

DMR Basics, Programming & Hot Spot

HAM FUN - TIMOTHY S. TAKEUCHI - W6TST

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DMR Basics, Programming & Hot Spot

- The Very Basics by John 'Miklor' K3NXU
- BrandMeister Overview & Updates by Anthony Marcin, W7XM
- Building a DMR Codeplug from Scratch by Anthony Marcin, W7XM
- Connecting a Hotspot to BrandMeister by Anthony Marcin, W7XM

DMR

Level Set & Purpose

▶ I am not a DMR Expert

- I've been operating with DMR for years on and off
- Goal of this presentation is to introduce you to the topics, discuss basics and hope it leads you to explore further.
- Feel free to chose whatever you want to do including Brandmeister vs. DMR MARC

WHY DMR?

Analog

- Best/Only for Emergency Use
- Good for fringe coverage
- Stable infrastructure no dependance on digital standards
- Depends upon fixed infrastructure

DMR

- ▶ Good for casual/hobby use.
- Favorite for couch indoor monitoring w/ Hotspot
- Great voice quality until you lose sufficient digital signal
- Radios have great radio quality for both digital and analog
- Missed digital call support
- Hotspot gives opportunity to have your own personal 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 bandwidth, 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**.



TDMA = Time-Division MultipleAccess

Spectrum Efficiency 30ms Time Slices

A repeater interweaves the incoming signals based on the Time Slotrequested.



Time Slots

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

These divisions are referred to as <u>Time Slots</u>.

Each house has its own set of rooms. These are referred to as <u>Talkgroups (TG)</u>.



TS2





Talkgroups

There are currently over 1500 Talkgroups, ranging from:

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

Examples of these groups include:

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



Sample Repeater Configuration

Timeslot 1	Timeslot 2					
Talkgroup Name	Hold	Talkgroup ID	Talkgroup Name	Hold	Talkgroup ID	
Penna State	FT	3142	Local Repeater	FT	9	
Penna TAC	15	31421	Local Area	FT	2	
Maryland State	FT	3124	TAC 310	5	310	
North East Reg'l	FT	3172	TAC 311, 312	15	311, 312	
Mid Atlantic	FT	3173	Delaware State	FT	3110	
Nationwide	5	3100	Kentucky State	15	3121	

The configuration will vary from one repeater to another. Contact your local club or repeater owner to determine the exact configuration.

The World Wide Network Latency

An example of the complexity of the network is shown here. Although the internet is fast, it is not instant. Your audio is digitally processed in your handhel forwarded to the repeater, then to a regional serve connected to a series of worldwide servers where it is distributed.

The process is then reversed before it is delivered to the receiving station. This is referred to as latency, a delay of your signal getting to the other end by as much as 2 seconds.

For this reason, it is advisable to pause for two or three seconds before making a return transmission to give a breaking station a chance to enter.



Push-to-Talk Analog vs Digital

Because of the number of TGs available, it's very possible someone might be using a TG other than the one you are monitoring. If this occurs, your signal could interfere with theirs. This is avoided by the way DMR handles the PTT function.

With Analog, pressing the PTT keys the transmitter and you're ready to go.

Not so on DMR. When the PTT is pressed, a signal is sent to the repeater which checks to see if the Time Slot is available. If it is, a data stream is sent back to the radio giving you the All Clear, sometimes generating a beep tone. This occurs in just under a second.

It is highly recommend that the BCLO (Busy Channel Lock Out) function is enabled. This prevents a station from transmitting on a Time Slot if it is currently active.

Another indicator that the TG is in use is an activity light on the handheld. If the LED is lit, the TS is in use.

When pressing the PTT, wait 1 or 2 seconds before speaking.

Busy Repeater Channel / Time Slot

You may see the Channel Busy indicator lit, but not hearing a conversation. This is caused by someone activating or using a repeater Talkgroup other than the one you are monitoring.

Digital Monitor (DMR) Your DMR radio may have a 'programmable key' function labeled Digi Monitor or Promiscuous mode. This open allows you to monitor all activity on one or both time slots regardless of the Talkgroup in use. This is a monitoring function only.

Monitor Mode (Analog)

This is an analog function which opens the squelch allowing you to listen to activity on that frequency.

The Monitor and Digital monitor modes are not interchangeable.

