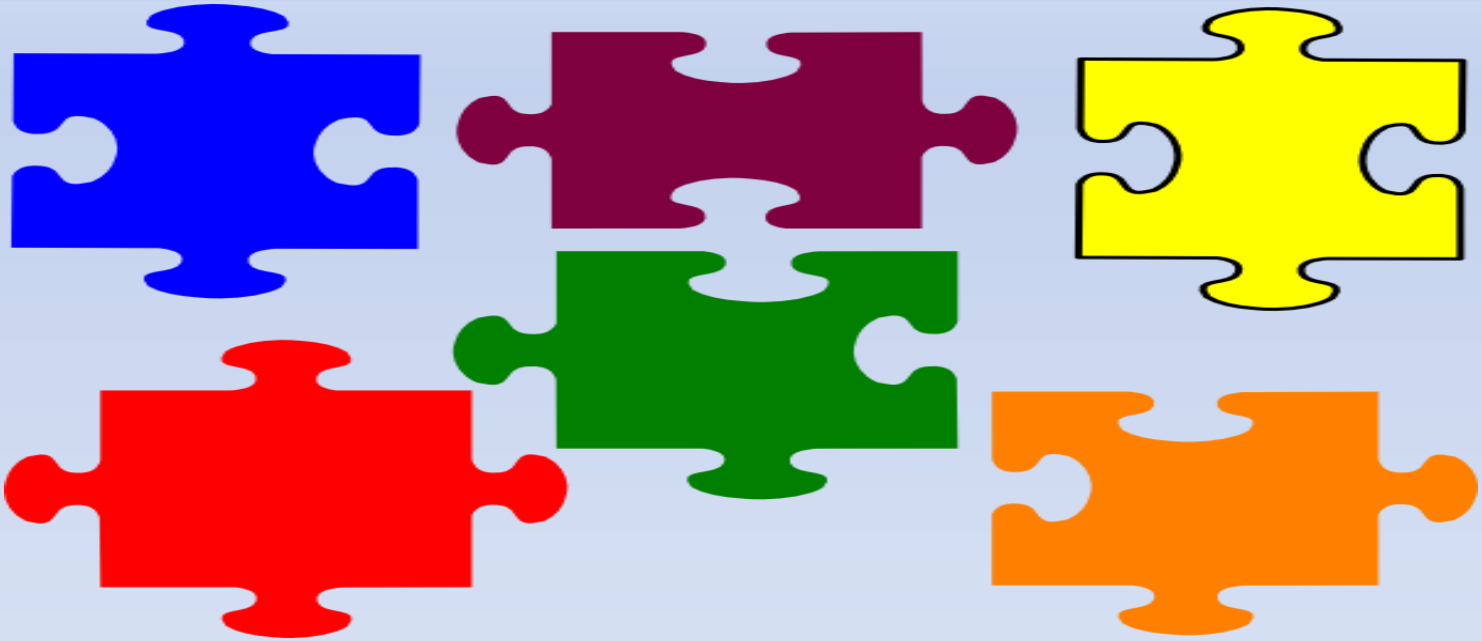
9-19-2020

PART 1

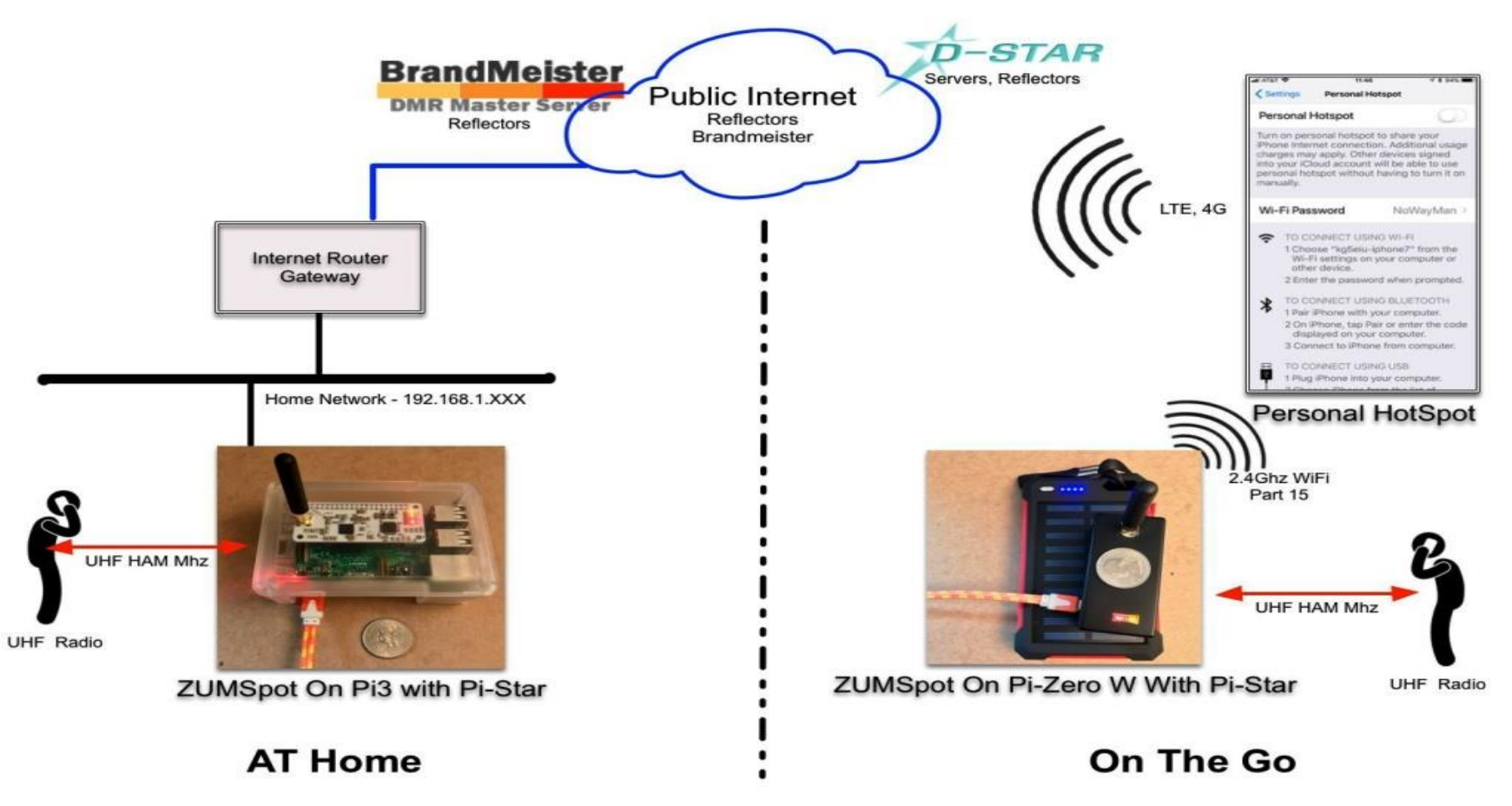
HOTSPOTS vs DV HOTSPOTS



"IT's not the Destination, It's the Journey"

By Dale Finley KB5NFT kb5nft@gmail.com 214-244-2100

How It Works



Nodes, Rooms, Groups, Reflectors, TalkGroups, Bridges, Transcode, FCS, YSF, Pi-Star, DCS, XLF, XRF, DVMega, MMDVM, BrandMeister, DMR-MARC, IPSC2, TGIF, QRM, Dashboards, HBHubnet, ircDDB Network, DVAP, DVDongle, Bridging between Allstar to DMR with full control, TDMA,

History (1)

- “The Road to the MMDVM” by Jonathan Nalor, G4KLX… Pacificon 2018 https://www.youtube.com/watch?v=LbJZkW3ZGms
- “Pi-Star Digital Voice Software” by Andy Taylor, MW0MWZ, https://www.pistar.uk/
- Guss PE1PLM https://microhams.blob.core.windows.net/content/2018/03/MHDC2018-PE1PLM.pdf
- “Jason Johnston” KC5HWB TAPR DCC 2018
- Yaesu Wires-X (Part 1) by John Kruk N9UPC
- “Peanut”, “BlueDV”, “AMBE”, “AMBE Server”, “Treehouse” by David Palin, PA7LIM http://www.pa7lim.nl/

History (2)

