

## **EMCOMM Training**

### **Packet Radio Operations**

#### **Objectives**

Basic packet radio operations will be covered using packet radio and RMS Express.

#### **Packet Radio Operations**

Many Emergency Communications teams make use of the Winlink 2000 radio e-mail system to provide a backup, radio based, e-mail system. Winlink can exchange messages to and from other amateur radio stations (call signs) and also with regular Internet e-mail addresses. A U/VHF radio, along with an attached TNC, computer, and the RMS Express software, provide us with access to the amateur radio "last mile" connection to a Winlink Radio Mail Server (RMS Gateway) station. The Winlink system is normally a client/server system, similar to a regular Internet POP/SMTP e-mail system. Winlink RMS gateway stations connect to a Common Message Server (CMS) via the Internet to exchange messages with users. If the Internet fails at the RMS gateway station, the connection to the CMS can be rerouted via HF radio, or messages may be stored locally until the Internet connection is restored (this local storage function is not available on all RMS gateway stations). The state and county EOC's and most city EOC's have access to the Winlink system. RMS Express is also capable of peer-to-peer connections with other local users for message transfer when a RMS Gateway station is not available.

Since the connection to the RMS gateway station is established over RF, the operator must select the correct call sign for the RMS gateway station, and the correct operating frequency. This is different than a typical Internet e-mail system where the server connection is always the same. There are several RMS gateway stations in the Puget Sound, using different call signs and on different frequencies. This provides redundancy during a disaster. If no RMS gateway station is available, a direct peer-to-peer connection will be used. This type of connection should be coordinated on a voice channel to ensure the connection settings are correct and the receiving station is ready.

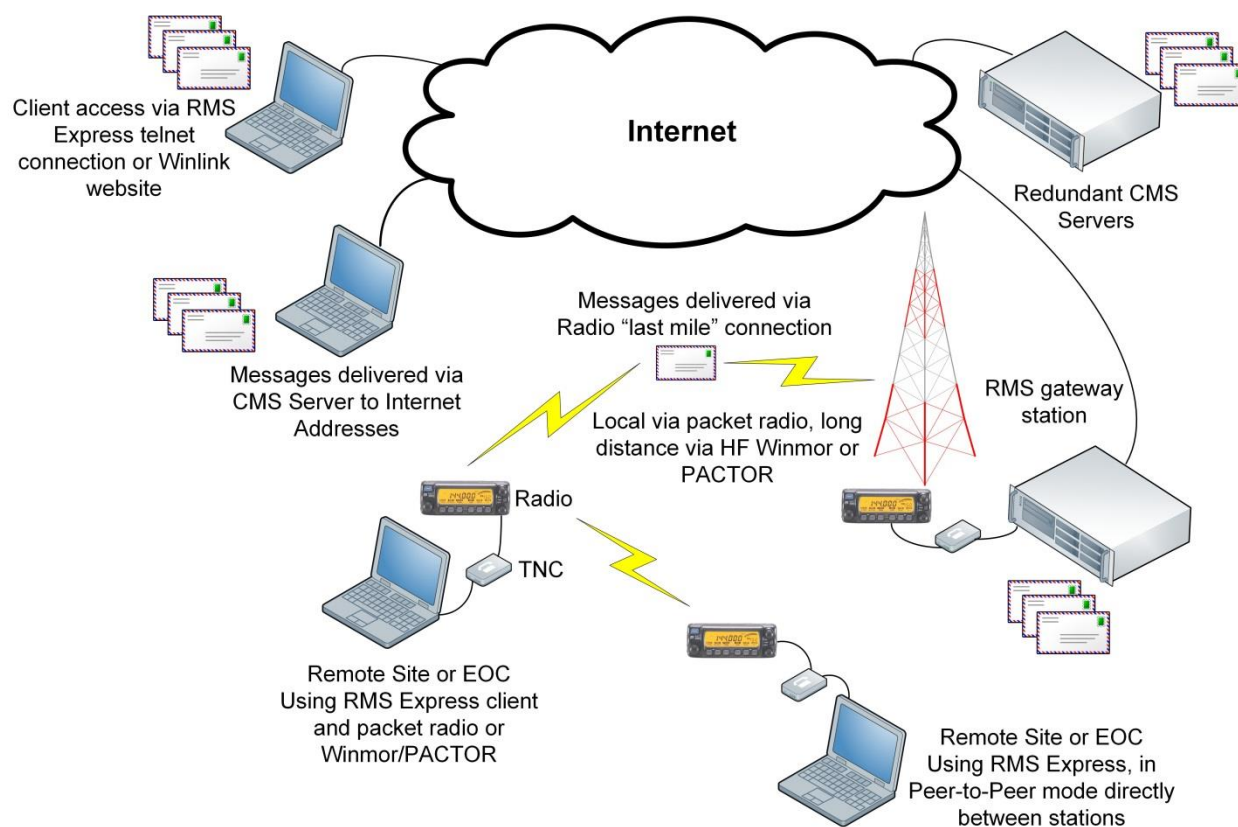
RMS Express can be installed on a personal computer, configured for your call sign, and configured to use an Internet connection (telnet) to transfer messages. There is no cost for the software, which can be downloaded from the links below. EMCOMM members are encouraged to do this to gain more experience with these programs. EMCOMM members are also encouraged to obtain the necessary equipment to augment their personal stations to include packet radio capability.

