfully, it's challenging to figure out where to begin.

DMR uses Time Division Multiple Access (<u>TDMA</u>) to generate its signal instead of the Frequency Division Multiple Access (<u>FDMA</u>). Specifically, DMR uses 2-slot TDMA (the slots are numbered 1 and 2, or TS1 and TS2).

What this means is that calls on two different channels can share the *same frequency simultaneously*. Each call is sliced up into chunks of a few milliseconds, and the slices from the two calls are interleaved on the signal. This happens so fast that we hear what we perceive of as a continuous transmission even though it's coming in chunks, looking like this:



This also means that when you program a DMR channel, you must specify both the frequency and the time slot, so that your radio and the repeater can encode and decode which chunks on the signal belong to the channel you're using.

#### **COLOR CODES**

Another fundamental piece of the puzzle is color codes (CC). Think of the as the digital version of a PL tone like you find on analog repeaters. When you want to use a DMR repeater, you need to program in the appropriate color code to open it up and have the repeater respond that it's hearing your transmission. There are 16 color codes, 0 - 15. Why are they called color codes? Nigel, G8IFF educated us on the answer:

"[I]n the early days of DMR being a Motorola commercial system, the radio programming was done by Motorola who sold you a "plug" containing diodes that you plugged into a socket on the radio's circuit board. No user programming in those days. The color code was so called because it was indicated by a colored dot printed on the code plug you were supplied with." Nigel, G8IFF

Just as with analog radio CTCSS tones, you need to get the appropriate color codes from the organization operating the repeater in order to be able to use the repeater. When you program a DMR channel, in addition to the frequency and the time slot, you must specify the color code; otherwise, you won't be able to access the repeater.

The magic formula to accessing a DMR repeater...

#### Frequency + Time Slot + Color Code

Let's take a look at an example of a local Lansing, Michigan DMR repeater.

Frequency: 442.0875 (+5 MHz) Color code: 1

#### Time slot: 1

The above programming will get you onto the wide-area MI State time slot 1 of the KB8SXK repeater located on top of the old McLaren Hospital on Greenlawn Avenue.. It's a part of the Mi-5 system.

Frequency: 444.7875 (+5 MHz) Color code: 2

#### Time slot: 2

The above programming will get you onto the KB8SXK time slot 2 of the Lansing repeater located on top of the old McLaren Hospital on Greenlawn Avenue. This repeater is also a part of the Mi-5 system.

#### TALKGROUPS

Finally ... let's talk about talk groups!

Of course, the whole point of getting onto a DMR repeater is to talk to other hams, and you do that by visiting a talk group, which enables one-to-many communication, sort of like a conference call or a

chat room. Anything transmitted to a talk group is transmitted to everyone listening to (linked to) that talk group.

There are worldwide, nationwide, regional, statewide, area, and local talk groups, as well as language-based talk groups. For example, on Brandmeister:

- Talk group 91 is Worldwide
- 93 is North America
- 3100 is U.S. Nationwide *Note:* 3100 is an example of a talk group that is bridged across networks; it is U.S. Nationwide on the DMR-MARC, DMR+, and Brandmeister networks.
- 3126 is U.S. State of Michigan
- 3169 is U.S. Midwest Region
- 9 is for using local communications on a single repeater
- 2 is used when repeater owners decide to link multiple repeaters in a region together

In addition, there are the TAC (Talk Around Channel) channels (U.S.: 310 – 319; worldwide: 901 – 903). TAC 310, 311, and 312 are bridged between different networks, and Brandmeister is a guest on these channels. Hams that want to have longer chats in order not to tie up main channels that are more widely shared can use the TAC channels.

But what about the difference between static talk groups and dynamic talk groups?

Talk groups are either static (always activated) or dynamic (user-activated). When you activate a dynamic talk group on a repeater's time slot by keying up, it typically remains activated while there are transmissions on it, then drops from the repeater after some period of inactivity, for example, after 10 or 15 minutes. You don't need to manually unlink from a talk group.

When you're using a simplex hotspot on the Brandmeister network, there also are auto-static talk groups that you can setup on your hotspot. For more info, see the article <u>Brandmeister dynamic</u>, <u>static</u>, <u>and auto-static talkgroups</u>.

On many repeaters in Michigan and across the country, the talk groups you can use on a given time slot are specified by the repeater administrator, including any dynamic talk groups you want to use. Please see <u>MNDMR talk groups</u> to understand how most MNDMR repeaters are programmed and what talk groups they allow on TS1/TS2. If you want the freedom to use any talk group you'd like, you might want to invest in a Pi-Star hotspot.