- D-Star InfoCon 2016 by John Davis, WB4QDX https://www.youtube.com/watch?v=rR9oTNlvzeI
- OpenSpot3 by Jason Johnston KC5HWB https://www.youtube.com/watch?v=n8bp5q1K-MU
- Overview by Brian Young, KA9QJT From A to Z Soup to Nuts https://www.rarsfest.org/Documents/Intro%20to%20D-Star%20DMR%20and%20YSF%20Voice%20Mode%20Technology%20-%20KA9QJT%20-%20042019.pdf

??? Questions to Ask ???

- What is a Hotspot vs DV Hotspot?
- Can I use my “Phone/Tablet’s” Hotspot
- Is my phone Hotspot now a gateway/router?
- What is DVMega vs MMDVM?
- Do you already have a Digital Radio?

  ---> DMR, Dstar, Fusion <---
- Why not just use a Repeater?
- What if I travel about in my car/RV?
- Is the internet required?
- Do I want to tinker or just buy a plug-n-play?
- What is a “Radio Less” Digital Radio?

Pieces

NANO-SPOT
DMR
AMOVI

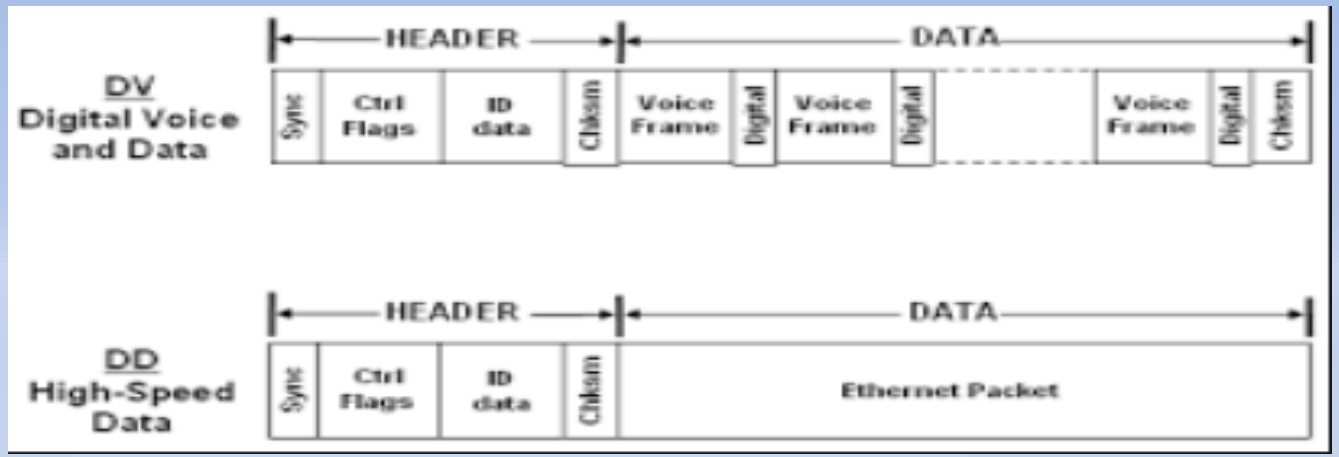
D-STAR


TYT
DVM2 Ohio
Main
CH 7
Menu
GPS
COM
DVMega2
D-STAR
YAESU
443.450
openSPOT
Digital
FT2D
BACK
DISP
BAND
A/B
V/M
SharkRF
openSPOT
USB
RESET
ETH
STATUS
ACT
MODEM
ETH ACT
ANT
Tytera
OPEN TG9
Main
CH 9
Menu
DV
DONGLE

