



INTRO TO AMATEUR RADIO HOTSPOTS

By: Jim Dixon - KA6ETE

Hotspots

TYPES

WHAT DOES IT DO

SET UP

SHOULD I BUILD
OR BUY A HOTSPOT



Types

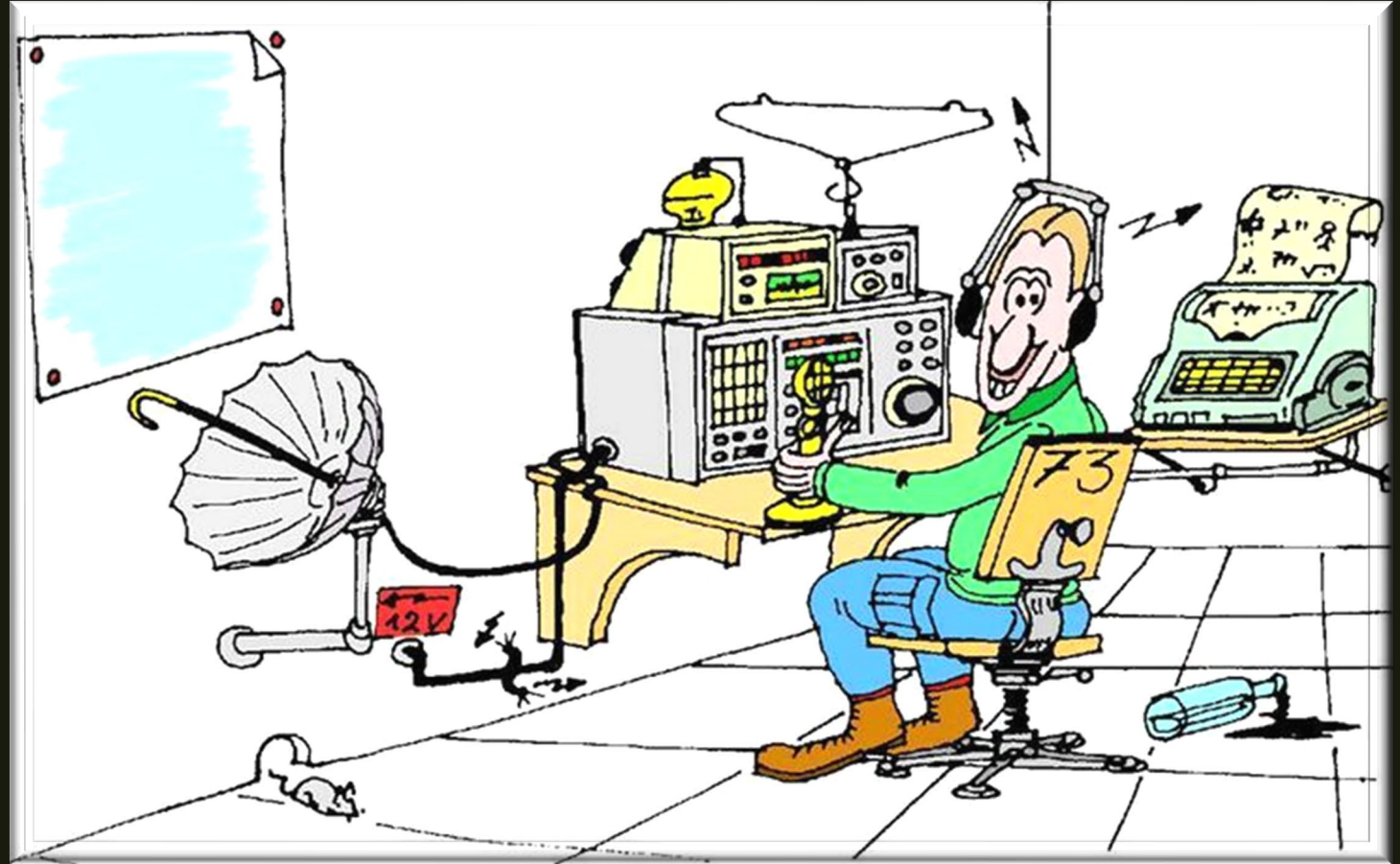
There are many options for Amateur Radio Hot Spots:

- MMDVM (most common)
- JumboSpot
- SkyBridge+
- OpenSpot
- Among Others



What does a Hotspot do?

