



Winlink for Amateurs

Version 2.2 November 17, 2011



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Duties of a Communications Volunteer

This document focuses on the technical issues involved in setting up and using the WCARES drop-kits. But in an emergency situation, *communications* in the broadest sense is what counts. If you discover that you cannot establish a Winlink connection, try making voice contact. If you can't make contact using the drop-kit, try using your car radio or a HT. If you can't make any type of radio contact, try using cell phones or other means of communications. Don't get so absorbed in the drop-kit that you fail to utilize other communication methods that are available. Use good sense, and be resourceful. What counts is reliable and timely exchange of messages.

Winlink Drop Kit

The WCARES "drop kits" are self-contained units that can be quickly installed in the field to establish both voice and Winlink e-mail communication.

Drop Kit Packaging



Equipment List

The Winlink Drop Kit components are pre-assembled and pre-wired on a tray.

To begin the operation, open the drop kit carrying case and remove the tray and any other components from the case.

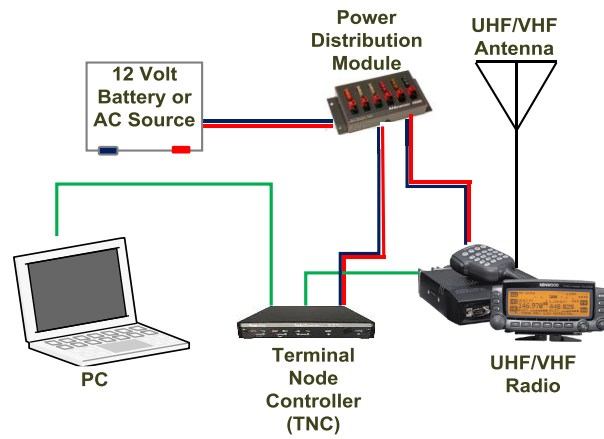


The Drop Kit minimum configuration is comprised of the following items (see numbers in the picture above):

1. PWRgate PG-40S backup power system. This switches the power automatically to a backup battery if the AC supply goes off.
2. RIGrunner power distribution strip. This has sockets for PowerPole connectors.
- 3a. Kenwood D-700 Dual-Band radio with microphone.
- 3b. Detachable control head for D-700 radio.
4. Kantronics KPC-9612+ modem.
- 5a. ICOM D-Star 1.2 GHz radio.
- 5b. Detachable control head for Icom D-Star radio.
6. Serial to USB cable adapter. The USB cable will be plugged into a USB port on the computer.
7. Laptop computer with the RMS Express program installed.
8. A VHF/ UHF mag-mount antenna

9. A 12 volt power supply or 12 volt battery (If AC power is unavailable)
10. Operating manuals for the Kenwood and ICOM Radios.
11. Diamond X-6000A triband vertical antenna
12. Tripod base

Equipment Connection Diagram



Basic WinLink Drop Kit Configuration

Component Connections and Power-Up

Electrical Connections

1. Locate the RIGrunner distribution strip (item 2 in the picture) and insure that the power cables for all needed components are securely plugged into the RIGrunner. The AC power supply connects to the front “PS” socket, and a battery connects to the rear “BAT” socket.

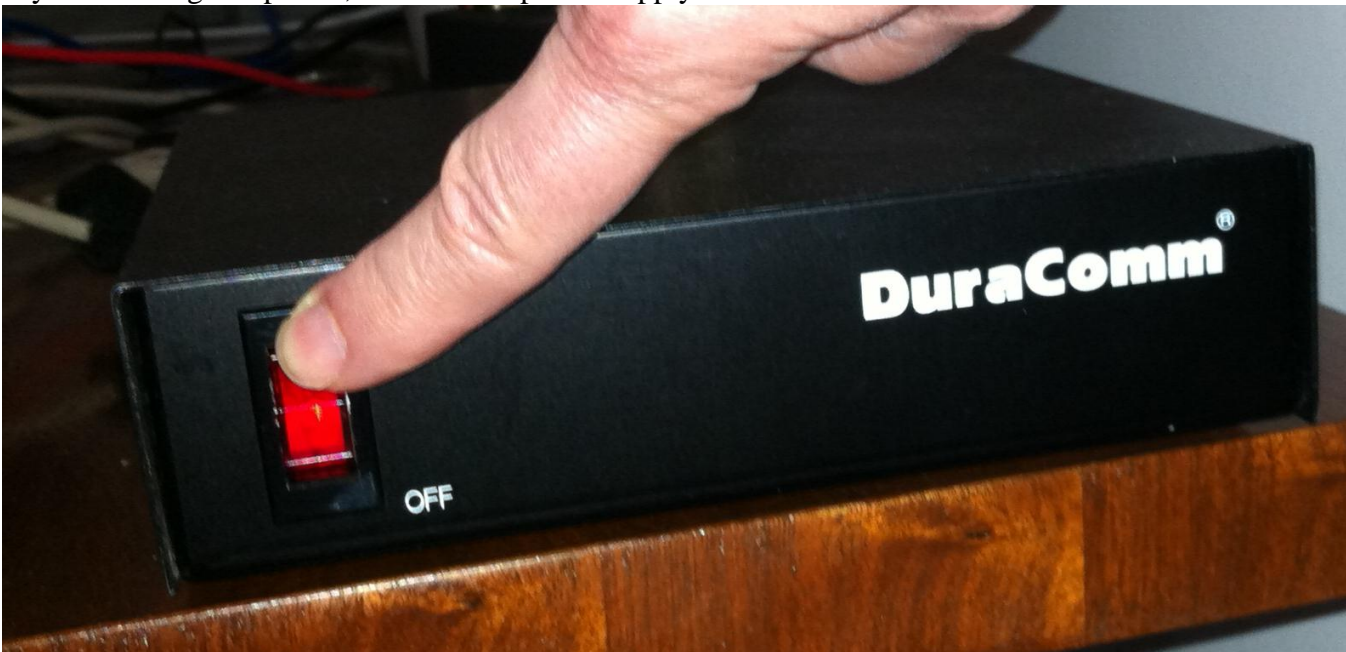


2. Plug the power supply cord into a 110 volt source and connect the power pole connectors on the power supply cable to the “PS” terminals on the PWRgate PG-40S (next to finger in the picture). If you don’t have AC power available, connect a battery with Power Pole connectors to the “BAT” terminal (rear terminal behind the “PS” terminal) of the PWRgate PG-40S.

3. Connect a VHF, UHF or dual band antenna to the Kenwood D-700 radio (item **3a** in the picture).



4. If you are using AC power, turn ON the power supply.



5. Turn on the Kantronics KPC-9612+ modem (item 4 in the picture). The power switch is located on the far right side of the front head. Push "IN" to turn the power ON.