Networks



BrandMeister

You may hear reference to various networks.

The DMR-MARC network was developed several years ago by the MotorolaARC.

The more recent Brandmeister network was developed in Europe. Although their roots are totally different, they are much like two pine trees planted side by side. As time evolves, more of the branches (Talkgroups) become common to both.

Some examples are shown on the next page.

Also, it should be noted that not all networks support the same features, such as GPS and APRS.



Shared Network TG Activity



BrandMeister

TAC 310, 311, 312	shared	TAC 310, 311, 312
313 > 319	Х	313 > 319
State Groups	shared	State Groups
Regional Groups	Х	n/a
Nationwide 3100	shared	Nationwide 3100

Some examples of TG sharing are shown above.

There are 10 'TAC' channels. While TAC 310, 311and 312 are common to both networks, 313-319 are not. US State Groups are common to both networks, while Regional Groups are not.

Repeater vs. Hotspot

There are two main pieces of equipment used to access the DMR network.

One is a <u>Repeater</u> which is normally located at a high elevation with wide area coverage. The repeater is then linked to the internet allowing it to access one or more DMR network servers.

Note: Not all repeaters share the same Talkgroups. This is determined by the repeater's owner.

The other is known as a <u>Hot Spot</u>. These were developed for local range access to a network when no repeater is

available. These low power devices receive a users digital signal and passes it to a DMR network via the internet.







Activity Levels

This varies by Talkgroup (TG). Local groups usually carry the lowest level of activity, where State and Regional activity is a bit heavier.

The bulk of the activity can be found on the National and World Wide TGs

		<u>TG</u>	<u>Activity</u>
Local 2	Local Cluster of Repeaters	2	Low
• Local 9	Main Repeater Only	9	Low
PA State	PA Statewide	3142	Med
 MD State 	MD Statewide	3124	Med
 NE Reg'l 	Northeast Regional	3172	Med
 Mid Atlantic 	Mid Atlantic	3173	Med
• TAC 311, 312	Chat Groups	311, 312	Med
 Nationwide 	National Calling Channel	3100	High
• TAC 310	Main <u>Secondary</u> Chat Group	310	High

Important Operating Note TG-3100 Nationwide

- **TG 3100** was created as a shared Nationwide Calling Channel. If you are using a hotspot, once activated, the group remains Static and will remain continuously active until another TG is selected..

- **TG 310, 311, and 312** are secondary TAC channels.

They are set up as <u>PTT</u> groups requiring activation (kerchunk) once every 10 minutes to reactivate.

-TG 3100 is for establishing an initial contact. If the conversation continues for more than 2 or 3 minutes, stations should move to one of the three TAC channels to clear 3100 as a courtesy to those monitoring.

Note: Also remember, there are over 1,500 available talkgroups. If the activity is spread out, there is plenty room for everyone to enjoy the DMR experience.

Repeater Operating Notes

• 3 second pause before PTT

This allows for network latency as well as a courtesy pause for those wanting to enter the conversation.

• 1 second pause after PTT This is required for your radio to sync with the repeater and network

Time Slot in use

This is usually shown by an indicator light or a time slot busy tone on your radio.

Talkgroup in use

You may not immediately hear an active Talkgroup. When switching to a different TG, your radio may need to sync to a conversation already in progress.

Announcing your presence

Announce both your Call Sign and Talkgroup. This will allow someone who is scanning to identify your Talkgroup so they can answer your call.

Repeater Operating Notes

- Brandmeister Network "User Blocked" (521) *** When using the Brandmeister Network, your server access will be blocked for one hour if the following conditions are met:
 - 5 transmissions of less then 2 seconds in a 1 minute time span.

This is part of the network loop prevention.

After one hour, access to that server will automatically be restored.

Use the correct cable

Baufeng UV5R, Wouxun UV6, and others

 USB Circuitry in the cable (common for most USB cables)



Anytone 868/878 or Btech 6X2

USB Circuitry is in the Radio (not the cable)



DMR Issues

 Make sure you have the current CPS (Customer Programming Software) and Firmware J

CPS not forward compatible!

