

ircDDB Repeater

Bridgerland Amateur Radio Club

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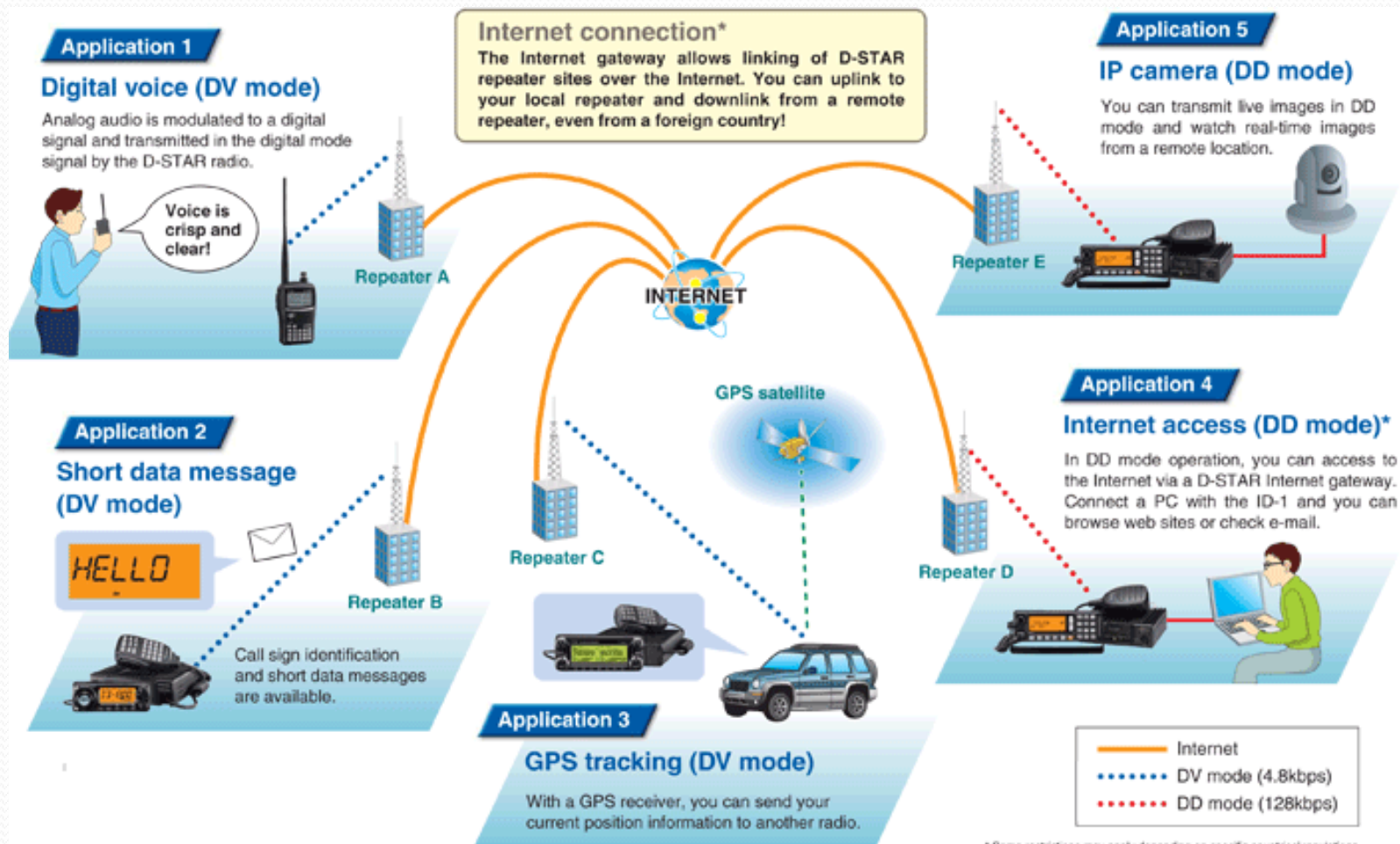
What is D-Star?

- D-STAR (Digital Smart Technologies for Amateur Radio) is a radio system which offers digital voice and data communication. Repeater sites are pre-dominantly connected over the Internet and form a wide area amateur radio network as a result that can span states, countries, continents or the entire world.
- Thanks go to Duffy WB8NUT (<http://wb8nut.com/dstar/>) for allowing us to re-produce information from his page

A Typical D-Star System:

- The D-Star repeater system is typically composed of a repeater controller, 1.2GHz, 70cm and 2mtr digital voice repeater, digital data repeater and the Internet gateway PC. The D-STAR system repeater can perform multiple relay functions as shown in the diagram on next slide.
- The D-Star repeater operates similar to existing analog repeater. That is a simple relay of transmit and receive communication within or across the 2m, 70cm or 23cm bands.
- When D-Star repeaters are connected with the Internet gateway, the D-Star system relays the received data over the Internet. Your message will get through virtually to anywhere in the D-Star system.

