

## Affordable and Proven Radio Data Rigs for Winlink Email Service

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After a year of working with a wide variety of rigs to use for Winlink's amateur radio email service, we feel confident in making the following recommendations for affordable options for the average ham to take advantage of the Club's local server for the 1200 baud Packet mode, VE7SPR-10 on Bruce Peak, which is part of the Winlink global email network and in the near future, will also provide inter-member email back-up when Winlink access is down.

Option 1: A PC running Windows 10 and Winlink Express, interfaced with a KISS\* hardware TNC that is suitable for Packet Winlink service (e.g. TNC-Pi 9K6, TNC-X or Nino TNC).

Option 2: A Raspberry Pi SBC (single board computer) running PiGate 2.1, interfaced with a suitable hardware TNC for Packet Winlink service (e.g. TNC-Pi 9K6, TNC-X, Nino TNC or some radios with a built-in TNC).

Option 3: A "virtual" software TNC running on a Windows PC or Raspberry Pi SBC with a data audio adapter a.k.a. "sound card." Depending on the computer operating system, there is a choice of VHF and HF modes (Direwolf, ARDOP, VARA) and a choice of Winlink and email clients (Winlink Express, Pat Winlink, PiGate).

Each of the above options can be implemented for approximately \$200 additional cost for all aspects of data capability, assuming that the user already has suitable VHF radio and a PC or other common devices for normal email applications. Some of the components are available as kits, so Hams who have the required skill and equipment may be able to save a portion of this cost. Alternatively, \$200 is about the incremental cost for a new radio with a built-in TNC or data audio adapter comparable to the above options.

Option 1 is the classic approach and is generally an over-the-counter solution. Once the user has mastered the complexities of the Winlink Express "all things to all people" email application, the hardware is plug and play except for TX audio level adjustment. The constraints are Windows PC and 1200 baud packet on VHF, (the 9600 baud packet option is not supported in most locations, including SSI). The main cost is about \$200 for a turn-key, basic KISS\* TNC, (or about one half of this amount for a Nino kit).

Option 2 is by far the easiest to use and has special features for emergency communications. It is limited (by location) to 1200 baud Packet but the user interface can be almost any computing device that is capable of an Internet connection (yes, even a smart phone) and most common email apps. The basic cost is a Raspberry Pi (about \$100 including essential accessories) plus a \$100 KISS\* TNC (either an external unit e.g. Nino TNC or a Pi "hat" e.g. TNC-Pi 9K6/Teensy 3.2)

Option 3 is the most versatile, offering HF as well as VHF data modes, using free software and implemented on either a PC (with Winlink Express) or a Raspberry Pi4 (with Pat Winlink). This option can be technically demanding in the downloading, installing and configuration of the virtual TNC software but the reward is a choice of data modes and performance equal to or better than most hardware TNCs. A "sound card" interface is required, either built into the radio or an adapter such as DINAH, Easy-Digi or Signalink at \$75 - \$200 including all cables.

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\* KISS = Keep It Simple, Stupid (no kidding – this is commonly used to describe a simple packet TNC)