Software links

RMS Express: <http://www.winlink.org/ClientSoftware>

TNC-X: <http://tnc-x.com/>

The diagram below gives an overview of the Winlink system



**Winlink 2000 System Diagram**

A local station will use RMS Express as the radio e-mail client application. There are other packet applications available, but this training focuses on RMS Express.

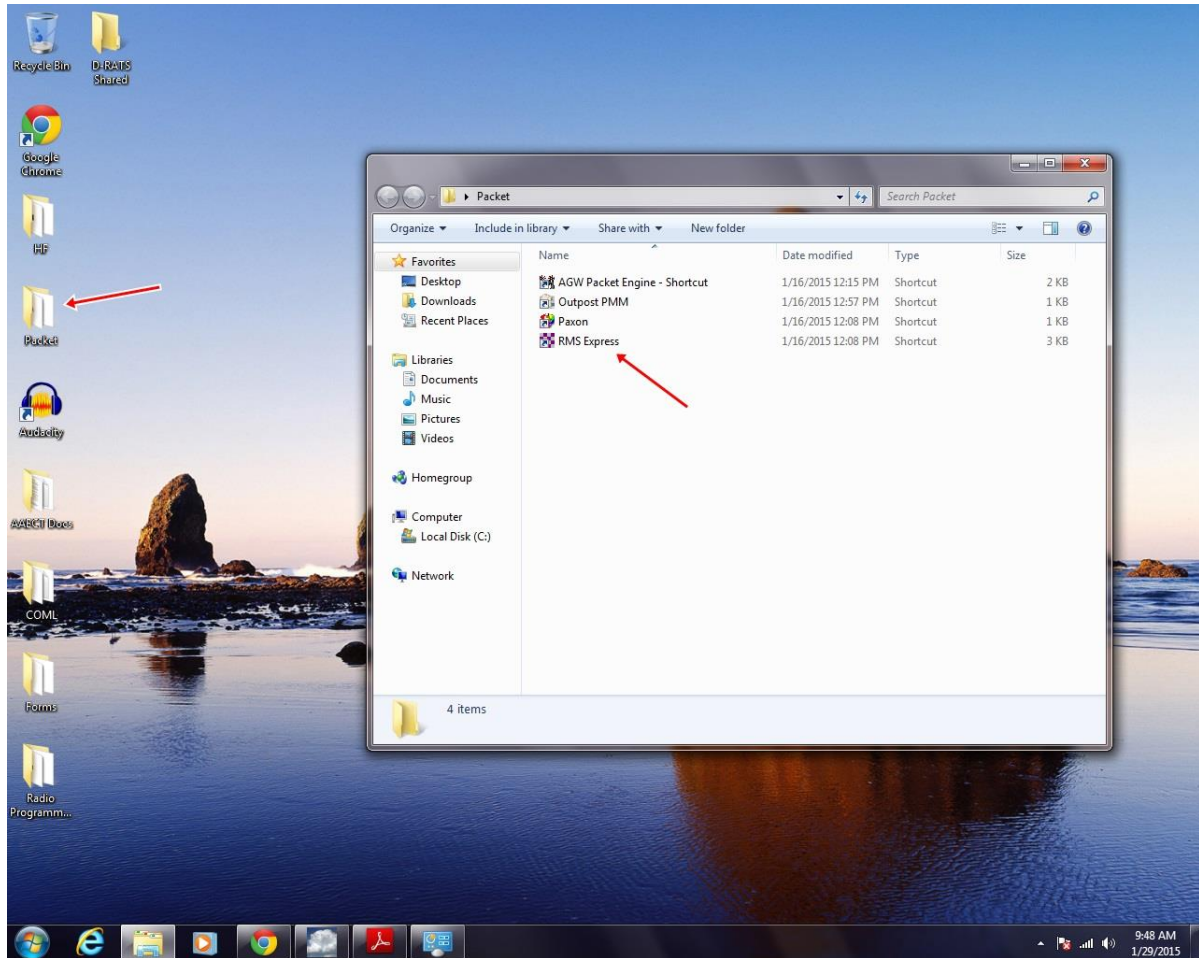
It is important to remember that a packet station transfers data very slowly compared to a modern Internet connection (think early dial-up speeds), so message content should be kept to a minimum, and any attachments included must be very small or the transfer could take a long time to complete and will tie up the frequency and RMS gateway station, preventing other stations from using these shared resources. The maximum message size that the Winlink system will allow is 120K including any attachments. Messages that exceed this limit will be rejected by the Winlink system.

