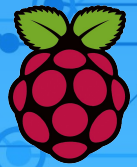
Intro To Pi-Star And MMDVM

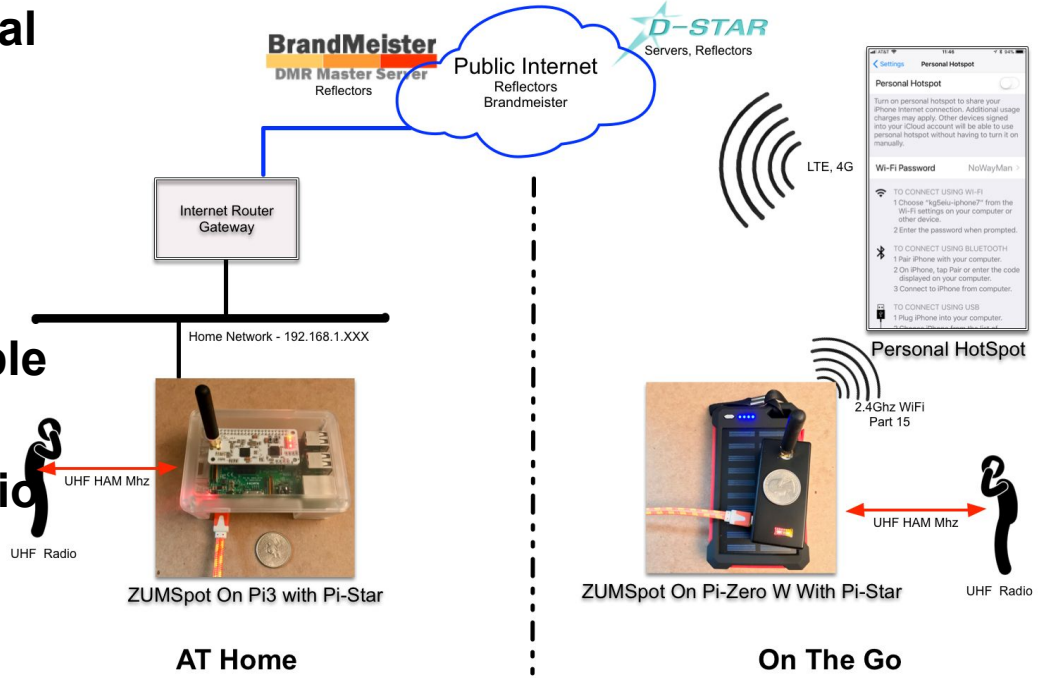
McKinney Amateur Radio Club
March 2019

KG5EIU - David



Why HotSpots/Pi-Star - System Diagram/Use

- Gives Operator fast easy digital access globally
- High Quality Digital Audio Experience
- No Repeater Access Needed
- Multiple Digital Modes Available with Pi-Star (6 total)
- Most still require operator radio
- Most require a computer or Raspberry PI



Two HotSpot Types/Categories

No Operator Radio Needed (usually USB dongles and a computer)

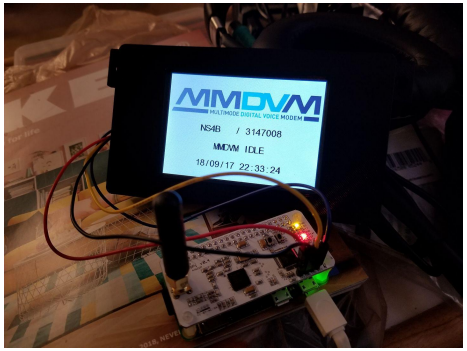
- Uses a computer + hardware dongle/vocoder + software
- Requires computer mic and headset plus USB port to power dongle
- Requires “good” Internet connection to/from computer

Operator Radio Needed (HT or mobile/base) (Pi-Star systems need a radio)

- Uses computer + hardware dongle and software + Operator RADIO
- Uses hotspot/appliance/transceiver + Operator RADIO
- Requires “good” internet to/from computer and/or hotspot/appliance

