



Getting Started with D-STAR

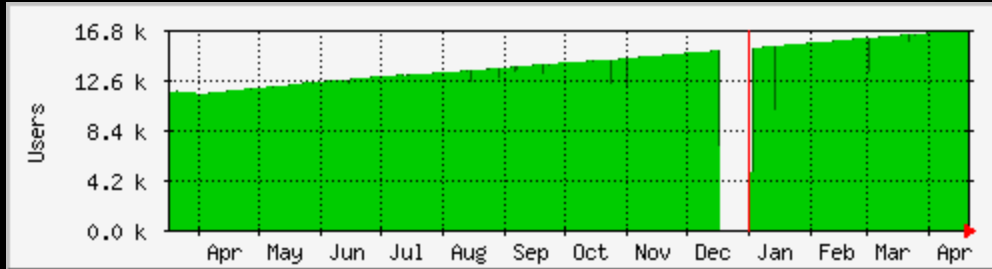
The Basics

*Ed Woodrick WA4YIH
www.DSTARInfo.com*

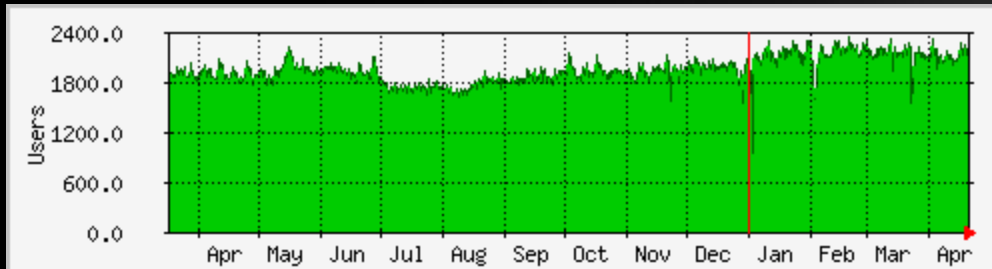


How Popular is D-STAR

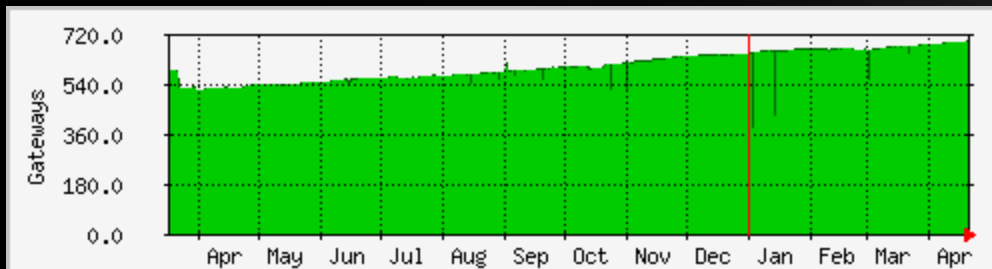
Registered Users



Users per day



Repeaters





What is D-STAR

The Technical Definition

D-STAR



Digital - Smart Technologies for Amateur Radio

D-STAR (Digital - Smart Technologies for Amateur Radio) is a digital voice and data protocol specification developed as the result of research by the Japan Amateur Radio League to investigate digital technologies for amateur radio. While there are other digital on-air technologies being used by amateurs that have come from other services, D-STAR is one of the first on-air and packet-based standards to be widely deployed and sold by a major radio manufacturer that is designed specifically for amateur service use.

Courtesy Wikipedia



Digital Radio

D-STAR is a true digital signal using GMSK (Gaussian Minimal Shift Keying)

In digital communication, **Gaussian minimum shift keying** or **GMSK** is a continuous-phase frequency-shift keying modulation scheme. It is similar to standard minimum-shift keying (MSK); however the digital data stream is first shaped with a Gaussian filter before being applied to a frequency modulator. This has the advantage of reducing sideband power, which in turn reduces out-of-band interference between signal carriers in adjacent frequency channels. However, the Gaussian filter increases the modulation memory in the system and causes intersymbol interference, making it more difficult to discriminate between different transmitted data values and requiring more complex channel equalization algorithms such as an adaptive equalizer at the receiver. GMSK has high spectral efficiency, but it needs a higher power level than QPSK, for instance, in order to reliably transmit the same amount of data.

GMSK is most notably used in the Global System for Mobile Communications (GSM).

Courtesy Wikipedia



Data Stream

Within the D-STAR Digital Voice protocol standards (DV), voice audio is encoded as a 3600 bps data stream using proprietary AMBE encoding, with 1200 bps FEC, leaving 1200 bps for an additional data "path" between radios utilizing DV mode. On air bit rates for DV mode are 4800 bit/s over the 2 m, 70 cm and 23 cm bands.

In addition to DV mode, a high speed Digital Data (DD) mode can be sent at 128 Kbps only on the 23 cm band.

Courtesy Wikipedia



AMBE

Overview

AMBE is a codebook-based vocoder that operates at bitrates of between 2 and 9.6 Kbps, and at a sampling rate of 8 kHz in 20-ms frames. The audio data is usually combined with up to 7 bit/s[citation needed] of forward error correction data, producing a total RF bandwidth of approximately 2250 Hz (compared to 2700–3000 Hz for an analog single sideband transmission). Lost frames can be masked by using the parameters of the previous frame to fill in the gap.

History

In 1967 Osamu Fujimura (MIT) showed basic advantages of the multi-band representation of speech ("An Approximation to Voice Aperiodicity", IEEE 1968). This work gave a start to development of the "multi-band excitation" method of speech coding, that was patented in 1988 by founders of DVSI as "Multi-Band Excitation" (MBE). All consequent improvements known as Improved Multi-Band Excitation (IMBE), AMBE, AMBE+ and AMBE+2 are based on this MBE method.

Usage

It is used by the Inmarsat and Iridium satellite telephony systems and certain channels on XM Satellite Radio and is the speech coder for OpenSky Trunked radio systems.

AMBE is used in D-STAR amateur radio digital voice communications. It has met criticism because the nature of its patent and licensing runs counter to the openness of amateur radio.

The NXDN digital voice and data protocol uses the AMBE +2 codec. NXDN is implemented by Icom in the IDAS system and by Kenwood as NEXEDGE.

APCO Project 25 Phase 1 and Phase 2 trunked radio systems also use the AMBE+2 codec.

Courtesy Wikipedia

What is D-STAR

In English

D-STAR

- Developed by JARL – Cross between ARRL and FCC in Japan
- Advanced Digital Technology
- Narrowband Transmission
- Voice and Data are transmitted simultaneously
- Two modes
 - DV – Most commonly used, voice and 9600 bps data at the same time
 - DD – Only available at 1.2 GHz, 128 kbps data only
- D-STAR Protocol is open
 - Vocoder is proprietary
 - State of the art technology
 - Chip is readily available

How Open is D-STAR

- DVDongle – access D-STAR network as a peer
- DV Access Point - similar to D-STAR repeater
- G4ULF gateway software – Provides “equivalent to Icom” repeater implementation
- Low Speed serial is transparent transport
- High-Speed Data provides Ethernet interfaces

How is D-STAR different from FM?

