Ham Radio Hotspots

A Brief Introduction

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What is a Node/Hotspot?

Pi-Star ZumSpot

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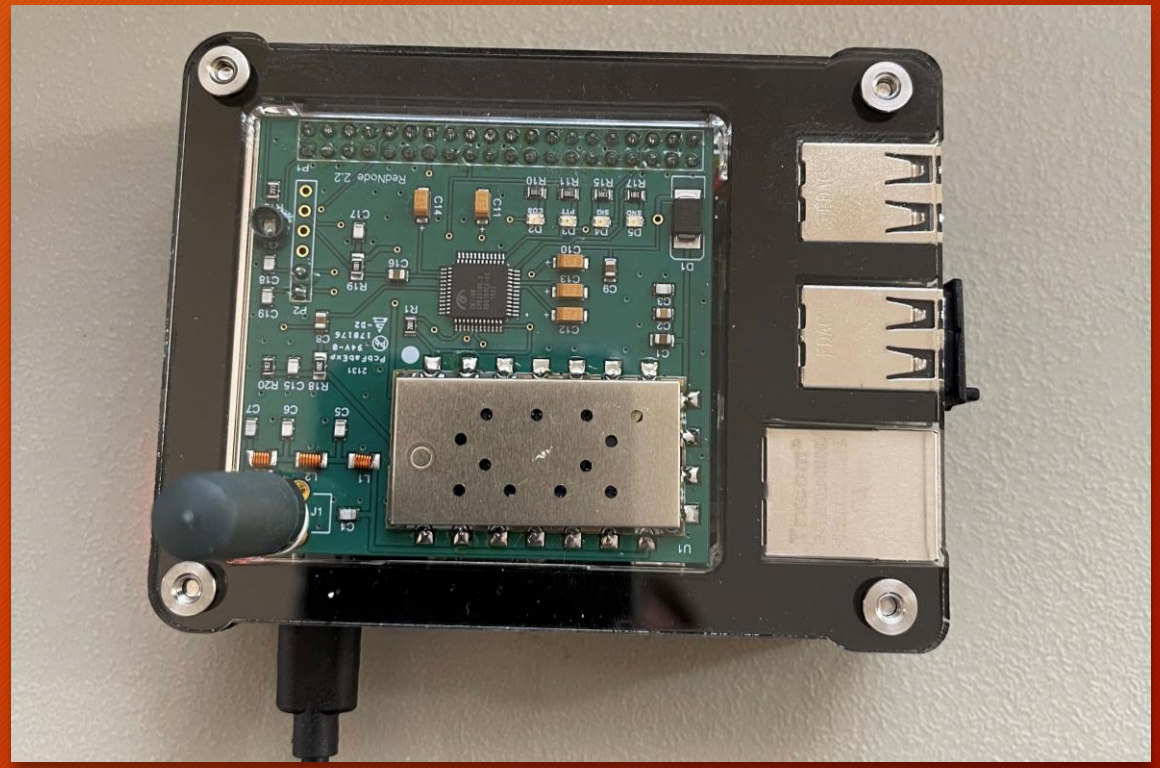
Node-Ventures ClearNode



What is a Node/Hotspot?

- The terms “Node” or “Hotspot are both used to describe a personal, low-power combination of hardware, firmware and software that enables an amateur radio operator to link directly via the Internet to digital voice systems around the world.
- Many of these are developed using a small single board computer know as a “Raspberry Pi”.
- A low power radio transceiver board (usually UHF) is also part of this system.

What is VOIP?

- VOIP is an acronym for “Voice over internet protocol”. What this means is you take an analog voice signal and convert it to digital packet format, send it over the Internet to another device that changes the digital packets back into analog voice.
- **Why bother with all this?**
- HotSpots all use VOIP. Using a Hotspot allows you to talk to people all over the world using just a HT.

Will every Hotspot work with all digital modes?

- There are many digital modes used in Amateur Radio. No Hotspot supports them all. It's important to pick one that has the digital modes that you want.
- Examples of digital modes supported by hotspots: IRLP, Echolink, Allstar, DMR, YSF, D-star, P25 and others.

Are Hotspots hard to configure?