In short, a Hotspot is just another tool at our disposal to increase our communications ability. They give us the ability to connect to talk groups worldwide without tying up a repeater, leaving it open for others to use.



Setting up a Hotspot

ALWAYS check with your area's frequency coordinator or areas frequency allocation for the recommended frequency to use.

Colorado Council of Amateur Radio Clubs

www.ccarc.net

Colorado Council of Amateur Radio Clubs, Inc.
Colorado's Coordination and Support Body

CCARC Hotspot Guidelines Posted!

The CCARC Frequency Coordinator recommends that hotspots be deployed in the 70 cm band using one of the following frequencies:

438.4500, 438.4750, 438.5000, 438.5250, 438.5500, 438.5750, 438.6000, 438.6250, 438.6500 and 438.6750 MHz.

Guideline are posted here

 Wayne Heinen / December 26, 2020

CCARC IS AN ARRL AFFILIATED ORGANIZATION

CCARC is the umbrella coordination body made up of many clubs across the State of Colorado to oversee Amateur Frequency Coordination and policies for the State of Colorado.

All clubs are welcome to join.

Step 1:

Logging into the pi-star interface, this can be done by either accessing the pi-stars default wifi AP (access point) or by plugging into your home networks via ethernet cable (if applicable).

Hostname: pi-star Pi-Star:4.1.4 / Dashboard: 20210212

Pi-Star Digital Voice Dashboard for KA6ETE

Dashboard | Admin | Configuration

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	
Tx	438.450000 MHz
Rx	438.450000 MHz
FW	HS_Hat:v1.4.7
TCXO	14.7456 MHz

DMR Repeater	
DMR ID	3114929
DMR CC	1
TS1	disabled
TS2	enabled

DMR Master	
BM United States ..	

Gateway Activity							
Time (UTC)	Mode	Callsign	Target	Src	Dur(s)	Loss	BER

Local RF Activity							
Time (UTC)	Mode	Callsign	Target	Src	Dur(s)	BER	RSSI

Pi-Star / Pi-Star Dashboard, © Andy Taylor (MW0MWZ) 2014-2021.
ircDDBGateway Dashboard by Hans-J. Barthen (DL5DI),
MMDVMDash developed by Kim Huebel (DG9VH),
Need help? [Click here for the Facebook Group](#)
or [Click here to join the Support Forum](#)
[Get your copy of Pi-Star from here.](#)

If this is your first-time logging in, you will need to locate the pi-stars IP address if using an Ethernet connection.

The default username is: pi-star

The default password is: raspberry

Hostname: pi-star Pi-Star:4.1.4 / Dashboard: 20210212

Pi-Star Digital Voice Dashboard for KA6ETE

Dashboard | Admin | Configuration

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

Radio Info	
Trx	
Tx	438.450000 MHz
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Get your copy of Pi-Star from [here](#).

Step 2:

Once logged in you will need to set up the internet connection if using Wi-Fi. If you plan on only using Ethernet connection, you can skip this step.

- Click on the “Configuration” tab located on the top of the screen
- Scroll to the bottom and click “Configure WiFi” and then “Scan for Networks”
- Select your Network and enter the PSK (password) then click on “Save (and connect).”

At this point your pi-star should reboot, if not then scroll to the top and click on “Power” then “Reboot”. This takes about 2 minutes and when it powers back up it should automatically connect to your network.

Tip: You can add more than one Wi-Fi network and it will connect in order. This will allow you to connect to remote Wi-Fi at different locations without having to reconfigure in the future.