The Pi-Star website also hosts a current and complete <u>Brandmeister Talk group List</u>, including descriptions and a link to the Brandmeister Hoseline page, where you can listen to activity. Wondering what hoseline is? <u>https://hose.brandmeister.network/</u> is live audio feed database where you can monitor any talk group on Brandmeister using your computer, tablet or phone but you're unable to talk. You can only listen.

## ZONES

Zones are an organizational tool, like file folders, for the channels in your DMR radio; in other words, a zone is a group of channels.

The channel selector on many DMR radios lets you choose from 16 (or more) channels. In order to get past that limitation, you can use zones. For example, a typical DMR radio that could handle 64 zones capable of storing 16 channels each, for a total capacity of 1,024 channels.

You can organize your zones however you want, for example, you might want one or more "Home" zones for channels that correspond to your favorite talk groups that you can reach via the repeaters that are within range of your home. You might want a "Commute" zone that corresponds to the talkgroups you most often use via the repeaters that are in range as you drive to and from work. If you use a hotspot, you might want some "Hotspot" zones for the talkgroups you key up via your hotspot. You might want some other zones that correspond to the groups of talk groups your club uses, or to nets you frequently participate in. Some people set up zones based on repeater locations.

It's pretty easy to use zones: you create a zone, name it, and then add channels to it. Optionally, you can change the order of the channels within the zone.

#### SIMPLEX FREQUENCIES

Just as you can use analog transceivers in FM mode, you can use DMR-capable transceivers to talk directly from radio-to-radio simplex. These are commonly used North America DMR simplex frequencies and are recommended for all DMR users in the United States to have programmed:

Admit criteria: Always or Channel Free Time slot: 1 Color code: 1 Talkgroup ID: 99

UHF simplex channels:

- <u>441.0000 MHz</u>
- 446.5000 MHz
- 446.0750 MHz
- 433.4500 MHz

VHF simplex channels:

- <u>145.7900 MHz</u>
- <u>145.5100 MHz</u>

## DMR NETS

A good resource for finding DMR nets across the United States is the Ham Radio DMR Nets Telegram group. It has a quite comprehensive list of active DMR nets. Each net is displayed an hour before it goes live, making it easy to find out what's currently on the air: <u>https://t.me/HamRadioDMRNets</u>

## CODEPLUGS

"Codeplug" is a common name used for a radio configuration file that sets the frequencies, color codes, timeslots and talk groups into channels which are organized into zones. Code plugs can be shared to minimize the time and errors to configure a radio. Michigan-focused code plugs for popular radios are available <u>here.</u>

#### DMR Nets in Michigan:

- Monday 7:45pm-8:30pm DMR Tech Net on TG-3126
- Monday 8:30pm-9:15pm Michigan One DMR Net on TG-3126
- Monday 9:15pm-10:00pm Post DMR Tech Net on TG-TAC310
- Saturday 7:00pm-7:15pm Arrow DMR Net on TG-3126
- Sunday 6:30pm-7:00pm UP Net on TG-31268

#### Michigan DMR Talk Groups:

TG-3126	Michigan statewide
TG-31260	Michigan WX/ARES/EmComm
TG-31261	Mi-5 Statewide 1
TG-31262	Mi-5 Statewide 2
TG-31263	Mi-5 Event 1
TG-31265	Mi-5 Event 3
TG-31267	West Michigan Talk Group
TG-31268	Upper Peninsula Talk Group
TG-31269	West Michigan Technical Group

#### **DMR Resources:**

https://www.michiganonedmr.net/ to find Michigan Brandmeister repeaters & it's a good DMR resource

https://dmrtechnet.net/ a good DMR resource

https://radioid.net/ to request a free Digital Radio ID & update your digital contacts list

https://brandmeister.network/ good resource guide to Brandmeister repeaters

https://support.bridgecomsystems.com/product-support good support page for Anytone radios

https://www.repeaterbook.com/ to find Michigan DMR repeaters (listed later in this document)

https://www.radioreference.com/ to find Michigan radio frequencies (Police, Fire. Air, etc)

https://www.youtube.com/@BridgeComSystemsInc

https://www.youtube.com/@HamRadio2

https://www.youtube.com/@HamRadioCrashCourse

https://www.youtube.com/@ARRLHQ

https://www.youtube.com/@HR4NT

https://www.youtube.com/watch?v=ts2nkCDIS4s&list=PL0R9jy9LZw\_2Je-1Td9Xb2S8-VI\_bFTGG





## Mi5 Network Sites / Talkgroups

All users on the Mi5 System are required to subscribe to our users list. This is a low traffic list with announcements that affect the use of the system. Please send a blank email to mi5-users+subscribe@googlegroups.com or visit https://groups.google.com/d/forum/mi5-users

Here are talkgroups that are in-use on our repeaters. Please see the table towards the bottom to show what talkgroups are on which site. Mi5-STATEW1 and Mi5-STATEW2 are our primary use talkgroups on our network open for general ham communcations. Event Talkgroups are only to be used with permission from a director/owner of the network.

