AllStar for Amateur Radio

Class Presentation to West Valley Amateur Radio Club

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AllStar
Link

BEFORE we begin... Raise your right hand, and repeat after me...

I, (state your name), do hereby and hereon, solemnly promise and swear...

That I WILL NOT connect to ANY remote AllStar node

without first checking that I AM NOT

already connected to a remote node,

Or a remote node connected to an amateur radio repeater, a parrot node,

and ESPECIALLY not to a large remote regional linked repeater system.

I take this obligation upon myself

without reservation, equivocation,

or mental reservation in mind of me whatever...

BINDING MYSELF under penalty of groveling forever ...

before all other attendees of this session, and profusely swearing to never do it ...

EVER AGAIN.

Everyone can talk around the world!

- With just a Technician License and ANY FM simplex transceiver, you can talk around the world, with simplex FM audio quality

- You can do this for a total investment of around as little as $110 (not including the transceiver)

- You don't even NEED a transceiver (smartphone OK)

- THOUSANDS of linked nodes and repeater systems allow quick and simple contact with other hams all over the US and the world
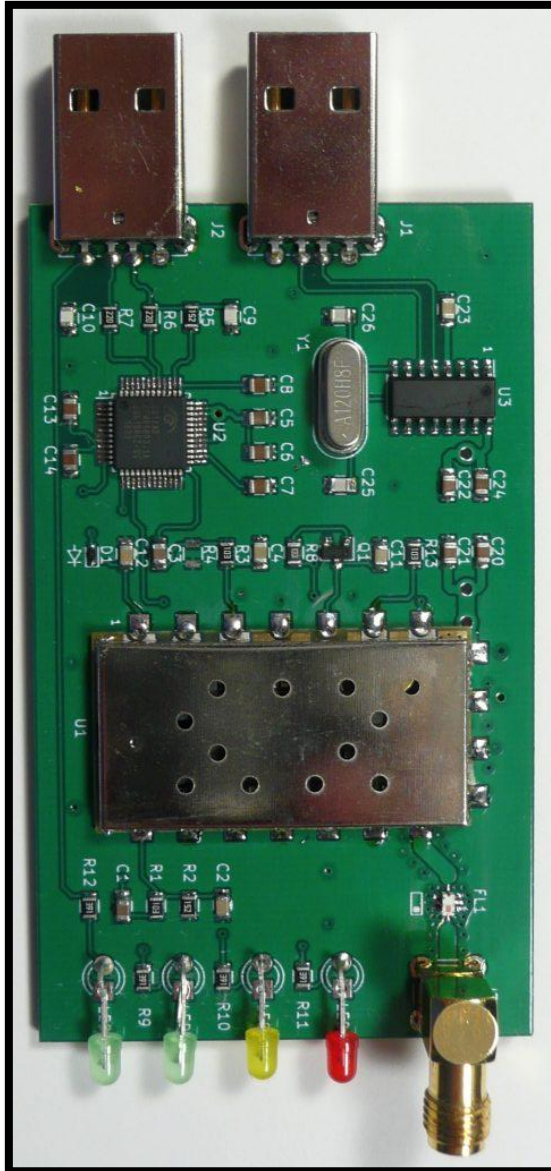
What is AllStar?

- AllStarLink is a network of Amateur Radio repeaters, "AllStar nodes" and hot spots accessible to each other via Voice over Internet Protocol.

- AllStarLink runs on a dedicated computer (including the Rasperry Pi) that you host at your home, repeater site or even in the cloud. (Smartphone apps exist that negate the need for an actual personal node)

- It is based on the open source Asterisk PBX running the app_rpt application. App_rpt makes Asterisk a powerful system capable of controlling one or more radios.

- It provides linking of your personal radio node to other AllStar nodes anywhere in the world via VoIP.

- AllStar node connections can be over Ethernet or Wi-Fi. Connections from Echolink, other VoIP clients, and even telephone calls are supported.

- AllStarLink has **37,174** users and **38,480** nodes.

