Information and news about D-STAR in Amateur Radio

D-STAR Newsletter

15 May 2009

Volume 1, Issue 1

D-STAR Statistics

- Over 1400 Users Active Each Day
- Over 8000 Registered Users
- Over 400 Repeater Systems

Inside this issue

California Looks to 1.2 GHz for Frequencies

Curt Kundred, W6FQ

Frequency issues are of paramount concern in most major metropolitan areas, none more so than in Northern California.

The Department of Defense's PAVE PAWS radar system has eliminated much of the 70cm spectrum shuttering many repeaters in this heavily populated region. Compounding this problem is the fact that the 2-meter spectrum is already pushed to its limits and new technologies, which make more efficient use of this shared resource, have not necessarily been greeted with open arms.

While trying to work with the coordinating authorities on plans to accommodate both entrenched and newer technologies, D-STAR users have had to look at innovative approaches to make use of these powerful new tools.

Operators throughout Northern California are making greater use of the 23cm band. While not ideal for mobile use it has become an increasingly more important—albeit expensive—mode for base operations.

While D-STAR systems have had problems finding permanent frequencies on the 2-meter spectrum, the 1.2 GHz systems have found permanent homes and are serving as a catalyst to grow a legion of D-STAR supporters.

"In 1987, I installed the first 1200 MHz analog

(Continued on page 6)

D-RATS Maps and Messages

Dan Smith, KK7DS

It's hard to ignore the growing popularity of Icom's new D-STAR radios. One of the attractive attributes of the devices is the integrated data capability, allowing an attached device to send and receive data without any additional hardware such as a TNC. The radios make use of this channel for GPS position information, but also provide a serial port for general use.

D-RATS is an application that allows an attached PC to use the radio's serial port to transfer data of various types. A general purpose file-transfer function allows transporting documents, spreadsheets and even images over the air. An integrated map shows you where and how far away other stations are from your current position. Structured form-based messages allow peragency forms to be defined and sent over the air error-free, and can be printed on either end.

D-RATS can behave like a "server" for files or a drop box for messages, allowing it to function unattended in a remote location. A recent addition to the toolkit is an email gateway which allows a station with internet (or WinLink) access to share the service with other RF stations.

Anyone interested in testing without the use of a radio can use the included "ratflector" tool to link multiple D-RATS stations over a conventional network (or high-speed D-STAR link). This can be very valuable for classroom-based training and simulation. The ratflector can also be connected to a single radio to bridge the network traffic to RF, or to multiple radios to create a "poor man's digipeater".

(Continued on page 5)

Welcome to D-STAR Info We're All About D-STAR

Welcome to the inaugural issue of D-STAR Info. This newsletter is all about D-STAR, the open digital standard for Amateur Radio developed by the Japan Amateur Radio League and in use worldwide. D-STAR is experiencing tremendous growth and is finding many uses in Amateur Radio.

We want to share your stories about what's happening in D-STAR, how it's being used and bring you operating hints and tips.

D-STAR Info will be published quarterly and available in print, web and downloadable PDF formats.

To be your source for D-STAR information, we need you! Please send us your stories, photos, events, tips and news from your area to Articles@DSTARInfo.com.

D-STAR for Everyone!

Been looking for an easy way to climb aboard the D-STAR express? Let the new IC-80AD and ID-880H be your tickets to ride! With an improved user interface, smart new look, and free programming software included you can't go wrong!

Get on track and join in on the D-STAR fun today!

3G D-STAR

NEW IC-80AD

THIRD GENERATION 2M/70CM DUAL BANDER

- 5/2.5/.5/.1 Watt 2m/70cm
- AM, FM, WFM
- RX: 0.495-999.990MHz**
- Improved User Interface
- Color Power
- Free Programming Software!*

*www.icomamerica.com/amateur/DSTAR
for details about free software

NEW IC-880H

VERSATILE 2M/70CM DUAL BAND MOBILE

- 50 Watt/VHF/UHF
- AM, FM, DV
- RX: 118-999.99MHz**
- 800 Alphanumeric Memory Channels
- **Free Programming Software!***

D-STAR

*www.icomamerica.com/amateur/DSTAR
for details about free software

Featured Net

Southeastern D-STAR Weather Net

The Southeastern US is an area frequented by severe weather in the form of thunderstorms, lightning, hail, tornados and hurricanes. D-STAR's ability to communicate easily around the Southeast is a valuable tool during severe weather conditions.

