Set Up a VHF/UHF Winlink RMS For Your County
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Disclaimer: *I'm not part of the WINLINK Development Team and my information here is my unofficial opinion.*

Lots of hams are beginning to understand how to send formal emergency or personal traffic via the WINLINK system.   By making radio data connections to still-Internet-connected RMS (radio message server) stations that are located far away from a disaster area, radio communicators can move formal traffic (including modest-sized attachments) in and out of a disaster area.   This best-in-class volunteer-driven system provides a nice complement to tactical nets, which provide immediate connections inside a disaster area.

Every County
In recognition of this powerful tool, the 2016 ARES® NFL Section Communication Plan highly encourages county-based WINLINK RMS stations with these words: "It is encouraged to have a WinLink 2K RMS station in each county or at least a digipeater to reach a neighboring RMS station in another county."   (See: http://archive.arrl-nfl.org/wp-content/uploads/2016/03/NFL-Section-Comm-Plan-FINAL-May-1-2016.pdf)

So how do you do this?
It turns out it is pretty easy to do, the software is free, authorization is easy, and the connections are basically the same four-wire (mic, ground, push-to-talk, receiver-audio) that are very familiar to anyone who has ever operated a phone-patch, packet radio, or set up a voice repeater.

The advent of simple sound-card based systems, such as the Signalink, Navigator and others, have made the hardware literally "off the shelf." And you can still homebrew the simple transformer-isolation / audio-detection PTT if you wish.   There are lots of tutorials out there to help you get the wiring working. (For example: http://qsl.net/kx4z/DigitalConnections.pdf)

Free Software: Although I like raspberry-pi Linux-type systems based on John Wiseman's linbpq software (http://www.cantab.net/users/john.wiseman/Downloads/pilinbpq) , the windows-based RMS_PACKET software from the Winlink Development Team is particularly easy to configure. The URL is: https://downloads.winlink.org/Sysop%20Programs/RMS_Packet_install_2-1-39-0.zip

Decades ago most radio data was moved by hardware TNC's but recently soundcard-based systems using software to handle the lower network layers has become much more popular. RMS_PACKET can easily connect to UZ7HO's popular soundmodem.exe (http://uz7.ho.ua/modem_beta/soundmodem105.zip) to provide the packet AX.25 layer, or can use the extremely high speed VARA FM.   The former provides legacy-compatible AX.25 packet modulation that works with digipeaters and nodes; the latter provides ground-breaking speed but is more limited in capabilities to be extended by other stations.   Work on that part is proceeding.

Some commitment needed….
RMS system operators need to understand it requires some commitment. Prospective "sysops" should already be very familiar with winlink operation, and with general packet or VARA techniques, setup and operation.   There are some other commitments required by the WINLINK folks which can be reviewed here: https://winlink.org/content/join_gateway_sysop_team_sysop_guidelines   You're providing an important training and service opportunity, and your station needs to be pretty solid and you need to be on top of the Winlink advances.   With that said, you can then easily get approval via an

email to Steve Waterman (k4cjx@comcast.net) who is a friend of mine.   If you need help, I can help! Once you are approved for operating a VHF/UHF RMS station, your WINLINK call/password are approved for connection to the central message server system (CMS) via Internet.   From there you can begin to configure the software.

You'll use **soundmodem.exe** (the other half of the equation) for packet communications via a soundcard – RMS Packet.exe can automatically start it for you. There are two important setup screens:

1.   Settings | Site Properties:
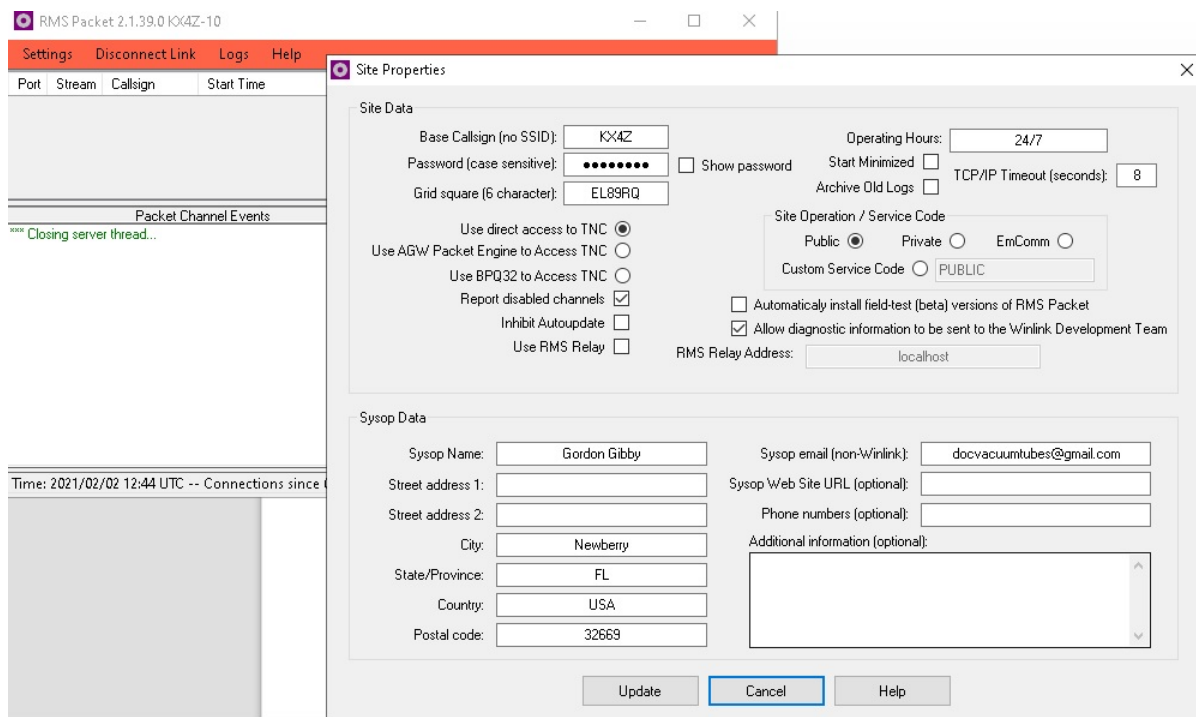
Figure: **Settings || Site Properties** *allows you to enter callsign password, contact information, and set to "directly connect to a TNC"*