AllStar vs Amateur Radio Hotspots

AllStar provides digital VoIP access between your node (or smartphone) and remote personal nodes, remote repeaters, and linked regional repeater systems

Uses SIMPLEX FM only (or a smartphone app)

AllStar is not a proprietary digital mode requiring a special radio from Icom, Yaesu, or other vendor

Hotspots use those special radios to connect to the primary digital modes: DSTAR (Icom & Kenwood), C4FM – YSF reflectors, FCS servers, WiRES-X (Yeasu), DMR (many radio vendors)

Hotspot demonstration (if desired by group)

What can you connect to with AllStar?

- Remote personal AllStar nodes
  - Requires the remote user's node to have specific router ports forwarded to the IP address of their node on their local area network
    - Usually port 4569… example: 192.168.99.210:4567
- Remote repeaters
  - N7YS repeater for example (connect to node 63916)
- Remote linked repeater systems
  - US systems – examples: East Coast Reflector node 27339, Cross Roads Ham Radio Club [Texas] node 28528
  - Other systems worldwide: HUBNet (UK) node 41288, VK3RBA Hub (Australia) node 50522

VK3RBA Hub (Australia) node 50522
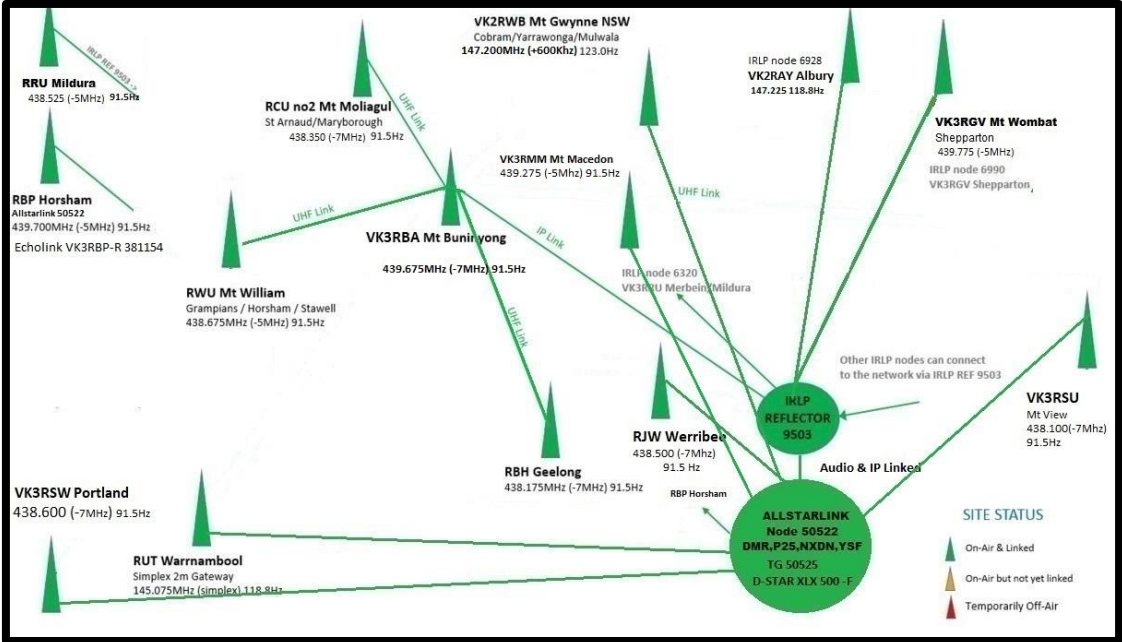
HUBNet (UK) node 41288
