Gaining Skill at Digital Data Communications: Winlink emergency communications tools

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ARRL 2022 NATIONAL CONVENTION

ORLANDO HamCation®

Categories of Data Transmissions

- There are LOTS of different ways to categorize data transmissions.
  - BROADCAST (1:Many) versus CONNECTED (1:1)
  - NON-ERROR-CORRECTED versus Forward Error Correction (embedded redundancy) versus ARQ (acknowledge-request)
  - SINGLE CHARACTER-BASED versus PACKETS
  - PEER TO PEER versus CLIENT-SERVER
  - KEYBOARD TO KEYBOARD versus Store/Foward (e.g. EMAIL)
  - PROPRIETARY versus OPEN SOURCE
  - FREE versus SOLD
  - Etc.

Data Transmission: FLDGI

- FLDGI (NBEMS)
  - Usually: Character-based, BROADCAST communications, no/FEC error correction
  - **TYPICAL EMERGENCY USAGE:**
    - **Excellent for TACTICAL COMMS**, e.g. **Nets with multiple participants**
    - **Much better than voice for getting thru!!**
  - Additional software (layers) provide for packet-based communications, error correction, forms, etc.
  - *Generally a peer-to-peer communication (participants must both be present same time, same frequency - Disadvantage*
  - Examples: PSK31, MFSK, MT63 (used for ARRL Field Day Bulletins)
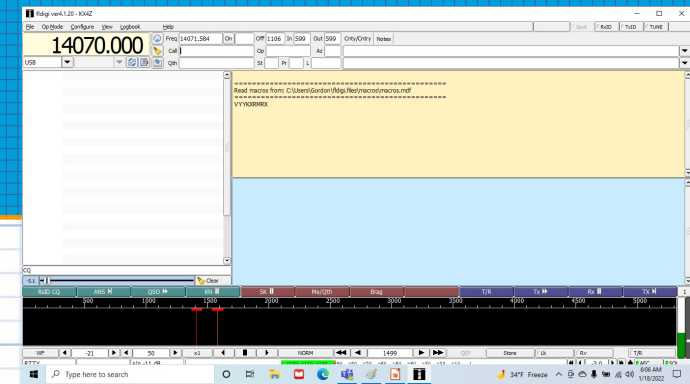
Data Transmission: WINLINK

- WINLINK

  - Store and forward EMAIL system (SYSTEM = association of collaborating stations; undefined in FCC-speak)

  - PACKET-based, ARQ Error Correction.

  - Much better than VOICE at getting through!

  - TYPICAL EMERGENCY FUNCTION:
    - JUMP OUT OF DISASTER AREA to functioning RMS gateways
    - Large choices of gateways; no scheduling needed!

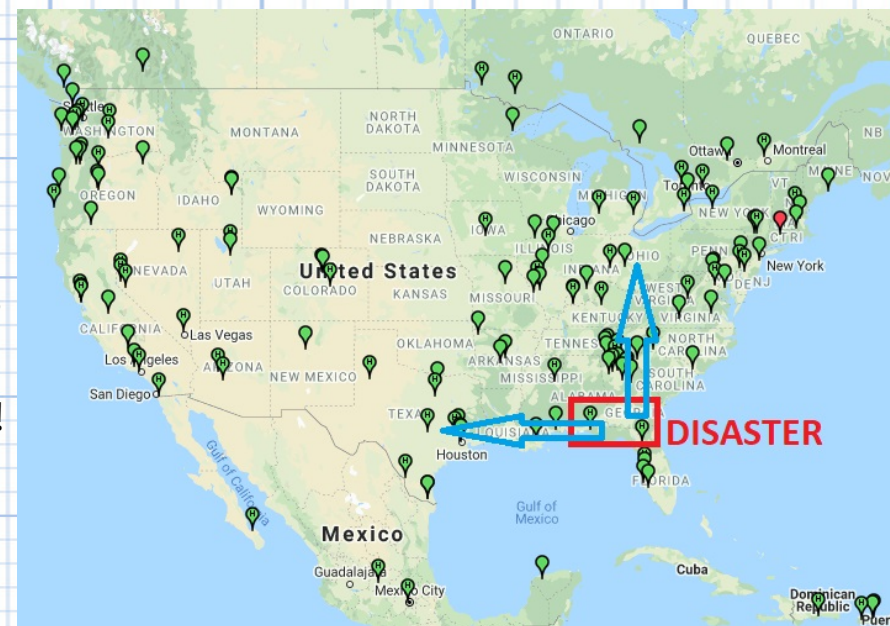 - DISADVANTAGE: NOT useful for keyboard to keyboard

Massive Internet Attack

- Very slow RMS-to-RMS relaying "Radio Only"

- Works….but very limited capability. KEY CAPABILITY OF SHARES

- Doesn't exist in PACKET due to limitations AX.25

Map: Winlink volunteer
RMS <VARA> servers

Use the Tool that FITS at that moment!

