



# Getting Started with D-STAR

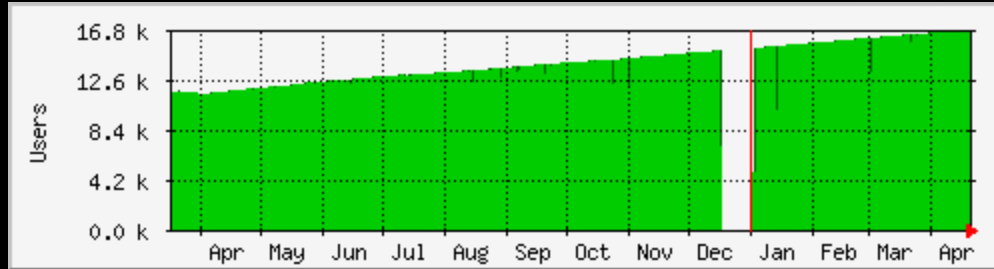
*The Basics*

*Ed Woodrick WA4YIH  
www.DSTARInfo.com*

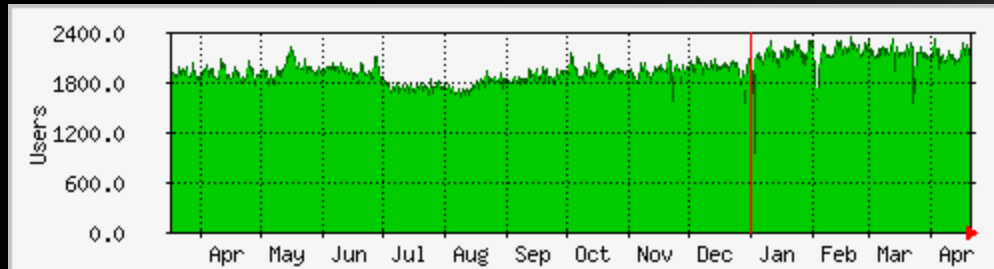


# How Popular is D-STAR

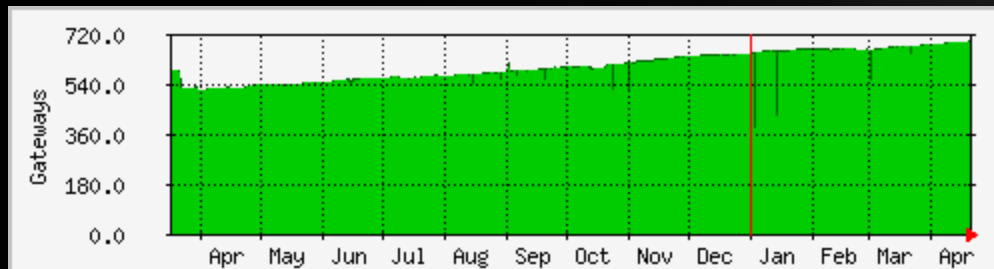