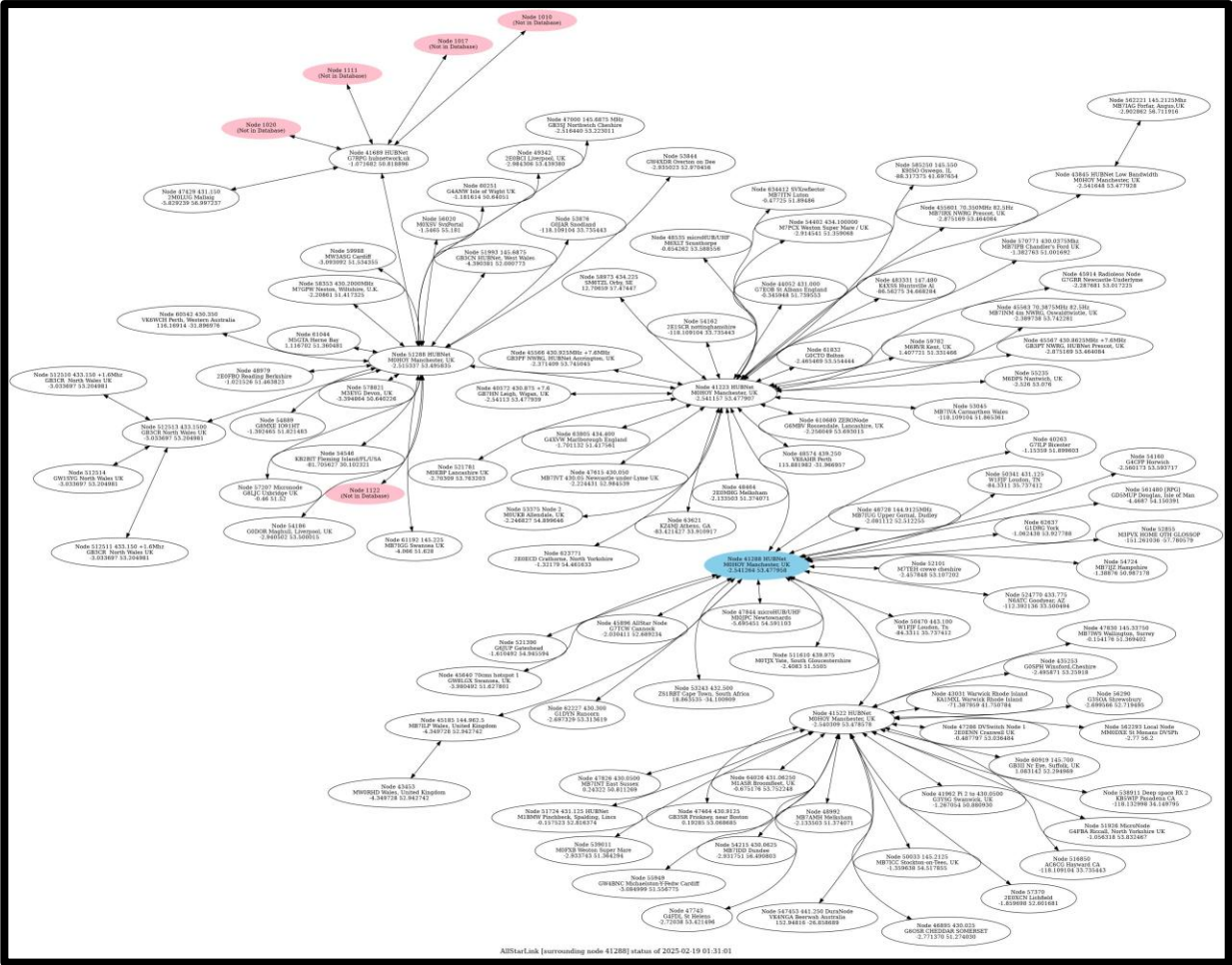
Overseas Remote Regional Linked Repeater Systems

Skill Check Quiz

1. What is the main resource that is needed to use AllStar?

2. Approximately how many AllStar nodes currently exist in the global AllStar network?

3. How is AllStar different from hotspots?

4. Name three digital modes used in amateur radio.

5. There are three basic "things" you can connect to using AllStar. Name two of them.

6. How can AllStar Link provide access to the **West Valley Amateur Radio Club Del Webb Boswell Hospital repeater**?

I hereby **REAFFIRM** my commitment to my prior obligation regarding linking of multiple nodes and/or systems.

What is required to run an AllStar Node?

Simplex FM transceiver of any kind (even a cheap Chinese HT)

A computer to run the AllStar software (AllStar Link or HamVOIP) - this computer can be a Raspberry Pi (most common), or Dell 3040 MiniPC, or similar (R-Pi is small, inexpensive, and stable; Pi3b+1GB minimum required)

A fully-constructed AllStar PC board (can be purchased in kit form or fully assembled)

The AllStar node must be configured – accomplished via both SSH (Secure Socket Shell) and scripts. (Not difficult!)

