

Winlink — Amateur Radio's Email Network

Imagine you're a ham who has been tasked with providing communication to an American Red Cross shelter in an area devastated by a hurricane. While traditional voice communication can be important in these situations, critical information today travels more often by email. Agencies such as the American Red Cross and many others have come to depend upon internet email as their primary means of exchanging information with support facilities that may be tens or hundreds of miles away — or even farther.

But there is a problem in our imaginary situation. The hurricane has destroyed the commercial communications infrastructure. Email is useless because a connection to the internet doesn't exist. Now what do you do?

Bridging “the Last Mile”

While the internet may be unavailable inside the disaster zone, if you travel far enough beyond the affected area, you'll discover that the internet is still very much alive. Your challenge will be to bring internet access *into* the disaster zone so that support personnel at the shelter can communicate effectively. In telecommunications this is sometimes called a *last-mile* solution. It means using wireless technology to span whatever gaps may exist between the nearest access point on a commercial network and the area where the network connection is most needed.

Fortunately, hams have a number of last-mile solutions in their public service toolkits. Among the most popular of these is a wireless network known as *Winlink*.

Common Message Servers (CMS)

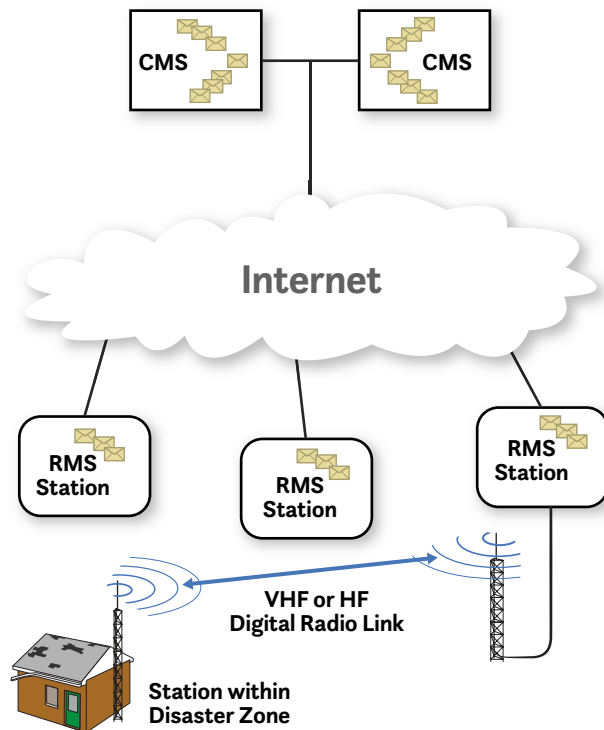


Figure 1: The Winlink network consists of Common Message Servers (CMSs) that are connected via the internet to hundreds of Remote Message Servers (RMSs) at ham stations throughout the world. You can access a Remote Message Server by radio and use it to send emails to and from the internet. [ARRL 1977]

The Winlink Network

Winlink is an amateur radio network that supports wireless email communication to and from the internet. It was designed and built by hams, and it is maintained by hams.

At the core of Winlink are computers known as *Common Message Servers*, or CMSs (see Figure 1). These computers reside in secure, protected facilities, safe from hackers or other disruptions. They connect to the internet through high-speed fiber-optic cables. The CMSs send, receive, and store email messages traveling to and from the internet.

CMSs are also connected via the internet to *Remote Message Servers*, or RMSs, at amateur radio stations around the world (see Figure 2). RMS stations are also referred to as *gateways*.

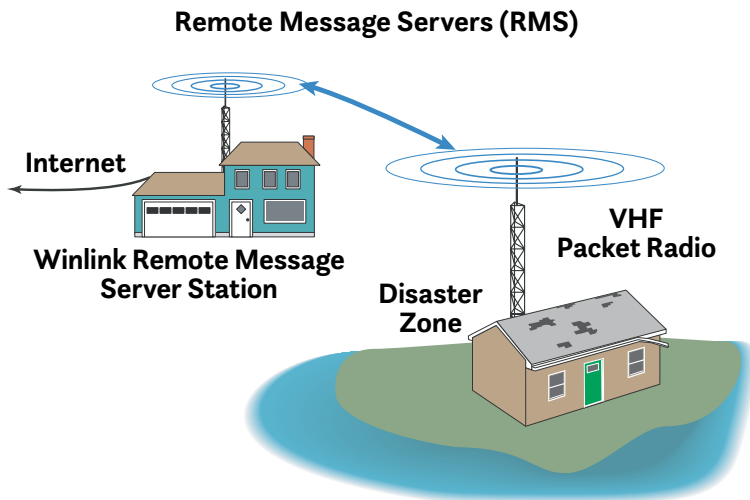


Figure 3: Using VHF packet radio to connect to an RMS station outside a disaster area. [ARRL 1978]

Every RMS, regardless of where it is located, has access to all email traffic stored at the CMSs. This means that if one RMS goes offline for some reason, users can still retrieve their messages by simply connecting to a different RMS. Putting it a different way, what one RMS “knows,” all the others know as well.

An RMS station acts as the last-mile connection to the “client” — that’s you. It can communicate with you by VHF *packet radio* (a form of digital communications), or it may be able to link to you

on HF frequencies using other digital systems, such as PACTOR.

Let’s say there is an RMS station just outside the disaster zone, and you can reach it on VHF. By using packet radio and your FM transceiver, you can connect to the RMS and provide internet email access to the staff at your shelter. They can use your amateur radio connection to send vital information to their headquarters and other facilities (see Figure 3). Read “Packet Radio and the Terminal Node Controller” in this issue to learn more about packet radio.