- In many ways, it is functionally identical
 - Bandwidth limited voice transmissions
 - Commonly used with repeaters
 - Half-duplex operation
 - VHF/UHF is common location
 - Transmission range
- Additional Capabilities
 - Simultaneous Voice and Data transmission
 - Call sign sent at key-up
 - Short message transmission
 - All current radios provide D-STAR and FM capabilities
 - Automatic radio programming (except for frequency)
 - Data interface is digital – No Analog!
 - Commands sent in the data stream

Voice Compression

- Voice is highly compressed
- Voice has FEC (Forward Error Correction)
- Consistently better quality than FM
- All or nothing
- R2D2 – artifact of Icom implementation of D-STAR
 - Sending bad packets through the vocoder (i.e. squelch left open)
 - Not found in Internet Labs devices
- Audio doesn't change
 - Simplex is the same as duplex
 - Linked repeaters same as local repeater
 - Australia sounds just like the operator next to you (except accent and call sign)

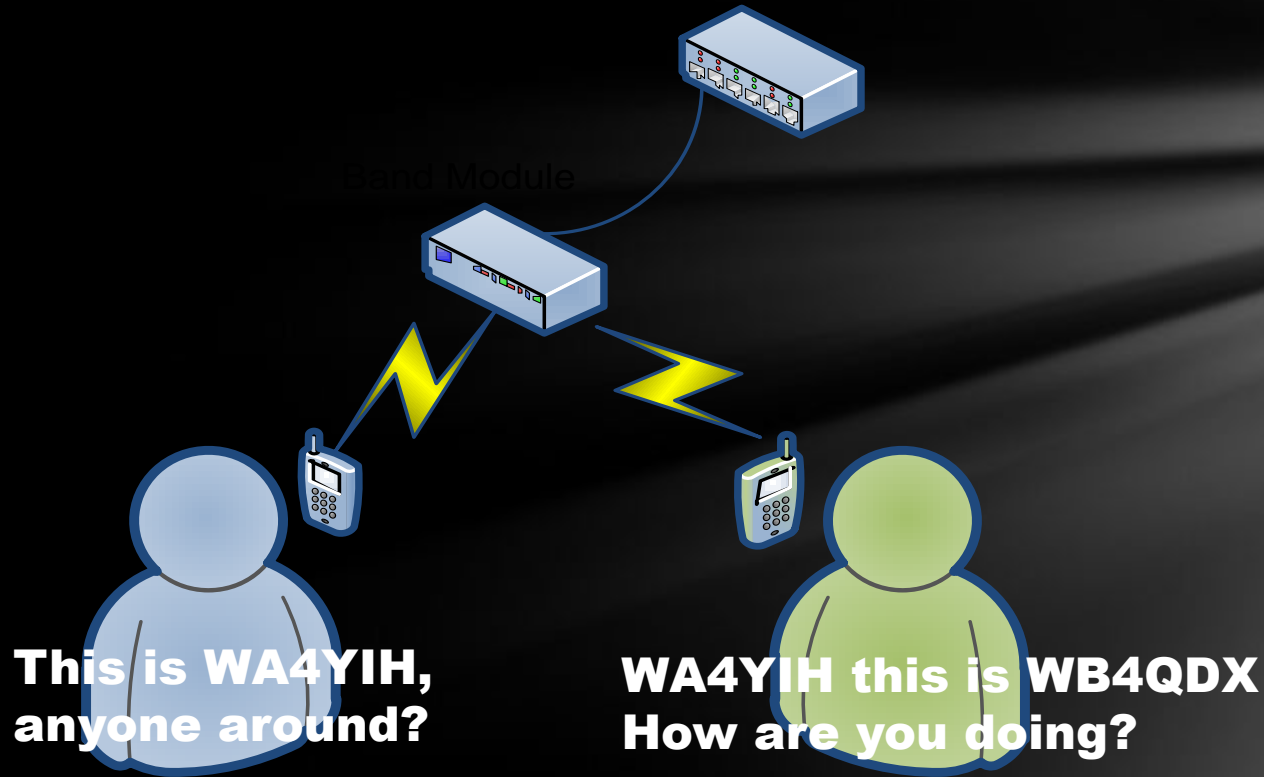
Levels of D-STAR

*You don't have to know it all to begin
with*

Doing D-STAR 101

- Tune radio to repeater
- Listen before talking
- Look on your radio for other stations call sign and information
- Use it like FM radio / repeater
- Repeater may be linked
- The person that you are talking to may not be local

