

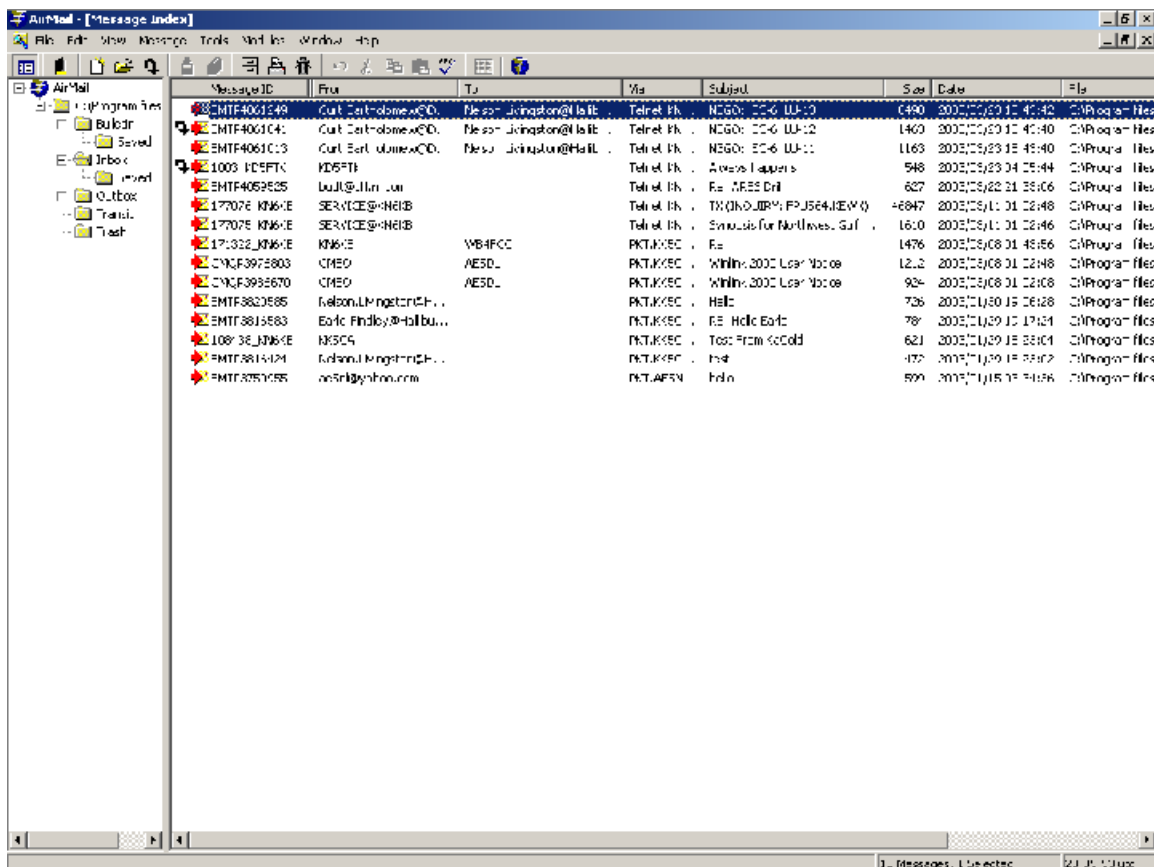
# PACKET RADIO PRIMER

by: Nelson Livingston AE5NL

## AirMail

A beginners guide on how to use Airmail.

Once the software is running and configured you will get a screen that looks similar to this.



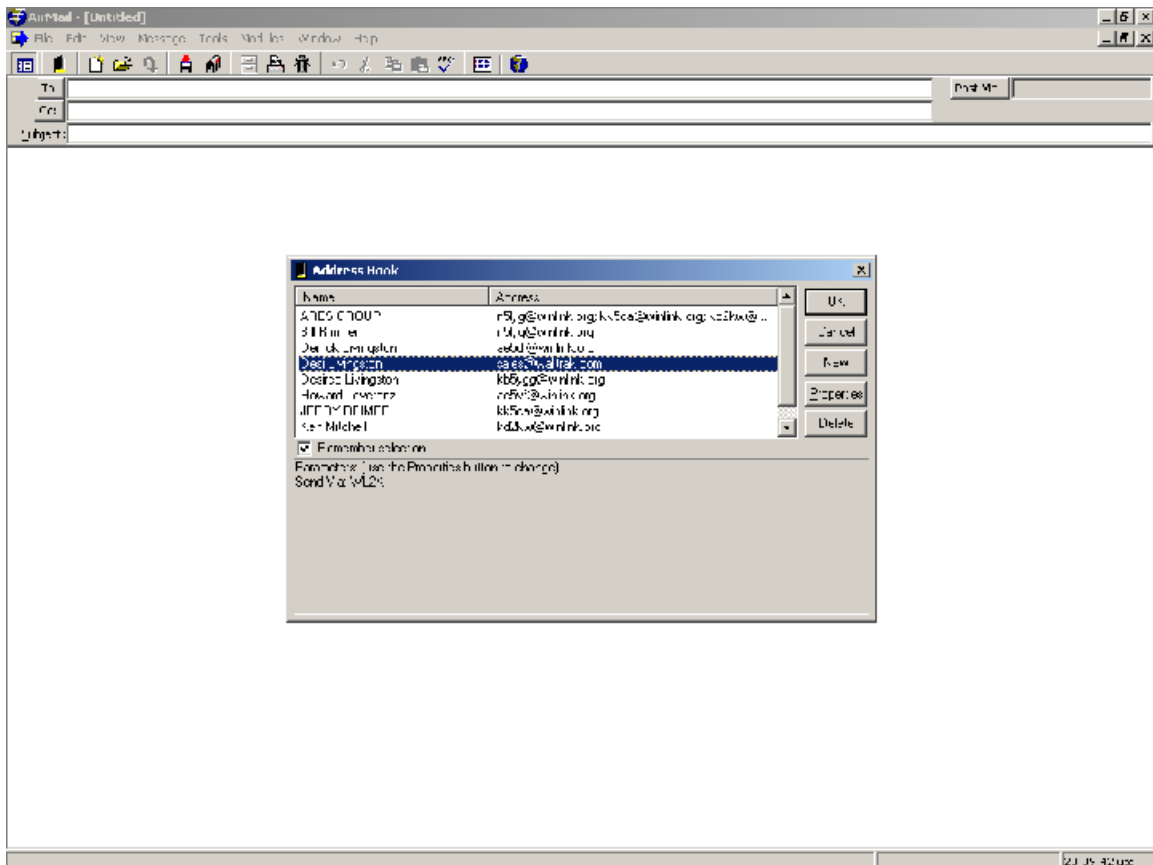
You will notice it has a normal email look and feel.

The very first thing you want to do is open up the Packet module. More on why later.

You can now minimize this. We will return here later.

