



# DSTAR DIGITAL HOTSPOT

DVAP with Raspberry Pi

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# DIGITAL VOICE

- What is DV?
  - Digital Voice transmits a Digital signal as opposed to Analog (FM)
- Advantages
  - DV is considered to provide a higher quality voice communication
  - Generally uses less bandwidth
  - Less Degradation and therefore less noise and loss
- Disadvantages
  - No fading into noise, below a certain level it is just gone
  - Cost of Equipment (Generally more expensive)

# MODES

- Dstar
  - Open Source, designed for Amateur Radio
  - Widest distribution, supported by Icom and now Kenwood
  - Default for the state of Georgia
- DMR
  - Originally (and still) used in business applications
  - A Motorola standard
  - Presently 3 major networks for Amateur Use
    - DMR MARC (Motorola)
    - DMR+
    - Brandmeister
- System Fusion
  - Yaesu C4FM
  - Newest and least distributed to date

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# WHY A DSTAR DIGITAL HOTSPOT?

- Not Near Repeaters
- Ease of Changing Reflectors
  - No Link/Unlink etc needed
- You are not tying up a local Repeater
- You are not sending local traffic over the Reflector
- Allows a portable system

# HOTSPOT OPTIONS

- DV Dongle (DV3K) \$149
  - Must use Computer
  - Does not need/use a radio
- DV4 Mini \$129
  - USB to Computer
  - Uses a radio for transmit, receive and control
  - Effectively your personal repeater
- DVAP (Digital Voice Access Point) \$259
  - USB to Computer
  - Uses a radio for transmit, receive and control
  - Effectively your personal repeater
- DV Mega \$129
  - Is a board and must plug into I/O of a PI
  - Operates similar to DVAP
  - Not usable with a PC
- Openspot Shark RF (NEW) \$239
  - Fully self contained

# MY CRITERIA FOR CHOICE

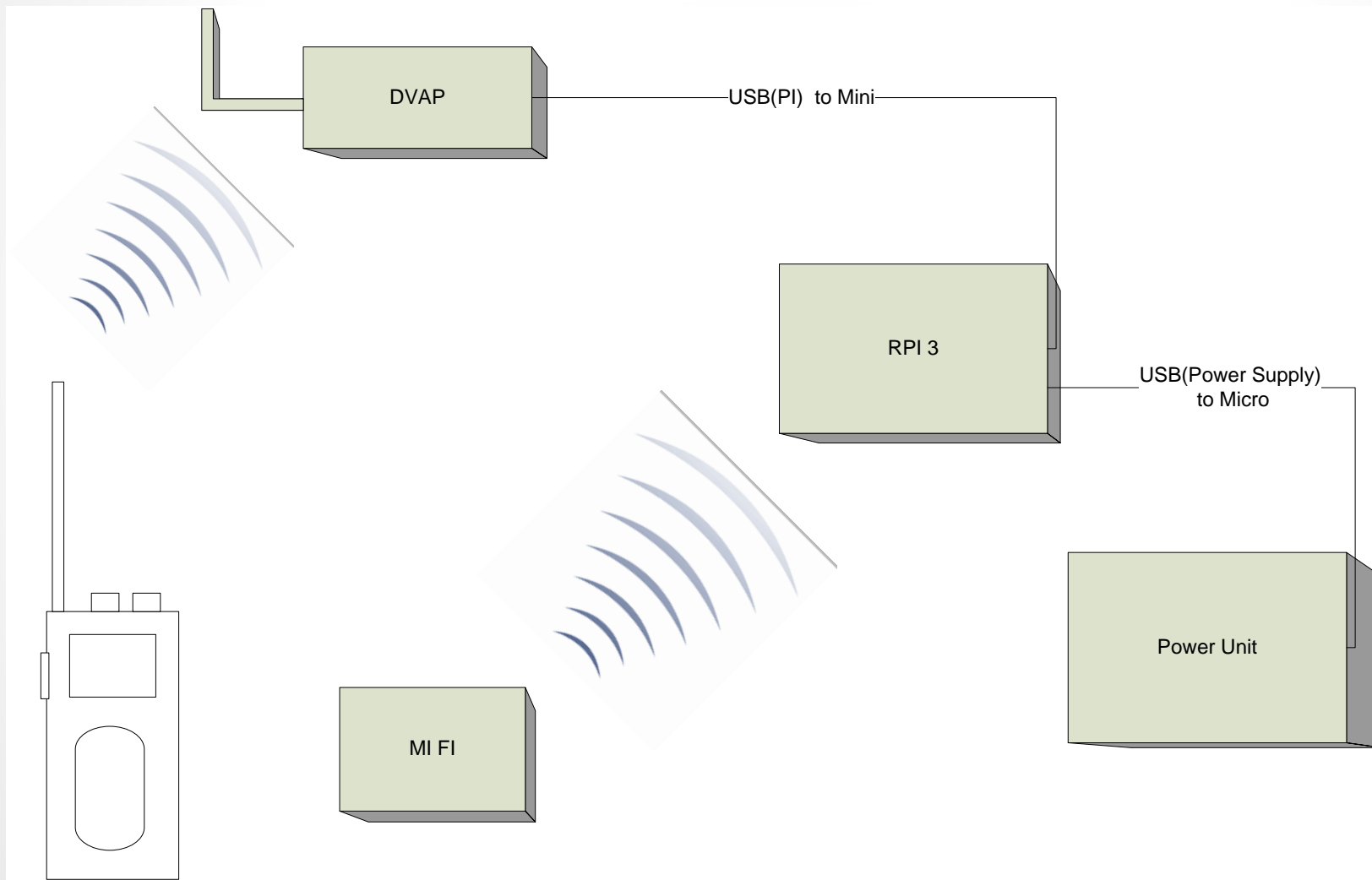
- Wanted to be able to plug in to Computer
- Compatible with Raspberry Pi
  - Preferred w/ PI3
- Cost
  - Offset by finding a DVAP Used on QRZ
- Abundance of Info on making it work
  - DVAP was very positive
  - Had some issues with available info on DV Mega
  - Reports on DV4Mini were “iffy”
- My Choice – DVAP
  - Liked Dv Mega as a unit, it won on price but would not work alone on PC
  - DVAP used was a few dollars more and could operate alone on PC