Live System Information



Figure 2: A map of all Winlink Remote Message Server (RMS) stations within the US, Canada, and Central America that can be accessed by VHF packet radio.

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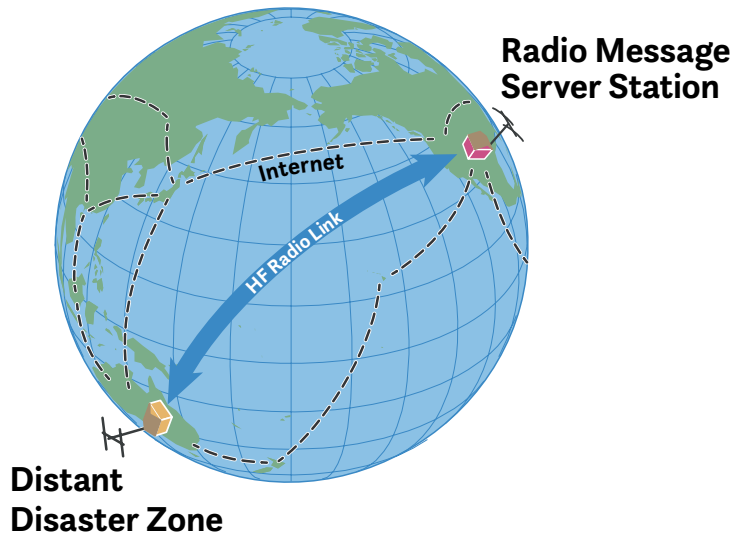


Figure 4: When disasters strike isolated areas, hams use HF frequencies to access Winlink RMS stations over hundreds or even thousands of miles. [ARRL 1979]

But what if the nearest RMS is hundreds or even thousands of miles away? (This could occur if you are providing disaster support on an isolated island, for example.) With an HF transceiver and the appropriate hardware and software, you will be able to exchange emails with one of the many RMS stations that have HF digital capability (see Figure 4).

Because of the limitations of VHF and HF radio, Winlink emails must be limited in size to no more than 12 kilobytes. That's adequate for most text messages, but it cannot support images or other large files.

What You Need to Access Winlink

The first thing you'll need is a copy of the *Winlink Express* software (see Figure 5), which you can download at winlink.org. This is the preferred software for communicating with the Winlink network.

Install the software on a Windows computer that has internet access. When you start *Winlink Express* for the

first time, you'll be asked to set up a Winlink account. The account, like the software, is free.

If you plan to access the network through VHF/UHF packet radio, *Winlink Express* can be set up to work with a packet radio *terminal node controller* (TNC) hardware device or software. As you'll discover elsewhere in this issue, a TNC makes it possible to communicate digitally using an ordinary FM transceiver.

By establishing a VHF link to your nearest RMS, you'll be ready to send and receive emails through the Winlink system.

To access an RMS on HF frequencies, you will need to use *Winlink Express* with an HF transceiver that is connected to a PACTOR modem. PACTOR is a type of digital communication used at HF frequencies. *Winlink Express* can also use software alternatives to PACTOR that require only an inexpensive interface between your radio and your PC.

Winlink is a sophisticated, complex system, so you'll need to wade through a lot of specialized information and terminology. Fortunately, Winlink offers a wealth of information online in their "Book of Knowledge" at winlink.org/content/winlink_book_knowledge.

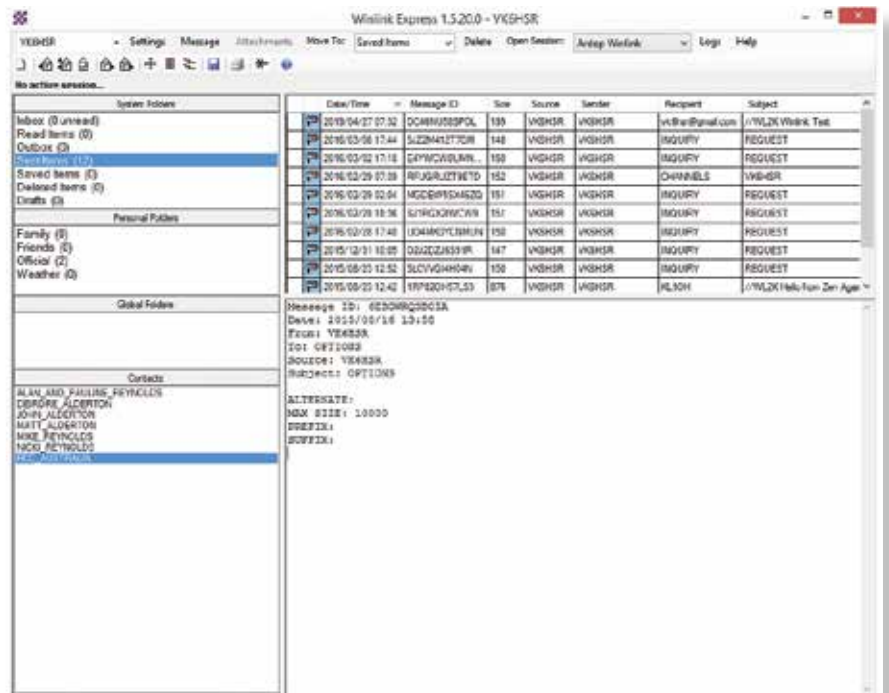


Figure 5: An example of *Winlink Express* software.