Software to manage and control the node – also very simple to use

TIDRADIO TD-H3

Raspberry Pi Model 4b 8GB

40-Pin General-Purpose Input/Output Header

Broadcom BCM2711 CPU

8GB RAM

PoE HAT Header

2.4/5GHz Wi-Fi Bluetooth 5.0

Gigabit Ethernet

Micro SD Card Slot

2 x USB 3.0

2-Lane MIPI DSI Display Port

2 x USB 2.0

USB-C Power Port 5V/3A

2 x Micro HDMI Ports (Up to 4K60P)

2-Lane MIPI CSI Camera Port

4-Pole Stereo Audio
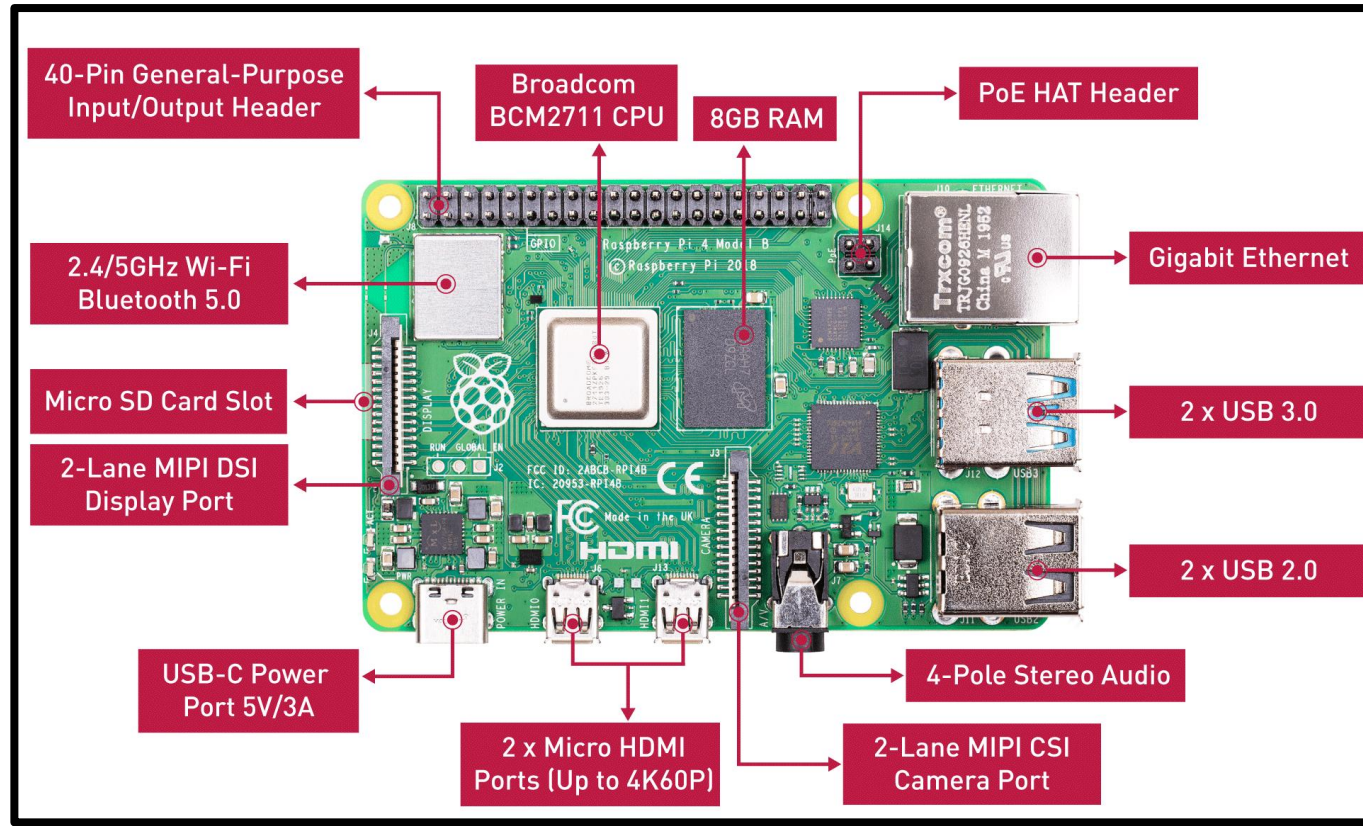
HamVoIP Pi Hat AllStar Node
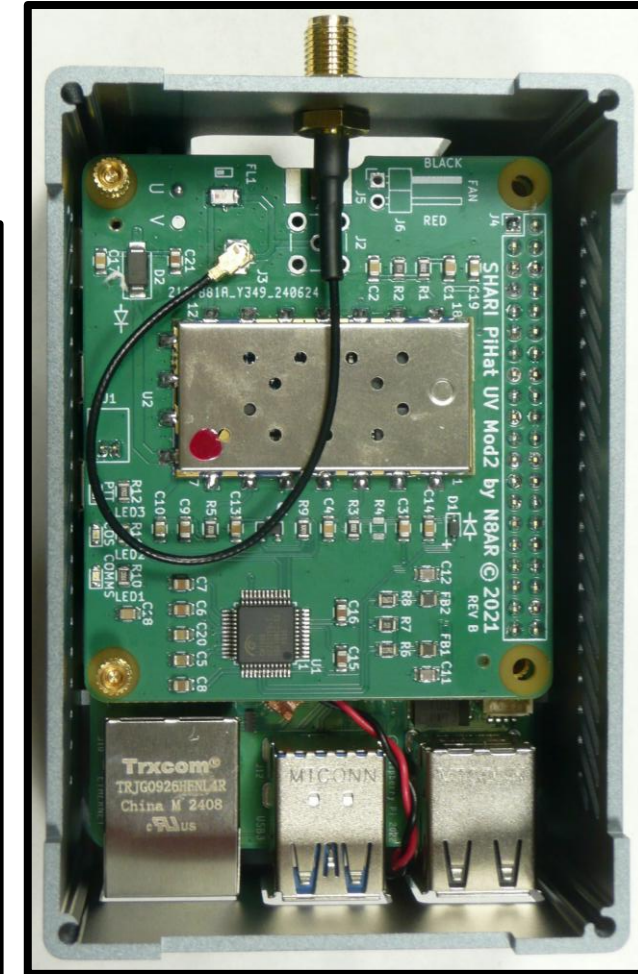
Popular AllStar Nodes