## Registered Users



## 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)

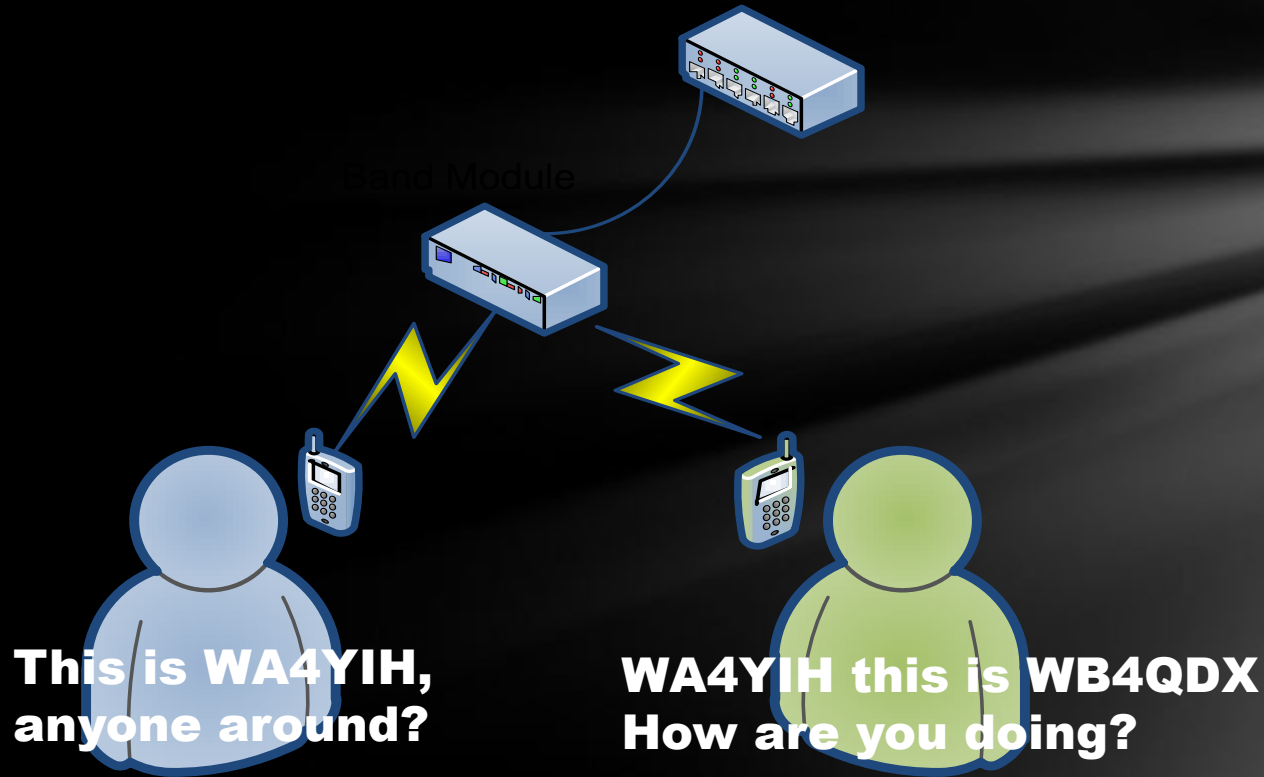
# Levels of D-STAR

*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





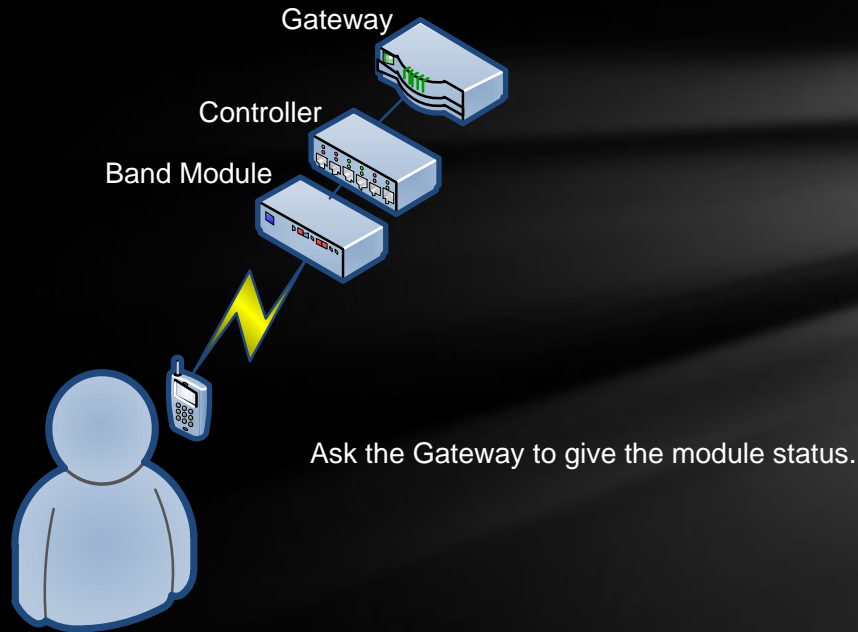