- The short answer is they can be. It depends on which you are using and what digital mode you use. Some, such as the Zumspot use a web interface. The ClearNode uses a smartphone app. They all run on a computer operating system known as “Linux” and if you are an expert you can make configuration changes directly using that. **For most people the web or smartphone interface is the easiest and best way to go.**

Pi-Star Digital Voice - Configuration

Gateway Hardware Information

Hostname	Kernel	Platform	CPU Load	CPU Temp
pi-star	4.19.97+	Pi Zero W Rev 1.1 (512MB)	2 / 1.26 / 0.61	44.4°C / 111.9°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: modem	Nextion Layout: ON7LDS L3	

Apply Changes

General Configuration

Setting	Value	
Hostname:	pi-star	Do not add suffixes such as .local
Node Callsign:	N6DLC	
CCS7/DMR ID:	1234567	
Radio Frequency:	439.025.000	MHz
Latitude:	34.11	degrees (positive value for North, negative for South)
Longitude:	-117.85	degrees (positive value for East, negative for West)
Town:	Fort Mohave, AZ DM25qa	
Country:	U.S.A.	
URL:	https://www.qrz.com/db/N6DLC	◉ Auto ○ Manual
Radio/Modem Type:	DV-Mega Raspberry Pi Hat (GPIO) - Single Band (70cm)	
Node Type:	◉ Private ○ Public	
APRS Host Enable:	○	
APRS Host:	noam.aprs2.net	
System Time Zone:	America/Anchorage	
Dashboard Language:	english_us	

Apply Changes

Yaesu System Fusion Configuration

Setting	Value	
YSF Startup Host:	FCS00390 - America-Link	
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	

