Winlink Express – Installation And Configuration
What is Winlink

- Worldwide system for sending e-mail via radio.
- Provides e-mail from almost anywhere in the world.
- Entirely supported and operated by amateur radio volunteers (Amateur Radio Safety Foundation, Inc.).
- Winlink Express software is the preferred client application.
- Adopted for contingency communication by many government agencies.
- Used by infrastructure-critical NGOs such as International & American Red Cross, Southern Baptist Disaster Relief, DHS Tiered AT&T Disaster Response & Recovery, FedEx, Bridgestone Emergency Response Team, etc.
Winlink Connection Modes

- **Telnet** – Non-radio connection through the Internet. **Good for training** (no radio equipment required) and use if radio is down or network is busy.

- **VHF/UHF Packet** (local LOS propagation) –
  - 9600 baud – Fast, reliable, range may be limited and requires $400 modem (Kantronics or SCS Tracker) or a good soundcard (non-Signalink) modem. Radio must be 9600 capable.
  - 1200 baud – Slower, but can use inexpensive TNC like Byonics TinyTrak-4, TNC-X, or even soundcard modems. Will work with virtually any FM radio.
Winlink Connection Modes

- **HF WINMOR** – “Poor man’s Pactor”. Not as good as Pactor, but operates with an inexpensive sound card device ($100), speeds between Pactor 2 and 3.
  - This mode will soon be replaced by the ADROP software TNC that is currently in test
- **HF Pactor 1, 2, 3 and 4** – Fast and reliable but requires an expensive modem ($1500+).
- All RF modes can be Peer-to-Peer.
Resources Needed for Winlink Express

VHF/UHF Packet Radio

- Computer running Windows XP through Windows 10.
- Microsoft .NET 3.5 framework.
- V/UHF radio with data port (1200/9600) or speaker/mic connection (1200 only).
- Packet TNC (Kantronics, TNC-X, MFJ, etc.), or SignaLink or similar USB soundcard interface. Might require a USB to Serial dongle.
- Note: Some new radios have built-insoundcards/TNC’s.
- Software downloads:
  - ftp://autoupdate.winlink.org/User%20Programs/
- All software is free, donation is suggested.
Packet TNC

- Can be simple KISS mode, or full function.
- Cost from about $100 to $1500.
- Radio needs to have a data port (1200/9600), or use microphone and speaker connections (1200 only).
- Some radios include a built-in TNC or sound card.
- Might require a USB to serial adapter (built-in on TNC-X)
  - Use FTDI chipset devices for best results
Packet TNC

- Prolific chipset USB to serial converters have driver issues.
- Counterfeit Chinese products used Prolific product ID and “piggy backed” on official Prolific drivers.
- Prolific countered by changing the hardware/drivers so the counterfeit devices would not work with their drivers.
- This website may help: http://www.ifamilysoftware.com/news37.html
- Adapters based on the FTDI chipset do not have this problem (yet anyway).
SignaLink Soundcard Interface

- Simple device powered by USB connection.
- Cost is about $100 including radio-specific cable.
- Radio needs to have a data (sound) port, or use microphone and speaker connections.
- Need to run “Software TNC” application such as Direwolf, or UZ7HO soundmodem.
Hardware TNC or Sound Card?
There are advantages to both

Hardware TNC
- Relatively low cost (TNC-X), old one in the closet?
- Probably the simplest connection.
- No additional software needed.

Sound Card
- Can be used for other digital modes besides Winlink.
- Software TNC has superior decode over older hardware TNC.
- Can be used for both Packet and Winmor.
Hardware TNC or Sound Card?

There are disadvantages to both

Hardware TNC
- Only does packet (or maybe Pactor too).
- Older units do not perform as well, no new development.
- Will require USB to serial adapter.

Sound Card
- Sound levels and other settings may be changed unexpectedly.
- Requires additional software, and a slightly more complex operation (more training?).
Hardware TNC or Sound Card?

Presenter Soapbox

1200b AFSK Packet must die!