Local



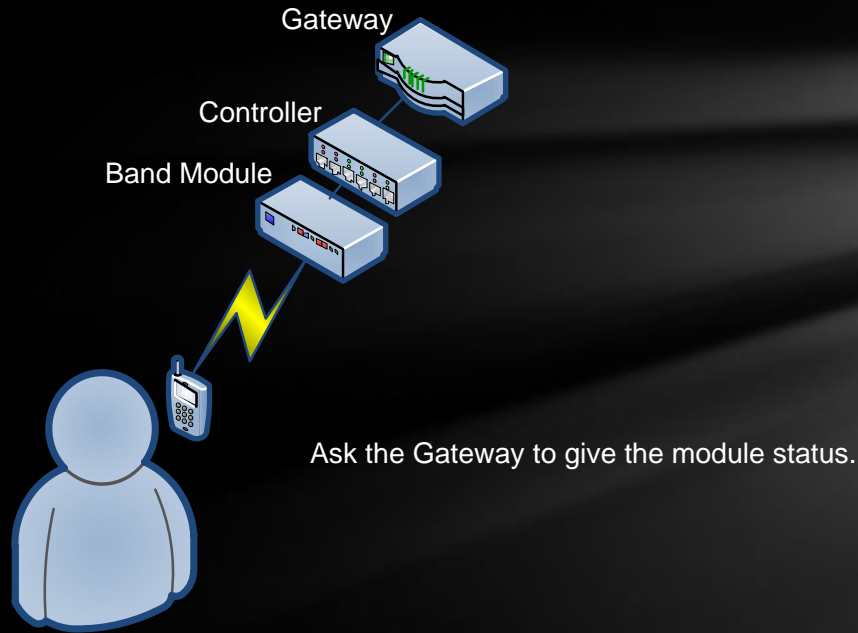


Doing D-STAR 201

- Repeater Status
- Echo Test



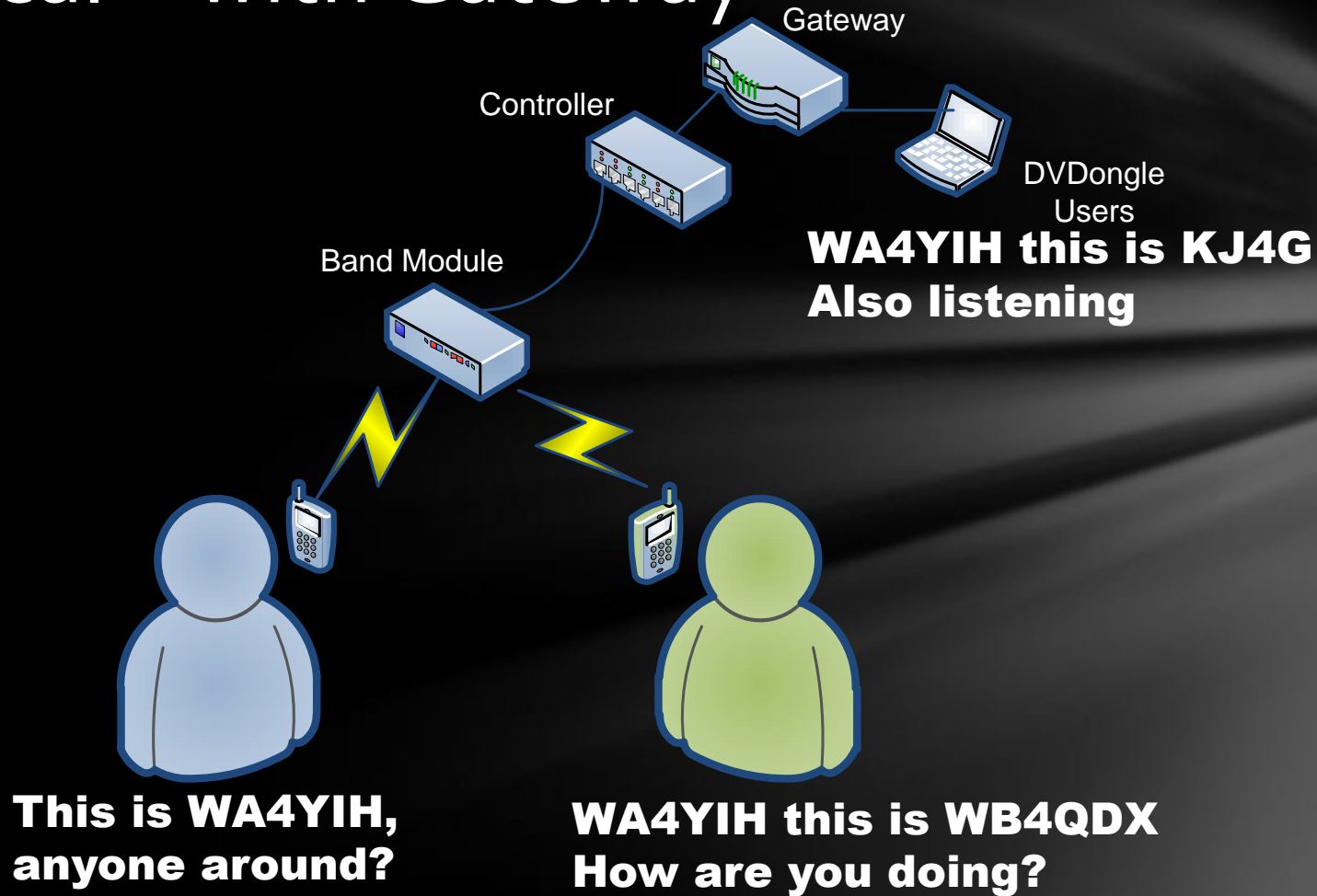
Repeater Status



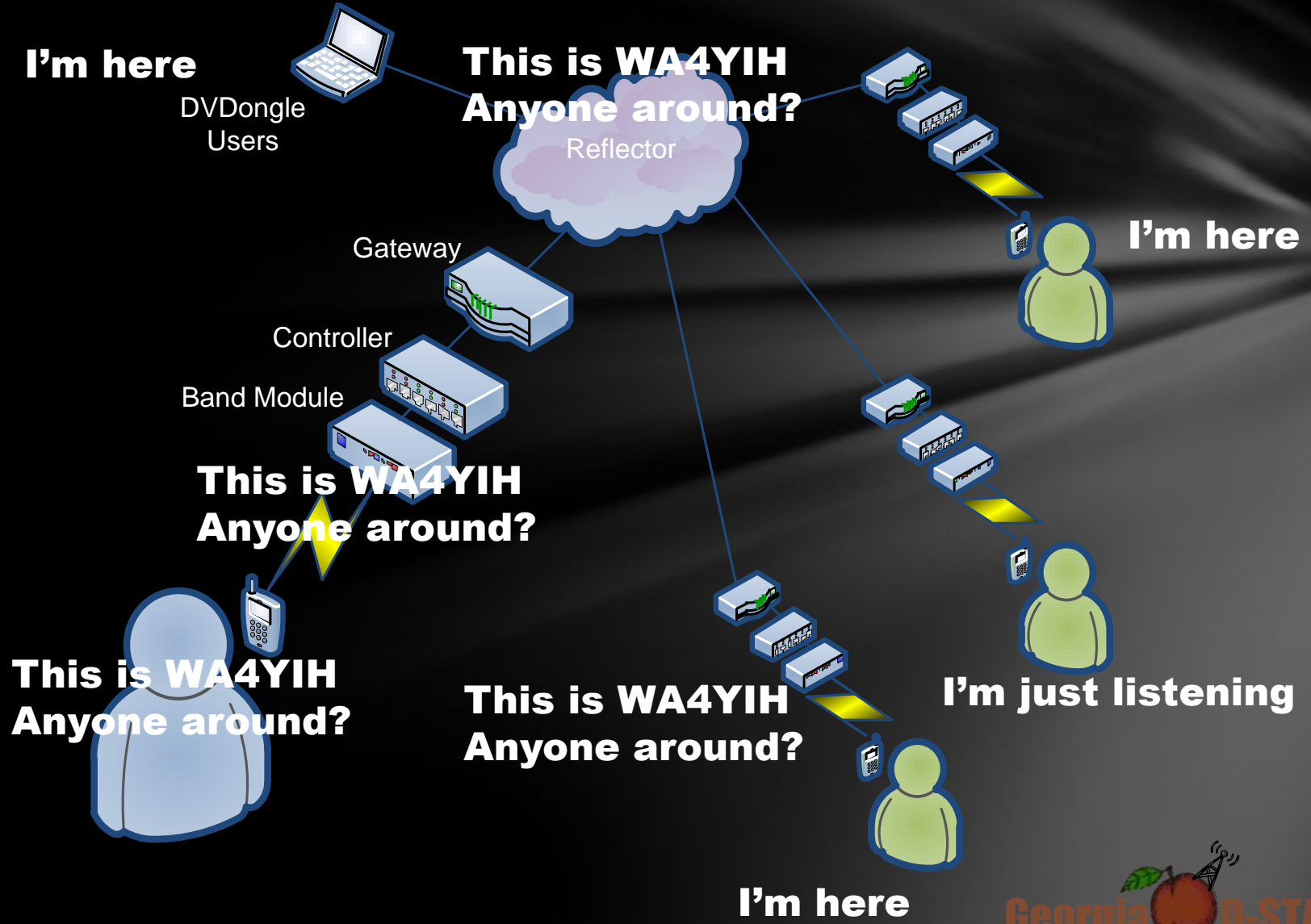
Doing D-STAR 301

- Call Sign Routing
 - Repeater
 - User
- Repeater linking

Local – with Gateway



Linked Repeaters



Registration

It is what it is.