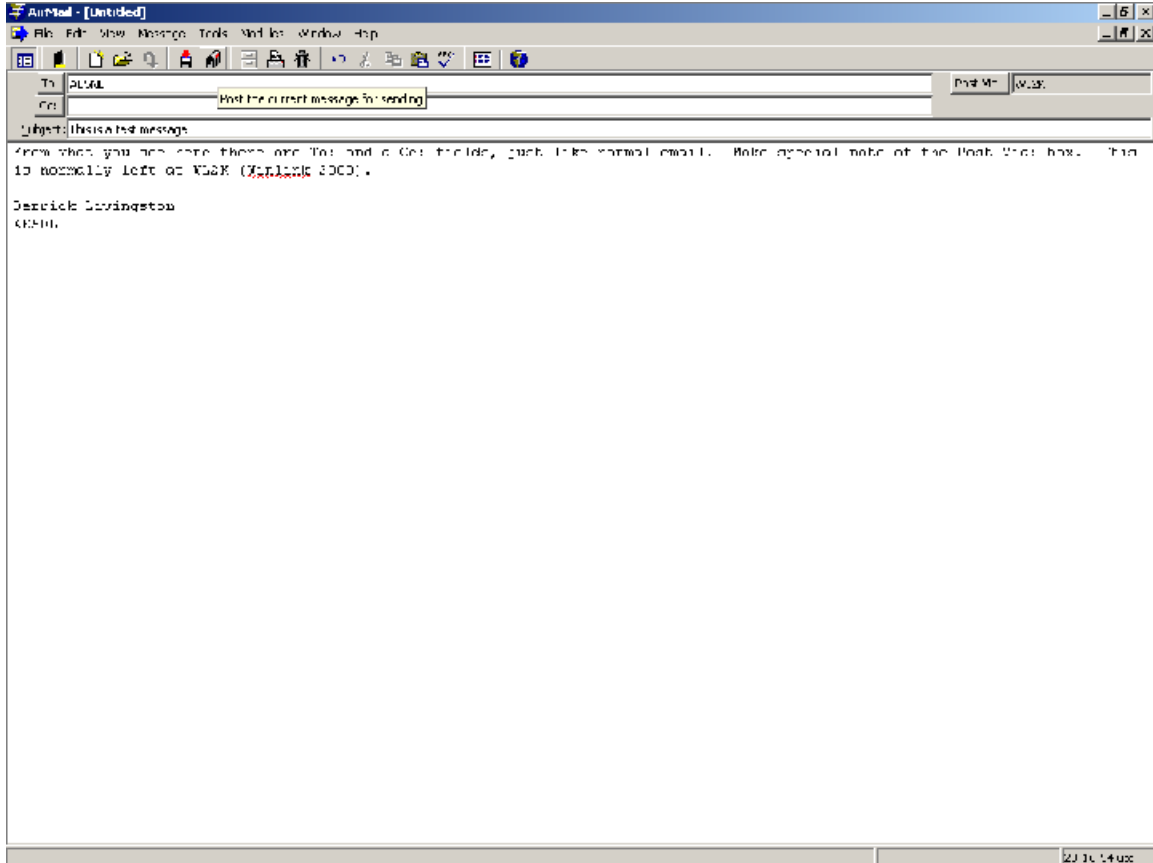
## COMPOSE A MESSAGE

To create a new e-mail message press the Format a New Message Icon. The first thing that pops up is your address book.



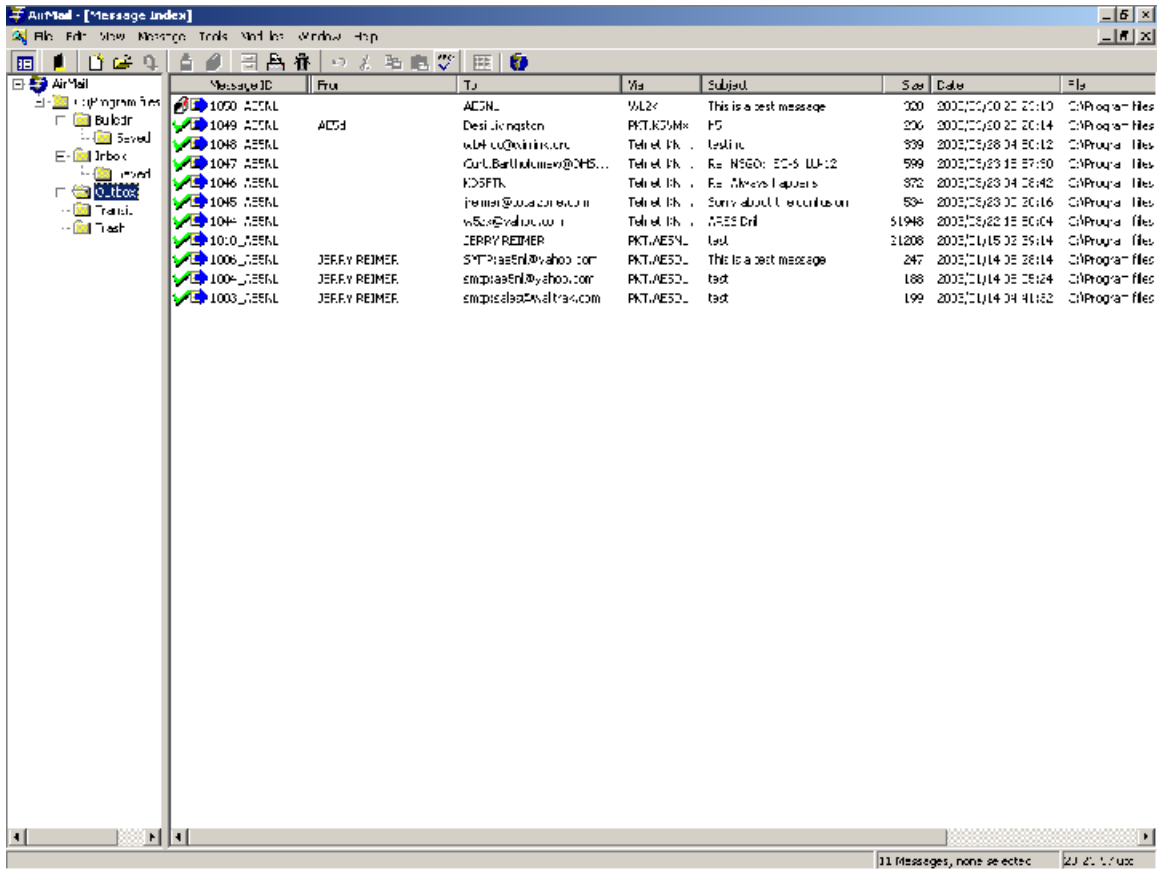
Select one of the recipients in the list, then select OK, or hit cancel to proceed on to the message.

The following screen will appear.



From what you see here there are To: and a Cc: fields, just like normal email. Make special note of the Post Via: box. This is normally left at WL2K (Winlink 2000). Once you have completed the message and are ready to send, press the mailbox icon. This is putting it in the mailbox for delivery. This will take you back to the main screen. Your email will be in the outbox.

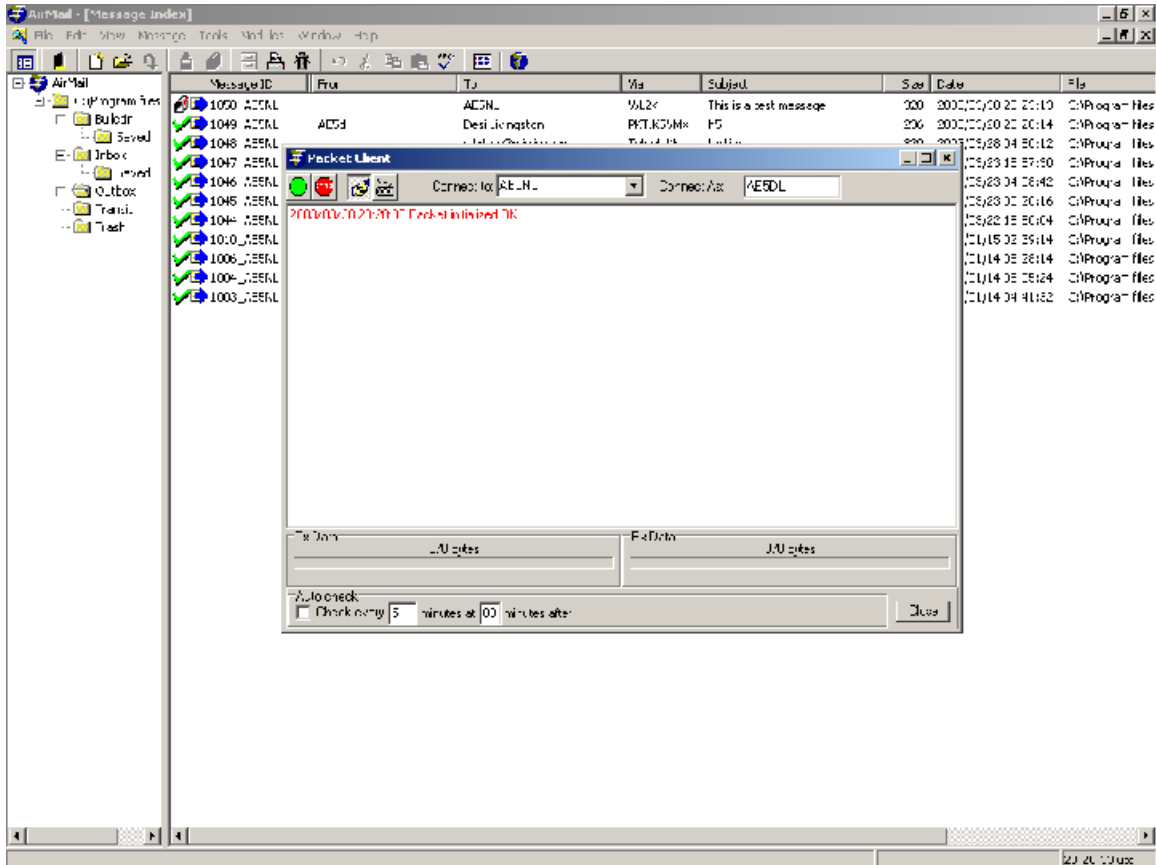
Notice below that it will not have a check mark next to it indicating that it has not yet been delivered.



