

# W6AGO

## AEA Amateur Radio Club



# Winlink (RF email) Overview and Demo

Bob Lanahan

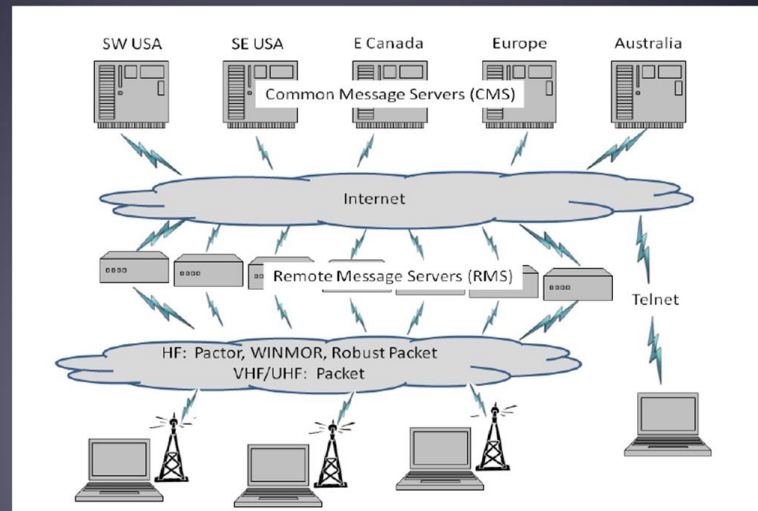
Jul 2023

# Winlink Overview and Demo

- **History – Tom E's briefing March 2018**
- **Cables and setup**
- **Installing Winlink**
- **Telnet Winlink**
- **Packet to a Winlink Node (RMS then to/from CMS and back)**
- **Packet to Packet with another Radio Operator**

## Winlink 2000 Architecture (Conventional Mode)

- CMS
- RMS (gateway)
- Client (you)



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# History

- Tom E briefed winlink to the club in date 2018/2019?
- <http://www.aeclubs.org/w6ago/> or ask Bob for a copy

**MARS**  
MILITARY AUXILIARY RADIO SYSTEM  
US ARMY AIR FORCE NAVY-MARINE CORPS

Email via Radio!  
**WINLINK 2000**  
Global Radio Email System  
I'm ready, are you?

## The Winlink 2000 Radio e-Mail Network

E-mail with or without the Internet

Developed by  
The Winlink Development Team

POWER GRIDS  
WESTERN INTERCONNECT  
SOUTHEASTERN INTERCONNECT  
CENTRAL INTERCONNECT  
TEXAS INTERCONNECT

**BREAKING NEWS**  
POWER OUTAGE HITS NYC, MI, DETROIT  
OTTAWA, TORONTO, CLEVELAND

DEFENSE SECRETARY LEON PANETTA WARNS OF "CYBER PEARL HARBOR".

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# The A2 Shack Setup

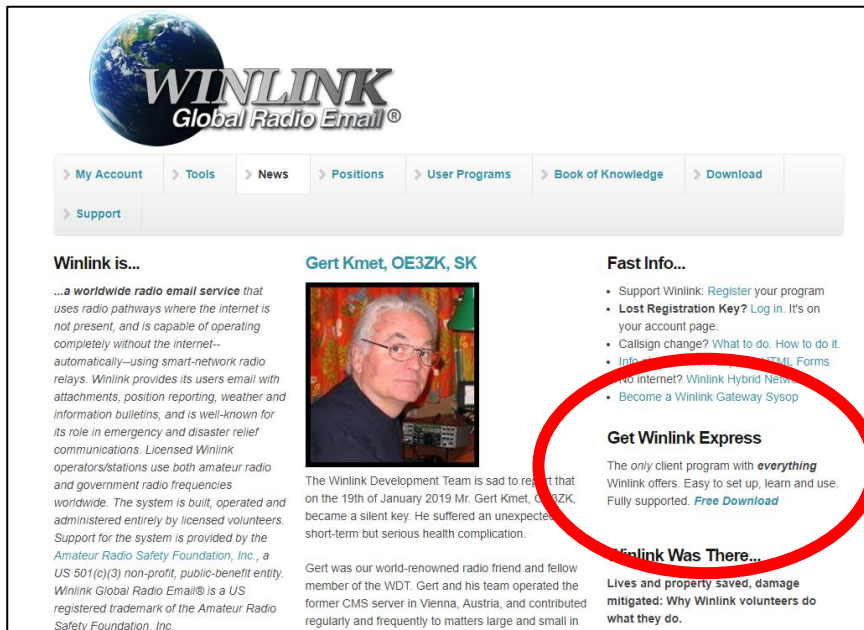


# Cables & Setup

- Ordered a RS-232 to Kenwood Comm cable \$50? – one week
- Ordered a USB to RS-232 cable \$20 – one week
- Plug the cable in to laptop, it will download drivers (be connect to the internet)
  - It will set up a Comm port (might need if for troubleshooting)
  - Find the comm port using the hardware detection – comm port 5
  - Think each usb port has it's own comm port

# Installing Winlink

- Go to website – <https://www.winlink.org/>
- Download Winlink Express
- My big issue – it needs Microsoft .Net 3.5 framework 3.5 to operate (this is the software that does the port mapping, USB, and data control)
  - Took about 30 – 45 mins to install



**Winlink 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 its users email with attachments, position reporting, weather and information bulletins, and is well-known for its role in emergency and disaster relief communications. Licensed Winlink operators/stations use both amateur radio and government radio frequencies worldwide. The system is built, operated and administered entirely by licensed volunteers. Support for the system is provided by the Amateur Radio Safety Foundation, Inc., a US 501(c)(3) non-profit, public-benefit entity. Winlink Global Radio Email® is a US registered trademark of the Amateur Radio Safety Foundation, Inc.

**Gert Kmet, OE3ZK, SK**  
The Winlink Development Team is sad to report that on the 19th of January 2019 Mr. Gert Kmet, OE3ZK, became a silent key. He suffered an unexpected short-term but serious health complication.

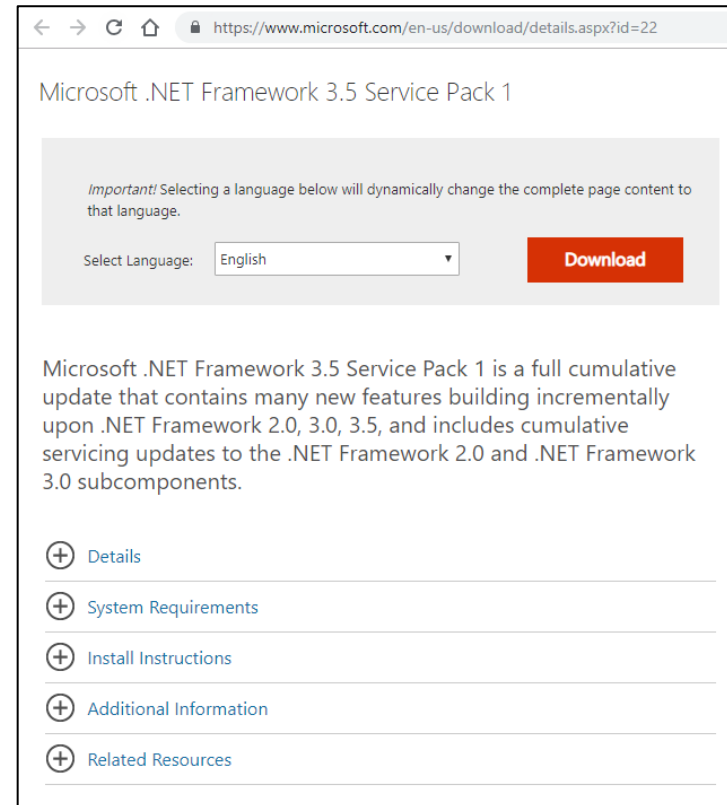
Gert was our world-renowned radio friend and fellow member of the WDT. Gert and his team operated the former CMS server in Vienna, Austria, and contributed regularly and frequently to matters large and small in

**Fast Info...**

- Support Winlink: Register your program
- **Lost Registration Key?** Log in. It's on your account page.
- Callsign change? What to do. How to do it.
- Info on Winlink Hybrid Network
- No internet? Winlink Hybrid Network
- Become a Winlink Gateway Sysop

**Get Winlink Express**  
The only client program with **everything** Winlink offers. Easy to set up, learn and use. Fully supported. [Free Download](#)

**Winlink Was There...**  
Lives and property saved, damage mitigated: Why Winlink volunteers do what they do.



Microsoft .NET Framework 3.5 Service Pack 1

*Important!* Selecting a language below will dynamically change the complete page content to that language.