While this mode is relatively easy to setup and get working, and we must retain this capability for certain conditions, it is time to move up to faster modes.

UZ7HO soundmodem provides several options for higher speed communications. 4800b should be easy to achieve for most setups.

Both Direwolf and UZ7HO support G3RUH 9600b support and modern radios should handle this speed.
Installing Winlink Express

- Download zip file:
  - ftp://autoupdate.winlink.org/User%20Programs/
  - www.winlink.org – Client Software, Winlink Express
  - Watch for false downloads
- Extract the .msi installer from the zip file and run it.
- Complete the setup screens (call sign, location, etc.).
- Browse C:\RMS Express\, right click on.
  - RMS Express.exe and select option to create a shortcut.
  - Change the name to Winlink Express.
User Preferences

- Click “Files” followed by “Preferences/Message Notification”
Installing Winlink Express

- The first time you originate a message using Winlink Express, you will be registered in the Winlink system and will have a callsign@winlink.org address. This account remains active as long as you use is regularly. Inactive accounts will be purged after about 1 year.
- You will also have access to the Winlink Webmail system and other good tools on the Winlink.org website.
Initial Packet Setup
Hardware TNC
Initial Packet Setup
Hardware TNC COM Port
Initial Packet Setup

Sound Card Interface

- Download zip file (UZ7HO low speed):
  - Extract the program from the zip file and run it.
  - Configuration settings from the drop down menus.
  - Windows only, firewall message.

- Download zip file (UZ7HO high speed):
  - Extract the program from the zip file and run it.
  - Configuration settings from the drop down menus.
  - Windows only, firewall message.
Initial Packet Setup

Sound Card Interface

- Download zip file (Direwolf):
  - [https://github.com/wb2osz/direwolf/releases/download/1.3-dev-K/direwolf-1.3-dev-K-win.zip](https://github.com/wb2osz/direwolf/releases/download/1.3-dev-K/direwolf-1.3-dev-K-win.zip)
  - Extract the program files from the zip file and run the app.
  - Edit the INI file to configure.
  - Multi-platform capable.
Initial Packet Setup
Sound Card Interface (UZ7HO and Signalink)
Initial Packet Setup
Sound Card Interface (UZ7HO High Speed)
UZ7HO and Direwolf both create "KISS TNC" servers within the network stack, ports on the firewall must be opened to allow Winlink Express (and other applications) to use the virtual TNC.
Initial Packet Setup
Sound Card Interface (UZ7HO and Signalink)

UZ7HO and Direwolf both allow for multiple modems using a “stereo” sound card, for Signalink, only modem “A” is available. Set to AFSK AX.25 1200bd modem.
UZ7HO and Direwolf both allow for multiple modems using a “stereo” sound card. For initial setup, only use modem ch “A”. Set to FSK G3RUH 9600bd modem.
Initial Packet Setup
Sound Card Interface (Direwolf and Signalink)
Initial Packet Setup
Sound Card Interface (Direwolf High Speed)

Uncomment 9600

Specify PTT port used
Initial Packet Setup
Sound Card Interface (Direwolf)

Direwolf startup shows available audio devices. Signalink shows as USB Audio Codec.
Initial Packet Setup
Sound Card Virtual TNC

Reading config file direwolf.conf
Available audio input devices for receive (×=selected):
  0: Microphone Array (Realtek High
  × 1: Microphone (USB Audio CODEC) (channel 0)
Available audio output devices for transmit (×=selected):
  0: Speakers / Headphones (Realtek
  × 1: Speakers (USB Audio CODEC) (channel 0)
Channel 0: 1200 baud, AFSK 1200 & 2200 Hz. E+, 44100 sample rate
Note: PTT not configured for channel 0. (Ignore this if using Ready to accept KISS client application on port 8100 ... Ready to accept AGW client application 0 on port 8000 ...