DIGITAL VOICE SYSTEMS, INC.
The Speech Compression Specialists

VOCODER

AMBE
stands for
Advanced Multi-Band Excitation

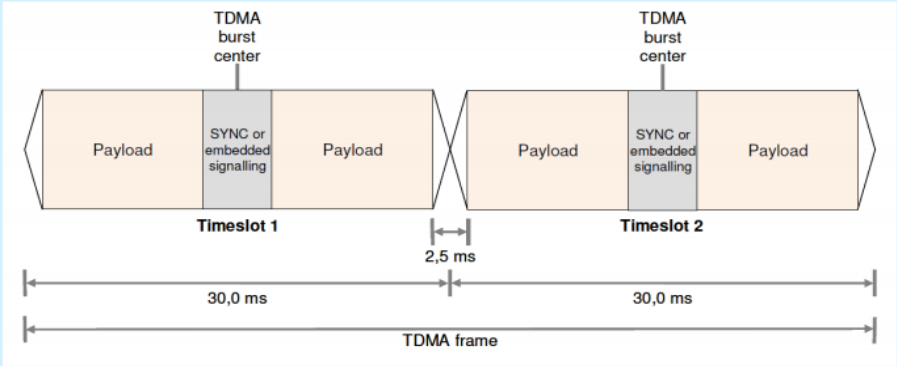


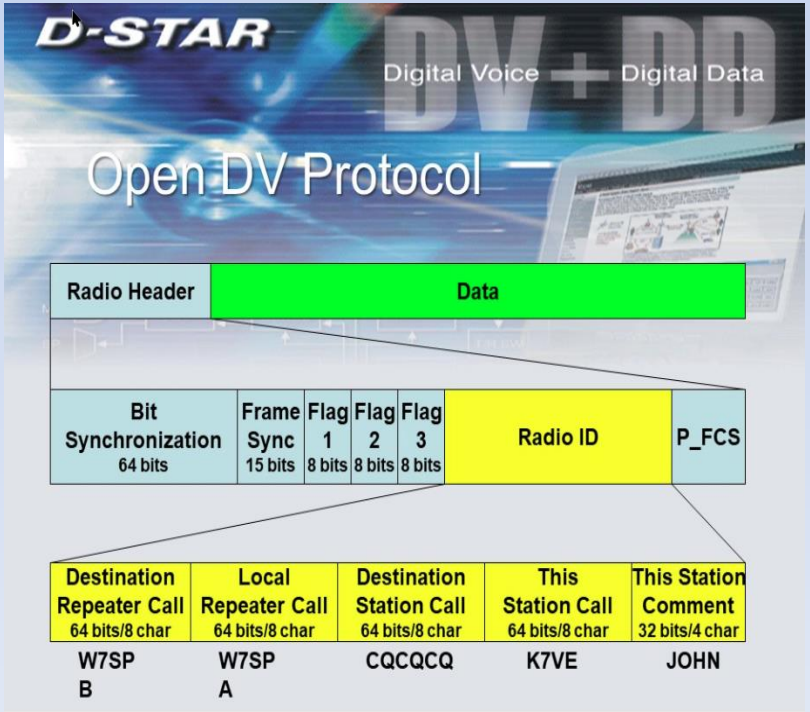
Dstar

C4FM is similar but different

In Dstar you do NOT need to ID, It is embeded

DMR TDMA burst





Voice Samples

(http://www.w2sjw.com/radio_sounds.html)

- **DMR**

  http://www.w2sjw.com/sounds/DMR_Decoded.mp3

- **Dstar and FM**

http://www.w2sjw.com/sounds/Weak%20Signal%20D-STAR.mp3

- **C4FM**

http://www.w2sjw.com/sounds/Yaesu_Fusion_Decoded.mp3

R2D2

Today's DV MEGA with RPi

DV MEGA RASPBERRY PI W/MMDVMHOST

- Modes Supported: DMR / DStar / Fusion (YSF) / P25 (newly added)
- Hardware Required: DVMega (single or dual band) Raspberry PI (2 or 3)
- Software Required: Raspian OS (Pi Linux), MMDVMHost, ircDDB Gateway (DStar), YSFGateway (Fusion)
- All the software can be set to start on boot for standalone headless ops
- Prebuilt images can be loaded to SD card then used in Pi
- Each mode can be enabled or disabled in the MMDVMHost ini file
- External screens supported by MMDVMHost to display info
- VNC can be used to remotely connect to Pi screen over network
- Can connect to any WiFi network or use Ethernet port

Pi-Star Digital Voice Dashboard for KB5NFT

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	Listening YSF
Tx	438.600000 MHz
Rx	438.600000 MHz
FW	ZUMspot:v1.4.16
TCXO	14.7456 MHz

D-Star Repeater	
RPT1	KB5NFT B
RPT2	KB5NFT G
D-Star Network	
APRS	texas.aprs2.net
IRC	rr.openquad.net
Linked to **REF030 C** (DPlus Outgoing)	

DMR Repeater	
DMR ID	3148042
DMR CC	1
TS1	disabled
TS2	enabled
DMR Master	
BM United States ..	

