



D-STAR InfoCon 2014

at Dayton Hamvention

Part 2 – Using D-STAR

John Davis WB4QDX



Getting on the Air

• FM Repeater

- Mode - FM
- Frequency
- Offset
- CTCSS / TSQ
- Tone frequency

• D-STAR Repeater

- Mode - DV
- Frequency
- Offset
- UR
- RPT1
- RPT2

The Big Three

- **MY** or **MYCALL** is your own callsign and is set once in radio
- **UR** or **URCALL**: Where do I want to go?
- **RPT1**: The repeater and module I am transmitting to (ex. KJ4GGV C)
- **RPT2**: Where I want my transmission to go (normally to “G”, the Gateway)
 - *NOTE: It's a good practice to put the callsign and “G” in RPT2 even if talking local so other linked repeaters, DV Dongles and DV Access Points can hear your transmissions*

RPT1, RPT2 Format

- Normal format (xxnxxx m)
 - Callsign is left justified
 - Module is always in 8th position
 - C=VHF
 - B=UHF
 - A=1.2 GHz
- Examples (*" " represents a space*)
 - WD4STR C
 - W4DOC C
 - W4GR C



DPLUS adds functions

- *DPLUS is a program developed by Robin Cutshaw, AA4RC, which adds linking functions and the use of DV Dongles, DV Access Points and Hotspots to D-STAR. DPLUS is active on most gateway-equipped repeaters.*
- Characters used with DPLUS
 - G – Gateway
 - E - Echo Test
 - I – Identification
 - L – Link Repeater
 - U – Unlink Repeater



Basic QSO

- Sample for KJ4GGV VHF/2m Repeater
145.2800 MHz +5.0 MHz Offset
 - MY WB4QDX
 - UR CQCQCQ
 - RPT1 KJ4GGV ■ C
 - RPT2 KJ4GGV ■ G

"■" represents a space

Used for talking on local repeater. If repeater is linked, you are also heard on any of the linked repeaters

Linking to a Repeater

- Sample for KJ4GGV VHF/2m Repeater
145.2800 MHz +5.0 MHz Offset

- MY WB4QDX
- UR WX4GPBAL (or W4DOC ■ CL, W4GR ■ ■ CL)
- RPT1 KJ4GGV ■ C
- RPT2 KJ4GGV ■ G

"■" represents a space

*Key once, gateway responds with voice prompt "Remote System Linked".
Change to CQCQCQ in UR for QSO.*

Linking to a Reflector

- Sample for KJ4GGV VHF/2m Repeater
145.2800 MHz +5.0 MHz Offset

- MY WB4QDX
- UR REF002AL
- RPT1 KJ4GGV■C
- RPT2 KJ4GGV■G

"■" represents a space

*Key once, gateway responds with voice prompt "Remote System Linked".
Change to CQCQCQ in UR for QSO.*

Unlinking

- Sample for KJ4GGV VHF/2m Repeater
145.2800 MHz +5.0 MHz Offset

- MY WB4QDX
- UR ■■■■■■U
- RPT1 KJ4GGV■C
- RPT2 KJ4GGV■G

"■" represents a space

Key once, gateway responds with unlinked voice prompt. Change to CQCQCQ in UR for QSO.

Memory Management

- Radios have different capabilities and number of memories
- First generation radios have standard memory locations for FM or DV
 - **Method 1** – Store commands in memory for favorite reflectors or repeaters
 - **Method 2** – Use UR memories for favorite reflectors or repeaters (uses fewer memory locations)
- Newer radios with DR mode simplify programming
 - **Method 3** – Use DR mode with repeater list and GPS for nearest repeater

Radio Memory Management – Method 1

Organize blocks of channels stored in memories:

- Can be used with any D-STAR radio
- Create a group or bank of memories for each repeater
- Store commands for each function in a memory of the group