The Southeast D-STAR Weather Net was created to practice linking systems and operating a regional, multi-state net. The net was one of the first to use the "quick key" format for check-ins using D-STAR's callsign visibility with each transmission. When a state is called, stations key for one second and Net Control sees a list of callsigns allowing rapid check ins to the net.

When severe weather occurs in the Southeast, stations are encouraged to connect repeaters to REF002A for information on affected areas, approaching conditions or to provide communications assistance.

The net meets regularly for training and practice on Sunday evenings at 2100 Eastern, 2000 Central on REF002A with over 50 stations and 25 repeaters typically connecting each week.

D-STAR Nets

Weekday	Time	TZ	Description	Location
Monday	20:00	EST	DV Weekly D-STAR Net	K3PDR
Tuesday	20:30	EST	Tri-State Amateur D-STAR Net	REF001C
Tuesday	19:30	CST	Huntsville D-STAR Net	KI4PPFC
Tuesday	20:00	PST	San Diego D-STAR Tech	KI6KQU
Tuesday	20:30	CST	Birmingham Amateur Radio Club Net	REF002B
Tuesday	20:00	PST	Independent Radio Club Net	WA6IRCC
Tuesday	20:00	CST	Texas D-STAR Net	REF004A
Tuesday	19:00	EST	EPA, NJ, NY Regional EmComm Net	REF002A
Tuesday	19:00	EST	Toronto ARES Net	VE3WIKC
Wednesday	21:00	EST	Florida State-Wide D-STAR DV Net	REF004B
Wednesday	20:00	PST	The Puget Sound D-STAR Roundtable	WD7STRB
Wednesday	20:00	PST	Los Angeles D-STAR Nets	REF012B
Wednesday	20:30		Indiana State D-STAR Net	W9ARP•B W9ICE•B
Wednesday	20:30	CST	Tuscaloosa Tall Tower D-STAR Net	REF002B
Thursday	19:30	CST	East Alabama D-STAR Net	WB4GNAC
Thursday	19:00	PST	W6DHS Global Village Net	REF001C
Thursday	20:00	EST	EMDRC D-STAR Net	REF003C
Thursday	19:45	EST	Malfunction Junction ARC SC	KJ4BWKC
Thursday	19:30	EST	Stafford Amateur Radio Association	WS4VA•C N4USI•C
Friday	21:00	EST	Canadian D-STAR Net	REF016B
Saturday	18:00	CEST	Italian Language Net	REF007A
Sunday	20:00	EST	Buckeye D-STAR Net	W8DIG•C
Sunday	21:00	EST	Southeastern D-STAR Weather Net	REF002A
Sunday	19:00	PST	Federal Way Amateur Radio Club	REF001B
Sunday	09:30	PST	BCSF Net	K6MDD•C VA7ICMC
Sunday	20:00	CST	Texas Interconnect Team Net	K5TIT
Sunday	20:00	CST	Ozark Mountain D-STAR Net	REF001C
Sunday	20:00	PST	BC to SF Net	REF014A

Grant Sources Can Fund New D-STAR Systems

Getting a D-STAR repeater in an area can be challenging. The same obstacles must be overcome for any repeater project. First, there's the site issue. Having a great repeater location that covers the desired area may be easier than you think. Frequencies are also a scarce commodity so partnering with an existing repeater may be your best path. In most areas, there are many repeaters, but not as much activity. Converting an existing repeater to D-STAR can solve the site and frequency problem with the added benefit of attracting new activity. Many clubs sponsor multiple repeaters and are looking for new ways to attract club members and support new Amateur Radio technologies. Making a presentation to a local club or EmComm group such as ARES or RACES can generate interest in D-STAR

The next question is how to pay for the equipment. The basic D-STAR repeater consists of a controller and from one to four radio modules depending on the frequency bands and data speeds you wish to support. As with all repeaters, a DC supply, rack and duplexers for each band are necessary. If you want to add the capability for linking to other D-STAR systems (this is the real magic of D-STAR), add a computer dedicated to the Gateway function. In its simplest form, count on about $3,500 growing to around $14,000 for a fully equipped system with all new hardware. Don't let the price tag scare you off because most Amateurs have access to duplexers, power supplies and other hardware that can keep the cost down.