YSF Network
Linked to FCS00334

Gateway Activity

Time (CDT)	Mode	Callsign	Target	Src	Dur(s)	Loss	BER
17:31:56 Sep 4th	YSF	W5TXR	ALL at FCS003-34	Net	0.8	0%	1.2%
17:31:22 Sep 4th	D-Star	W2UIS	CQCQCQ	Net	2.2	0%	0.0%
17:30:15 Sep 4th	D-Star	W9GVW/B	CQCQCQ	Net	0.6	0%	0.0%
17:30:04 Sep 4th	D-Star	KB5NFT/TIME	CQCQCQ	Net	4.3	0%	0.0%
17:29:55 Sep 4th	D-Star	KF0ACS	CQCQCQ	Net	3.4	0%	0.0%
17:28:01 Sep 4th	YSF	FCS	ALL at FCS003-34	Net	1.4	0%	1.3%
17:27:29 Sep 4th	DMR Slot 2	KI5KLX	TG 3148	Net	TX 283+ sec		
17:25:47 Sep 4th	DMR Slot 2	KB5NFT	TG 3148	RF	0.4	0%	0.6%
17:25:26 Sep 4th	DMR Slot 2	KB5NFT	TG 3148	Net	0.5	0%	0.0%
17:16:15 Sep 4th	DMR Slot 2	KB5GLC	TG 3148	Net	5.9	0%	0.1%
17:15:09 Sep 4th	DMR Slot 2	N5MXE	TG 3148	Net	4.1	0%	0.0%
17:07:14 Sep 4th	DMR Slot 2	N5HYH	TG 3148	Net	0.8	0%	0.0%
16:19:10 Sep 4th	DMR Slot 2	KM7WDT	TG 3148	Net	5.0	0%	0.0%
14:58:02 Sep 4th	DMR Slot 2	W5PIX	TG 3148	Net	10.9	1%	0.0%
14:57:49 Sep 4th	DMR Slot 2	KG5PTE	TG 3148	Net	9.1	0%	0.0%
14:50:35 Sep 4th	DMR Slot 2	K0LWY	TG 3148	Net	0.5	0%	0.0%
14:45:36 Sep 4th	DMR Slot 2	KB5CTM	TG 3148	Net	28.2	0%	0.0%
14:30:40 Sep 4th	DMR Slot 2	NB5H	TG 3148	Net	5.2	0%	0.1%
14:11:52 Sep 4th	DMR Slot 2	K5MVZ	TG 3148	Net	18.8	0%	0.0%
14:11:28 Sep 4th	DMR Slot 2	KC5RJL	TG 3148	Net	82.9	0%	0.0%

Local RF Activity

Time (CDT)	Mode	Callsign	Target	Src	Dur(s)	BER	RSSI
17:25:47 Sep 4th	DMR Slot 2	KB5NFT	TG 3148	RF	0.4	0.6%	S9+46dB (-47 dBm)

PiStar

Pi-Star Digital Voice - Configuration

Gateway Hardware Information

Hostname	Kernel	Platform	CPU Load	CPU Temp
pi-star	5.4.51-v7+	Pi 3 Model B+ (1GB) - Sony, UK	1.38 / 0.6 / 0.39	60.7°C / 141.3°F

Control Software

Setting	Value
Controller Software:	○ DStarRepeater ◉ MMDVMHost (DV-Mega Minimum Firmware 3.07 Required)
Controller Mode:	◉ Simplex Node ○ Duplex Repeater (or Half-Duplex on Hotspots)

Apply Changes

MMDVMHost Configuration

Setting	Value				
DMR Mode:	●	RF Hangtime:	20	Net Hangtime:	20
D-Star Mode:	●	RF Hangtime:	20	Net Hangtime:	20
YSF Mode:	●	RF Hangtime:	20	Net Hangtime:	20
P25 Mode:	○	RF Hangtime:	20	Net Hangtime:	20
NXDN Mode:	○	RF Hangtime:	20	Net Hangtime:	20
YSF2DMR:	○				
YSF2NXDN:	○				
YSF2P25:	○				
DMR2YSF:	○	Uses 7 prefix on DMRGateway			
DMR2NXDN:	○	Uses 7 prefix on DMRGateway			
POCSAG:	○	POCSAG Paging Features			
MMDVM Display Type:	Nextion	Port:	/dev/ttyUSB0	Nextion Layout:	ON7LDS L3

Apply Changes

General Configuration

Setting	Value		
Hostname:	pi-star	Do not add suffixes such as .local	
Node Callsign:	KB5NFT		
CCS7/DMR ID:	3148042		
Radio Frequency:	438.600.000	MHz	
Latitude:	32.9806	degrees (positive value for North, negative for South)	
Longitude:	-96.8809	degrees (positive value for East, negative for West)	
Town:	Carrollton, EM12nx		
Country:	USA		
URL:	http://www.qrz.com/db/KB5NFT		◉ Auto ○ Manual
Radio/Modem Type:	ZUMspot - Single Band Raspberry Pi Hat (GPIO)		
Node Type:	○ Private ◉ Public		
APRS Host:	texas.aprs2.net		
System Time Zone:	America/Chicago		
Dashboard Language:	english_us		