Registration Process

http://www.dstargateway.org/D-Star_Registration.html

You DO NOT Have to be registered to talk.

You have to be registered to Call Sign Route or to Link Repeaters

Needed for DVDongle and DVAP operation

Register at Repeater closest to you

Registration is a 3-step process

- You create new user account
- Repeater Administrator approves you
- You create D-STAR Terminal

Only register once – Registrations are good worldwide!



Step 1 – Create User Account


D-STAR Gateway System - Windows Internet Explorer

https://w4doc.dstargateway.org/TopMenu.do Certificate Error Google

File Edit View Favorites Tools Help

Google G- Go + Bookmarks 0 blocked Check AutoLink Settings

D-STAR Gateway System Page Tools

 **D-STAR Gateway System (W4DOC)** REVISION 1.0

The agreement document

I agree to abide by all rules and regulations of The Atlanta Radio Club and FCC Part 97. I understand that should I not comply, I may be removed from the D-Star network without warning.

Do you agree?

YES: NO:

Enter your personal information!

CallSign: Equal to or less than 7 characters.

Name:

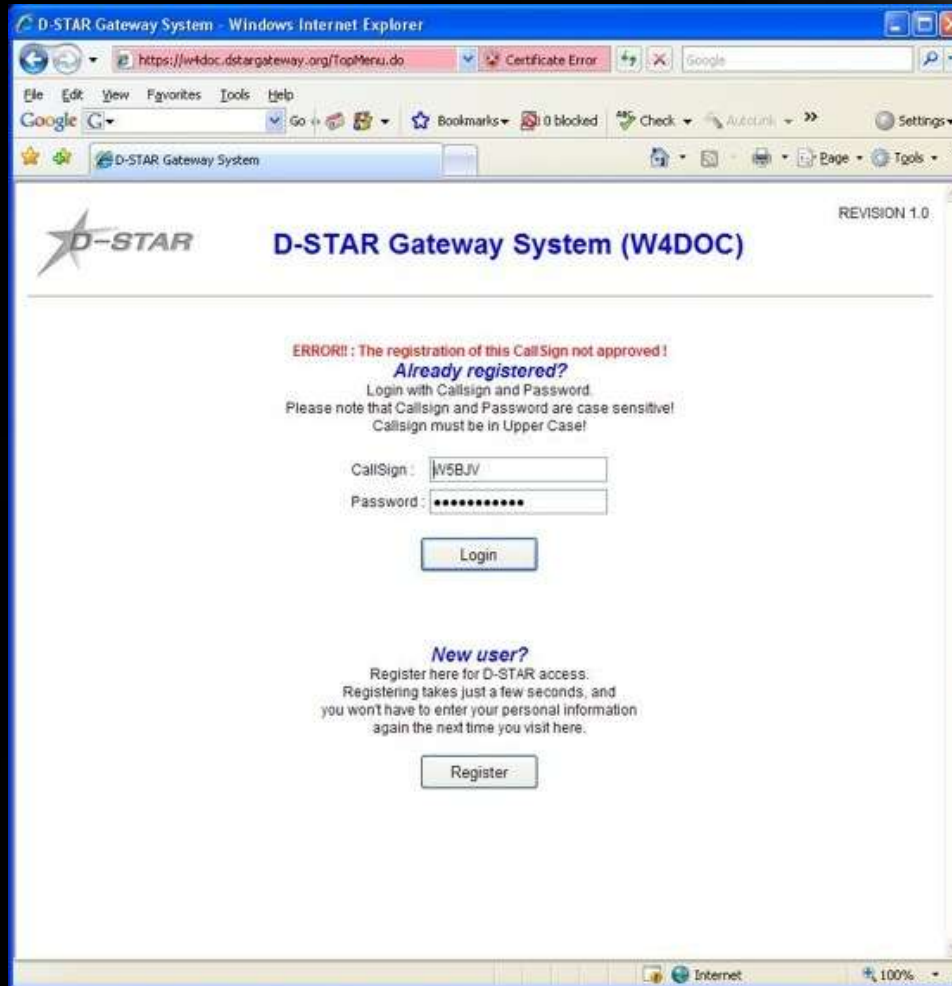
E-mail: Make sure you use a valid e-mail address.

Password: 8 to 16 characters.

Password confirm:

Internet 100%

Step 2 – Wait for authorization




D-STAR Gateway System - Windows Internet Explorer

https://w4doc.dstargateway.org/TopMenu.do Certificate Error Google

File Edit View Favorites Tools Help

Google G Go Bookmarks 0 blocked Check A.A.Link Settings

D-STAR Gateway System

 **D-STAR Gateway System (W4DOC)** REVISION 1.0

ERROR!! : The registration of this Call Sign not approved!
Already registered?
Login with Callsign and Password.
Please note that Callsign and Password are case sensitive!
Callsign must be in Upper Case!

CallSign:

Password:

Login

New user?
Register here for D-STAR access.
Registering takes just a few seconds, and
you won't have to enter your personal information
again the next time you visit here.

Register

Internet 100%

Step 3 – Create Terminal


D-STAR Gateway System - Windows Internet Explorer

https://w4doc.dstargateway.org/PersonalInfo/nit.do Certificate Error Google

File Edit View Favorites Tools Help

Google G- Go + 0 blocked Check AutoLink >> Settings >

D-STAR Gateway System Page Tgols >>

 **D-STAR Gateway System (W4DOC)** REVISION 1.0

Login: W5BJV Logout

[User Information](#) [GW Information](#) [Terminal Information](#) [Personal Information](#)

Please, edit after making a left check box on.

Name : Marcal Pizini

E-mail : w5bjv@am1.net

Password : _____

Password Confirm : _____

If the station has multiple radios, Target CS are distinguished by initial(last character) of a space or a capital english letter.
 Definition character as follows.... (G)is a gateway, (S)is a local server.
 Usually RPT(Repeater) isn't checked, initial AreaRPT CS is the port A of ZoneRPT CS.
 If RPT is checked, AreaRPT CS is the same as Target CS.

