All About Winlink

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- https://wordart.com/create

Digital Modes

RTTY · Winlink · DSTAR · PSK31 · C4FM · DMR · Fldigi · JT44 · WSTJ-X · JT65 · Fusion · APRS · Packet · FT-8 · JS8CALL · WIRES-X

Scope of this Presentation

- ## What's In
  - Winlink for the typical ham radio operator
  - The basics to send and receive messages

- ## What's Out
  - Settings for particular radios and interfaces
  - Details regarding use of Digipeaters/Nodes
 - How operate an RMS Gateway

Winlink Global Radio Email®

- The Winlink system is a worldwide radio email service that uses radio pathways where the internet is not present, and is capable of operating completely without the internet--automatically--using smart-network radio relays.

- Winlink provides users email messaging with attachments, position reporting, weather and information bulletins, and is well-known for its role in emergency and disaster relief communications.

- The Winlink system uses the Internet (when available) to send messages between users. Five servers worldwide provide the backbone.

- Winlink can send messages to & from regular Internet Email Addresses.

- Winlink can also send messages direct between users (Peer-to-Peer).

- User software formerly called RMS Express, now Winlink Express.

WinLink Network
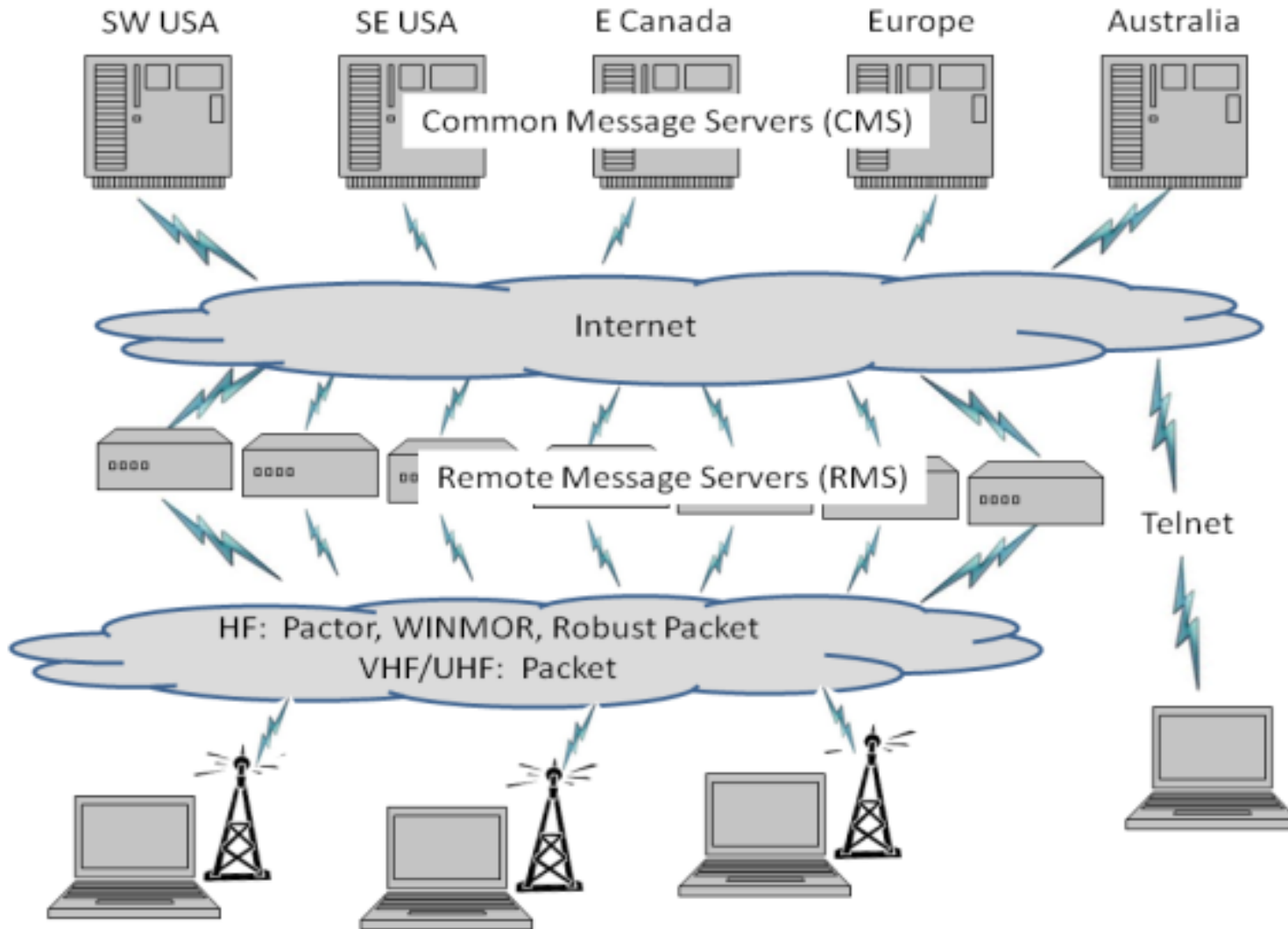
Winlink Limitations

- Backup messaging system

- Does not replace your normal email account

- Does not replace your internet service provider

- Does not provide any ability to surf the Internet

- Most messages sent via Radio transmit slower than most home internet or cell phone connections

- Max size of email and attachments=120,000 bytes

- Regulations prohibit commercial content over the air

- No built-in search function for messages

- No cloud database for messages – only stored on your PC

Origin of Winlink

- Winlink is an all-volunteer project of the Amateur Radio Safety Foundation, Inc. (ARSFI), a non-profit public benefit corporation.