Hostname: pi-star Pi-Star:4.1.4 / Dashboard: 20210212

Pi-Star Digital Voice Dashboard for KA6ETE

Dashboard | Admin | **Configuration**

Modes Enabled	
D-Star	DMR
YSF	P25
YSF XMode	NXDN
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Network Status	
D-Star Net	DMR Net
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YSF2DMR	NXDN Net

Gateway Activity								
Time (UTC)	Mode	Callsign	Target	Src	Dur(s)	Loss	BER	

Local RF Activity								
Time (UTC)	Mode	Callsign	Target	Src	Dur(s)	BER	RSSI	

Wireless Configuration

Refresh Reset WiFi Adapter **Configure WiFi**

Wireless Information and Statistics	
Interface Information Interface Name : wlan0 Interface Status : Interface is down IP Address : Subnet Mask : Mac Address : b8:27:eb:5e:27:6f	Wireless Information Connected To : AP Mac Address : Bitrate : Signal Level : WiFi Country : JP
Interface Statistics Received Packets : Received Bytes : Transferred Packets : Transferred Bytes :	

Information provided by ifconfig and iwconfig

WiFi Info

WiFi Regulatory Domain (Country Code) : JP

Network (0) Delete

SSID : **KA6ETEWIFI**

PSK :

Scan for Networks (10 secs) Add Network Save (and connect)

Connect	SSID	Channel	Signal	Security
Select	DixonHomeWiFi1	5.0GHz Ch44	-18 dBm	WPA2-PSK (TKIP) with WPS
Select	XFINITY	5.0GHz Ch44	-18 dBm	[WPA2-EAP-CCMP][ESS]
Select		5.0GHz Ch44	-17 dBm	[WPA-EAP-CCMP][WPA2-EAP-CCMP][ESS]
Select	ILikeTurtles2.4	2.4GHz Ch11	-14 dBm	WPA2-PSK (AES)
Select		2.4GHz Ch6	-28 dBm	WPA2-PSK (AES)
Select	DixonHomeWiFi1	2.4GHz Ch6	-28 dBm	WPA2-PSK (TKIP) with WPS
Select		2.4GHz Ch6	-28 dBm	WPA2-PSK (AES)
Select		2.4GHz Ch6	-28 dBm	[WPA-EAP-CCMP][WPA2-EAP-CCMP][ESS]
Select	NETGEAR49	2.4GHz Ch11	-70 dBm	WPA2-PSK (TKIP) with WPS
Select	[range] Samsung	2.4GHz Ch1	-72 dBm	WPA2-PSK (AES)
Select		2.4GHz Ch6	-81 dBm	WPA2-PSK (AES)
Select	rzaissadog	2.4GHz Ch6	-80 dBm	WPA2-PSK (TKIP) with WPS
Select		2.4GHz Ch6	-84 dBm	[WPA2-EAP-CCMP][ESS]
Select		2.4GHz Ch6	-84 dBm	[WPA-PSK-CCMP+TKIP][WPA2-PSK-CCMP+TKIP][ESS]
Select	xfinitywifi	5.0GHz Ch44	-18 dBm	none

Step 3:

General Configuration

- Host Name (if desired)
- Callsign
- DMR ID number
- Simplex Frequency the pi-star will use
- Location
- Town (Town and Grid square)
- Country
- Website URL (optional)
- Board type (can be found either on the board itself or in the manual for the board)
- Time Zone
- Language

General Configuration	
Setting	Value
Hostname:	pi-star <small>Do not add suffixes such as .local</small>
Node Callsign:	KA6ETE
CCS7/DMR ID:	3114929
Radio Frequency:	438.450.000 MHz
Latitude:	40.43729 <small>degrees (positive value for North, negative for South)</small>
Longitude:	-105.0841 <small>degrees (positive value for East, negative for West)</small>
Town:	Loveland, DN70kk
Country:	United States
URL:	www.ka6ete.com <input type="radio"/> Auto <input checked="" type="radio"/> Manual
Radio/Modem Type:	STM32-DVM / MMDVM_HS - Raspberry Pi Hat (GPIO) ▼
Node Type:	<input type="radio"/> Private <input checked="" type="radio"/> Public
APRS Host Enable:	<input type="checkbox"/>
APRS Host:	noam.aprs2.net ▼
System Time Zone:	UTC ▼
Dashboard Language:	english_us ▼

Tip:

You must hit "Apply Changes" after each section of configuration.