Select Language:  [Download](#)

Microsoft .NET Framework 3.5 Service Pack 1 is a full cumulative update that contains many new features building incrementally upon .NET Framework 2.0, 3.0, 3.5, and includes cumulative servicing updates to the .NET Framework 2.0 and .NET Framework 3.0 subcomponents.

- + Details
- + System Requirements
- + Install Instructions
- + Additional Information
- + Related Resources

# Install / Boot Up Winlink

Winlink Express Properties

Call Signs

My Callsign:  My Password:  (Case sensitive)  Show password

Callsign suffix (optional):  (Used for country code)

Password recovery e-mail:   
(Non-Winlink e-mail address where lost password will be sent when requested)

Auxiliary Callsigns and Tactical Addresses

**DM03TW**

My Grid Square:

Winlink Express registration key:

Service Codes

(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)

Name:

Street address 1:

Street address 2:

City:

State/Province:

Country:

Postal code:

Web Site URL (optional):

Phone number:

Non-Winlink e-mail:

Additional information (optional):

Recalculate HF path quality if SFI changes more than:

Keep logs for  weeks. Keep deleted messages for  days.

Display list of pending incoming messages prior to download

Warn about connections to stations holding messages

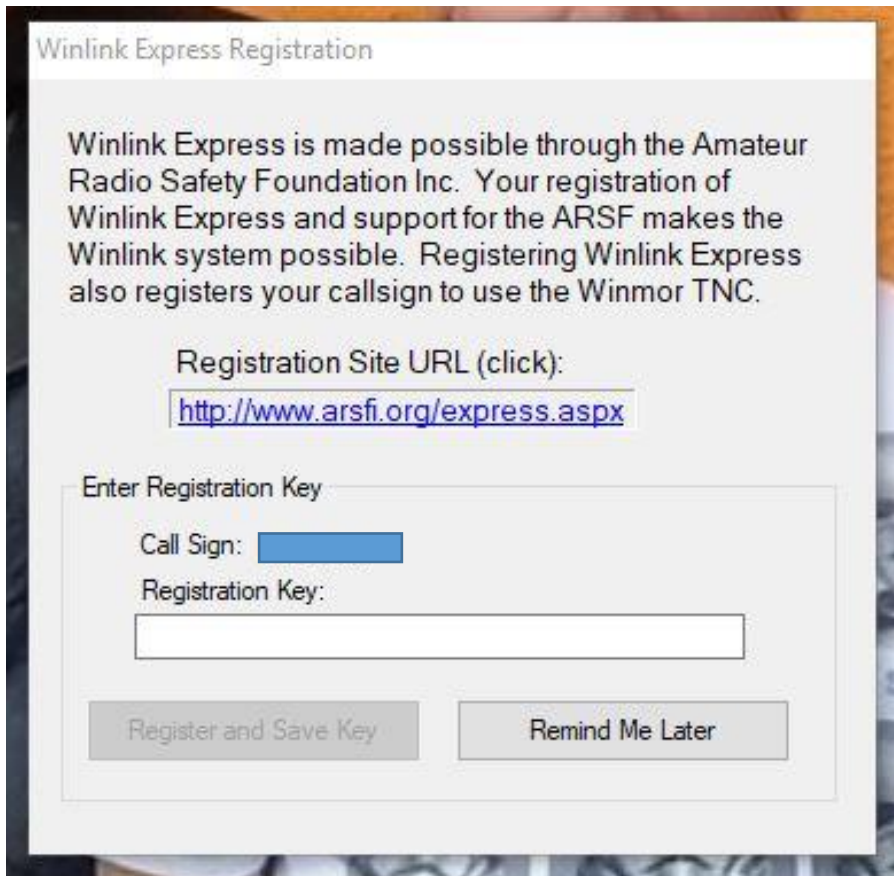
Allow diagnostic information to be sent to the Winlink Development Team

Automatically install field-test (beta) versions of Winlink Express

- Install winlink
- Will take you right into Setup
- Create account and password
- call sign @ winlink.org
- Know your 6 letter Grid Square or know your Lat/ Long

# Nag screen ...

You will get a nag screen when you open the application again. The Nag screen will make you wait a bit, before it lets you select “remind me later”, but you don’t have to buy the program or get a registration key.



Winlink Express Registration

Winlink Express is made possible through the Amateur Radio Safety Foundation Inc. Your registration of Winlink Express and support for the ARSF makes the Winlink system possible. Registering Winlink Express also registers your callsign to use the Winmor TNC.

Registration Site URL (click):  
<http://www.arsfi.org/express.aspx>

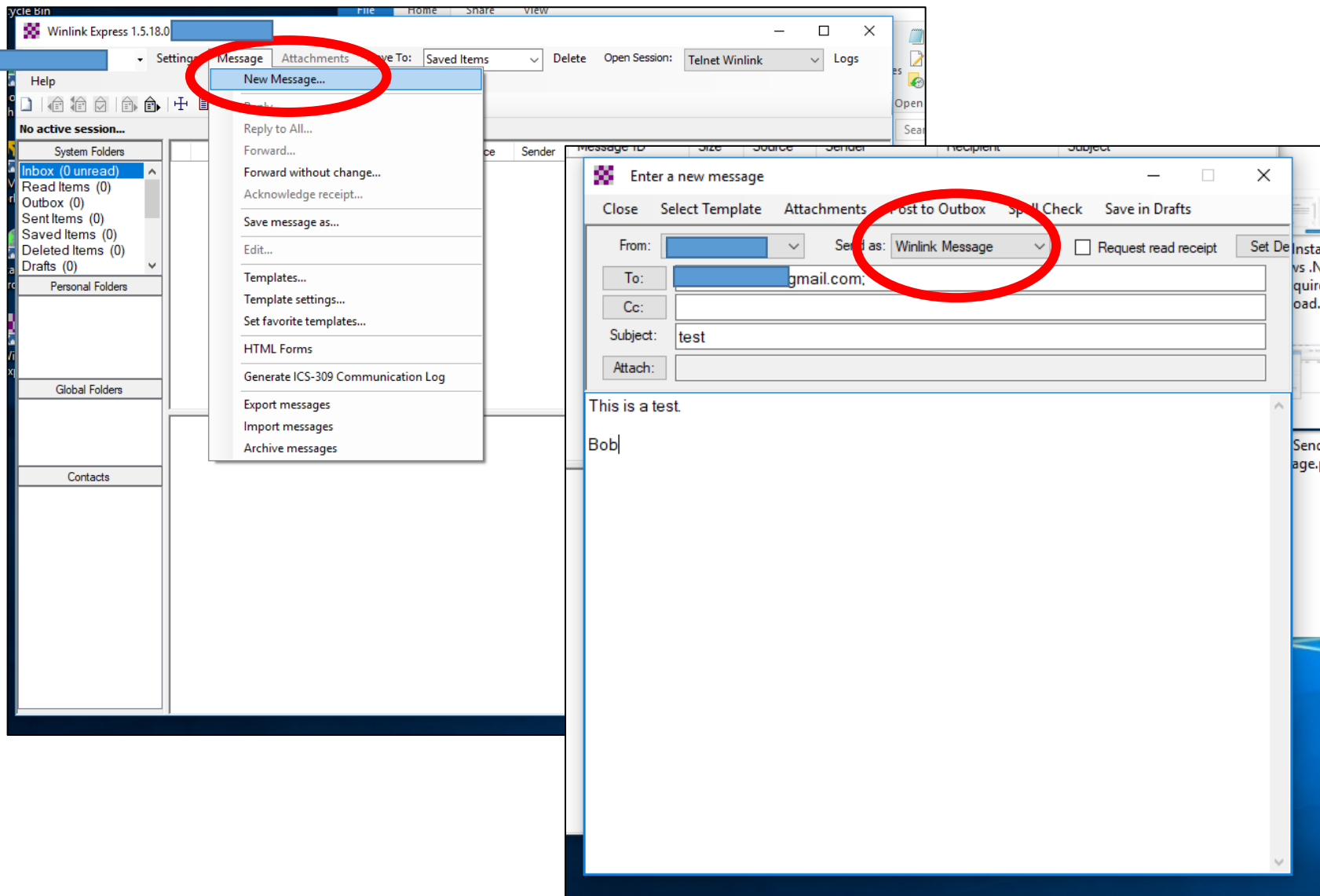
Enter Registration Key

Call Sign:

Registration Key:



# Create an Email



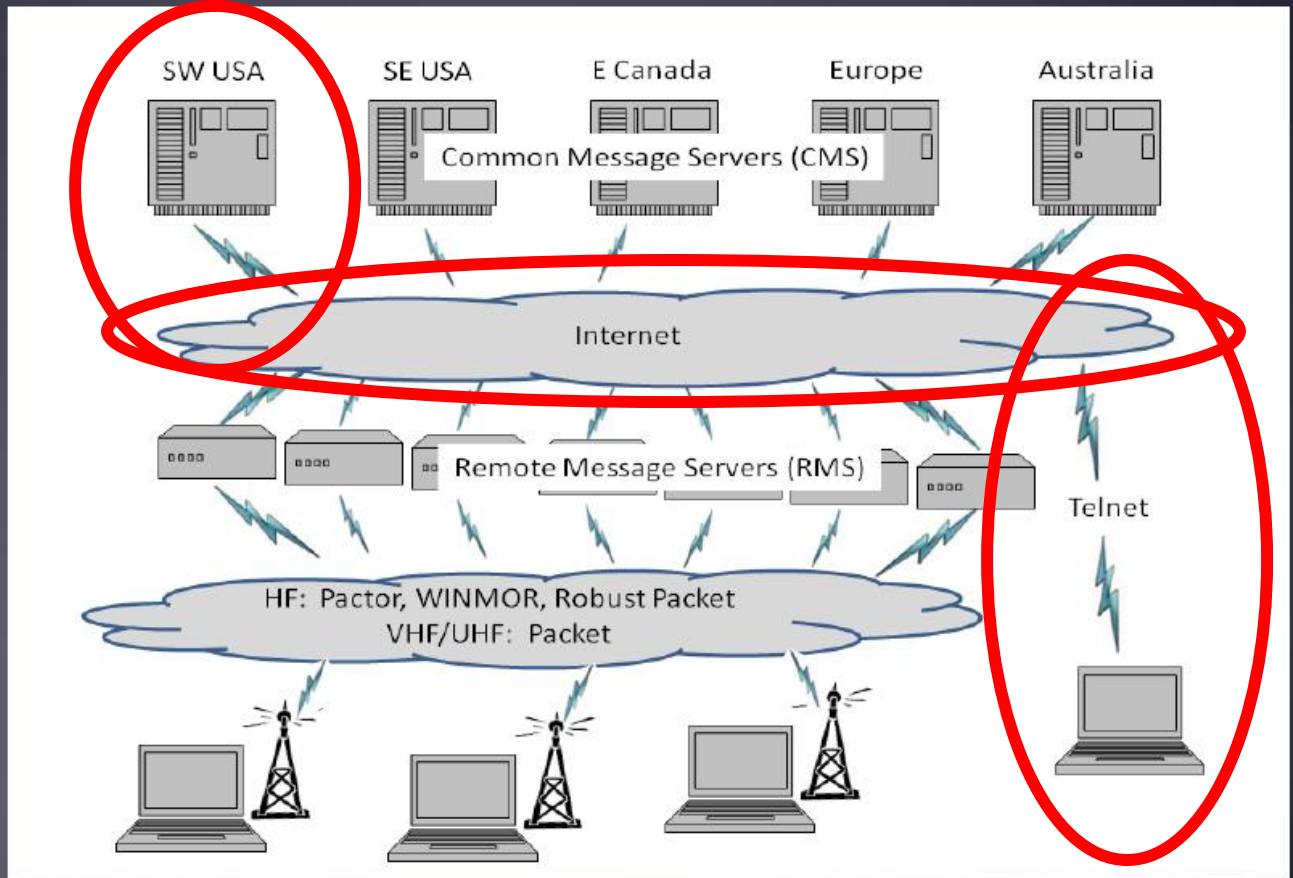
# Post Message to Outbox

The screenshot displays the Winlink Express 1.5.18.0 application window. The main interface includes a menu bar (File, Home, Share, View), a toolbar, and a sidebar with folders like 'Inbox (0 unread)', 'Read Items (0)', 'Outbox (0)', 'Sent Items (0)', 'Saved Items (0)', 'Deleted Items (0)', and 'Drafts (0)'. A table with columns 'Date/Time', 'Message ID', 'Size', 'Source', 'Sender', 'Recipient', and 'Subject' is visible. A 'No active session...' message is shown above the table. A 'Enter a new message' dialog box is open, featuring a red circle around the 'Post to Outbox' button. The dialog also includes fields for 'From', 'To' (with a partial email address 'mail.com;'), 'Cc', 'Subject' (containing 'test'), and 'Attach'. The message body contains the text 'This is a test.' and 'Bob|'. Other buttons in the dialog include 'Close', 'Select Template', 'Attachments', 'Spell Check', and 'Save in Drafts'.

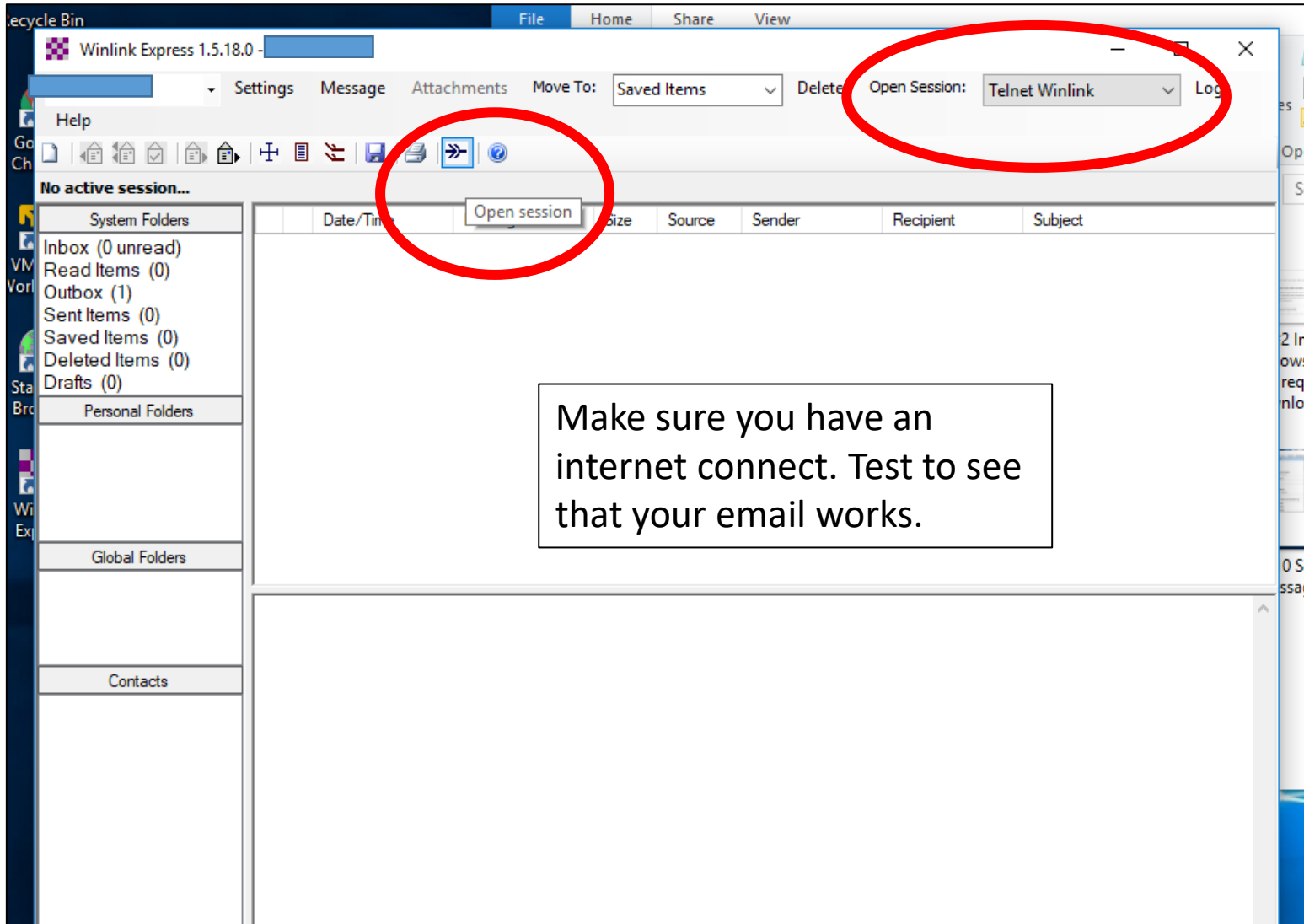
# Now - Try a Telnet Email

## Winlink 2000 Architecture (Conventional Mode)

- CMS
- RMS (gateway)
- Client (you)



# Open a Telnet session



The screenshot shows the Winlink Express 1.5.18.0 application window. The interface includes a menu bar with 'File', 'Home', 'Share', and 'View'. Below the menu bar, there are buttons for 'Settings', 'Message', 'Attachments', 'Move To: Saved Items', 'Delete', 'Open Session: Telnet Winlink', and 'Log'. A toolbar contains various icons, including a blue arrow pointing right, which is circled in red. A tooltip 'Open session' is visible over this icon. The main area displays a table with columns for 'Date/Time', 'Size', 'Source', 'Sender', 'Recipient', and 'Subject'. The table is currently empty, with the text 'No active session...' above it. A text box in the center of the screen contains the following text:

Make sure you have an internet connect. Test to see that your email works.