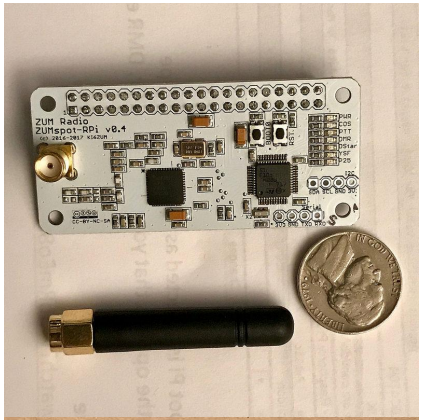
HotSpots: Software + Hardware + Op Radio

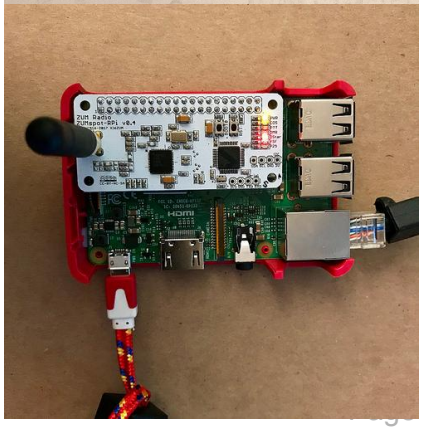
- MMDVM - Open Source Multi-Protocol Digital Voice Modem
- ZUMSpot - Radio Module Board (UHF Transceiver) For Pi Hat
- Raspberry Pi - Credit-Card-Sized Computer (Pi3B+, P2, Pi3, Pi-ZeroW)
- Pi-Star - Custom Software Image For Pi (Raspbian + MMDVM)



ZUMSpot Board - UHF Transceiver Pi-Hat

- 32-bit ARM Processor, 10mW RF Power
- “Open” design
- SMA Antenna Connectors
- DMR, P-25, D-Star, System Fusion, NXDN, POCSAG
- Firmware pre-loaded, upgradable
- Display support: NEXTION, I2C Support
- Status LEDS, USB powered
- Needs operator radio’s
- YSF2DMR Gateway Support





ZumSpot Kit
https://www.hamradio.com/detail.cfm?pid=H0-015993

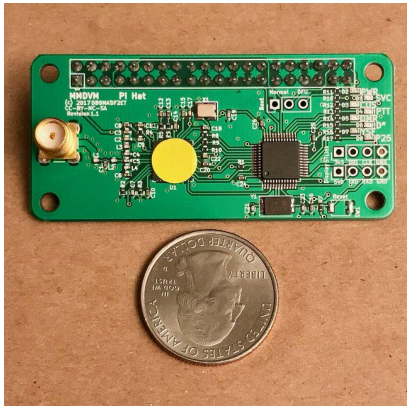
ZUMSpot Board - HotSpot Examples

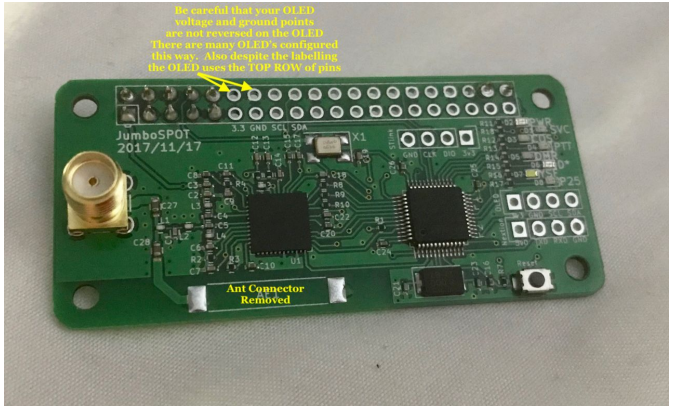
More Photos In The Flickr Gallery - https://flic.kr/s/aHsm3gQNuo

Jumbo Spot/China Spot/MMDVM_HS_HAT

- Clone/knock-off of MMDVM PiHat (all open source design)
- UHF or VHF Transceiver Raspberry Pi-Hat
- eBay.com, tindie.com (https://www.tindie.com/stores/dave31418/)
- Now upgradable (firmware)

Setup Guide
http://www.hagensieker.com/blog/page/?post_id=99&title=jumbospot-dmr-hotspot