## Primary Use Talk-Groups

Slot	Mi5 Talkgroup	Alpha	Use	From BM Talkgroup
1	51	Mi5-STATEW1	Normal General State-Wide Use	31261
2	52	Mi5-STATEW2	Normal General State-Wide Use	31262

#### Secondary – Special Event Use Talk-Groups

Slot	Mi5 Talkgroup	Alpha	Use	From BM Talkgroup
1	53	Mi5-EVENT1	Slot 1 Special Event Use ONLY	31263
2	54	Mi5-EVENT2	Slot 2 Special Event Use ONLY	
1	55	Mi5-EVENT3	Slot 1 Special Event Use ONLY	31265
2	56	Mi5-EVENT4	Slot 2 Special Event Use ONLY	

## Mi5 DMR Sites

Location	SiteID	Frequency	Offset	Color Co	de 🕈 Callsign	Master	\$ Slot 1 \$	Slot 2 🕈
Bancroft	BAN	443.31250	+5	1	W8FSM	East	Linked	Linked
Bay City	BAY	443.81250	+5	1	KC8ELQ	East	Linked	Linked
Burnside	BRN	443.11250	+5	1	W8FSM/N8VDS	East	Linked	Linked
Byron Center	BYN	444.62500	+5	1	KD8RXD	West	Linked	Linked
Cass City	CAS	442.08750	+5	1	W8CMN	East	Linked	Linked
Dansville	DAN	444.70000	+5	1	N8OBU	East	Linked	Linked
Detroit	DET	444.00000	+5	1	KE8HR	East	Linked	Linked
Fenton	FEN	443.92500	+5	1	W8FSM	East	Linked	Linked
Frankenmuth	FRA	444.25000	+5	1	W8FSM	East	Linked	Linked
Grand Rapids	GRD	444.25000	+5	1	N8JSN	West	Linked	Linked
Grass Lake	GLK	443.81250	+5	1	KC8LMI	East	Linked	Linked
Greenville	GRN	443.38750	+5	1	KD8RXD	West	Linked	Linked
Hackleburg	HAK	442.08750	+5	1	W8FSM	North	Linked	Linked
Hamilton	HAM	443.92500	+5	1	W8FSM	West	Linked	Linked
James TWP	JAM	443.60000	+5	1	N8VDS	East	Linked	Linked
Lansing	LAN	442.08750	+5	1	KB8SXK	East	Linked	Linked
Lincoln	LIN	442.01250	+5	1	W8JJR	East	Linked	Linked
Lowell	LOW	443.11250	+5	1	KD8RXD	West	Linked	Linked
Mayville	MAY	443.85000	+5	1	KB8SWR	East	Linked	Linked
Midland	MID	443.95000	+5	1	W8CMN	East	Linked	Linked
Milan	MIL	443.11250	+5	1	W2PUT	East	Linked	Linked
Mio	MIO	444.70000	+5	1	W8CMN/N9KOP	North	Linked	Linked
Morley	MOR	442.21250	+5	1	W8CMN	West	Linked	Linked
Mt.Clemens	MTC	443.95000	+5	1	KD8EYF	East	Linked	Linked
Muskegon	MKG	444.95000	+5	1	K8WNJ	West	Linked	Linked
Novi	NVI	442.21250	+5	1	KC8LTS	East	Linked	Linked
Pinconning	PIN	444.62500	+5	1	W8CMN	East	Linked	Linked
Shepherd	SHP	442.01250	+5	1	W8CMN	East	Linked	Linked
Southgate	SGT	443.32500	+5	1	KC8LTS	East	Linked	Linked
West Olive	FIL	443.57500	+5	1	K8OEC	West	Linked	Linked