A club or EmComm group may have funds or funding sources available. Repeaters with a focus or stated purpose to support emergency communications can open additional doors for new funding sources. After 9/11, the Department of Homeland Security began funding EmComm projects. Unfortunately, funding had to be for P-25 projects only. The good news is that has changed. In August 2008 when DHS released the updated National Emergency Communications Plan, D-STAR qualified in the "Emerging Technology" category and EmComm projects have been funded around the country. They not only provide funding to purchase hardware, they cover installation, upkeep, as well as training. While Part 97 defines Amateur Radio as non-compensated communications, there is nothing in Part 97 that says Amateurs Radio Operators must provide their equipment for free!

Contact your local Emergency Management Agency to explore funding possibilities under the NECP. For more information on the NECP, visit

www.dhs.gov/xlibrary/assets/national_emergency_communications_plan.pdf.

W0S Salutes Titanic

Rod Kittleman, KØADI
Southwest Missouri ARRL PIO

When the Titanic went down 97 years ago in 1912 more than 1,500 people perished. 706 survived, and maybe solely thanks to new technology, the Marconi radio, used to signal for help.

On Saturday April 11th, Ham radio operators from all over Missouri flocked to the Titanic Museum in Branson to honor the brave radio crew who risked their lives to send out that SOS. Again, another new technology was brought on board.

DSTAR became a major player for the WØS Special Event thanks to the Ozark Mountain Amateur Radio group and Connie Ballantyne KB0ZSG.

"Several hams made contact with the Titanic Museum using the gateways REF001C, and REF005A and an Icom 2820." said spokesperson Rod Kittleman, ARRL PIO for the SW Missouri hams. "We made contact with Scotland, England, Canada, Australia, Italy, France, Spain, as well as several states in the United States. With over 300 contacts made, DSTAR came in second behind CW for making the most contacts. This is the third year that we have used DSTAR and 2009 proved that the mode is growing."

Plans are in place to hold the WØS Special Event every year up to 100th anniversary of the Titanic disaster. To see highlights and updates from the event go to www.wzeros.com for photos and video .

THE BC to SF NET

The Longest Running Net on D-STAR
Curt Kundred, W6FQ

Gordon "Gord" Dick (VE7FKY) and Darryl Cohn (WA6YTD) share much in common. They were both drawn to amateur radio at a time when building systems was as much a part of the hobby as using them and they both share a desire to spread the word—well sometimes lots of words—about the power of D-STAR.

"The early days of D-STAR were extremely frustrating," said Gordon Dick. "We had these great radios full of promise but you'd turn them on and all you'd get was silence—but at least it was digital quality," he says with a smile.

To combat this problem the two friends decided that if they just started talking others would soon join in. So in late March 2007, they began what is believed to be North America's first and now longest running D-STAR net. Connecting the Bay Area's K6MDD repeater and operators with their counterparts on the VA7ICM repeater in Surrey, British Columbia, the BC to SF Net was begun.

"Initially we were using the old G1 D-STAR systems so it was not a simple process to connect repeaters, each radio had to be configured correctly," said Darryl Cohn. "It was tedious and required lots of patience because one radio without the proper settings would cause the repeater connection to crash, but Gord and I worked through the bugs and helped others to join in the conversation."

The first Net lasted 90 minutes and had only 4 check-ins, but those four operators were not only part of North American D-STAR history they became first hand witnesses to D-STAR lore. During the session, Darryl asked Gord how his signal was coming through and Gord replied, "You sound like that guy from Star Wars, R2D2." The famous phrase stuck and is now a permanent part of D-STAR vernacular.

"In 2007 we talked a lot about the technology and just helping folks to understand their radios", says Dave Billeci. (WA6UHA) "But after two years we've really come to know one another, so now it's more about discussing current events and sharing what's going on in our lives. And because of this wonderful net I've even had the pleasure of meeting up with my Canadian friends while travelling through British Columbia."

There are many D-STAR nets now but this one is special," says George Tickner. (KI6NHY) "It has a long history and it's an honor to be one of many operators to keep this Sunday morning tradition alive. The relationships that we've developed are in many ways a tribute to Darryl and Gord. Their original intent was to promote a new technology but I think the lessons we'll all take away are far more profound."

"I'm always joking that today's D-STAR is not your father's Oldsmobile. D-STAR is constantly changing and I'd love to see the net on a reflector," said Larry Lecrone. (WW6USA) "The Bay Area is massive and one repeater cannot provide coverage everywhere but I also understand that this net is not about numbers of check-ins it's about tradition and common respect."

While there may not always be consensus as to how the two groups connect, participants in the "longest running net on D-STAR" agree that conversations and friendship are what drive the hobby—but amateur radio and technologies like D-STAR make those magical—and sometimes even historical—connections possible.