# Doing D-STAR 201

- Repeater Status
- Echo Test



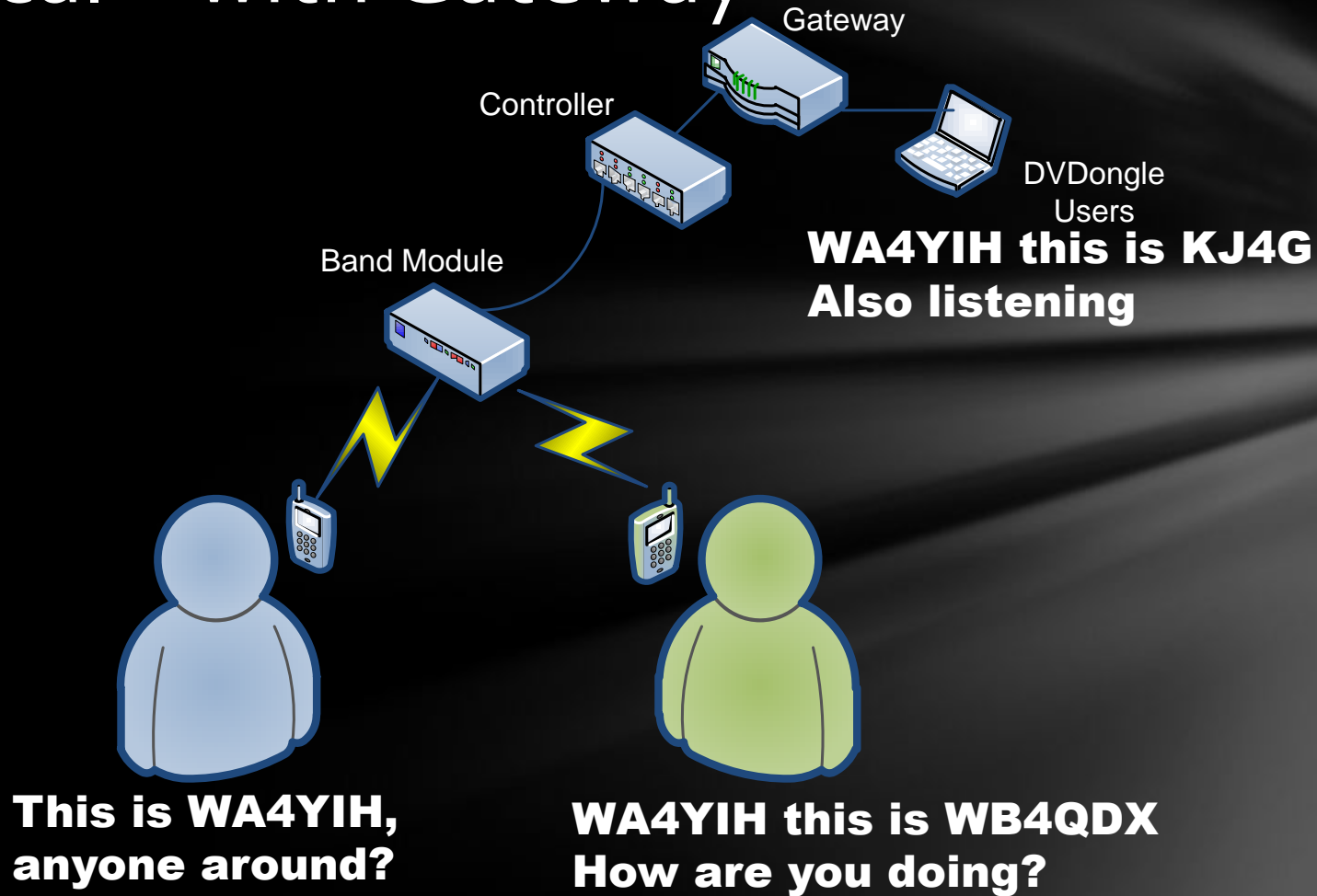
# Repeater Status



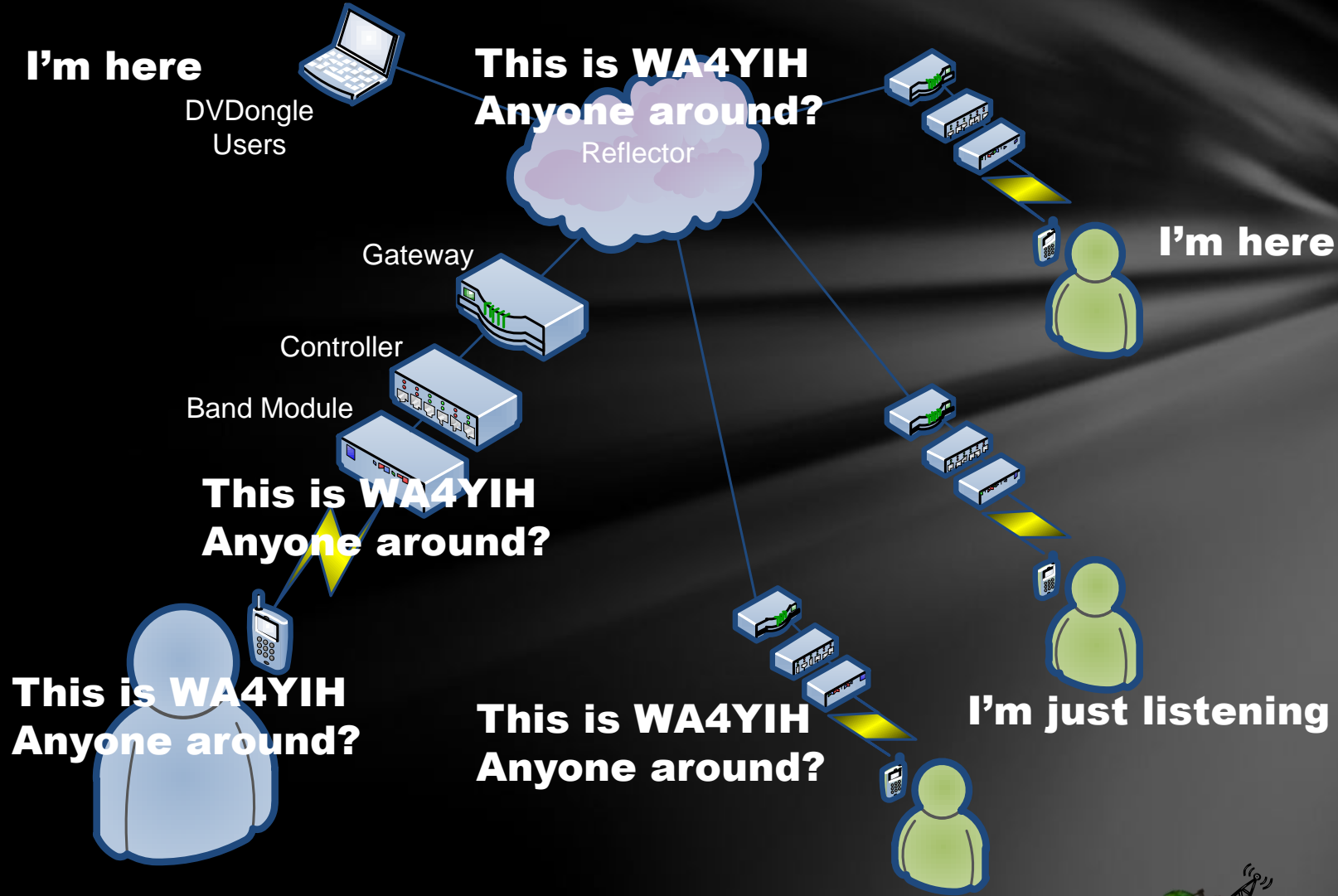
# Doing D-STAR 301

- 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