- Built, maintained and supported entirely by volunteers of the Winlink Development Team.

- Winlink is happy to take donations for support.

- Winlink grew from Packet Radio. Packet has been around for many years.

- Earliest version was in use in 1990. Now full-featured software.

- Regular updates are made, including fixes and new features.

- Winlink messages are NOT encrypted, are NOT private, and can be read by at least the Gateway SYSOPS.

Why Winlink?

- Regional Internet outages can occur during natural disasters

- Detailed, accurate messages can be transmitted via ham radio using the Winlink System

- Send messages out of the effected region

  - Quickly alert family of your status

- Support emergency services within effected region

  - Served agencies are familiar with email messages

Multiple Modes in One Program

- Winlink includes multiple modes in one program - Packet, Pactor, Winmor, ARDOP, VARA, and direct between radios (Peer-to-Peer)

- VHF/UHF & HF & Telnet (Internet)

- Recommend Winlink Express – a full-featured email client, which is free. Donations accepted.

- More Mode info can be found at www.winlink.org or in the Winlink Express program.

Uses & Users

- Popular with ARES & EmComm folks
- Used during at least 14 recent hurricanes
- 2018 Western Wildfires
- 2017 Mexico City Earthquake
- Other high profile disasters
- Lives and property saved, damage mitigated
- Sailors stay connected at sea, over marine radio

Statewide Growth

- Illinois experienced much growth in numbers of Winlink VHF Gateways and Digipeaters in 2018

- Approximately 40 VHF Gateways are online in Illinois, operating on VHF frequency 145.610 MHz

- Former IL State Police Radios have been repurposed for some of the new gateways

- We now have a local VHF Winlink Gateway located at Kickapoo. Also can digipeat signals for greater range. Gateway Name = KD9ANU-10, Digi Name = PEORIA

- Plus an in-range Digipeater is operating in Mason County. Digi Name = WD9FMB-1 or MASON