Send Files and Photos on 1.2 DD at 128 Kb

One of D-STAR's unique capabilities is the ability to send and receive 128 Kb data on 1.2 GHz using the Icom ID-1 radio. The ID-1 acts as an Ethernet link to the Internet with its own IP address. You need to get that IP address from the Registration Page where you registered your call. You local system administrator can also help you locate that IP address.

Once you've connected a PC to your ID-1's Ethernet port and setup your PC's Ethernet port to that address, you're in business.

Last October's ARES Simulated Emergency Test for Gwinnett County, Georgia used the ID-1 to transmit field photos of simulated flood locations directly to EOC screens. One of the photos sent over D-STAR is shown at right.

Photo sent over ID-1 from field to EOC.
Photo provided by Gwinnett County ARES (Georgia)

What is a Reflector?

John Davis, WB4QDX
Contributing Editor

Most D-STAR systems connect to the Internet from DSL systems that have a downlink speed of 1.5 to 3 mbps. That's plenty for most linking and data applications. However, the uplink speed is on average128 to 384 kbps. That's still okay for linking to another repeater and even accepting a DV Dongle or two. But what if you want to use the Multicast feature that was introduced in G2 or you want to link several repeaters together. Chances are you won't have enough uplink bandwidth to support several connections.

Developed as an offshoot of the DPlus software from Robin Cutshaw (AA4RC), the Reflector software emulates the three modules of a D-STAR repeater. The difference is that Reflectors are computers with a fast CPU and more memory and connected to a robust, high speed data link as in a Data Center.

When a repeater is linked to a reflector, it only has to feed the data stream to one gateway, the Reflector, and let it distribute the data stream to all the repeaters connected to the Reflector.

If your System Admin permits linking, you can link to a Reflector by putting `REF001CL` in UR to link to Reflector `001•C`.

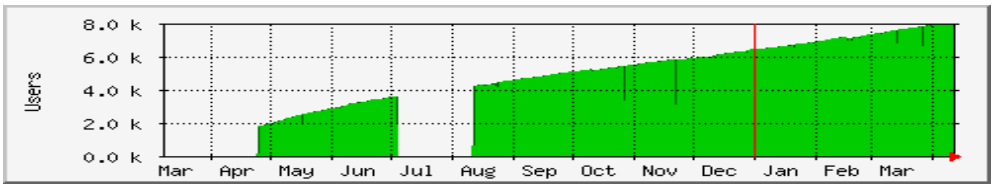
A complete list of reflectors can be found at www.dstarinfo.com/reflectors/reflectors.htm

D-STAR Continues to Grow

Courtesy of DStarUsers.org

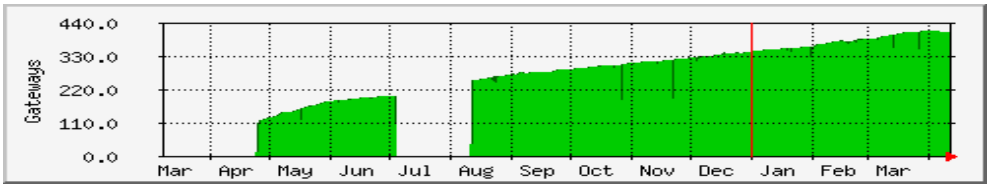
D-STAR continues to experience tremendous growth increasing from around 2,000 registered users in April, 2008 to over 8,000 in one year.

Registered D-STAR Users



Registered D-STAR Gateways (multiple repeaters are usually registered under one gateway)

The number of D-STAR Gateways has also grown from around 110 systems to over 400 in the last 12 months. Each Gateway may have from one to four repeaters connected.



(Continued from page 1) *D-RATS Maps and Messages*

Finally, a public always-on ratflector is available for testing and discussion with other users around the globe.

D-RATS is freely-available, open-source, and cross-platform. Native packages are available for Linux, Mac OS and Windows. If you're interested in D-RATS, go to the web page for download and installation information. If you're interested in testing beta versions, reporting bugs, and suggesting new features, be sure to join the mailing list.

www.D-RATS.com

Alabama Links Repeaters for Severe Weather (11 April 2009)

Randall Lander, Alabama ARES District 7 DEC
(Reprinted with permission from the AL-DSTAR Yahoo Group)

Hello Everyone,

As most of you know, today in Alabama we had a High Risk and a moderate Risk for severe weather across most of the state. We linked up WB4GNA Cheaha, K4DSO Birmingham, W4KCQ Tuscaloosa and W4AP Montgomery to Reflector 002 B. Even a few Georgia D-STAR Systems linked in to listen to the severe weather events and reports. This was a very important link up session. It showed at a moments notice in a time of need, we can link up D-STAR for Emergency or Tactical nets. This was also important to show the NWS stations that we want to support there operations any way possible. This is another way to get vital weather reports from long distance the weather offices quickly from anywhere in the state.

