

**Sunspots vs. Hotspots,**

**OR ...**

**DMR-101**

**MTARA 11/7/17 Meeting**

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# Digital VHF/UHF Radio

- VHF/UHF radios - - running with the Internet as the backbone
- VOIP, just like Skype, but for us hams!
- Internet **REQUIRED**

# Digital VHF/UHF Choices

- Vendor Implementations
  - DSTAR (Icom, Kenwood)
  - C4FM/System Fusion (Yaesu)
  - DMR (TYT, Motorola, Connect Systems, Hytera ...)

# DMR - Digital Mobile Radio

- DMR utilizes TDMA, it comes from the commercial world ("MotoTRBO")
- Not analog, but most (UHF) HTs do have analog channel ability
- DMARC and Brandmeister implementations for repeaters
- PAPA System invested in DMR here in SoCal

### PAPA System Repeaters

- 12 Analog (70cm and 222 MHz)
- 10 D-STAR (70cm, 23cm, 2M)
- 11 DMR (70cm)
- 13 sites in Southern California

Blueridge

Edom Hill

Mt Lukens

Mt Wilson

Mt Woodson

Out Mt

Otay

Palomar

Saddle Pk

San Marcos

Santa Ynez

Santiago

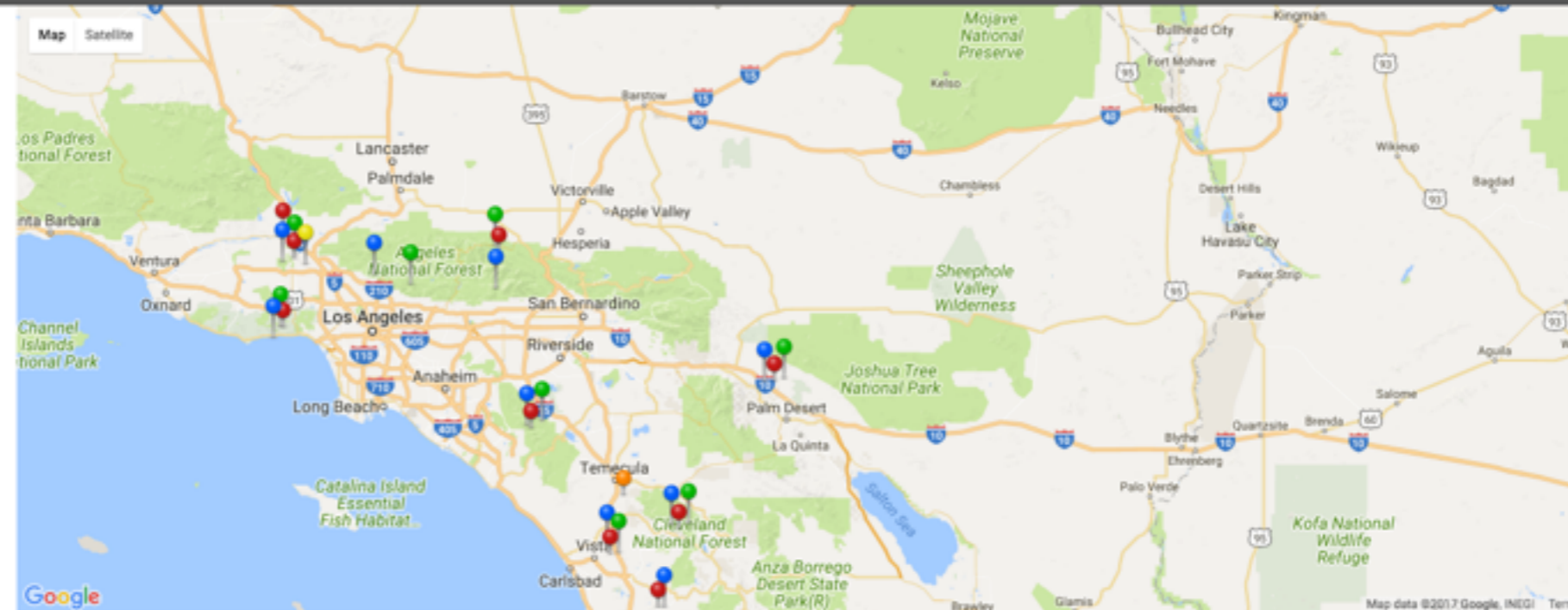
Sunset

Vista Multimode

Southern California's Premier Repeater System

# papa system

Southern California's Premier Repe



# DMR SoCal repeaters

The "blue pins"