](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.

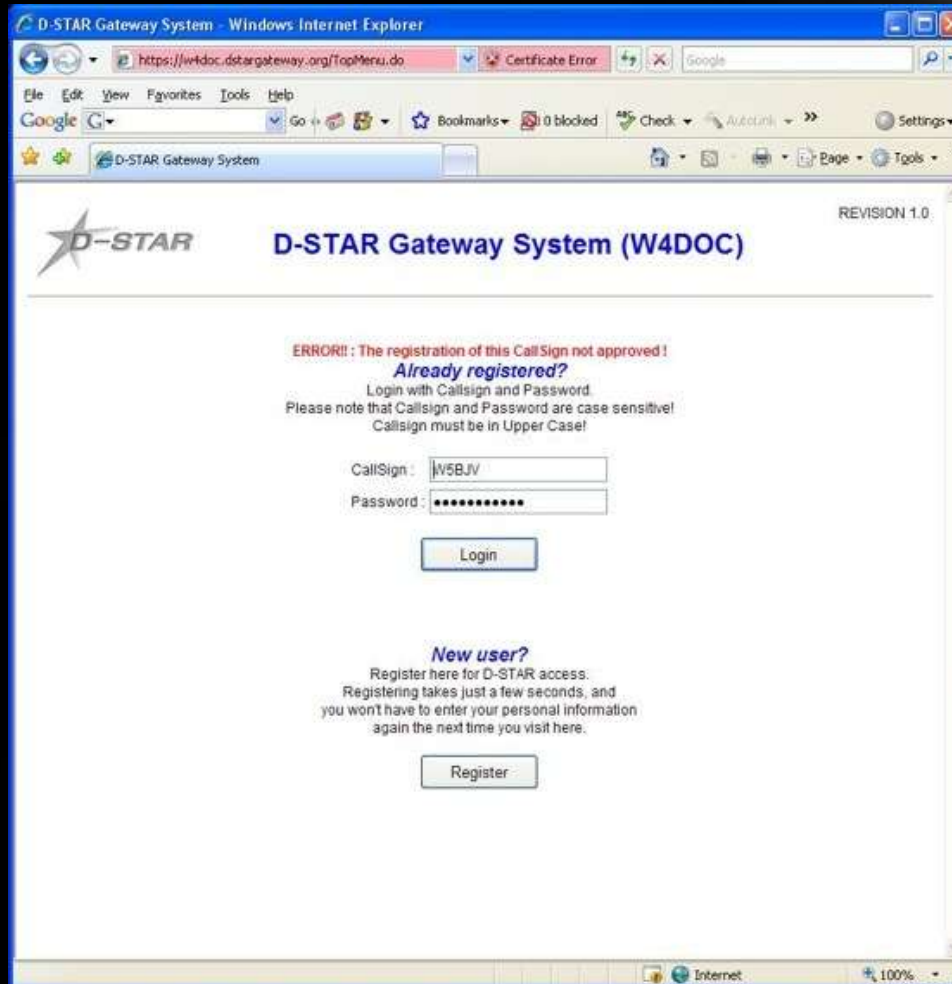
Password:  8 to 16 characters.

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 Go Bookmarks 0 blocked Check AutoLink Settings