	Initial	RPT	local IP	pname	Del
<input checked="" type="checkbox"/> 1: W5BJV	<input type="checkbox"/>	<input type="checkbox"/>	10.220.101.184	w5bjv-dvdongle	
<input type="checkbox"/> 2: W5BJV	<input type="checkbox"/>	<input type="checkbox"/>	10.220.101.185		
<input type="checkbox"/> 3: W5BJV	<input type="checkbox"/>	<input type="checkbox"/>	10.220.101.186		
<input type="checkbox"/> 4: W5BJV	<input type="checkbox"/>	<input type="checkbox"/>	10.220.101.187		
<input type="checkbox"/> 5: W5BJV	<input type="checkbox"/>	<input type="checkbox"/>	10.220.101.188		
<input type="checkbox"/> 6: W5BJV	<input type="checkbox"/>	<input type="checkbox"/>	10.220.101.189		
<input type="checkbox"/> 7: W5BJV	<input type="checkbox"/>	<input type="checkbox"/>	10.220.101.190		
<input type="checkbox"/> 8: W5BJV	<input type="checkbox"/>	<input type="checkbox"/>	10.220.101.191		

Check item and change a set value.
Click the Update button.

Update

Done Internet 100%

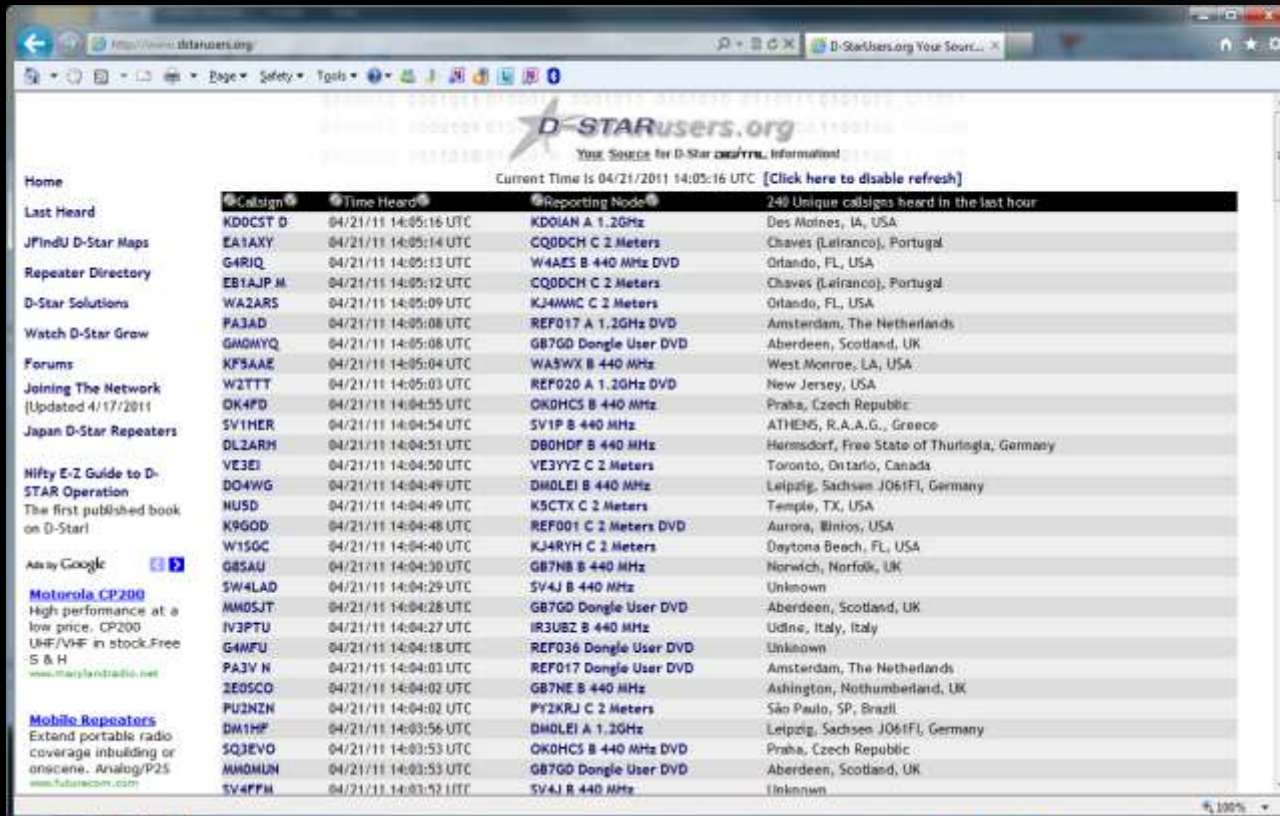
D-STAR Resources

*D-STAR and Internet work well
together*

Last Heard List

www.DSTARUsers.org

Stations appear on list when transmitting on an Internet Connected repeater



Home	240 Unique callsigns heard in the last hour
Last Heard	KD0CST D 04/21/11 14:05:16 UTC KDOIAN A 1.2GHz Des Moines, IA, USA
JFindU D-Star Maps	EA1AXY 04/21/11 14:05:14 UTC CQDDCH C 2 Meters Chaves (Leiranco), Portugal
Repeater Directory	G4RIQ 04/21/11 14:05:13 UTC W4AES B 440 MHz DVD Orlando, FL, USA
D-Star Solutions	EB1AJP M 04/21/11 14:05:12 UTC CQDDCH C 2 Meters Chaves (Leiranco), Portugal
Watch D-Star Grow	WA2ARS 04/21/11 14:05:09 UTC KJ4MWC C 2 Meters Orlando, FL, USA
Forums	PA3AD 04/21/11 14:05:08 UTC REF017 A 1.2GHz DVD Amsterdam, The Netherlands
Joining The Network	GW6WYQ 04/21/11 14:05:08 UTC GB7GD Dongle User DVD Aberdeen, Scotland, UK
(Updated 4/17/2011)	KF5AAE 04/21/11 14:05:04 UTC WA5WX B 440 MHz West Monroe, LA, USA
Japan D-Star Repeaters	W2TTT 04/21/11 14:05:03 UTC REF020 A 1.2GHz DVD New Jersey, USA
Nifty E-Z Guide to D-STAR Operation	OK4FD 04/21/11 14:04:55 UTC OKDHCS B 440 MHz Praha, Czech Republic
The first published book on D-Star!	SV1HER 04/21/11 14:04:54 UTC SV1P B 440 MHz ATHENS, R.A.A.G., Greece
As by Google	DL2ARH 04/21/11 14:04:51 UTC DB0HDF B 440 MHz Hermsdorf, Free State of Thuringia, Germany
Motorola CP200	VE3EI 04/21/11 14:04:50 UTC VE3YYZ C 2 Meters Toronto, Ontario, Canada
High performance at a low price. CP200 UHF/VHF in stock. Free S & H	DO4WG 04/21/11 14:04:49 UTC DM0LEI B 440 MHz Leipzig, Sachsen J061FI, Germany
www.marylandradio.net	HUSD 04/21/11 14:04:49 UTC K5CTX C 2 Meters Temple, TX, USA
Mobile Repeaters	K9GDD 04/21/11 14:04:48 UTC REF001 C 2 Meters DVD Aurora, Illinois, USA
Extend portable radio coverage inbuilding or onscene. Analog/P25	W15GC 04/21/11 14:04:40 UTC KJ4RYH C 2 Meters Daytona Beach, FL, USA
www.futurecom.com	G8SAU 04/21/11 14:04:30 UTC GB7NB B 440 MHz Norwich, Norfolk, UK
	5W4LAD 04/21/11 14:04:29 UTC SV4J B 440 MHz Unknown
	MM05JT 04/21/11 14:04:28 UTC GB7GD Dongle User DVD Aberdeen, Scotland, UK
	IV3PTU 04/21/11 14:04:27 UTC IR3UBZ B 440 MHz Udine, Italy, Italy
	G4MFU 04/21/11 14:04:18 UTC REF036 Dongle User DVD Unknown
	PA3V N 04/21/11 14:04:03 UTC REF017 Dongle User DVD Amsterdam, The Netherlands
	ZE0SCO 04/21/11 14:04:02 UTC GB7NE B 440 MHz Ashington, Northumberland, UK
	PV2NZN 04/21/11 14:04:02 UTC PY2KRJ C 2 Meters São Paulo, SP, Brazil
	DM1HF 04/21/11 14:03:56 UTC DM0LEI A 1.2GHz Leipzig, Sachsen J061FI, Germany
	SQ3EVO 04/21/11 14:03:53 UTC OKDHCS B 440 MHz DVD Praha, Czech Republic
	MH0MUN 04/21/11 14:03:53 UTC GB7GD Dongle User DVD Aberdeen, Scotland, UK
	SV4FFM 04/21/11 14:03:52 UTC SV4J B 440 MHz Unknown

