

D-STAR Operation and Programming

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WB4QDX

What is D-STAR?

- D-STAR is an open worldwide standard for digital communications over Amateur Radio
- The D-STAR standard was developed by the Japan Amateur Radio League (JARL)
- D-STAR uses the AMBE 2000 vocoder chip under license from DVSI
- Icom is initial Amateur Radio manufacturer of mobiles, HTs, repeaters and controllers



How D-STAR Works

- D-STAR is digital modulation
- Voice is converted from analog to digital for transmission
- Data is combined with digitized voice for transmission at 4800 bps
- Callsign is included with each transmission
- Calls are routed by callsign



What can D-STAR Do?

- Transmit and receive voice and 1200 baud data simultaneously on 2m, 440 and 1.2 GHz
- 128 Kb data transmission on 1.2 GHz with Internet connectivity
- DPRS automatic position reporting simultaneous with voice
- Repeater linking with Gateway and Internet connection
- Connect to other station regardless of location
- Users can connect to D-STAR systems via PC with DV Dongle (similar to EchoLink)

D-STAR Basics

- **Each radio has four callsigns to program**

MYCALL (MY)	Originating User (your callsign)
URCALL (UR)	Destination User (or CQCQCQ for call)
RPT1	Originating Repeater
RPT2	Local Destination Repeater or Gateway

- **Each repeater module is designated with a letter in the 8th position (ex. WD4STR C):**

C – VHF (2m, DV)

B – UHF (70cm, DV)

A – 1.2 GHz (23cm voice, DV)

A – 1.2 GHz (23cm high speed data, DD)

G - Gateway

D-STAR Programming Basics

- Every CALLSIGN field will have 8 characters
 - The 8th character is a port designator for the *System/Gateway* fields (if left blank, the system assumes PORT A is used)
- **ONLY** use designated letters in the 8th position (no numbers)
- Repeaters should use club calls not the callsign of a user (a callsign cannot be a user and repeater)
- Watch your Callsign usage
 - N9JA A is OK
 - W4OZK2 is OK
 - WB4QDX B is OK
 - AA4RC C is OK (note double space after callsign)
 - N9JAA is NOT ok (This is a legitimate callsign for another person)

Basic Programming (Simplex)

- Tune to desired simplex frequency
- Callsign Programming
 - MYCALL = WB4QDX
 - RPT 1 = not used
 - RPT 2 = not used
 - URCALL = CQCQCQ

Results

- I can talk to other D-STAR users tuned to the same frequency and programmed the same way.

Basic Repeater Communications

Callsign of the System

- WD4STR: Lawrenceville, GA

Callsign Programming

- MYCALL = WB4QDX
- RPT 1 = WD4STR C (for 2 meters)
- RPT 2 = not used (WD4STR G for DV Dongle support)
- URCALL = **CQCQCQ**

Results

- My call would be routed on the WD4STR, 2 meter repeater, locally. Anyone locally on 2 meters can talk to me.

Intrasite Programming (Crossband)

Callsign of the System

- WD4STR: Lawrenceville, GA

Callsign Programming

- MYCALL = WB4QDX
- RPT 1 = WD4STR C
- RPT 2 = WD4STR B
- URCALL = **CQCQCQ**

Alternate Programming

- MYCALL = WB4QDX
- RPT 1 = WD4STR C
- RPT 2 = WD4STR G
- URCALL = **/WD4STRB**

Results

- My call would originate on the WD4STR 2 meter repeater locally and be heard on both the WD4STR 2 meter and 440 repeaters. Users on 2 meters can talk to me. Users on 440 can hear me, but must cross band to talk to me.
- Using G in RPT2 allows communication with DV Dongle users
- *Use a slash (/) preceding repeater callsigns in URCALL. User callsigns have no slash.*

Talking to Distant Repeaters

Callsign of the System

- WD4STR: Lawrenceville, GA

Callsign Programming

- MYCALL = WB4QDX
- RPT 1 = WD4STR C
- RPT 2 = WD4STR G
- URCALL = /W4DOC C or /KI4SBAC

Results

- My call would originate on the WD4STR 2 meter repeater locally and be heard on the distant repeater. Distant user must "one-touch" or program to talk to me.

