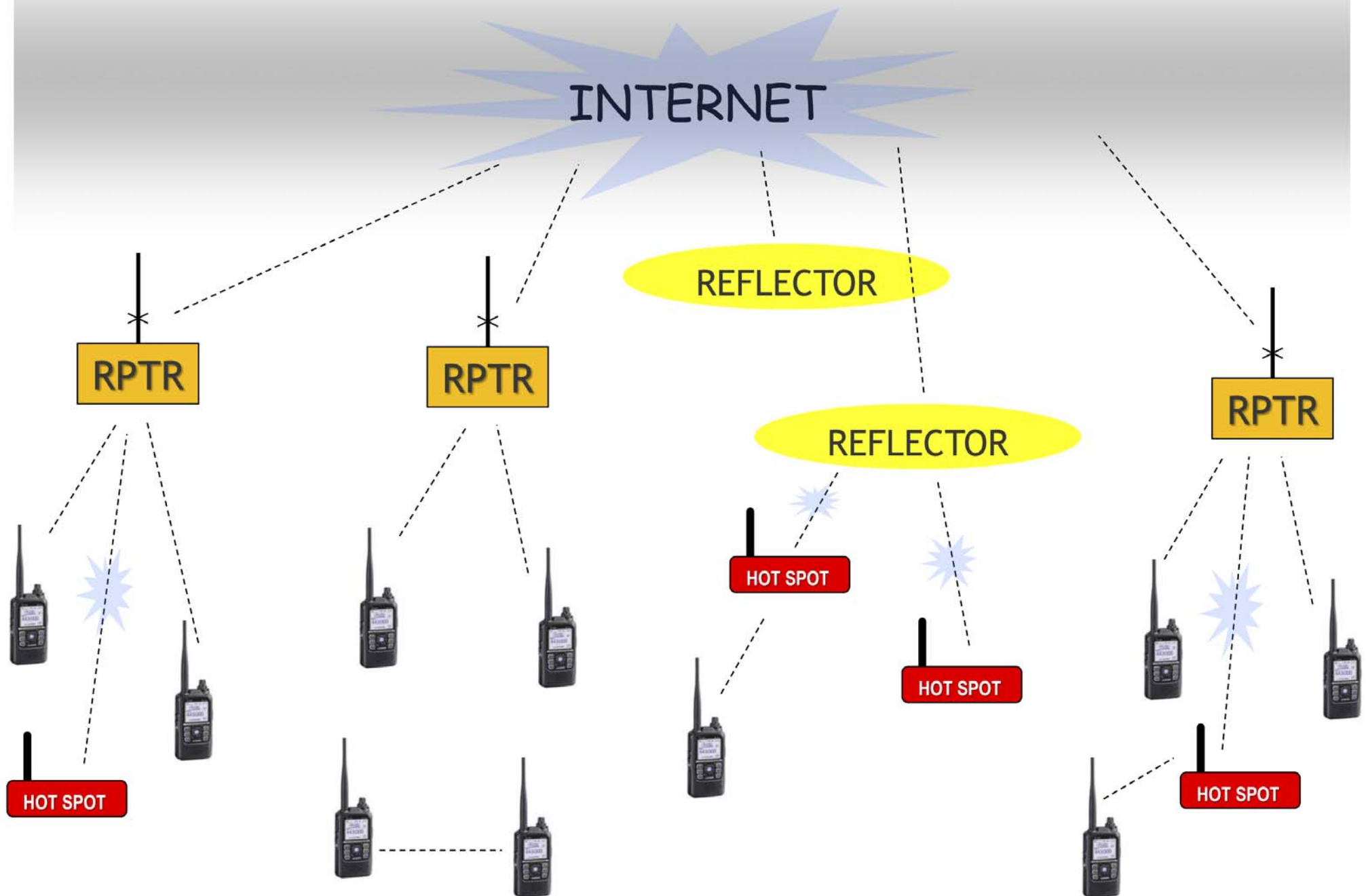


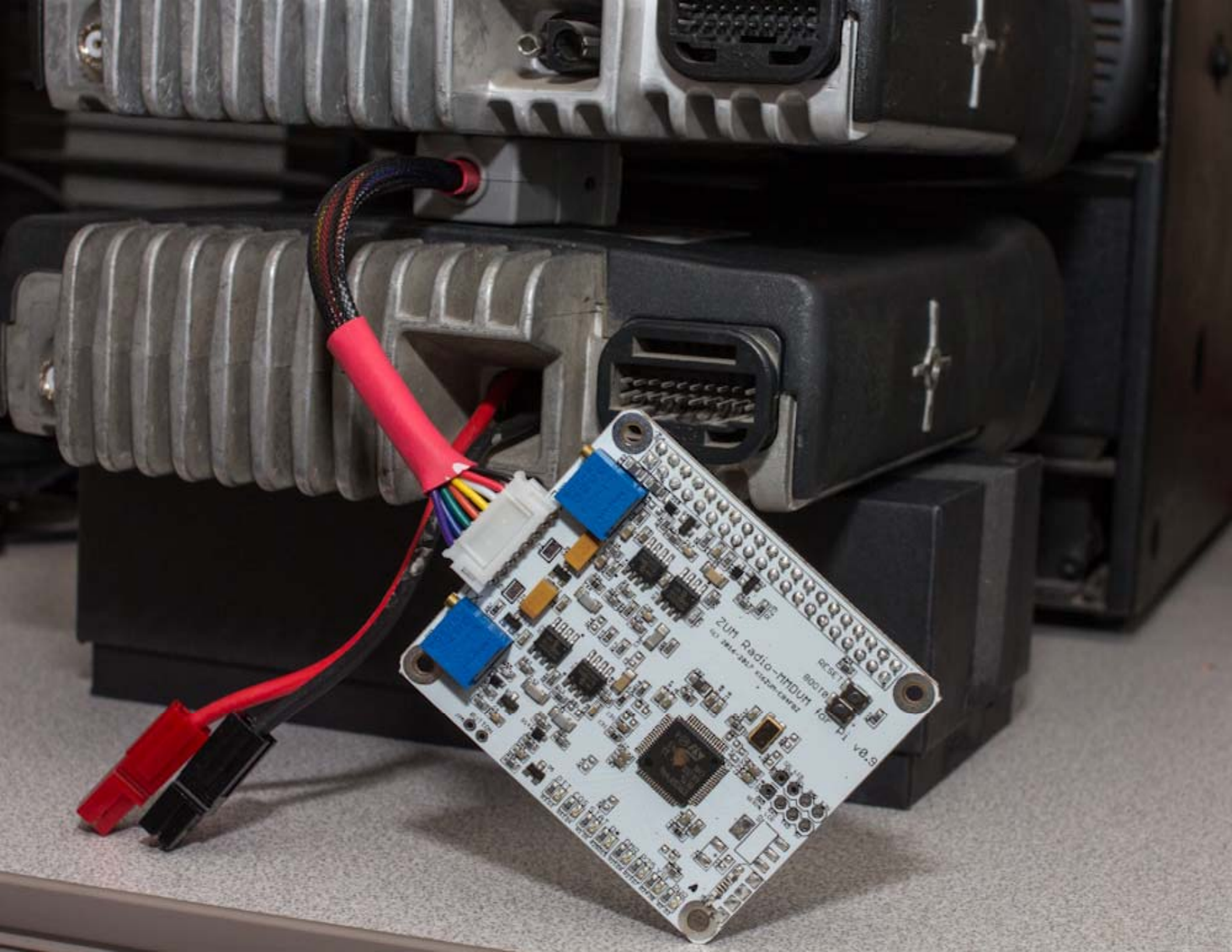
MMDV

MULTIMODE DIGITAL VOICE MODEM

D-STAR Network







PiStar.UK - Pi-Star Digital Voice Software

[Home](#)[Information](#)[Help](#)[Pi-Star Tools](#)[BrandMeister Tools](#)[DMR+ Tools](#)[D-Star Tools](#)[YSF/FCS Tools](#)[P25 Tools](#)[NXDN Tools](#)[Downloads](#)[Credits](#)[Links](#)

Home

Pi-Star is a software image built initially for the Raspberry Pi (produced by the Raspberry Pi Foundation). The design concept is simple, provide the complex services and configuration for Digital Voice on Amateur radio in a way that makes it easily accessible to anyone just starting out, but make it configurable enough to be interesting for those of us who cant help but tinker.

Pi-Star would not be here today, were it not for the software made by Jonathan Naylor (**G4KLX**), we started with his DStarRepeater and ircDDBGateway and now support the full G4KLX MMDVM suite, including the extra cross-mode gateways added on by Andy (**CA6JAU**), I cannot thank these guys for the vast amount of time and effort that they continue to put into their projects.

