

VIRGINIA NET

BEACON



JANUARY 2020

HEADLINES

Chester, January 11, 2020. Welcome to the January edition of the *Virginia Net Beacon* – the digital newsletter of the Virginia Net (VN), a Virginia Section National Traffic System (NTS) CW net. In this addition, we feature a technical article about Winlink.

NET MANAGER BULLETIN

Propagation at net time has been varied over the last few months. During a number of net sessions, long-skip has dominated with a station from Ontario Canada being very strong and the Virginia stations so weak that they are barely readable. We have also had a couple net sessions where we experienced QRM from stations using the FT8 digital mode. Their normal frequency is 3573.0 KHz, so I'm not sure why they have been operating so close to the VN frequency. Using a very narrow IF filter in combination with IF shift and reduced RF Gain has been successful in rejecting most of the interference and being able to copy the net stations.

Since the last edition of the *Beacon*, I've added a new Packet Terminal Node Controller (TNC) to the station. The TNC is the SCS Tracker / DSP TNC. It has the capability to do 1200 Baud VHF Packet, 300 Baud HF Packet, and a mode called Robust Packet, which is also for HF and can be either 300 or 600 Baud. Robust Packet was the main reason I got the TNC and it is far superior to standard 300 Baud HF Packet. Standard Packet and Robust Packet are used on HF for Automatic Packet Reporting System (APRS) and Winlink. I do VHF APRS while mobile, but I do not have a suitable VHF transceiver in the shack for VHF Packet. There is only so much money the XYL will let me spend on ham gear, so I had the choice of the VHF packet capable radio or the TNC, so I chose the TNC since it would also work with the HF rig.

TECHNICAL ARTICLE

Winlink, is a worldwide system that seamlessly uses both amateur radio and the internet to send and receive email messages. Winlink email capability includes regular email (with attachments), formatted

messages (radiogram and ICS-213 templates), position reporting, weather, and information bulletins. It can use VHF or HF and a number of digital modes, including Packet, PACTOR, WINMOR, ARDOP, and VARA – all depending on your station capability. It is used extensively for emergency and disaster relief communications and provides interoperability with served agencies.

One of the most publicized uses was on October 29, 2012 when the Captain of the HMS Bounty sailing ship replica used Winlink to send a distress message to the U.S. Coast Guard. The ship was sinking due to damage caused by Hurricane Sandy. Fourteen of the 16 souls aboard were rescued by the Coast Guard.

So, how does it work? You need five things: transceiver, a soundcard modem, a radio control interface, a Personal Computer (PC), and Winlink Express software.

Transceiver and Control Interface.

The ideal transceiver will have radio to computer interface capability. This interface provides automatic frequency, mode, and transmitter keying control. My Yaesu FTdx3000 has a USB Type B connection (like a printer) and a simple USB Type B to Type A cable provides both computer control and soundcard interface. Yaesu calls their version of computer control “CAT”, Icom is called “CI-V”, and Kenwood is “IF-232C”. If not built in to the radio, sometimes an external interface box is required, and I’ve also seen a serial converter built directly into the interface cable itself. If your radio does not have computer control capability, it may

still be able to be used, but will require manually selecting the frequency, mode, and using VOX.

Soundcard Modem

The third thing you need is a radio to computer soundcard modem, which interface for the transmit and receive audio. The modems have impedance matching and optical isolation for the audio connections and many have built-in soundcards. My FTdx3000 has a built-in soundcard, but there are a number of external interfaces available from Tigertronics, MFJ, West Mountain Radio, and others. Some, like the RIGblaster Advantage, also come with the radio control interface for a one-box solution. I use a Tigertronics Signalink USB for my portable HF station. This modem sells for \$139.95 with the radio interface cable. The soundcard modem will work on all digital modes and not just Winlink. Figure (1) shows a block diagram of a generic digital mode station configuration that uses discrete interfaces – many variations are possible.

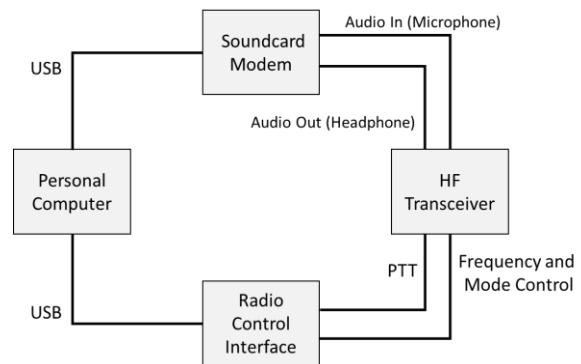


Figure 1. Digital Mode Station Configuration.

Personal Computer.

PC selection is easy. Most ham digital mode software doesn’t have stringent requirements for processor power or memory. I’m using

the cheapest Windows 10 laptop I could find from one of the office supply chain stores.

Setting any internal jumpers and connecting the hardware cables takes care of the hardware configuration part of the system.

Software.