D-STAR Gateway System Page Tools

**D-STAR** **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%

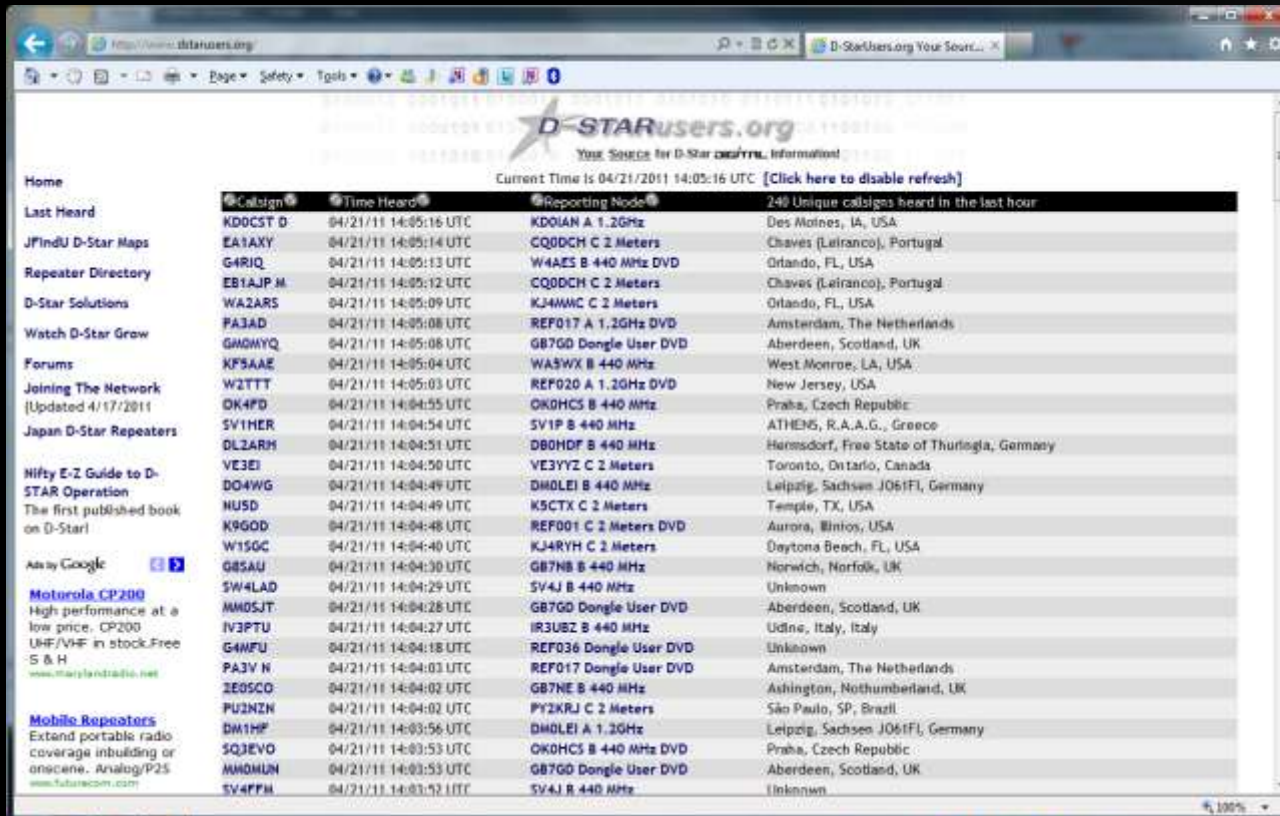
# D-STAR Resources

*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
<b>Last Heard</b>	<b>240 Unique callsigns heard in the last hour</b>
<b>KD0CST D</b> 04/21/11 14:05:16 UTC	<b>KD0IAN A 1.2GHz</b> Des Moines, IA, USA
<b>EA1AXY</b> 04/21/11 14:05:14 UTC	<b>CQ0DCH C 2 Meters</b> Chaves (Leiranco), Portugal
<b>G4RIQ</b> 04/21/11 14:05:13 UTC	<b>W4AES B 440 MHz DVD</b> Orlando, FL, USA
<b>EB1AJP M</b> 04/21/11 14:05:12 UTC	<b>CQ0DCH C 2 Meters</b> Chaves (Leiranco), Portugal
<b>WA2ARS</b> 04/21/11 14:05:09 UTC	<b>KJ4MWC C 2 Meters</b> Orlando, FL, USA
<b>PA3AD</b> 04/21/11 14:05:08 UTC	<b>REF017 A 1.2GHz DVD</b> Amsterdam, The Netherlands
<b>GW6WYQ</b> 04/21/11 14:05:08 UTC	<b>GB7GD Dongle User DVD</b> Aberdeen, Scotland, UK
<b>KF5AAE</b> 04/21/11 14:05:04 UTC	<b>WA5WX B 440 MHz</b> West Monroe, LA, USA
<b>W2TTT</b> 04/21/11 14:05:03 UTC	<b>REF020 A 1.2GHz DVD</b> New Jersey, USA
<b>OK4FD</b> 04/21/11 14:04:55 UTC	<b>OK0HCS B 440 MHz</b> Praha, Czech Republic
<b>SV1HER</b> 04/21/11 14:04:54 UTC	<b>SV1P B 440 MHz</b> ATHENS, R.A.A.G., Greece
<b>DL2ARH</b> 04/21/11 14:04:51 UTC	<b>DB0HDF B 440 MHz</b> Hermsdorf, Free State of Thuringia, Germany
<b>VE3EI</b> 04/21/11 14:04:50 UTC	<b>VE3YYZ C 2 Meters</b> Toronto, Ontario, Canada
<b>DO4WG</b> 04/21/11 14:04:49 UTC	<b>DM0LEI B 440 MHz</b> Leipzig, Sachsen J061FI, Germany
<b>HU5D</b> 04/21/11 14:04:49 UTC	<b>K5CTX C 2 Meters</b> Temple, TX, USA