# Telnet Session

```
Telnet Winlink Session
Exit  Settings  Start  Stop  Time to next Autoconnect = Disabled
*** Connecting to a CMS...
*** Connected to AWS at 2018/10/05 18:51:10
[WL2K-5.0-B2FWIHJM$]
:PQ: 20902194
CMS>
:FW: ██████████
[RMS Express-1.5.12.0-B2FHMS]
:PR: 20456386
:WL2K DE ██████████(DM03TV)
FC EM 3V0D40HSADEC 192 173 0
F> C8
FS Y
*** Sending 3V0D40HSADEC.
FF
*** Completed send of message 3V0D40HSADEC
*** Sent 1 message. Bytes: 206, Time: 00:00, bytes/minute: 46532
FQ
```

# SMTP Feedback

Winlink Express 1.5.18.0

KK6WYW Settings Message Attachments Move To: Saved Items Delete Open Session: Packet Winlink Logs Help

In Packet Winlink session.

System Folders	Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
Inbox (1 unread)	2019/01/23 0...	2761T17J3JKA	467	SMTP	SMTP:famert...		Re: //WL2K 2nd UHF/VHF message via Winlink
Read Items (0)	2019/01/23 02:44	8GH21R179YBH	462	CMS	SERVICE		Service Advice Message
Outbox (0)	2019/01/19 18:34	BZ2U96B3YZ80	267	SMTP	SMT [redacted]		Re: //WL2K test

Personal Folders

Global Folders

Contacts

Message ID: 8GH21R179YBH  
 Date: 2019/01/23 02:44  
 From: SERVICE  
 To: [redacted]  
 Source: CMS  
 Downloaded-from: RMS:K6CCR-10  
 Subject: Service Advice Message

We have been unable to deliver your message:  
 MessageId: GOAZNT6XBJNP  
 To: SMTP:[redacted]aero.com  
 Subject: //WL2K 2nd UHF/VHF message via Winlink  
 for the reason given below by the remote mail server.

"550-5.1.1 The email account that you tried to reach does not exist. Please try"

This advice applies only to SMTP:[redacted]aero.com. Other addressees of the same message may have been successfully forwarded.

Email to Kirk Failed ...

# Tom's Reply

Winlink Express 1.5.18.0

Settings Message Attachments Move To: Saved Items Delete Open Session: Packet Winlink Logs Help

In Packet Winlink session.

	Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
Inbox (0 unread)	2019/01/23 02:45	2761T17J3JKA	467	SMTP	SMTP:famertre...		Re: //WL2K 2nd UHF/VHF message via Winlink
Read Items (0)	2019/01/23 02:44	8GH21R179YBH	462	CMS	SERVICE		Service Advice Message
Outbox (0)	2019/01/19 18:34	BZ2U96B3YZ80	267	SMTP	SI [redacted] h.		Re: //WL2K test

System Folders

- Inbox (0 unread)
- Read Items (0)
- Outbox (0)
- Sent Items (3)
- Saved Items (0)
- Deleted Items (0)
- Drafts (0)

Personal Folders

Global Folders

Contacts

Message ID: 2761T17J3JKA  
 Date: 2019/01/23 02:45  
 From: [redacted]  
 To: [redacted]  
 Source: SMTP  
 Downloaded-from: RMS:K6CCR-10  
 Subject: Re: //WL2K 2nd UHF/VHF message via Winlink

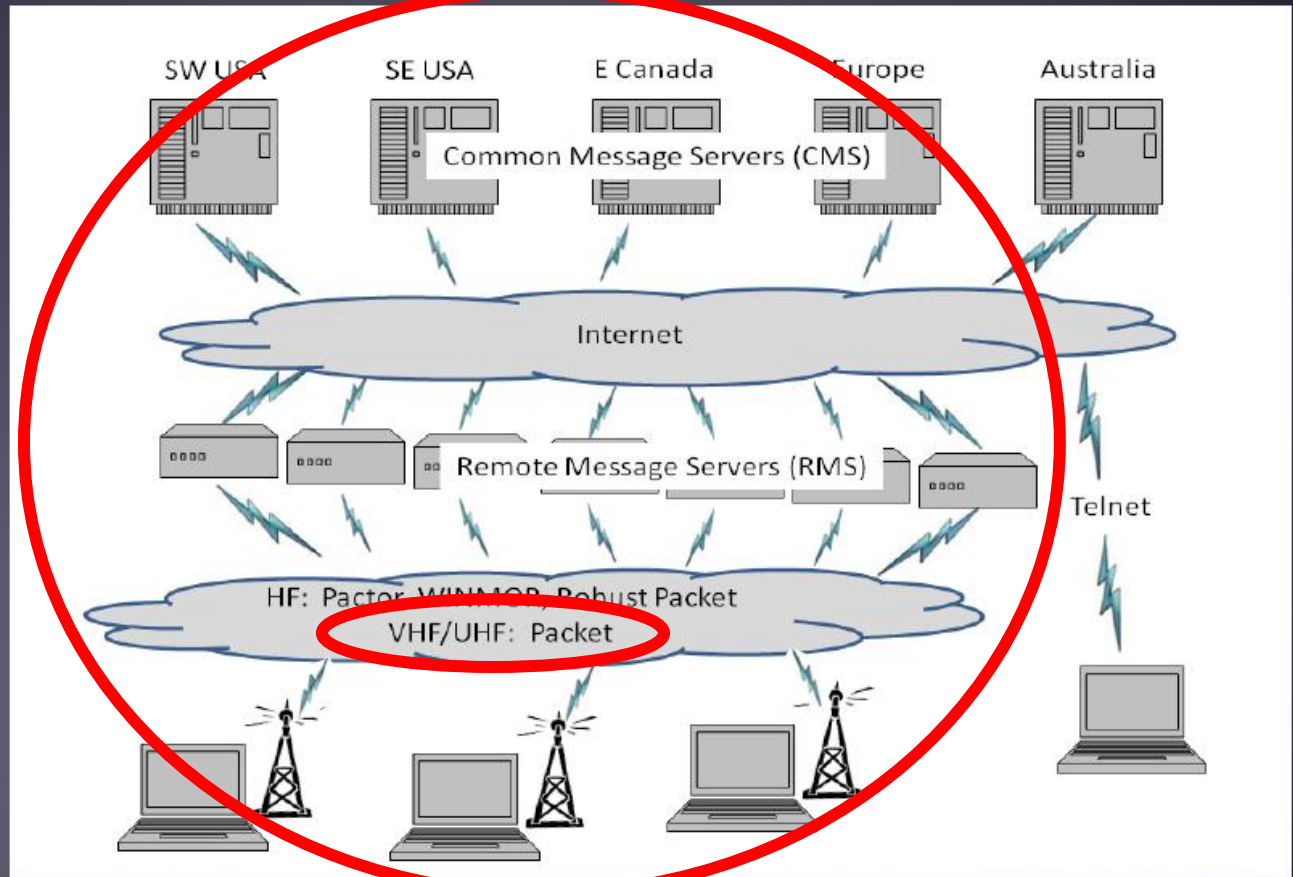
FB OM 73!

Tom [redacted]  
 On Jan 22, 2019, 6:44 PM -0800, [redacted]nk.org, wrote:  
 > Hi Guys,  
 >  
 > Took a couple of hours, but I was finally able to send email via the Culver city CCAR Winlink email system.  
 >  
 > Now I need to build a briefing and try to capture all the setting, so this works at my demo next week.  
 >  
 > thnx,  
 > Bob  
 >

# Now - Try a Radio Email

## Winlink 2000 Architecture (Conventional Mode)

- CMS
- RMS (gateway)
- Client (you)





# Find a station

Packet Winlink Session

Exit Settings Switch to Peer-to-Peer Session Channel Selection Band Start Stop

Connection type: Direct K6CCR-10 Via

Connection script: Edit script Add script Remove script

Time to next Autoconnect = Disconnected

Packet Channel Selector

Exit Select Channel Update Table Via Internet Update Table Via Radio

Stations found within 1000 kilometers of your grid square.