# DMR Concepts

- Obtain radio and Subscriber ID
- Program radio with “codeplug” (see PAPA)
- Jump on a repeater or roll your own ...
  - “Hotspot”
  - Not tied to a repeater
  - Maximum flexibility

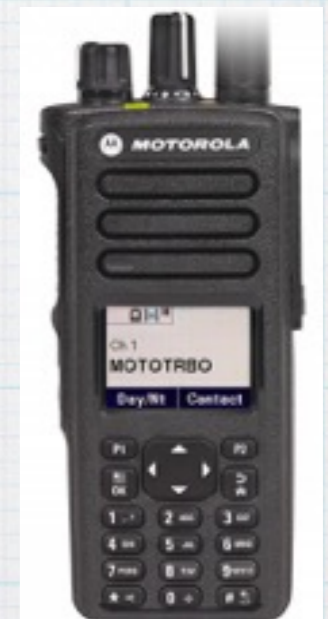
# DMR Radios

- TYT MD380/MD390, \$

- TYT MD2017, \$\$

- Motorola XPR7550e, \$\$\$






















- Anytone AT-D868UV, \$\$



# Talkgroups

- TG91 - Worldwide
- TG93 - N. America
- TG3100 - USAwide
- TG3106 - SoCal
- Tons more ...

Active calls in the last 5 minutes

Time	Duration	Call	Group
07:25:29	1s	 KG6IIX (Rafael O)	 334
07:25:29	1s	 SM5YMS (Malmen)	 2400
07:25:29	1s	 N4GDG (Gary)	 310514
07:25:28	2s	 SP8WJS (Andrzej)	 26085
07:25:26	4s	 UT4UDN (Ivan)	 25501
07:25:26	4s	★ BG6QYE (Wenxian)	★ 46001
07:25:26	4s	★ Anonymous	 26228
07:25:25	5s	 IZ0OWM (PIETRO1956)	 222035
07:25:25	5s	 WA0BAG (Paul)	 314703
07:25:23	7s	 VE3MKY (Mike)	 91
07:25:22	8s	 OH7FES (Ari)	 2441
...	...	 K0RTY (Ari)	 31070



# My "hotspot" hardware

- TYT MD380

- Great entry level radio, \$89 (Amazon)

- SharkRF openSPOT (the node), \$239 (GigaParts, ouch!)

- Internet access point

- I use my iPhone 6 in "personal hotspot" mode

- Portable Router

- TP-Link N300 Wireless W-Fi Nano Travel Router, \$30 (Amazon)