<b>K9G0D</b> 04/21/11 14:04:48 UTC	<b>REF001 C 2 Meters DVD</b> Aurora, Illinois, USA
<b>W15GC</b> 04/21/11 14:04:40 UTC	<b>KJ4RYH C 2 Meters</b> Daytona Beach, FL, USA
<b>G85AU</b> 04/21/11 14:04:30 UTC	<b>GB7NB B 440 MHz</b> Norwich, Norfolk, UK
<b>5W4LAD</b> 04/21/11 14:04:29 UTC	<b>5V4J B 440 MHz</b> Unknown
<b>MM05JT</b> 04/21/11 14:04:28 UTC	<b>GB7GD Dongle User DVD</b> Aberdeen, Scotland, UK
<b>IV3PTU</b> 04/21/11 14:04:27 UTC	<b>IR3UBZ B 440 MHz</b> Udine, Italy, Italy
<b>G4MFU</b> 04/21/11 14:04:18 UTC	<b>REF036 Dongle User DVD</b> Unknown
<b>PA3V N</b> 04/21/11 14:04:03 UTC	<b>REF017 Dongle User DVD</b> Amsterdam, The Netherlands
<b>3E0SCO</b> 04/21/11 14:04:02 UTC	<b>GB7NE B 440 MHz</b> Ashington, Northumberland, UK
<b>PJ2NZN</b> 04/21/11 14:04:02 UTC	<b>PY2KRJ C 2 Meters</b> São Paulo, SP, Brazil
<b>DM1HF</b> 04/21/11 14:03:56 UTC	<b>DM0LEI A 1.2GHz</b> Leipzig, Sachsen J061FI, Germany
<b>SQ3JEVO</b> 04/21/11 14:03:53 UTC	<b>OK0HCS B 440 MHz DVD</b> Praha, Czech Republic
<b>MH0MUN</b> 04/21/11 14:03:53 UTC	<b>GB7GD Dongle User DVD</b> Aberdeen, Scotland, UK
<b>5V4FFM</b> 04/21/11 14:03:52 UTC	<b>5V4J B 440 MHz</b> 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 the URL: <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  
UVB 441 5000 +5.0000  
DVC 145 0600 +1.4000
- Function: Local Repeater with Gateway
- Destination Module: DD A 1298 0000 RPS  
UVB 441 5000 +5.0000  
DVC 145 0600 +1.4000

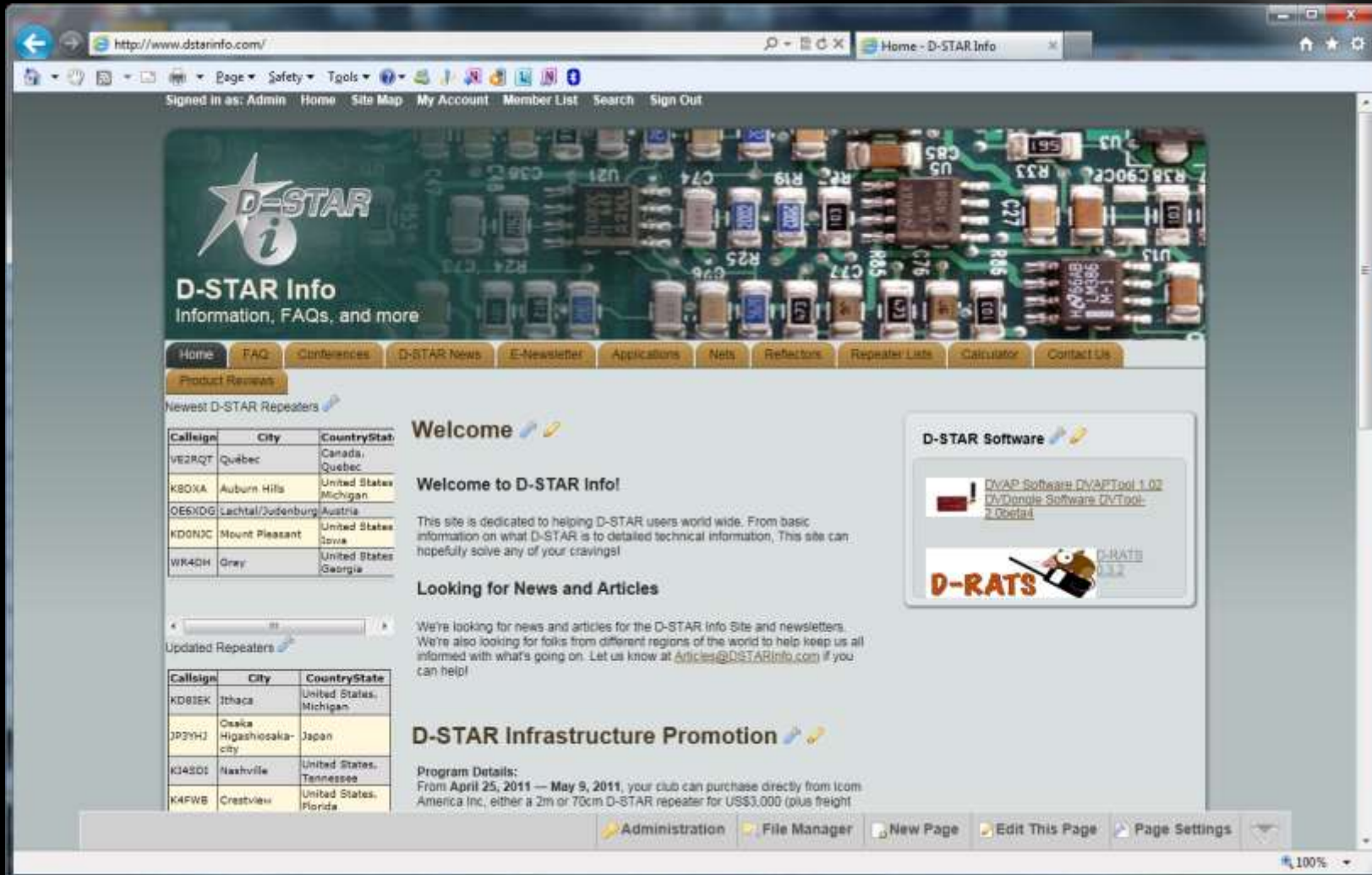
Below the form, there is a link: "For D-STAR News and Information, check out [www.DSTARINFO.com](http://www.DSTARINFO.com)".