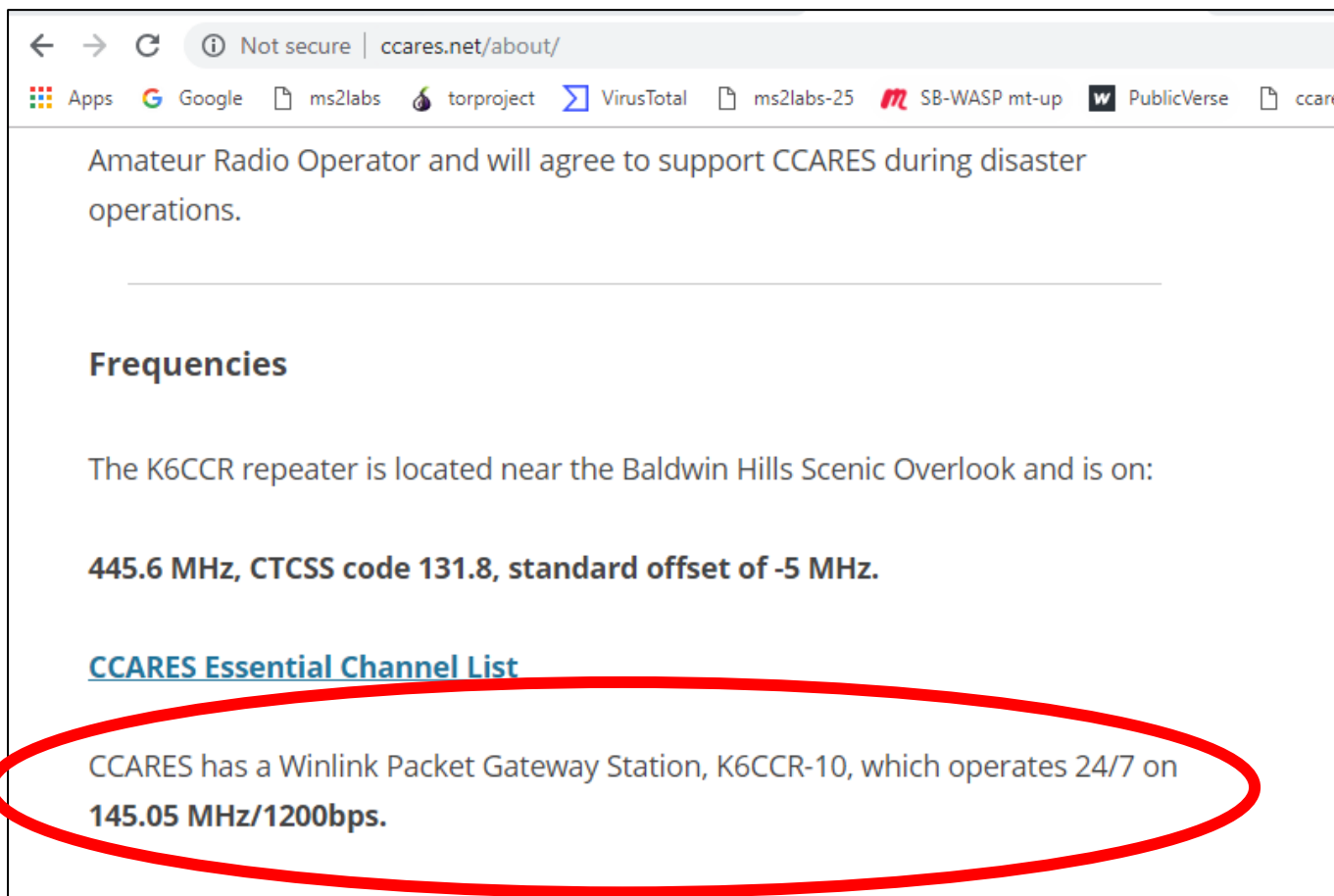
Callsign	Frequency (MHz)	Baud	Grid Square	Group	Distance (mi)	Bearing (Degrees)
K6CCR-10	145.050	1200	DM04TA	PUBLIC	006	000
AJ7C-10	145.050	1200	DM04TA	PUBLIC	006	000
AJ7C-10	431.125	9600	DM04TA	PUBLIC	006	000
W2NP-10	145.050	1200	DM04UC	PUBLIC	012	025
KE6WEZ-10	145.050	1200	DM04PG	PUBLIC	030	320
W6ACS-11	431.125	9600	DM13CW	PUBLIC	034	090
K6NBR-10	431.475	9600	DM13BO	PUBLIC	037	129
K6NBR-10	145.050	1200	DM13BO	PUBLIC	037	129
W6ACS-10	431.475	9600	DM13DS	PUBLIC	040	107
KK6MTQ-10	145.630	1200	DM04VM	PUBLIC	041	014
AG6MO-10	145.090	1200	DM14EC	PUBLIC	044	075
WB6TT-10	144.970	1200	DM13FU	PUBLIC	048	097
W6ACS-12	431.075	9600	DM13EK	PUBLIC	055	128
KE6NYT-10	145.050	1200	DM04LM	PUBLIC	055	317
WM6T-10	145.090	1200	DM14JG	PUBLIC	071	071
KG6HSQ-10	145.050	1200	DM13JJ	PUBLIC	077	119
KD6ILO-10	145.050	1200	DM13IF	PUBLIC	080	128
N1CWP-10	145.050	1200	DM13LM	PUBLIC	082	119

1. Need internet
2. Pick a station,
  - Close is good
  - Notice Data Rate
    - 2 meter vs 70 cm

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# Find a Station



← → ↻ ⓘ Not secure | ccares.net/about/

Apps Google ms2labs torproject VirusTotal ms2labs-25 SB-WASP mt-up PublicVerse ccar

Amateur Radio Operator and will agree to support CCARES during disaster operations.

---

## Frequencies

The K6CCR repeater is located near the Baldwin Hills Scenic Overlook and is on:

**445.6 MHz, CTCSS code 131.8, standard offset of -5 MHz.**

[CCARES Essential Channel List](#)

CCARES has a Winlink Packet Gateway Station, K6CCR-10, which operates 24/7 on **145.05 MHz/1200bps.**

# Set up

Packet Winlink/P2P Setup

TNC Connection

Packet TNC Type: Kenwood TM-D710 B-Band

Packet TNC Model:

AutoConnect Time: Disabled

Serial Port: COM5

Serial Port Baud: 9600

If Auto Connect is enabled, open session when Winlink Express is started

TNC Parameters

1200 Baud  9600 Baud

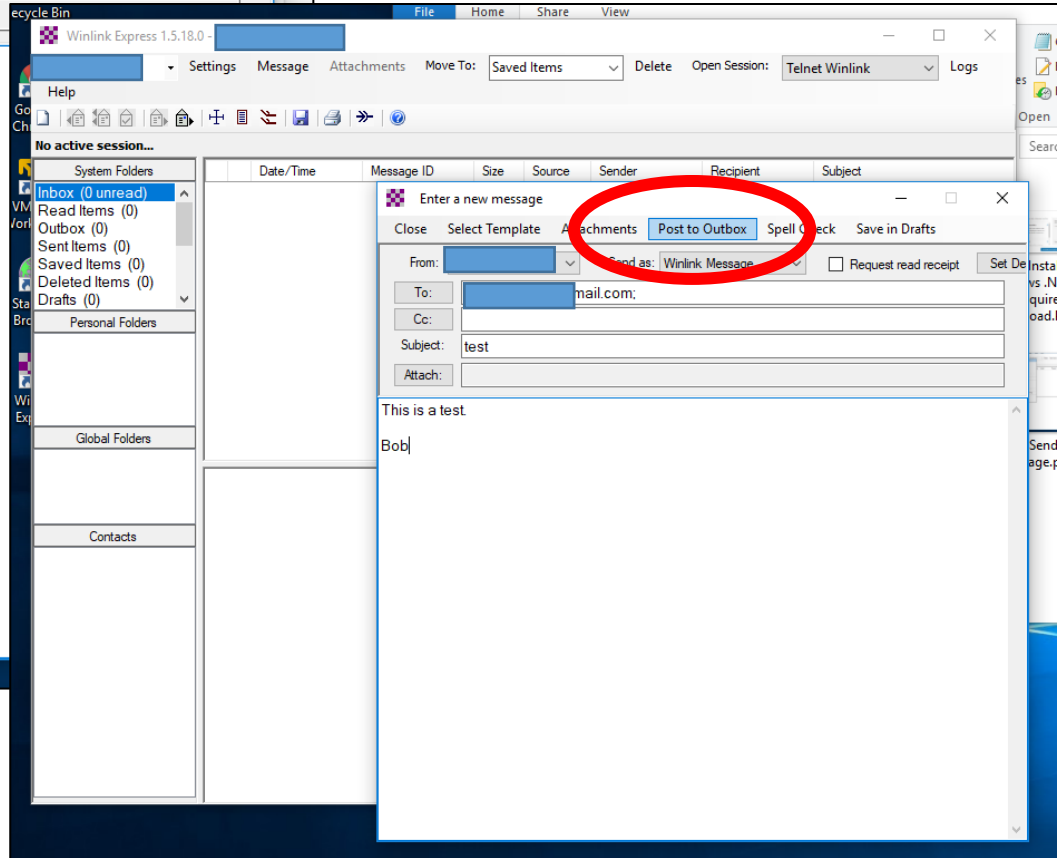
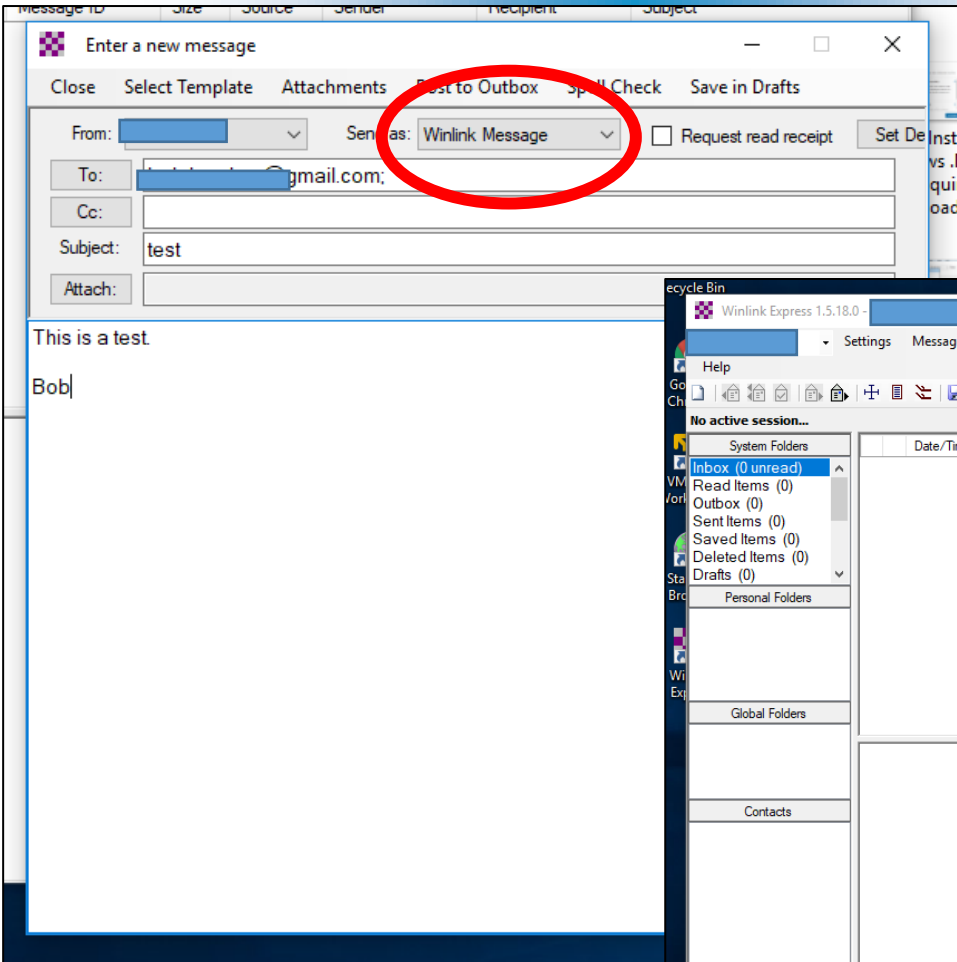
TX Delay (Milliseconds):	400	300
Maximum Packet Length:	128	255
Maximum Frames:	2	7
Frack:	2	2
Persistence:	160	224
Slot time:	30	20
Maximum Retries:	5	5

Disable Xmt Level Adjust  Transmit Level: 100 100

Update Cancel

- Radio and Band
- Port
- TNC parameters
- Important, listen to the channel, set your squelch properly.
- Your radio won't transmit if it hears a busy channel !!

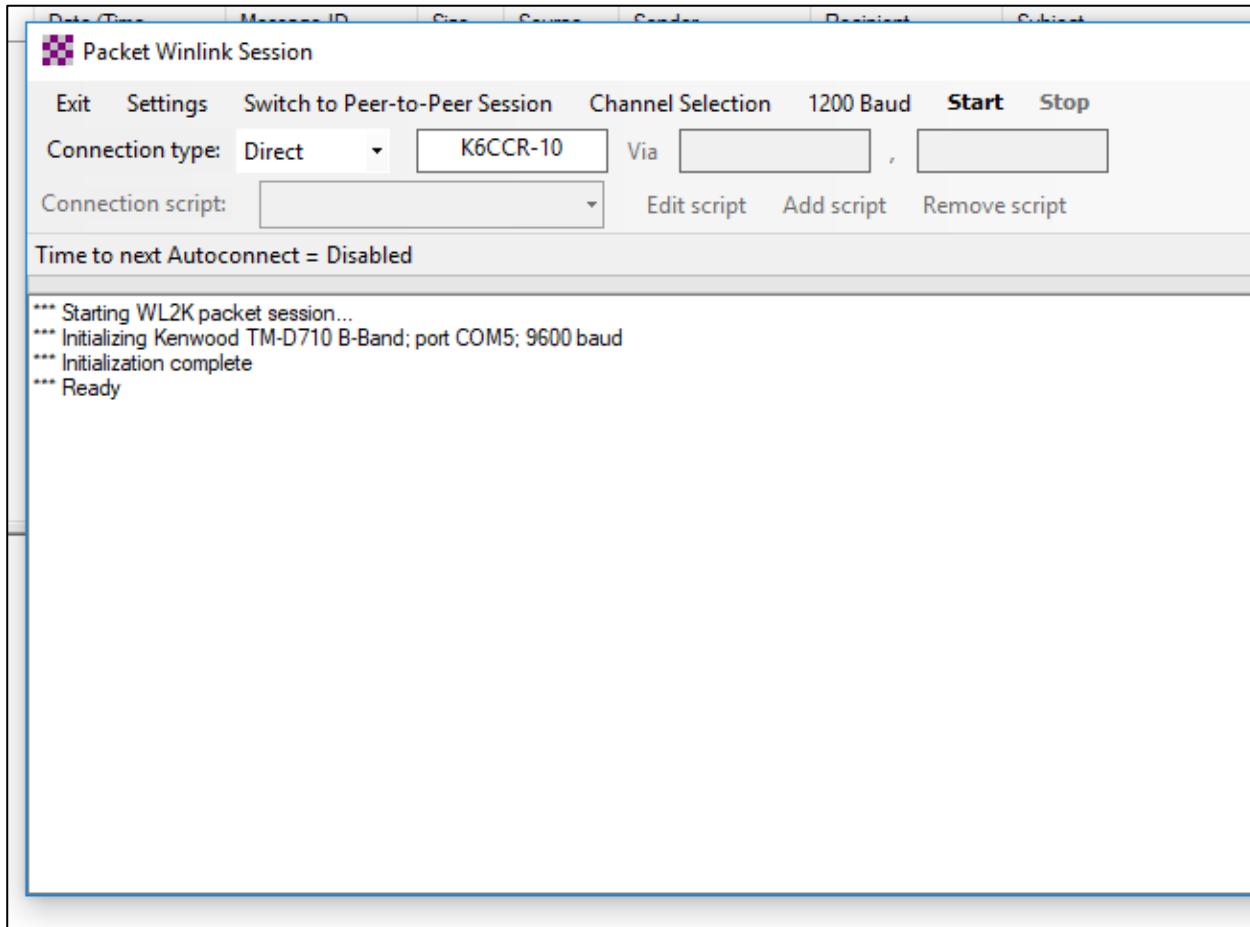
# Create email, Post to outbox



# Set up – Connect to the radio

- Radio and Band
- Port
- TNC parameters

- Important, listen to the channel, set your squelch properly.
- Your radio won't transmit if it hears a busy channel !!



# A successful connection !!

The screenshot shows the Packet Winlink Session interface. At the top, there are buttons for 'Exit', 'Settings', 'Switch to Peer-to-Peer Session', 'Channel Selection', '1200 Baud', 'Start', and 'Stop'. The 'Start' button is circled in red. Below these buttons, the 'Connection type' is set to 'Direct' and the 'Channel' is 'K6CCR-10'. There are also buttons for 'Edit script', 'Add script', and 'Remove script'. The status bar shows 'Received: 468 Sent: 304 Time to next Autoconnect = Disabled'. The main window displays a log of the session, including the start of the call, opening of the serial port, and the receipt of a message from BZ2U96B3YZ80.

```
*** Starting to call K6CCR-10
*** Opening serial port COM5; 9600 baud; Kenwood TM-D710 B-Band
*** Connecting to K6CCR-10
*** Connected to K6CCR-10 at 2019/01/23 02:31:07

Culver City ARES RMS Packet Gateway 145.05 | DM04ta
[WL2K-5.0-B2FWIHJM$]
:PQ: 31456252
CMS via K6CCR >
:FW: [REDACTED]
[RMS Express-1.5.18.0-B2FHM$]
:PR: 35389784
; K6CCR-10 DE KK6WYW (DM03TW)
FC EM OQD2RXB3BFV7 168 155 0
F> 84
:PM: KK6WYW BZ2U96B3YZ80 231 [REDACTED]@mail.com Re: //WL2K test
FS Y
*** Sending OQD2RXB3BFV7.
FC EM BZ2U96B3YZ80 271 231 0
*** Completed send of message OQD2RXB3BFV7
*** Sent 1 message. Bytes: 175, Time: 00:06, bytes/minute: 1545
F> B6
FS Y
*** Receiving BZ2U96B3YZ80
*** BZ2U96B3YZ80 - 286/243 bytes received
*** Bytes: 255, Time: 00:01, bytes/minute: 14278
FF
FQ
*** --- End of session at 2019/01/23 02:31:55 ---
*** Messages sent: 1. Total bytes sent: 175, Time: 00:47, bytes/minute: 220
*** Messages Received: 1. Total bytes received: 255, Total session time: 00:47, bytes/minute: 320
*** Disconnected at 2019/01/23 02:32:03

*** Disconnect reported.
```

Hit Start ...

