

Gaining Skill at Digital Data Communications: Winlink emergency communications tools

Gordon Gibby KX4Z NCS521
NND4FL
docvacuumtubes@gmail.com

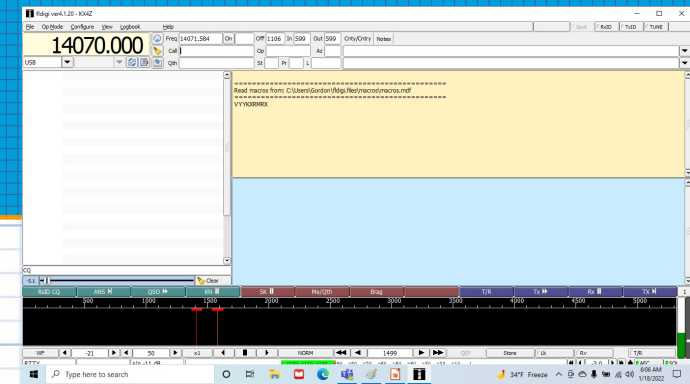


Categories of Data Transmissions

- 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

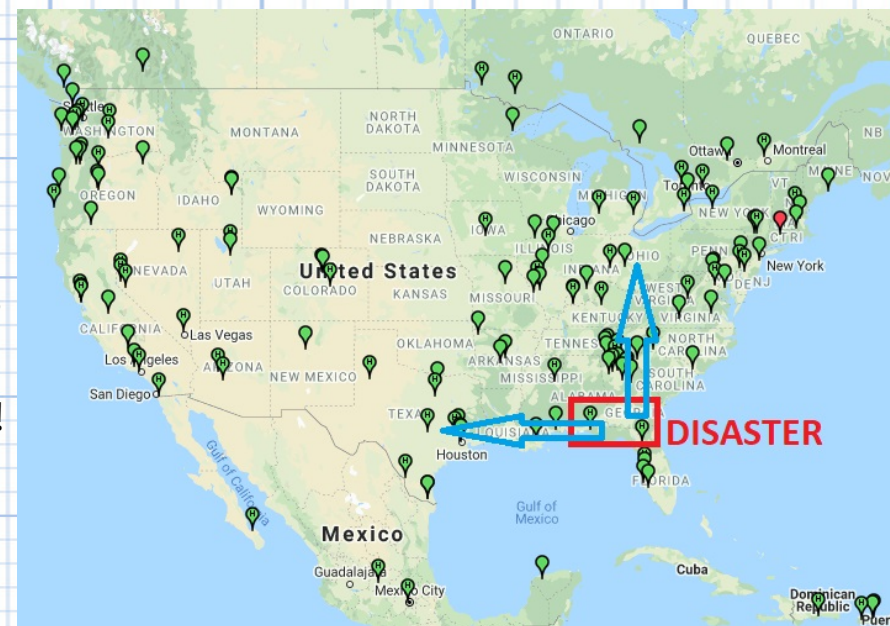
Winlink Express 1.544.0 - K1AZ

Settings Message Attachments Move To Saved Items Delete Open Session View HT Window Logs Help

No active sessions.

Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
2021/12/23 1:00:00	BM47244EKESJ	1531	W4AKH	W4AKH	K1AZ	GORDON, FL WL Net Check in Reminder - The Best
2021/12/23 12:22	EXN0PFB920	163	K4NEA	K4NEA	K1AZ	c7100
2021/12/23 12:22	K2L00K03A4	466	N2UL	N2UL	K1AZ	Radio Only W4RA FM
2021/12/23 12:08	QD80C0304E	1203	K04SH	K04SH	K1AZ	GORDON, FL WL Net W4AKH REPORT 12/21/21 113 Stations
2021/12/16 12:56	RZ2RG02WPE	406	K4K4Z	K4K4Z	K1AZ	Re: FL WL NET, Gordon, Eilat (Travel Talent) GA, W4RA BOM
2021/12/03 01:47	4LPUS52V7NRV	2578	K4K4Z	K4K4Z	ACTYSET	ICS 300 log for Winlink S.E.T. exercise messages
2021/12/02 23:46	M550B20YV557	2121	K4K4Z	K4K4Z	K1AZ	ICS 300 - SUSAN HALBERT - K4K4Z - 2021-12-02 19:40
2021/12/02 23:36	REL45G52WHP	2228	K4K4Z	K4K4Z	K1AZ	JWLXZ 214-2021 SET - SUSAN HALBERT 2 OCT 9:00 - 2:00
2021/12/02 19:46	W4K4Z04K0007	2320	N4K4Z	N4K4Z	NF4AC	214-SET 2021 - Best Wallace 0900 - 1100
2021/12/02 19:46	RZ2RG02WPE	2578	N4K4Z	N4K4Z	NF4AC	ICS 300 - Alachua County EDC - Best Wallace - N4K4Z - 2021
2021/12/02 19:45	S0628R00HY	1888	K4K4Z	K4K4Z	NF4AC	214-SET 2021 - m Wallace 0900 - 1100
2021/12/02 19:45	F0T5SHR05G	1876	K4K4Z	K4K4Z	NF4AC	ICS 300 - m Wallace - K4K4Z - 2021-12-02 09:00
2021/12/02 18:24	EDH0N30K7C	391	K4K4Z	K4K4Z	NF4AC	COLUMBIA COUNTY ARES ENDEX REPORT
2021/12/02 16:13	U4M4K4Z0N	411	NF4AC	NF4AC	NF4AC	SMTP sendmail
2021/12/02 16:13	40007C05VGB	379	NF4AC	NF4AC	NF4AC	Test Radiogun Survivor Message
2021/12/02 16:01	VYPMU43308	1382	NF4AC	NF4AC	NF4AC	JWLXZ R/ SPOTREP 021572Z OCT 2021
2021/12/02 16:03	RSPO5C8K4L	642	NF4AC	NF4AC	ACTYSET	ALACHUA COUNTY AGGREGATE REPORT
2021/12/02 14:23	U4K4Z04K0007	757	W4K4Z	W4K4Z	SMTP gpg2h	Flad's Inedix Emergency Comm Test (Not Real World)
2021/12/02 14:21	K2L00K03A4	466	K4K4Z	K4K4Z	SMTP gpg2h	EMERGENCY TEST (GET)
2021/12/02 14:12	U4K4Z04K0007	757	K4K4Z	K4K4Z	SMTP sendmail	Radio Radio Email From: Craig Fugate - DO NOT REPLY

Message ID: 1X0K085151EF
Date: 2023/08/13 13:35



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



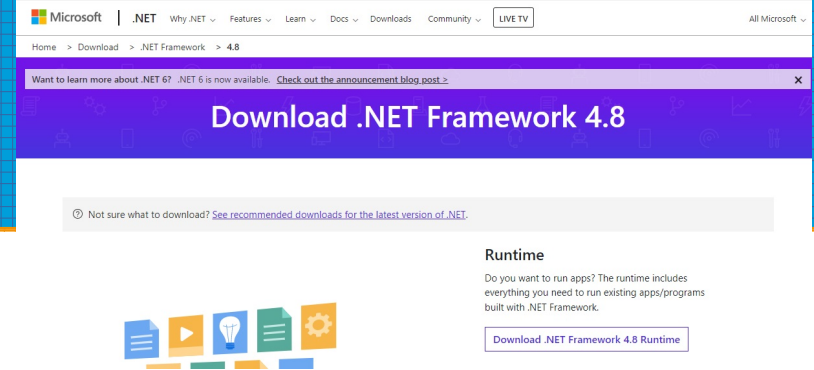
Use the Tool that FITS at that moment!

- 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., but beyond our scope for today. (NOTE: PAT has added support for FORMS)