D-STAR Calculator

www.DSTARInfo.com/dstar-web-calculator.aspx

The screenshot shows the D-STAR Calculator web application. The browser address bar displays <http://www.dstarinfo.com/dstar-web-calculator.aspx>. The page title is "D-STAR Calculator 2.2.0.2".

The main form contains the following fields:

- Source Repeater: United States, Georgia Lawrenceville WD4STR Gateway
- Source Module: DD A 1298 0000 RPS, DV B 440 5500 +5.0000, DV C 145 0600 +1.4000
- Function: Local Repeater with Gateway
- Destination Module: DD A 1298 0000 RPS, DV B 440 5500 +5.0000, DV C 145 0600 +1.4000

Below the form, there is a link to www.DSTARINFO.com for news and information.

A blue box contains the following text:

Programming for talking on WD4STR (port DV B) to (port DV B)
YOUR: CQ CQ CQ
RPT1: WD4STR-B
RPT2: WD4STR-G
Set Radio To: 440.5500 MHz Offset +5.0000 MHz
*+ represents a space
[Help!](#)

A diagram illustrates the setup. A Gateway is connected to a Repeater. The Repeater is connected to two mobile radios. The Gateway is also connected to a DV Dongle, which is connected to a DV Dongle User. The diagram shows the flow of communication between the gateway, repeater, and users.

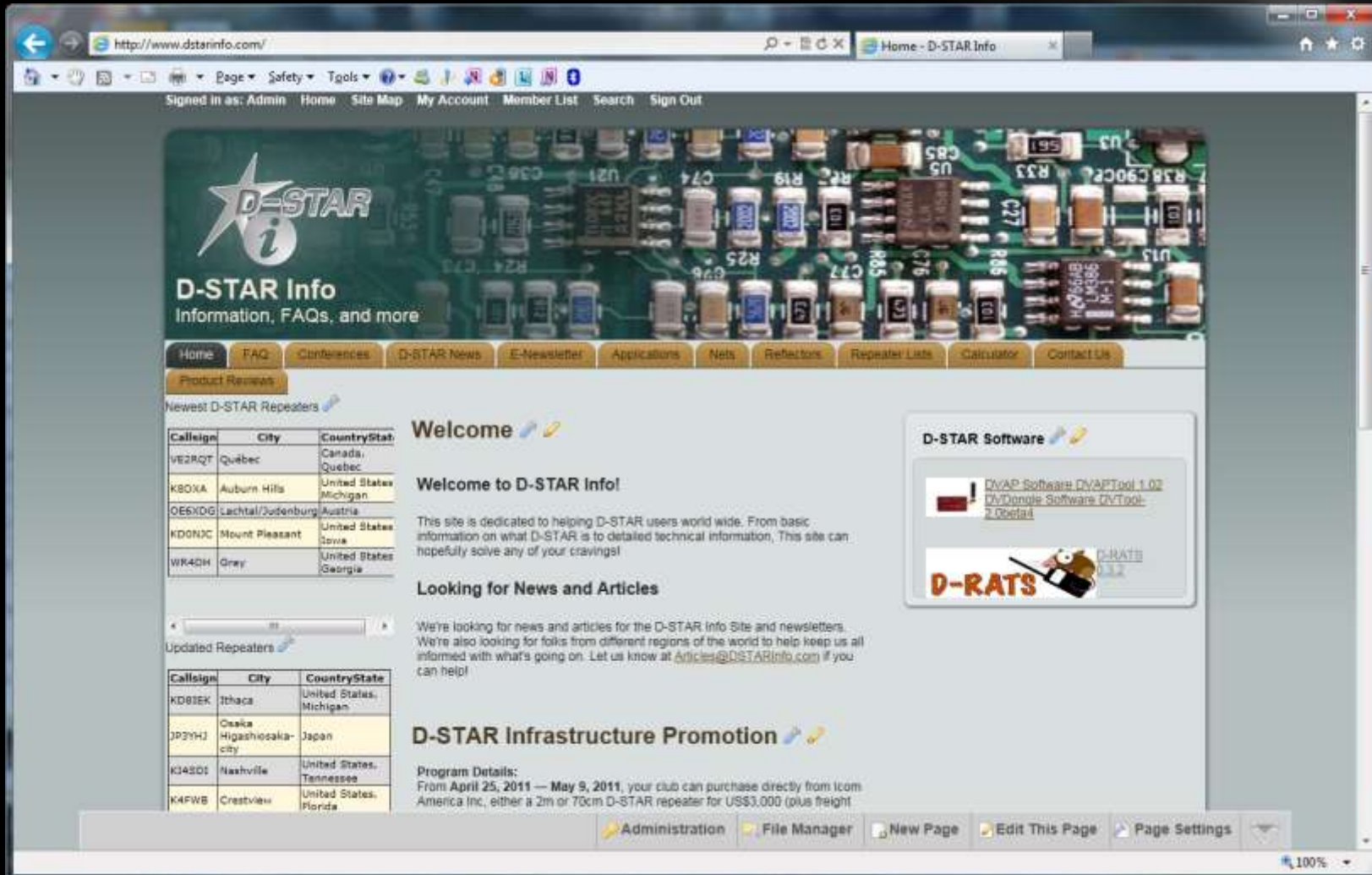
Text on the left side of the diagram: "I'm near Lawrenceville GA USA. I'm talking on WD4STR (port DV B) and my radio is set to 440.5500 +5.0000 and I am routing through the gateway to allow DV Dongle users to hear me"

Text on the right side of the diagram: "I'm also near the same repeater and listening on the same port"

Text at the bottom left: "CQ CQ CQ This is (your call sign) listening on the Lawrenceville repeater. WD4STR (port DV B)"

Text at the bottom right: "Say Hoondy!"