Step 4:

Configure DMR settings:

- Set the DMR Master
- Hotspot Security
- ESSID #
- DMR Color Code

Late 2020 Brandmeister started requiring a Hotspot Security PSK to use a hotspot. To set this up you will need to go to www.brandmeister.network and create an account. Under your account, go to Selfcare and enter the PSK of your choice. This is what you will use in the Hotspot DMR Configuration.

DMR Configuration	
Setting	Value
DMR Master:	BM_United_States_3101
Hotspot Security:
BrandMeister Network:	Repeater Information Edit Repeater (BrandMeister Selfcare)
DMR ESSID:	3114929 21
DMR Color Code:	1
DMR EmbeddedLCOnly:	<input type="checkbox"/>
DMR DumpTADData:	<input checked="" type="checkbox"/>
<input type="button" value="Apply Changes"/>	

Tip: The DMR ESSID while not required is there to remove issues that may occur if your radio and Hotspot are using the same DMR ID number.

Pi-Star Digital Voice - Power

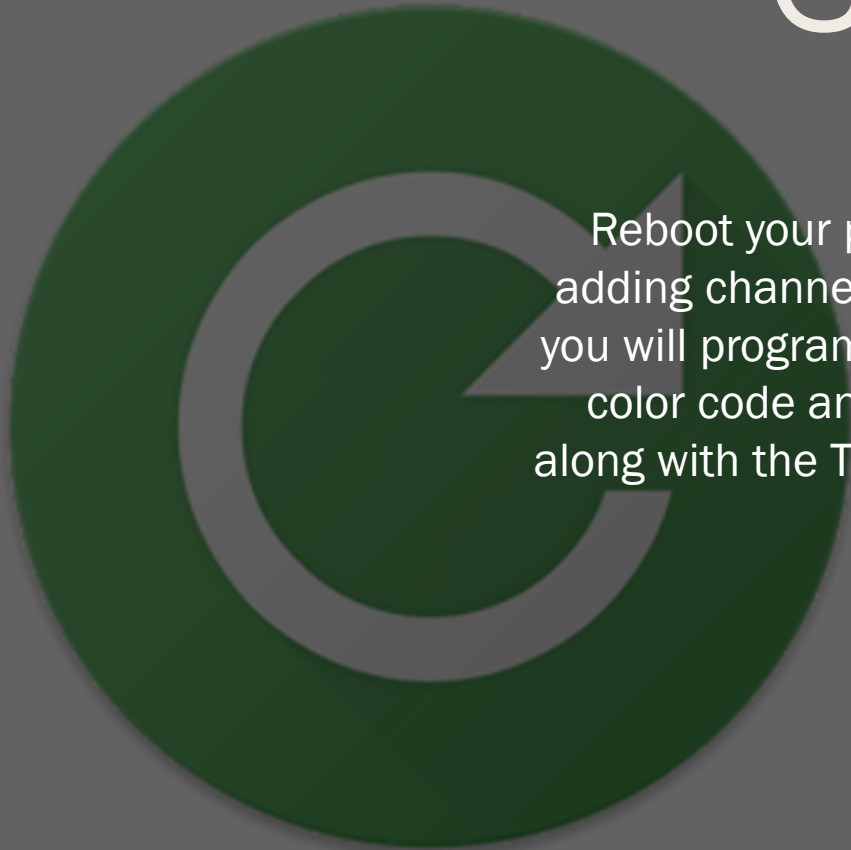
[Dashboard](#) | [Admin](#) | [Update](#) | [Backup/Restore](#) | [Configuration](#)