- AllScan ANH100 Half-Duplex AllStar Node
  - Includes Dell Wyse 3040 MiniPC, AllScan URI101 URI, and 1 Retevis RT85 HT $249

- kitsforhams.com
  - **SHARI** (***S***A818 ***H***am ***A***llstar ***R***adio ***I***nterface) PiHat
  - SHARI PiHat (Unistorm Case)
    - Kit $80 (solder the SA818S radio module onto the PCB for additional $5 – worth it)
    - Fully Assembled & Tested $205, $215 with fan

Popular AllStar Nodes

- SHARI PI3U or PI3V
    - Kit - $65
    - Fully assembled/tested $90

- AliExpress SHARI clone

- Fully assembled ~ $50

- AllScan ANF101 Full-Duplex Nodes with Retevis/TYT HTs - $550

Skill Check Quiz

1. What is a **Raspberry Pi** and why is it suitable to build an AllStar node?

2. What minimum Raspberry Pi model is recommended for an AllStar node?

3. What type of **microSD card** is required?

4. What type of **transceiver** is needed for an AllStar Link node?

5. Name **two recommended AllStar node hardware solutions**.

I hereby **REAFFIRM** my commitment to my prior obligation regarding linking of multiple nodes and/or systems.

Do I even need an AllStar Node?

A node IS NOT required, but is the BEST interface for using AllStar

A node provides much greater performance, flexibility, and useability

If you don't want to implement a personal node, you can use smartphone applications

DVSwitch for Android (covered in this session)

RepeaterPhone for iOS (will not be covered here)

Dialer | Status | Accounts | Config   Dialer | Status | Accounts | Config   Dialer | Status | Accounts | Config   Dialer | Status | Accounts | Config

524770   **524770**   **524770**   **524770**

Connect   Hangup   Connect   Hangup   Connect   Hangup   Connect   Hangup

Screen 1 keypad:

1	2	3	A
4	5	6	B
7	8	9	C
*	0	#	D

More...