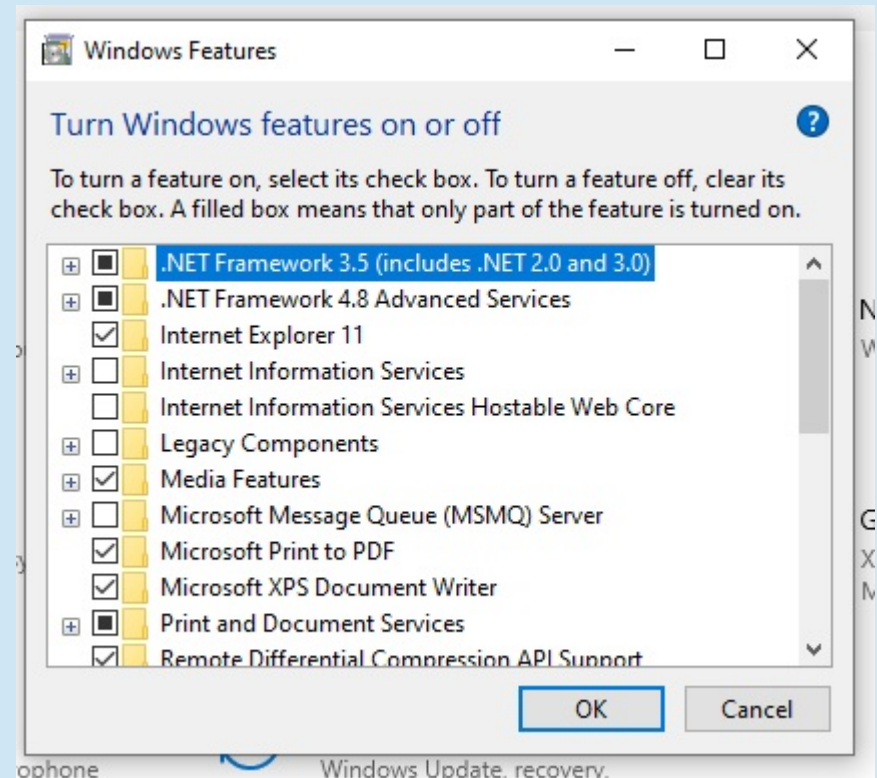
Requires .NET



- .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 features on or off” allows you to check whether .NET versions installed.
- WE HAVE SOFTWARE on a private server.



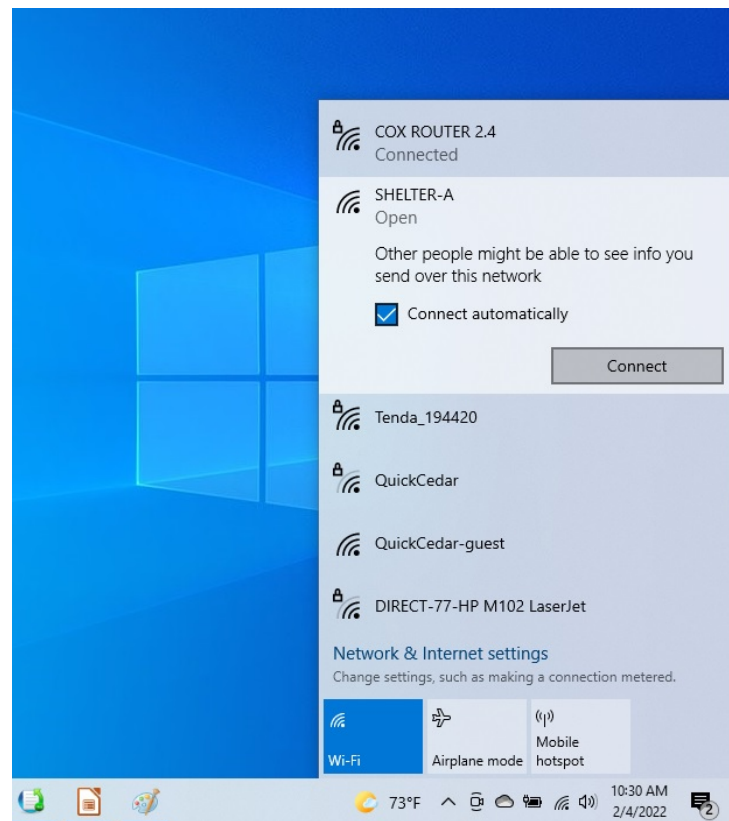
Academy Stand-Alone Web Server

- WIFI: SHELTER-A
- No passphrase; no encryption
- NOT connected to Internet
- Has everything needed.
- Avoids passing thumbdrives from computer to computer.