Finish composing all the messages you want to so that when you connect, you can deliver multiple messages at one time.

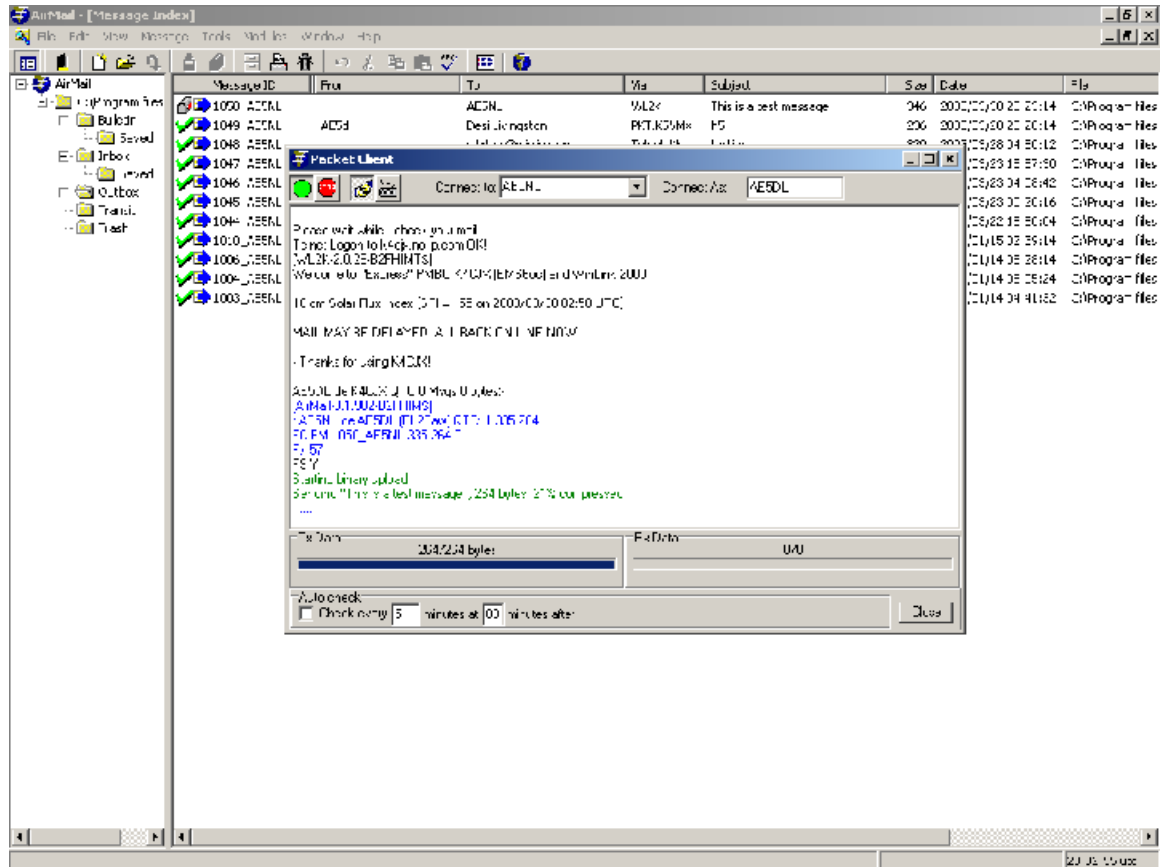
## SEND AND RECEIVE MESSAGES (simplex)

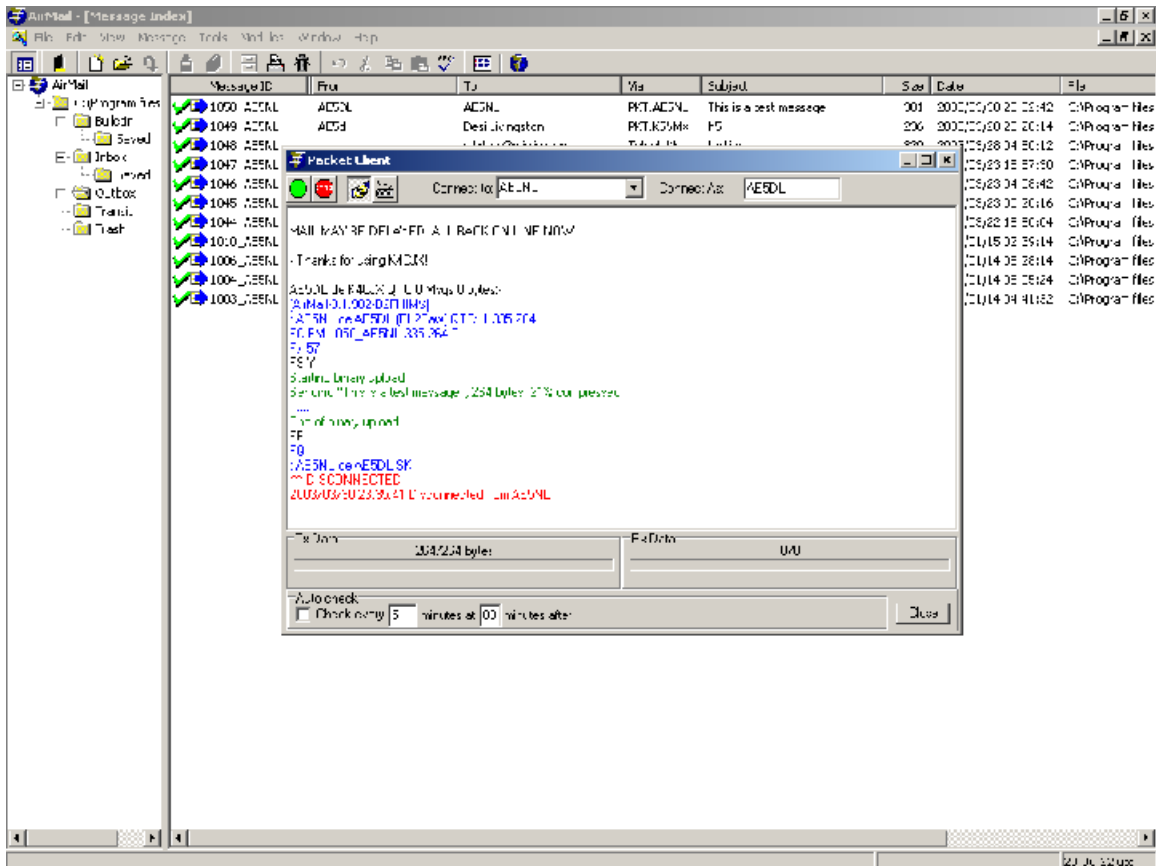
Ok, now lets go to the Packet client module screen either selected from the taskbar or by selecting that module from the menu bar, then select packet client. Then you should see a screen that looks like this.