Next, download and install Winlink Express software from:

<https://winlink.org/WinlinkExpress>

After installing the software, the most difficult thing is configuring the settings in the software and radio menus. Take them one sub-system at a time. First, get the radio control interface working for frequency, mode, and transmitter keying control by the computer. Figure (2) shows the Winlink setup window for “Radio Setup”.

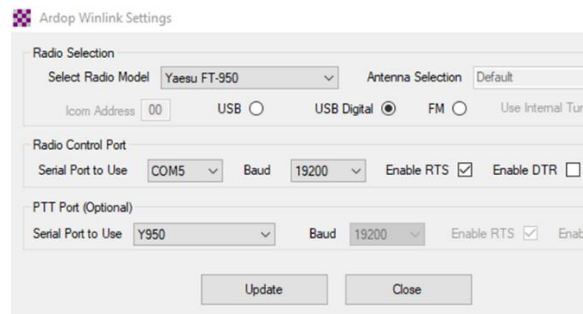


Figure (2). Radio Setup Window.

In my configuration, my transceiver was not listed in the Radio Model drop-down list, so I used “Yaesu FT-950” because it was the closest in CAT operation. I use USB Digital for the radio mode because then it uses the IF width and IF offset frequency for digital modes instead of those normally used for SSB voice. Set the USB COM port and Baud rate. My radio ended up on USB COM5 on the PC and I use 19200 Baud. My radio also uses RTS for transmitter keying (PTT) and

VN Beacon

DTR for CW/RTTY keying. Getting these settings right took trying almost every combination of settings in both the software and radio menus. When you do get these settings right, the transceiver will change frequency and mode when you select a channel using the Winlink software and the transceiver will go to transmit when transmitting.

Next, get the audio setup configuration working. Figure (3) shows my TNC settings.

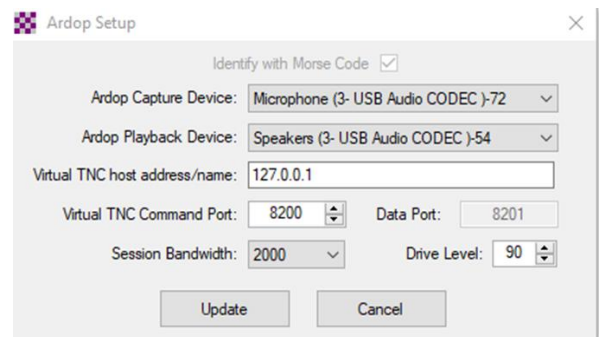


Figure 3. TNC Settings.

You should only need to select the soundcard interface Capture and Playback devices. The rest of the settings usually can be left in their default settings. When correct, you will see the receive audio displayed on the TNC waterfall, as shown in figure (4), and have transmit audio in your monitor.

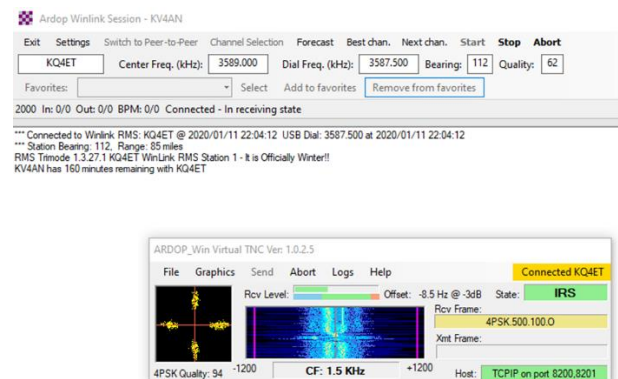


Figure 4. Winlink Express Receiving.

Adjust your transmit audio gain so that there is no more than half deflection on the ALC meter, as shown in figure (5). Don't drive the ALC all the way to the right edge of the ALC region or you will have distorted audio (this is true for all digital modes).

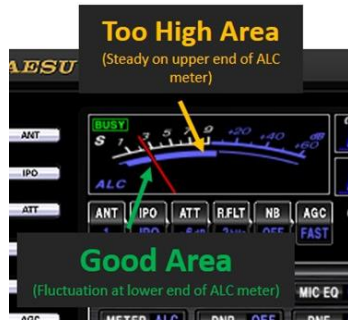


Figure 5. Correct ALC Meter Readings.

Menu Settings.

If you have a modern transceiver with menus, you may have a number of menu settings to configure. My FTdx3000 had menu settings for IF and frequency offset, data in/out Audio connection, Transmit and Receive audio levels, COM port baud rate, RTS/DTR for PTT and CW/RTTY keying, and data mode. Like the software settings, the menu settings are not well documented and may require some thought as to what exactly the menu setting does and some trial-and-error to get right.

Once configured, you are ready to send and receive email over radio. Select the digital mode to use. Winlink HF has WINMOR, ARDOP, and VARA as the soundcard-based digital modes. They each have strengths and weaknesses in the varied HF environment of static crashes, interference, fading, and so forth. I usually use ARDOP. Figure (6) shows the channels available for connection.