D878UV	\times
Model type is wrong.	
ОК]

Programming Analog vs. DMR

Analog

- Frequency / Frequencies / Offset
- CTCSS/PL/DCS Analog or Digital Tone

DMR

- Frequency / Frequencies / Offset
- Color Code
- Slot
- Talk Group / Station ID
- Your ID

SUNDAY DIGITAL ACADEMY

Building a DMR Codeplug from Scratch

Presented by Anthony Marcin, W7XM

WHAT IS A CODE PLUG

REPEATER INFORMATION

Stores Information such as Frequency, Color Code, Offsets

CONTACT LIST

Stores DMR Database of Radio IDs and call signs FEATURE SETTINGS

Stores General Settings for the radio, key layouts, etc.

Typically using the Manufacturer's Customer Programming Software - CPS

ZONE

Group of Channels (Folder Structure)

COLOR CODE

Access Code (Like PLTone)

TIMESLOT

Assignment of Talk Group, TS1 or TS2

TALK GROUP

Virtual Channels (ID, Alias Name)

CHANNEL

Frequency, Talk Group, Timeslot

TALKAROUND

Simplex

DMR Terminology

WHAT IS NEEDED

- List of Talk Groups
- Repeater / Hotspot Frequencies
- Color Code, Offsets, Timeslots
- **Programming Software** (CPS)
- Cable which came with radio
- Your DMR Radio



<u>CODE PLUG</u> HIERARCHY

- Upload/Create Talk Groups First
- Create Scan List -Optional
- Build Channels Freq, CC, TS, Etc.
- Create Zones, Select Channels
- Enter Radio ID (http://RadioID.Net)
- Upload Contact List Optional



TIME SLOTRULE

Time Slot 1 - Out of Area Talk Groups

Time Slot 2 - Local Talk Groups

This is a general practice but will vary by location. Check with repeater listings for details on how talk groups should be assigned to time slots.



Talk Groups

Build out the talk groups you want to talk on.1. Add Name, 2. Select Group Call in Call Type3. Enter Talk Group ID.

) 🗃 🖬 🤫 🕾 📢					
78UVII	No.	TG/DMR ID	Call Alert	Name	Call Type
Common Seeing	1	91	None	World Wide	Group Call
Zone	2	3100	None	USA Nationwide	Group Call
Scan List	3	3106	None	California	Group Call
- Boaming Zone	4	3132	None	Nevada	Group Call
FM	5				
	6				
- Roaming Channel	7	Talk Gr	oup Edit3	×	
- Device information	8				
- Optional Setting	9				
Alarm Setting	10		Name	California	_
Local Information	11		Call Type	Group Call	
Hot Key	12		TG/DMR ID	3106	
APRS	13		Call Alert	None	
Digital	14		1		
- Radio ID List	15		<u>O</u> K	Cancel Previous Next	
Contact/Talk Group	16				
Prefabricated SMS	17				
Receive Group Call List	18				
AES Encryption Code	19				



Channels

ТХ	RX	CC	Offset	Name
431.040	431.040	1	0MHz	Hotspot
440.2125	445.2125	1	+5MHz	Walnut



Channels

Build Out channels in the code plug.
1. Enter Channel Name 2.RX/TX 3. Select Digital Type
4. Select Contact (Talk Group) 5. Enter Color Code
6. Choose Slot 7. Select Repeater in DMR Mode

Channel Name	HS ₩o	vrld		
Receive Frequency	431.04000		F PTT Prohibit Talk	Around(Simplex) CAPRS RX
Transmit Frequency	431.04000		Work Alone DataACK D	isabl⊟ Auto Scan 🛛 □ Ana Aprs Mut
Correct Frequency[Hz]	0		Digital	
Channel Type	D-Digital	-	Contact	World Wide
Transmit Power	Low	•	Radio ID	
Band Width	12.5K	-	Color Code	1
TX Permit	Always	•	Slot	Slot2
Scan List	None	-	Receive Group List	None
APRS Report Type	Off	-	Digital Encryption	Off
Analog APRS PTT Mode	Off	~		
Digital APRS PTT Mode	Off	~	AES Digital Encryption	Off
Digital APRS Report Channel	1	~	Multiple Key	Off
Exclude channel from roaming	off	-	Random Key	Off
DMR MODE	Repeater	•	SMS Forbid	Off
				Call Confirmation Ranging
				SMS Confermation





Contact List

Zone Talk Groups Build Out Zones and Select Channels. Scan List 1. Add Zone Name 2. Select Channels to include in zone. A Channel HS Worldwide • Hotspot 441.040 Zone Name **B** Channel HS California -Channel Available Channel Zone Channel Member HS Nevada HS Worldwide HS California HS USA >> Order By Zone << ID Name Up Down Radio ID Order By ID Name Contact List OK Cancel Previous Next



To obtain a Radio ID you can visit http://radioID.net

Contact List


Tips for Code Plugs 1 (at your own risk!)