ASL-PHONE

Screen 2 dialog — More...

Macros

Modes

Nodes

AllstarLink

Audio Settings

About

Cancel

Screen 3 dialog — AllstarLink

WT Setup

Enter WT Mode

Extended ASL Lookup

Last Heard

Update Node List

Cancel

Screen 4 dialog — Web Transceiver

User Name :   Input call sign

Password :   Input password

🟢   Update token

Transmit Level

Receive Level

Cancel   Save

PTT

Interfaces

- DVSwitch demonstration

Interfaces

Supermon – (demonstration)

Allmon - (demonstration)

AllScan - (demonstration)

AllScan v0.80 NR9V San Diego, CA | Cfgs | Users | Settings | Logout

Connection Status

NR9V San Diego, CA - Node 571572

Node	Node Info	Received	Dir	Connected	Mode
571572	Idle				

No Connections

Node# [ ] Add Favorite Delete Favorite
Connect Disconnect Monitor Local Mon DTMF
☐ Permanent ☑ Disconnect before Connect

Favorites

# ▲	Node	Name	Desc	Location	Rx%	LCnt
1	51597	AA6DP Catalina, CA	-	cloud	13	1
2	47487	AB9S HUB1-ASL2	Supermon Node	Chicago,IL	7	1
3	46969	AG4VA	SOTA Hub	Cloud, VA	2	0
4	27339	WB2JPQ East Coast Reflector	East Coast HUB1	Wilmington, NC, USA	26	101
5	512511	GB3CR Standby GB3CR	433.150 -1.6Mhz	North Wales UK	25	1
6	54318	GB3EG 430.9125	430.9125 + 7.6mhz	wigan, greater manchester	7	3
7	50683	GB3PI	145.750	Barkway, Hertfordshire, UK	15	1
8	2514	GB3ZB 430.825	430.825 +7.6MHz	Dundry, Bristol	10	1
9	41360	GB7SJ 433.175	433.175 +1.6 103.5hz	Northwich Cheshire UK	12	3
10	42235	K4JDR	441.725+Backbone HUB	Raleigh, NC	3	8
11	28404	K6RRR	San Diego Hangout	San Diego, CA	3	3
12	43763	K6TZ	SBARC Hub	Santa Barbara, CA	1	4
13	27833	K9IIK-R K9IIK	145.230 -600	Schaumburg, IL	15	0
14	59246	K9SA	443.250	Round Lake, IL	0	0
15	555491	K9TAY	CFMC 144 - 146.760	Chicago, IL	-	0
16	555492	K9TAY	CFMC 440 - 443.750	Chicago, IL	2	0
17	47243	KR8T	443.800+	Grand Rapids, MI	19	0
18	511681	KR9RK	442.000	Racine,Wisconsin	8	8
19	51288	M0HOY	HUBNet	Manchester, UK	30	36
20	2196	M0JKT	FreeSTAR UK HUB 1	freestar.network	18	43
21	45479	N0ECT	HUB/Server	Glenwood Springs, Colorado	3	10
22	46331	N4LMC W4GTA 145.350	W4GTA 145.350 100.0	Lookout Mtn, GA - EL W4EDP-R	15	10
23	29883	N6LXX MAIN HUB 29833	MAIN N6LXX HUB	HARVARD HUB	3	4
24	54576	N8UKF	443.200 Fusion	Muskegon Michigan	0	0
25	2495	N9GMT Milwaukee, WI	FM38 Network Hub	New Berlin, WI	14	20
26	53573	NWAG Morecambe, UK	NW AllStar Group	Lancashire, UK	17	25
27	55553	Parrot+ Dallas, TX	enhanced parrot	Plano, TX	3	4
28	47620	*ROC-HAM* W2JLD Hub 1	Radio Network Hub 1	Rochester, NY	15	6
29	47970	W3QV/R 147.03 PMRC	147.03/63 PMRC	Roxborough Philadelphia PA	12	9
30	50015	W4KEV/ R 145.370	145.370/R Knoxville	Knoxville, TN	2	12
31	51018	W6EK	145.430	Auburn, CA	7	37
32	44045	W7HEN HUB	W7HEN.org HUB	Henderson, NV	4	15
33	603231	W7YRC 146.880	146.880 Mhz Tanks	Prescott, AZ	1	1
34	472440	W8IRA	147.160+	Grand Rapids, MI	6	7
35	27404	W8MW US	SOUTHCARS HUB	USA	3	3
36	598730	W9BMK	P25 Bridge Astro DIU	Chicago, IL	-	0
37	42742	W9HHX	145.270-	Milwaukee, WI	0	0
38	43628	W9SBE Lockport, IL	Lkpt Hub	Lockport, IL	5	6
39	48752	WA5AIR HUB#1	Conroe,Texas HUB	SouthCoastReflector.com [USA]	16	20
40	51560	WB9YPA/R	223.980 (-1.6MHz)	South Bend, Indiana	6	2
41	458800	WM9W	224.52MHz	Chicago	7	6
42	2462	WW7PSR 146.960	146.960-	Seattle, WA	41	36