The browser's status bar shows "Administration", "File Manager", "New Page", "Edit This Page", and "Page Settings". The zoom level is 100%.



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[Product Reviews](#)

Newest D-STAR Repeaters

Callsign	City	Country/State
VE2RQT	Quebec	Canada, Quebec
K80XA	Auburn Hills	United States, Michigan
OE6XDG	Lachtal/Judenburg	Austria
KD0NJC	Mount Pleasant	United States, Iowa
WR4QH	Gray	United States, Georgia

Welcome

Welcome to D-STAR Info!


This site is dedicated to helping D-STAR users world wide. From basic information on what D-STAR is to detailed technical information, This site can hopefully solve any of your cravings!

Looking for News and Articles

We're looking for news and articles for the D-STAR Info Site and newsletters. We're also looking for folks from different regions of the world to help keep us all informed with what's going on. Let us know at Articles@DSTARInfo.com if you can help!

D-STAR Software

- DVAP Software DVAPTool 1.02
- DVDenote Software DVTool-2 Obefad



Updated Repeaters

Callsign	City	Country/State
KD8IEK	Ithaca	United States, Michigan
JP3YHJ	Osaka Higashiosaka-city	Japan
KJ4SDJ	Nashville	United States, Tennessee
K4FWB	Crestview	United States, Florida

D-STAR Infrastructure Promotion

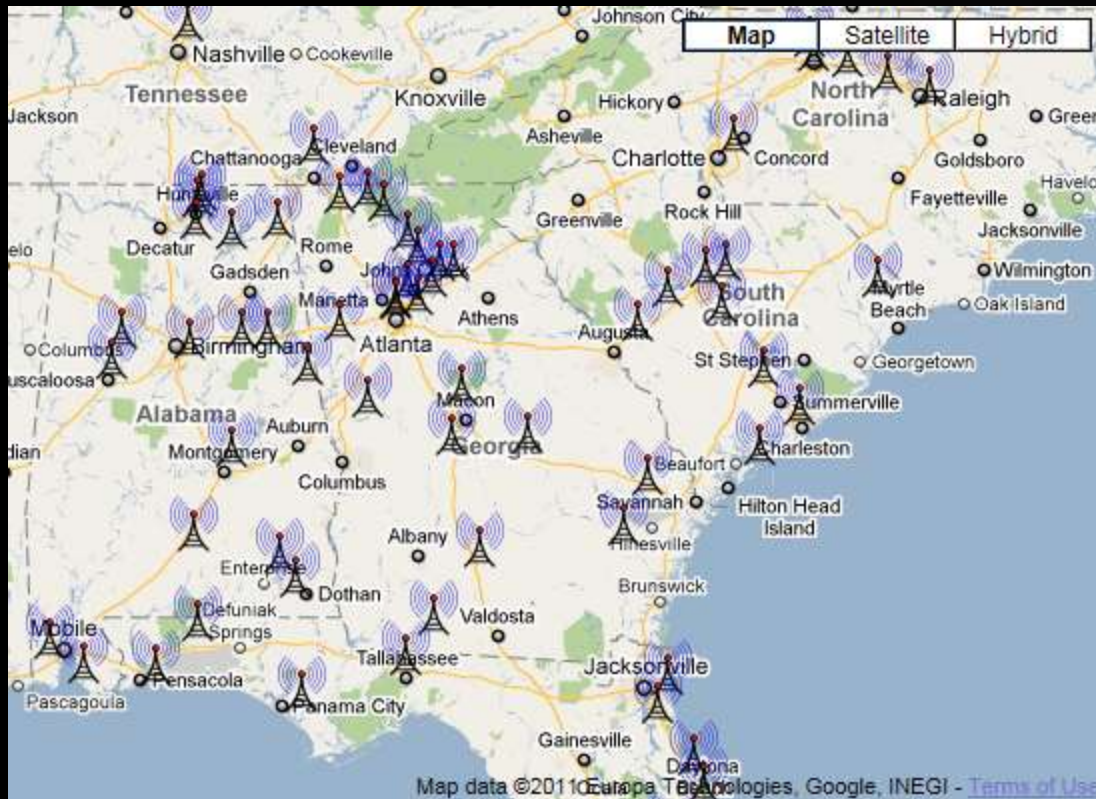
Program Details:
 From April 25, 2011 — May 9, 2011, your club can purchase directly from Icom America Inc, either a 2m or 70cm D-STAR repeater for US\$3,000 (plus freight)

[Administration](#)
[File Manager](#)
[New Page](#)
[Edit This Page](#)
[Page Settings](#)