Software And Firmware For HotSpots

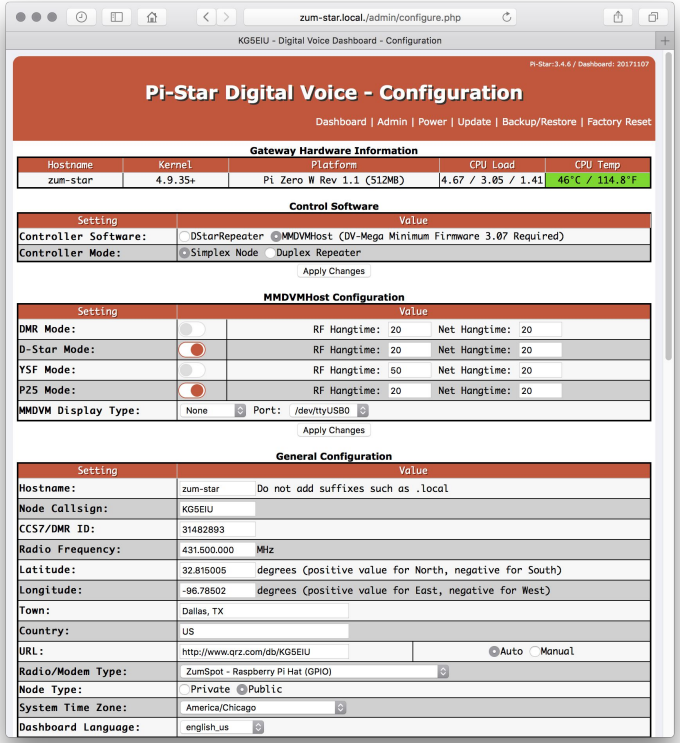
Dongles and USB Sticks - Usually A Closed System

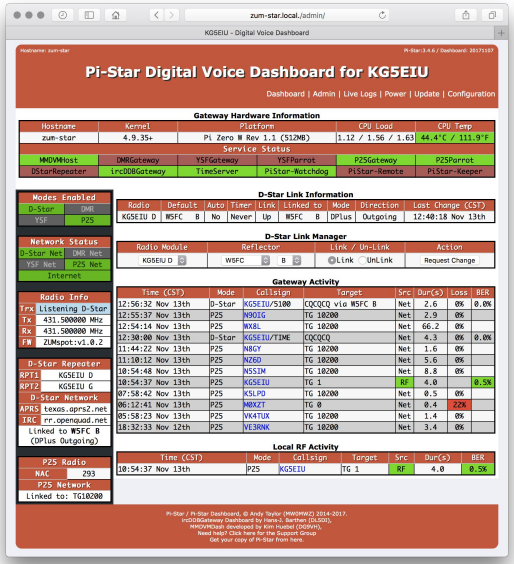
- Custom software and firmware provided by hardware vendor

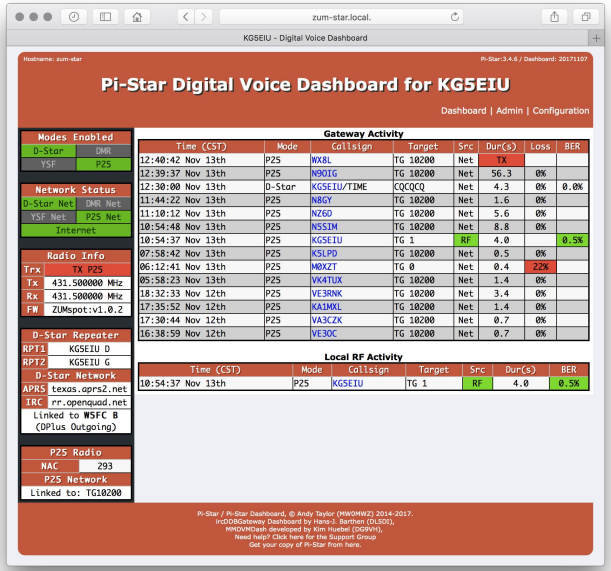
RPi “images” Completely Open Source

- Pi-Star - Hardened Raspberry Pi OS with included MMDVM - Open Source Multi-Protocol Digital Voice Modem code + POCSAG
- Firmware open sourced
- Several choices but Pi-Star most popular and easy