AllScan v0.77 N6ATC Goodyear, AZ | Cfgs | Users | Settings | Logout

Connection Status

N6ATC Goodyear, AZ - Node 524771

Node	Node Info	Received	Dir	Connected	Mode
524771	Idle				
41288	M0HOY HUBNet Manchester, UK	Never	OUT	00:00:13	Transceive

Node# 41288 Add Favorite Delete Favorite
Connect Disconnect Monitor Local Mon DTMF
☐ Permanent ☑ Disconnect before Connect

Favorites

# ▲	Node	Name	Desc	Location	Rx%	LCnt
1	458800	WM9W	224.52MHz	Chicago	-	-
2	51288	M0HOY	HUBNet	Manchester, UK	22	25
3	50683	GB3PI	145.750	Barkway, Hertfordshire, UK	9	1
4	40070	GB3NF	145.625Mhz -0.6Mhz	Nottingham, UK	20	0
5	512511	GB3CR North Wales, UK	433.150 +1.6Mhz	North Wales UK	22	1
6	41360	GB7SJ 433.175	433.175 +1.6 103.5hz	Northwich Cheshire UK	14	3
7	50711	M0RGV	-	Fleetwood/Lancashire/UK	-	-
8	53573	NWAG Morecambe	NW AllStar Group	Lancashire, UK	27	23
9	27339	W...		...A	24	107
10	2462				36	40
11	502370				-	-
12	2135				4	12
13	43763	K6TZ	SBARC Hub	Santa Barbara, CA	0	1
14	47970	W3QV/R W3QV Roxborough PA	147.03/63 PMRC	Roxborough, Philadelphia, PA	11	15
15	472440	W8IRA	147.160+	Grand Rapids, MI	10	7
16	51018				11	28
17	48496		SARA Allstar Hub	Wadsworth Ohio US	14	7
18	2514		430.825 +7.6MHz	Dundry, Bristol	25	1
19	2065					
20	48423					
21	51597	AA6DP Catalina		cloud		
22	506451	*A MistFit Hub* N7ADR	MistFit Network USA	www.mistfithub.net		
23	2495	N9GMT FM38 Hub, Milwaukee WI	FM38 Network Hub	New Berlin, WI		
24	47620	*ROC-HAM* W2JLD Hub 1	Radio Network Hub 1	Rochester, NY		
25	51860	K7LWH	145.49	Kirkland WA		
26	46079	SKYHUB Hub, Denver, CO	SkySystem Hub	Denver, Co, USA		

AllScan – the BEST way to control a node

- Simple, quick, and efficient way to manage and control your node
- Runs great on a desktop PC or a smartphone

Connection Status

N6ATC Goodyear, AZ - Node 524771

Node	Node Info	Received	Dir	Connected	Mode
524771	PTT-Keyed				
41288	M0HOY HUBNet Manchester, UK	00:00:01	OUT	00:01:15	Transceive