Save Often w/ file name tagged w/ date (Doe-2021-11-18.rdt or Doe-2021-11-18-1900.rdt)

Tools available on internet to help you generate your own code plug. (i.e. NOGSG DMR Contact Manager)

Example code plugs are out there.



Tips for Code Plugs 2a

Absolute Must To Do Tasks when using someone else's Code Plug:

► Change the Radio ID:

No.	Radio ID	Name
1	1234567	MYCALL
2		

Radio ID	1234567	
Radio ID Name	MYCALL	

Tips for Code Plugs 2b

Manual TX Intervals[s]

APRS Auto TX Intervals[s] 300

Support For Roaming Off

Fixed Location Beacon On

Aprs Alt Data Feet

AprsDisTime 3S

•

Report Channel

Current Channel

Current Channel

Hickory APRS

Current Channel

Current Channel

Report

Channel

Slot

Slot

Channel

Channel

Absolute Must To Do Tasks when using

someone else's Code Plug:

Change the APRS Info: D878UV[D878UV:UHF[400 - 48C

n <u>T</u> o	ol <u>V</u> iew <u>H</u> elp	1	Ei	le <u>M</u> odel <u>S</u> et <u>P</u> rogram <u>T</u> o	00	ddd.ddddd	6 Current 7 Current	t Channel Channel Channel Channel
	Record	Annex Function Setting ×		그 🗃 📕 📲 🚧 🏭 🚱	_ 1	Latitude 0.00000	8 Current	t Channel 💌 Channel
_	Import	ī.	D8	78UV		North And South Latitude N		_
	Export	GPS	- 8	Common Setting	- 1	Longitude 0.00000		Repeater Activation Delay[ms]
	Mode	—		Channel		East And West Things E		
	eXtended	- Bluetooth	-	Zone	- 1			
	Firmware and Icon Update	500 Hours Record	-	Scan List			(
	Boot Image	-	-	EM	- 1	Analog APRS TX Tone Off	Transmission Frequency [MHz]	144.39000
	Default Channel Information	APRS		Auto Repeater Offset Frequer		TOCALL APDR10	Transmit Delay[ms]	600 💌
əqı	Options			Roaming Channel		TOCALL SSID -5	Send Sub Tone	Of •
	Standby BK Picture1		-	- Device Information		Your Call Sign MYCALL Your SSID -7	DCS	62.5 ·
	Standby BK Picture2	OK Cancel	-	Optional Setting		APRS Symbol Table /	Prewave Time[ms]	600 💌
	export Data Conversion File		-	Alarm Setting	_ 1	APRS Map Icon [Transmit Power	High
-		1		Local Information	- 1	Digipeater Path	WIDE1-1WIDE2-1	na AprsTx Narror
				Hot Key	- 1	San Benio C	0. ARES	Canal

DMR

Tips for Code Plugs 3

- Use your favorite spreadsheet program to manipulate files.
 - ▶i.e. Export Frequencies, make changes and import back
 - Save before and after
 - Check frequencies, zones, etc to make sure they still look good
 - Changes made have confused linking of entries.

Group Call to Club Call

You can use a group call like a talk group. For San Benito Amateur Radio Association: 3163173

Brandmeister is not or rarely issuing new Talk Groups.