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" (router) is connected to a "Repeater" (radio) and "D-Star Users" (laptop and mobile phone). The "Repeater" is also connected to "Remote Users" (two mobile phones). The text below the diagram reads: "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 Doogle users to hear me." and "I'm also near the same repeater and listening on the same port".

At the bottom, there is a text box: "CQ CQ CQ This is (your call sign) listening on the Lawrenceville repeater, WD4STR (port DV B) Say Hoowdy!" and a navigation bar with "Administration", "File Manager", "New Page", "Edit This Page", and "Page Settings".



[Home](#)
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[Nets](#)
[Repeaters](#)
[Repeater Lists](#)
[Calculator](#)
[Contact Us](#)

[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](mailto: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**

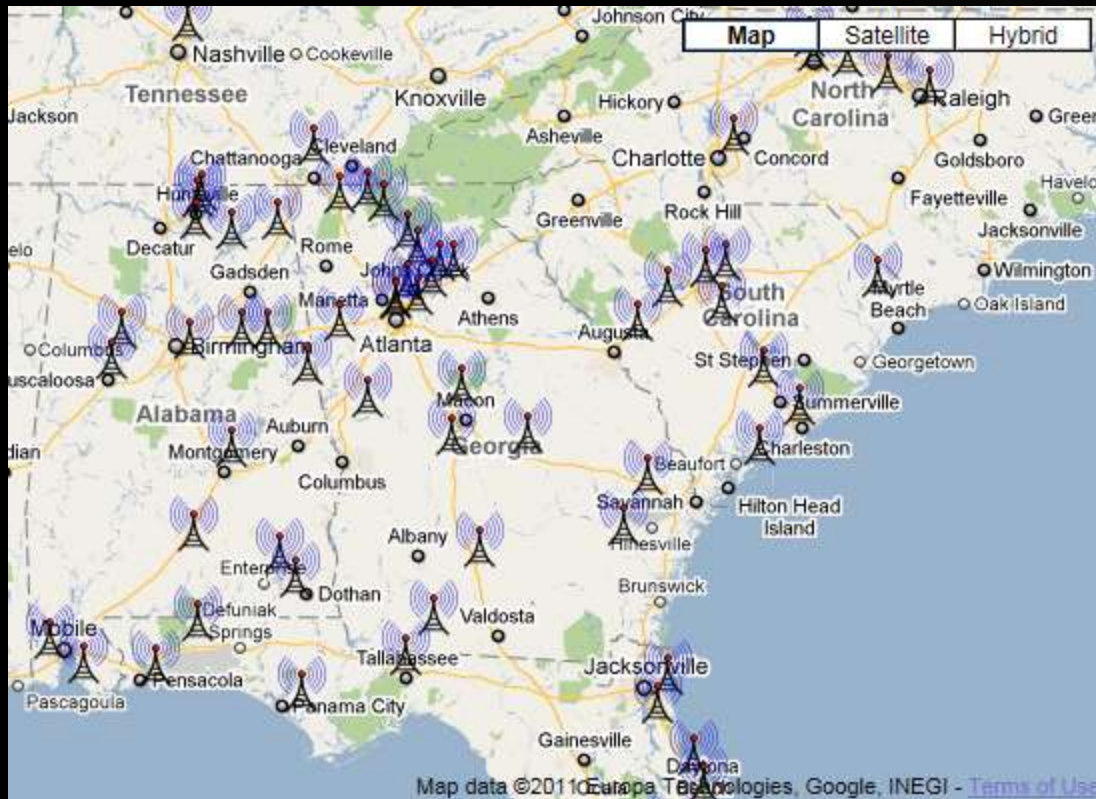
**Program Details:**  
 From April 25, 2011 — May 9, 2011, your club can purchase directly from Icom America Inc, either a 2m or 70cm D-STAR repeater for US\$3,000 (plus freight)