A Typical D-Star System:



What is ircDDB

- ircDDB stands for "irc(**internet relay chat**)-based Distributed Database". ircDDB is simply a network to exchange callsign and routing information between D-Star gateways. The ircDDB network does not directly handle any voice traffic, it simply tells connected gateways where a callsign was last heard and how to connect directly to a specific gateway (via its public IP address). ircDDB provides up-to-date routing information without the synchronization delay associated with the ICOM implementation of the same functionality (which could be over an hour out of date). ircDDB can also provide (almost) real-time information via various "visualization" sites.

What's the difference between ircDDB and USTRUST?

- Both networks provide routing information to their connected gateways, with one difference: ircDDB is not a "trust" system.
- The USTRUST network requires the registration of both user callsigns and gateways. In other words it aims to be the trusted source of D-Star information. Unregistered callsigns are not allowed to communicate through gateways that purely use the USTRUST network. Additionally, DPlus reflectors require USTRUST registered callsigns. You can, however, carry out a local QSO on any repeater without registering, you just can't communicate with the rest of the USTRUST based D-Star network through the gateway using callsign/node routing or via Dplus links.
- ircDDB only requires registration of gateways so that they can log in to the network and share routing information. There is no need to register individual callsigns if you communicate entirely within the ircDDB-based D-Star network.

Isn't the USTRUST network more secure?

- The USTRUST registration process only ensures that someone has registered a callsign that is in use on the USTRUST network. The callsign itself is not securely tied to any particular individual or hardware. In other words, it is no different to other Amateur Radio modes. Just as we can have pirates using bogus callsigns on SSB, FM or digital modes, we can have pirates on D-Star. In the end, this sort of security is the domain of licensing and the licensing authority.
- When it comes to the ircDDB add-on that is available to ICOM repeater operators for G2 gateways, the add-on has been reviewed and approved by the USTRUST network operators. There is no security risk inherent in installing the ircDDB add-on and the USTRUST network will not be disturbed by the add-on in any way.

What is a reflector?

- A reflector can be considered to be similar to a repeater, but with no RF capabilities. Reflectors are Internet connected servers, generally in data-Centers, which receive a transmission from a connected gateway (via the Internet) and send it out to all other connected gateways for retransmission, via RF in the case of a repeater. The term gateway is used in the broader sense, which includes devices such as dongles and DVAPs.
- NUTS (Northern Utah Technical Society) has a Reflector #029 with Channels A, B & C.

What is a DCS Reflector?

- DCS reflectors are just a different type of D-Star reflector, the others being Dextra/XREF and DPlus/REF reflectors. Until recently, when similar functionality was added to DPlus, the main advantage of DCS was that header information was transmitted with each voice packet. This approach avoided some routing issues and therefore provided some advantages like increased reliability and the ability to pick up a QSO mid over. DCS reflectors also handle contention between transmissions in a more graceful way.
- DCS reflectors have up to 26 Channels available in comparison to the five available on REF & XREF reflectors. Typically module A of all DCS reflectors are linked, creating a worldwide "channel".

ircDDB Live

- <http://ircddb.net/live.htm>

The Icom D-Star Repeater



The ircDDB Repeater



Components of Repeater Hotspot

- GMSK Modem (Node Adapter)
 - Receiver
 - Transmitter
- } Node Adapter controls the Radios COS and PTT
- Duplexer
 - Computer for Gateway connectivity
 - Feedline
 - Antenna