### Essential Skills

- Identify the components and software of the packet station
- Determine the correct settings to connect with a local RMS gateway
- Transfer messages using RMS Express and an RMS gateway station
- Transfer messages peer-to-peer between stations with RMS Express

## Step 1, Locations

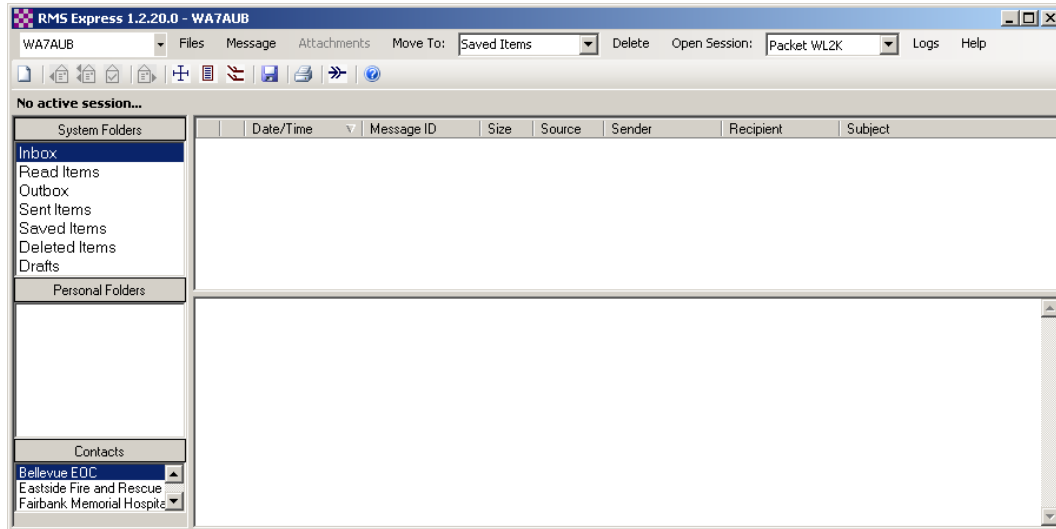
- ☐ Locate the following components of the packet station:
- ☐ U/VHF Transceiver
- ☐ Packet radio TNC
- ☐ Ham station computer
- ☐ Packet folder on the computer desktop (if setup this way)
- ☐ Packet programs in that folder (RMS Express)