# WHAT MAKES IT ALL WORK

- **Raspberry Pi**
  - 2b or 3b
- WI FI
  - PI2 needs a WIFI Dongle – PI3 has one built in
  - WIFI Source
    - Home Router
    - **Portable Wifi**
      - **MiFi**
      - **Cell Phone**
- Power USB source
  - Computer
  - **Portable phone charger**
- **Image File (Operating System)**
  - Maryland
  - Western DStar
  - Dstar Commander



# MY PORTABLE



# MY PARTS LIST

- Icom ID 51A
- Raspberry PI3 KIT with Case
- Verizon Jetpack MIFI 6620L
- RAVPower 13000mAh (5V / 4.5A Dual USB Output) Portable Charger Power Bank External Battery
- Cable USB to Mini 12"
- Cable USB to Mini 8"
- Image File Dstar Commander (free d/l)
- Win32 Diskimager (software free)
- 5/8" Velcro Dots (any Velcro will do)

# CONFIGURATION

- Flash Image File to 8GB micro SD (Win32 Disk Imager)
- Run DSTAR Config (from package with Image File)
  - Lets you config by answering prompts
  - No external connections required
- Program radio on same simplex you specified in Config
  - Create a CQCQCQ channel
  - Add as many LINK channels as you want reflectors
    - 001C, 030B, 030C, Unlink, Echo
    - (I found you do NOT need to unlink, just dial a 2<sup>nd</sup> reflector)
  - Add advanced commands (included in Image)
    - Re-Boot (restarts PI Op system)
    - Shutdown (safely de-activates PI before removing Power)

# PHOTOS:



# ADVANCED CONFIGURATION

- Accessible Via GUI in PI
  - Requires Keyboard
    - I bought a mini WIFI keyboard for \$20
    - Could use a USB keyboard
  - Requires Video Screen
    - Available Monitors
    - Connect to any TV with HDMI cord
- Allows access to included software
  - WIFI Config
    - Add or Change WIFI Options
    - I have 3 tier, Home, CELL and then MIFI
  - ircDDB Config (allows control via APP)
    - I use ircDDB Remote via Android (Available for Iphone)
    - Provides Full access to All Reflectors
  - Full PI config via command line