- FLDGI software/protocols for data-based (keyboard / texting) Nets that function with more resilience than voice nets due to lower SNR requirements
  - JS8 provides VERY much lower SNR requirements
- WINLINK software/protocols for formal traffic (reports, data, attachments) via email.
  - Both 500Hz and 2.4-kHz level comms possible
  - Store/forward system means schedules / nets not as important.
  - Alternatives include additional layers on FLDGI (still require scheduling) and JS8 (caching of short messages)
- Teaching BOTH systems can lead to confusion. We have tried! WINLINK HF often easier to teach than VHF (AX.25) because modem software is built in for ARDOP and readily available for VARA.
- FM-familiar users don't have to pay as much attention to modulation levels; on HF these become IMPORTANT to avoid over/under-modulating.

Getting WINLINK set up: TODAY

- Primarily for WINDOWS-type computers.

- Their development group stretched thin enough just keeping and advancing on ONE platform (especially as Microsoft keeps "upgrading"

- There are alternatives for LINUX / Mac etc., <u>but beyond our scope for today</u>. (NOTE: PAT has added support for FORMS)

Requires .NET
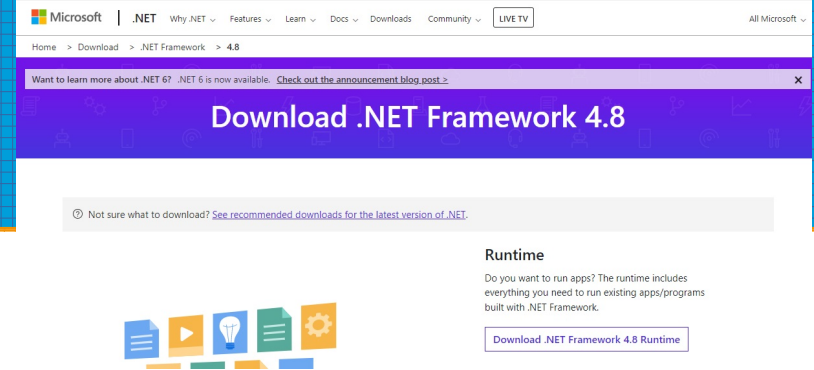
- .NET framework involves communications between processes, computers, security issues.

- Must be up to certain level for WINLINK client software to properly function.   Older versions (e.g. VISTA) no longer working properly;

- Windows 10 no problem; also Windows 8 no problem

- In pre-conference email encouraged updating; easy to have WINDOWS search for and install updated .NET if required.

Mentors to help you…..

- Windows SETTINGS "Turn Windows feaures on or off" allows you to check whether .NET versions installed.

- WE HAVE SOFTWARE on a private server.
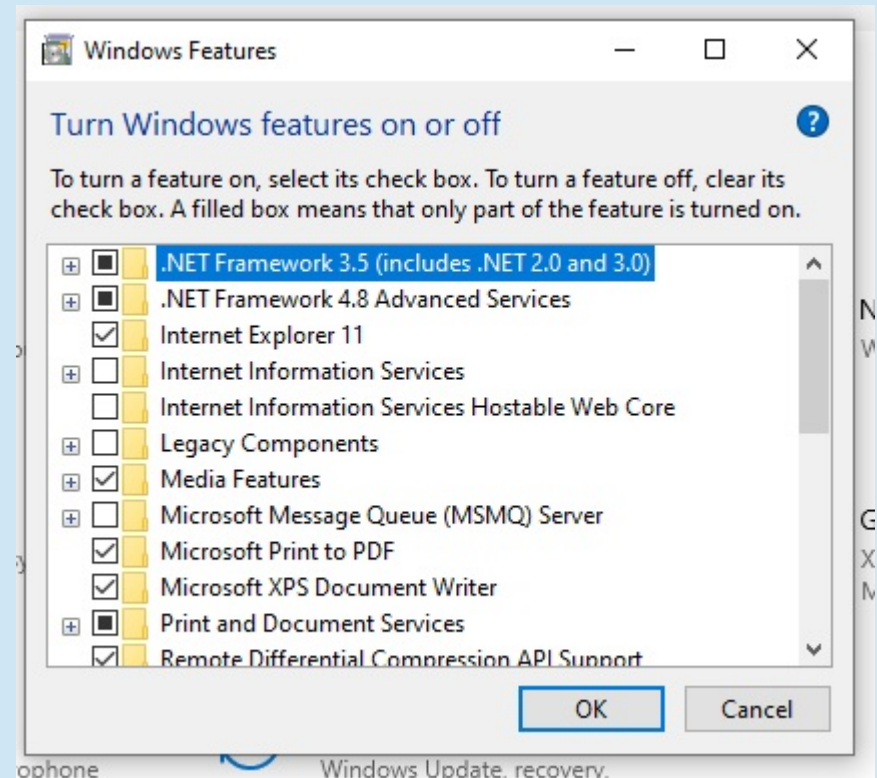
Academy Stand-Alone Web Server