Illinois VHF Gateways

- Go to winlink.org
- Select >Tools
- On the RMS Map, choose the radio button "Packet"
- Zoom in to the region of interest
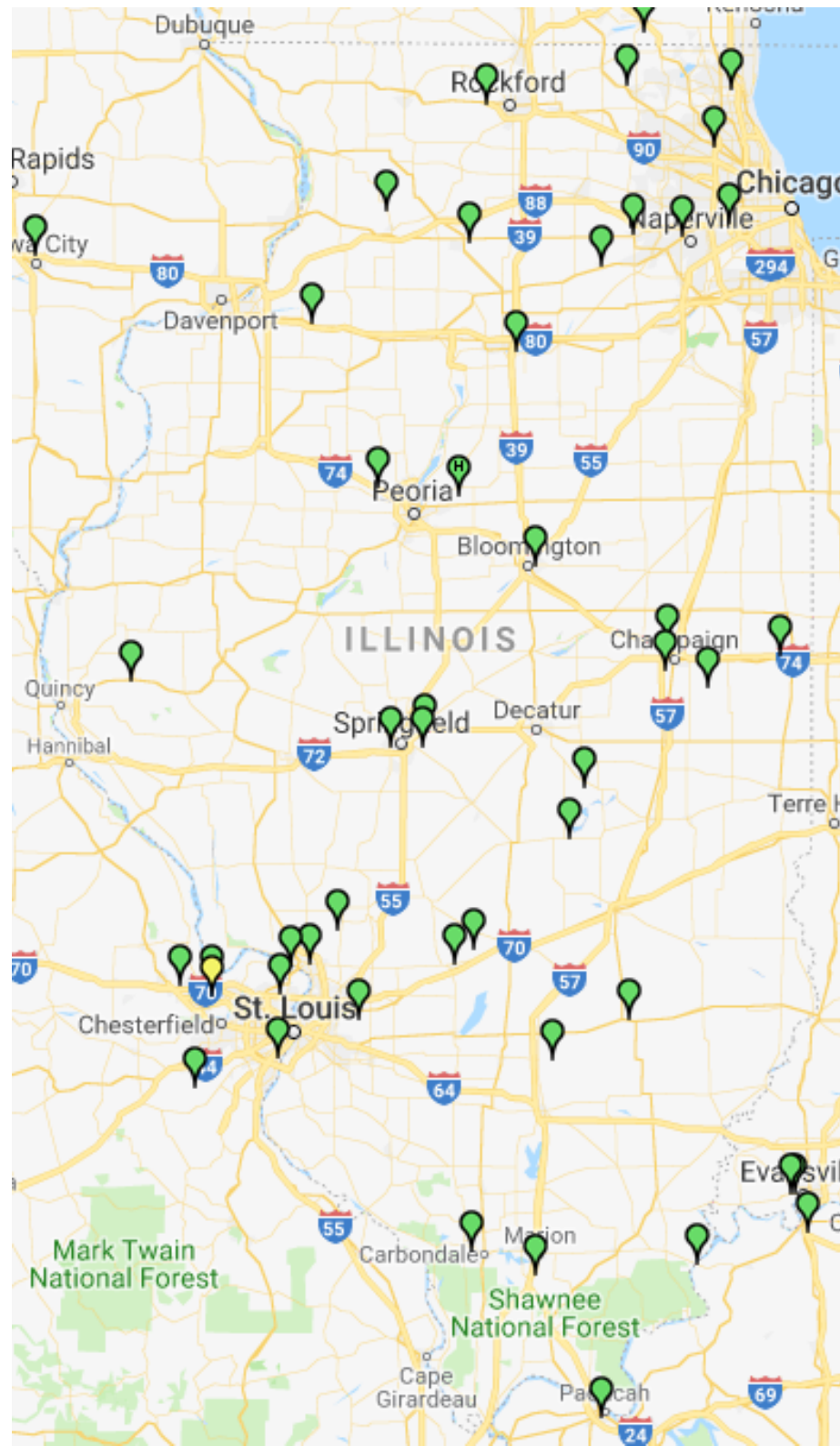
Live Stations – Winmor HF

- Go to winlink.org
- Select >Tools
- On the RMS Map, choose the radio button "Winmor"
- Zoom in to the region of interest

As of 02/03/2019 5:10 PM

Getting Ready with Winlink

- Practice using Winlink software without Radio
    - Uses only an Internet Connection (Telnet mode)
    - All the non-radio software features are available
- Start sending radio messages at later time

All About Winlink.odp / pdf

Software & Equipment Needs

- Winlink Express client software runs only on Windows (7, 8, or 10)

- Microsoft .NET Framework 3.5 must be enabled (it's typically loaded)

- Create your own Winlink account using Winlink Express software

- VHF radio for Packet/VARA

- HF radio for Pactor/Winmor/ARDOP/VARA

- Interface Box (TNC or external sound card) and Cable

- Some radios have built-in TNC (Kenwood D700 & D710)

- Some radios have built-in sound card (IC-7100, 7300, 7410, 7600, 9100)