DMR Configuration

Setting	Value
DMR Master:	BM_United_States_3102
Hotspot Security:	
BrandMeister Network:	Repeater Information | Edit Repeater (BrandMeister Selfcare)
DMR ESSID:	3148042 None
DMR Color Code:	1
DMR EmbeddedLCOnly:	
DMR DumpTAData:	

Apply Changes

D-Star Configuration

Setting	Value
RPT1 Callsign:	KB5NFT B
RPT2 Callsign:	KB5NFT G
Remote Password:	•••••••••
Default Reflector:	REF030 C — Startup / Manual
ircDDBGateway Language:	English_(US)
Time Announcements:	
Use DPlus for XRF:	Note: Update Required if changed

Apply Changes

Yaesu System Fusion Configuration

Setting	Value
YSF Startup Host:	FCS00334 - TEXAS-NEXUS
UPPERCASE Hostfiles:	Note: Update Required if changed
WiresX Passthrough:	

Apply Changes

Firewall Configuration

Setting	Value
Dashboard Access:	Private / Public
ircDDBGateway Remote:	Private / Public
SSH Access:	Private / Public
Auto AP:	On / Off — Note: Reboot Required if changed
uPNP:	On / Off

Apply Changes

Wireless Configuration

Refresh | Reset WiFi Adapter | Configure WiFi

Wireless Information and Statistics

Interface Information

```
Interface Name : wlan0
Interface Status : Interface is up
IP Address : 192.168.29.220
Subnet Mask : 255.255.255.0
Mac Address : b8:27:eb:f3:53:bc
```

Interface Statistics

```
Received Packets : 10383721
Received Bytes : 1246880967 (1.1 GiB)
Transferred Packets : 302
Transferred Bytes : 44237 (43.2 KiB)
```

Wireless Information

```
Connected To : CellSpot_5GHz_D6E8
AP Mac Address : 78:24:af:d6:d6:ec
Bitrate : 351.0 MBit/s
Signal Level : -20 dBm
Transmit Power : 31 dBm
Link Quality : 100 %
Channel Info : 5.0GHz Ch149 (5.745 GHz)
WiFi Country : US
```

Information provided by ifconfig and iwconfig

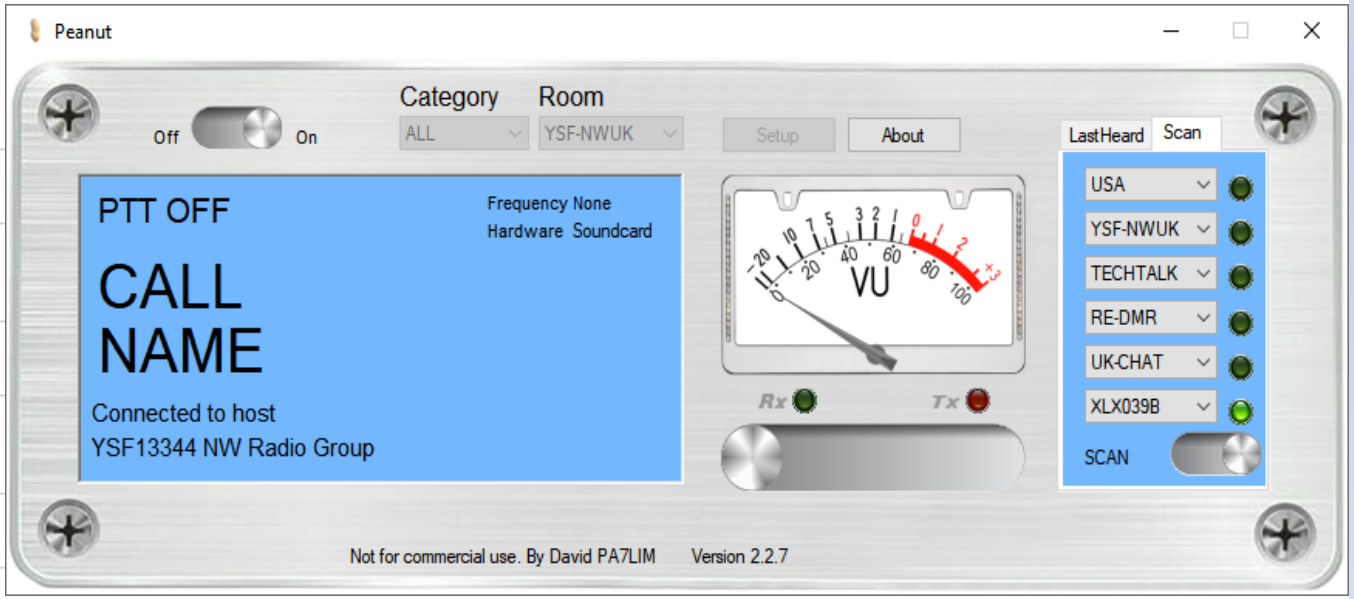
OpenSpot by SharkRF

Hardware transcoding for the best voice quality

Peanut (RadioLess)

Peanut user registration

Your request can take 24 hours maximum! Do not make multiple requests!!
If you do not received a code within 24 hours, sent an email to peanut@pa7lim.nl
Peanut is only for licensed radio amateurs!