# Mailbox updates – Kirk email Failed

It sends email waiting in your outbox ...

The screenshot shows the Winlink Express 1.5.18.0 interface. The left sidebar displays the folder structure under 'In Packet Winlink session.', including System Folders (Inbox, Read Items, Outbox, Sent Items, Saved Items, Deleted Items, Drafts) and Personal Folders. The 'Outbox (0)' folder is selected, and a table of messages is displayed.

Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
2019/01/23 02:39	GQAZNT6XBJNP	433				//WL2K 2nd UHF/VHF message via Winlink
2019/01/23 01:25	OQD2RXB3BFV7	175				//WL2K test

The selected message (Message ID: GQAZNT6XBJNP) is displayed in the main pane. The message details are as follows:

Message ID: GQAZNT6XBJNP  
 Date: 2019/01/23 02:39  
 From: [Redacted]  
 To: [Redacted]  
 Cc: [Redacted]@mail.com  
 Source: [Redacted]  
 Subject: //WL2K 2nd UHF/VHF message via Winlink

The body of the email reads:

Hi Guys,  
 Took a couple of hours, but I was finally able to send email via the Culver city CCAR Winlink email system.  
 Now I need to build a briefing and try to capture all the setting, so this works at my demo next week.  
 thnx,  
 Bob

# Mailbox updates

Winlink picks up any email that is sitting in the CMS (via internet), and moves it thru your RMS (internet), then via radio back to you, if addressed to you.

The screenshot shows the Winlink Express 1.5.18.0 interface. The top menu bar includes 'Settings', 'Message', 'Attachments', 'Move To: Saved Items', 'Delete', 'Open Session: Packet P2P', 'Logs', and 'Help'. The main window displays a list of messages with columns for Date/Time, Message ID, Size, Source, Sender, Recipient, and Subject. A red oval highlights the message with ID 29LWZR6NX83X, dated 2019/01/27 22:43, with subject 'test #3'. Below the list, the detailed view of this message is shown, including the header and body text.

Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
2019/01/27 22:46	DGELC8QMDHUX	164				test 4
2019/01/27 22:43	29LWZR6NX83X	191				test #3
2019/01/27 22:40	GMWZPQ014N...	178				test 2
2019/01/24 02:36	JIDEP08YPB78	168				//WL2K test3
2019/01/23 02:39	GQAZNT6XBJNP	433				//WL2K 2nd UHF/VHF message via Winlink
2019/01/23 01:25	OQD2RXB3BFV7	175				//WL2K test

Message ID: 29LWZR6NX83X  
Date: 2019/01/27 22:43  
From: [Redacted]  
To: [Redacted]  
Source: [Redacted]  
P2P: True  
Subject: test #3

this is test 3 from Bob, [Redacted]

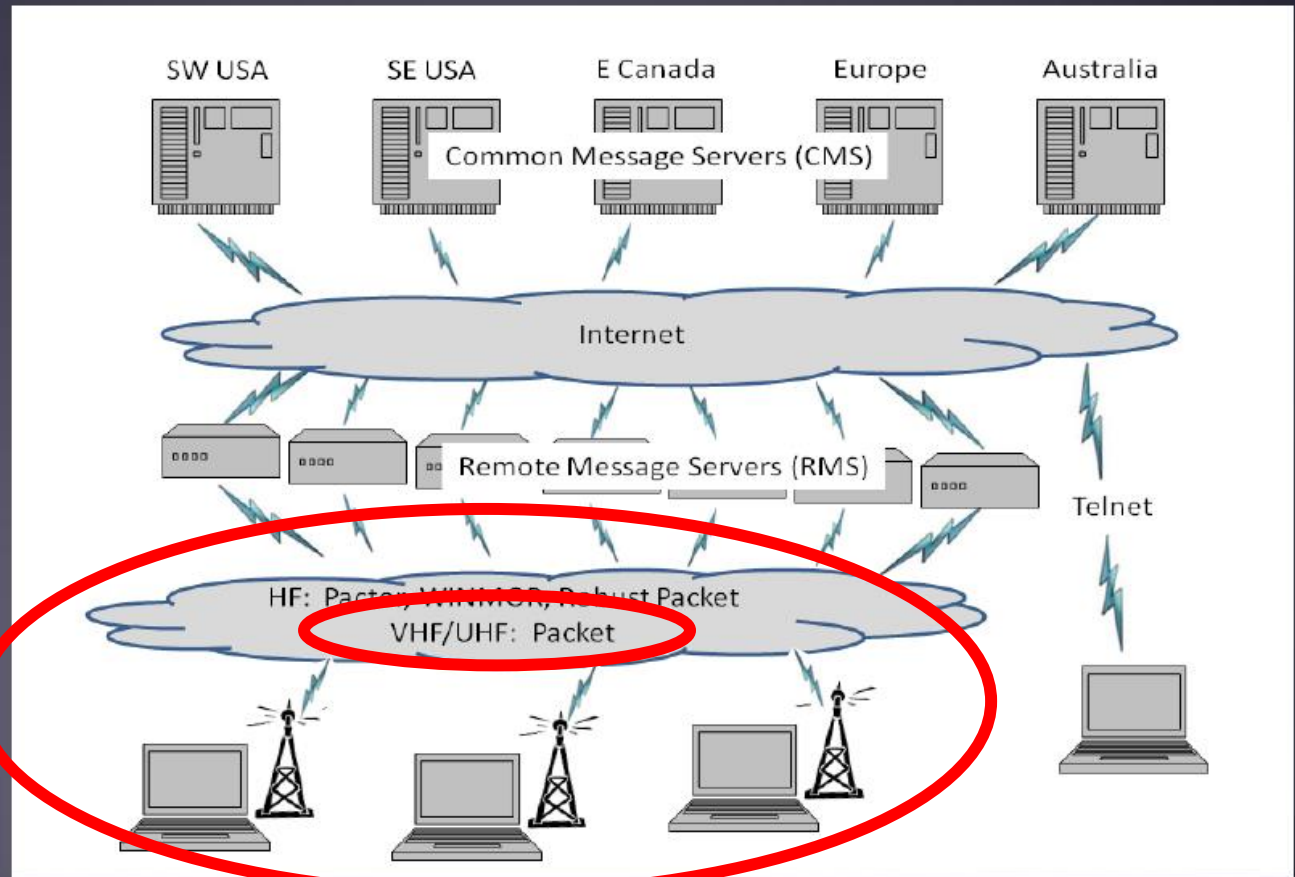
431.475 mhz, p2p



# Now - Try a Radio P2P Email

## Winlink 2000 Architecture (Conventional Mode)

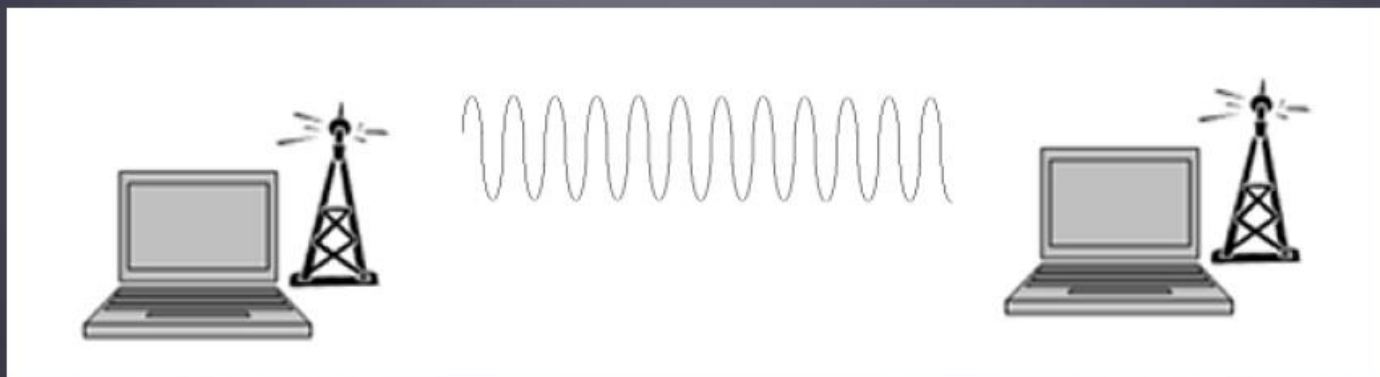
- CMS
- RMS (gateway)
- Client (you)



# P2P Radio Only

## Winlink Peer-To-Peer Radio-Only Operation

- Peer-to-peer: direct radio connection between end-users
- The Internet is not used, all communication by radio.
- Only the two client stations are involved.
- 100% error-free transmission and file attachments.