D-STAR is not going to compete with analog weather nets, but will aid analog weather nets by giving information via voice and Data and not using the main Emergency repeater for reports. Today while linked to the reflector waiting on the weather to arrive, several stations practiced and tested D-RATS on the chat and sending memos to each other. Also using the map portion of D-RATS, WB4FAY was mobile sending his GPS coordinates and we we're able to track him live as well as AA4RC in Atlanta was sending his GPS coordinates.

If anytime, anyone in the state of Alabama needs the Cheaha Mountain D-STAR linked to anything for any event, please let me know.

01000100 00101101 01010011 01010100 01000001 01010010 00100000 01010010 01101111 01100011 01101011 01110011

(Continued from page 1) *California Looks for Frequencies*

repeater on Mt Diablo at 3800'. The user base grew to about 40 people before the manufacturers stopped producing 1200 MHz analog radios. In 2006, I converted the 1200 MHz analog repeater to D-STAR and added both the VHF and UHF modules," commented Tim Barrett (K6BIV), trustee of the Bay Area's K6MDD repeater. "The coverage of the D-STAR 1200 MHz is about 15% better than that of the former analog 1200 MHz repeater. The D-STAR 1200 MHz user base is about 40 people and is continuing to build. All of the D-STAR users on the 1200 MHz repeater comment on the audio quality of the D-STAR system and less interference than they do on other bands."

To propel this growth and to share particular insight into the capabilities of the Icom ID-1, a group of Northern California operators began a net in December of last year.

"We not only want to grow enthusiasts we want to shorten learning curves on all the capabilities of these amazing systems," said George Tickner, (KI6NHY) control operator of the ID-1 net. "We feel we're doing that but more importantly we've built strong bonds amongst the group."

"I've been hamming for 47 years and I'm having a ball," commented Darryl Cohn. (WA6YTD) "I've become a big fan D-STAR and of the ID-1 radio in particular. The quality of transmission and its capabilities are unmatched. The more people are exposed to the system I am convinced the more popular it will become and the more attractive our hobby will be to a new generation of Hams."

The net welcomes anyone with an interest in this band and the ID-1 systems. The net runs between 8:00 a.m. and 9:30 a.m. PDT every Sunday on reflector 14A.

01000100 00101101 01010011 01010100 01000001 01010010 00100000 01010010 01101111 01100011 01101011 01110011

I Just Bought A D-STAR Radio—Now What?

Ed Woodrick, WA4YIH—Contributing Editor

I'm going to guess that you'll figure out how to get the radio out of the box, battery installed, and antenna connected, so I'm skipping that part. Let's say that you got a new radio, like one of the Icom IC-80AD, IC-91AD, or IC-92AD handhelds and you are at the Dayton Hamvention, ready to get started with D-STAR.

You've heard the horror stories about programming the radio and you're a bit hesitant to turn the radio on, but I'll go through a couple of steps that will get you on the air in VERY FEW KEYSTROKES.

The first is determining the frequency of the local repeater. If you can't find another D-STAR user nearby, go to www.DSTARUsers.org . Select *Repeater Directory* on the left hand side to bring up a list of all known repeaters . You can sort it by clicking on one of the up or down arrows on the column headings.

For D-STAR repeaters, you will need to be on the B VFO, which you can change by hitting the BAND button. Then, select the VFO and enter your frequency. The offset should be correct unless using an odd-split repeater,

We're almost there.

Press and hold the MODE button until the mode switches. Press and hold again until you get to DV. If you don't see a DV then you probably programmed the frequency in the A VFO and will need to switch to the B VFO.

At this point in time, you should be able to hear D-STAR transmissions. That's about as simple as programming an FM repeater isn't it!

Before you try to transmit, there's two more things that you need to do. The first is to set your callsigh. Select Menu-Callsign-My and enter your callsign.

If you hear someone on the repeater, press and hold the RX->CS (bottom-right key) button to copy the repeater's callsign into memory. Once this is done, you should be able to make your first D-STAR contact!

