

# D-Star for Analog Guy

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If you are a ham operator that enjoys talking on 2 meter and 70 cm repeaters, but just can't find any intelligent activity on them any longer, then listen up!

D-Star is gaining in popularity and you are missing out on the fun. Read on to learn about the basics of D-Star and why there is lots of activity there. I won't tell you what radio to buy here, or how to use your new D-Star radio.

There are lots of resources on the internet for that. What I am going to explain is how D-Star is different from analog and why you might be interested in it if your are an analog repeater operator. I think you will find that it is worth giving D-Star a try.

A D-Star repeater operates similar to a regular analog FM repeater. It listens for your signal on an input frequency and retransmits your signal on an output frequency on the same band. The signal being generated from the D-Star radio is not an analog signal, but a digital signal.

The D-Star radio includes a chip which converts your voice directly from your microphone to a digital signal and the radio then transmits that digital signal to the repeater where it is retransmitted on output frequency. Other hams pick your signal up with their D-Star radio. Their radios decode the digital signal and your voice comes out on their radio.

The quality is excellent because your voice is being converted to a digital stream of data right inside your radio and is being converted back to analog audio right inside your buddies radio. There is no picket fencing like there is in the analog FM modes, but there is R2D2. What is R2D2? Well, lets just say if you are a Star Wars fan you will recognize it when you hear it.

As an added bonus, I have found that my signal seems to go further with D-Star than on analog FM. I am not sure if this is really the case, but I can tell you that I have had conversations through a repeater with 100% dead full quieting audio using my 5 watt HT and a repeater located 12 miles from my home.

All this would be enough to convince most people that D-Star is superior to regular analog FM, but that is not where the fun stops. The most exciting aspects of D-Star is gateways and reflectors.

What is a gateway? A gateway is simply an entrance point, doorway, port, etc to the internet. All D-Star repeaters come with a gateway to connect the repeater to the internet. Why would you want to do that? To link to a reflector on the internet.

A reflector can be thought of as a repeater that is located somewhere on the internet that has unlimited inputs and outputs. Multiple repeaters can be connected to one reflector and every signal that is received on one repeater is transmitted on all repeaters linked to the reflector.

Let's look at one scenario as an example.

Lets say Ken, KE3C (that's me) is transmitting on the input frequency of the K3PDR 2 meter repeater, My buddy Andy, KD3RF is located in Munich, Germany and he is listening on the DB0TVM repeater. Both repeaters are linked to reflector REF020A (20 alpha). When I key up and give my call, my call is heard by all stations monitoring the reflector 20A. That includes the K3PDR repeater, the DB0TVM in Germany repeater and any other repeater connected to 20 alpha. Andy hears my call because the repeater he is monitoring is linked to 20 alpha and he comes back to me and we have a conversation. Pretty cool! At least I think so.

Any repeater linked to the reflector 20A through its gateway can hear any other repeater or station connected to the reflector. Not only that, but on most repeaters, operators can send a command to the repeater to link the repeater to any number of gateways.

If that were not enough, it gets even more interesting. These days there is a device called a Digital Voice Access Point or DVAP for short that any operator can connect directly to their home personal computer to access a reflector directly. A DVAP is just a small, low power 2 meter or 70 centimeter transceiver that connects to the USB port of your personal computer and acts as kind of a personal simplex repeater with built in gateway.

The way it works is very similar to a repeater, except it does not repeat. It receives the signal from your D-Star radio as a digital stream much like a repeater would and it transmits that stream through the gateway to the reflector. The reflector then reflects the signal out to the other repeaters or DVAPs connected to it and your voice comes out on all repeaters and DVAPs that are connected to the reflector. The nice thing about the DVAP is that the DVAP is a personal D-Star hotspot. That allows you, the operator, to have excellent coverage to whatever D-Star repeat or reflector you like. You send commands to the dvap to link and unlink from whatever reflectors or repeaters you want to talk through and they hear you instantly.

Many hams are using the DVAP and hooking the DVAP up to a raspberry pi computer. The raspberry pi is a credit card sized computer that runs the Linux operating system and cost about \$55.00 for the computer and a case. The DVAP is hooked up to the raspberry pi via the USB cable. Open source software written by G4KLX is run on the raspberry pi which communicates with the DVAP and controls the reflector and repeater linking and forwards your signal to the reflector or repeater you choose. With this setup the operator has an instant D-Star portable hotspot that can be linked to any reflector or repeater.

I have personally even used this setup in my car. I connect my raspberry pi to my cell phone via the wifi hotspot feature on my phone and I have a 100% portable mobile hotspot. I know....I know...it is not real radio if I am using the cell phone network.....but it is fun.

There are many popular D-Star reflectors on the internet. My favorite is REF001C. You can link to it by sending REF001CL to any repeater or DVAP using your D-Star radio. Reflector 1 charlie is the international super reflector. It is always active with hams from all parts of the world. It is not uncommon to hear hams from as far away as Japan, Australia and New Zealand on this reflector.

In the North Eastern US many repeaters are linked on a schedule or permanently to reflector 20A. In the Philadelphia region, many repeaters are linked to reflector 20A 24 hours a day 7 days a week. Other repeaters do not link to reflectors on any schedule and are available for any ham operator to link to other reflectors or repeaters as they would like. The K3PDR repeater on 2 meters (K3PDR B) is usually linked to reflector 20A and the 70 cm repeater (K3PDR C) is usually open for linking as needed by all hams.

My hope is that this little description of the D-Star radio network will peak your interest and D-Star and someday I will hear you giving me a call on the air. I lurk around on reflector 20A. I look forward to hearing your melodious tones calling my call someday.

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