W7EFR-10 audio level = 64(30/19) [NONE] 11111111
[0.3] W7EFR-10>BEACON:EF8R Winlink RMS Packet Server<0x0d>
Unknown message type E, motorcycle

W7EFR-1 audio level = 63(30/18) [NONE] 11111111
[0.3] W7EFR-1>ID:Network Node (COUGAR)<0x0d>
Unknown message type N, Ambulance

K7CST-10 audio level = 92(44/23) [NONE] 11111111
[0.4] K7CST-10>BEACON:Winlink 2000 RMS Packet Server<0x0d>
Initial Packet Setup

Sound Card Virtual TNC

Make sure your Virtual TNC server TCP ports do not conflict with the Winlink Express forms server.
Initial Packet Setup
Set your transmit levels correctly! (It is not plug and play)

- http://www.zeitnitz.de/Christian/scope_en
Initial Packet Setup

Important Parameters

- TX Delay (TXD)
- Packet Length
- Max Frames
- Frack
- Max Retries
- AutoConnect Time

Note: For soundcard configurations, TXD is set in the Software TNC application.
Initial Pactor Setup

PTC modem
Resources Needed for Winlink Express

HF Winmor

- Same computer and software requirements as V/UHF Packet. Winmor modem is included with Winlink Express.
- ITSHF propagation prediction program. Note, you will be prompted to download this on first Winmor run. A link to the software will be provided.
- HF radio with data (sound) port and optionally computer control (CI/V, CAT, etc. for rig control).
- SignaLink or similar soundcard interface, may be built-in on newer radios.
- All software is free, donation is suggested.
Configuring Sound Levels
Watch drive/ALC levels on transmitter

Set to Max

Note: Adjust SignaLink TX level for minimum or no ALC action on HF transmitter
Winmor Registration Screen

Appears each time you start Winmor until you register and get a key.

Registration Site URL:
http://www.arsfi.org/winmor.aspx

Call Sign: NS7C
Registration Key:

Register and Save to ini  Remind Me Later
Initial Winmor Setup
Selecting the Audio Device

- **WINMOR Capture Device:** Microphone (2-USB Audio CODEC) 4b
- **WINMOR Playback Device:** Speakers (2-USB Audio CODEC) 4b
- **Virtual TNC host address/name:** 127.0.0.1
- **Virtual TNC Command Port:** 8500
- **Data Port:** 8510
- **Inbound Session Bandwidth (Hz):** 500
- **Drive Level:** 90
Winmor Radio Setup
Rig Control Parameters

Radio Selection
- Select Radio Model: Icom Amateur Radios
- Antenna Selection: Default
- Icom Address: 00
  - USB
  - USB Digital
  - FM
  - Use Internal Tuner

Radio Control Port
- Serial Port to Use: COM7
- Baud: 19200
- Enable RTS
- Enable DTR
- TTL

PTT Port (Optional)
- Serial Port to Use: External
- Baud: 38400
- Enable RTS
- Enable DTR

Buttons:
- Update
- Close
Composing A Message

- New Message Button
- Click "To" or "CC" for contacts
- Multiple recipients and CC
- File attachments
- Post to Outbox
- Request Read Receipt
Pending Message In Outbox

Open Session

Winlink Express 1.5.2.0 - NS7C

No active session.

System Folders
- Inbox (0 unread)
- Sent Items (1)
- Saved Items (1)
- Drafts (0)

Personal Folders

Global Folders

Message ID: IDAOHY1H9VG
Date: 2017/04/10 23:14
From: NS7C
To: NS7C
Source: NS7C
Subject: FW: //WL2K WA R4 EOC Sitrep-12/31/16 Quarterly Activation-

----- Message from KE7UXB sent 2016/12/31 18:31 -----

Message ID: P1OBQMN0913
Date: 2016/12/31 18:31
From: KE7UXB
To: NS7C
Source: KE7UXB
Subject: //WL2K WA R4 EOC Sitrep-12/31/16 Quarterly Activation-