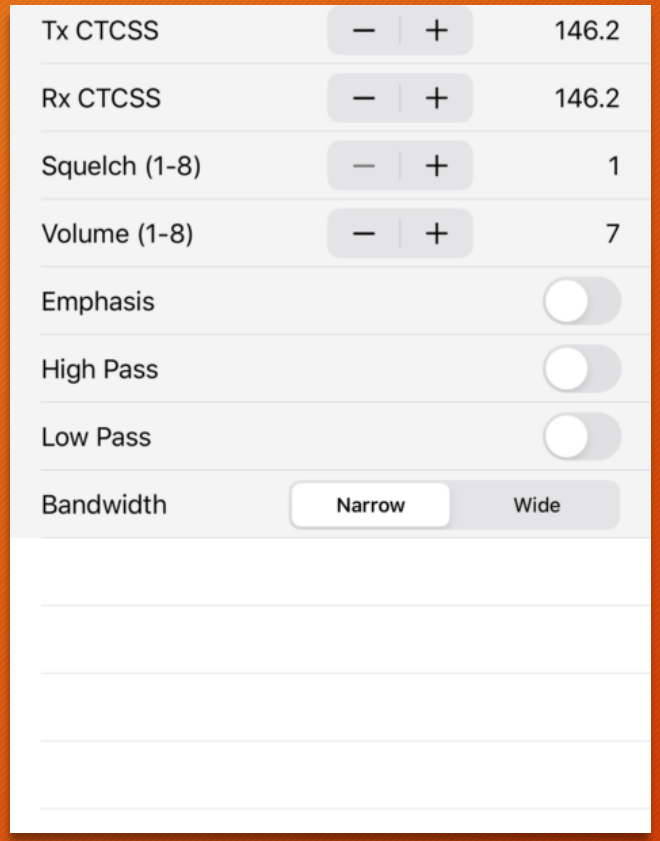
Apply Changes

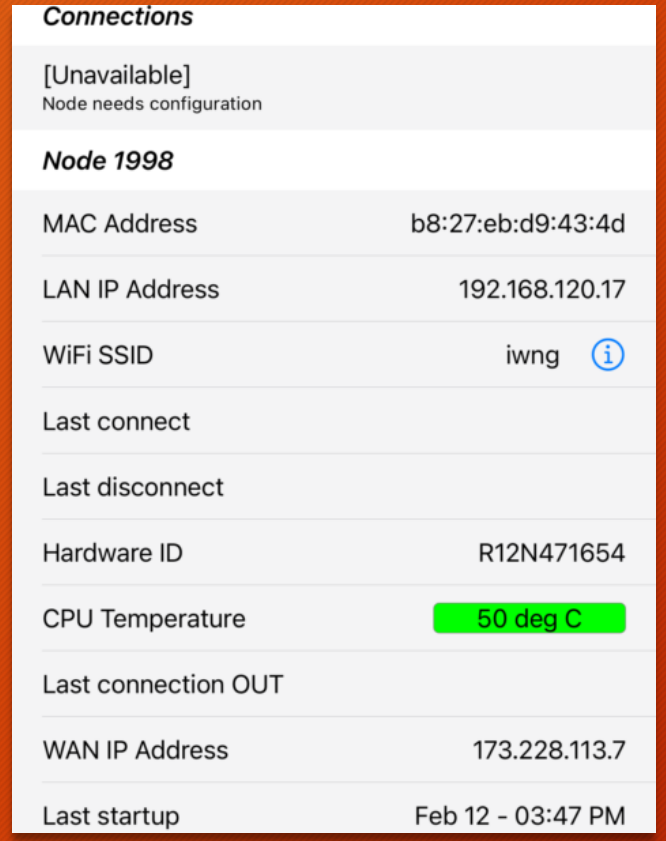
Wireless Configuration

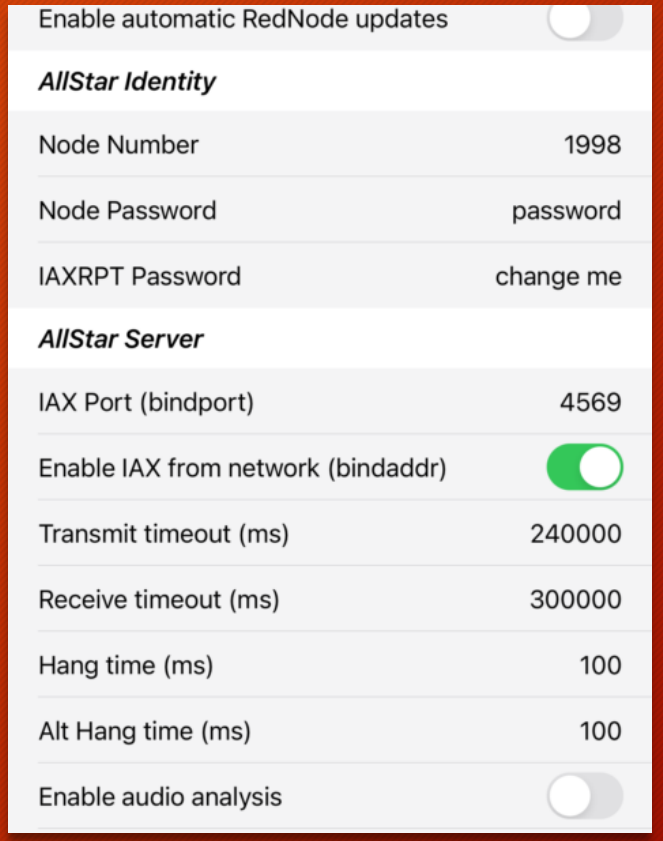
Refresh | Reset WiFi Adapter | Configure WiFi

Wireless Information and Statistics

ClearNode SmartPhone Setup







Nano-Node IRLP/Echo Control Panel

Can you control a Hotspot from your radio?

- Yes, all of these Hotspots have some way to connect and disconnect as well as a few other things via DTMF codes sent from your radio.
- For example *3<node-number> will connect an Allstar node, *81 will play a system status message
- These codes can be changed by the owner if needed

Reflectors – what are they?

- Reflectors are computers somewhere on the Internet where multiple Hotspots or repeaters can connect to have a group linked up.
- There are many well known commonly used reflectors such as “America-Link” where you will hear people from all over the world.
- Being able to connect to these radio “chat-rooms” can be fun.

How much does all this cost?

The ZumSpot sells for $250 at Ham Radio Outlet.