Talking to a User in Another Area

Callsign of the System

- WD4STR: Lawrenceville, GA

Callsign Programming

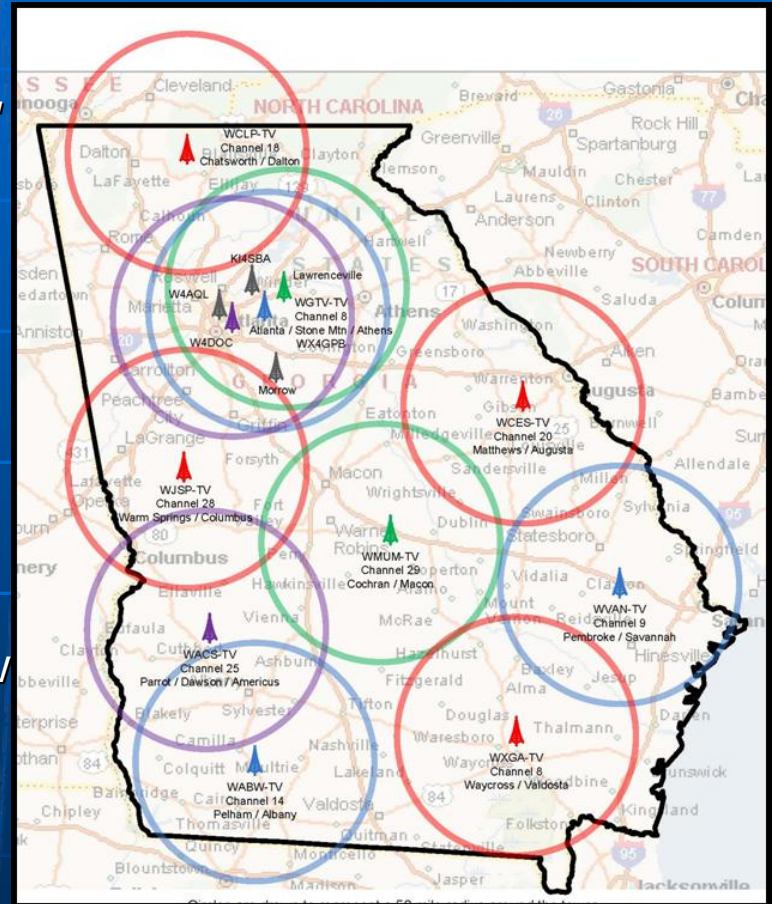
- MYCALL = WB4QDX
- RPT 1 = WD4STR C
- RPT 2 = WD4STR G
- URCALL = AA4RC C or WA4YIH C

Results

- My call would originate on the WD4STR 2 meter repeater locally and be heard by the desired user on the distant repeater. The other user must "one-touch" or program to talk back.

What's Happening with D-STAR

- Four D-STAR repeaters operational in Metro Atlanta area (Lawrenceville, Cumming, Midtown, Stone Mountain)
- Georgia statewide D-STAR network planned on GPB towers
- Alabama has 12 repeater D-STAR network in operation
- 100 repeaters in operation in US, 160 worldwide
- Gateway software upgrade (G2) now shipping with new features
- New features and capabilities by independent developers expand D-STAR



D-STAR Resources

- Great D-STAR website - www.dstarusers.com
- D-STAR calculator – www.dstarinfo.com
- Georgia D-STAR Yahoo Group
groups.yahoo.com/ga_dstar
- General D-STAR Yahoo Group
groups.yahoo.com/dstar_digital
- Icom Support Forums
www.icomamerica.com/en/support/forums
- DV Dongle Info – www.moetronix.com/dvdongle