Name:

John Doe

Email:

john@gmail.com

HAM CALL:

PA7LIM

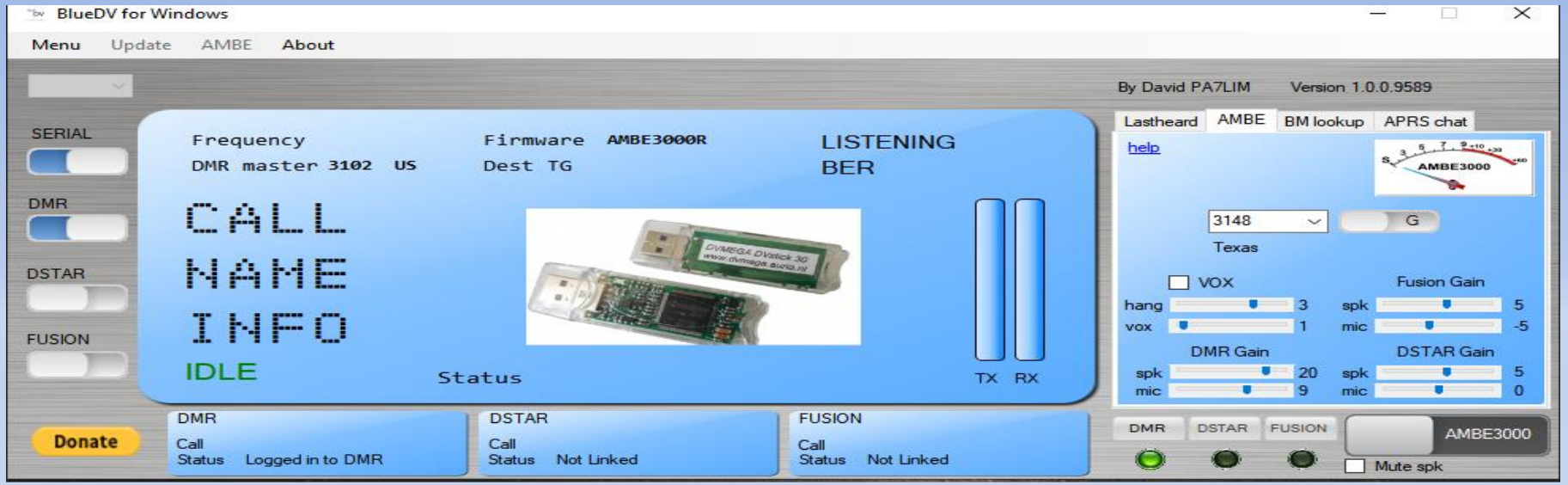
Upload copy license (JPG, JPEG, PNG & GIF):

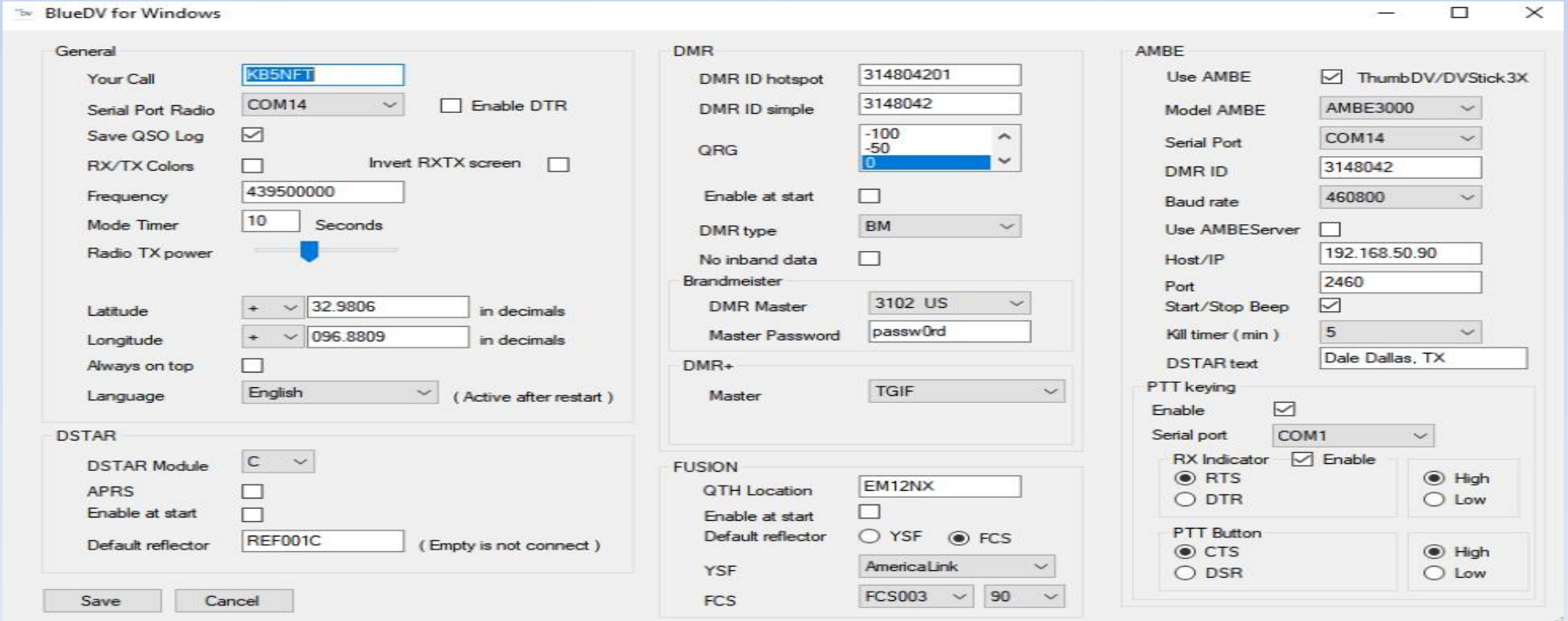
Choose File No file chosen

Submit

Do you have a problem with registration (due spam) : peanut@pa7lim.nl

BLUEDV


BlueDV for Windows
Menu
Update
AMBE
About
By David PA7LIM
Version 1.0.0.9589
SERIAL
DMR
DSTAR
FUSION
Frequency
DMR master 3102 US
Firmware AMBE3000R
Dest TG
LISTENING
BER
CALL
NAME
INFO
IDLE
Status
TX
RX
Lastheard
AMBE
BM lookup
APRS chat
help
AMBE3000
3148
G
Texas
VOX
hang 3
vox 1
Fusion Gain
spk 5
mic -5
DMR Gain
spk 20
mic 9
DSTAR Gain
spk 5
mic 0
Donate
DMR
Call
Status Logged in to DMR
DSTAR
Call
Status Not Linked
FUSION
Call
Status Not Linked
DMR
DSTAR
FUSION
AMBE3000
Mute spk