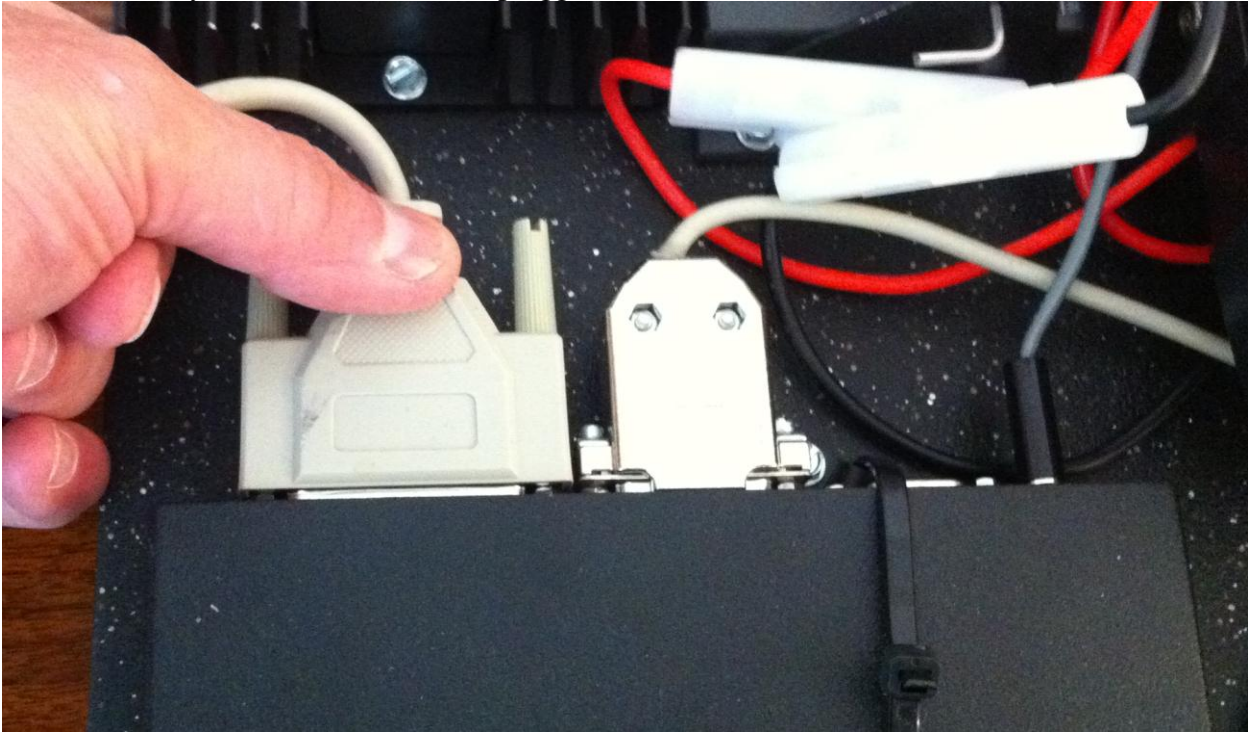


6. Turn on the Kenwood D-700 radio. By pushing the ON/OFF button on the top right side of the control head (item 3b in the picture). The button is labeled "PWR".



7. Locate the serial cable plugged into the rear of the Kantronics modem. It will have a serial to USB adapter (item 6 in the picture) attached to the serial port of the Kantronics

modem. Verify that the serial cable is plugged into the Kantronics modem.



8. Make sure the serial cable is plugged into the serial-USB adapter.



9. Plug the USB end of the cable into an open USB slot on the computer.



Antenna Setup

The drop kit comes with both a mag-mount VHF/UHF antenna and a Diamond X-6000A triband vertical antenna with tripod mount.

Mag-mount antenna

If your operating position is not too far from one of the RMS nodes, you may be able to use the mag-mount antenna. Mag-mount antennas must have some sort of ground plane under them. If you can put it on the top of a vehicle, that is ideal. If you are operating inside, look for some large object such as metal filing cabinet. Do not put it on the drop kit power supply or any of the radios or computers. If you can't find anything else, a cookie baking pan may be sufficient.



Diamond X-6000A triband antenna and tripod mount

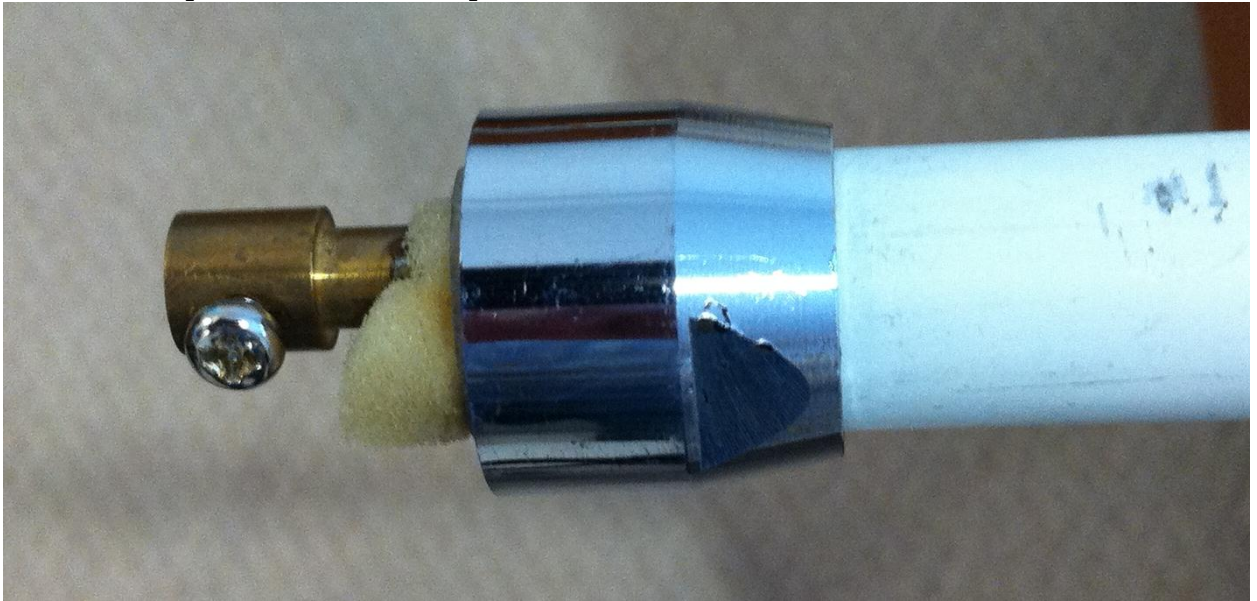
The Diamond X-6000A triband antenna consists of two antenna sections that join together, three radials, and a tripod mount.



Follow these steps to assemble the Diamond antenna:

1. Unfold the legs of the tripod mount and set it upright outdoors (if possible) in a level area that is free from obstructions and away from traffic flow.

