

# D-Star the Easy Way Using the DV Dongle

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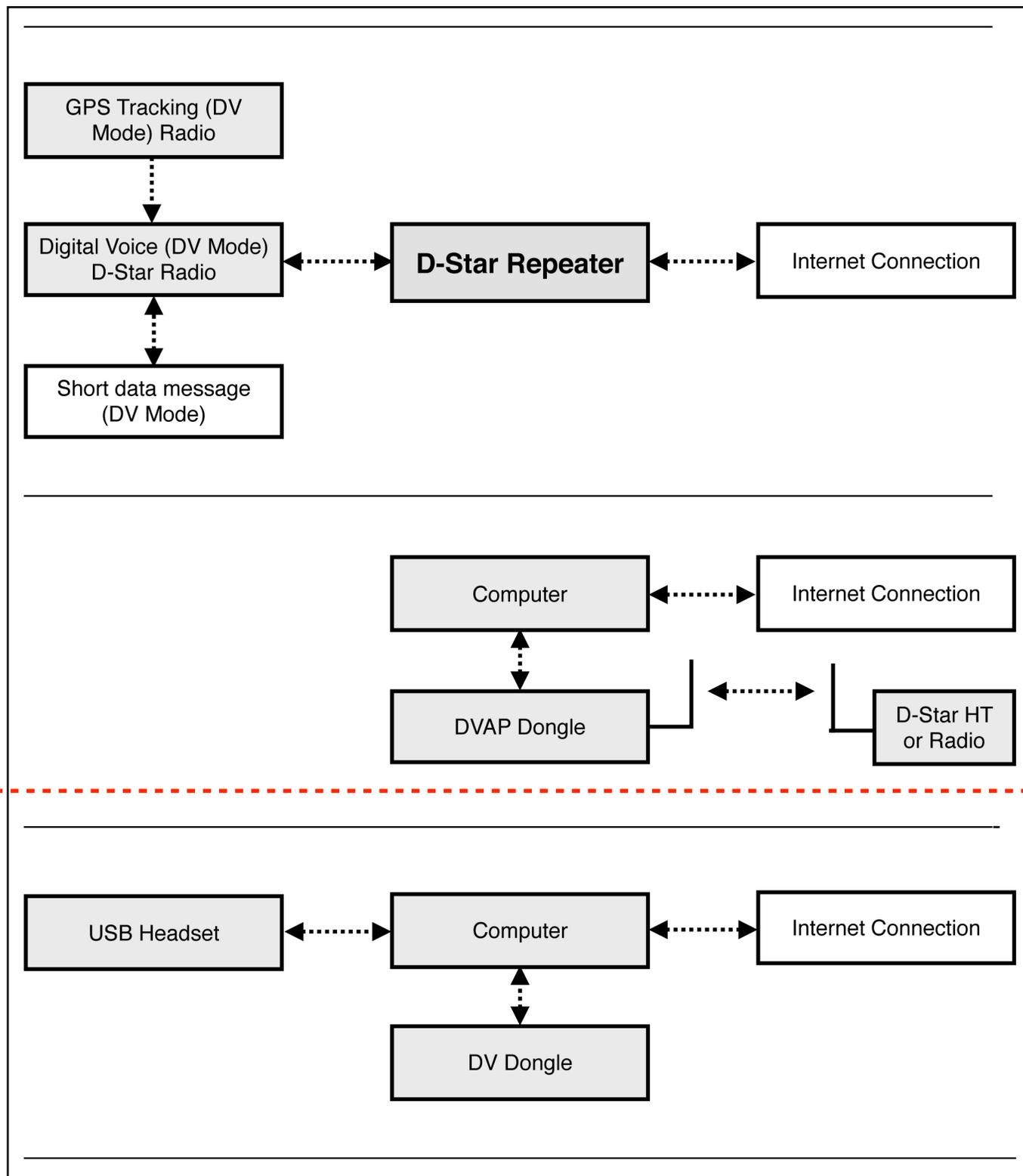
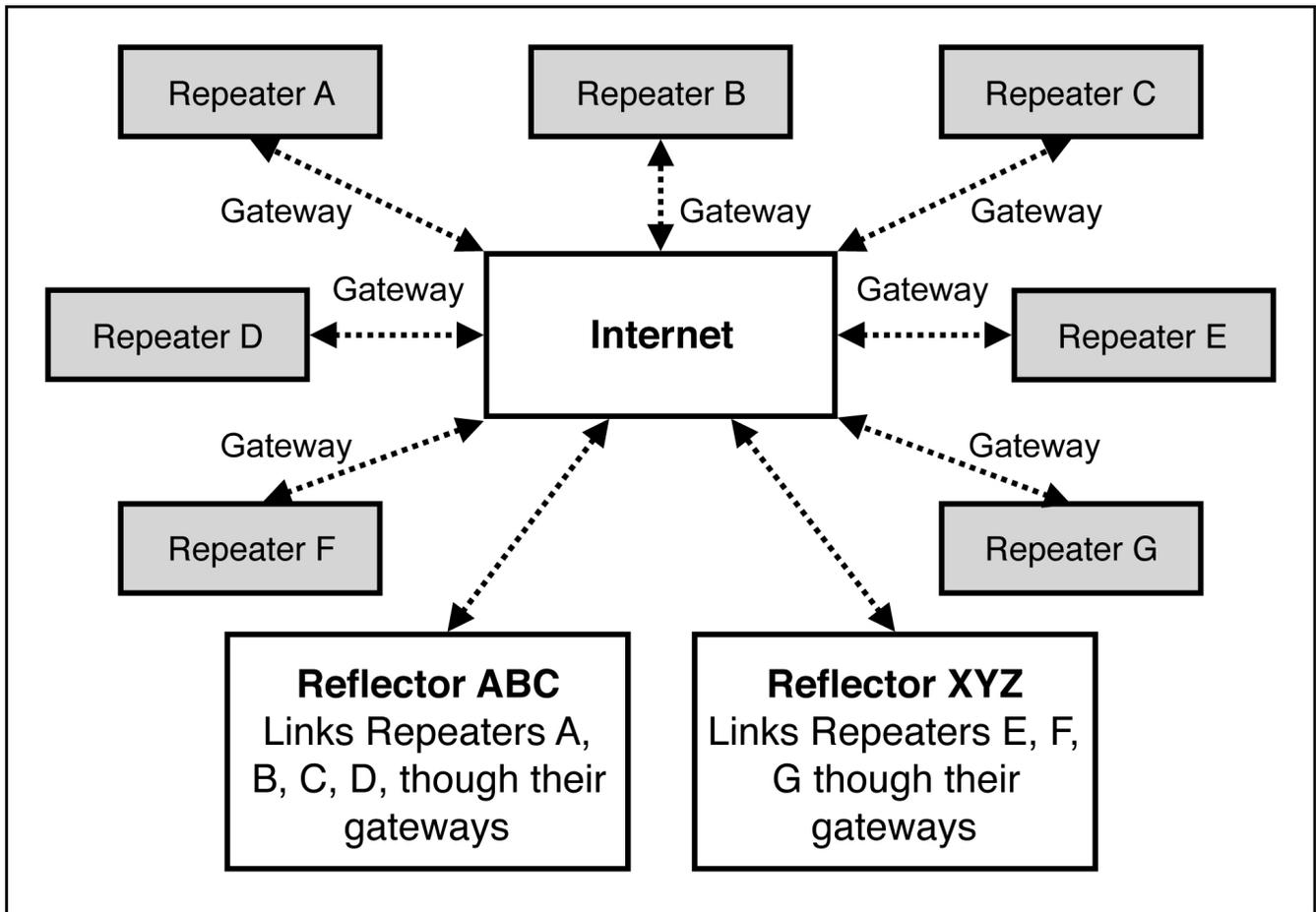