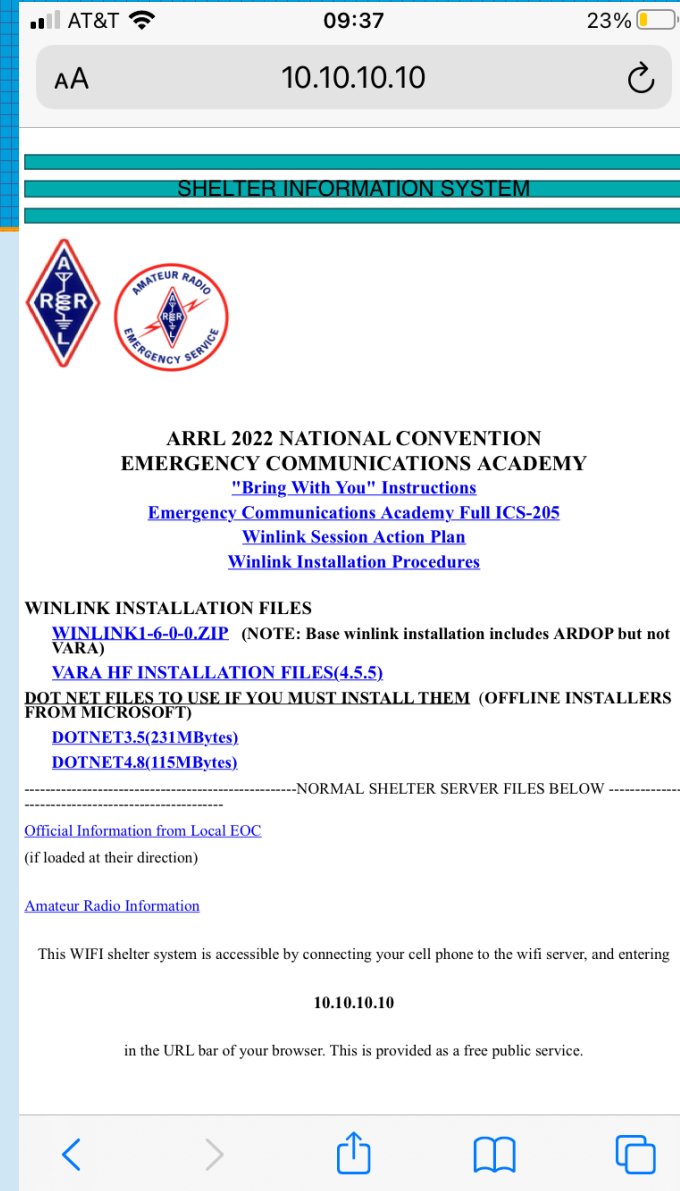
Our stand-alone WEB

- 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 locator, contact address etc as suits you.
- Your radio email address is **<YOURCALL>@WINLINK.ORG**

The screenshot shows the 'Winlink Express Properties' dialog box. Red boxes and numbers highlight specific fields: 1. 'My Callsign' field containing '3X4Z'; 2. 'My Password' field containing '*****'; 3. 'Password recovery e-mail' field containing 'docvacuuntubes@gmail.com'; 4. 'My Grid Square' field containing 'EM85UO'; 5. 'Service Codes' dropdown menu set to 'PUBLIC'; 6. 'Contact Information' section, which includes fields for Name, Street address, City, State/Province, Country, Postal code, Web Site URL, Phone number, and Non-Winlink e-mail.

Winlink Express Setup

Winlink Express 1.5.44.0 - KX4Z

KX4Z

No active sessions

System Folder

Inbox (79 unread)

Read Items (0)

Outbox (0)

Sent Items (2)

Saved Items

Deleted Items

Drafts (1)

Personal Folders

FieldDay2011

Gordon (0)

HurricaneTest

Global Folders

Contact List

43228@NTSOH

AB4NX

AD4BL

AE4AG

AG6SV

AI4NF

AJ4FW

AL6F

AL6J

AL7N

ANDERSON_EF

ARCSE

ART_(GMAIL.CO

ART_(WINLINK)

BANNON_GENE

To: AA3YB

From: KX4Z

Winlink Express Properties

Call Signs

1 My Callsign: **KX4Z**

2 My Password: **.....** (case sensitive)

Call sign suffix (optional): (Used for country code)

3 Password recovery e-mail: **docvacuumtubes@gmail.com**
(Non-Winlink e-mail address where lost password will be sent when requested)

Auxiliary Callsigns and Tactical Addresses

☒ ACTYSET
☐ FLEXDOCUNIT
☒ RDEM

4 My Grid Square: **EM85UO** Lat/Lon to Grid Square

Winlink Express registration key: **21FFF635823AE84C2EE08792B343F51**

Service Codes

5 **(different for SHARES)** **PUBLIC**

(Use PUBLIC for ham call signs. Separate multiple service codes by spaces.)

If you change service codes, you must update the list of channels.

Contact Information (Optional) 6

Name: **Gordon Gibby MD**

Street address 1: **15216 NW 41st Ave**

Street address 2:

City: **Newberry**

State/Province: **FL**

Country: **USA**

Postal code: **32669**

Web Site URL (optional):

Phone number:

Non-Winlink e-mail: **docvacuumtubes@gmail.com**

Additional information (optional):

LEAVE DEFAULTS!

Recalculate HF path quality if SFI changes more than: **30**

Keep logs for **2** weeks. Keep deleted messages for **30** days.