CH No	Frequency	Dup	Offset	TS	Mode	Name	Your Call Sign	RPT1 Call Sign	RPT2 Call Sign
1	145.200	DUP-	0.6	10kHz	DV	KI4SBA C	CQCQCQ	KI4SBA C	KI4SBA G
2	145.200	DUP-	0.6	10kHz	DV	UNLINK	U	KI4SBA C	KI4SBA G
3	145.200	DUP-	0.6	10kHz	DV	SBA C ID	I	KI4SBA C	KI4SBA G
4	145.200	DUP-	0.6	10kHz	DV	REF001C	REF001CL	KI4SBA C	KI4SBA G
5	145.200	DUP-	0.6	10kHz	DV	REF002A	REF002AL	KI4SBA C	KI4SBA G
6	145.200	DUP-	0.6	10kHz	DV	REF004A	REF004AL	KI4SBA C	KI4SBA G
7	145.200	DUP-	0.6	10kHz	DV	REF030A	REF030AL	KI4SBA C	KI4SBA G
8	145.200	DUP-	0.6	10kHz	DV	REF030B	REF030BL	KI4SBA C	KI4SBA G
9	145.200	DUP-	0.6	10kHz	DV	REF030C	REF030CL	KI4SBA C	KI4SBA G
10	145.200	DUP-	0.6	10kHz	DV	ECHOTEST	E	KI4SBA C	KI4SBA G

Radio Memory Management - Talk

- Use this channel for general QSO
- No linking commands required or repeater already linked
- CQCQCQ in UR field

CH No	Frequency	Dup	Offset	TS	Mode	Name	Your Call Sign	RPT1 Call Sign	RPT2 Call Sign
1	145.200	DUP-	0.6	10kHz	DV	KI4SBA C	CQCQCQ	KI4SBA C	KI4SBA G
2	145.200	DUP-	0.6	10kHz	DV	UNLINK	U	KI4SBA C	KI4SBA G
3	145.200	DUP-	0.6	10kHz	DV	SBA C ID	I	KI4SBA C	KI4SBA G
4	145.200	DUP-	0.6	10kHz	DV	REF001C	REF001CL	KI4SBA C	KI4SBA G
5	145.200	DUP-	0.6	10kHz	DV	REF002A	REF002AL	KI4SBA C	KI4SBA G
6	145.200	DUP-	0.6	10kHz	DV	REF004A	REF004AL	KI4SBA C	KI4SBA G
7	145.200	DUP-	0.6	10kHz	DV	REF030A	REF030AL	KI4SBA C	KI4SBA G
8	145.200	DUP-	0.6	10kHz	DV	REF030B	REF030BL	KI4SBA C	KI4SBA G
9	145.200	DUP-	0.6	10kHz	DV	REF030C	REF030CL	KI4SBA C	KI4SBA G
10	145.200	DUP-	0.6	10kHz	DV	ECHOTEST	E	KI4SBA C	KI4SBA G

Radio Memory Management - ID

- Use to see if repeater is linked or unlinked
- If linked, repeater says “Remote system linked”
- Data line will indicate where repeater or reflector linked
- Return to CQCQCQ channel to talk

CH No	Frequency	Dup	Offset	TS	Mode	Name	Your Call Sign	RPT1 Call Sign	RPT2 Call Sign
1	145.200	DUP-	0.6	10kHz	DV	KI4SBA C	CQCQCQ	KI4SBA C	KI4SBA G
2	145.200	DUP-	0.6	10kHz	DV	UNLINK	U	KI4SBA C	KI4SBA G
3	145.200	DUP-	0.6	10kHz	DV	SBA C ID	I	KI4SBA C	KI4SBA G
4	145.200	DUP-	0.6	10kHz	DV	REF001C	REF001CL	KI4SBA C	KI4SBA G
5	145.200	DUP-	0.6	10kHz	DV	REF002A	REF002AL	KI4SBA C	KI4SBA G
6	145.200	DUP-	0.6	10kHz	DV	REF004A	REF004AL	KI4SBA C	KI4SBA G
7	145.200	DUP-	0.6	10kHz	DV	REF030A	REF030AL	KI4SBA C	KI4SBA G
8	145.200	DUP-	0.6	10kHz	DV	REF030B	REF030BL	KI4SBA C	KI4SBA G
9	145.200	DUP-	0.6	10kHz	DV	REF030C	REF030CL	KI4SBA C	KI4SBA G
10	145.200	DUP-	0.6	10kHz	DV	ECHOTEST	E	KI4SBA C	KI4SBA G

