

# Winlink System: Email over Radio

**Lake Washington Ham Club**

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## N6NBN

**Affiliated with: Seattle ACS, Medical Services Team of Western Washington, American Red Cross, Bellevue Communications Support, Puget Sound Repeater Group, West Seattle Amateur Radio Club**

# Winlink: What I'll cover today...

- Purpose of Winlink System
- Pros and Cons of Winlink
- Equipment Needed: Basic Overview
- Typical Uses for Drills and Exercises
- Typical Use in Real Emergencies
- I use it almost daily, all over the Puget Sound area, from my vehicle, and various Radio Rooms.
- All questions welcome: Email: [N6NBN@arrl.net](mailto:N6NBN@arrl.net)

# What is the Winlink System (a/k/a “Winlink”) ?

## What is the Winlink System ?

A World-Wide, Robust, Resilient  
Email-over-Radio System and Network, for Amateur  
Radio Licensees.

[also used by Open-Water Mariners, and U.S.  
Government agencies, see “SHARES HF”]



**Winlink Gateway Station: could be VHF/UHF, or HF**



**Your Winlink Station**

# What is Winlink good for? [1 of 2]

- Sending and receiving Email and Small Attachments, using Amateur Radio frequencies and tools;
- Communicating with non-Hams; to/from anyone with an Email Address!
- Winlink is heavily used in “EmComm” (Emergency Communications) planning and exercises, and Real World situations.
- Winlink can be used locally by connecting with relatively nearby “Gateways” on VHF and UHF frequencies;

## What is Winlink good for? [2 of 2]

- Winlink can also be used over HF frequencies, over much greater distances.
- Winlink costs nothing to use, except for a small one-time fee to Register your copy of “Winlink Express”, the recommended Winlink program for Windows.
- Peer-to-Peer (“P2P”) also very useful. (no infrastructure needed)
- Communicating with non-Hams.

# What is Winlink *not* good for??

- NO: Surfing the Web (Winlink isn't an Internet Service substitute; it's just Email);
- NO: Sending or Receiving Large Files or Images (but VARA FM!!)
- NO: Any activity of a Monetary Nature; (FCC Rules!!)
- No Encryption is Allowed (on Amateur Frequencies);
- Not Recommended, if Urgency is Required;



## How would Winlink be used during an activation?

- Requests for Non-Urgent Information;
- Requests for Supplies (Example: ICS-213RR form);
- Status Reports from Field Stations to Incident Command (Ex: Field Situation Report form);
- Updates & Instructions from EOC to Field Stations (Ex: ICS-205 of Radio Channels currently being used);
- Relaying “I’m OK!” messages to out-of-area Contacts, for Citizens at local shelters;
- Reporting Staffing Info at Field Stations, to EOC (check-in, check-out)
- Sending “windshield survey” Photos from Mobile Patrols to Incident Command, during and after a large-scale event.

## When is a Winlink Message better than Voice?

- Complex, Detailed information that needs to arrive 100% accurately;
- Information being submitted onward to a Database
  - (Ex: Field → IC → WebEOC);
- Agency-originated Bulletins;
- Information NOT urgent in nature;
- Sending attachments: Spreadsheets, Documents for Distribution to the Public, Photographs;

# How does a Winlink Message travel thru the system?

**Outgoing  
Email  
Message is  
composed in  
Winlink  
Express  
email  
client  
program...**

Enter a new message

Post to Outbox Select Template Attachments Spell Check Save in Drafts Close

From: N6NBN Send as: Winlink Message  Request message receipt Set

To: WW7RC;

Cc: n6nbn@arrl.net

Subject: Check-in with American Red Cross, Seattle HQ radio room

Attach:

I am available for deployment from Newcastle, WA, for the Western Washington area.  
mobile phone: 206-335-0881  
Vehicle Tracker: APRS: N6NBN-13



# Outgoing message(s) are Posted to the OutBox...

Winlink Express 1.7.3.0 - N6NBN

N6NBN Settings Message Attachments Move To: Saved Items Delete Open Session: Telnet Winlink Logs

Help

No active session...

Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
2023/01/13 21:54	OOE...	394	N6NBN	N6NBN	WW7RC...	Check-in with American Red Cross, Seattle HQ r

System Folders

- Inbox (0 unread)
- Read Items (0)
- Outbox (1)**
- Sent Items (652)
- Saved Items (147)
- Deleted Items (9)
- Drafts (9)

Personal Folders

- 9-25-21\_\_Jeffersor ^
- ARCCENTRAL\_5-
- ETO-08\_7-22-21 (2
- ETO-08\_7-8-21 (14
- Field Day Radiogr v

Global Folders

- ARCCENTRAL\_4- ^
- ARCCENTRAL2 (0
- ARCCENTRAL3 (0
- ETO-08 WLT 12-8 v

Contacts

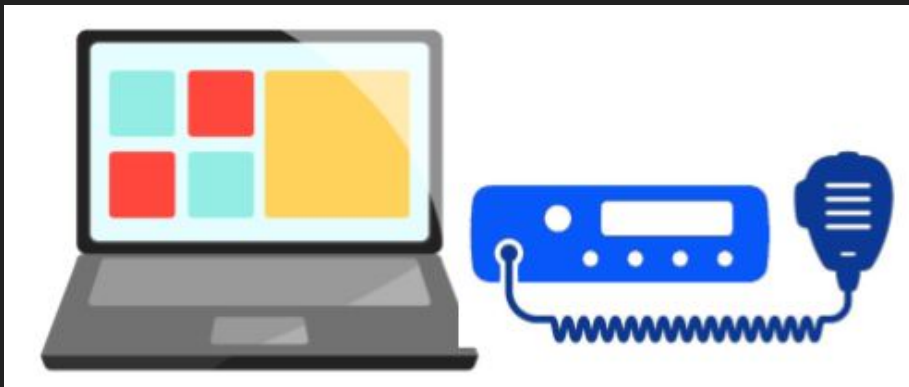
- 2E00PV** ^
- 7033031489@PM.SPF
- 7033031489@TMOMA
- 7033031489@TXT.AT
- 7033031489@VTEXT.!

Message ID: OOEBMENUYE6K  
Date: 2023/01/13 21:54  
From: N6NBN  
To: WW7RC  
Cc: n6nbn@arrl.net  
Source: N6NBN  
Location: 34.145833N, 118.125000W  
Subject: Check-in with American Red Cross, Seattle HQ radio room

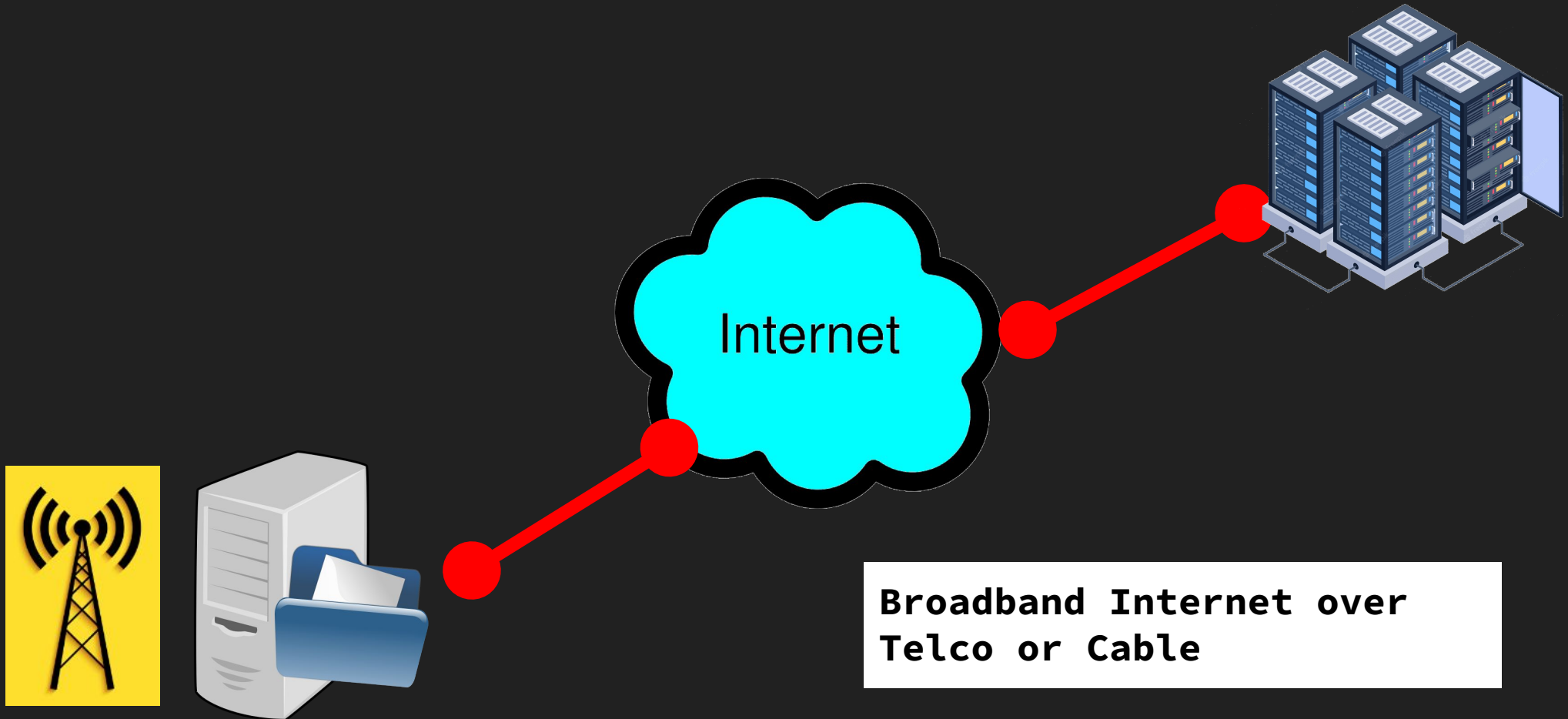
I am available for deployment from Newcastle, WA, for the Western Washington area.  
mobile phone: 206-335-0881