Select the closest TelPac server from the connect to: pull-down list, or enter a new one. If you can connect to the station running the TelPac server on simplex, you are ready. If not, see the section on SEND AND RECEIVE MESSAGES (using a node). Press the Green “GO” button. At this point it is more or less automatic.

You may watch and verify the transmission.  
 The following two screens show the progression.





Note: It will take a minute or so to start as it is exchanging information with the server as to the last message number sent, last number received etc.

When it is done, you will see two things; the Packet Module screen will say End of Binary upload, and also your outbox will now have a check mark next to your message. It is now on the internet. It should be at its destination just like you had sent it with your regular internet provider. Had there been email for you it would have downloaded the message while you were connected. And there would be a NEW message in your inbox. You may want to minimize the packet client and have the inbox active.

## ATTACHMENTS

This same procedure is followed if you need to attach an external document. Exception: Before posting the mail to the outbox, go to the file menu and go down to Attach File.

## CONNECTING TO ANOTHER AIRMAIL USER

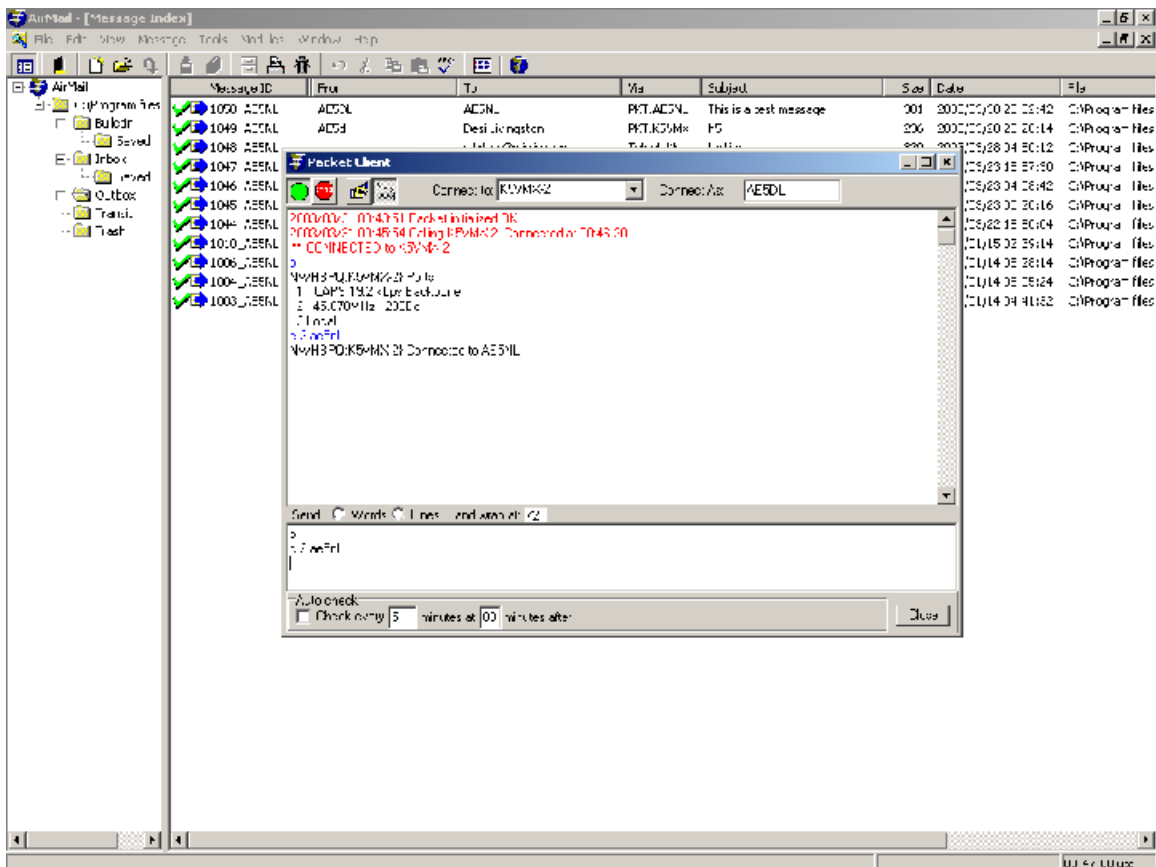
Two methods: Chat keyboard to keyboard or to deliver mail. If you are connecting to another Airmail user to chat keyboard to keyboard you just need to be in the keyboard mode. To change to the keyboard mode click on the keyboard Icon.

If you are connecting to another Airmail user simplex to SEND AND RECEIVE MAIL the only change to this process is to replace the Post Via: to the call sign of the mail recipient.

## SEND AND RECEIVE MESSAGES (using nodes)

If you have to go through a node of any kind to connect to the station running the TelPac server you need to modify the instructions to the Packet module for the delivery process. First you must connect to the node using the call sign and not the Alias. In this example, I am going to use the NWHPBQ node and its call sign is K5VMX-2.

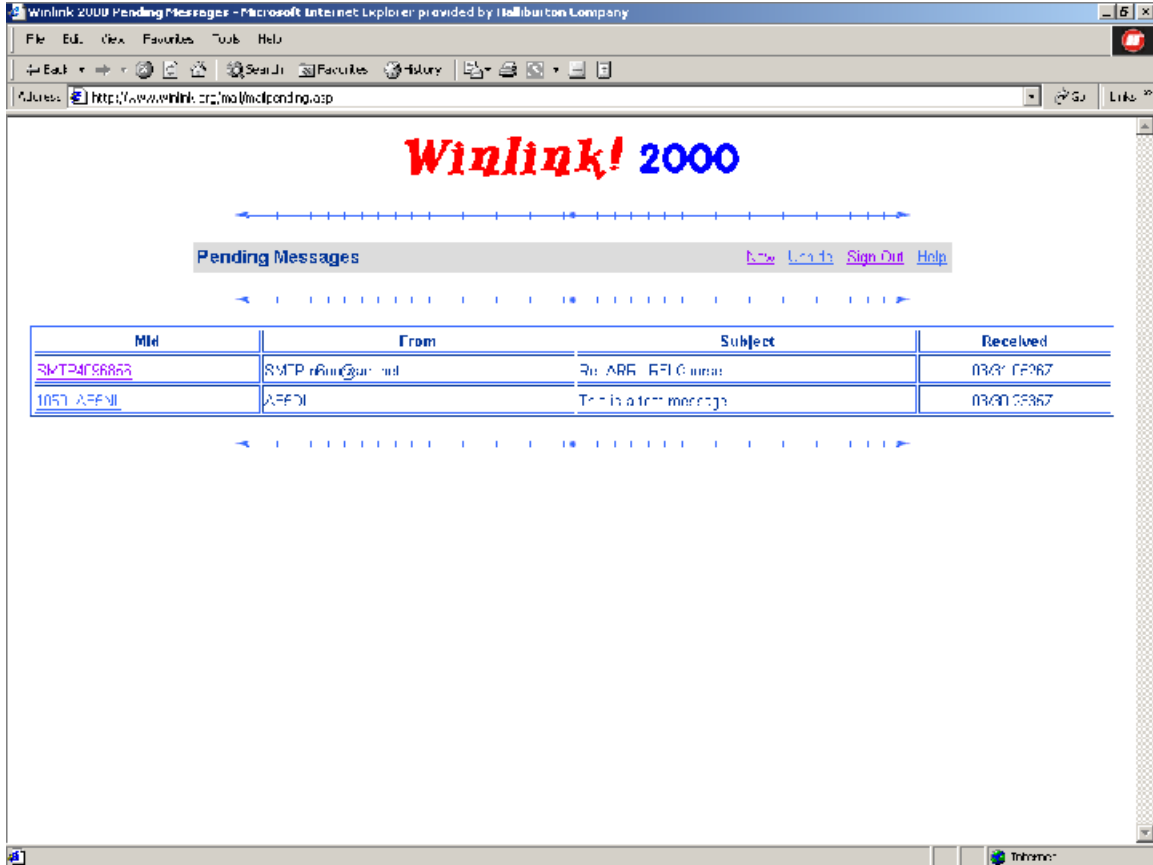
This must be done in the keyboard mode and not the handshake mode. Change to the keyboard mode by hitting the keyboard Icon. This will open a small window on the bottom of this window like the example seen below. I have also issued the Ports command to show that the next step must include which port to connect on. Once you have determined the port you will not have to do this step each time. The command is C (connect) 2 (port) and AE5NL (call sign).