2. Expose the end of the antenna that is inside the upper section. You may need to tap the open end of the section on a clean object to shake the antenna down to the point where it is exposed.



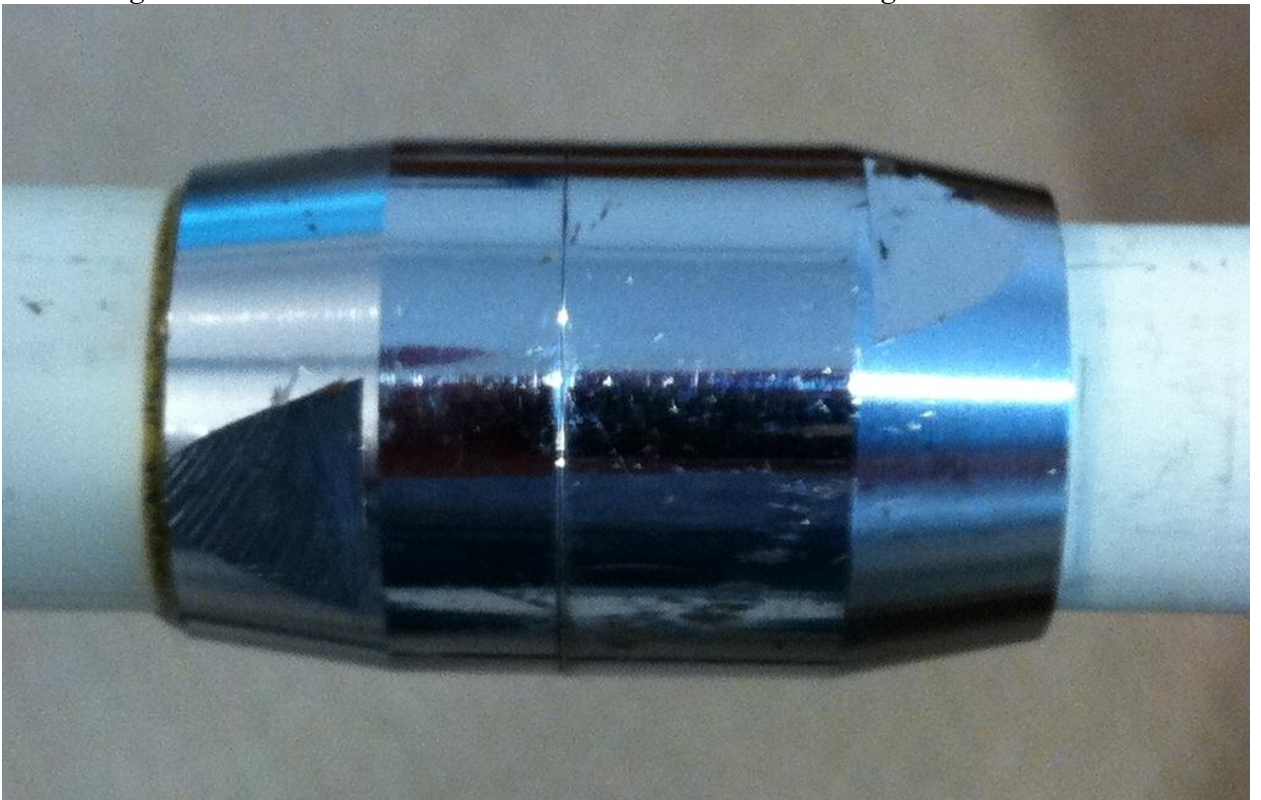
3. Slide the exposed connector wire from the lower section into the junction, and tighten the screw.



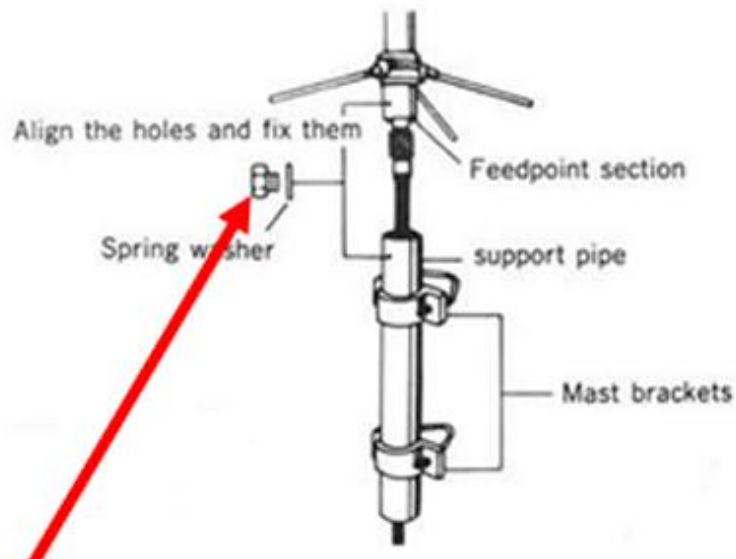
4. Slide upper fiberglass section into the lower shell until the black line on the upper section is even with the top of the lower section screw connector.



5. Screw together the silver section connectors. Do not over-tighten.



- Slide the vertical antenna into the top of the tripod mount. Align the holes at base of the antenna with the hole in the support pipe, and insert the provided bolt and spring washer.



- Screw the three radial bars into the base of the antenna base, and tighten the lock nuts.



- Connect the 'N' connector of the provided coax cable to the base of the antenna and the PL-259 (UHF) connector to the back of the D-700 radio.
- To reduce strain on the antenna and feedline, make one turn of coax immediately below the antenna, and attach it to the tripod mount.

Safety Markings and Cautions

It is important to consider safety when setting up the drop kit. The tripod antenna and coax are worthy of special note.

The base of the tripod should be marked with yellow “caution” tape, and the coax should be taped to the pavement if it passes through a walking area. Here is an example:



The radials at the base of the antenna also should be marked with yellow caution tape:



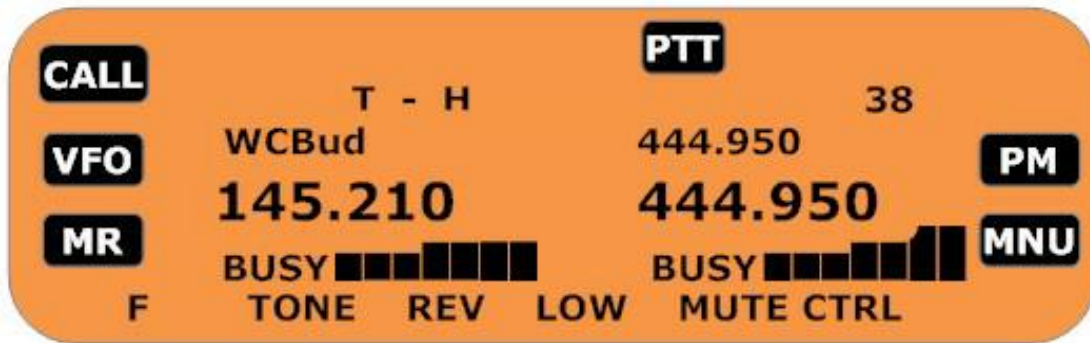
Once the antenna has been mounted on the tripod, the support staff attached to the antenna should be raised so that the antenna radials are above head level:



Tuning the Kenwood D-700 Radio for RMS Stations

The D-700 is a dual band radio with the ability to monitor two bands simultaneously. The left side of the display shows the **A Band** frequency that is selected, and the right side displays the **B Band** frequency. The “PTT” icon is shown over the side that is set to transmit when PTT is pressed.