BlueDV for Windows
General
Your Call KB5NFT
Serial Port Radio COM14
Enable DTR
Save QSO Log
RX/TX Colors
Invert RXTX screen
Frequency 439500000
Mode Timer 10 Seconds
Radio TX power
Latitude + 32.9806 in decimals
Longitude + 096.8809 in decimals
Always on top
Language English (Active after restart)
DSTAR
DSTAR Module C
APRS
Enable at start
Default reflector REF001C (Empty is not connect)
Save
Cancel
DMR
DMR ID hotspot 314804201
DMR ID simple 3148042
QRG -100 -50 0
Enable at start
DMR type BM
No inband data
Brandmeister
DMR Master 3102 US
Master Password passw0rd
DMR+
Master TGIF
FUSION
QTH Location EM12NX
Enable at start
Default reflector YSF FCS
YSF AmericaLink
FCS FCS003 90
AMBE
Use AMBE ThumbDV/DVStick3X
Model AMBE AMBE3000
Serial Port COM14
DMR ID 3148042
Baud rate 460800
Use AMBEServer
Host/IP 192.168.50.90
Port 2460
Start/Stop Beep
Kill timer (min) 5
DSTAR text Dale Dallas, TX
PTT keying
Enable
Serial port COM1
RX Indicator Enable
RTS
DTR
High
Low
PTT Button
CTS
DSR
High
Low

Guus van Dooren

PE1PLM

DVMEGA

the Swiss army knife for Digital Voice

Under development

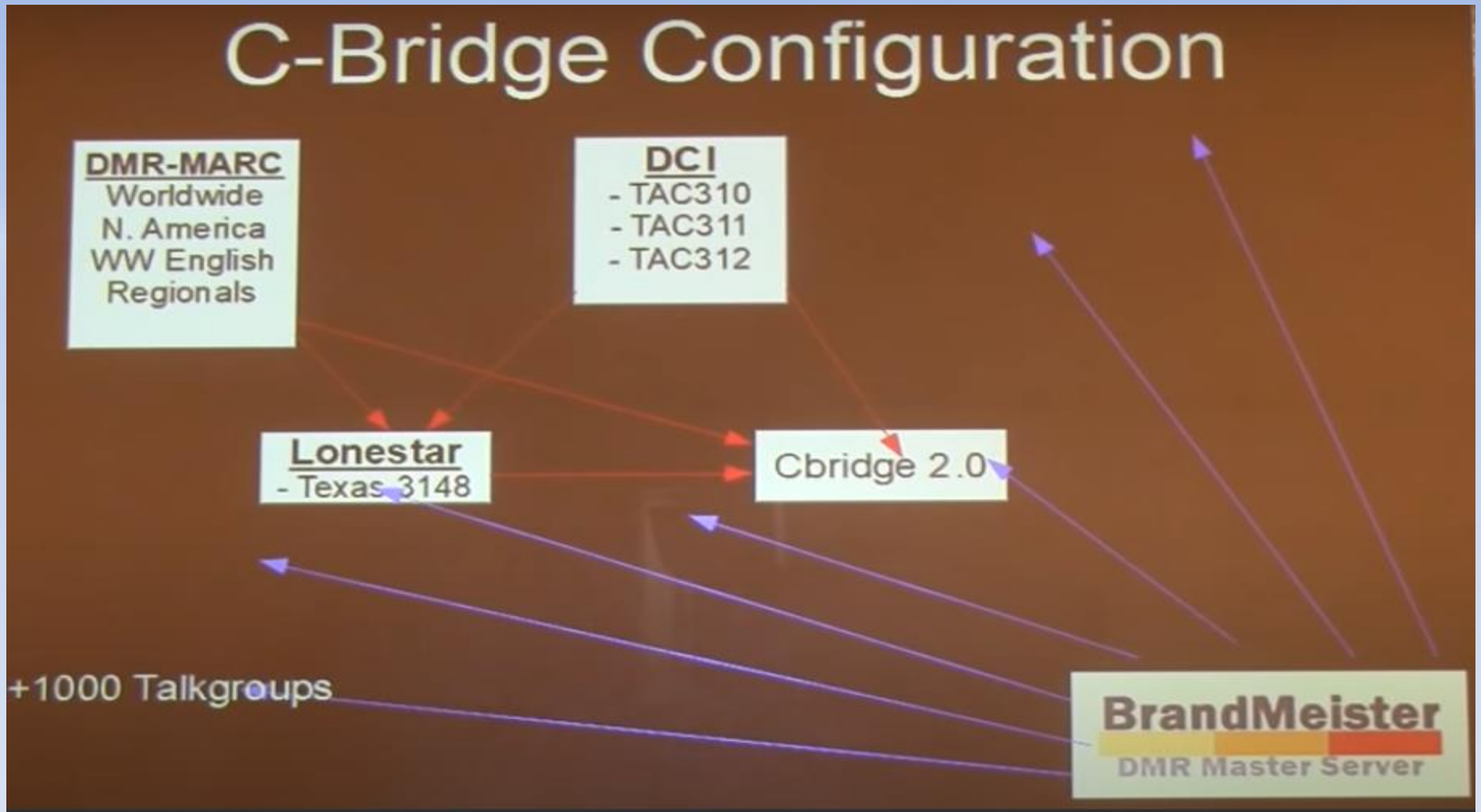
- DVMEGA Dongle, use D-Star, DMR and Fusion digital networks with only a AMBE3000 and host integrated mice and speaker.