Connection made to a Winlink Gateway via RF..



Gateway connects to Winlink Servers via Internet...



# Winlink Email System “lives” on Amazon’s AWS Servers



It's just like the old dial-up days of the early Internet...

- **Messages are only sent and received, during a “connection session”.**
- **Not at all like our cell phones or computers, which have an “always connected” Internet.**
- **Instead of using a Phone Line, we are using Radio:**
  - **Modems at both ends, converting Data to Audio Signals, and Back;**
  - **To check for messages, you have to re-connect occasionally;**
  - **Much slower than the High-Speed Broadband Connections we usually enjoy, and take for granted.**



# Learning the Winlink System

## Recommendations:

- Start with “Winlink Without Radio”, i.e. “Telnet” Internet connections;
- Get comfortable with Winlink Express on your Windows computer;
- Then, work on connecting a Radio and a Sound Device, for the “real Winlink” experience.
- Practice using local VHF and UHF gateways: both AX.25 Packet, and VARA FM, are well distributed in the Greater Seattle area.

# Practicing Winlink

- Winlink Wednesdays:
  - <https://winlinkwednesday.net/>
- Winlink Thursdays:
  - <https://emcomm-training.org/>
- Winlink Wednesdays Alberta:
  - <https://wcar.ca/home/winlink/>
- Idaho Winlink Wednesday: <https://winlinkofidaho.blogspot.com/>
- Exchange Winlink messages with your Team Members every week, just like checking-in on your Voice Nets;
- Ask other Hams if they are on Winlink, so you can practice with them;
- Use Winlink for your Events, Drills, and Exercises.
- WA state-wide “Fifth Saturday” Drills, 4 times a year.
- Send me messages! N6NBN

# More Resources:

- [WaveTalkers.com](http://WaveTalkers.com)
- [Winlink.org](http://Winlink.org)
- [Wiki.psrg.org](http://Wiki.psrg.org)
- [CommAcademy.org](http://CommAcademy.org)
- “Stormageddon Playbook”: Winlink Proficiency Exercise:
  - <https://emcomm-training.org/Stormageddon-Playbook.pdf>
- KM6ZPO Winlink Workshops:
  - <http://km6zpo.com/winlink-workshops/>
- ARRL of Eastern Massachusetts:
  - <https://ema.arrl.org/ares/winlink-2000/>