## Step 2, Message transfer using RMS Express

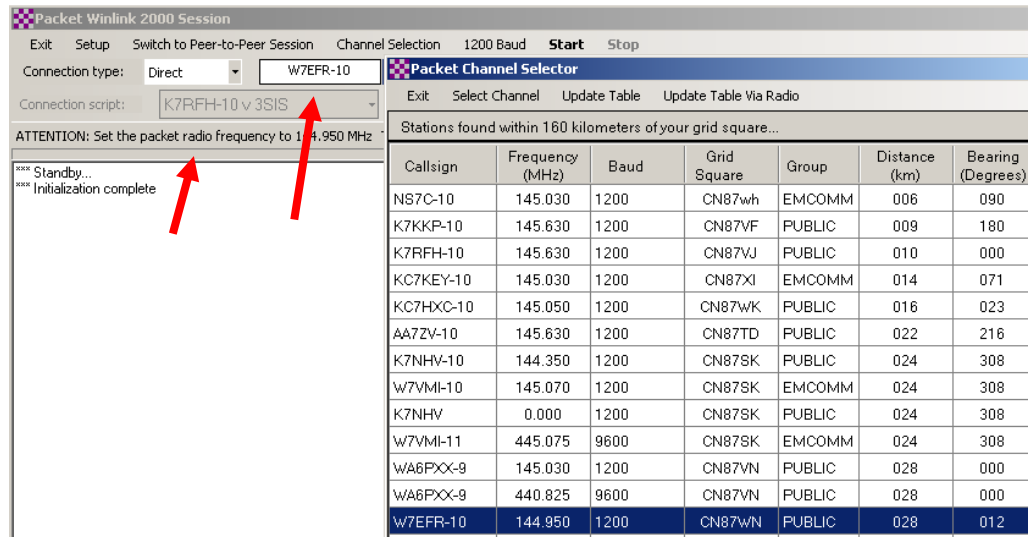
RMS Express can transfer messages using Packet, Pactor, Robust Packet, Winmor, and Telnet protocols. This training module will focus on packet operations.