Pi-Star - Software Image/Appliance







Current Version as of Mar 10, 2019: v3.4.17_20

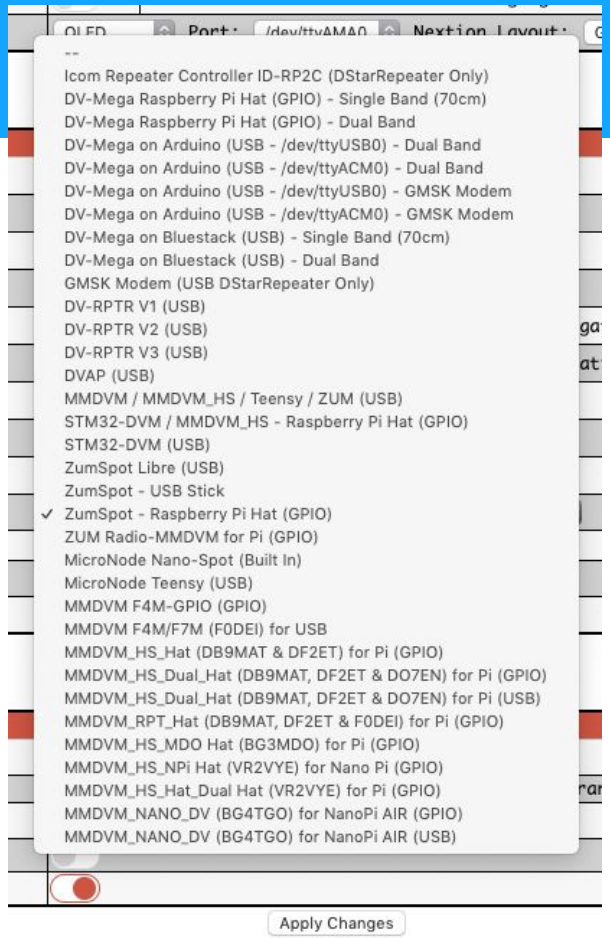
Updated frequently! (get the Beta!!)

Pi-Star Digital Voice Software - http://www.pistar.uk

Hardware Support With PiStar

PiStar (download from http://www.pistar.uk/downloads/)

- Custom RPI software, free and open source.
- New Icom radio terminal mode support
- Lots of dongles, boards, and USB sticks supported. (as of Feb 2019 ver 4.0 RC3)



PiStar Software Features

Digital Modes As Of Mar 2019

- DMR
- D-Star
- Fusion (YFS, FCS)
- P25
- NXDN
- POCSAG (paging)

PiStar Features As Of Mar 2019

- YSF 2 DMR
- YSF 2 NXDN
- YSF 2 P25
- DMR 2 YSF
- DNR 2 NXDN
- DAPNET Paging - hampager.de
- Icom Terminal Mode (RC4 beta)

Handy Network Portals and Dashboards

Great way to see “what is going on” - in the Internet side

BrandMeister Dashboard (DMR) Self Help and more

- https://brandmeister.network

Xreflector.net

- http://xreflector.net/neu3/

DMR Plus CCS7 User Database

- http://www.mw0mwz.co.uk/dmrusers.php

DAPNET (Paging)

- https://hampager.de/#/

Get Started Quickly With A HOTSpot:

You Will Need:

Digital Radio (Fusion, D-Star, DMR, NXDN, P25) base, mobile or HT

WiFi Internet Connection (L3 no good need L2 ie. password)

Acquire/Purchase:

HotSpot: ZUMspot Kit - HRO https://www.hamradio.com/detail.cfm?pid=H0-015993

MMDVM_HS_HAT - https://www.tindie.com/products/dave31418/mmdvm_hs_hat-rev-15-simplex/

Case: https://www.hamradio.com/detail.cfm?pid=H0-016096

Read/Follow:

Well Done Setup Guide: https://www.toshen.com/ke0fhs/pi-star.htm

ZUMSpot Board - Reference Links

- MMDVM - https://github.com/g4klx
- ZUMSpot - (hamradio.com)
- MMDVM_HS_HAT rev 1.5 - tindie.com N5BOC Store
- Raspberry Pi - https://www.raspberrypi.org/products/
- Pi-Star (and forums) - http://www.pistar.uk
- Support/Latest Info - https://www.facebook.com/groups/pistarusergroup/
- Initial Setup Videos W1MSG - https://youtu.be/B5G4gYDdJeQ
- BrandMeister Network - https://brandmeister.network
- KG5EIU Photo Gallery - https://flic.kr/s/aHsm3gQNuo
- DAPNET - Decentralized Amateur Paging Network https://hampager.de/#/

Thank You!

Comments And Questions?

KG5EIU - David