DMR Fun

Customize Power Up Screen



Customize Your Background

MR

D



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BrandMeister Overview & Updates

BrandMeister

Presented by Anthony Marcin, W7XM

Hotspot Security

- Required for all Hotspots (MMDVM, Homebrew)
- Set Password in Selfcare
- 20 Characters or Less
- Non-complex





ID and Call Sign Matching

Node Callsign and Radio ID in hotspots Must Match RadioID.net

		General Config	uration		
Setting			Va	lue	
Hostname:	pi-star	Do not add suffi	kes such as	.local	
Node Callsign:					
CCS7/DMR ID:					
Radio Frequency:	431.020.000	MHz			
Latitude:	50.00	degrees (positive	e value for	North, negative for South)	
Longitude:	-3.00	degrees (positive	e value for	East, negative for West)	
Town :	Anytown		0.		
Country:	United States				
URL:	http://www.mw0r	mwz.co.uk/pi-star/		🔿 Auto 💿 Manual	
Radio/Modem Type:	ZUMspot - Singl	e Band Raspberry Pi	Hat (GPIO)	~	
Node Type:	● Private ○ P	ublic			
DMR Access List:					
APRS Host Enable:					
APRS Host:	rotate.aprs2.net	~			
System Time Zone:	America/Los_An	igeles 🗸			
Dashboard Language:	english_us	*	NG		
		Apply Chang	jes		



Repeaters Device Passwords

- Device Password MMDVM/Motorola Repeaters
- MMDVM 20 Characters or less, non-complex
- Motorola Hex Value, 16 Character Max

Device Password		
Enter new Password		
	Save Password	



Repeater ID & Radio ID Matching

- Radio ID and Radio Alias matching RadioID.net
- Sysop Rights Auto assigned with listed Trustee on RadioID.net
- Radio Alias start with Call Sign followed by space,dash,slash



Master 3101 Decommissioned

- Master Server 3101 has been decommissioned.
- Use 3102, 3103, or 3104



Text Capture

- New Feature to store Text
 Message until next connection.
- Stores 7 Days
- Must Enable in SelfCare

۵:		
Brand	Chinese Radio	~
APRS Interval	Off	~
APRS Icon	*	In Call Off GPS
Compact / CSBK data	Off	Text Off Capture



Hose.BrandMeister.Network

- New Hose is online. <u>http://hose.brandmeister.network</u>
- Listen to Talk Groups via Browser
- Direct URL https://hose.brandmeister.network/#/?subscribe=[tg]
- Display limited to 4 Digit TGs
- Ability to type in 1 to 7 digit TG to listen
- RegEx Filter Dollar \$ and Pipe |



Support Options.

- New Help Site online <u>http://help.brandmeister.us</u> NEW!
- Open Support Ticket: <u>http://support.brandmeiser.network</u>
- Telegram:

https://t.me/joinchat/C3GS20QYNAxkXzEH8DBRgA

- News: <u>http://news.brandmeister.network</u>
- Groups IO: <u>https://groups.io/g/BrandMeisterUSA</u>



Monitor

N6SBC Hoseline: https://hose.brandmeister.network/#/?su bscribe=3163173

Activity on Brandmeister: https://brandmeister.network/index.php? page=profile&call=YourCall SUNDAY DIGITAL ACADEMY



Connecting a Hotspot to BrandMeister

Presented by Anthony Marcin, W7XM

PROFILE SETTINGS

Email / Password

TALKER ALIAS /APRS

Set Text, Icon, Interval, APRS Alias ID, etc.

HOTSPOT SECURITY

Set Password for Hotspots

SMS / Text Messaging

Set Radio Type / Text Capture Feature

API KEYS

BrandMeister Manager on HotSpots

AIR SECURITY

Enable Radio ID Security to prohibit users from using ID

BM SelfCare

Your ID & Other's IDs

Signup for your Digital ID for DMR at: https://www.radioid.net/account/register #!

Digital Contact List may be found at: http://www.dmrcontacts.com/

SelfCare Registration

• Visit

brandmeister.network

• Click on the Register Link (Top Right)

BrandMeister	≡ Register Login ## EN	o: Settings
B User Dashboard	Login	
Last Heard		
Repeaters 4509	Login with your SelfCare account	
Hotspots 12703	Callsign	5
Masters 45	Password	
û Alerts	Password	-
🔟 Data Visualisation 🛛 <	Login Forgot your password?	
Information <	Not a member? Register!	
Services <		

SelfCare Registration

- Enter Password
- Enter "70" for the Anti
 - Spam Question.
- DMR ID

Security		
Password		
Password		٩
Confirm Password		
Confirm Password		٩
Anti Spam		
What is the wavelength of the	UHF band in centimeters?	
Answer with a number		
DMR ID		
Enter one of your DMR IDs to v	validate your account	
l'm not a robot	reCAPTCHA Privacy - Terms	
	Register!	