HF Channel Selector

Exit Select Update Table Via Internet Update Table Via Radio Forecast SFI All RMS

Callign	Frequency (kHz)	Mode	Grid Square	Hours	Group	Distance (mi)	Bearing (Degrees)	Path Reliability Estimate	Path Quality Estimate
KQ4ET	3589.000	2000	FM16XU	00-23	PUBLIC	85	112	98	62
AJ4FW	3595.000	2000	FM07BC	00-23	PUBLIC	134	265	97	61
N3HYM-10	3587.500	1000	FM19FK	00-23	PUBLIC	147	358	97	61
K3DO	3595.500	2000	FM19GL	00-23	PUBLIC	150	000	97	61
KB3PCY	3593.500	2000	FM29EV	00-23	PUBLIC	204	028	96	60
KK4NTE	7104.000	2000	EM74VV	00-23	PUBLIC	411	248	96	56
WW4MSK	7103.500	2000	EM74UW	00-23	PUBLIC	414	249	96	56
W6IDS	7084.500	500	EM79NV	00-23	PUBLIC	438	296	96	58
VE3HUL	7108.000	2000	FN03IR	10-22	PUBLIC	454	348	96	59
W1EO	7102.500	2000	FN42IM	00-23	PUBLIC	485	040	96	59
W6IDS	7102.500	500	EM79NV	00-23	PUBLIC	438	296	96	58

Figure 6. Available Channels.

Winlink Express uses propagation prediction software to recommend the channels most likely to support a connection. Once connected, Winlink will send any messages in the outbox and receive any messages waiting for you from the Winlink email system. Figure (7) shows the Winlink mailbox.

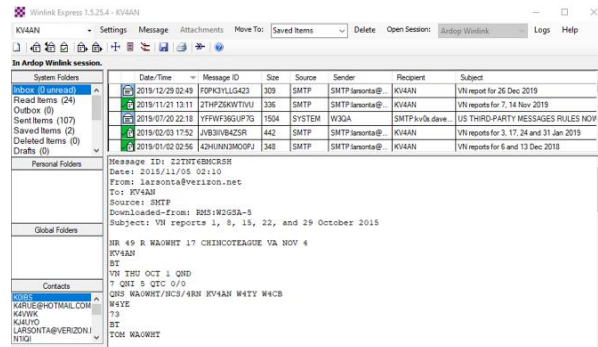


Figure 7. Winlink Mailbox.

Mail can be sent and received from the Winlink email system or from any commercial email address, as long as you have added them to your Winlink whitelist - which helps you keep within the rules on Third Party Traffic.

Winlink is an invaluable system for sending and receiving email over amateur radio. It can seamlessly operate on both HF and VHF using multiple modes. It has many benefits to offer the NTS in our mission of traffic

handling, especially during disasters. I believe Winlink has a role in supporting and modernizing the National Traffic System (NTS). It is worth the cost and effort to add Winlink to your toolbox of communications capabilities. Let me know if you need any help setting up your Winlink station.

Send me your Member Message or Technical Article by email and we'll put it in the next edition of the *Beacon*.

JOKES

A teacher asked her students to use the word "beans" in a sentence. "My father grows beans," said one girl. "My mother cooks beans," said a boy. A third student spoke up, "We are all human beans."

Q: Did you hear about the kidnapping at school?

A: It's okay. He woke up.

Q: What happens to a frog's car when it breaks down?

A: It gets toad away.

Send your jokes (they don't need to be radio or electronics related, but need to be suitable for the XYL to read) to me by email.

RECIPE

Quick and Easy Scrambled Eggs

Ingredients:

- Two Eggs
- 1 Tbsp. Milk
- 1/8 Cup Shredded Cheese
- Dash of Salt
- Dash of Pepper

Instructions:

Crack both eggs into a microwave-safe bowl around 4 inches in diameter and 2 inches deep. Add milk, cheese, salt, and pepper. Mix with fork. Microwave for 30 seconds. Remove bowl from microwave and stir with fork. Replace bowl in microwave and cook for an additional 25 seconds. Remove from microwave and stir with fork. Let sit for a minute and then serve.

SCHEDULE

Table (1) shows the weekly schedule for the VN, which meets daily at 2300 local time on 3568.5 KHz CW. Please consider volunteering for an "OPEN" slot. Also, please fill in as NCS if the scheduled NCS is not present – sometimes things come up.

SKED	NCS	4RN
SUN	OPEN	OPEN
MON	K4VWK	K4VWK
TUE	KV4AN	OPEN
WED	W4IVF	W4IVF
THU	WA0WHT	WA0WHT
FRI	KV4AN	OPEN
SAT	W4YE	W4YE

Table 1. VN Weekly Schedule.

Table (2) shows the VN net activity for the last three months.

	OCT	NOV	DEC
QNI	113	93	85
QND	197	178	154
LISTED	16	15	13
CLEARED	13	11	11
SESSIONS	29	29	26

Table 2. VN Net Activity.