Node# **41288** [Add Favorite] [Delete Favorite]

[Connect] [Disconnect] [Monitor] [Local Mon] [DTMF]

☐ Permanent ☑ Disconnect before Connect

Favorites

#▲	Node	Name	Desc	Location	Rx%	LCnt
1	458800	WM9W	224.52MHz	Chicago	-	-
2	51288	M0HOY	HUBNet	Manchester, UK	22	25
3	50683	GB3PI	145.750	Barkway, Hertfordshire, UK	9	1
4	40070	GB3NF	145.625Mhz -0.6Mhz	Nottingham, UK	20	0

AllScan – close up

Supermon – the other way to control and manage an AllStar node (legacy, and still useful)

N6ATC - Supermon 6.2.2+ AllStar Manager

Logout
Goodyear, Arizona, USA
RPi4 SHARI Node

AllStar/IRLP/Echolink System Manager

524770	52478	524771	524772	524773	524774	1999	All Nodes	IsNodes	ECR	HAMVOIP

52478 => N6ATC 433.775 Munds Park, Arizona ▼   ☐ Permanent

Connect	Disconnect	Monitor	Local Monitor	DTMF	Lookup	Rpt Stats	Bubble Chart	Control	Favorites

Configuration Editor	Iax/Rpt/DP RELOAD	AST START	AST STOP	RESTART	Server REBOOT	SW Update?

AllStar How To's	AllStar Wiki	CPU Status	AllStar Status	Registry	Node Info	Active Nodes	All Nodes

GPIO	Linux Log	AST Log	Connection Log	Web Access Log	Web Error Log	Restrict

[N6ATC-52477] [WAN IP: 68.104.247.122] [WLAN IP: 192.168.99.209] [AstP: 4569] [MgrP: 5038] [SShP: 222]
[Tuesday, February 18, 2025 MST 19:03:38 up 3 days, 3:40, 0 users, load average: 0.39, 0.20, 0.18]

Display Configuration   [CPU: 110°F, 43.8°C @ 19:03]

[Weather conditions for Goodyear, Arizona, USA 85395: 69°F, 20°C / Clear]

Node 52478 => N6ATC 433.775 Munds Park, Arizona   Bubble Chart

Node	Node Information	Received	Link	Direction	Connected	Mode
Could not connect to Asterisk Manager.						

Node 524770 => N6ATC 433.775 Goodyear, AZ   Bubble Chart   IsNodes

Node	Node Information	Received	Link	Direction	Connected	Mode
524770	Idle					
41288	M0HOY HUBNet Manchester, UK	000:05:19	ESTABLISHED	OUT	19:05:11	Transceive

Node 524771 => N6ATC 431.175 Goodyear, AZ   Bubble Chart

Node	Node Information	Received	Link	Direction	Connected	Mode
Could not connect to Asterisk Manager.						

Node 524772 => N6ATC 435.300 Goodyear, AZ   Bubble Chart

Node	Node Information	Received	Link	Direction	Connected	Mode
524772	Idle					
63916	NY7S 147.300 Sun City West, Arizona	000:00:34	ESTABLISHED	OUT	00:04:34	Transceive

Node 524773 => N6ATC 435.800 Goodyear, AZ   Bubble Chart

Node	Node Information	Received	Link	Direction	Connected	Mode
524773	Idle					
40658	SWAN Hub Port 1 S.W. England UK	000:40:04	ESTABLISHED	OUT	15:28:40	Transceive

Node 524774 => N6ATC 433.775 Goodyear, AZ   Bubble Chart

Node	Node Information	Received	Link	Direction	Connected	Mode
Could not connect to Asterisk Manager.						

Private Node 1999 => Node not in database   IsNodes

Node	Node Information	Received	Link	Direction	Connected	Mode
1999	Idle					
No Connections.						

AllStar Demonstration

Demonstration

Session Participant Hands-On Activity

AllStar node setup procedure demonstration

- Demonstration assumes microSD card has been formatted and the hamvoip AllStar image has been installed.

- Configuration begins at the initial node startup step

I hereby **REAFFIRM** my commitment to my prior obligation regarding linking of multiple nodes and/or systems.

Questions & Comments