## Michigan DMR Repeaters

	Call Sign	Location	Network	requerie	Offect	00	Cue One	Dette	1
ON AIR	W8FSM	Alanson	Mi5 Network	442 0975	Unset	00	Sysups	Rpt ID	4
ON AIR	K4KWO	Albion	BrandMoietor	442.00/5	+5	1	KARMA		Dist
ON AIR	WARP	Ann Arbor	BrandMeister	442.1125	+5	1	K4KWQ	310226	BM
ON AIR	KARWAN	Radava	Dranuweister	443.500	+5	1	NSLBV	312654	FT
ON AIR	W/8ESM	Rancroft	DGI MiE Network	442.0375	+5	2	KABWYN	312622	PT
OFF AIF	KCRELO	Bay City	MID Network	443.3125	+5	1			
ON AID	MORCO	Bassomer	MI5 Network	443.8125	+5	1			
ON AIR	MORCG	Bessemer	Chicagoland	443.125	+5	8	W9RCG	312644	FT
ON AIR	WOFSM	Burnside	Mi5 Network	443.1125	+5	1			1
ON AIR	KD8RXD	Byron Center	Mi5 Network	444.625	+5	1	And and a second second	anno see	
ON AIR	KD8RXD	Byron Center	BrandMeister	442.925	+5	2	KE8CPD	312669	FT
ON AIR	N8VPZ	Cassopolis	Crossroads DMR	443.55	+5	1	N9VPZ	and the second	1 million
ON AIR	NOHEE	Charlotte	BrandMeister	442.2625	+5	1	N8HEE	312636	BM
ON AIR	KD8VIV	Clarkston	DCI	444.8375	+5	2	W8CMC		PT
ON AIR	N8OBU	Dansville	Mi5 Network	444.700	+5	1			1
ON AIR	KE8HR	Detroit	Mi5 Network	444.000	+5	1	Contraction of the local division of the loc		T
ON AIR	W8CMC	Detroit	MotoDMR	444.675	+5	2		312632	1
ON AIR	W8FSM	Fenton	Mi5 Network	443.925	+5	1	-	1999 N. 1997 A. 2008	1
ON AIR	W8FSM	Frankenmuth	Mi5 Network	444.250	+5	1	1		1-
ON AIR	N8JSN	Grand Rapids	Mi5 Network	444.250	+5	1	1		
ON AIR	KC8LMI	Grass Lake	Mi5 Network	443.8125	+5	1			
ON AIR	KD8RXD	Greenville	Mi5 Network	443,3785	+5	1			
ON AIR	W8FSM	Hamilton	Mi5 Network	443 925	+5	1			
ON AIR	K8DAA	Holland	BrandMeister	443 8875	+5	4	KSDAA	210399	PM
ON AIR	W8YY	Houghton / Hancock	HARC	444 500	+5	1	NODAM	510288	DIVI
ON AIR	WALRK	Howell	BrandMeister	442.575	+5	1	WALDY.	200407	Die
ON AIR	NALIRW	Jackson	BrandMaister	442.575	+0		VVOLKK	310195	BW
ON AIR	NAVDS	James Two	MiE Network	442.500	+5	1	N8URW	312615	FT
ON AIR	KM8CC	Kalamazoo	RepedMaister	443.600	+5	1			
ON AIR	KDODAD	Kant City	brandweister Mic Natural	443.400	+5	1	N8RMA	310797	
ON AID	KDORAD	Lensing	MID Network	442.2125	+5	1	KB8ZGL		
ON AID	KDOONN	Lansing	BrandMeister	444.7875	+5	2	KB8SXK	312649	
ON AID	MOLID	Lansing STAPON SA-SLOT A	MIS Network	442.0875	+5	1	KB8SXK		
ON AIR	KDODAD	Lincoln	MI5 Network	442.0125	+5	1	I management		
ON AIR	NUORAD	Lowell	BrandMeister	443.650	+5	2	KE8CPD	312668	FT
ON AIR	WOAGB	Mackinaw City	BrandMeister / TGIF	444.375	+5	1	N8APX	312824	
ON AIR	KBOP	Marquette	BrandMeister	442.200	+5	1	KB0P	311795	BM
ON AIR	KB8SWR	Mayville	Mi5 Network	443.850	+5	1			-
ON AIR	W2PUT	Milan	Mi5 Network	443.1125	+5	1			
ON AIR	K8SN	Moline	BrandMeister	442.3875	+5	1	K8SN	312653	BM
ON AIR	KD8EYF	Mt. Clemens	Mi5 Network	443.950	+5	1			1
ON AIR	K8WNJ	Muskegon	Mi5 Network	444.950	+5	1	1		
ON AIR	KC8LTS	Novi	Mi5 Network	442.2125	+5	1			-
ON AIR	N8URW	Onsted	DCI	442.5125	+5	1	N8URW	312630	-
ON AIR	KM8CC	Oshtemo Township	BrandMeister / TGIF	444.575	+5	1	N8YUI	312479	
ON AIR	W8YY	Phoenix / Calumet AFS	HARC	444.750	+5	1	-		
ON AIR	KE8FJW	Sault Ste Marie	BrandMeister	444.1375	+5	1	KE8FIW	311088	BM
ON AIR	KC8LTS	Southgate	Mi5 Network	443.325	+5	1	LIMMIN AND	944000	1000
ON AIR	W8CCE	Stutsmanville / Petoskey	BrandMeister	443.375	+5	1	N8APX	312066	
OFF AIR	N8OUZ	Traverse City	D-MARC / DMR+	442.875	+5	1	NSCN	912000	-
OFF AIR	W8TCM	Traverse City	BrandMeister / TGIF	442,500	+5	1	N8DMH	312820	
OFF AIR	KA8WYN	Warren	DCI	442.0375	+5	3	W8CMC	217923	PT
							Treeting		
NAIR	N8QQS	Waterford	MotoDMR	442.8375	+5	1	N8NOF	3126	55 F
N	NSORW	Waterloo	DCI	443.890	+5	1	NRURM	3126	02
NAIR	K80EC	West Olive	Mi5 Network	443.575	+5	1	NOURV	5120	02
A. A. J. M.	N4KCD	Wixom	BrandMeister	442 975	+5	-	Nakon	_	
NAIR									