Pi-Star can be what ever you want it to be, from a simple single mode hotspot running simplex providing you with access to the increasing number of Digital Voice networks, up to a public duplex multimode repeater!

The world is at your fingertips, and the choices are yours!

If you like to get your hands dirty, delve beneath the simple to use web based dashboard, Pi-Star provides some unique tools to make administration easy, but we also encourage those who want to understand what the system is and how it works to be as involved as they want to be!

Most importantly, have fun using Pi-Star!

W-Star 3.5.10 / Dashboard 205 PGM

Pi-Star Digital Voice Dashboard for MW0MWZ

Dashboard | Admin | Config

Modes Enabled

D-Star DMR

YSF P25

Network Status

D-Star Net DMR Net

YSF Net P25 Net

Internet

Active Starnet Groups

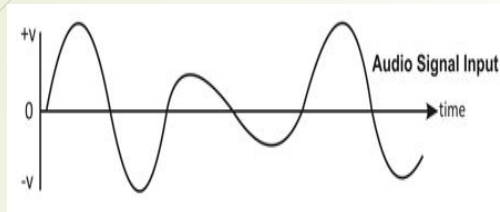
CallSign	LogOff	Info	UTOT	GTOT
PISTAR B	PISTAR U	Pi-Star User Group on D-Star	30	30
GN6GM B	GN6GM U	Blackwood Club Members Group	30	30

Last 20 calls heard via this Gateway

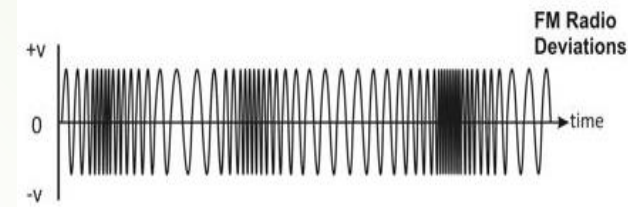
Time (BST)	Mode	CallSign	Target	Src	Dur(s)	Loss	BER
2017-05-30 16:30:19	D-Star	MW0MWZ DAVE	CQCQCQ via REF001 C	Net	0.8	0%	0.2%

Analog FM

MIC

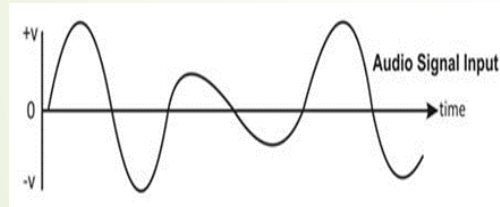


Modulator



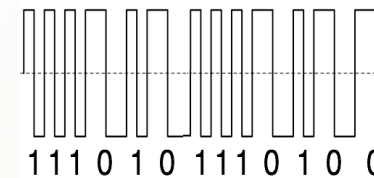
Digital Voice

MIC



Vocoder

AMBE by Digital
Voice Systems, Inc.



Modulator

D-STAR – GMSK
DMR – 4FSK
Fusion – C4FM
P25 – C4FM

Major DV Mode Spec Differences

	Vocoder	Channels	Bandwidth	Multiplex	Modulation
P25 – Phase 1*	IMBE	1	12.5 kHz	FDM	C4FM
D-STAR	AMBE+	1	6.25 kHz	FDM	GMSK
DMR	AMBE+2	2	12.5 kHz	TDM	4FSK
NXDN	AMBE+2	1	6.25/12.5 kHz	FDM	C4FM
System Fusion	AMBE+2	1	12.5 kHz	FDM	C4FM
Free DV (HF)	Codec 2	1	1.25 kHz	FDM	QPSK

*P25 phase 2 is excluded because it is still under development

Pi-Star Digital Voice Dashboard for KJ600V

[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	Listening D-Star
Tx	438.800000 MHz
Rx	438.800000 MHz
FW	MMDVM:20190130
TCXO	12.0000 MHz

D-Star Repeater	
RPT1	KJ600V B
RPT2	KJ600V G
D-Star Network	
APRS	sjc.aprs2.net
IRC	rr.openquad.net
Linked to XRF303 D (DPlus Outgoing)	