Power

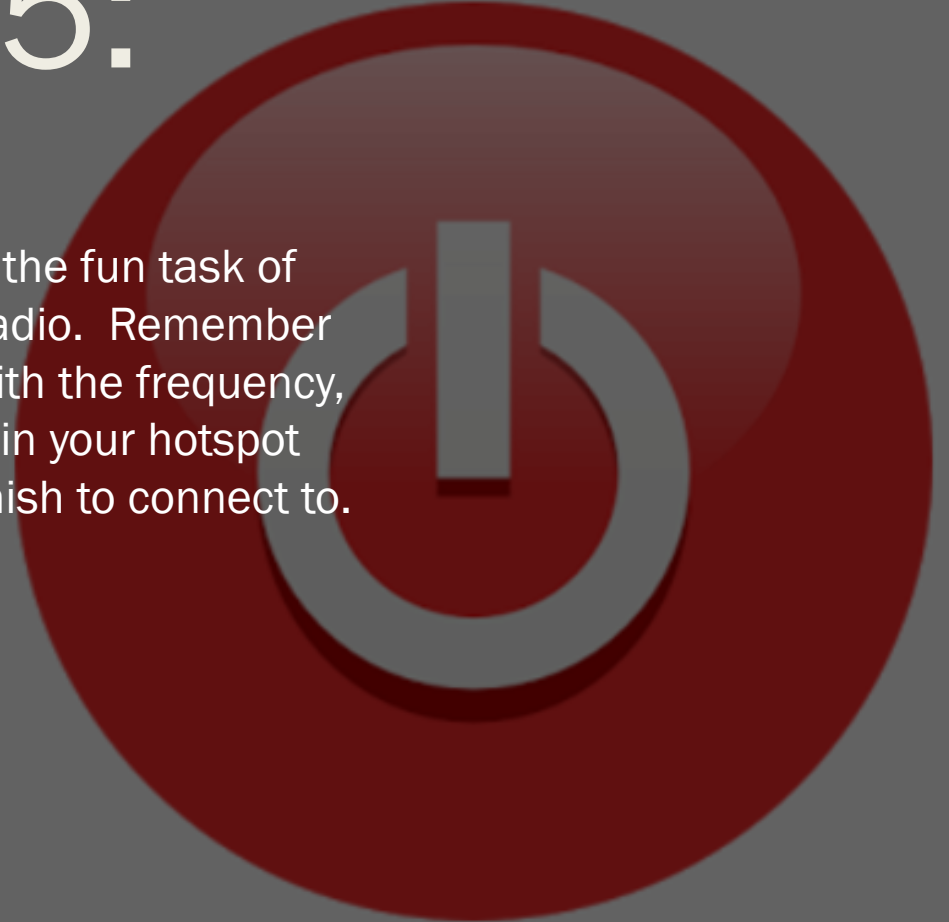
Reboot

STEP 5:

Shutdown



Reboot your pi-star and begin the fun task of adding channels to your DMR radio. Remember you will program the channels with the frequency, color code and timeslot listed in your hotspot along with the Talk Group you wish to connect to.





Should I build or buy a Hotspot?

Pre-built

Pros:

- Easy Setup
- Pre-programmed
- Customer support

Cons:

- Higher Cost
- Proprietary components
- Relying on manufacturer for repairs and service

Build your own

Pros:

- Cheaper
- Programmed to your needs
- Community Support
- Better Understanding of the equipment
- More options for adding to your hardware

Cons:

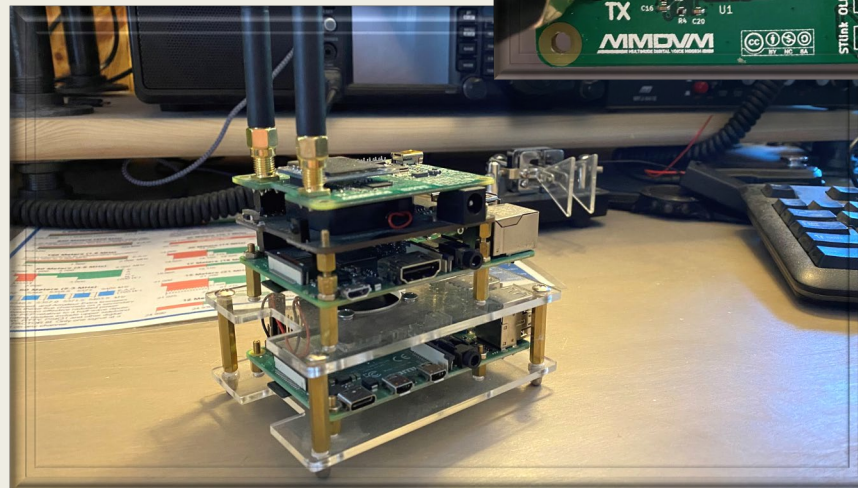
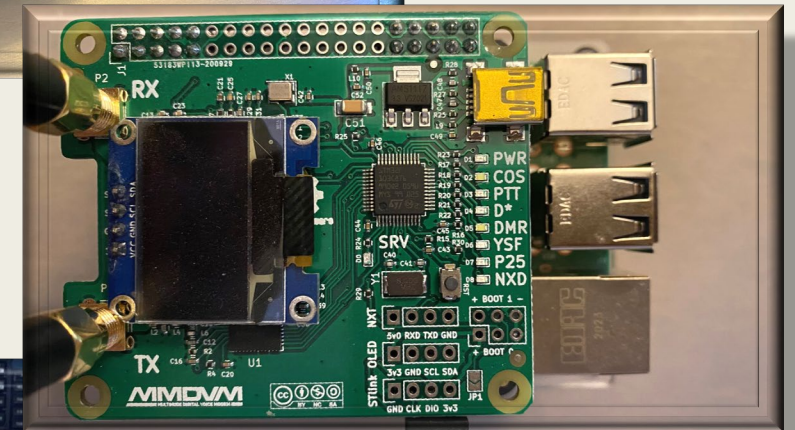
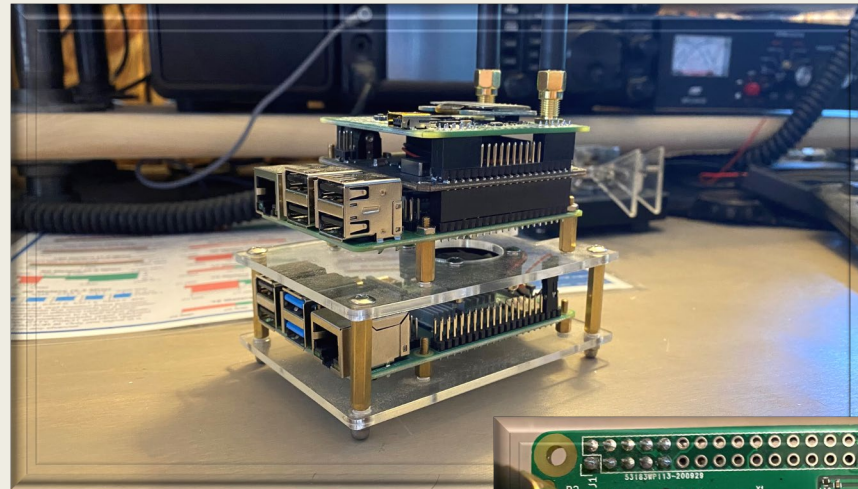
- Steeper learning curve
- More work to set up

My Hotspot

- Raspberry Pi3 B+ \$41.99
- AURSINC MMDVM Full Duplex Board \$69.99
- MakerFocus Raspberry Pi power board \$21.99

Additional Item for logging and other data modes:

- Raspberry Pi 4 8GB Ram \$109.99
- Total Cost: \$243.96





The END

Thank you for Listening

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