- WIFI: SHELTER-A

- No passphrase; no encryption

- NOT connected to Internet

- Has everything needed.

- Avoids passing thumbdrives from computer to computer.

Our stand-alone WEB

- Look for WIFI SHELTER-A

- Connect (it can be slow)

- Does NOT connect to the Internet.
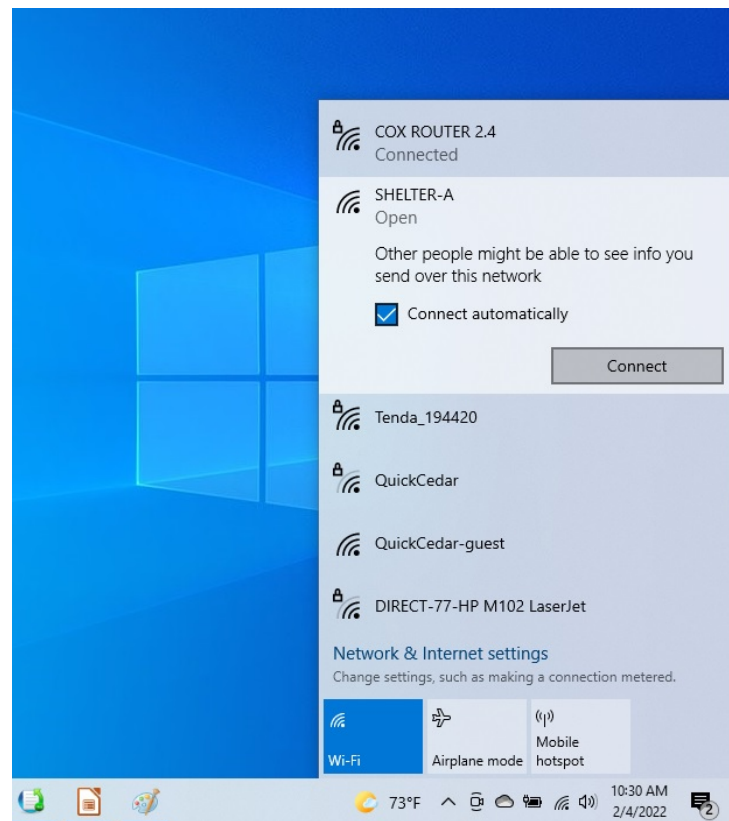
10.10.10.10

- What it looks like on a cell phone.

- Mentor will help you download and install software.