For more help with programming your D-STAR radio, check out the D-DTAR Calculator at www.DSTARInfo.com.

To utilize some of the advanced features such as linking, you will need to be registered. You do not need to be registered to talk. To register, follow the instructions at www.DSTARGateway.org.

See Included File for GigaParts Ad

D-STAR Info Newsletter

A publication of
Georgia D-STAR, Inc.

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Sales@DSTARInfo.com

For general inquiries, send to
Info@DSTARInfo.com

Notes from the Trust Server Team

Jim McClellan, N5MIJ—Trust Server Admin Team

We are excited to see the development of the D-STAR Newsletter, and hope to see continued growth and interest here. D-STAR is the most exciting thing to hit amateur radio in a long time. The expansion of the D-STAR Network has been astonishing, even to us! As caretakers of the Trust Server for the network, we see a lot of things that might help both new and existing Gateway administrators. We'll try to touch on some of the important ones in each issue.

For a new Gateway administrator, there is nothing more important than reviewing the notes online, especially those available at DStarUsers.org. Simply go to www.DStarUsers.org, and follow the "Joining the Network" link on the left side of the page. One of the most important things to remember is to simply follow the instructions. Do NOT let your local Linux expert tell you a "better way", or to attempt to install either the Operating System or the Gateway without following the instructions. Doing so will almost certainly guarantee you the chance to start over, at the beginning. We've learned this lesson the hard way.

For existing Gateway administrators, there is an important point that is not well publicized or documented. When your Gateway fails and you have to rebuild it, or when you decide to change call signs, you **MUST** coordinate with the Trust Server Team **BEFORE** you begin. There is some manual effort involved at the Trust Server, and attempting to do this on your own won't work. We'll be happy to work with you, just give us the chance.

One more critical point that needs to be publicized is that the current D-STAR Gateway program allows only one Trust Server in the network. Attempting to add a subordinate Trust Server or hierarchical Trust Servers won't work yet. Please be patient. We know this is a feature we need.

Our last comment for this issue involves development of new tools and programs. The D-STAR network is not yet as resilient as we'd really like. Please consider working with us on an offline test network when you develop new things to introduce. Don't test your spiffy new widget on the production network! We'll work with anyone willing to follow procedures to ensure compliance. There are already teams lining up to test new features, functionality, and programs for the enhancement of D-STAR. None of us know all of the details of D-STAR yet, and the extra time in testing is more than returned in not having to troubleshoot and repair the production D-STAR network.

D-STAR provides us some exciting new capabilities. Along with that, we still have some limitations that we've not yet overcome. It's a great time to be involved with the technology, and the Trust Server Admin Team sincerely appreciates your patience and support as we try to keep up with the astonishing growth of D-STAR.

Product Review
RT Systems Windows Programming Software

Memory channels hard to program? These days, radios are packed with so many features that all their details can be frustrating. Too many buttons to push and knobs to turn!

RT Systems' spreadsheet style radio programming software makes it easy to deal with all those details. With your radio off and using your computer, type memory channel details into designated fields in the spreadsheet. No guessing about what needs to be entered. Drop down menus help you pick correctly. Copy and paste callsigns between columns to easily setup D-STAR details. D-STAR options are always available. Copy and paste memory channel details between radio files… even radios from different manufacturers.

Then, connect your radio with the supplied cabling, turn it on; click "Send". In less than a minute, your radio is programmed and ready to use.

Spreadsheet style programming software is available for over 45 different radios including several D-STAR models: Icom IC-91A/D, IC-92, IC-2820, IC-2200, and ID-800.

RT Systems, Inc. introduced amateur radio programming software in 1995. E-mail and live telephone tech support with licensed experienced hams is available five days a week.

Learn more at www.rtsystems.com or contact websales@rtsystems.com.

D-STAR Tips and Tricks

To quickly link repeaters, save the linking command as a memory.

```
  UR: REF001AL
RPT1: WD4STR•B
RPT2: WD4STR•G
```

To quickly unlink, save the unlinking command as a memory.

```
  UR: •••••••U
RPT1: WD4STR•B
RPT2: WD4STR•G
```

To see if a repeater is linked.

```
  UR: WD4STR•I
RPT1: WD4STR•B
RPT2: WD4STR•G
```

If the repeater responds "Remote System Linked" then the repeater is linked, if it replies with nothing or an identification, then it is not linked.

• should be entered as a space