Gateway Activity

Time (PDT)	Mode	Callsign	Target	Src	Dur(s)	Loss	BER
18:55:38 Apr 19th	D-Star	N1DZS/DMR	CQCQCQ via XRF303 D	Net	29.6	0%	0.0%
18:54:08 Apr 19th	D-Star	KE0FH5/DMR	CQCQCQ via XRF303 D	Net	12.6	0%	0.0%
18:54:00 Apr 19th	D-Star	KJ600V P/FRED	CQCQCQ	RF	8.0	0%	0.0%
18:48:42 Apr 19th	D-Star	KI6UJH/D74	CQCQCQ	Net	16.8	1%	0.0%
18:35:50 Apr 19th	D-Star	VK4DA/BOB	CQCQCQ	Net	0.8	0%	0.0%
18:18:04 Apr 19th	D-Star	K9MIT/DNGL	CQCQCQ	Net	7.5	0%	0.0%
17:50:01 Apr 19th	D-Star	KI7SBU/880H	CQCQCQ	Net	5.7	0%	0.0%
16:56:58 Apr 19th	D-Star	KJ7FPM	CQCQCQ	Net	5.7	0%	4.7%
15:53:36 Apr 19th	D-Star	KE6YGM/ID51	CQCQCQ	Net	7.1	0%	0.0%
15:45:52 Apr 19th	D-Star	KJ600V/INFO	CQCQCQ	Net	6.9	0%	0.0%
15:45:17 Apr 19th	D-Star	KJ600V/ECHO	CQCQCQ	Net	9.1	0%	0.0%
14:19:20 Apr 19th	D-Star	AA6KA/ID51	CQCQCQ via REF014 C	Net	0.9	0%	0.0%
14:15:52 Apr 19th	D-Star	N6XN/NAPA	CQCQCQ via REF014 C	Net	5.6	0%	0.0%
14:15:23 Apr 19th	D-Star	KI6SZE/4100	CQCQCQ via REF014 C	Net	25.4	0%	0.0%
13:52:40 Apr 19th	D-Star	N6PTS/D74	CQCQCQ via REF014 C	Net	0.1	0%	0.0%
13:38:44 Apr 19th	D-Star	WA6EKS	CQCQCQ via REF014 C	Net	1.5	0%	0.0%
12:20:22 Apr 19th	D-Star	N07E/9100	CQCQCQ via REF014 C	Net	2.5	0%	0.0%

Local RF Activity

Time (PDT)	Mode	Callsign	Target	Src	Dur(s)	BER	RSSI
18:54:00 Apr 19th	D-Star	KJ600V P/FRED	CQCQCQ	RF	8.0	0.0%	

Pi-Star Digital Voice - Configuration

[Dashboard](#) | [Admin](#) | [Expert](#) | [Power](#) | [Update](#) | [Backup/Restore](#) | [Factory Reset](#)

Gateway Hardware Information

Hostname	Kernel	Platform	CPU Load	CPU Temp
pi-star	4.9.35-v7+	Pi 3 Model B (1GB) - Embest, CH	0.16 / 0.27 / 0.14	47.8°C / 118°F

Control Software

Setting	Value
Controller Software:	<input type="radio"/> DStarRepeater <input checked="" type="radio"/> MMDVMHost (DV-Mega Minimum Firmware 3.07 Required)
Controller Mode:	<input checked="" type="radio"/> Simplex Mode <input type="radio"/> Duplex Repeater (or Half-Duplex on Hotspots)

[Apply Changes](#)

MMDVMHost Configuration

Setting	Value
DMR Mode:	<input type="checkbox"/> RF Hangtime: 20 Net Hangtime: 20
D-Star Mode:	<input checked="" type="checkbox"/> RF Hangtime: 20 Net Hangtime: 20
YSF Mode:	<input type="checkbox"/> RF Hangtime: 20 Net Hangtime: 20
P25 Mode:	<input type="checkbox"/> RF Hangtime: 20 Net Hangtime: 20
NXDN Mode:	<input type="checkbox"/> RF Hangtime: 20 Net Hangtime: 20
YSF2DMR:	<input type="checkbox"/>
YSF2NXDN:	<input type="checkbox"/>
YSF2P25:	<input type="checkbox"/>
DMR2YSF:	<input type="checkbox"/> Uses 7 prefix on DMRGateway
DMR2NXDN:	<input type="checkbox"/> Uses 7 prefix on DMRGateway
POCSAG:	<input type="checkbox"/> POCSAG Paging Features
MMDVM Display Type:	None ▼ Port: /dev/ttyAMA0 ▼ Nextion Layout: G4KLX ▼