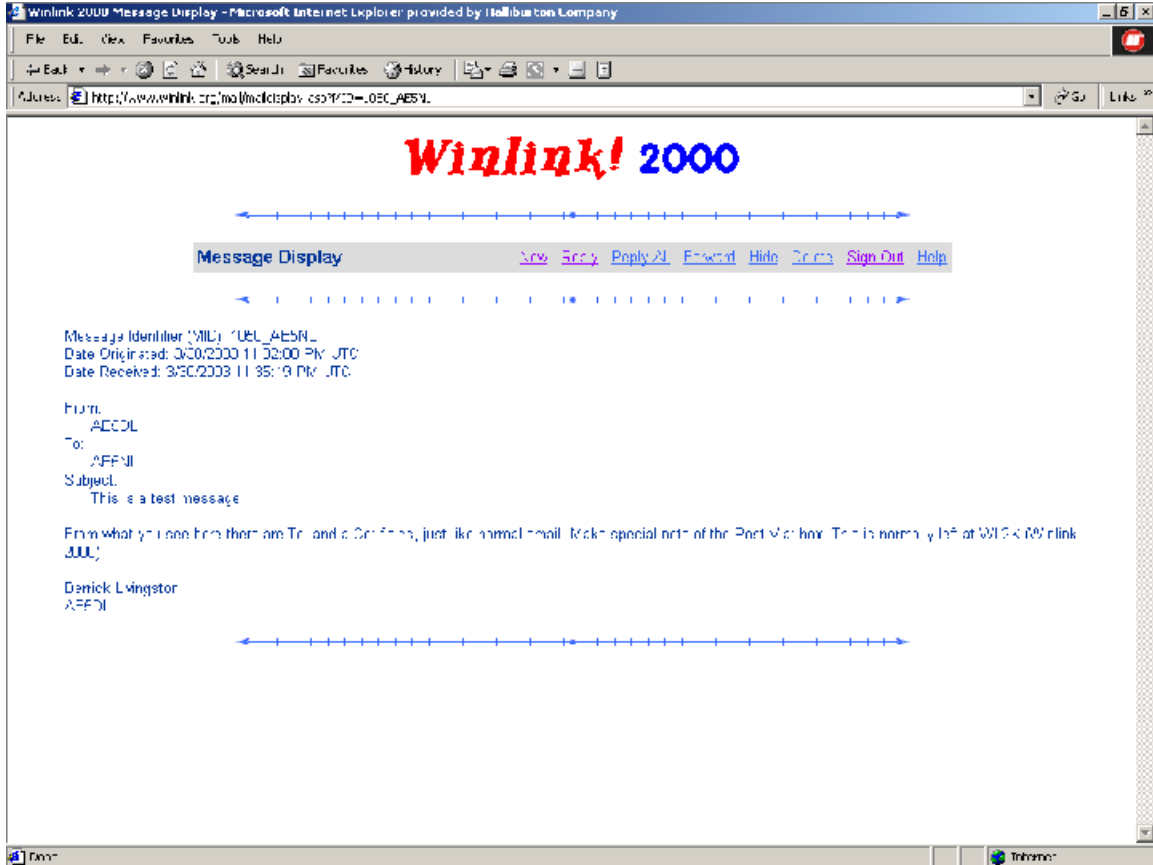
Once connected to the station running the TelPac server, switch back to the handshake mode by hitting the handshake icon.



Here is a shot of my inbox. In it is the message that was sent earlier in these instructions.



Lets open it and see.



It is the same message and it arrived perfectly. There is a drawback here. There is no facility to attach a file when sending a message.

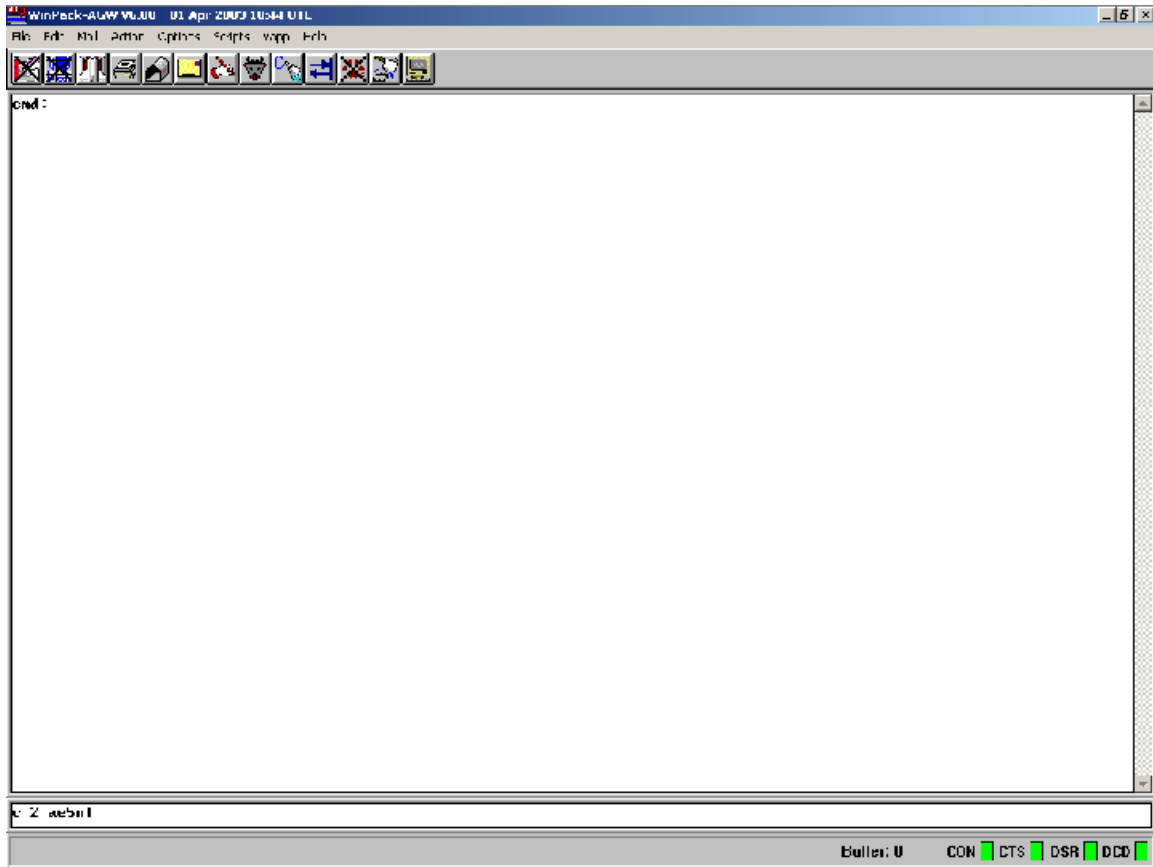
### **OTHER PACKET SOFTWARE INSTRUCTIONS (WINPACK SOFTWARE SHOWN)**

This type of connection can be done from as little as a handheld pc into a Kenwood D7 radio.