# Winlink Equipment for VHF/UHF



# Example: Winlink and Voice Field Station:

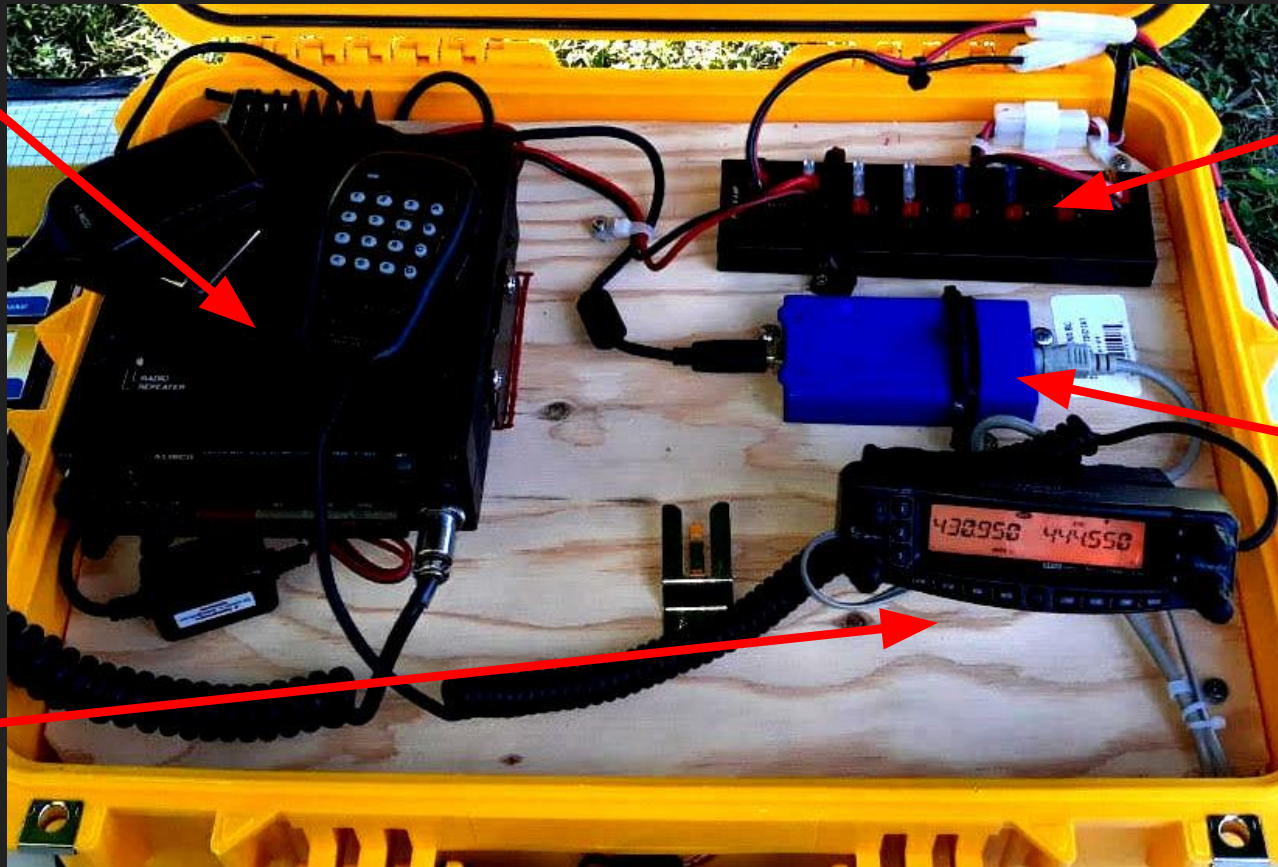


# My Go-Kit for Voice and Winlink:



# Go-Kit, close-up with captions

Dual-band  
Alinco mobile  
for voice  
comms



PowerWerx  
power-pole  
12VDC  
distribution  
block

Masters  
Communications  
DRA-30 Sound  
Card Device

Yaesu FT-8900  
quad-band  
mobile, for  
data and  
voice

NOT SHOWN:  
Panasonic  
ToughBook  
rugged laptop

# What am I using for Equipment?

- Mobile quad-band radio: a Yaesu FT-8900 VHF/UHF Mobile;
- Masters Comm's DRA-36 sound card, configured and cabled for Yaesu or Kenwood mobiles;
- A laptop running Windows 7/10/11 (I use and recommend Panasonic ToughBook laptops);
- A 35-amp-hour AGM Sealed Lead-Acid Battery (or other Power Source);
- A dual-band Mag-Mount antenna, or a J-Pole dual-band tripod-mounted antenna;



Winlink Setup for Packet and VARA FM, on VHF/UHF frequencies, using a Masters Communications sound card:

Antenna



Antenna



AGM Battery



Laptop



DRA-36 Sound Card



Mobile VHF/UHF Radio

**Winlink Setup for Packet and VARA  
FM on VHF/UHF frequencies, using a  
Signalink sound device.**



**Antenna**

Antenna



**AGM Battery**



**Laptop**



**Signalink Sound Card**



**Mobile VHF/UHF Radio**



# Radio: Yaesu FT-8900 Quad-Band VHF/UHF Mobile



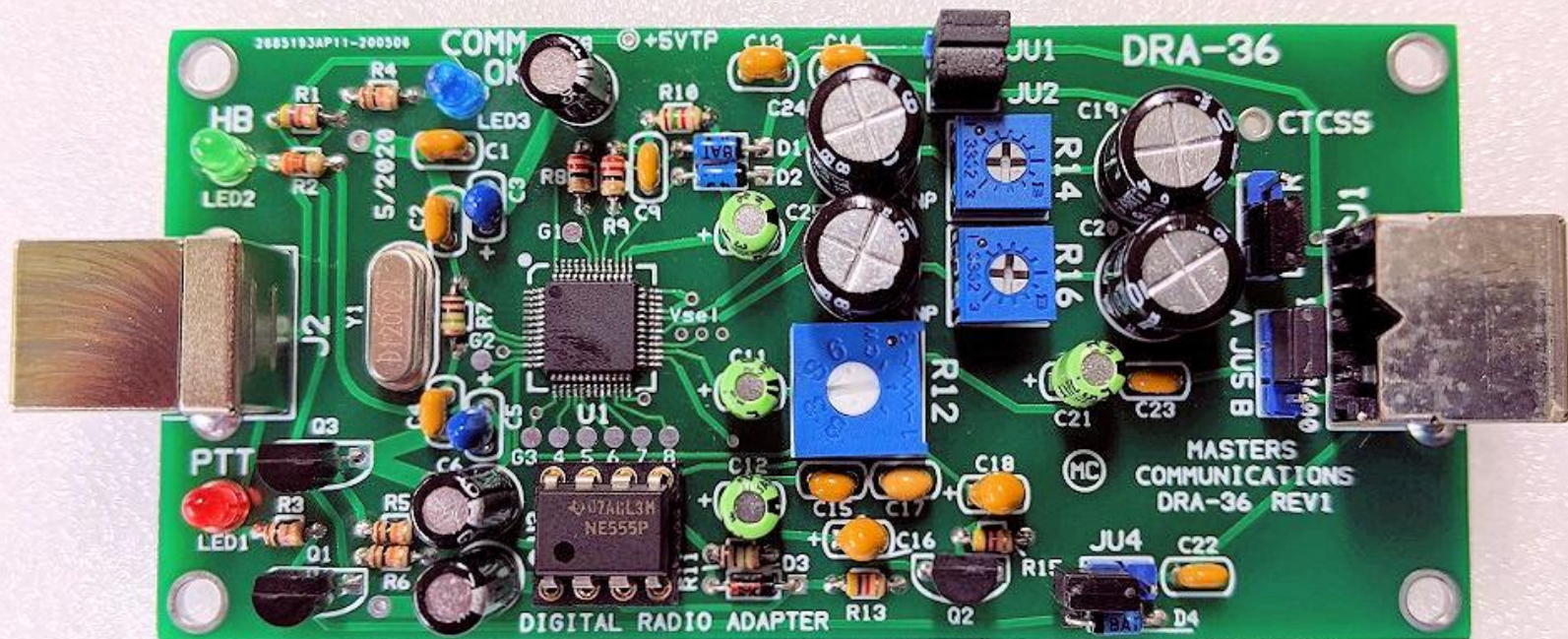
# External Sound Card: Signalink USB



# SignalLink USB: back of unit



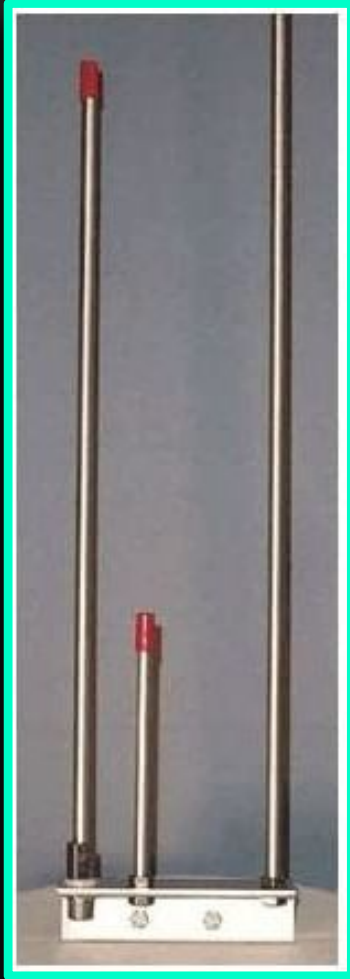
# Another Sound Device: Masters Comm's DRA-36



# Power Source: 35-amp-hour AGM Lead-Acid



# External Portable VHF/UHF Antenna on Tripod





# Windows Laptop: the Panasonic ToughBook



# What am I using for Software?

- Packet: “SoundModem” version 1.14 [or newer] from:  
<http://uz7.ho.ua/packetradio.htm>
- “VARA FM” version 4.x [or newer] from  
<https://rosmodem.wordpress.com/>
- “Winlink Express”, from:  
<https://winlink.org/WinlinkExpress>