Repeaters

www.DSTARInfo.com

www.DSTARUsers.org





D-STAR Nets

Name	Description	Day	Local Time	Time Zone	UTC	Location
FHN	Florida Hurricane Net	Mon	22:00:00	Eastern Daylight Time	2:00:00	REF034A
NEADS	New England Amateur D-STAR Net	Tue	20:00:00	Eastern Daylight Time	0:00:00	REF010C
QUEBEC1	Réseau D-STAR du Québec	Tue	20:00:00	Eastern Daylight Time	0:00:00	REF005B
ROCKET	Huntsville D-STAR Net	Tue	19:30:00	Central Daylight Time	0:30:00	K14PPFC
TRI1C	Tri-State Amateur D-STAR Net	Tue	20:30:00	Eastern Daylight Time	0:30:00	REF001C
TEXAS	Texas D-STAR Net	Tue	20:00:00	Central Daylight Time	1:00:00	REF004B
NCDS1	North Carolina D-STAR Net	Tue	21:00:00	Eastern Daylight Time	1:00:00	REF017C
ALADS	Birmingham Amateur Radio Club D-STAR Net	Tue	20:30:00	Central Daylight Time	1:30:00	REF002B
CODS	Colorado D-STAR Net	Tue	20:00:00	Mountain Daylight Time	2:00:00	WoCDS B
IRCN	Independent Radio Club Net	Tue	20:00:00	Pacific Daylight Time	3:00:00	WA6IRCC
SDTECH	PAPA System D-Star Net	Tue	20:00:00	Pacific Daylight Time	3:00:00	REF012B
LONDON	London D-STAR Net	Wed	20:00:00	GMT Daylight Time	19:00:00	GB7OK
INDS	Indiana State D-STAR Net	Wed	20:30:00	Eastern Daylight Time	0:30:00	W9ARP B WgICE B
FLDS	Florida State-Wide D-STAR DV Net	Wed	21:00:00	Eastern Daylight Time	1:00:00	REF004B
NCRN	National Capital Region Net (Washington DC)	Wed	21:00:00	Eastern Daylight Time	1:00:00	REF025C
WWDVAP	Worldwide DVAP Net	Wed	18:00:00	Pacific Daylight Time	1:00:00	REF014C
TTTDS	Tuscaloosa Tall Tower D-STAR Net	Wed	20:30:00	Central Daylight Time	1:30:00	REF002B
ILLDS	Illinois State D-STAR Net	Wed	21:00:00	Central Daylight Time	2:00:00	REF001B
PUGET	The Puget Sound D-STAR Roundtable	Wed	20:00:00	Pacific Daylight Time	3:00:00	WD7STRB
STAFFORD	Stafford Amateur Radio Association	Thu	19:30:00	Eastern Daylight Time	23:30:00	WS4VAC N4USI C
MJARC	Malfunction Junction ARC SC DSTAR	Thu	19:45:00	Eastern Daylight Time	23:45:00	KJ4BWKC
QUEBEC2	Réseau D-STAR du Québec	Thu	20:00:00	Eastern Daylight Time	0:00:00	REF005B
EMDRC	EMDRCD-Star Net	Thu	20:00:00	Eastern Daylight Time	0:00:00	REF003C
EAL	East Alabama D-STAR Net	Thu	19:30:00	Central Daylight Time	0:30:00	WB4GNAC
GVN	W6DHS Global Village Net	Thu	19:00:00	Pacific Daylight Time	2:00:00	REF001C
CODSN	Central Ohio D-STAR Net	Thu	20:00:00	Eastern Daylight Time	0:00:00	REF038A
CANADA	Canadian D-STAR Net	Fri	21:00:00	Eastern Daylight Time	1:00:00	REF016B
PUGETS	Puget Sound D-STAR Social Net	Fri	20:00:00	Pacific Daylight Time	3:00:00	REF035C
CNCRN	National Capitol Region Net (Ottawa)	Sat	8:30:00	Eastern Daylight Time	12:30:00	REF016B
QUEBEC3	Réseau International D-STAR Francophone	Sat	10:00:00	Eastern Daylight Time	14:00:00	REF005B
ITALIAN	Italian Language Net	Sat	18:00:00	Central Europe Daylight Time	16:00:00	REF007A
WIDSTAR	Wisconsin D-STAR Net	Sun	21:00:00	Central Daylight Time	2:00:00	REF019B
BCSF	BCSF Net	Sun	9:30:00	Pacific Daylight Time	16:30:00	K6MDD C VA7ICMC
NODIG	Ohio State Wide D-STAR Net	Sun	20:00:00	Eastern Daylight Time	0:00:00	REF038A
NUTS	Northern Utah Technical Society (NUTS)	Sun	19:00:00	Mountain Daylight Time	1:00:00	REF029C
OZARK	Ozark Mtn D-STAR Net	Sun	20:00:00	Central Daylight Time	1:00:00	REF001C
SEWX	Southeastern D-STAR Weather Net	Sun	21:00:00	Eastern Daylight Time	1:00:00	REF002A
TITN	Texas Interconnect Team Net	Sun	20:00:00	Central Daylight Time	1:00:00	K5TIT
DSRS	D-STAR Radio Scanning Net	Sun	21:00:00	Eastern Daylight Time	1:00:00	REF012C
FWARC	Federal Way Amateur Radio Club	Sun	19:00:00	Pacific Daylight Time	2:00:00	REF001B
BC2SF	BC to SF Net	Sun	20:00:00	Pacific Daylight Time	3:00:00	REF014A





Reflectors

Reflector	Usage	Location	Links	Special
REF100		Australia, United States	REF100	200MHz
REF101	Blind D-STAR repeater	Australia, United States	REF101	200MHz
REF102	D-STAR MegaRepeater	Australia, United States	REF102	200MHz
REF103	D-Star Reflectors	Australia, United States	REF103	200MHz
REF104	D-Star Reflectors	Norfolk, United States	REF104	200MHz
REF105	Scot's Net	Norfolk, United States	REF105	200MHz
REF106	Sama Net	Norfolk, United States	REF106	200MHz
REF107	Ad-hoc Emergency Use - Australia	Australia	REF107	200MHz
REF108	Paralink for Repeater, including WA Part 8 Repeaters - Australia	Australia	REF108	200MHz
REF109	Australia Net	Australia	REF109	200MHz
REF110	Australia US-phones	United States	REF110	1 GHz
REF111	Tasnet (Tasmania)	United States	REF111	1 GHz
REF112	General Ray (Over-English only please)	United States	REF112	1 GHz
REF113	UK Net, Paralink Repeaters	London, England	REF113	Status Update Guide Information
REF114	French Language - General and Business	London, England	REF114	Status Update Guide Information
REF115	Spanish Net	London, England	REF115	Status Update Guide Information
REF116	Denmark, Sweden, and Norway Repeaters	London, England	REF116	Status Update Guide Information
REF117	General Net	Italy	REF117	200MHz
REF118	Italian repeater (PMR, LPML, Local and all weekend)	Italy	REF118	200MHz
REF119		Italy	REF119	200MHz
REF120		Italy	REF120	200MHz
REF121		Italy	REF121	200MHz
REF122		Italy	REF122	200MHz
REF123		Italy	REF123	200MHz
REF124		Italy	REF124	200MHz
REF125		Italy	REF125	200MHz
REF126		Italy	REF126	200MHz
REF127		Italy	REF127	200MHz
REF128		Italy	REF128	200MHz
REF129		Italy	REF129	200MHz
REF130		Italy	REF130	200MHz
REF131		Italy	REF131	200MHz
REF132		Italy	REF132	200MHz
REF133		Italy	REF133	200MHz
REF134		Italy	REF134	200MHz
REF135		Italy	REF135	200MHz
REF136		Italy	REF136	200MHz
REF137		Italy	REF137	200MHz
REF138		Italy	REF138	200MHz
REF139		Italy	REF139	200MHz
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Questions

Schedule

Time	New User Track	Intermediate User Track	Repeater Owner, System Admin Track
8:45 – 9:30	Opening Session – Cisco Auditorium		
9:40 – 10:40	Getting Started with D-STAR Room 1110	Low Speed Data/DPRS Room 1120	Repeater Basics Room 1100
10:45 – 11:45	Linking/Call sign Routing Room 1110	High Speed Data/1.2 GHz Room 1120	G2 Gateway/Trust Server Room 1100
11:45 – 12:45	Lunch – Dining Hall in Student Center		
12:45 – 1:15	Demonstrations, Equipment Exhibits - Lobby		
1:15 – 2:15	Programming Radios Room 1100	Hotspots Room 1120	Repeater Operation, Maintenance – Room 1110
2:20 – 3:20	Programming Radio Practice Room 1100	D-RATS Room 1120	Gateway Utilities & Add- ons Room 1110
3:25 – 4:25	Using D-STAR Room 1100	DV Dongle and DVAP Room 1120	G4ULF Gateway Software Room 1110
4:30 – 5:30	Closing Session / Prizes – Cisco Auditorium		



For More Information

www.DSTARInfo.com

www.DSTARUsers.org

www.D-RATS.com

www.DVAPDongle.com

www.DVDongle.com

G4ULF.blogspot.com (G4ULF Repeater Software)

www.K4DSO.COM (DPlusReport and Monlink)

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