In the picture that follows, the A band (left side) is set to the Brentwood voice repeater, 145.210. The B band (right side) is set to the Brentwood UHF RMS server on frequency 444.950. Note that the “PTT” icon is shown over the right side indicating that the B Band (444.950) will be used for transmission.



With the radio set as shown in this picture, the Brentwood voice repeater can be monitored at the same time that the radio is receiving from the RMS server.

To select the A Band (left side) frequency for transmission, press the left concentric button just the right of the buttons below the screen. **To select the B Band** frequency, press the right concentric button at the bottom right corner of the control unit.



Select the B Band for Winlink digital connections. "PTT" should appear above the right side frequency.



Selecting the Transmit Band and Setting the Frequency

Turn the knob at the bottom left of the D-700 to select the frequency of the Winlink RMS node you want to connect to.



There are two UHF RMS nodes in the Brentwood area that are available for ham use: WC4EOC-9 and WC4EOC-10. Tune the radio to the one that you think will provide the best signal. If you are unable to connect to it, try the other one. The WC4EOC-9 station in Brentwood is a good one to try first.

List of RMS Servers

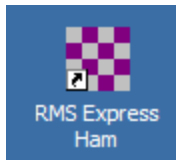
Location	Band	Dial Frequency	Call sign	Type of Station
Brentwood	VHF	(MED)	AAD4TN-9	MARS
Heritage (Thompson's Station)	VHF	(MGD)	AAD4TN-10	MARS
Brentwood	UHF	440.950	WC4EOC-9	Ham
Heritage (Thompson's Station)	UHF	440.925	WC4EOC-10	Ham

Using the RMS Express Software

RMS Express is the program you will use to compose and send messages through the Winlink system. RMS Express is a well-designed program that is easy to use and very similar to many other e-mail programs. RMS Express is installed on the notebook computer with the drop kit.

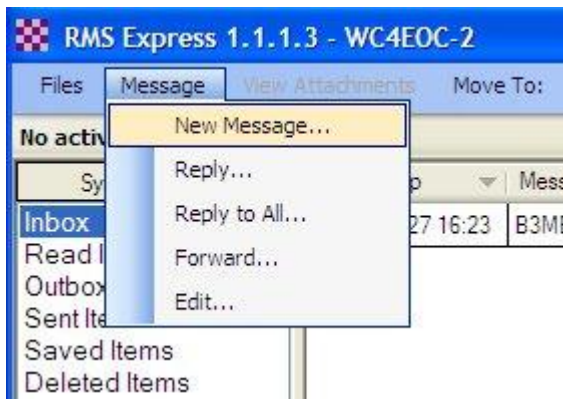
Starting RMS Express

RMS Express is the computer program you will run on the notebook computer to send and receive e-mail messages through Winlink. To start RMS Express, click the icon on the desktop:

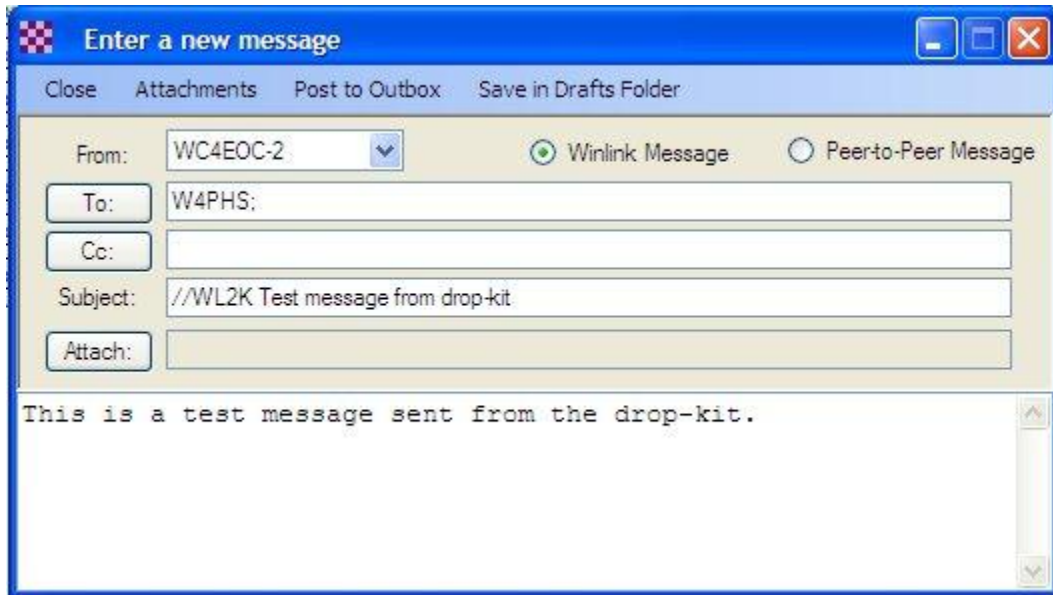


Composing a Message to Send

After RMS Express starts, click “Message” on the menu bar and select “New message” from the drop-down menu:



RMS Express will display a message composition screen where you can enter the e-mail address of the recipient, the subject of the message, and body of the message, and any file attachment(s).