Radio Memory Management - Link

- Tune to channel and key briefly to initiate link command
- System will say “Remote system linked” if successful
- Return to CQCQCQ channel to talk

CH No	Frequency	Dup	Offset	TS	Mode	Name	Your Call Sign	RPT1 Call Sign	RPT2 Call Sign
1	145.200	DUP-	0.6	10kHz	DV	KI4SBA C	CQCQCQ	KI4SBA C	KI4SBA G
2	145.200	DUP-	0.6	10kHz	DV	UNLINK	U	KI4SBA C	KI4SBA G
3	145.200	DUP-	0.6	10kHz	DV	SBA C ID	I	KI4SBA C	KI4SBA G
4	145.200	DUP-	0.6	10kHz	DV	REF001C	REF001CL	KI4SBA C	KI4SBA G
5	145.200	DUP-	0.6	10kHz	DV	REF002A	REF002AL	KI4SBA C	KI4SBA G
6	145.200	DUP-	0.6	10kHz	DV	REF004A	REF004AL	KI4SBA C	KI4SBA G
7	145.200	DUP-	0.6	10kHz	DV	REF030A	REF030AL	KI4SBA C	KI4SBA G
8	145.200	DUP-	0.6	10kHz	DV	REF030B	REF030BL	KI4SBA C	KI4SBA G
9	145.200	DUP-	0.6	10kHz	DV	REF030C	REF030CL	KI4SBA C	KI4SBA G
10	145.200	DUP-	0.6	10kHz	DV	ECHOTEST	E	KI4SBA C	KI4SBA G

Radio Memory Management - Unlink

- Tune to channel and key briefly to initiate link command
- System will say “Remote system unlinked” if successful
- Return to CQCQCQ channel to talk

CH No	Frequency	Dup	Offset	TS	Mode	Name	Your Call Sign	RPT1 Call Sign	RPT2 Call Sign
1	145.200	DUP-	0.6	10kHz	DV	KI4SBA C	CQCQCQ	KI4SBA C	KI4SBA G
2	145.200	DUP-	0.6	10kHz	DV	UNLINK	U	KI4SBA C	KI4SBA G
3	145.200	DUP-	0.6	10kHz	DV	SBA C ID	I	KI4SBA C	KI4SBA G
4	145.200	DUP-	0.6	10kHz	DV	REF001C	REF001CL	KI4SBA C	KI4SBA G
5	145.200	DUP-	0.6	10kHz	DV	REF002A	REF002AL	KI4SBA C	KI4SBA G
6	145.200	DUP-	0.6	10kHz	DV	REF004A	REF004AL	KI4SBA C	KI4SBA G
7	145.200	DUP-	0.6	10kHz	DV	REF030A	REF030AL	KI4SBA C	KI4SBA G
8	145.200	DUP-	0.6	10kHz	DV	REF030B	REF030BL	KI4SBA C	KI4SBA G
9	145.200	DUP-	0.6	10kHz	DV	REF030C	REF030CL	KI4SBA C	KI4SBA G
10	145.200	DUP-	0.6	10kHz	DV	ECHOTEST	E	KI4SBA C	KI4SBA G

Radio Memory Management - Echotest

- Tune to channel, key and speak
- System will echo back your transmission
- Return to CQCQCQ channel to talk