Ok after you have configured your software you will see a screen with a command prompt.

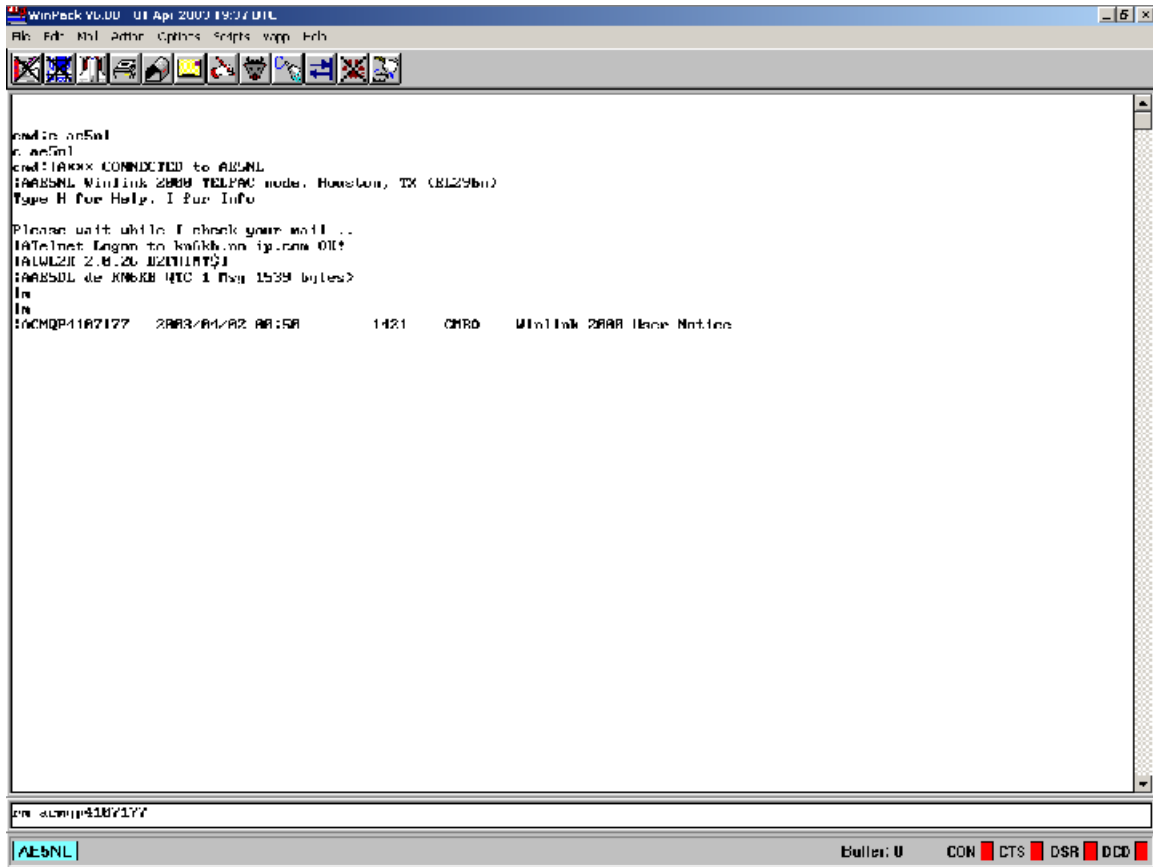
This first example is connecting to a station running the TelPac server software simplex. First you will need to issue a connect command.

This is usually in the form of  
C (call sign) followed by the enter key.



The server should kick back some form of welcome message and then whether or not you have any messages. As indicated below we have one message waiting. You will need to now issue the command LM for List My messages. This is done in the command area of the screen which is usually located at the bottom.

The server will then reply with the information of message ID#, date, time, size, who from and Subject.



Next we need to issue the RM command for Read Message followed by the message number. I issued the command RM CMQP4107177 and then the server will respond with your message. Remember this is not captured in an in-box anywhere. So you have a couple of alternatives here. Most terminal programs have a capture buffer feature that will allow you to capture the incoming data into a file.

You can use the windows highlight, copy, and paste into notepad or word processor file. Below is the message.

```
WinPack V6.00 - Fri Apr 2000 19:42:01L
File Edit Mail Address Options Scripts Window Help

>MessageID: CNQP4187177
Date: 2000/04/02 08:58
From: CHRIS
To: AEG001
Subject: Winlink 2000 User Notice

Update April 1, 2000

Yesterday, over 250 non-weathering Weather bulletins
were deleted from the Catalog list. Those deleted
included the 3 day GRIB weather products,
NR04.GIF, and All Brazil weather with the exception
of GERAL.HTML.

GRIB info and GRIB_SOURCES were replaced by a new
WL2K_HELP file called CUSTOM.GRIB. Written by Jim,
keGek, author of AirMail, CUSTOM.GRIB is an excellent,
extensive help file for using the AirMail GRIB graphic
file reader, now incorporated in AirMail version 3.1.982
or later.

To fully take advantage of these changes, if a new Catalog
list should be uploaded into your AirMail system. If you
do this, all old weather products and help files which
have been deleted will disappear. This will keep you
from requesting information which is no longer available.
only to receive notice to this effect. However, if you are
a Partner User, updating may be easier since the update is
much smaller.

Should you not know how to request a catalog update or
catalog list, please email Steve, k4u,jk@comcast.net for
this information. This information is also now in the WL2K_HELP
list, and is entitled, UPDATE_CAT.

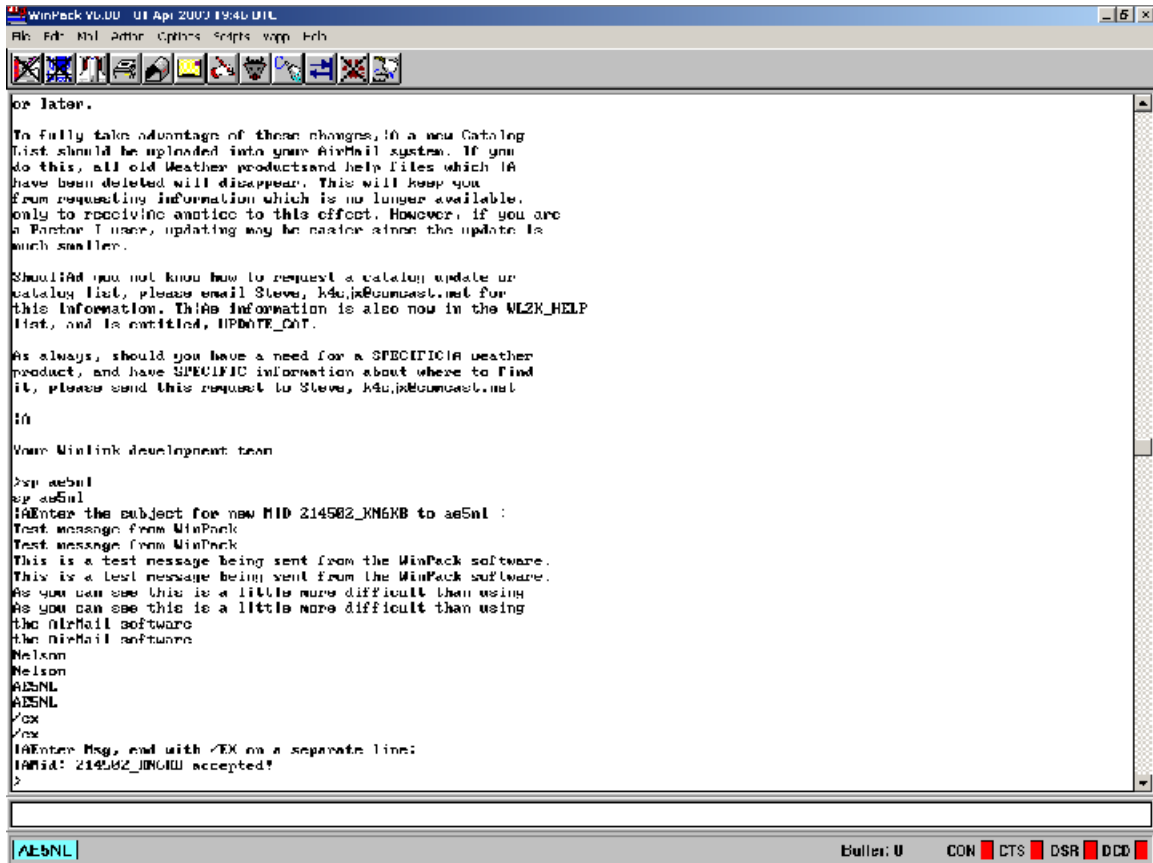
As always, should you have a need for a SPECIFIC weather
product, and have SPECIFIC information about where to find
it, please send this request to Steve, k4u,jk@comcast.net

in

Your Winlink development team
>
```