SelfCare Registration

- Email Confirmation Sent. Please Check Spam Folders
- Allow 48 Hours after clicking Confirm for review/activation.



- Required on all Master Servers to be set as of October 1, 2021
- Hotspotswill not connect with default password of "passw0rd"
- Passwords less than 20 characters in length
- Non-complex passwords (don't use @#!&, etc). Simple

Hotspot Security

Hotspot Security

- Log into BrandMeister
- Click Your Call (upper right)
- Click on Selfcare



Hotspot Security

- Click the TAB of ID
- Type in Password under Hotspot Security
- Password disappears after saving.

BrandMeister	=	≓≋ EN © Settings
2 User Dashboard	SelfCare Setting	User Dashboard > SelfCare
🛔 Last Heard		
🚔 Hotspots 🛛 🔒 🔒	Brand Chinese Radio ~ Language English	~
Hasters		
🗘 Alerts	APRS Off V APRS W7XM Callsign	×
🔟 Data Visualisation <	APRS A In Call OB APRS Tony-Las Vegas	5
Information <	ICON OF5 TEXL	
🖋 Services 🗸 🗸 🗸	AirSecurity / TOTP	
SelfCare		
Hotspot		
I My hotspots <	Hotspot Security	
Sysop Menu	Password Enter new Password	
8 Sysop Dashboard		-
My Repeaters C	Save	Restore defaults

- Pi-Star Most Popular Hotspot Software
- Shark RF Open Spot (1, 2, 3)
- BlueDV

Connect a Hotspot to BM

- <u>http://pi-star.local</u>
- pi-star |raspberry



Hotspot IP Address

- When setting up your Hotspot note the ip address on your network. Likely (192.168.1.26 or something like that)
- <u>http://pi-star.local</u> has never worked for me
- Also, change the password and record it somewhere safe

- Click on Configuration
- Upper Right Corner



• Click "Apply Changes" after completing each section.



Di-	Stor Dia	ital Voico	- Conf	iguratio	9-8ar-4.1	.\$ / Dechaserd: 36210721		
	star Digi	Dashboard Admin	Expert Pc	wer Update E	lackup/Rest	ore Factory Reset		
	Ga	teway Hardware In	formation					
Hostname Ken	nel	Platform	10072030	CPU Los	d	CPU Temp		
pi-star 4.19	.974	P1 ZEPO W REV 1.1 ((51298)	0.47 / 0.71	/ 8.35	2.6°L/.98.7°E		
	_	Control Softwa	ire					
Controller Software:		R MICHANNET (Dol-No	Value ma Minimum F	innuana 2.07 Ro	aut cod)			
Controller Mode:	Simplex Node O Duplex Repeater (or Half-Duplex on Hotspots)							
		Apply Change	s		/			
Setting		MMDVMHost Config	Uration Value					
DMR Mode:		RF Hangtime:	20	Net Hangtime:	20			
D-Star Mode:		RF Hangtime:	20	Net Hangtime:	20			
YSF Mode:	0	RF Hangtime:	20	Net Hangtime:	20			
P25 Mode:	0	RF Hangtime:	20	Net Hangtime:	20			
NXDN Node:	0	RF Hangtime:	20	Net Hangtime:	20			
YSF2DMR:	0.1							
YSF2NOON :	0							
YSF2P25:	0							
DMR2YSF:	0		Uses 7 prefi	x on DMRGateway	ě.			
DMR2NXON :	0)	1	Uses 7 prefi	x on DMRGateway	ń.			
POCSAG:	0		POCSAG Pa	ging Features				
MMDVM Display Type:	None 🗸	Port: /dev/ttyAM/	A0 🗸 Next	ion Layout: G	4KLX	~		
Setting	pi-star	General Configur	ation Value	local		15		
Node Callsign:	WZXM			1102				
CCS7/DMR ID:	3132067							
Radio Frequency:	431 020 000	MUT						
Latituda:	27 762980	denena (antibios	unline from the		(en fronth)			
Langituda	121.0659	degrees (posicive	value for it.	aren, negacive i	or souch)			
tongacuue:	-121.9008	degrees (positive	Value for E	ist, negative re	or west)			
Town:	San Ramon, CA							
country:	united States				æ	1		
uni:	nup://www.mw0m	wz.co.uk/pi-star/	(00)0)	01	uto ® Mani	Jal .		
Nada Type:	Resident - Single	band Raspberry Pi Ha	at (GPIO)					
APRS Host Enable:	S Private () Pu	0110						
APRS Host:	rotate.aprs2.net	~1						
System Time Zone:	America/Los And	eles 🗸			_			
Dashboard Language:	english us							
		Apply Change	s					
Setting			Value					
DMR Master:	BM_3103_United	States						
Hotspot Security:		۲						
BrandMeister Network:	F and a second block of the	epeater Information	Edit Repea	iter (BrandMeist	er Selfcare)		
DVR Color Code:	1 Vone V							
DMR EmbeddediCOnly:						6		
DMR DemolaData:								
		Apply Chappe						
		Contraction and and and and and and and and and an	2					