- ☒ Display list of pending incoming messages prior to download
- ☒ Warn about connections to stations holding messages
- ☒ Allow diagnostic information to be sent to the Winlink Development Team
- ☒ Automatically install field-test (beta) versions of Winlink Express

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

Winlink Express 1.5.44.0 - KX4Z

CALL Settings Message Attachments Move To: Saved Items Delete Open Session: Vara HF Winlink Logs Help

START MESSAGE PICK RADIO/INTERNET

No active session...

System Folders

- Inbox (79 unread)
- Read Items (0)
- Outbox (0)
- Sent Items (24)
- Saved Items (2)
- Deleted Items (2)
- Drafts (1)

Personal Folders

- FieldDay2018 (0)
- Gordon (0)
- HurricaneTest (0)

Global Folders

Contacts

- 43228@NTSOH
- AB4NX
- AD4BL
- AE4AG
- AG6SV
- AI4NF
- AJ4FW
- AL6F
- AL6J
- AL7N
- ANDERSON_ERIC
- ARCSE

Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
2021/12/23 15:22	8M47J44EKSSJ	1531	W4AKH	W4AKH	KX4Z	GORDON, FL WL Net Check in Reminder + The Best
2021/12/23 15:22	EX7KDPPB98Z0	169	K4NEA	K4NEA	KX4Z	ic7100
2021/12/21 20:28	8QLVDOK5G84L	464	N3XL	N3XL	KX4Z	Radio Only VARA FM
2021/12/21 16:05	D8XEOI53IOJE	1283	KK4SHF	KK4SHF	KX4Z	GORDON, WL Net W4AKH, REPORT 12/21/21 118 Stations
2021/10/16 12:56	RRZYRGDWBP...	406	KK4INZ	KK4INZ	KX4Z	Re: FL WL NET, Gordon, Elijah (Travel Trailer), GA, VARA 80M
2021/10/03 01:47	4UPL5S2V7NRV	25176	KK4INZ	KK4INZ	ACTYSET...	ICS 309 log for Winlink S.E.T. exercise messages
2021/10/02 23:46	M0SOBI2WV507	2121	KG4VWI	KG4VWI	KX4Z...	ICS 309- SUSAN HALBERT - KG4VWI - 2021-10-02 19:40
2021/10/02 23:38	HEL4SUGVZMNF	2228	KG4VWI	KG4VWI	KX4Z...	//WL2K 214- 2021 SET - SUSAN HALBERT-2 OCT 9:00 - 2 OCT
2021/10/02 19:46	HYMT6PVX8WD7	2329	NH2KW	NH2KW	NF4AC...	214- SET 2021 - Brett Wallace-0900 - 1100
2021/10/02 19:46	6RZFJ48H1O4L	2262	NH2KW	NH2KW	NH4AC...	ICS 309- Alachua County EOC - Brett Wallace - NH2KW - 2021-
2021/10/02 19:45	5Q0E2BR0IHY	1888	KO4JWC	KO4JWC	NF4AC...	214- SET 2021 - eM Wallace-0900 - 1100
2021/10/02 19:45	FJDT5SNR8OSQ	1870	KO4JWC	KO4JWC	NF4AC...	ICS 309- eM Wallace - KO4JWC - 2021-10-02 0930
2021/10/02 16:24	60DHGNSI8K76	391	K9RFT	K9RFT	NF4AC	COLUMBIA COUNTY ARES ENDEX REPORT
2021/10/02 16:13	3UJM4JFOTZN	411	NF4AC	NF4AC	SMTP:caroletpto...	Test Radiogram Survivor Message
2021/10/02 16:13	4O2078C55VQB	379	NF4AC	NF4AC	ACTYSET	Test Radiogram Survivor Message
2021/10/02 16:01	VYYPMU39308	1382	NF4AC	NF4AC	NF4AC	//WL2K R/ SPOTREP 021557Z OCT 2021
2021/10/02 15:03	RCSP0SCM8XXL	642	NF4AC	NF4AC	ACTYSET	ALACHUA COUNTY AGGREGATE REPORT
2021/10/02 14:23	UQJQIOIUI9XQ	757	W4JIR	W4JIR	SMTP:gigi2nora...	(Reid's friend) Emergency Comm Test...(Not Real World)
2021/10/02 14:21	IQ3UEZM60B7P	602	K9RFT	K9RFT	SMTP:gigi2nora...	SIMULATED EMERGENCY TEST (SET)
2021/10/02 14:12	ZCBQY1Y7815E	757	KK4INZ	KK4INZ	SMTP:carwilewilli...	Status Radio Email From: Craig Fugate - DO NOT REPLY!

Message ID: 1XWXB9515LKP
Date: 2020/08/13 13:38

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 Single 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!