[Apply Changes](#)

General Configuration

Setting	Value
Hostname:	pi-star Do not add suffixes such as .local
Node Callsign:	KJ6OOV
Radio Frequency:	438.800.000 MHz
Latitude:	37.0621 degrees (positive value for North, negative for South)
Longitude:	-122.0101 degrees (positive value for East, negative for West)
Town:	Scotts Valley

Gateway Hardware Information

Hostname	Kernel	Platform		CPU Load	CPU Temp
pi-star	4.9.35-v7+	Pi 3 Model B (1GB) - Embest, CH		0.38 / 0.35 / 0.15	47.8°C / 118°F
Service Status					
MMDVMHost	DMRGateway	YSFGateway	YSFParrot	P25Gateway	P25Parrot
DStarRepeater	ircDDBGateway	TimeServer	PiStar-Watchdog	PiStar-Remote	PiStar-Keeper

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 D-Star
Tx	438.800000 MHz
Rx	438.800000 MHz
FW	MMDVM:20190130
TCX0	12.0000 MHz

D-Star Repeater	
RPT1	KJ6OOV B
RPT2	KJ6OOV G
D-Star Network	
APRS	sjc.aprs2.net
IRC	rr.openquad.net
Linked to XRF303 D (DPlus Outgoing)	

D-Star Link Information

Radio	Default	Auto	Timer	Link	Linked to	Mode	Direction	Last Change (PDT)
KJ6OOV B	REF014 C	Auto	Never	Up	XRF303 D	DPlus	Outgoing	18:54:08 Apr 19th

D-Star Link Manager

Radio Module	Reflector	Link / Un-Link	Action
KJ6OOV B ▾	REF014 ▾ C ▾	<input checked="" type="radio"/> Link <input type="radio"/> UnLink	Request Change

Gateway Activity

Time (PDT)	Mode	Callsign	Target	Src	Dur(s)	Loss	BER
19:00:04 Apr 19th	D-Star	WD0HDR/DMR	CQCQCQ via XRF303 D	Net	TX		
18:59:32 Apr 19th	D-Star	N1DZS/DMR	CQCQCQ via XRF303 D	Net	28.1	0%	0.0%
18:59:14 Apr 19th	D-Star	AC2F/DMR	CQCQCQ via XRF303 D	Net	1.5	0%	0.0%
18:59:04 Apr 19th	D-Star	KD8IE/7100	CQCQCQ via XRF303 D	Net	0.8	0%	0.0%
18:58:04 Apr 19th	D-Star	N7DEN/DMR	CQCQCQ via XRF303 D	Net	1.4	0%	0.0%
18:54:08 Apr 19th	D-Star	KE0FHS/DMR	CQCQCQ via XRF303 D	Net	12.6	0%	0.0%
18:54:00 Apr 19th	D-Star	KJ6OOV P/FRED	CQCQCQ	RF	8.0	0%	0.0%
18:48:42 Apr 19th	D-Star	KI6UJH/D74	CQCQCQ	Net	16.8	1%	0.0%
18:35:50 Apr 19th	D-Star	VK4DA/BOB	CQCQCQ	Net	0.8	0%	0.0%
18:18:04 Apr 19th	D-Star	K9MIT/DNGL	CQCQCQ	Net	7.5	0%	0.0%
17:50:01 Apr 19th	D-Star	KI7SBU/880H	CQCQCQ	Net	5.7	0%	0.0%
16:56:58 Apr 19th	D-Star	KJ7FPM	CQCQCQ	Net	5.7	0%	4.7%
15:53:36 Apr 19th	D-Star	KE6YGM/ID51	CQCQCQ	Net	7.1	0%	0.0%
15:45:52 Apr 19th	D-Star	KJ6OOV/INFO	CQCQCQ	Net	6.9	0%	0.0%
15:45:17 Apr 19th	D-Star	KJ6OOV/ECHO	CQCQCQ	Net	9.1	0%	0.0%
14:19:20 Apr 19th	D-Star	AA6KA/ID51	CQCQCQ via REF014 C	Net	0.9	0%	0.0%
14:15:52 Apr 19th	D-Star	N6XN/NAPA	CQCQCQ via REF014 C	Net	5.6	0%	0.0%
14:15:23 Apr 19th	D-Star	KI6SZE/4100	CQCQCQ via REF014 C	Net	25.4	0%	0.0%
13:52:40 Apr 19th	D-Star	N6PTS/D74	CQCQCQ via REF014 C	Net	0.1	0%	0.0%
13:38:44 Apr 19th	D-Star	WA6EKS	CQCQCQ via REF014 C	Net	1.5	0%	0.0%