CH No	Frequency	Dup	Offset	TS	Mode	Name	Your Call Sign	RPT1 Call Sign	RPT2 Call Sign
1	145.200	DUP-	0.6	10kHz	DV	KI4SBA C	CQCQCQ	KI4SBA C	KI4SBA G
2	145.200	DUP-	0.6	10kHz	DV	UNLINK	U	KI4SBA C	KI4SBA G
3	145.200	DUP-	0.6	10kHz	DV	SBA C ID	I	KI4SBA C	KI4SBA G
4	145.200	DUP-	0.6	10kHz	DV	REF001C	REF001CL	KI4SBA C	KI4SBA G
5	145.200	DUP-	0.6	10kHz	DV	REF002A	REF002AL	KI4SBA C	KI4SBA G
6	145.200	DUP-	0.6	10kHz	DV	REF004A	REF004AL	KI4SBA C	KI4SBA G
7	145.200	DUP-	0.6	10kHz	DV	REF030A	REF030AL	KI4SBA C	KI4SBA G
8	145.200	DUP-	0.6	10kHz	DV	REF030B	REF030BL	KI4SBA C	KI4SBA G
9	145.200	DUP-	0.6	10kHz	DV	REF030C	REF030CL	KI4SBA C	KI4SBA G
10	145.200	DUP-	0.6	10kHz	DV	ECHOTEST	E	KI4SBA C	KI4SBA G

Memory Management – Method 2

- Can be used with any D-STAR radio
- Program one memory location per repeater with CQCQCQ in UR field
- Utilize “Your Call Sign” memories for UR field

Call Sign	U22	K4WAK BL	U52
My Call Sign	U23	K4DSO CL	U53
Your Call Sign	U24	K4DSO BL	U54
Received Call Record	U25	K4DSO AL	U55
VFO Call Sign			

- Select Memory location and change UR field for favorite linking command

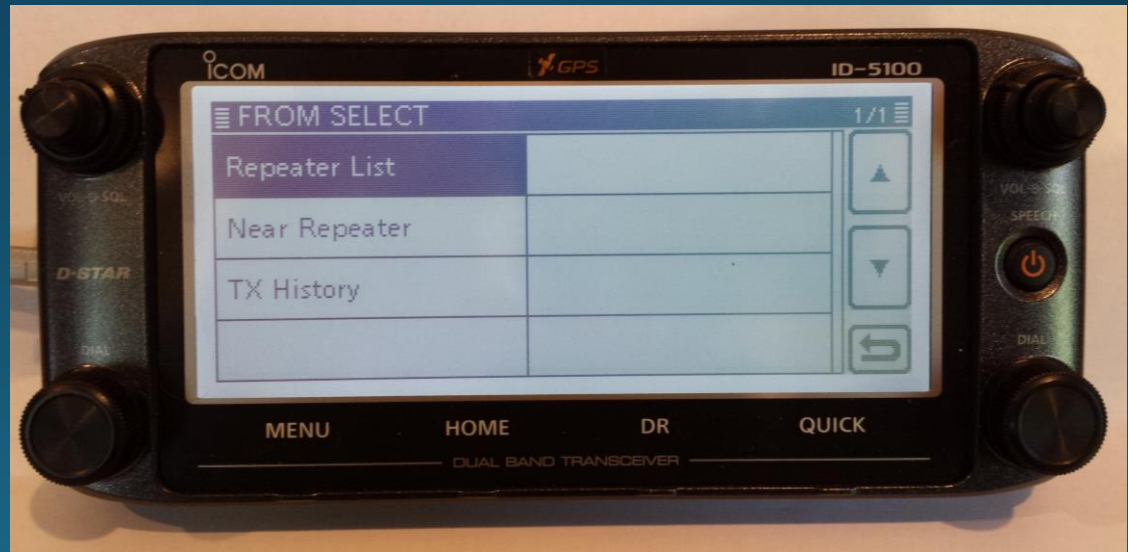
Memory Management – Method 3 (DR Mode)

- Available on ID-31, ID51, IC-7100, ID-5100
- Radios have regular memories usually used for FM
- Geocoded Repeater List / DR memories used for D-STAR
- ID-5100 Repeater List may be used for FM or D-STAR
- DR Mode introduces TO/FROM screen for easy use