Figure 1 - D-Star Basic Configuration



**Figure 2 - D-Star Reflectors and Gateways**

## D-Star

First, let us look at what an HF radio is. HF radio requires an expensive transceiver, a large antenna, and usually an antenna tuner. Then, one must pray for favorable propagation at specific times of the day or night. Often, contacts are noisy and hard to hear.

Now, let us talk about D-Star. D-Star is a digital voice and text mode, which enables it to make connections via the internet. With a simple VHF/UHF D-Star capable transceiver that costs about the same as most dual band VHF/UHF transceivers, one can talk to the world with crystal clear audio. The antenna is the same VHF/UHF antenna that we all commonly use. If cost is a major factor, a single band transceiver can be used.

Or, a DV Dongle, a Mac or PC computer with an internet connection, and a headset can be used. This is the least expensive and easiest way to get on the air with D-Star.

Or, a DVAP Dongle, a Mac or PC computer with an internet connection, and a D-Star radio can be used.

Once a D-Star connection is established, one can connect to reflectors and repeaters all around the world as seen in Figure 2.

There are repeater maps, repeater lists, and other information at: <http://www.dstarinfo.com>

## D-Star Registration Steps

Make sure you register at one site and only one site. Follow ALL of the steps shown at [http://www.dstargateway.org/D-Star\\_Registration.html](http://www.dstargateway.org/D-Star_Registration.html) This is a two-step process. After approval, further steps are required. Check your registration at: <http://dstar.info/query.html>

1. Find a D-Star repeater in your area that has a website that you can register with.
2. Follow the registration steps.
3. Wait for an email from the D-Star administrator approving your registration or try to log in periodically to check on the status of your registration at the same URL you used to register with using your callsign (IN UPPER CASE) and the password you entered during registration. If your registration is pending approval, you will see an Error that the registration has not yet been approved. If it is approved, you will be granted access and you will be able to log into the system and configure your personal information. **THIS NEXT STEP IS REQUIRED.** Once you are logged in, click on “Personal Information” at the right of the page.
4. Click on the checkbox next to the number “1”. Then click inside the “Initial” box to the right of your callsign on the same line as the number “1”. Type in a single space character. This will not show up but is very important. Do not click on the “RPT” check box. In the “pname” box, enter your callsign in lower case followed by a dash “-” followed by your type of radio, e.g. 2820 or dvdongle. All characters in the “pname” box should be lower case and there should be no spaces. When complete, click on “Update”.

## Some Common D-Star Repeaters

D-Star Repeaters connect to an internet gateway. Reflectors link specific gateways. All linked gateways hear all traffic from all of the gateways connected to the reflector. Reflectors provide a way to link multiple gateways together, providing an easy way to create a wide-area repeater, hold a multi-gateway net, etc. on the fly. Each reflector has three modules, A, B and C.

Some common US reflectors:

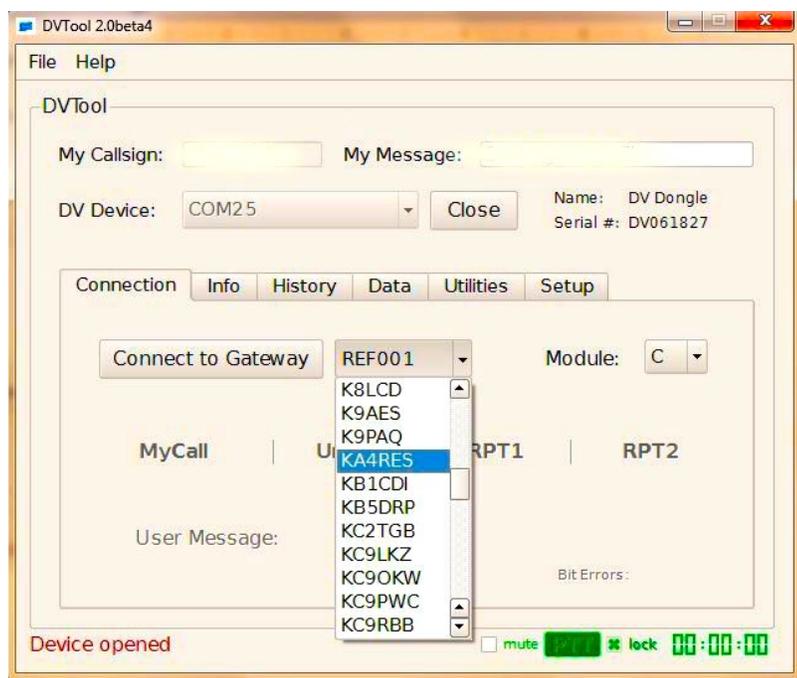
- REF069C (New England Repeaters)
- REF030C (Georgia/Southeast Repeaters)
- REF009C (Arizona Permalink Repeaters)
- REF014B (US West Coast Repeaters)