2. Settings | Packet Channels:
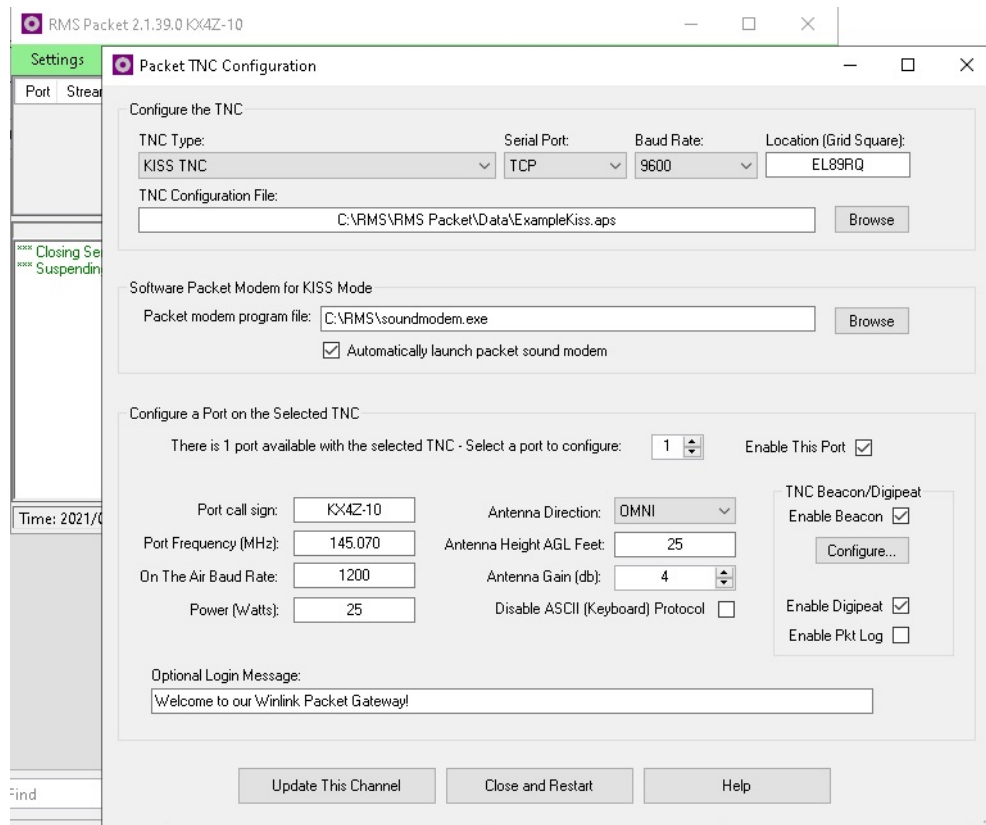
Figure: `Settings | Packet Channels`. *Although you typically set the frequency of your radio by simply adjusting its dial, you need to tell the RMS_Packet software your frequency so it can be reported out to potential users. You also select to use a "KISS TNC" via "TCP" – the connection is made internally in your computer's tcp/ip ports.*

Port Connections

How does RMS_Packet software connect to `soundmodem.exe` software? Over a TCP/IP port connection, which is specified in a couple of lines of configuration in its .ini file and somewhat transparent to the setup:

```
[TNC Properties]
TNC Type=KISS TNC
Serial Port=TCP
….  (other lines not shown here)
TCP Host=127.0.0.1
TCP Port=8100
```

Bottom line: So you should configure your soundmodem.exe to enable tcp/ip connections over the same port, 8100 in this example. (See: https://www.qsl.net/nf4rc/UnderstandingAudioChannelConfiguration.pdf)

Packet vs. VARA FM

I currently recommend that RMS stations using AX.25 (packet) enable the digipeating option. VARA FM, while much faster, currently has a somewhat more complicated "digipeating" option which will be likely further improved over time. Very compact, fast, local servers would benefit from VARA FM,

whereas large systems designed to serve one or more entire Counties might sacrifice speed to get the advantages of robust digipeating options.

Standard modulation level adjustment
From this point, one just needs to adjust the receiver audio gain so that soundmodem decodes signals well, and adjust the transmitter audio gain on the Signalink / computer for good push-to-talk reliability and correct modulation levels.   Basically, set the audio so that it is just below where the perceived audio on a monitoring radio ceases to get louder is a reasonable approximation. For more information, see https://www.qsl.net/nf4rc/UnderstandingAudioChannelConfiguration.pdf

Conclusion
Setting up a local ARES® VHF/UHF Winlink RMS server is a good way to begin to add additional capabilities to a local volunteer group. As your "sysops" gain expertise, they may naturally migrate to also offering and HF RMS server as well.   When that's done properly, VHF users can get the advantages of automatic HF ability to "jump out" of a disaster area even when the local internet/cell phone is completely obliterated.