- ☐ Launch RMS Express, this will bring up the main RMS Express window

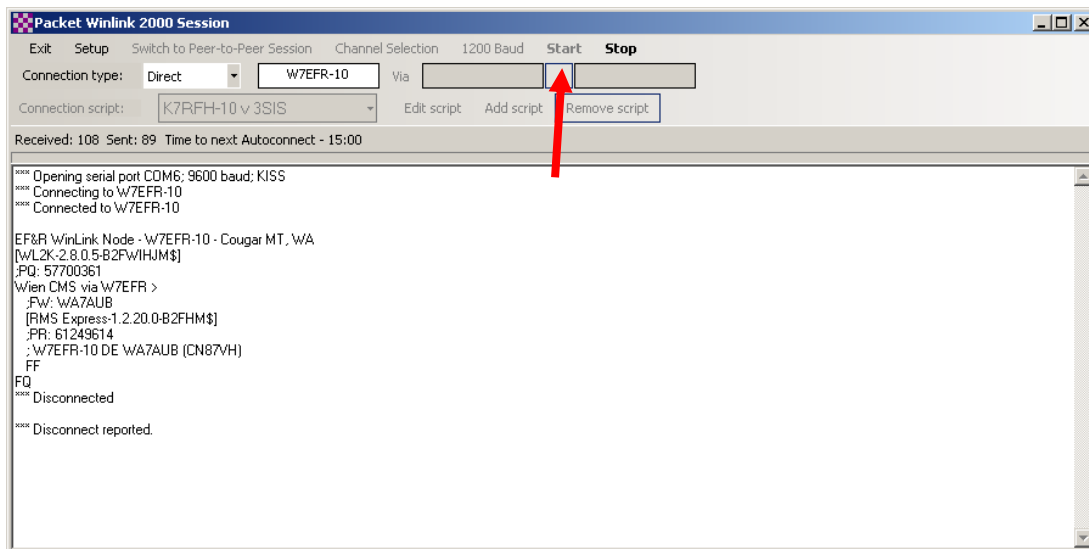


- ☐ Identify the following items on the RMS Express main screen:
  - Station ID in the upper left corner (pull down to change or add call signs)
  - System folders on the left side
  - Contacts/address book on the left side
  - Message header area and message preview windows in the center
  - Toolbar ICONs
- ☐ Using the pull down menu in the call sign field, select the station call sign that will be used
  - Several call signs can be configured within RMS Express

- ❑ In the “Open Session” pull down, select Packet WL2K, then click on the words “Open Session”
- ❑ The Packet Winlink 2000 Session window will open, click on Channel Selection, this will open the local channel list
- ❑ Locate a nearby RMS gateway station (for example, W7EFR-10) in the list and either double click on this entry, or select it and then click on “Select Channel”.
- ❑ Note that the selected station is now in the station ID window, along with the reminder to change radio frequencies if needed. The Connection Type should be “Direct” unless the station selected is beyond the simplex range, and a relay will be required. You can also enter the RMS gateway call sign in the station field directly if you know it, and bypass the channel selection process

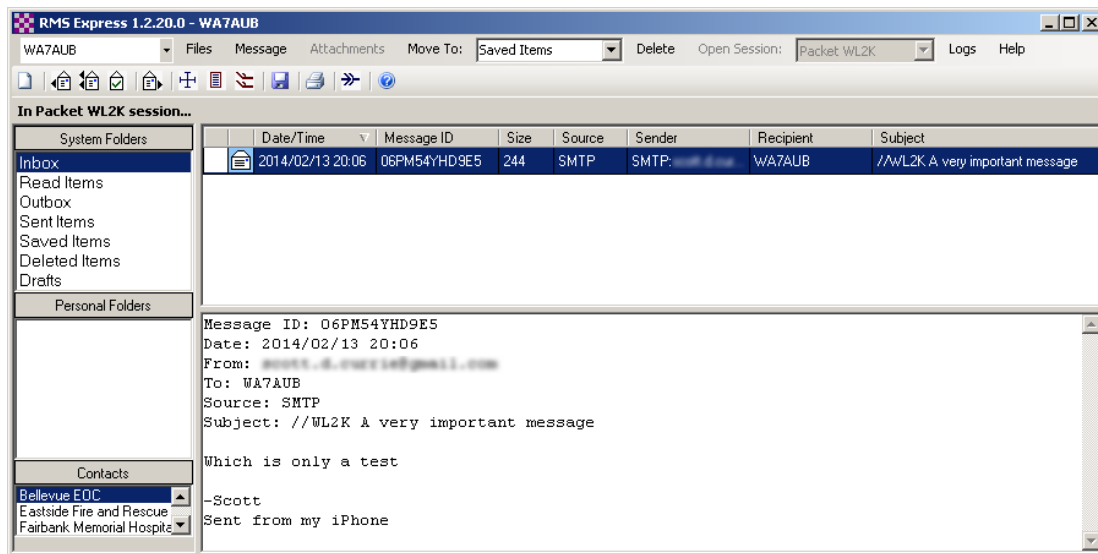


- ❑ Press “Start” to initiate a send/receive session with the RMS. Note the progress messages in the window. RMS uses a binary protocol