Ok next we will send an email to another Winlink user. We issue the command SP (call sign). The SP is for Send Private. The system will then respond with Enter the subject for new (then a message id #). Give it a subject and hit enter. The system will then prompt with Enter msg. End with /EX on a separate line. The /EX will tell the server to exit the message as you are done.

Note: Knowing the sequence, you do not have to wait on the prompt from the server on any of these. You may type the entire message before actually getting all the prompts as indicated in the example below.



If you want to send an internet email you must enter the command similar to this. SP smtp:john.doe@gothamcity.com. It **MUST** include the "smtp:" before the e-mail address. All of the other prompts, etc. are the same.

To save you the time and trouble of issuing the H for help command, here is a what you will get if you were to hit H for help here.

Updated Jan 29, 2003

WL2K is designed for automatic message transfer using standard FBB BBS<>BBS protocol but accepts limited keyboard commands as part of WL2K's Short Message System (SMS) and new TELPAC nodes.

Input from keyboard is case insensitive and will be prompted by a ">".

Client Program:

Recommended access to the system is through a WL2K compliant client program, AirMail. This is available free for ham use. Download from [www.airmail2000.com](http://www.airmail2000.com)

Other helpful sources for information for users and sysops at <http://www.winlink.org>

Supported keyboard commands:

H or HELP gives you this file

I or INFO gives you info about the system features and specifics about this station.

LM or LISTMINE lists all traffic pending for your call.  
Shows MID, date, size, from and subject.

K or KILL <MID> e.g. K 1234\_KN6KB Marks the pending message delivered.  
Message may still be read for 3 days.

B, BYE, QRT, LOGOFF, or LOGOUT Forces a disconnect of the link.

The following commands available only via Telnet Server, TELPAC, or Packet connections (not HF)

R or READ <MID> e.g. R 1234\_KN6KB Read the specified MID.  
Only MIDs addressed to your call, bulletins, or originated by you may be read.  
No attachments.

LB or LISTBULLETINS Lists all active bulletins in the system.  
Shows MID, date, size, from and subject.

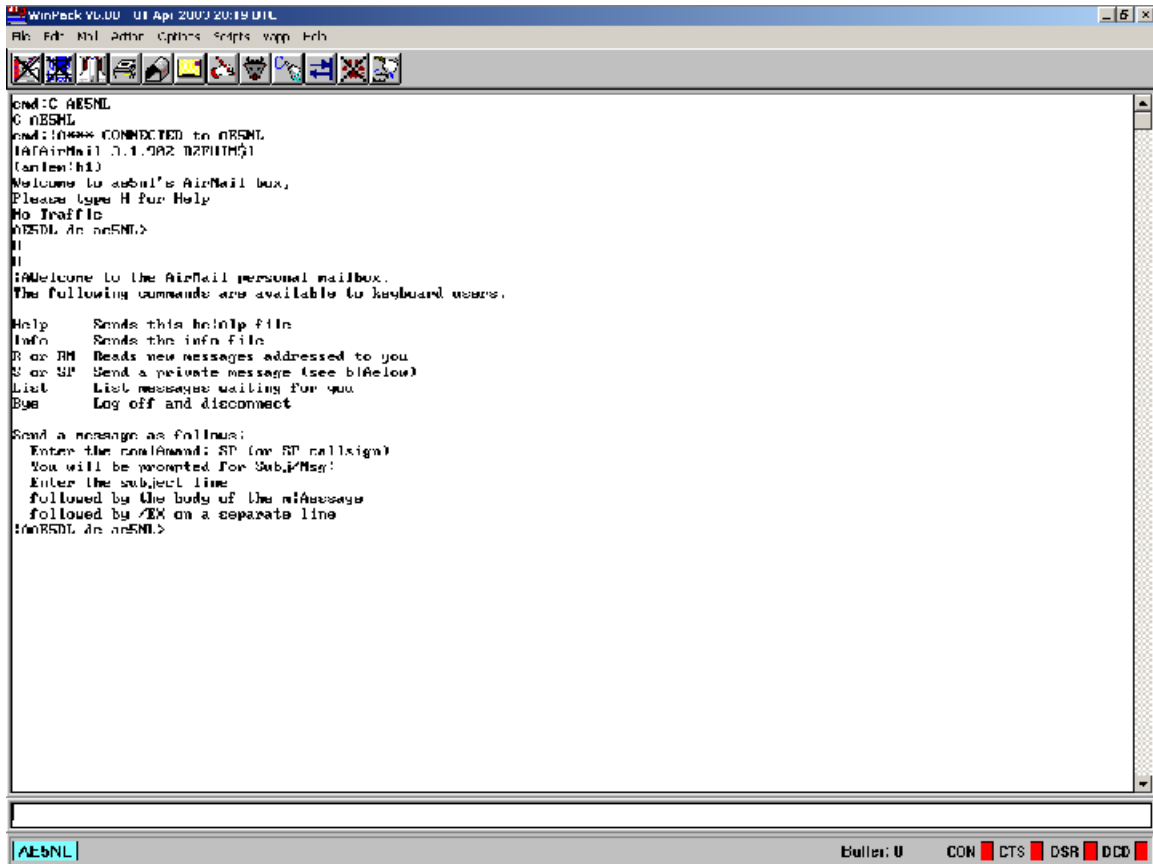
SP or SENDPERSONAL <Destination(s)> Send a personal text message to the destination(s) indicated. Destinations may be a Radio callsign (w/wo Hroute) or "SMTP:<email\_address>"  
Multiple destinations should be seperated by ";" or ","  
e.g. SP W4ABC;KC4YEK@KC4YEK.#CFL.FL.USA.NA;SMTP:Johndoe@aol.com

You will be prompted for a subject of the new message:  
And then prompted for the message body:  
For the message body enter any text. use CR for multi-line. End with /EX on a separate line.  
No attachments.  
Acceptance of the message will be confirmed.