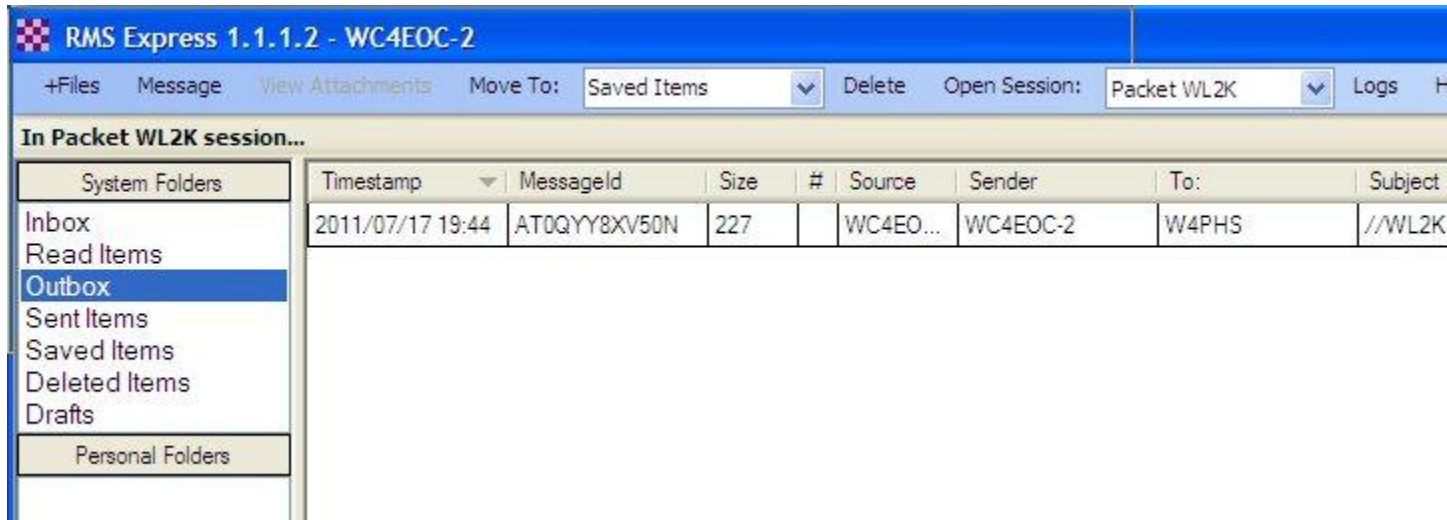


If the message is being sent to a Winlink e-mail address, you can specify only the call sign and omit “@winlink.org”. For example, the screen shown above shows a test message being sent to W4PHS@winlink.org. If you send a message to an external, non-Winlink address, specify the full e-mail address in the usual format.

Note, you should specify “//WL2K” at the front of the subject. For MARS operation, put “//MARS” at the front of the subject and include the appropriate MARS message priority code (usually “R”). You do not have to use this when sending messages through Winlink to external addresses, but it’s a good idea to get in the habit of using the prefix whenever you deal with Winlink e-mail.

Once you finish entering the message, click “**Post to outbox**”.

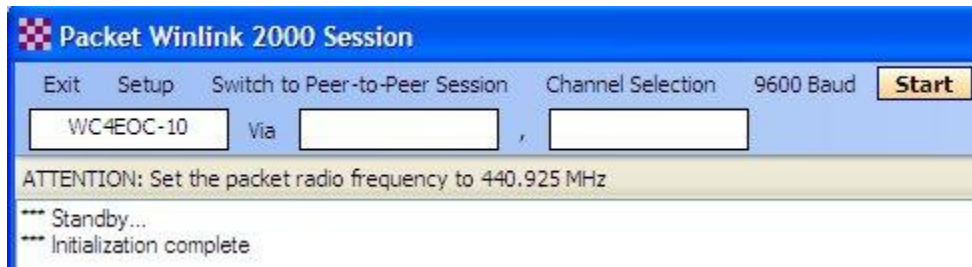
If you select the “Outbox” entry in the left panel of the main screen, you can see a list of the messages that are waiting to be sent.



Connecting to the RMS Server to Send and Receive Messages

Once you have composed the messages you want to send, check the top menu bar and make sure “Packet WL2k” is selected next to the “Open Session” item. If this isn’t selected, open the drop-down list and select it.

Next, click the “Open Session” item on the menu bar. RMS Express should display a Packet session screen that looks like this:



Note that it says “Initialization complete”. That means that it successfully connected to the Kantronics modem and initialized it. If the USB connection from the modem is not plugged into the computer, or if the COM port number is wrong, you will see a screen that says:



If this happens, take these actions:

1. Close the Packet session screen.
2. Stop RMS Express.
3. Check to see that the Kantronics modem is powered on (the pilot light should be lit).
4. Check that the serial cable is connected to the Kantronics modem.
5. Check that the serial cable is connected to the Keyspan serial-USB adapter.
6. Make sure the USB cable is plugged into the notebook computer.
7. If you can't find a problem, unplug the USB cable, wait 10 seconds, then plug it in and try again. You should hear the Windows "ding dong" sound when you plug in the USB cable.
8. If this still didn't solve the problem, see the section starting on page 39 for detailed information about diagnosing COM port problems.

Selecting the RMS Server to Connect to

Click "Channel section" on the Packet session menu bar to open the RMS selection list.

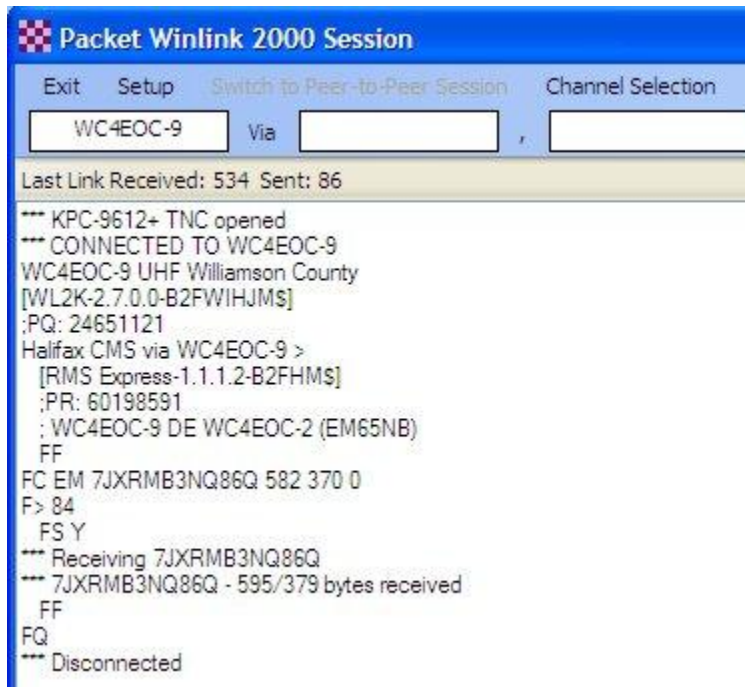
Callsign	Frequency (MHz)	Mode	Grid Square	Distance (Kilometers)	Bearing (Degrees)
WC4EOC-10	440.925	9600	EM65NW	098	000
WC4EOC-9	440.950	9600	EM66OA	107	004
N1EMP-10	145.050	1200	EM66RA	111	016
W4GHD-10	145.025	1200	EM66OB	111	004
N4AAN-10	441.000	9600	EM66NK	153	000
N4AAN-10	145.010	1200	EM66NK	153	000

Note the frequency shown by the server you want to use, and verify that the D-700 is tuned to that frequency.

Double click either WC4EOC-9 or WC4EOC-10 to select one or the other. The channel selection screen will close.