D-STAR (Digital Smart Technologies for Amateur Radio) is a digital voice and data protocol specification developed for use in amateur radio. D-Star compatible radios are available on VHF and UHF amateur radio bands. In addition to the over-the-air protocol, D-Star enables D-Star radios to be connected to the Internet or other networks. D-STAR is the result of research by the Japan Amateur Radio League to investigate digital technologies for amateur radio.

# DV Dongle Programming

A DV Dongle is a D-star device that is used with a computer that is connected to the internet and a headset. Connect the DV Dongle to the USB port of the computer and the headset to the audio jacks. After much trial and error, it seems that the sound card headsets don't work well with the DV Tool software. I got very poor audio reports. USB headsets works well with the DV Tool Software. The one recommended is the Logitech USB Comfort headset.

Download the latest **DV Tool** software from [www.dvdongle.com](http://www.dvdongle.com)



Connect the headset to a USB port.

Install the DV Dongle .exe software. To start using the DV Dongle, double click on the file DV Tool icon. DVTool will start and display a dialog windows similar to the picture above.

Under setup, choose the USB headset audio device. The Audio Input and Output drop down lists allow for the selection of multiple audio devices if they exist.

In Windows control panel or settings for Mac, select sound. Then, adjust the USB microphone sensitivity. Maximum should work well.

Adjust the speaker volume to what is comfortable in the headset. Medium is a setting to start with.

Enter your call sign and message at the top of the screen.

Click on "Open" to connect to the DV Dongle.

Once the DV Dongle is opened, the Device Name, Serial Number, Boot Version, and Firmware Version fields should show data specific to the hardware you have opened.

DVTool then makes a request to an internet based D-Star gateway name server. The D-Star gateways that are available for DVTool connections are listed in the drop down selection box next to "Connect to Gateway".

Connect to a D-Star gateway for receiving and/or transmitting voice. The gateway drop down selection box lists all gateways that are currently running the required software and have IP ports forwarded correctly.

The PTT button (green box in the lower right corner) behaves similar to the PTT button on a radio. When you click and hold, your mic audio is transmitted to the gateway/module selected. When you unclick, the transmission ends.

The DV Dongle has four LED's which indicate the current operating status. The blue LED shows data is being transmitted from the PC/Mac to the device. The yellow LED shows data is being transmitted from the device to the PC/Mac. The green LED shows the mode of operation, slow pulsing indicates idle and fast blinking indicates running. The red LED shows overruns or underruns between the PC/Mac and the device and should normally be off. If you notice frequent red LED activity, your PC/Mac may not be sufficiently fast to operate with the device or you may have other programs running that are taking CPU cycles away from the DVTool application.

The DV Dongle is a high speed, real time device. It communicates with the PC/Mac at 230Kbps and needs adequate CPU speed and time to operate properly. Many operations on the PC/Mac can interfere with normal operations. These include screen savers, web browsers, instant messengers, etc. For best operation, avoid running CPU intensive applications when operating the DV Dongle.

Some common US reflectors:

- REF069C (New England Repeaters)
- REF030C (Georgia/Southeast Repeaters)
- REF009C (Arizona Permalink Repeaters)
- REF014B (US West Coast Repeaters)

## **Testing**

Connect to the remote system "E" module to run an echo test completely through the network. Connect to "REF030EL" and key up and talk for a few seconds. The audio and data should appear on the screen in a few seconds.