Sysop: Rick Muething KN6KB  
E-mail: KN6KB@winlink.org or rmuething@cfl.rr.com

## WINPACK CONNECT TO STATION RUNNING AIRMAIL

This is done the same way as the TelPac server. First by entering the connect command. C (call sign). You will again get the connected message and should be followed by some sort of welcome message. This welcome message tells you that it is an Airmail box, and that it has no traffic for me. Issuing the H (help) command gets very similar to that of the TelPac server.



```
WinPack 96.00  01 Apr 2003 20:19 DTL
File Edit Mail Editor Options Scripts Wpp Help
[Icons]
cmd:C ARESNL
C ARESNL
cmd:10*** CONNECTED to ARESNL
!A!Airmail 0.1.0A2 02P11M$1
(online:hl)
Welcome to subul's Airmail box,
Please type H for Help
No Traffic
ARESNL An ARESNL>
H
H
!A!Welcome to the Airmail personal mailbox.
The following commands are available to keyboard users.
Help      Sends this help file
Info      Sends the info file
R or RM   Reads new messages addressed to you
S or SP   Send a private message (see below)
List      List messages waiting for you
Bye       Log off and disconnect

Send a message as follows:
Enter the command: SP (or SP call sign)
You will be prompted for Subj/Msg:
Enter the subject line
followed by the body of the message
followed by /EM on a separate line
!A!ARESNL An ARESNL>
```

ARESNL

Buffer: U CON DTS DSR DCD

I sent three different type messages to this station and they each react differently. The first example was to the station I connected to, the second was a different station and the third was an internet e-mail. I typed them all without stopping so you can see when the system actually responded.

Here is the sequence of entries for the mail.

SP AE5NL

Enter Subject line followed by Msg:

TEST MESSAGE FROM WINPACK FOR AE5NL

THIS MESSAGE IS FOR AE5NL AND

FROM THE WINPACK SOFTWARE

/EX

SP KK5CA

Message Filed as 1160\_ae5NL

AE5DL de ae5NL>

Enter Subject line followed by Msg:

TEST TO KK5CA

THIS ONE IS CONNECTED TO AE5NL DESTINATION KK5CA

AND I AM USING the Winpack software.

Nelson

/ex

sp ae5nl@yahoo.com

Message Filed as 1161\_ae5NL

test message

This is a test message from winpack to an airmail

station. Destination is the internet.

nelson

/ex

Enter Subject line followed by Msg:

Message Filed as 1162\_ae5NL

As you can see you can type a good ways ahead. What you don't get is spell check. If you send a bad line there is no backing up and fixing it. NOTE: There is a key difference here in that the message headed for the internet **DOES NOT** have the "smtp:" added. This is because the station that will deliver it to the internet is a WL2K client and doesn't require one.

The email to the destination station appears in the in-box and the other two were in the transit box.

## **GLOSSARY OF TERMS**

### **AX.25 Protocol**

A modem protocol adapted for use in amateur radio digital operations. It is the most widely used protocol for digital communications. There are other modes such as TCP and the TOR modes.

### **Airmail**

Airmail is a messaging program (similar to Outlook) specifically designed for connection to a HF radio mailbox station. Once connected to a compatible station, message transfer is completely automatic. On the ham bands, Airmail can transfer messages automatically with any station supporting the BBS or F6FBB protocols, such as Winlink-2000 ([www.winlink.org](http://www.winlink.org)), Winlink, F6FBB and MSYS and other Airmail stations.

### **BBS**

Bulletin Board System is an electronic bulletin board service maintained by an individual or organization for the primary purpose of exchanging information.

### **DIGipeater**

A packet-radio station used to re-transmit signals that are specifically addressed to be re-transmitted by that station.

### **FRAME**

A block of data that not only includes the information for the other station but also the information necessary to get it there. A packet can consist of multiple frames of information.

### **GATEWAY**

A gateway is a nodestack or routing software setup that allows multiple frequencies to be in used at the same time. You can come into the gateway on one frequency and go out on another. You can also come into a gateway using one type of protocol and go out using another. TCP/IP (internet) connections are available at some gateway stations.

### **HTS**

Hidden Transmitter Syndrome. This is the single biggest problem in packet radio. It is a station that is not heard by one or both stations trying to communicate. The interference causes retries and timeouts.

### **HSMM**

High Speed Multi Media. High-speed data links (up to 20 Mbit/s). High-speed digital audio/video.

**IP**

Internet Protocol. The workhorse protocol of the TCP/IP combination.

**KISS**

Keep It Simple Stupid. This is the widely used method of TNC to Terminal control.

**MULTI-MODE**

A TNC that has HF and VHF packet plus the TOR modes which includes Pactor. The Kantronics Kam Plus is an example.

**NEIGHBOR NODE**

An adjacent node which can be reached in a single hop. Packet networks consist of many nodes, some of which are neighbors and the rest are distant nodes which depend on intervening nodes to complete the path.

**NET/ROM**

This is a networking software used for nodes.

**NETWORK**

A collective term used to refer to a set of nodes with their neighbors, routes, paths, etc., which make up an interconnected collection of packet radio facilities capable of transporting information between stations.

**NODE**

The fundamental hardware building block of packet radio networks. At a minimum, a node will consist of a TNC capable of running some type of routing software such as TheNet and X1J. More complex computer based routers such as the G8BPQ node code and the multi-level communications server methods used by such programs as MSYS, FBB, TCP (NOS) and FlexNet which is gaining popularity.

**NODESTACK**

Is the common name for nodes that employ two or more TNCs, each of which is connected to a radio via its own radio port and to all the other TNCs via the cabling of a multi-drop serial cable.

**NOS**

Network Operating System. This is the basic TCP/IP software package for packet.

**Official Emergency Station**

An officially appointed amateur radio station. It has complete emergency communications capabilities and participates in drills and exercises.

**PACKET**

A mode of digital transmission where data is assembled in groups of data or frames of information. A packet of data consists of two or more frames.

## **PACTOR**

A digital mode used on HF which has a high reliability of getting through under adverse conditions.

## **PARAMETERS**

The TNC used in a digital system has various settings which must be programmed by the operator to obtain the best performance for its particular function. These settings are called parameters and are different for each use, e.g. user station, node, etc.

## **PATH**

A path is a complete circuit between two packet radio stations. A path may cover several routes and nodes to bridge two stations. A path may travel over a number of frequencies and may involve hardwired (cable) connections as well as radio (RF) links.

## **PMS / PBBS**

Personal Message System is the term applied to a simple private TNC based messaging (mailbox) system.

## **PORT**

All nodes have one or more ports. A port in this discussion is a physical interface between the TNC and a radio such as a cable connection. A typical TNC will have at least one radio port and one cable port usually an RS-232 connection to a computer running some type of communications software.

## **PROTOCOL**

A set of rules used for communication. This can include the speed used, the number of bits, the mark and space frequencies. In packet radio, AX.25 is the form of protocol.

## **ROUTE**

A one hop path between two neighbor nodes and the fundamental element of a path/circuit.

## **TCP**

Transmission Control Protocol.

## **TCP/IP**

Transmission Control Protocol/Internet Protocol is a protocol used primarily on the Internet, but has also been adapted to some forms of amateur radio digital transmissions.

## **TelPac**

TELPAC is a new mechanism for delivering mail from the Winlink 2000 system to the wireless ham user. "TELPAC" stands for TELnet PACket bridge. TELPAC is optimized to easily interface Winlink 2000 to conventional VHF/UHF Packet users and BBSs. This includes simple portable terminals (e.g. Palm devices) as well as more capable FBB compatible programs including AirMail packet.

## **TNC**

A Terminal Node Controller is essentially a smart modem designed for packet radio. It operates using Bell 103, 202 and 212 modem standards. It is the device used to interface the radio and terminal.

## **WinLink 2000**

Winlink 2000 utilizes enabling technologies and sound operating practices to provide a full-featured radio digital message transfer system, [worldwide](#). Email transfer, position reporting, weather and bulletin services, and emergency communications are now available to the amateur radio community by linking radio to the Internet.

## **WORMHOLE**

This is a vague term. It refers to a communications link between two widely separated communications facilities. A wormhole has the ability of making the two distant facilities appear to be connected directly to each other. Such a wormhole are available from the N5VDA server. Wormholes may be RF or LL based.