# “SoundModem” software from UZ7HO

Welcome to the personal page

## UZ7HO

[Home](#) | [Contesting](#) | [Guestbook](#) | [Log search](#) | [Packet-Radio](#)

### Solar-Terrestrial Data

03 Feb 2018 0825 GMT  
SFI: 68 SN: ◊  
A-Index: 4  
K-Index: ◊  
X-Ray: A2.4  
304A: 97.3 @ SEM

### Calculated Conditions

Band	Day	Night
80m-40m:	Good	Good
30m-20m:	Poor	Poor
17m-15m:	Poor	Poor
12m-10m:	Poor	Poor

Signal Noise: S0-S1

[Click to Install Solar Data On your Web Site](#)  
<http://www.n0nbs.com>  
Copyright Paul L Herrman 2010

## The software Packet-Radio TNC

I am developing a software dual-port Packet-Radio TNC that uses a soundcard as a modem and supports AX.25 protocol. It has been tested on Windows XP, Vista, 7, 8, 10 and has proved stable in operation. The Soundmodem has two TCP/IP interfaces to link with client application: AGW PE and (X)KISS. In case of AGW PE interface, this modem is a direct replacement of original AGW Packet Engine and emulates AGW PE API. The Soundmodem may be used to build EMCOMM, APRS, BBS, Node station, for satellites etc. It supports such modes:

Soundmodem	High-Speed Soundmodem
<ul style="list-style-type: none"><li>• AFSK 300, 600, 1200, 2400 baud.</li><li>• (D)PSK 300, 600, 1200, 2400 baud.</li></ul>	<ul style="list-style-type: none"><li>• G3RUH 4800, 9600, 19200 baud.</li><li>• Manchester 1200, 2400, 3600, 7200 baud.</li></ul>

# How do I install and configure "SoundModem" ?

<http://n4ser.org/2016/soundcard-winlink-2-uz7ho-replaces-agwpe/>

UZ7HO SoundModem

Soundmodem

Settings View Clear monitor About

Ch A 1700 Ch B 2200 DCD threshold  Hold pointers

1:Fm KA0MOS To ID Via KJ4BIZ,K9VSO <UI F/C Pid=F0 Len=75> [04:45:44R]  
KA0MOS/VE1 NODE-ka0mos-9 BBS-ka0mos NETROM-ka0mos-7 chat-ka0mos-4 NS Canada  
1:Fm KA0MOS-7 To NODES <UI F/C Pid=CF Len=7> [04:46:45R]  
pBRGH20  
1:Fm W6QAV-15 To K9VSO-1 <SABM P/C> [04:47:46R]  
1:Fm KA0MOS To ID Via KJ4BIZ,K9VSO <UI F/C Pid=F0 Len=75> [04:55:44R]  
KA0MOS/VE1 NODE-ka0mos-9 BBS-ka0mos NETROM-ka0mos-7 chat-ka0mos-4 NS Canada  
1:Fm KA0MOS To ID Via KJ4BIZ,K9VSO <UI F/C Pid=F0 Len=75> [05:05:44R]  
KA0MOS/VE1 NODE-ka0mos-9 BBS-ka0mos NETROM-ka0mos-7 chat-ka0mos-4 NS Canada  
1:Fm KA0MOS-7 To NODES <UI F/C Pid=CF Len=7> [05:08:25R]  
pBRGH20  
1:Fm VE1XL-1 To K9VSO-7 <SABM P/C> [05:10:15R]  
1:Fm VE1XL-1 To K9VSO-7 <RR F/R R2> [05:10:23R]

MyCall	DestCall	Status	Sent pkts	Sent bytes	Rcvd pkts	Rcvd bytes	Rcvd FC	CPS TX	CPS RX	Direction