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

# Repeaters

[www.DSTARInfo.com](http://www.DSTARInfo.com)

[www.DSTARUsers.org](http://www.DSTARUsers.org)





# D-STAR Nets

Name	Description	Day	Local Time	Time Zone	UTC	Location
FHN	<a href="#">Florida Hurricane Net</a>	Mon	22:00:00	Eastern Daylight Time	2:00:00	REF034A
NEADS	<a href="#">New England Amateur D-STAR Net</a>	Tue	20:00:00	Eastern Daylight Time	0:00:00	REF010C
QUEBEC1	<a href="#">Réseau D-STAR du Québec</a>	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	<a href="#">Tri-State Amateur D-STAR Net</a>	Tue	20:30:00	Eastern Daylight Time	0:30:00	REF001C
TEXAS	<a href="#">Texas D-STAR Net</a>	Tue	20:00:00	Central Daylight Time	1:00:00	REF004B
NCDS1	<a href="#">North Carolina D-STAR Net</a>	Tue	21:00:00	Eastern Daylight Time	1:00:00	REF017C
ALADS	<a href="#">Birmingham Amateur Radio Club D-STAR Net</a>	Tue	20:30:00	Central Daylight Time	1:30:00	REF002B
CODS	<a href="#">Colorado D-STAR Net</a>	Tue	20:00:00	Mountain Daylight Time	2:00:00	WoCDS B
IRCN	<a href="#">Independent Radio Club Net</a>	Tue	20:00:00	Pacific Daylight Time	3:00:00	WA6IRCC
SDTECH	<a href="#">PAPA System D-Star Net</a>	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	<a href="#">Indiana State D-STAR Net</a>	Wed	20:30:00	Eastern Daylight Time	0:30:00	W9ARP B WgICE B
FLDS	<a href="#">Florida State-Wide D-STAR DV Net</a>	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	<a href="#">Tuscaloosa Tall Tower D-STAR Net</a>	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	<a href="#">The Puget Sound D-STAR Roundtable</a>	Wed	20:00:00	Pacific Daylight Time	3:00:00	WD7STRB
STAFFORD	<a href="#">Stafford Amateur Radio Association</a>	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	<a href="#">Réseau D-STAR du Québec</a>	Thu	20:00:00	Eastern Daylight Time	0:00:00	REF005B
EMDRC	<a href="#">EMDRCD-Star Net</a>	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	<a href="#">W6DHS Global Village Net</a>	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	<a href="#">Réseau International D-STAR Francophone</a>	Sat	10:00:00	Eastern Daylight Time	14:00:00	REF005B
ITALIAN	<a href="#">Italian Language Net</a>	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	<a href="#">BCSF Net</a>	Sun	9:30:00	Pacific Daylight Time	16:30:00	K6MDD C VA7ICMC
NODIG	<a href="#">Ohio State Wide D-STAR Net</a>	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	<a href="#">Ozark Mtn D-STAR Net</a>	Sun	20:00:00	Central Daylight Time	1:00:00	REF001C
SEWX	<a href="#">Southeastern D-STAR Weather Net</a>	Sun	21:00:00	Eastern Daylight Time	1:00:00	REF002A
TITN	<a href="#">Texas Interconnect Team Net</a>	Sun	20:00:00	Central Daylight Time	1:00:00	K5TIT
DSRS	<a href="#">D-STAR Radio Scanning Net</a>	Sun	21:00:00	Eastern Daylight Time	1:00:00	REF012C
FWARC	<a href="#">Federal Way Amateur Radio Club</a>	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









# Yahoo Groups

Groups.Yahoo.com

- [DSTAR\\_digital](#)
- [DVAPDongle](#)
- [DVDongle](#)
- [GA\\_DSTAR](#)
- [SE\\_WXNet](#)
- [D-STAR\\_23cm](#)



# 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](http://www.DSTARInfo.com)

[www.DSTARUsers.org](http://www.DSTARUsers.org)

[www.D-RATS.com](http://www.D-RATS.com)

[www.DVAPDongle.com](http://www.DVAPDongle.com)

[www.DVDongle.com](http://www.DVDongle.com)

[G4ULF.blogspot.com](http://G4ULF.blogspot.com) (G4ULF Repeater Software)

[www.K4DSO.COM](http://www.K4DSO.COM) (DPlusReport and Monlink)

[Groups.Yahoo.com](http://Groups.Yahoo.com)

- [DSTAR\\_digital](#)
- [DVAPDongle](#)
- [DVDongle](#)
- [GA\\_DSTAR](#)
- [SE\\_WXNet](#)
- [D-STAR\\_23cm](#)