Local RF Activity

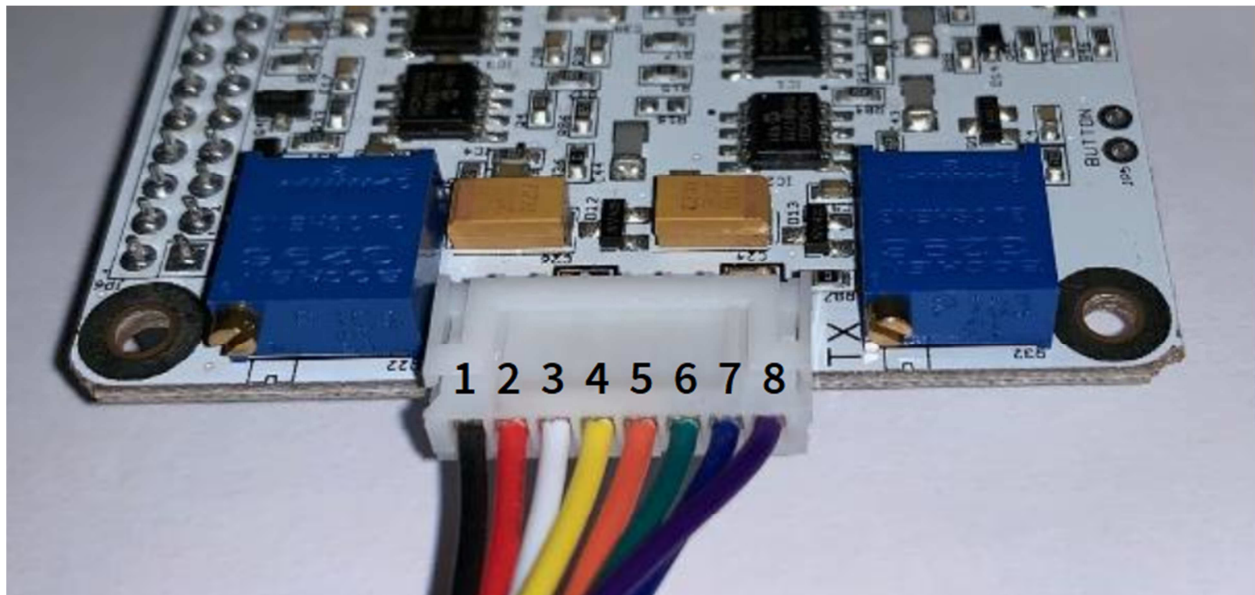
Time (PDT)	Mode	Callsign	Target	Src	Dur(s)	BER	RSSI
18:54:00 Apr 19th	D-Star	KJ6OOV P/FRED	CQCQCQ	RF	8.0	0.0%	

MMDVM-Pi rev. 0.9 board

- Designed for repeater and high power hotspot applications – connects to user supplied Raspberry Pi board
- Utilizes a high performance 32bit ARM processor running at 180Mhz (Room for future upgrades)
- Fourth generation analogue filter design that provides an extremely low BER compared to previous generations
- 2 Multi-turn pots for fine RX and TX adjustments
- Onboard LEDs to show status and modes (PTT, COS, Power, D-Star, DMR, P25, Fusion)
- Connection for Nextion LCD screen
- 8 pin JST Connector with pigtail wires
- Open source MMDVM firmware preloaded and easily upgraded by software

Wiring connections

Here is a picture of the 8 pin header with cable showing wire colors:



Here is a table of the pin numbers, names and wire colors:

Pin number	Signal name	Description	Wire color
1	CTRL	Control (output)	Black
2	COS/STAT1	Carrier sense (input)	Red
3	RX audio	Receive audio from radio (input)	White
4	Ground	Signal ground	Yellow
5	Ground	Signal ground	Orange
6	TX audio	Transmit audio to radio (output)	Green
7	PTT	Push to talk (enable transmit) (input)	Blue
8	RSSI	Received signal strength indicator (input)	Purple