1000 2000 3000

1000 2000 3000

# Setup: SoundModem for Signalink USB sound

## UZ7HO SoundModem Installation

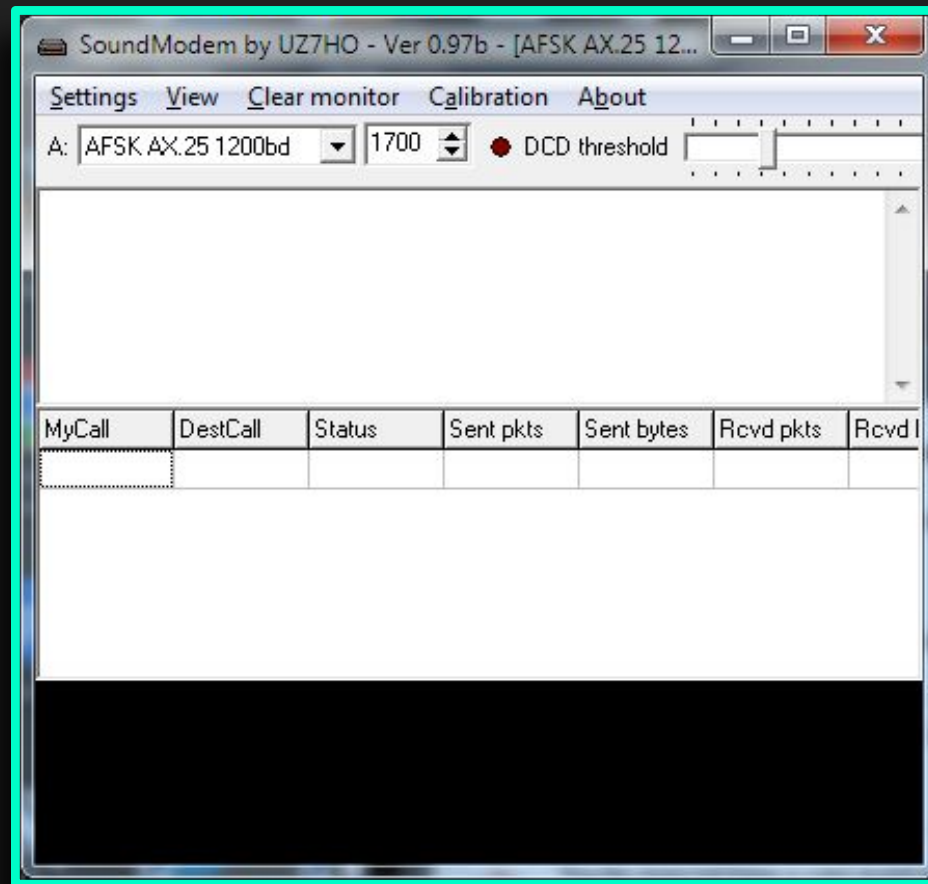
This procedure applies to use of the Signalink USB for VHF Packet. It assumes that the Signalink USB has been set up correctly as shown in the Signalink operation and instruction manual. Particularly with respect to the Windows system sound settings.

- Go to <http://uz7.ho.ua/packetradio.htm> and download the file soundmodemXX.zip.
- The XX refers to the version number.
- There are some other files you can download, but that one is the only one you need to run the program.
- Unzip the file and copy the soundmodem.exe to a convenient folder. There is no installation required.
- Run the .exe file. You may get a message from your Anti-Virus program. Ignore it.
- On the SoundModem screen, click Settings/Devices.
- Output and Input devices:
  - Signalink USB: Select USB Audio CODEC for both Output and Input devices.
  - Homebrew interface: select your soundcard input and output connected to your interface.
- Check – TX rotation
- Check – Single channel output
- Check – Color waterfall. This can use a lot of computer resources, so you may not want to check this. It will depend upon your computer's CPU.
- Check – Stop waterfall on minimize.
- Check – Enabled for KISS Server Port. Do not check AGWPE Server Port.
- PTT Port:
  - For the Signalink USB this should be NONE
    - Make sure neither box is checked.

## Why do I need the SoundModem program?:

- Simulates Packet Radio AX.25 protocol with Signalink External Sound Card, or the DRA-xx Sound Cards;
- Replaces a \$200 (or more!!!) Packet TNC;
- Passes data to & from Winlink Express and your Radio;

Now, we configure the SoundModem program...



# ... and we start up Winlink Express

The screenshot shows the Winlink Express 1.5.11.0 - N6NBN interface. The window title is "Winlink Express 1.5.11.0 - N6NBN". The menu bar includes "N6NBN", "Settings", "Message", "Attachments", "Move To: Saved Items", "Delete", "Open Session: Packet Winlink", "Logs", and "Help". The toolbar contains various icons for file operations. Below the toolbar, it says "No active session.".