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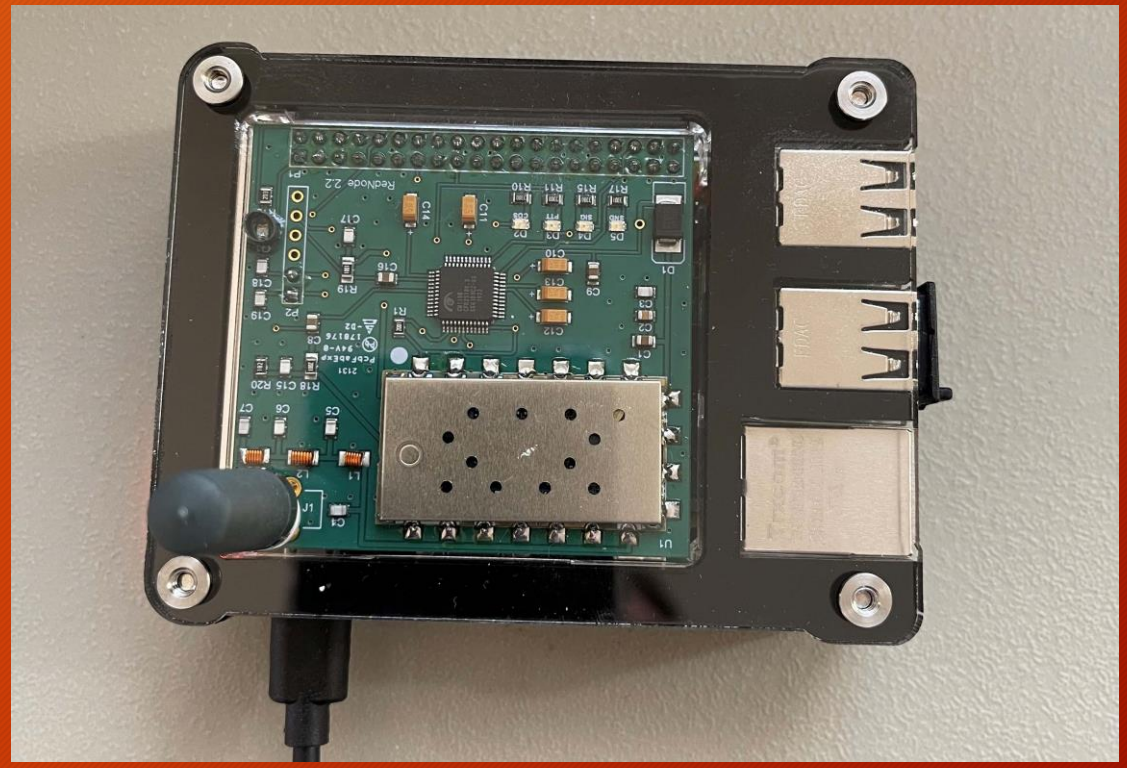
The ClearNode sells for $295 at Node-Ventures.com



How much does all this cost?

The Nano Node IRLP/Echo is listed at $495 at micro-node.com

Which one do you want?

- It depends.
- A ZumSpot must be used with a radio that has a digital mode such as C4FM (YSF).
- A ClearNode is only used with an analog radio but can still connect to most digital modes using built-in conversion software. It is the best choice if you are using ***Allstar***.
- A Nano-Node IRLP/Echo is the only choice if you need to use the ***IRLP*** protocol. It does not connect to most radio digital modes such as YSF or DMR. It also uses an analog radio.

Is this real Ham Radio?

- After all, we *are* using the Internet to communicate. But it does start with a radio and end with a radio. Hams use the Internet for so many things these days, doing research, purchasing radios, antennas and parts. Using QRZ and ARRL.ORG. Not to mention the thousands of YouTube videos out there teaching us about our hobby. So why not use the Internet to facilitate talking?
- Something we should all keep in mind: ***Do radio stuff***. ***Have fun doing it***. ***Show people how fun it is!*** -- credit: The Noise Blankers Radio Group mission statement

A Few Links

- Ham Radio Outlet – hamradio.com
- Node-Ventures – node-ventures.com
- Micro-Node International – micro-node.com
- Allstar – allstarlink.org
- IRLP – irlp.net
- Yaesu System Fusion – systemfusion.yaesu.com/what-is-system-fusion/