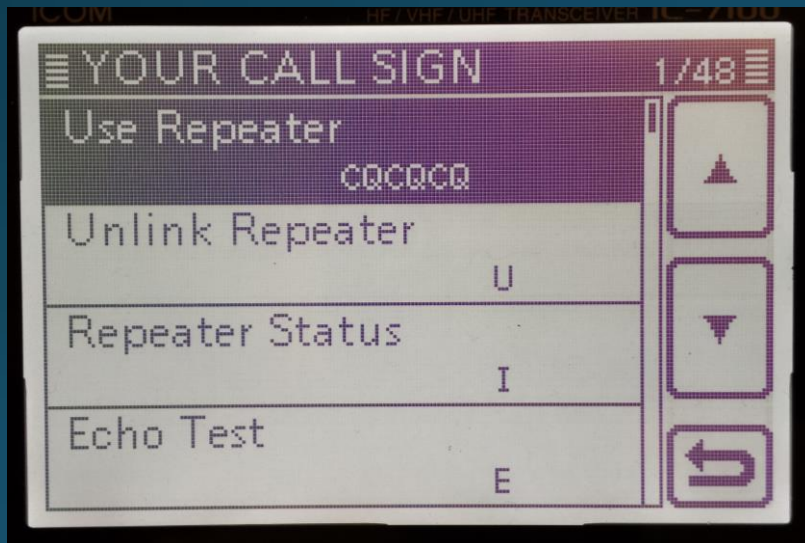
Using DR Mode

- Select FROM to pick a repeater
- Utilizes internal GPS to know where you are
- Repeater List has geocoded repeaters
- Selecting Nearest Repeater finds closest repeaters
- Select desired repeater



Using DR Mode

- Select TO on screen
- Select “Your Call Sign” (“Reflector” on ID-5100)
- Select “Use Repeater” (“Link to Reflector” on ID-5100) to talk (like CQCQCQ)



DR Mode

- Link to a repeater or reflector while in TO field by rotating knob (*ID-5100 select Gateway CQ for repeater list or Repeater List>Link to Reflector for list of reflectors*)
- Return to Use Repeater/Reflector for CQCQCQ for talking





Programming for the DVAP

• Standard Memories

Receive Frequency	Transmit Frequency	Offset Frequency	Offset Direction	Operating Mode	Name	Your Callsign	Rpt-1 CallSign	Rpt-2 CallSign
145.79000	145.79000		Simplex	DV	DVAP	CQCQCQ		
145.79000	145.79000		Simplex	DV	Unlink	U	DIRECT	
145.79000	145.79000		Simplex	DV	DVAP ID	DVAP I	DIRECT	
145.79000	145.79000		Simplex	DV	REF001C	REF001CL	DIRECT	
145.79000	145.79000		Simplex	DV	REF002A	REF002AL	DIRECT	

• Repeater List

Name	Sub Name	Repeater Call Sign	Gateway Call Sign	Operating Freq	DUP	Offset Freq	USE (FROM)
JD DVAP VHF				145.790000		0.600000	Yes
JD DVAP UHF				441.000000		5.000000	Yes
VHF DV Simplex				145.670000		0.600000	Yes
UHF DV Simplex				445.670000		5.000000	Yes
DVAP Default VHF				146.550000		0.600000	Yes
DVAP Default UHF				446.550000		5.000000	Yes



D-STAR's 1.2 GHz Radio



- Icom ID-1
- Operates FM Voice or GMSK (D-STAR) modes
- D-STAR modes include voice, low speed data (1200 bps) or high speed data (128 kbps)
- 10W transmit output



ID-1 High Speed Data Mode

- Radio acts as Ethernet wireless bridge
- Has RJ-45 Ethernet connector for HS data
- Can be used for Internet connectivity through D-STAR repeater with DD module
- Can be used to create wireless bridge between two points
- When communicating through DD repeater, know assigned IP address (10.x.x.x)