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# Set up Kenwood Radio



- Talking on the w6HA repeater
- And sending Winlink packets
- Point to Point with Mike V

# Make Sure you address your email for P2P, post to outbox

Winlink Express 1.5.18.0

Settings Message Attachments Move To: Saved Items Delete Open Session: Packet P2P Logs Help

No active session...

Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
2019/01/27 22:55	N3K6FUXDLIP1	200				test 6

Edit a draft message entered by KK6WYW

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

From: [redacted] Send as: Radio-Only Message [v] Request read receipt Set Defaults

To: [redacted]

Cc:

Subject: test 6

Attach:

Message  
Date: 2019/01/27 22:55  
From: KK6WYW  
To: N6MDL  
Source: Mike, this is a test  
P2P: True  
Subject: A test of Bob's first P2P email.  
Mike, th Bob - [redacted] via P2P  
A test o  
Bob - KK6WYW

Winlink Express 1.5.18.0

File Home Share View

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

No active session...

Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
-----------	------------	------	--------	--------	-----------	---------

Enter a new message

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

From: [redacted] Send as: Winlink Message [v] Request read receipt Set Defaults

To: [redacted] gmail.com

Cc:

Subject: test

Attach:

This is a test  
Bob]

# Connect your radio

1. Connect your radio
2. Either you send or the other person sends, when connect to the radio, it's in listen mode
3. Important, listen to the channel, set your squelch properly, your radio won't transmit if it hears a busy channel !!

Packet Winlink Session

Exit Settings Switch to Peer-to-Peer Session Channel Selection 9600 Baud Start Stop

Connection type: Direct ▾ W6ACS-10 Via  ,

Connection script:  ▾ Edit script Add script Remove script

Received: 120 Sent: 121 Time to next Autoconnect = Disabled

```

*** Starting to call W6ACS-10
*** Opening serial port COM5; 9600 baud; Kenwood TM-D710 B-Band
*** Connecting to W6ACS-10
*** Connected to W6ACS-10 at 2019/01/24 02:33:12

WELCOME TO THE ORANGE COUNTY RACES LOMA RIDGE RMS SITE. 431.475 MHz
[WL2K-5.0-B2FWIHJM$]
:PQ: 28058089
CMS via W6ACS >
:FW: ██████████
[RMS Express-1.5.18.0-B2FHMS$]
:PR: 31861625
: W6ACS-10 DE ██████████ (DM03TW)
FC EM QFRN31N3DJH6 155 147 0
F> A9
*** Disconnected at 2019/01/24 02:34:26

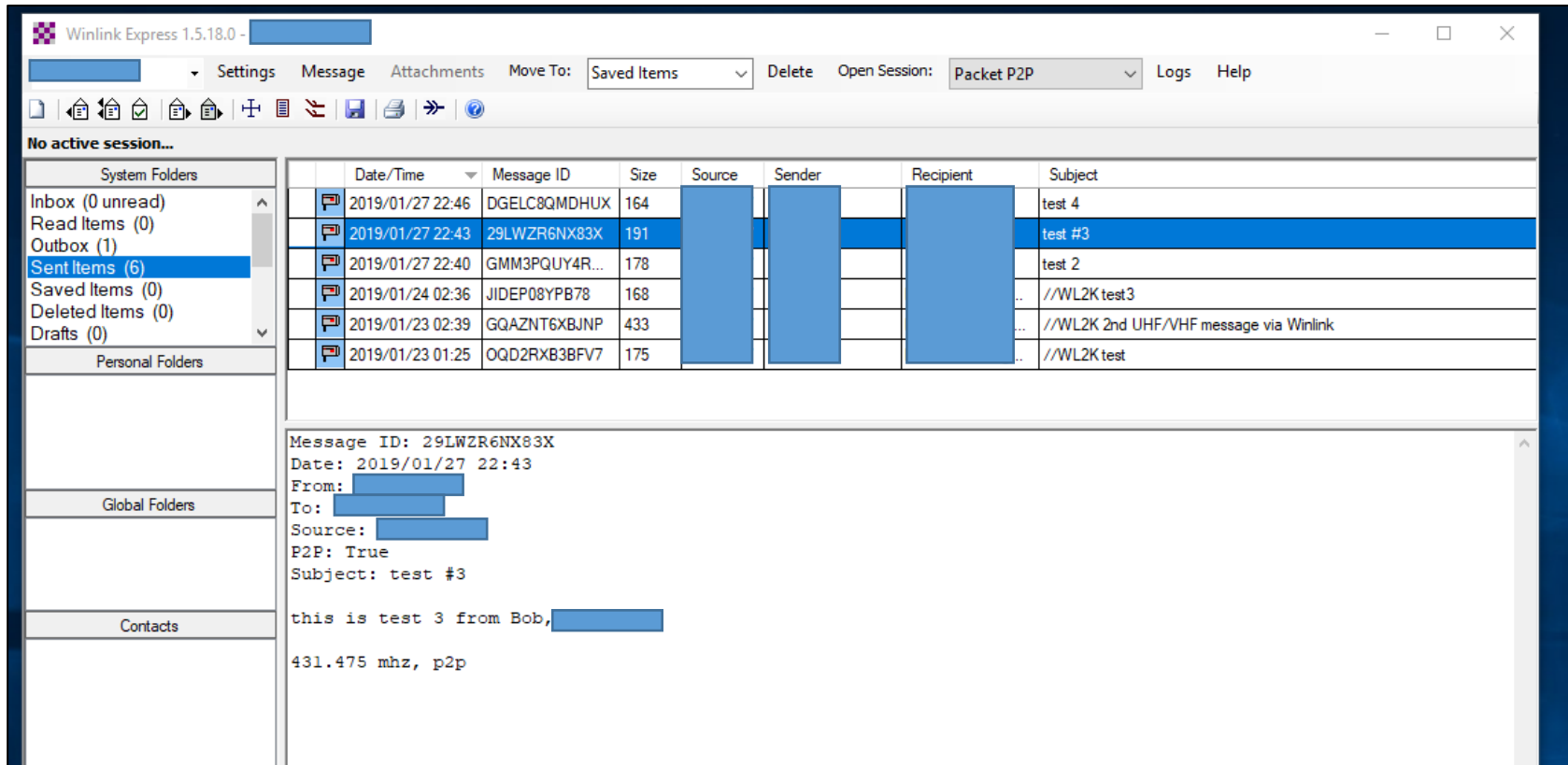
*** Disconnect reported.
```

This isn't a P2P Session, it's a 431 Mhz attempt to Orange County Races – with squelch set wrong

I don't think I have any screen prints of the P2P sessions (sigh)

# Mailbox updates

It sends email waiting in your outbox, for the recipient (didn't check if it sends others, but I doubt it, we aren't set up to be an RMS)  
 Recipient sends you email, You send him an email also.



Winlink Express 1.5.18.0 - [redacted]

Settings Message Attachments Move To: Saved Items Delete Open Session: Packet P2P Logs Help

No active session...

	Date/Time	Message ID	Size	Source	Sender	Recipient	Subject
	2019/01/27 22:46	DGELC8QMDHUX	164				test 4
	2019/01/27 22:43	29LWZR6NX83X	191				test #3
	2019/01/27 22:40	GMM3PQUY4R...	178				test 2
	2019/01/24 02:36	JIDEP08YPB78	168				//WL2K test3
	2019/01/23 02:39	GQAZNT6XBJNP	433				//WL2K 2nd UHF/VHF message via Winlink
	2019/01/23 01:25	OQD2RXB3BFV7	175				//WL2K test

Message ID: 29LWZR6NX83X  
 Date: 2019/01/27 22:43  
 From: [redacted]  
 To: [redacted]  
 Source: [redacted]  
 P2P: True  
 Subject: test #3

this is test 3 from Bob, [redacted]

431.475 mhz, p2p

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# HF Video

<https://www.youtube.com/watch?v=96HzlabCJvw>

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# Questions?







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Backup slides

# .Net and Devices