You can connect to these repeaters and talk locally from any BM hotspot or repeater.

- 310797 KM8CC Kalamazoo 312654 - W8RP Ann Arbor 310226 - K4KWQ Albion 312649 - KB8SXK Lansing 312615 - N8URW Jackson 310195 - W8LRK Howell 311032 - N4KCD Wixom
- 311088 KE8FJW Sault Ste. Marie

Posted by Dustin N8RMA at 9:34 PM No comments:





This book is a guide to Digital Mobile Radio (DMR). It will help you to become familiar with the complex terminology used by the DMR crowd, purchase and program a DMR radio, and make your first few calls. It also includes sections on how to configure and use a DMR hotspot, using DMR repeaters, and talk groups. The book takes a practical approach, providing the information you need to get started with this exciting digital voice technology. Before you know it, you will be able to talk with amateur radio operators all over the world.

The **Parrot TG** channel (**TG9990**) allows you to talk to yourself to verify connectivity and strength with a hotspot/repeater, and every TG that we connect to, we MUST disconnect-from using the SKY **TG Disc** channel (**TG4000**).



https://dmrtechnet.net/

# DMR Tech Net

## Tom N8TJ:



Novice 1977 as WD8NPM. Currently most active on: DMR 3126 Brandmeister, 80m, 40m 20m CW. Other interests: motorcycles and northern MI. tom@dmrtechnet.net

#### Stan WB8QJZ:



I was licensed as a Novice in 1973 as WN8QJZ. I upgraded to Technician C and then to Amateur General Class. Primary interests include portable HF QRP operation and VHF/UHF experimentation including Slow Scan Television reception from the International Space Station . I hold a Commercial General Radio Telephone License. I retired from Michigan Technological University as a Senior Telecommunications Engineer and was the operator and chief engineer for the university's Ku Band Satellite Earth Station. <u>stan@dmrtechnet.net</u>

#### **Steve KC8WXM:**



Was in the U.S. Army 2<sup>nd</sup> of the 4<sup>th</sup> Cav. Crew chief for OH-58C Helicopters. Was sent to Saudi/Iraq during Desert Shield, Desert Storm. Hobbies: Camping, Hiking, Hapkido, Amateur Radio. Commander of American Legion Post 194 in Petoskey. steve@dmrtechnet.net

#### Dana KC0MYP:



In 1977, I passed the FCC 3rd Class license with broadcast endorsement to work at WVIC 94.9-FM/730-AM. After graduating from Michigan State University, I moved to Colorado and worked at Radio Shack for 19 years. In 2002 I earned my Technician class license and upgraded to General in April, 2022. Technology is great--when it works! Currently using three Anytone 878 handhelds and two Anytone 578 mobile radios with BT01 bluetooth mics. I'm most active on

Brandmeister DMR Talk Group 3126 Statewide Michigan. dana@dmrtechnet.net