The main area displays a list of messages with the following columns: Date/Time, Message ID, Size, Source, Sender, Recipient, and Subject. The messages are as follows:

Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
2018/02/03 0...	HHTN3CYVA...	652	KF7HYO	KF7HYO	K7BFL...	Re:HOW Club - Week 358 - Callsign Database
2018/02/03 0...	30214_K7BFL	1600	K7BFL	K7BFL	K7BIO...	HOW Club - Week 358 - Callsign Database
2018/02/02 1...	109Y80CE9I75	528	SYSTEM	SERVICE	N6MED...	//WL2K User Notice
2018/02/01 1...	Z87UE7MYSK...	1199	SYSTEM	WEBMASTER	N6NBN	[Winlink Global Radio Email] Account inactivity
2018/02/01 1...	5VIB79C60923	491	KI7QFV	KI7QFV	N6NBN	Re: //WL2K testing from radio
2018/01/31 1...	BGQ4Q7V6X...	1852	W7HEE	W7HEE	K7BFL...	Re:HOW Club - Week 357 - Snow and Ice
2018/01/30 2...	Q6QHGWGXZ8...	677	KK7PW	KK7PW	KI7QFV...	Re://WL2K Re:HOW Club - Week 357 - Snow ar
2018/01/30 1...	F5CFAVJM1W...	558	K7TEG	K7TEG	K7BFL...	//WL2K Re:HOW Club - Week 357 - Snow and k
2018/01/30 1...	0B0MSH15Y3TJ	401	K7TEG	K7TEG	N6NBN-7	Re: //WL2K ACS: N6NBN checking in from North
2018/01/30 16:28	63THTWBD3Z45	325	System	SERVICE	N6NBN	Position Report Acknowledgement

The selected message (Message ID: 63THTWBD3Z45) is displayed in the bottom pane with the following details:

Message ID: 63THTWBD3Z45  
Date: 2018/01/30 16:28  
From: SERVICE  
To: N6NBN  
Source: SYSTEM  
Downloaded-from: Telnet:cms.Winlink.org  
Subject: Position Report Acknowledgement

The following position report for N6NBN has been entered.

Date/Time: 2018/01/30 16:26:53  
Latitude: 47-34.94N  
Longitude: 122-19.74W



# ... and now Let's watch the Live Demo of Winlink in action!!

The screenshot shows the Winlink Express 1.5.11.0 interface. The window title is "Winlink Express 1.5.11.0 - N6NBN". The menu bar includes "N6NBN", "Settings", "Message", "Attachments", "Move To: Saved Items", "Delete", "Open Session: Packet Winlink", "Logs", and "Help". The toolbar contains various icons for file operations and session management.

The main area displays a list of messages under the heading "No active session." The table below shows the message list:

	Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
	2018/02/03 0...	HHTN3CYVA...	652	KF7HYO	KF7HYO	K7BFL...	Re:HOW Club - Week 358 - Callsign Database
	2018/02/03 0...	30214_K7BFL	1600	K7BFL	K7BFL	K7BIO...	HOW Club - Week 358 - Callsign Database
	2018/02/02 1...	109Y80CE9I75	528	SYSTEM	SERVICE	N6MED...	//WL2K User Notice
	2018/02/01 1...	Z87UE7MYSK...	1199	SYSTEM	WEBMASTER	N6NBN	[Winlink Global Radio Email] Account inactivity
	2018/02/01 1...	5VIB79C60923	491	KI7QFV	KI7QFV	N6NBN	Re: //WL2K testing from radio
	2018/01/31 1...	BGQ4Q7V6X...	1852	W7HEE	W7HEE	K7BFL...	Re:HOW Club - Week 357 - Snow and Ice
	2018/01/30 2...	Q6QHVGXZ8...	677	KK7PW	KK7PW	KI7QFV...	Re://WL2K Re:HOW Club - Week 357 - Snow ar
	2018/01/30 1...	F5CFAVJM1W...	558	K7TEG	K7TEG	K7BFL...	//WL2K Re:HOW Club - Week 357 - Snow and l
	2018/01/30 1...	0B0MSH15Y3TJ	401	K7TEG	K7TEG	N6NBN-7	Re: //WL2K ACS: N6NBN checking in from Nort
	2018/01/30 16:28	63THIWBDS3245	325	System	SERVICE	N6NBN	Position Report Acknowledgement

The selected message (Message ID: 63THIWBDS3245) is displayed in the lower pane with the following details:

Message ID: 63THIWBDS3245  
Date: 2018/01/30 16:28  
From: SERVICE  
To: N6NBN  
Source: SYSTEM  
Downloaded-from: Telnet:cms.Winlink.org  
Subject: Position Report Acknowledgement

The following position report for N6NBN has been entered.

Date/Time: 2018/01/30 16:26:53  
Latitude: 47-34.94N  
Longitude: 122-19.74W

# Presented by Bill Thomassen, N6NBN

- Questions, Comments, and Suggestions, please!
- This presentation will be made available via N6NBN.com at:  
[tinyurl.com/218k6p6w](https://tinyurl.com/218k6p6w)
- Email Questions & Comments to [N6NBN@arrl.net](mailto:N6NBN@arrl.net)
- Thank you for your time and attention!