Originating EOC: [Region 4]
To: NS7C
Successful connections end with FF and FQ commands, followed by a disconnect. If these are missing, the session failed and must be retried.
Packet Radio Session
Select Mode and Open Session
Packet Channel Selection
Based on your grid square

![Packet Channel Selector](image)

<table>
<thead>
<tr>
<th>Callsign</th>
<th>Frequency (MHz)</th>
<th>Baud</th>
<th>Grid Square</th>
<th>Group</th>
<th>Distance (mi)</th>
<th>Bearing (Degrees)</th>
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</thead>
<tbody>
<tr>
<td>NS7C-10</td>
<td>145.030</td>
<td>1200</td>
<td>CN87WH</td>
<td>EMCOMM</td>
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</table>
Packet Session (TNC)

Connect, login, send message, log off

Good sequence ends with FF followed by FQ

9600bd transfer
Packet Session (sound card)
Connect, login, check for message, log off
Winmor HF Session
## HF Channel Selection Screen

### Update Channel List
- Click the "Update Table Via Internet" button to update the channel list with internet data.
- Click the "Update Table Via Radio" button to update the channel list with radio data.
- Click the "Forecast" button to update the channel list with forecast data.
- Click the "SFI" button to update the channel list with SFI data.
- Click the "All RMS" button to update the channel list with all RMS data.

### Click Header to Sort
- Click on any header to sort the channel list accordingly.

### Double Click to Select
- Double click on any channel to select it.

### Green: good
- Green color indicates a good channel quality.

### Yellow: fair
- Yellow color indicates a fair channel quality.

### Red: bad
- Red color indicates a bad channel quality.

### Table Data

<table>
<thead>
<tr>
<th>Call Sign</th>
<th>Frequency (kHz)</th>
<th>Mode</th>
<th>Grid Square</th>
<th>Hours</th>
<th>Group</th>
<th>Distance (mi)</th>
<th>Bearing (Degrees)</th>
<th>Path Reliability Estimate</th>
<th>Path Quality Estimate</th>
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<tbody>
<tr>
<td>KSETA</td>
<td>14105.000</td>
<td>1600</td>
<td>CM88GF</td>
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<td>PUBLIC</td>
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<td>DM08HT</td>
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<td>43</td>
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</tr>
</tbody>
</table>
Check If Channel Is Free

Free Channel:

Busy Channel:
Active Winmor Connection
Winmor Session Log
Connect, login, send message, log off

---

Winmor Winlink Session - N57C

---

*** Connected to Winlink RMS: VA7DEP @ 2016/02/15 23:51:03 USB Dial: 7087.000 at 2016/02/15 23:51:03
RMS Time: 1:3:4:0
N57C has 180 minutes remaining with VA7DEP
(SFI - 180 on 2016/02/15 20:00 UTC)
[WL2K3.2-R2FW0-LMS]
[PQ]: 12037190
Path: CMG via VA7DEP
:FS: N57C
[RMS Express-1.3.9-0-B2F-M8]
[PR: 03525532]
: VA7DEP DE N57C (CN87WI)
: EM 9KBNFO85O0X9 265 226 0
: FA: CA

---

Sending 9KBNFO85O0X9.

---

*** Completed send of message 9KBNFO85O0X9
***

---

--- End of session at 2016/02/15 23:52:13 ---
--- Messages Received: 0. Total bytes received: 0. Total session time: 01:09. bytes/minute: 0
--- Disconnecting
--- Disconnected from Winlink RMS: VA7DEP @ 2016/02/15 23:52:26
--- Session: 1:4 min, Avg Thinput: 0 Bytes/min; 1 Min Peak Thinput: 552 Bytes/min

---
Packet P2P Session Log
Connect, login, send message, log off

Must match message destination
Conclusion

- Winlink Express use continues to grow, especially for EmComm.
- The Winlink Development Team continues to enhance capabilities to adapt to changing needs.
- Installation and set up is relatively easy.
- Familiar “e-mail” like interface.
- Supports multiple radio transfer modes.
- Support for both hardware and software interfaces.
Questions?