D-STAR, D-STAR

No. It's not what Tattoo says when he looks up into the evening sky over Fantasy Island.

D-Star is Digital Smart Technology for Amateur Radio.

Last month, I talked about how well D-STAR lends itself to conversation and how easy it is to see who is on other repeaters. This month, we'll go into more detail about how to actually make that connection with the other repeater.

But first, let's review some of the basics. D-STAR is digital. Even the modulation, GMSK (Gaussian Minimum Shift Keying) is completely digital. It can only transmit ones and zeros. This is the same modulation method used by the GSM wireless phone system.

Each D-STAR transmission has a header that includes the originating station's call sign known as MYCALL, some repeater routing information and the destination station's call sign, known as URCALL. In most cases, the destination is actually the string "CQCQCQ" which, of course, means any station. The repeater routing consists of two fields, RPT1 and RPT2. RPT1 is the call sign of the repeater you are using with a module designation in position 8. The standard module designations for voice are "A" for 1.2 GHz, "B" for 440 MHz and "C" for 2 meters. RPT2 generally is also the call sign of the repeater with a "G" in position 8. The "G" designates the Gateway module which is the repeater's connection to the Internet.

In the scenario I discussed last month, a ham first checks http://www.dstarusers.org and finds someone on a remote repeater to which he would like to talk. Let's assume for our discussion, that the local ham is on port "C" (2 meters) of the W4DOC D-STAR repeater in Atlanta and the remote user is on port "B" (440 MHz) of the WH6DIG D-STAR repeater in Honolulu.

The easiest way to do this is simply to link W4DOC port "C" to WH6DIG port "B". You do that by putting "WH6DIGBL" in URCALL and transmitting. Notice that the call sign, in this case, is 6 characters long, followed by "B" to indicate the 440 module and "L" which tells the repeater to link. If the call sign had been only 5 characters, there would be a space before the "B".

That's all there is to it. The repeater should respond with a voice message of "Remote system linked". Since the link stays up until someone takes it down, you should change URCALL back to "CQCQCQ". Then just carry on a conversation as you would if both parties were on the same repeater. Other than the repeater ID, whatever is transmitted by one repeater will also be transmitter by the other repeater.

When you are finished with your QSO, take the link back down by changing URCALL to "…….U" (7 blanks with "U" in position 8) and transmitting. The "U" of course means unlink. The repeater should respond with "Remote system unlinked." Don't forget to change URCALL back to "CQCQCQ".

Now, what if you want to link to more than one repeater? For bandwidth reasons, each module can support only one link at a time. The solution is to use a Reflector.

You may be familiar with reflectors used by IRLP, Echolink or even email reflectors. A D-STAR reflector does exactly the same thing. Each repeater connects to the reflector and a transmission from one repeater is sent to the reflector where it is "reflected" back to all of the other connected repeaters.

This is often used for nets. For example, the Southeastern D-STAR Weather Net which meets on Reflector 2-A, Sunday nights at 9:00 PM Eastern Time does exactly this. It regularly has 35 or more repeaters and 70 or more stations. If you want to join this net from your local repeater, you would do it exactly the same way you link to a remote repeater. Just put "REF002AL" in URCALL and transmit.

Often repeaters are linked to reflectors to increase coverage. Many of the Atlanta repeaters are linked to a common reflector so that hams in different parts of the metro area can participate in a common roundtable and continue their QSOs while driving from one coverage area to another.

In a nutshell, that's how D-STAR linking works.

For more information, be sure to checkout http://www.dstarinfo.com and http://www.dstarusers.org.

Please also let me know what topics you'd like to see covered in future columns.

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