Starting the Packet Connection

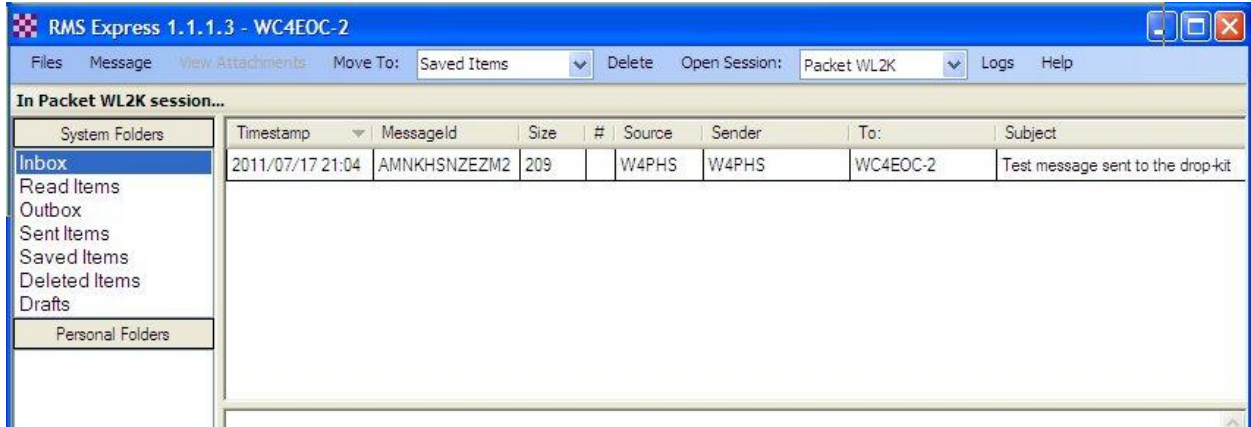
You are now ready to try to connect to the RMS server. Click “Start” on the Packet session screen to start the connection. If the connection is established, RMS Express will first check for any incoming mail and pull it down and then send any pending outgoing messages. A log will be displayed in the session screen:



Receiving E-mail Messages via Winlink

Each time you connect to an RMS hub using RMS Express, it checks automatically to see if you have any incoming mail, downloads it, and places it in the RMS Express Inbox. So, to check if you having incoming mail, just click “Open Session” on the RMS Express main menu and connect to an RMS hub. Remember that any message sent to you through Winlink must have “//WL2K” at the front of the subject unless the sender’s address is in your Contacts list.

Received messages that have not been read will be listed in the Inbox:



Reading a Received Message

Double click a message entry line to read the message:



As you read incoming messages, they will be moved automatically from the Inbox to the "Read Items" box.

Message Handling

Standard forms and record keeping

In order to achieve reliable communications, Winlink operators should use standard message forms (ICS-213) and standard logging forms (ICS-309). Analysis of message flow is often done after a disaster is over, so it is important to maintain records of all message traffic you send and receive.

Date and time

All messages will use local date and time in the 24-hour format unless the served agency specifies use of Universal Coordinated Time (UTC).

ICS-213 General Message Form

If possible, an assistant should transcribe messages to be sent onto ICS-213 forms before they are presented to the Winlink operator to be sent. However, in emergency situations message traffic may come from many sources, and it may be impractical to transcribe long messages before transmission. Regardless of the form that messages are presented, a file should be kept of the original messages.

Here is an example of an ICS-213 that might be prepared for transmission:

ICS 213

GENERAL MESSAGE		
TO: John Smith	POSITION: ARC Logistics	
FROM: Bill Jones	POSITION: Mt. Juliet shelter	
SUBJECT: Supplies request	DATE: 2-Aug-11	TIME: 10:30
MESSAGE:		
<p>Supplies needed:</p> <ul style="list-style-type: none"> 15 cots 15 blankets 60 bottles of water 		
SIGNATURE: Bill Jones	POSITION: shelter manager	
REPLY:		
DATE:	TIME:	SIGNATURE/POSITION:

To/Position – These field specify the individual or department to which the message is being sent.

From/Position – These fields specify the name and location of the originating site. Be specific so that when a reply is received it can be routed to the correct individual.

Subject – A brief description of the message.

Date – Local date when the message was prepared.

Time – Local time of day in 24-hour format unless the served agency specifies they want UTC time used.

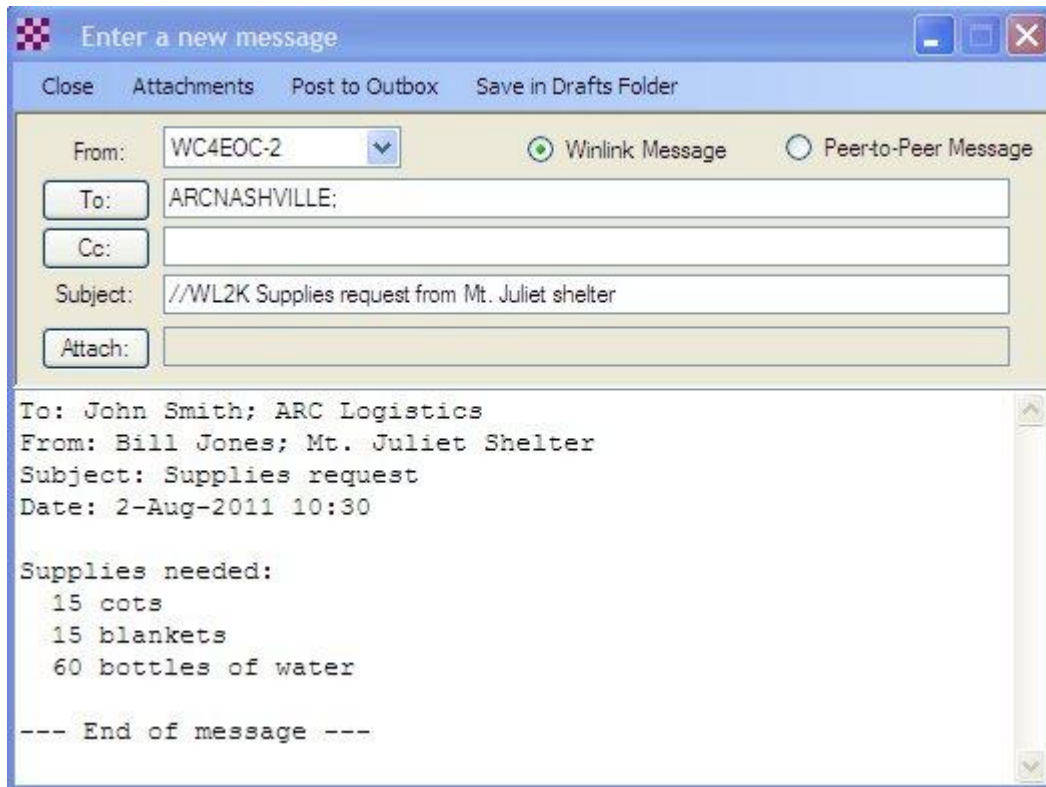
Message – The actual body of the message to be sent.