- Radio 101 applies – higher <u>Antenna</u>, SWR, Propagation, Power Level

- RFI can cause issues – remote antenna mount, ferrites on cable ends

- Handi-Talkies with rubber duck antennas may disappoint users

- Some Yaesu radios that claim to include a TNC cannot do Winlink

Interface Box Examples

- If not built-in to your radio, there are many options
- TNC (Terminal Node Controller) [many models]
  - Kantronics KPC-3+ USB ($199)
- Sound Cards (w/SoundModem or Direwolf - free software)
  - Signalink USB ($115, cable adds $22)
  - RigBlaster ($70 to $230)
  - More models
  - Unified Microsystems SCI-6 PC Sound Card Interface Kit ($35 with DIY cables) (an isolation card, uses PC's soundcard)
- High End Modem for PACTOR I thru IV
  - Spezielle Communications Systeme GmbH & Co. KG
  - P4dragon DR-7400 ($1500)

External Interface Options

Kantronics KPC-3 Plus TNC	Signalink USB Sound Card
SCI-6 PC Sound Card Interface Kit	P4dragon DR-7400 PACTOR Modem

Winlink Modes

- Internet Only
  - **Telnet** – Uses an Internet connection to the Winlink web servers.

- VHF/UHF Radio
  - **Packet** – (TNC or Sound Card) Uses the AX.25 (Amateur X.25) data link layer protocol, adapted for amateur radio use in the 1970's.

- HF Radio
  - **Winmor** (Sound Card) - Alternative to external Pactor hardware that works with a PC sound card to provide a virtual TNC enabling throughput performance approaching Pactor 2.
  - **PACTOR I-IV** (SCS Modem) - Utilizes a combination of simple FSK modulation, and the ARQ protocol for robust error detection and data throughput.
  - **ARDOP** – (Sound Card). HF software modem offering high-throughput and adaptive multi-bandwidth operation. Faster than Winmor in my experience.
  - **VARA** - (Sound Card) HF sound-card software modem offering high-throughput, fixed 2.5 KHz wide-bandwidth operation. (Free & paid versions)

Additional Software Features

- Winlink usually saves your selections without need to hit "Save"

- Forms/Templates – simplify information and the amount of data being sent, transmitted as text to all users without Winlink

- Store individual Contacts (Winlink Address Book)

- Create Group Contact Lists

- Use Personal Folders to store messages how you desire

- Store Signature text

- Has Built-in Spam filter using Whitelist

- Automatically check for new messages periodically (unattended)

- Forward received messages to Internet email account

- Preview messages before downloading

How to Install WinLink Express

- Visit the Winlink Download page to obtain Winlink Express software, at https://downloads.winlink.org/

- In the directory list, click on "User Programs"

- Click on "Winlink_Express_install_1-5-18_0.zip" to download

- Extract the files to another directory

- Double-click the file named "Winlink Express Install.msi"

- Select the Run button in the next window

- After the installation finishes, find and click on the "RMS Express" Program Icon. Might need to look in c:\RMS Express for RMS Express.exe.

Create a WinLink Account (1 of 2)

- Must have a valid Ham Radio License

- When run the first time, the program opens the "Properties Tab"

- Fill the blanks as much as you can

- Don't change or delete any default values that may be provided

- Recommend to NOT include any Call sign suffix, which is optional and just complicates things down the road

- Be sure to include your email in the fields labeled Password recovery email and also Non-Winlink e-mail

- You DO NOT need a Winlink Express registration key, leave that blank

- When finished, click on the "Update" button

Create a WinLink Account (2 of 2)

- Connect with the WinLink system to create your account (use the Telnet mode Internet connection)

- Do not use a password on your first connection

- A message containing your password will be sent to your account. (Can change the password later.)

- Retrieve password with a second connection

- Enter password in "Settings", "Winlink Express Setup"

- Your email address will be CALLSIGN@winlink.org

Winlink Express Setup

Connect to the System (1 of 3)