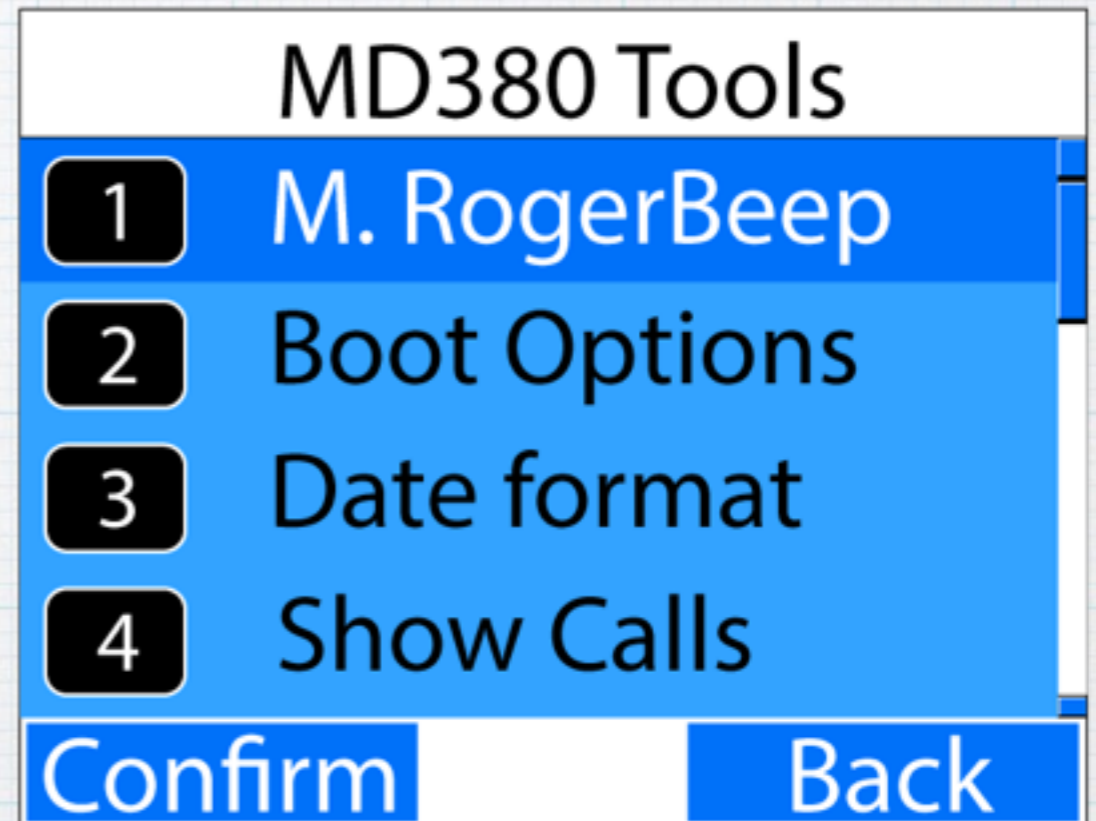
# Shark RF openSPOT

- Supports DMR (Brandmeister, DMRplus), D-Star (DCS, REF/DPlus, XRF/DExtra, XLX), System Fusion (FCS, YSFReflector) networks.
- Supports cross modem modes (C4FM radio on DMR, DMR radio on System Fusion)
- Simple, works without a computer. No additional hardware required. Web interface for configuration and monitoring.
- USB powered



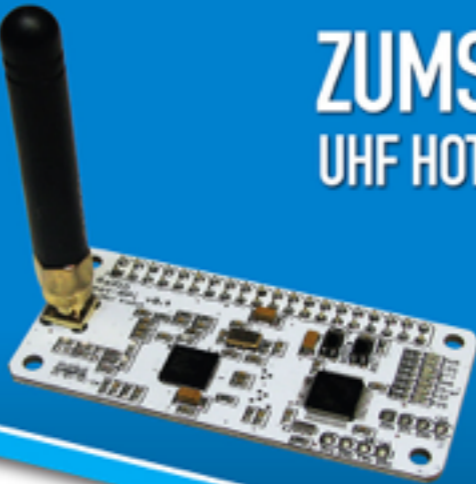
# MD380 Firmware

- The MD380 Tools is actively being developed by Travis Goodspeed and many others
- The "patched" firmware is developed primarily for the VHF MD380 Radio. The VHF Radio will support most features due to its smaller memory chip
- The community of developers has reverse engineered the radio to add amazing features



# Other hotspot solutions

- DV Mega with Raspberry Pi
- DV4Mini on Raspberry Pi or Windows
- Zumspot/RPi Zero



**ZUMSPOT RPi  
UHF HOTSPOT BOARD**

ZUMspot RPi  
+  
Raspberry Pi  
+  
MMDVM Software

**DIGITAL  
HOTSPOT**

with Raspberry Pi Zero

with Raspberry Pi 3 (B)

**ZUM SPOT  
RPI  
MULTIMODE DIGITAL HOTSPOT**

The ZUMspot RPi is an advanced radio module board. Paired with a Raspberry Pi and the MMDVM software becomes a small and efficient multi-mode digital hotspot.

- High performance 32-bit ARM processor
- Fully assembled and tested
- Supports DMR, P-25, D-Star and System Fusion
- Onboard LEDs to show status (Tx, Rx, PTT, Mode)
- Up to 10mW RF power
- SMA antenna connector, UHF antenna included
- Mounts cleanly on all current Raspberry Pi's including the Pi Zero
- Works on ODROID boards
- The firmware is pre-loaded and is easily upgraded via software.
- Connections for Nexion LCD display and I2C displays
- 1 Year Warranty
- Open source firmware (MMDVM) and board design
- Open source 3D printable case available
- 144 MHz, 220MHz and 900MHz versions to be released at a later date

Please contact Bruce Given [ve2gzi@gmail.com](mailto:ve2gzi@gmail.com) for details.

# Links

- Subscriber ID: <https://www.dmr-marc.net/cgi-bin/trbo-database/register.cgi>
- PAPA system info: <http://papasys.com/dmr/index.html>
- TYT MD380: <https://www.amazon.com/TYT-MD-380-Moto-TRBO-Radio/dp/B00X6FYWWS>
- Miklor site: <http://www.miklor.com/DMR/>
- SharkRF openSPOT: <https://www.sharkrf.com/products/openspot/>
- TYT MD380 Tools: <http://md380.tools/>