Signature/Position – The signature and location of the message originator.

Format of Winlink messages

The Winlink operator must transcribe the message from the ICS-213 form to a message in RMS Express. The Winlink message should parallel the structure of the ICS-213 form. It should have a header with the To/Position field, the From/Position field, the Subject, Date, and Time. There should be a blank line after the header followed by the body of the message. It is a good idea to put some sort of end-of-message indicator after the body to indicate that the entire message is complete.

Here is how the message shown above should be entered as a Winlink message:



ICS-309 Message Log Generation

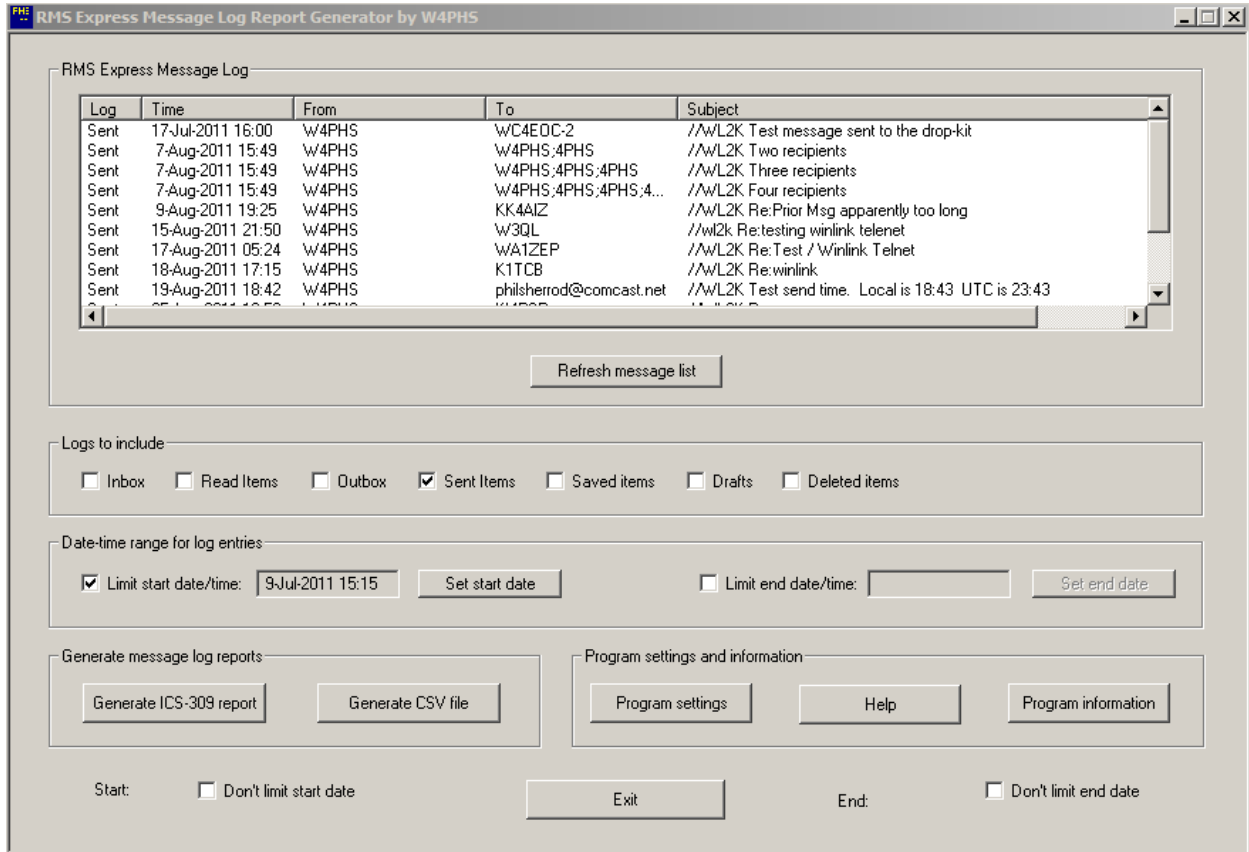
At the end of the event, you should submit an ICS-309 message log form showing a record of all messages sent and received by your station. Voice communications should be logged manually using an ICS-309 form. An ICS-309 form for Winlink messages can be generated automatically using the RMSMessageLog program that is installed on the drop kit.

Running RMSMessageLog

Click the program icon to start RMSMessageLog:



Here is an image of the main screen:



Selecting message logs

The upper portion of the screen has a scrollable list of messages found in the RMS Express databases. Below the message list is a group with checkboxes to select which message logs are to be included in the list. You can select any combination of the Inbox, Read items, Outbox, Sent items, Saved items, Drafts, and Deleted items logs. The message list will be updated to show only messages in the selected logs. The Inbox, Read Items, Outbox, Sent Items, and Saved Items logs should be selected.

Selecting a date range

Below the log selection checkboxes, you will find entries that can be set to limit the date-time range of messages included in the report. If you enable date-time restrictions, you can set the date by clicking the “Set start date” or “Set end date” buttons which will display a date-time selection screen like this:



Click the arrow buttons at the top of the calendar to move to earlier or later months, and then click a day entry in the month.

Generating an ICS-309 report

The ICS-309 form is the standard message log format used by the Incident Command System (ICS). Most organizations require each station to submit a 309 report showing all of the message traffic they handled. Click this button to generate a PDF file with the ICS-309 report. The message log and date-time restrictions control which message entries are included in the report.

Before creating the ICS-309 report, RMSMessageLog displays a screen where you can provide information to be inserted in the header field of the ICS-309 form. You also can specify the folder and file name of the PDF file.

ICS-309 control

PDF file that will be generated

C:\RMSMessageLogTest\Data\ICS309.pdf

Browse

Open the PDF file after creating it

Information for ICS-309 header (these fields may be left blank)

Task #: 1

Operational period #: 2

Task name: NMSZ Exercise

Radio operator name: Phil Sherrod

Station ID: W4PHS

Clear all fields

Generate ICS-309

Cancel

If you check the box “Open the PDF file after creating it”, RMSMessageLog will open and display the PDF file once it has been created. Note: you must have Adobe Acrobat reader installed on your computer to view PDF files.