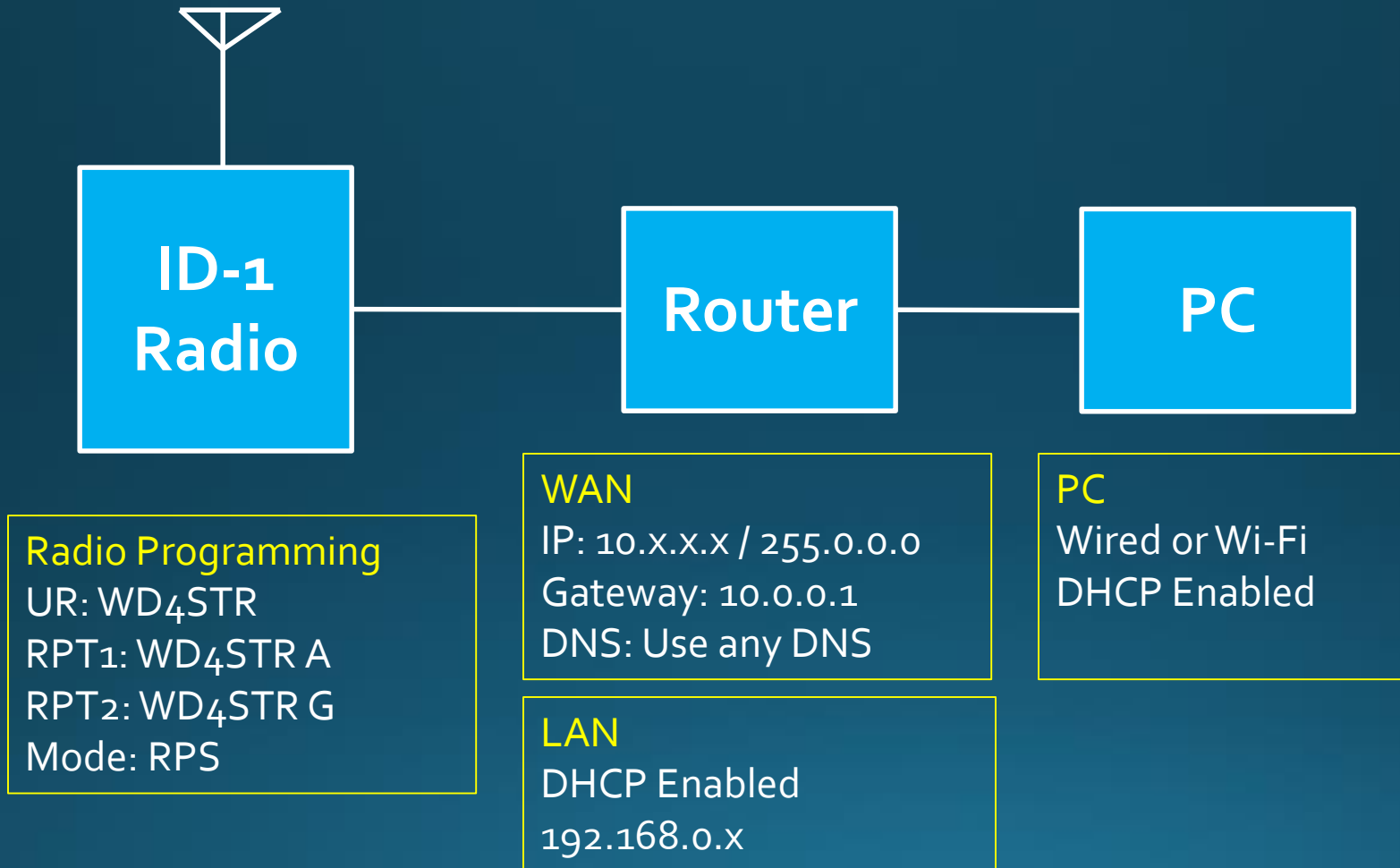
High Speed Data – DD Mode



- Ethernet connection to PC
- PC must use assigned IP address assigned at registration (10.x.x.x)
- Gateway is 10.0.0.1
- Use known DNS addresses
- ...or the easy way is to insert a router between ID-1 and PC and use DHCP!



Setup With Router





What Do You Do?