- You can also use real internet or thumbdrives – just git'er DONE!
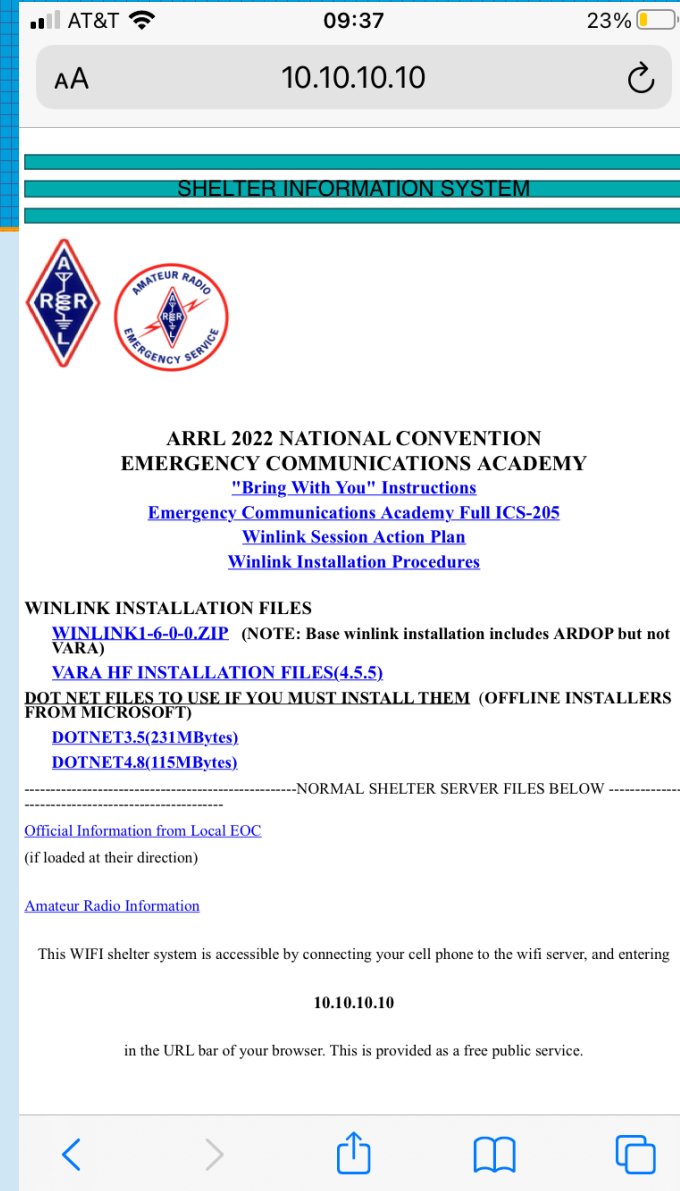
Overview:Installation Process

- Download WINDOWS installation package

  - Web: winlink.org web site

  - Here: Thumbdrives available

  - 10.10.10.10 local server

- Install

- Setup: Callsign, choose your password, provide password recovery email (NOT on winlink.org!), Maidenhead locater, contact address etc as suits you.

- Your radio email address is   <YOURCALL>@WINLINK.**ORG**

Winlink Express Setup

Radio Email

- This is an EMAIL system. Most volunteers rapidly comprehend it.

- RADIO email system: more than one way to send!

- Broken into two-step process

  - Create Message – then POST TO OUTBOX

  - Make desired CONNECTION in order to allow actual transmission

    - CONNECTIONS ("Session") include TELNET [regular Internet], PACTOR, ARDOP, VARA, AX.25 and possibly many more nuances

Get basic skills down first!

- Ability to send/receive email completely by radio out of disaster area (or camping site, or rural site, whatever) is key EMCOM skill.

- We want to help you advance closer to that actual skill today

- **Later** you can add additional skills:

  - Attachments to your email (keep SMALL)

  - ICS Forms, including ICS-213 etc

  - Photographs (technique for reducing size)

  - Peer-to-Peer communications work fine, also!

Getting on the RADIO!

- Mentors here to assist you. (short supply)

- TODAY: We will only use **pre-configured, working Radio Setups**

- Getting your computer connected to your home radio…..will take some elbow grease.

- A MENTOR or ELMER will be very helpful!

- YOU CAN DO IT!

- Watch for modulation levels! This is real ham radio!

Winlink also works on VHF/UHF

- Many VHF packet-based (AX.25) Winlink radio message servers all over the nation.

- Very dependent on INTERNET as unable to forward traffic via HF (unless connected to a hybrid station)

- Great for TRAINING….***but not our focus here today***.

This is Sinle Side Band RADIO

- FREQUENCIES

  - "Carrier Freq" = DIAL FREQUENCY

  - Winlink always uses UPPER SIDEBAND when on HF

  - The "CENTER FREQ" is always 1500 Hz (1.5 kHz) above the DIAL FREQUENCY.

  - Be certain when posting or reading frequencies, whether it is DIAL or CENTER…...

Your MISSION

- Shelter A Link: **WINLINK SESSION ACTION PLAN**.

- Get WINLINK installed on your personal computer (if not already)

- Get your ACCOUNT GOING (even if only thru TELNET)

- Participate in making a RADIO winlink connection (ARDOP or VARA)

- If your table is really advanced, work on sending an ICS-213.

- If you get really STUCK, find a Mentor and get UNSTUCK

- READY

- SET

- GO!!   You have until 3:30 to get AS MUCH DONE OF THE ACTION PLAN AS POSSIBLE!

Thank You!