• Set the Control Software - Simplex or Duplex mode

	Control Software
Setting	Value
Controller Software:	ODStarRepeater MMDVMHost (DV-Mega Minimum Firmware 3.07 Required)
Controller Mode:	Simplex Node O Duplex Repeater (or Half-Duplex on Hotspots)
	Apply Changes

• Enable DMR

Mode.

		MMD	VMHost Config	uration			
Setting				Value			
DMR Mode:			RF Hangtime:	20 N	et Hangtime:	20	
D-Star Mode:	0		RF Hangtime:	20 N	et Hangtime:	20	
(SF Mode:			RF Hangtime:	20 N	et Hangtime:	20	
P25 Mode:			RF Hangtime:	20 N	et Hangtime:	20	
NXDN Mode:			RF Hangtime:	20 N	et Hangtime:	20	
YSF2DMR:							
YSF2NXDN:							
YSF2P25:							
DMR2YSF:				Uses 7 prefix o	on DMRGateway	1	
DMR2NXDN:				Uses 7 prefix o	on DMRGateway		
POCSAG:				POCSAG Pagin	g Features	5.F.	
MMDVM Display Type:	None	✓ Port:	/dev/ttyAMA0	 Nextion Layo 	out: G4KLX	~	
			Apply Change	5			

- Call Sign
- DMR ID
- Frequency
- Modem

General Configuration					
Setting			Va	lue	
Hostname:	pi-star	pi-star Do not add suffixes s		.local	
Node Callsign:					
CCS7/DMR ID:					
Radio Frequency:	431.020.000	MHz			
Latitude:	50.00	50.00 degrees (positive value for North, negative for South)			
Longitude:	-3.00 degrees (positive value for East, negative for West)				
Town:	Anytown				
Country:	United States				
URL:	http://www.mw0r	mwz.co.uk/pi-star/		🔿 Auto 🔘 Manual	
Radio/Modem Type:	ZUMspot - Single Band Raspberry Pi Hat (GPIO)				
Node Type:	Private Public				
DMR Access List:					
APRS Host Enable:					
APRS Host:	rotate.aprs2.net V				
System Time Zone:	America/Los_Angeles				
Dashboard Language:	english_us	english_us v			
Apply Changes					

- DMR Master
- Hotspot Security
- ESSID
- Color Code

DMR Configuration						
Secting	Value					
DMR Master:	BM_3103_United_States					
BrandMeister Master:	BM_2001_Europe_HAMNET V					
BM Hotspot Security:	······ ()					
BrandMeister Network ESSID:	3132067 None V					
BrandMeister Network Enable:						
BrandMeister Network:	Repeater Information Edit Repeater (BrandMeister Selfcare)					
DMR+ Master:	DMR+_IPSC2-VKDMR					
DMR+ Network:	Options=					
DMR+ Network ESSID:	3132067 None ~					
DMR+ Network Enable:						
XLX Master:	XLX_950 V					
XLX Startup Module:	Default V					
XLX Master Enable:						
DMR Color Code:						
DMR EmbeddedLCOnly:						
DMR DumpTAData:						
	Apply Changes					

Green Means Connected

Network Status				
D-Star Net	DMR Net			
YSF Net	P25 Net			
YSF2DMR	NXDN Net			
YSF2NXDN	YSF2P25			
DMR2NXDN	DMR2YSF			
ar X) 			

• Yellow indicated password issue.