- Take picture
- Insert GPS data into meta data
- Upload photo to Picasa on Internet using ID-1
- View picture on Picasa website
- D-RATS chat session can be used for communications with ground



Picasa Website of Pictures



ARES SET Falcon - Scott Hartlage - Picasa Web Albums - Windows Internet Explorer

https://picasaweb.google.com/kf4pwi/ARESETFalcon?authkey=Gv1sRgCMany5HWzO_VoQE#

Google Search Share Bookmarks Check AutoFill Sign In

Picasa Web Albums - Scott... Oops! Internet Explorer co... HTTP 500 Internal Server E... HTTP 500 Internal Server E... iGoogle Radar OWA KG4IUM-9 VUE 100 News HC HYPERCONNECTIVITY Un... Suggested Sites

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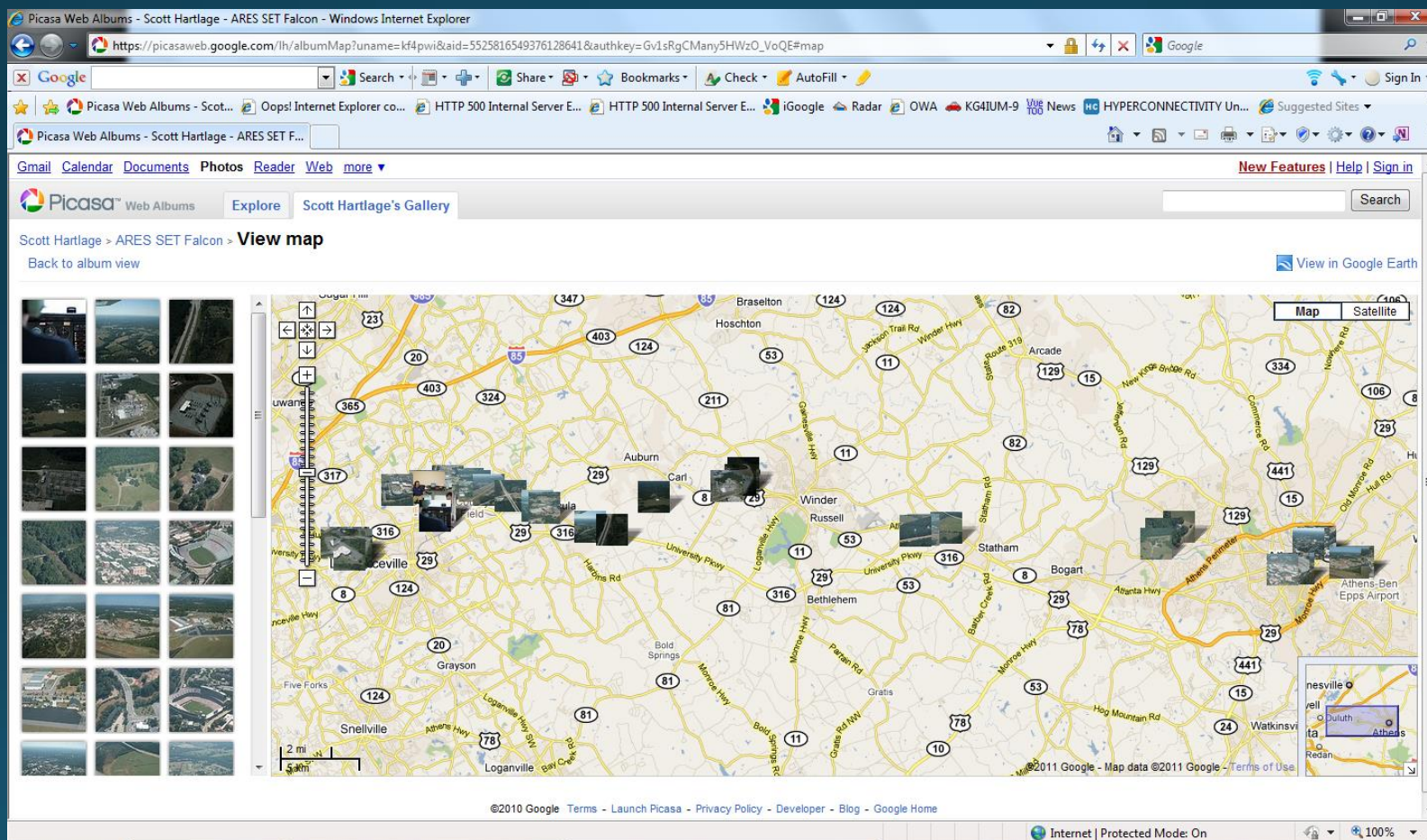
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Pictures Display on Google Maps



Click on picture to see on map



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