With the mode Telnet Winlink showing, Click on "Open Session"
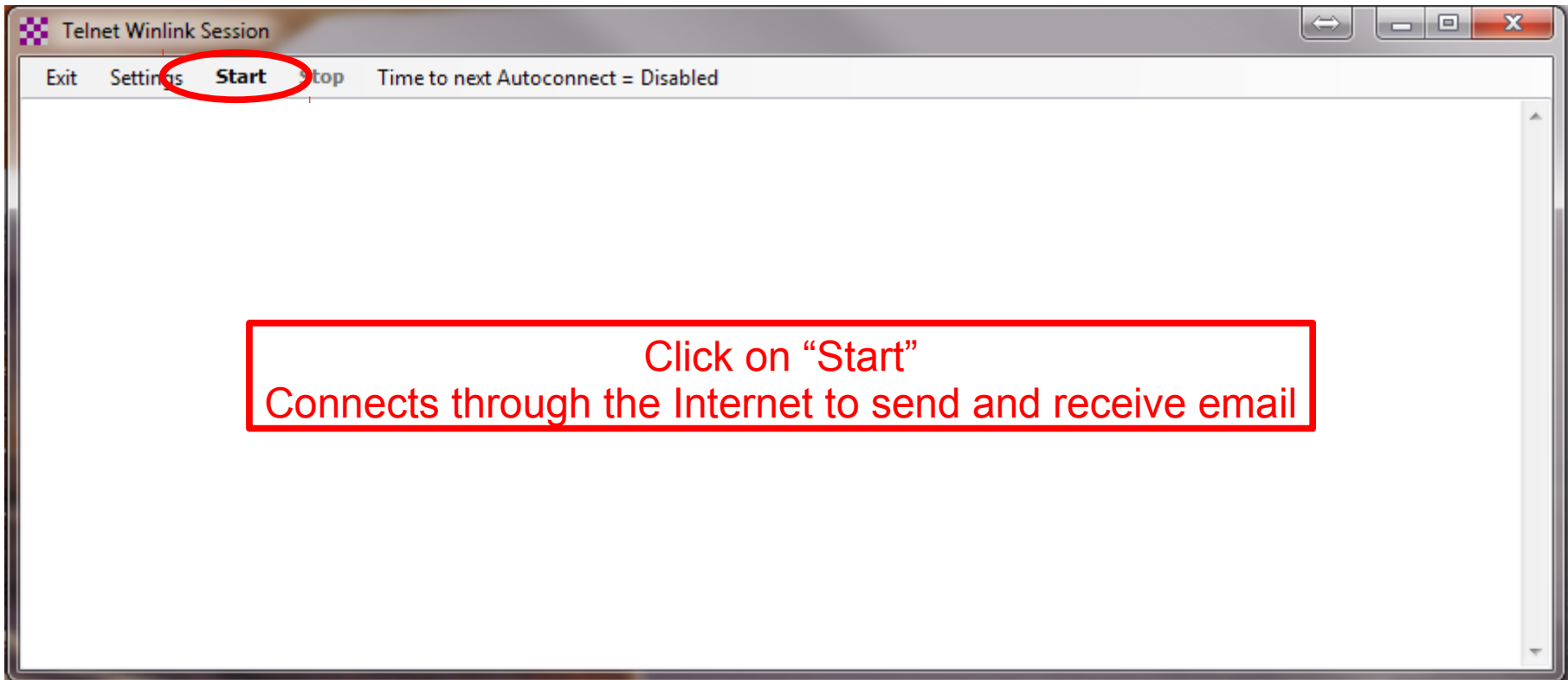
Telnet Winlink Session

Exit   Settings   **Start**   Stop   Time to next Autoconnect = Disabled

Click on "Start"
Connects through the Internet to send and receive email

Connect to the System (3 of 3)

Telnet Winlink Session

Exit Settings **Start** Stop Time to next Autoconnect = Disabled

```
*** Connecting to a CMS...
*** Connected to AWS at 2017/12/05 22:45:09
[WL2K-4.0-B2FWIHJM$]
;PQ: 34327558
CMS>
  ;FW: KD9ANU
  [RMS Express-1.5.10.0-B2FHM$]
  ;PR: 95475577
  ; WL2K DE KD9ANU (EN50EU)
  FF
FQ
*** --- End of session at 2017/12/05 22:45:10 ---
*** Messages sent: 0.  Total bytes sent: 0,  Time: 00:00,  bytes/minute: 0
*** Messages Received: 0.  Total bytes received: 0,  Total session time: 00:00,  bytes/minute: 0
*** Disconnected at 2017/12/05 22:45:15
```

Click on "Exit" after Disconnected is displayed
This window will then close

Winlink Express Screen

Preferences

Settings,
Preferences...