Here is an example of generated ICS-309 report:

COMMUNICATIONS LOG		TASK # 1		DATE PREPARED: 9-Aug-2011 TIME PREPARED: 15:17
OPERATIONAL PERIOD # 2			TASK NAME: NMSZ Exercise	
RADIO OPERATOR NAME: Phil Sherrod			STATION I.D. W4PHS	
LOG				
TIME	FROM	TO	SUBJECT	
3-Aug-2011 20:05	W4PHS	philsherrod@comcast.net	//w2k Test from office	
3-Aug-2011 20:11	W4PHS	philsherrod@comcast.net phil.sherrod@sandh.com	//w2k Second test	
4-Aug-2011 20:19	W4PHS	philsherrod@comcast.net	//WL2K Test one recipient	
4-Aug-2011 20:20	W4PHS	philsherrod@comcast.net phil.sherrod@comcast.net	//WL2K Two recipients	
4-Aug-2011 20:21	W4PHS	philsherrod@comcast.net phil.sherrod@sandh.com	//WL2K One recip, one CC	
4-Aug-2011 20:22	W4PHS	philsherrod@comcast.net phil.sherrod@sandh.com	//WL2K One recipient, one CC	
4-Aug-2011 20:22	W4PHS	philsherrod@comcast.net	//WL2K One recipient	
4-Aug-2011 20:23	W4PHS	philsherrod@comcast.net phil.sherrod@sandh.com philsherrod@comcast.net	//WL2K One recipient, two CC	
4-Aug-2011 20:24	W4PHS	philsherrod@comcast.net phil.sherrod@sandh.com philsherrod@comcast.net	//WL2K One recipient, two CC	

You can print the ICS-309 report, send the PDF file as an e-mail attachment, or save it to your disk or a flash drive.

The heading section of the form should include the date and time when the log was prepared, the name of the task (incident) being logged, the name of the radio operator, and the station call sign – for example, WC4EOC-2.

A separate entry should be logged for each message sent or received by the station. Include the following items of information:

1. The time when the message was sent/received in 24-hour format local time.
2. The sending station.
3. The receiving station
4. The subject of the message or a brief description

Diagnosing COM port problems

The drop kit should be properly configured to access the COM port connected to the Kantronics modem. However, if you try to start a packet session, and it displays this message:



Then there is a problem connecting to the COM port.

List of items to check

When this happens, check these things:

1. Is the Kantronic modem powered on (pilot light should be lit).
2. Is the serial cable plugged into the back of the Kantronic modem.
3. Is the serial cable connected to the Keyspan serial-USB adapter.
4. Is the USB cable plugged into the notebook computer.

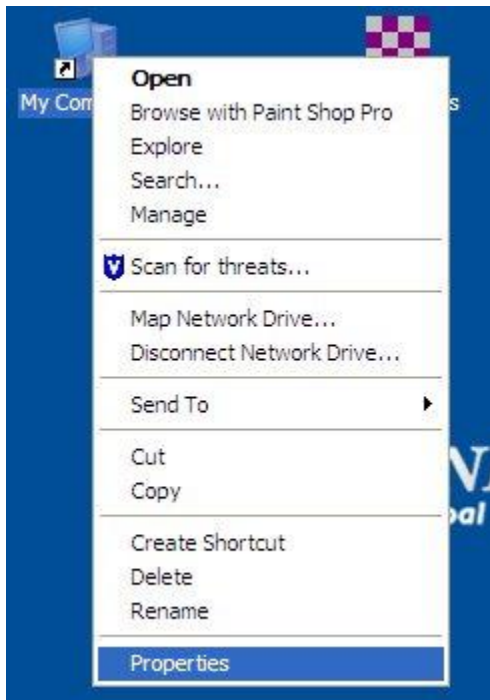
If all of these checks are correct, then the next step is to determine which COM port Windows is using for the serial connection.

Determining the COM port number

Right click on the “My Computer” desktop icon.



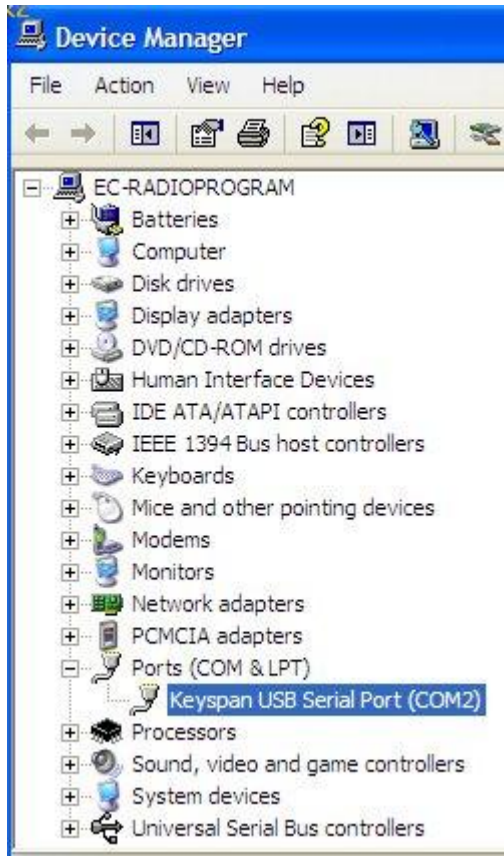
And select Properties from the popup menu:



Next, select the “Hardware” tab, and click the “Device Manager” button:



Expand the list of items under “Ports (COM & LPT)”, and you should see an entry for “Keyspan USB Serial Port”.



If you don't see a Keyspan entry, then the connection from the Kantronics modem, through the serial-USB adapter is not functioning, or the USB port isn't plugged into the notebook.

Assuming there is a Keyspan entry, note the COM port number. It is COM2 in this example. Then close the device manager screen.

Setting the COM port number in RMS Express

Once you have determined the correct COM port number, you must use this procedure to configure RMS Express to use it:

1. Start RMS Express
2. Click “Start Session” on the main RMS Express menu to open the Packet session screen.
3. Click the “Configure” button on the Packet session screen.
4. Select the correct COM port number on the Packet setup screen (shown below).
5. Click “Update” to close the configuration screen.
6. Close the Packet session screen.
7. Click “Start Session” to start a new session. Hopefully, it will now successfully initialize the modem.

Packet WL2K/P2P Setup

TNC Connection

Packet TNC Type:

Packet TNC Model:

Serial Port:

Serial Port Baud:

TNC Parameters

1200 Baud 9600 Baud

TX Delay (Milliseconds):	<input type="text" value="400"/>	<input type="text" value="300"/>
Maximum Packet Length:	<input type="text" value="128"/>	<input type="text" value="255"/>
Maximum Frames:	<input type="text" value="4"/>	<input type="text" value="7"/>
Frack:	<input type="text" value="2"/>	<input type="text" value="2"/>
Persistence:	<input type="text" value="160"/>	<input type="text" value="224"/>
Slot time:	<input type="text" value="30"/>	<input type="text" value="20"/>
Maximum Retries:	<input type="text" value="5"/>	<input type="text" value="5"/>
Transmit Level:	<input type="text" value="100"/>	<input type="text" value="100"/>