Satoshi Node Adapter



DUTCH* Star GSMK Modem



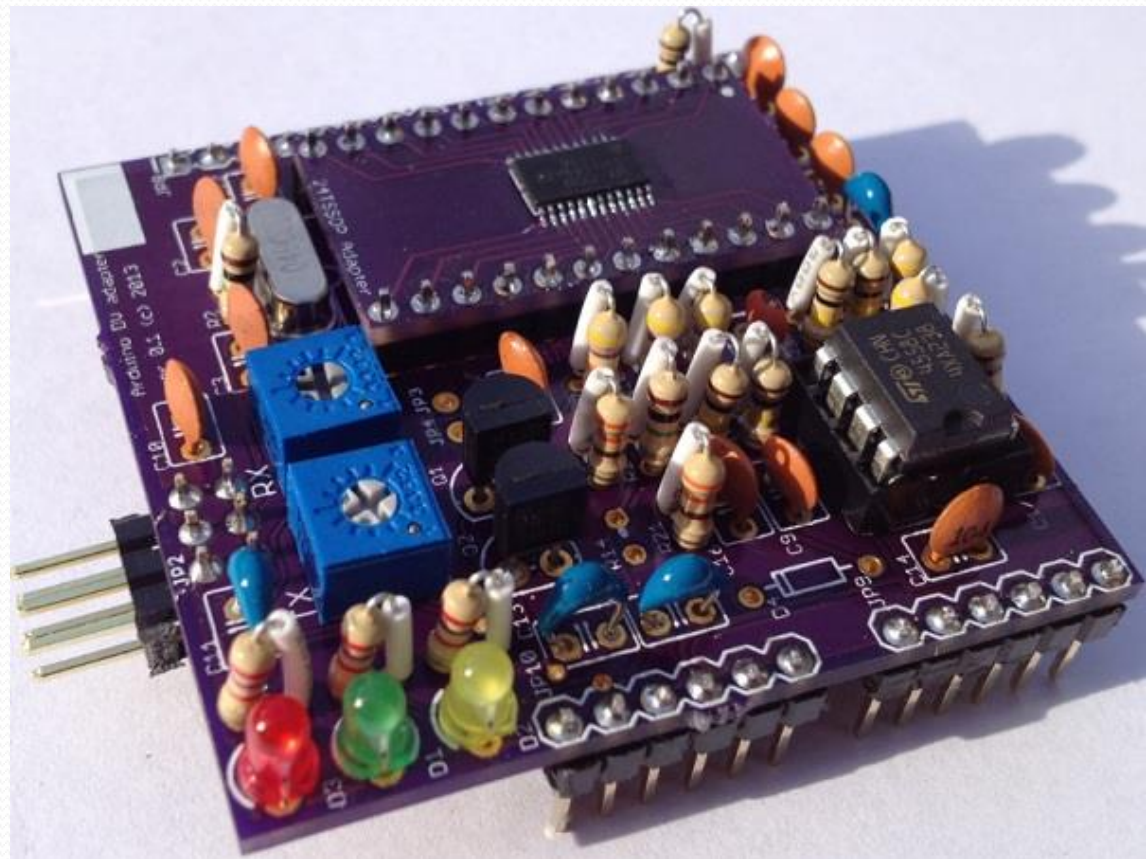
Matrix Circuits' Star Board From MoenComm



PAPA Systems GMSK Board

DV for Arduino

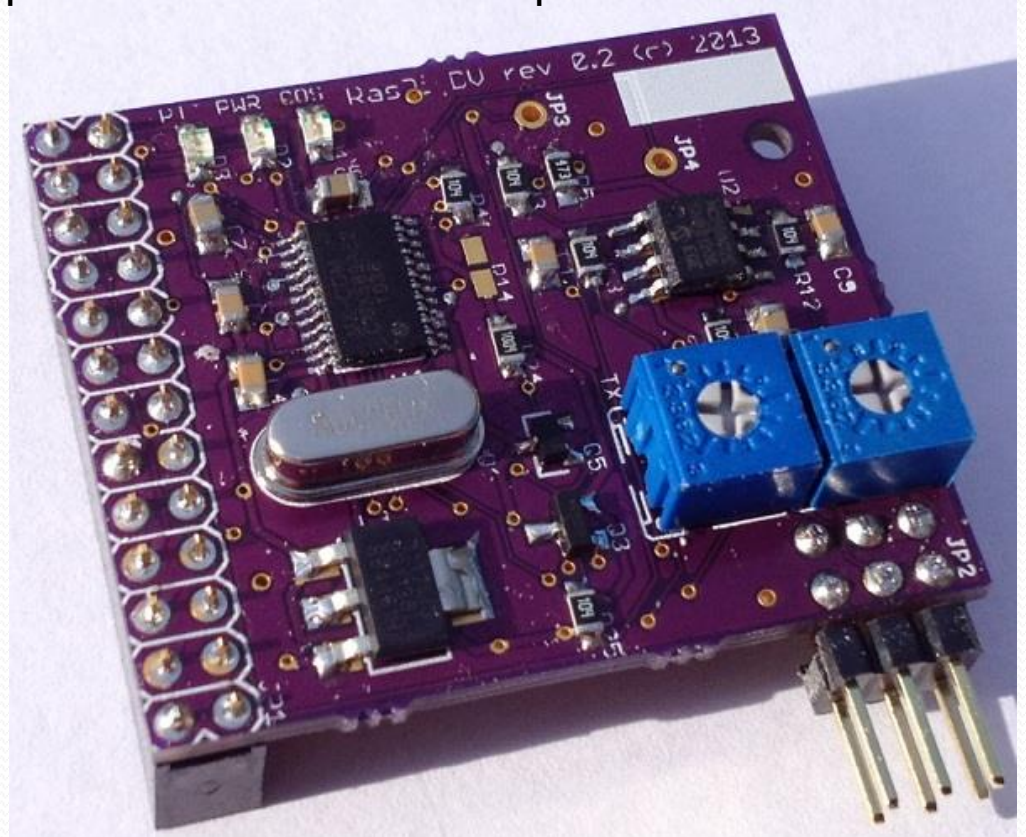
You get the hotspot capability by having a 9600 baud packet capable radio plus our GMSK board plus an Arduino board plus a PC/Mac/Pi plus Jonathan's (G4KLX) DStarRepeater software.