Compose New Message

Telnet Session Screen - Internet

Telnet Winlink Session

Exit   Settings   Start   Stop   Time to next Autoconnect = 59:58

```
*** Connecting to a CMS...
*** Connected to AWS at 2019/01/30 00:40:15
[WL2K-5.0-B2FWIHJM$]
;PQ: 16167235
CMS>
  ;FW: KD9ANU
  [RMS Express-1.5.18.0-B2FHM$]
  ;PR: 59685885
  ; WL2K DE KD9ANU (EN50EU)
  FF
FQ
*** --- End of session at 2019/01/30 00:40:16 ---
*** Messages sent: 0.  Total bytes sent: 0,  Time: 00:00,  bytes/minute: 0
*** Messages Received: 0.  Total bytes received: 0,  Total session time: 00:00,  bytes/minute: 0
```

1) Click on "Start" to begin sending and receiving messages

2) Click on "X" to close the window after the summary appears

Packet Session Screen - VHF

Packet Winlink Session   —   □   ✕

Exit   Settings   Switch to Peer-to-Peer Session   Channel Selection   1200 Baud   **Start**   Stop

Connection type: Direct ▼   KD9ANU-10   Via [   ] , [   ]

Connection script: [▼]   Edit script   Add script   Remove script

Received: 125 Sent: 1537 Time to next Autoconnect = 24:46

```
;PQ: 97249711
CMS via KD9ANU >
  ;FW: KD9ANU
  [RMS Express-1.5.18.0-B2FHM$]
  ;PR: 55107271
  ; KD9ANU-10 DE KD9ANU (EN50EU)
  FC EM 477DG5SBRN9V 3787 1348 0
  F> 39
FS Y
*** Sending 477DG5SBRN9V.
FF
*** Completed send of message 477DG5SBRN9V
*** Sent 1 message.  Bytes: 1410,  Time: 00:24,  bytes/minute: 3490
  FQ
*** --- End of session at 2019/01/30 00:33:30 ---
*** Messages sent: 1.  Total bytes sent: 1410,  Time: 00:47,  bytes/minute: 1770
*** Messages Received: 0.  Total bytes received: 0,  Total session time: 00:47,  bytes/minute: 0
*** Disconnecting
*** Disconnected at 2019/01/30 00:33:39

*** Disconnect reported.
```

Settings need to be adjusted
for your radio & interface

Packet Channel Selection

Packet Channel Selector

Exit   Select Channel   Update Table Via Internet   Update Table Via Radio

Stations found within 160 kilometers of your grid square.

Callsign	Frequency (MHz)	Baud	Grid Square	Group	Distance (mi)	Bearing (Degrees)
KD9ANU-10	145.610	1200	EN50CS	PUBLIC	010	237
WD9FMB-10	145.610	1200	EN50EQ	PUBLIC	011	180
K9WRA-10	145.610	1200	EN50HS	PUBLIC	014	113
KD9JFF-10	145.610	1200	EN50ML	PUBLIC	043	126
KB9YFW-10	145.610	1200	EN51LH	PUBLIC	044	044
NS0A-10	145.610	1200	EN41WK	PUBLIC	048	328
N9JWI-10	145.610	1200	EN51IR	PUBLIC	063	016
KB9APW-10	145.610	1200	EN51DU	PUBLIC	069	357
KD9FSG-10	145.610	1200	EN51JU	PUBLIC	072	017
N9PUZ-10	145.610	1200	EM59FT	PUBLIC	072	176
KD9BNQ-10	145.610	1200	EM59FS	PUBLIC	075	176
W9DUA-10	145.610	1200	EM59DS	PUBLIC	075	183
N9EF-10	145.610	1200	EN51QP	PUBLIC	076	043
KD9KDQ-10	145.610	1200	EN50UE	PUBLIC	084	123
K9KRO-10	145.610	1200	EN51SS	PUBLIC	088	043
K9MLT-10	145.610	1200	EN50UB	PUBLIC	089	127
NG9R-10	145.610	1200	EN40LA	PUBLIC	094	233

SoundModem (Sound Card)

Settings need to be adjusted for your radio & interface

Soundmodem can be downloaded at: http://uz7.ho.ua/packetradio.htm

Start SoundModem before Winlink Express If using a sound card interface

Winmor Session Screen - HF

Winmor Winlink Session - KD9ANU

Exit | Settings | Switch to Peer-to-Peer | Channel Selection | Forecast | Best chan. | Next chan. | Hide TNC | **Start**

N0LCR-1 | Center Freq. (kHz): 7103.500 | Dial Freq. (kHz): 7102.000 | Bearing: 347 | Quality:

Favorites: ▼ | Select | Add to favorites | Remove from favorites

Channel Free In: 0/0 Out: 0/0 BPM: 470/315 Disconnected

```
*** Connected to Winlink RMS: N0LCR-1 @ 2019/02/03 16:23:05  USB Dial: 7102.000 at 2019/02/03 16:23:05
*** Station Bearing: 347,  Range: 438 miles
RMS Trimode 1.3.22.0 Node in Knife River MN EN46cx
KD9ANU has 236 minutes remaining with N0LCR-1
[WL2K-5.0-B2FWIHJM$]
;PQ: 58381301
CMS via N0LCR-1 >
  ;FW: KD9ANU
  [RMS Express-1.5.18.0-B2FHM$]
  ;PR: 11779300
  ; N0LCR-1 DE KD9ANU (EN50EU)
  FC EM 9GOVJPX5MOF4 316 269 0
  F> 6B
FS Y
*** Sending 9GOVJPX5MOF4.
FF
*** Completed send of message 9GOVJPX5MOF4
*** Sent 1 message.  Bytes: 301,  Time: 01:06,  bytes/minute: 271
  FQ
*** --- End of session at 2019/02/03 16:26:29 ---
*** Messages sent: 1.  Total bytes sent: 301,  Time: 03:23,  bytes/minute: 89
*** Messages Received: 0.  Total bytes received: 0,  Total session time: 03:23,  bytes/minute: 0
*** Disconnecting
*** Disconnected from Winlink RMS: N0LCR-1 @ 2019/02/03 16:26:51
*** Session: 3.6 min;  Avg Thruput: 0 Bytes/min;   1 Min Peak Thruput: 470 Bytes/min
```

Settings need to be adjusted
for your radio & interface

HF Channel Selection Tool

HF Channel Selector

Exit   Select   Update Table Via Internet   Update Table Via Radio   Forecast   SFI   All RMS

Callsign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (mi)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
KG5KS-10	7101.500	1600	EM45JP	00-23	PUBLIC	369	194	91	55
N0LCR-1	7113.500	500	EN47DA	00-23	PUBLIC	438	347	89	56
N0LCR-1	7103.500	1600	EN47DA	00-23	PUBLIC	438	347	89	56
K0SI	3586.500	1600	EM39UA	00-23	PUBLIC	189	229	86	53
KD7UHR	3588.500	1600	EM58BQ	00-23	PUBLIC	150	185	86	54
W9FE	3597.000	1600	EM59AA	00-23	PUBLIC	127	188	84	53
W9JUN-10	7102.500	1600	EM78GU	00-23	PUBLIC	260	121	84	57
W6IDS	7084.500	500	EM79NV	12-23	PUBLIC	258	103	83	57
NF9D	3595.000	1600	EN51TW	00-23	PUBLIC	99	040	83	53
NS0A	3510.000	500	EN41WK	00-23	PUBLIC	48	328	83	53
W6IDS	7102.500	500	EM79NV	12-23	PUBLIC	258	103	82	56
KC8YJJ	7102.500	1600	EN90PL	00-23	PUBLIC	467	090	75	48
AJ4FW	10146.000	1600	FM07BC	00-23	PUBLIC	583	113	74	46
K9BBS-10	7102.500	1600	EM68SR	00-23	PUBLIC	223	130	74	53
KB5LZK	7101.200	1600	EM34UT	00-23	PUBLIC	441	200	73	46
AD5EO	7103.000	1600	EM34QN	00-23	PUBLIC	464	202	71	45
K0SI	7103.500	1600	EM39UA	00-23	PUBLIC	189	229	69	50

Winmor Virtual TNC - HF
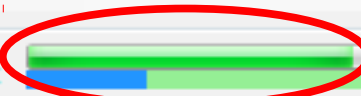
Look for "Channel Clear" in the
Busy Detector or low signal

