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# Discovering D-STAR

*Trying something new occasionally takes a leap of faith.*

Larry Moxon, K1KRC

For me, it all began with an idea. I wanted to become more active on 2 meters and 70 centimeters, not just to talk to friends, but for public service applications as well. If my objectives had ended there, an ordinary FM transceiver would have been more than adequate.

But I wanted to go beyond ordinary FM. In addition to my voice, I wanted the ability to swap digital information with my fellow hams. I wanted to exchange everything from short text messages to small files. I realized that I could accomplish some of this by tapping into the APRS (Automatic Packet/Position Reporting System) network with a standard analog FM transceiver and a packet TNC (Terminal Node Controller), but I wanted to push the envelope further. My ideal configuration was a digital communications system where the hardware was fully integrated — *everything*, from voices to text, would be digital within a single device. No external boxes or rat's nests of wires.

## D-STAR Discovered

I described my idea to a fellow ham and he suggested that I investigate D-STAR. I had heard about D-STAR, but I had always assumed that it was just ICOM's attempt at marketing another old-style analog FM radio with built-in packet and GPS positioning at a significant increase in price.

I was also concerned about what seemed to be a closed, proprietary system. Unlike analog FM where you can select from radios made by a number of different manufacturers, D-STAR looked like it was strictly an ICOM product.

As it turned out, I was wrong on several counts. First of all, D-STAR is an open digital protocol developed by the Japan Amateur Radio League (JARL) — it is *not* an ICOM product. Any manufacturer can make a D-STAR compatible transceiver. It just so happens that ICOM is the first to do so on a large scale.

Secondly, D-STAR transceivers are not at all like analog FM rigs, at least in a functional

sense. A D-STAR transceiver *can* operate as an analog FM rig for those times when you need to communicate with analog FM users (or through standard FM repeaters), but its true strength lies in its digital capability. You can use a D-STAR transceiver for voice communication in which your speech is converted to digital information and reconstructed — minus any noise — at the receiving end. You can also send a stream of digital data (containing your location, call sign, etc) *at the same time*. This isn't high-speed data, but it is perfectly adequate for the kind of brief

the other side of the continent. Once the call routing is programmed, you simply press the button and talk.

## On the Air with D-STAR

One day push finally came to shove. There was nothing left to do but make the investment and give D-STAR a try.

I entered the D-STAR universe by ordering an ICOM IC-2820H transceiver with the plug-in digital/GPS board. When it finally showed up, I eagerly opened the package and read through the manual. After wiring the power connections in my car, I was off and running.

Any new technology has a learning curve and that was certainly the case here. In my haste I had failed to correctly configure the DV mode; I couldn't make contacts! I went back to the manual, but I still was uncertain. This is where having a D-STAR mentor is invaluable. I had two: Bill, N1CNV and Fran, W1FJM. They had me up and running in no time.

The results were amazing. Voices were consistently, digitally clear. A glance at the radio would tell me who was calling, or where they were located. Connections

— even to distant locations — were made smoothly and automatically. Good old analog FM couldn't compare to that experience and I've never looked back!

No matter how much research you do, you'll never be completely sure until you make the leap of faith and try a new technology yourself. Breaking with old habits and assumptions is never easy, but the rewards can make the effort worthwhile.

ARRL member Larry Moxon, K1KRC, spent most of his career as a System Integrator for marine instrumentation data collection and logging, primarily dealing with government contracts. Now retired, he is presently working on several video and print projects to assist new D-STAR users. You can contact Larry at 338 Indigo St, Mystic, CT 06355-1326; k1krc@arrl.net. **QST**



Larry Moxon, K1KRC, enjoys a mobile D-STAR conversation with Fran, W1FJM.

information it usually carries. This is known as the D-STAR DV mode.

D-STAR also has a DD mode that is intended for dedicated data transfers rather than the digitized voice/data combo we find with DV. The ICOM ID-1 transceiver can exchange data on the 23 cm band at rates as high as 128 kbps in the DD mode. True, this is not broadband Internet, but it is fine for exchanging sizeable files. To put it in perspective, the DD mode on 23 cm is more than twice as fast as the fastest dial-up Internet connection.

Since the entire communication is digital, D-STAR offers some extraordinary capabilities. You can configure a D-STAR transceiver to respond only to calls from certain individuals, or you can direct calls to specific individuals or groups. This is perfect for public service. And the D-STAR repeaters themselves can be linked via the Internet for long distance coverage. You can use this function to set up a call to a buddy on

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