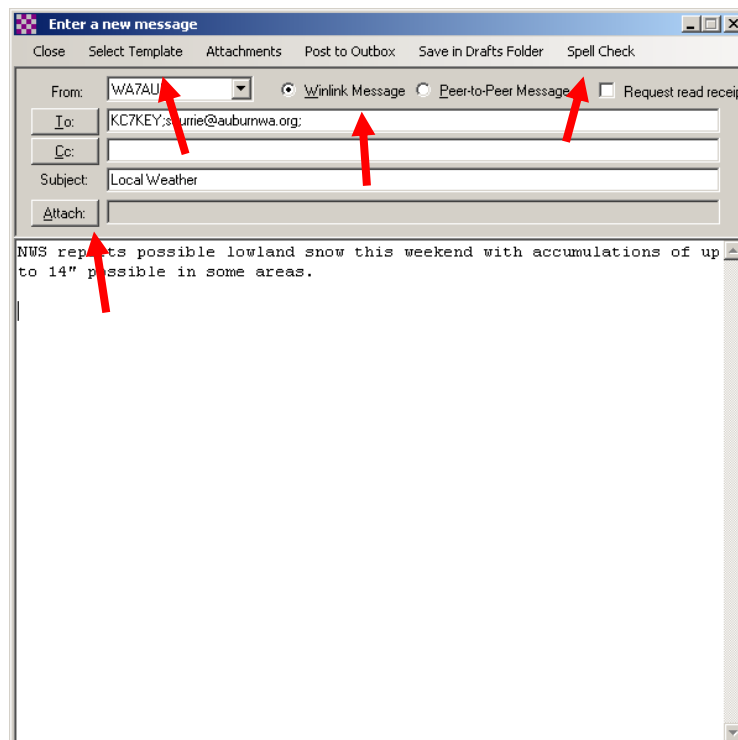


- ❑ You can leave the session window open, and return to the main RMS window

- Any new messages will now be in the Inbox, and the message preview will be displayed



- Note that the toolbar ICONs for forward, reply, etc. are now active. You can also right-click on the message header to select these functions
- Create a new message by clicking on the new message ICON, or pull down “Message” and select “New Message”
- In the new message window you will notice there are several additional functions available. The “To” field can have multiple addresses separated by semicolons. Click on the “To” button to select the address book. RMS Express recognizes Internet addresses directly. RMS Express also has a spell checker, and supports templates and attachments. Be sure to select “Winlink Message”



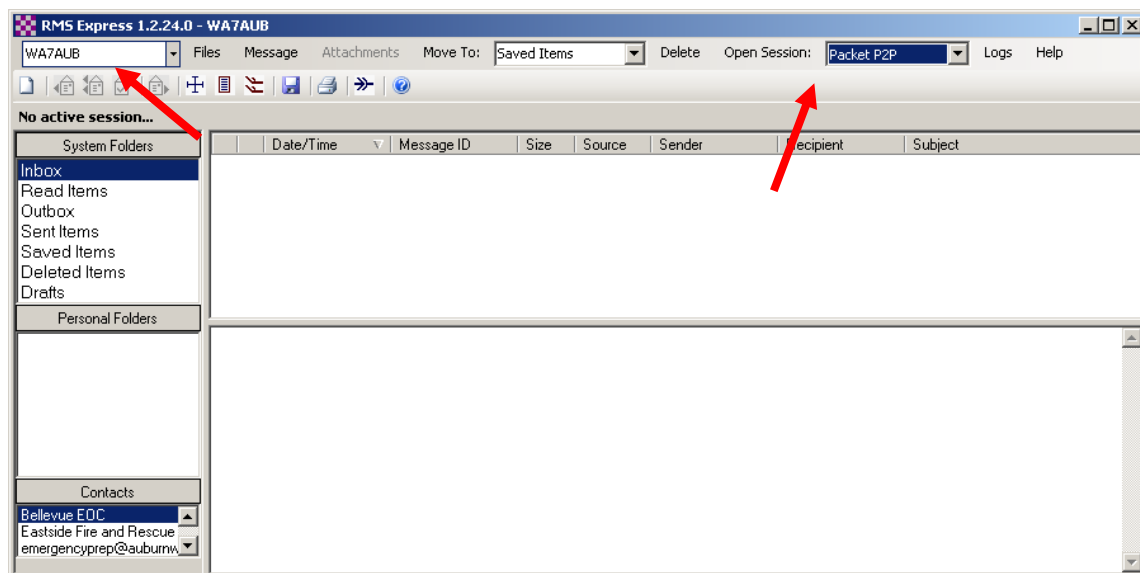
- ❑ Complete your test message, and then click on “Post to Outbox”. RMS Express will not start a send/receive session when you post a message to the Outbox, you must switch to the Packet Session window and click on “Start” to start the transfer
- ❑ When complete, close the Packet Winlink 2000 Session window