Forms or Templates

Template Manager — ☐ ✕

Close   Add   Remove   Edit

- Standard Templates (version 1.0.78.0)
  - AK_STATE_Forms
  - AMERICAN_RED_CROSS
  - ARRL_Forms
  - CANADIAN_Forms
  - CA_STATE_Forms
  - FEMA_Forms
  - FL_STATE_Forms
  - FMRE_Forms
  - GENERAL_Forms
  - HICS_Forms
  - HI_STATE_Forms
  - IARU_Forms
  - ICS_USA_Forms
  - IHS_Forms
  - NY_STATE_Forms
  - OH_STATE_Forms
  - OR_STATE_Forms
  - RADIOGRAM_RRI_Forms
  - SATERN_Forms
  - SHARES_Forms
  - SIMPLE_QUICK_Forms
  - TX_STATE_Forms
  - VA_STATE_Forms
  - WA_STATE_Forms
  - WEATHER_Forms
  - Form Recovery Addon for Firefox.txt
  - White List and Spam Control.txt
- Global Templates
- KD9ANU Templates

ICS213 Template (in Browser)

General Message (ICS 213)

[Load ICS213 INITIAL Data]   Form Instructions

1. Incident Name: [Incident number is optional]

2. To (Name/Position): [ ]

3. From (Name/Position): [ ]

4. Subject: [ ]   5. Date: [2019-1-29]   6. Time: [17:50]

7. Message:

[Be Brief and Concise]

8. Approved by: [ ]   Position / Title: [ ]

[Save ICS213 INITIAL Data]   [Submit]   [Reset Form]   Senders Base Call: [KD9ANU]   Ver 36.2

Whitelist – SPAM Control

- Over 90% of in-bound messages are SPAM

- Cannot turn off this feature

- Auto records Internet addresses you have used

- Stay in Whitelist for 400 days after last sent to

- Alternately the sender places //W2LK in subject

- Manually add email addresses to your Whitelist or Blacklist – see the Winlink FAQ file for how

Peer-to-Peer

- Send a message direct between two radios

- Packet, Winmor, Pactor are common modes

- Select desired mode in Open Session dropdown

- New Message - Send as Peer-to-Peer Message

- Coordinate P2P session via radio using voice

- Receiving station waits until sender transmits

Weekly Winlink Exercise

- Promotes regular practice with Winlink, educates regarding the features of Winlink software, and improves our capabilities with Winlink
- Similar to PAARC's Sunday Night Net, but no set time – you can respond when your schedule permits
- Participants respond to a Winlink message that I send (usually sent on Tuesday)
- Other similar Winlink Nets exist across the country
- Also suggest practicing peer-to-peer sessions

Winlink Support

- Good indexed Help within the Winlink Express program.

- Winlink Book of Knowledge (download latest pdf file)
  https://winlink.org/content/winlink_faq_feb_14_2019_revised_frequently_asked_questions_answers

- Winlink Forums (text-searchable)

  - Program Group

  - EmComm Group

- I'm not a fan of Winlink's online support philosophy and video-based materials provided. But such may work for you.

- Can also be hard to find up-to-date detailed help using general Internet searches. Yet this may be a good way to find help for specific radio and interface, if you include enough specifics in the search lingo.

Reminders

- Log in regularly – after 400 inactive days your account is turned off – Contact Admin to fix

- Winlink Express software updates automatically while open or when opened, also auto updates the Templates/Forms

- If out-of-date too much, full reinstall necessary

- You cannot send a Winlink message to your Winlink address – rejected as a duplicate

Terminology

- RMS – Radio Message Server

- RMS Gateway – A station that connects Winlink users to the Winlink servers on the Internet

- Winlink Express – Name of full-featured user software

- Digipeater or Digi – A station that receives and then immediately re-transmits digital signals (digital repeater)

- Node – A station that acts as at least both an RMS Gateway and as a Digipeater

- Virtual TNC – TNC functions provided via PC software

- Forms or Templates – structure desired data to be sent in a formatted way, yet minimize the information transmitted.

Winlink Express Alternatives

- Winlink without Winlink Express (~80% share)
  - Airmail – Windows
  - BPQ – Linux, Raspberry Pi
  - PacLink – Windows Vista and up
  - PacLink UNIX – Linux, Raspberry Pi
  - Pat – Mac, Linux
- May not have all features of Winlink Express
- Probably not supported as well as Winlink Express
- Expect Challenges & Difficulties
- I have no useful experience with any of these

Take Aways

- Choose Winlink Express Software

- Create your Account

- Practice using Telnet (radio later)

- Consider "Weekly Winlink Exercise"

- Ask if you need help

Live Demonstration

- Create a message and post to Outbox

- Send message via VHF to nearby RMS Gateway

- Gateway will forward message to the Internet

- Who has a SmartPhone to receive a message?

73
until another time