Network Status				
D-Star Net	DMR Net			
YSF Net	P25 Net			
YSF2DMR	NXDN Net			
YSF2NXDN	YSF2P25			
DMR2NXDN	DMR2YSF			
Connect to BM

- Configuration Issues
- DMR Gateway not enabled (if using)
- Check your configuration

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

After making changes in each section click "Apply Changes"

- Control Statics/Dynamics Via Hotspot
 Dashboards
- Pi-Star
- Shark RF Open Spot (1, 2, 3)





First Step, Generate API Key

- Log in
- Click on Call (Top Right)
- Click Profile Settings Link



- Click API Keys Button in
 - Security Settings.

🕰 API Keys
Ŷ
(a)

Click Add toCreate
 New API Key



• Enter Name for the Key

Enter a name for this key?

Choose for example the name of the application you use the key in this so you can identify it later

Pi Star			
	ОК	Cancel	

- Click Copy Button to copy API Key
- Click Ok when done.



• Go to http://pi-star.local

Hostname: pi-star								
Pi-S	tar Digi	ital Vo	ice Dash	board f	or 🗲			
					Dashb	oard Adm	in Config	guration
Modes Enabled			Gatew	vay Activity				
D-Star DMR	Time (PDT)	Mode	Callsign	Targe	t Src	Dur(s)	Loss	BER
YSF P25								
YSF XMode NXDN	T: (00T)	1.0.0.1	Local	RF Activity	0 (000		CT.
DMR XMode POCSAG	lime (PUI)	mode	Callsign	Target 5	rc Dur(s) BER	RS:	21
Network Status								
D-Star Net DMR Net								
YSF Net P25 Net								
YSF2DMR NXDN Net								
YSF2NXDN YSF2P25								
DMR2NXDN DMR2YSF								
Radio Info								
Tr. 421 020000 MH-								
431.020000 MHz								
EW 71Mspot:v1 4 12								
CX0 14 7456 MHz								
DMR Repeater								
DMR ID								
DMR CC 1								
TS1 disabled								
TS2 enabled								
DMR Master								
74.91.118.251								
		ar / Pi-Star Dashb ircDDBGateway [MMDVMDash Need help? or Click Get yo	oard, © Andy Taylor (MW Dashboard by Hans-J. Bar developed by Kim Huebel Click here for the Faceboo here to join the Support F our copy of Pi-Star from he	IOMWZ) 2014-2021. then (DL5DI), (DG9VH), ok Group Forum ere.				

- Click on Configuration
- Upper Right Corner



• Click on ExportLink

Pi-Star Digital Voice - Configuration

Dashboard | Admin | Expert | Power | Update | Backup/Restore | Factory Reset

• Click on BMAPI

Pi-Star Digital Voice - Expert Editors

Dashboard | Admin | Update | Upgrade | Backup/Restore | Configuration

Quick Edit: DStarRepeater | ircDDBGateway | TimeServer | MMDVMHost | DMR GW | YSF GW | P25 GW | NXDN GW | DAPNET GW Full Edit: DMR GW | PiStar-Remote | WiFi | BM API | DAPNET API | System Cron | RSSI Dat Tools: CSS Tool | SSH Access

- Paste API Key
- Click Apply Changes

	key	
apikey	m@3A5oy6g9CQ5vLN8jVg0wtZC3rZ6vRP3jrW1pnJBhRYTWfsneDF.XD1MenGYI h80US@oMNVX2IKMdHC\$eSoLEmXpzX@6KR0Rd11NiUu45UirJiOG8Pv8qBqDNK8 cWdr	
	Apply Changes	



Click on AdminLink

Pi-Star Digital Voice Dashboard for W7XM

Dashboard Admin Live Logs | Power | Update | Configuration

• Brandmeister Manager NowActive

Active BrandMeister Connections							
BrandMeister Master			er ID	Static TGs	Dynamic TGs		
BM 3103 United S	3132067		None	None			
BrandMeister Manager							
Static Talkgroup Slot		Add / Remove		Action			
	O TS1 (TS2	Add	\bigcirc Delete	Modify Static		
Drop QSO Drop All Dynamic							





Questions and Answers

SBCARA Tips & Slides

<u>http://sbcara.org/dmr21</u> (temporary page)

► This slide deck

Sample Code Plug w/ SBCARA Frequencies. Download as sbcara878.rdt