### Step 3, Peer-To-Peer Connections

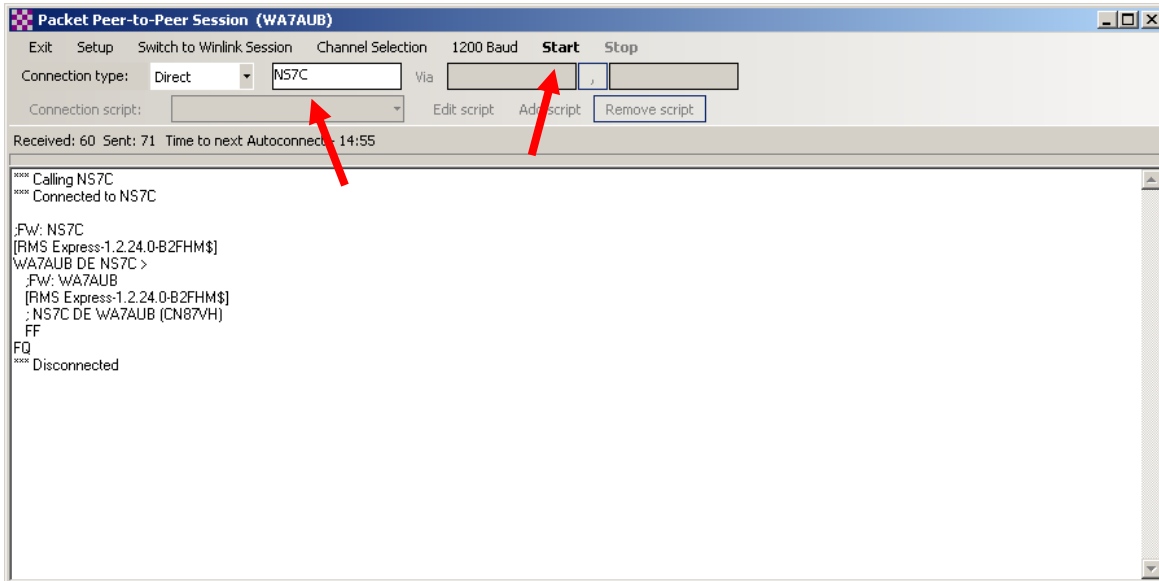
The previous steps make use of the Winlink System (WL2K), and assumes a RMS gateway station with a working Internet connection will be available. During a disaster, there may not be a working RMS station in range of the EOC. In this case, peer-to-peer (P2P) connections with other local city and county stations may become necessary. RMS Express supports P2P radio connections with other RMS Express stations using packet, robust packet, pactor, and winmor protocols. The following steps highlight the differences between WL2K and P2P connections, however, a P2P partner is required to actually transfer messages.

In order to establish a P2P connection with another station (outbound), or to respond to connection requests from another station (inbound), the Packet Peer-to-Peer Session must be open (at both stations). The station ID on the main RMS window is the call sign the requesting station must use to request an inbound connection. You will need to know the call sign in use at a remote station to establish an outbound connection.

- ❑ On the main RMS Express window, check that the desired station ID is set, then select “Packet P2P” and open the session drop down



- On the Packet Peer-to-Peer Session window, enter the call sign of the remote station you are contacting, and then click on “Start” to establish a connection and transfer messages. You will see the connection progress in the window



- In order for a message to be sent via P2P, you must select “Peer-to-Peer Message” and the destination call sign when creating a new message. Messages received P2P will be in the Inbox along with any WL2K messages