- DVMEGA Cast, direct connect to D-Star, DMR or Fusion digital networks using standard mice and speaker.

- DVMEGA Handy, handheld WIFI device with integrated host to connect D-Star, DMR or Fusion networks direct.

-DVMEGA Host, stand-alone DV host based on ESP32

DMR Networks



https://www.youtube.com/watch?v=6VRmdyfMfz0&t=3s

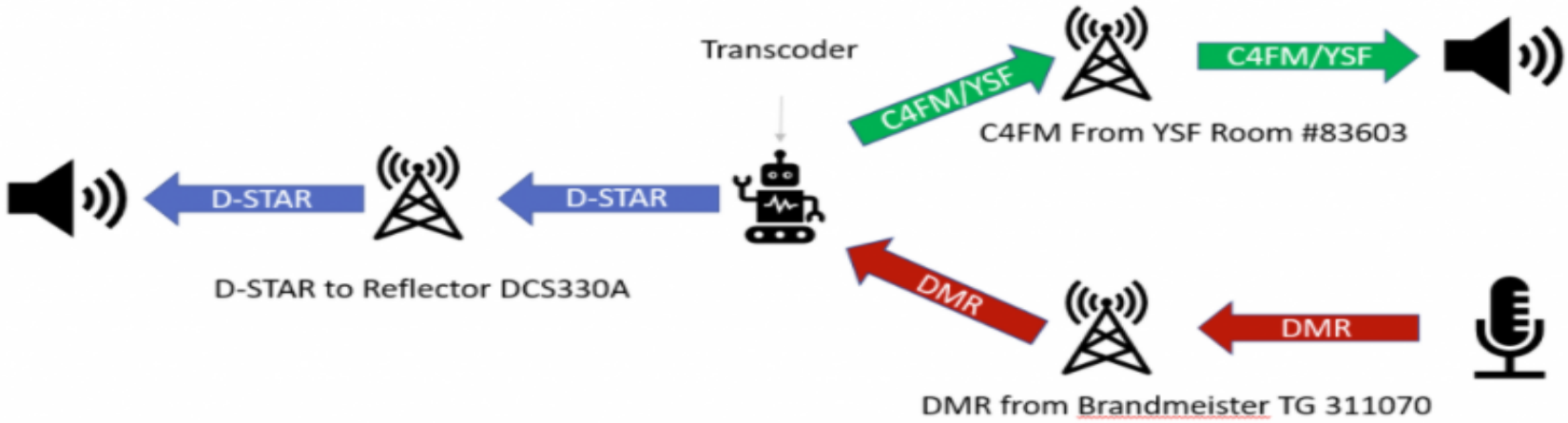
Google Chrome 84.0.4147.105

9:08:09 PM 8/10/2020

Windows 10 Enterprise 64-bit Build 18363

DMR Network Systems
As per DMRTexas.net

- CBridge 2.0 – Corsicana, Dallas, Denton, Farmersville, Grandbury, Haslet, Hillsboro, Howe, Lewisville, Richland Hills, Richardson, Weatherford
- Brandmeister – Dallas, Garland, Haslet, McKinney,
- Lonestar – Anna, Aubrey, Carrollton, Dallas, Grapevine, Rosston
- DilloDMR – Arlington, Dallas, Ft. Worth, Palo Pinto, Springtown (Quasi closed system)
- K4USD - Fairview
- ChicagoLand - Hurst



Enter the XLX Multiprotocol Reflector

XLXD has a complete transcoding implementation that can deal with both the data signalling and audio of D-STAR, YSF, and DMR. D-STAR reflectors are the most mature system in amateur radio and the technologies are stable and well-established. XLXD added on the WIRES-X protocol functions for YSF, which can be used both as a full-fledged WIRES-X room server or as a "YSF Gateway". Finally XLXD has added interoperability for DMR, being able to map its modules to DMR IDs on a DMR C-Bridge (e.g. Brandmeister, DMR-MARC, etc.).

A complete transcoding reflector will support D-STAR modules, YSF Rooms (i.e. YSF gateway-type rooms, not WIRES-X nodes), and DMR talkgroups that can all talk to each other.

XLX330 – The Megalink Reflector

Local to the greater-Akron area, XLX330 is offered as a tri-mode multiprotocol reflector. For more information:

XLX330 Dashabord

The Megalink Reflector

Using Reflector XLX330

Advanced Topic

Dashboards

- https://www.radioid.net/map#!
- https://brandmeister.network/
- http://tgif.network/
- http://qrm.kc3ol.net/
- https://nj6n.com/dplusmon/
- http://dstarinfo.com/
- https://dstarusers.org/
- http://peanut.pa7lim.nl/
- http://155.138.244.37/ipsc/index.html
- http://hb.superfreqdigital.com:8080/


AM
CW
FM
SSB
PACKET
APRS
Ham Radio
EME
Radiating Fun
RTTY
PSK
QRP
D-STAR
C4FM
SSTV
DMR
ATV
SATS
FT8

End of Part 1

- Questions
- Comments
- Suggestions
- Demo’s