PAPA Systems GMSK Board

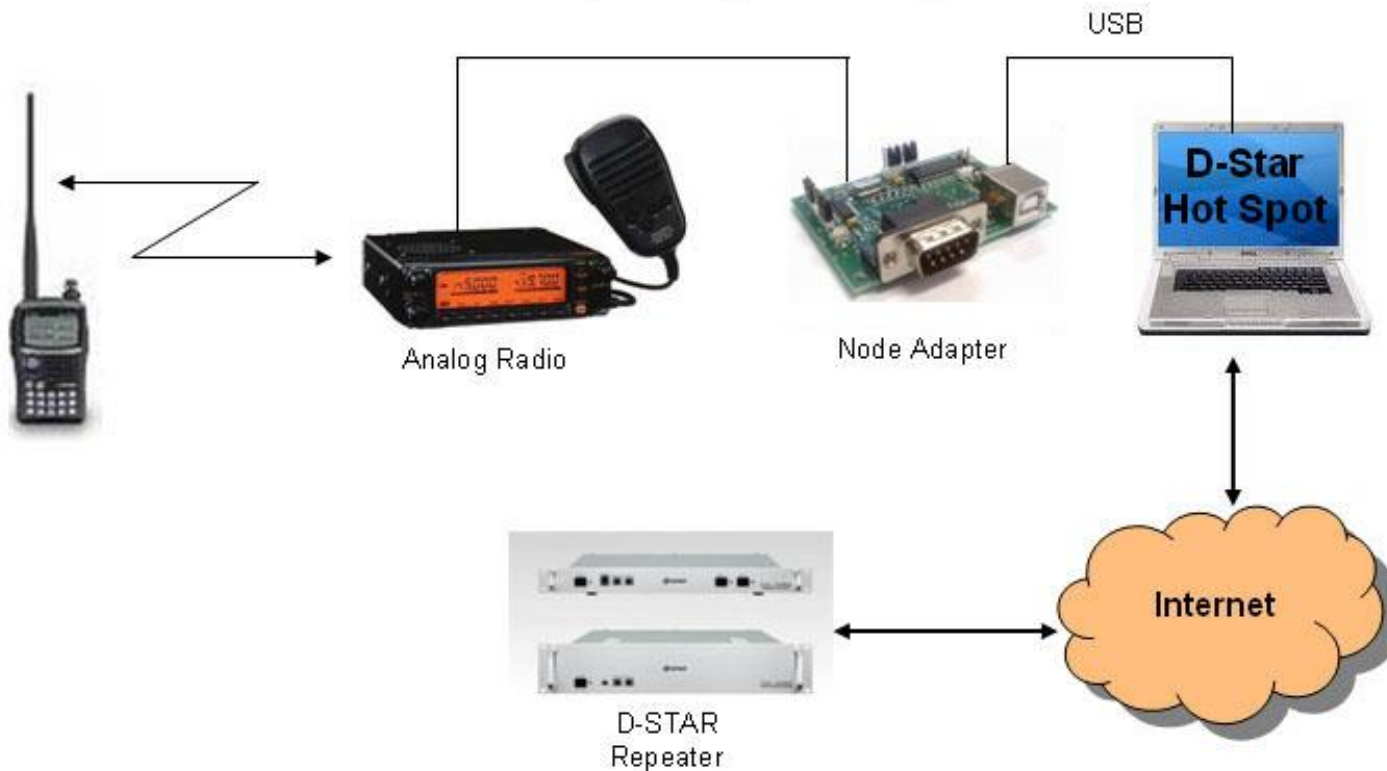
: RasPi DV

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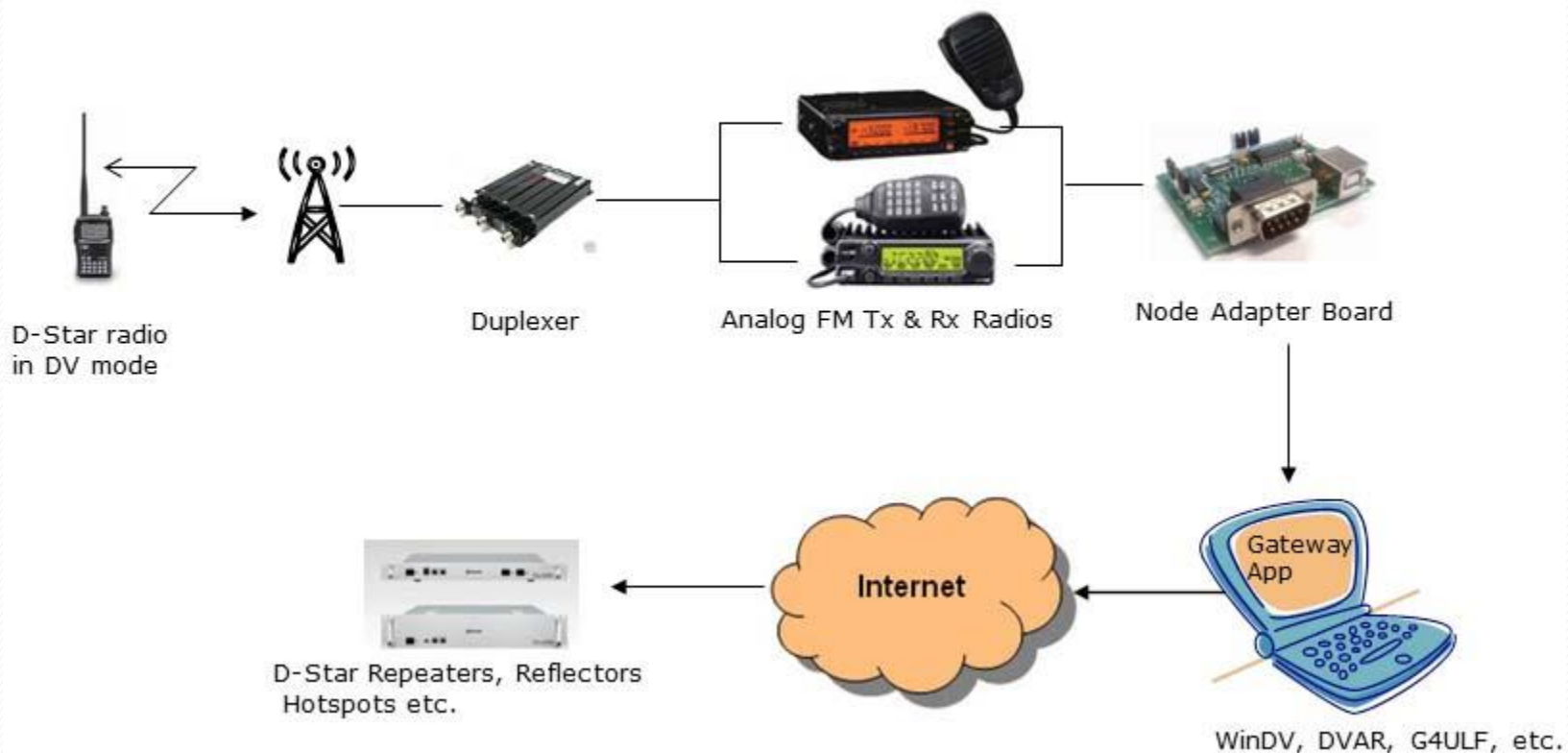
HotSpot Simplex

D-STAR Hot Spot - System Diagram



Hot Spot Repeater

A GMSK Node Adapter D-Star Compatible Repeater



Costs ICOM vs Hombrew

- Icom
- ID-RP2C D-Star Repeater controller \$1,399.95



- ID-RP4000V 70cm D-Star RF Module \$1,399.95



- Duplexer for 440 MHz
\$ 100.00 - \$600.00



- Homebrew
- Satoshi Board \$120.00



- UHF Radios Times 2 \$100.00 ea



- Duplexer for 440 MHz
\$ 100.00 - \$600.00



Costs ICOM vs Hombrew cont.

- Icom
- Computer a PC that can run CentOS 5.10 with 2 NIC's. \$150.00 - \$300.00



- Router \$25.00



- Total \$3,000.00 - \$3,700.00

- Homebrew
- Raspberry PI \$35.00



- Router \$25.00



- Total \$480.00 - \$980.00

Demo

