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Introduction to Winlink

1.1 OVERVIEW.

Thank-you Bob. Good evening to the net. Tonight, I'll be presenting an introduction to the Winlink digital computer program.

1.2 DEFINITION

The Amateur Radio Safety Foundation, the organization responsible for Winlink development and maintenance has created the following definition.

“Winlink is a network of amateur radio and authorized government-licensed stations that provides worldwide radio email using radio pathways where the internet is not present. The system is built, operated and administered entirely by licensed "Ham" volunteers. It supports email with attachments, position reporting, weather and information bulletins, and is well-known for its role in interoperable emergency and disaster relief communications. It is capable of operating completely without the internet--automatically--using smart-network radio relays.”

1.2.1 Winlink Description

So, who is using Winlink to support emergency communications? In addition to Pinellas ACS,

- a. Amateur Radio Emergency Services (ARRL ARES)
- b. Military Auxiliary Radio System (DOD/MARS)
- c. Radio Amateur Civil Emergency Services (RACES)
- d. National American Red Cross (ARC)
- e. Southern Baptist Disaster Relief
- f. Salvation Army
- g. US Coast Guard

- h. SHARES¹
- i. Many Federal, state and local government agencies, world-wide

1.2.2 Why use Winlink?

Why are so many emergency and governmental organizations using Winlink? First and foremost, it's because of its reliability, accuracy, and flexibility. Over one 15-year period, it demonstrated a 99.99% availability and 100% accuracy in message transmissions.

Let's look at some of the other key attributes of the Winlink system.

- a. **Radio connection bridge to Internet e-mail:** Winlink messages can be sent via radio from a user that has no internet connectivity, to a Winlink radio node that has internet connectivity. When an Internet connected Winlink node receives a message addressed to an internet address, the Winlink system will inject the radio message into the normal internet email system. Conversely, messages received from the internet can be sent via radio to Winlink nodes that have no internet connectivity.
- b. **Standard email formats and features.**
 - (1) Standard NIMS ICS Forms are embedded within the program. Examples include the ICS 213 general message form, ICS 213RR Resource Request form, ICS 214 Activity Log, and the ICS 309 Communications Log.
 - (2) Binary file attachments such as pictures, PDFs, spreadsheets
 - (3) Automatic message compression/decompression to minimize message size.
 - (4) Whitelist used to control SPAM
- c. **Modes of Operation:** The Winlink System has three basic modes of operation.
 - (1) **Normal Mode:** In this mode, Winlink messages are stored in an internet connected E-mail server known as the Common Message Server. This is

¹ SHARed RESources (SHARES) High Frequency (HF) Radio Program

very similar to the email architecture we are all familiar with. Winlink deviates from a standard email service by incorporating RF gateway stations known as Radio Message Servers. When an individual Winlink user needs to send a message, the Individual user will first send the message via radio to a Radio Message Server. The job of the Radio message server is to send the received message via the internet to the Winlink Common Message Server. Once connected, the RMS will also ask the CMS if it has any pending messages for the sending station. If it does, then the RMS will fetch the messages and send them via radio back to the sending station.

- (2) **Peer-to-peer connections between radio end-users:** Peer-to Peer operation cuts out all the middlemen. It enables any two radio users operating on the same frequency (VHF or HF) and using the same protocol to exchange Winlink message traffic. Of course, there are limitations:
 - (a) Both must be on the air at the same time
 - (b) Direct RF Connectivity
 - (c) Same frequency and protocol
 - (3) **Radio-only store and forward without Internet:** This network capability was developed to ensure that federal, state, and local agencies could maintain email connectivity in the unlikely event of a total internet outage. When operating in this mode, Winlink users world-wide still have the ability to exchange email traffic.
- d. **Interoperability:** Interoperability adds another level of robustness to the Winlink system. Winlink does not restrict users to a single communications protocol, RF frequency, or band. The system supports a constellation of RF gateway nodes that operate on a wide range of HF, VHF, and UHF frequencies. The system also supports wide range of communications protocols such as Packet, VARA,

ARDOP², and Pactor. This means that sending and receiving Winlink stations do not need to use the same RF band or communications protocol to exchange messages. For example, a user in Washington state could connect to an HF gateway station in Ohio and send a message into the Winlink system using a Pactor modem. The intended recipient in Florida could receive the message by connecting to a local VHF gateway node and downloading the message via 1200 baud packet.

- e. ***Geographical dispersion and redundancy for reliability:*** This means that users have the ability to connect to a wide range of RF gateway nodes located in a variety of locations. There can be multiple VHF/UHF gateways within any local area, so if a single RF gateway fails, an alternate site can be used. Likewise, HF users can connect to nodes located virtually anywhere in the world. This would enable users operating in an area impacted by a regional internet outage to still exchange email traffic with unimpacted areas.

1.2.3 What do you need to begin using Winlink?

To begin working with Winlink all you need to do is download and install the Winlink express computer program. Once installed and configured, you have all that you need to begin exchanging Winlink messages. The system supports a telnet capability that enables each user to send messages to and receive messages from the Winlink common Message Server. No RF connection is required. With this configuration in place, you are ready to participate in the PACS Winlink Training Net. No Previous experience is required.

1.3 QUESTIONS OR COMMENTS.

I'd like to pause here for a minute and ask if anyone has a comment or question about tonight's presentation. If you have a comment or question, please provide me with your call sign, slowly,

² Amateur Radio Digital Open Protocol

clearly, and phonetically so I don't make a mistake when I respond. And then ask your question or provide me with your comment.

This is WA1RYQ.

ACTION - PAUSING FOR QUESTIONS

1.4 CONCLUSION.

That's all I have for this week's training session. Let me conclude with a couple of reminders.

1. The next Winlink Training net is scheduled for Wednesday, August 17th, at 1930 hours local. This will be a mixed voice and data net with the voice segment taking place on the WD4SCD repeater. A Winlink bulletin describing the planned net activities will be sent to all registered Winlink net participants. A copy of the detailed bulletin will also be posted on the Pinellas ACS Website.
2. I would like to thank everyone who participated in this afternoon's SKYWARN® net.
3. I strongly encourage everyone to provide comments and suggestions for future training activities. I can be contacted at WA1RYQ@ARRL.net.

Now with that, I'll turn it back to Net Control.

1.5 QUESTIONS AND COMMENTS.

The following table contains a summary of the comments and questions provided by the membership during the presentation.

No.	Call Sign	Comments	Response
1	KC4SXO	From presentation it appears that Winlink is also used on non-amateur frequencies in support of government organizations. Is that Correct?	Yes, that is correct. SHARES, MARS, and the Coast Guard are using Winlink within their frequency allocations.
		No Questions or Comments	