Winlink Express 1.5.18.	0 - W7OWO					1.00		_	
W70W0 - S	ettings Message	Attachments	Move To: Sav	ed Items	✓ Delete	Open Session:	Telnet Winlink	✓ Logs	s Help
	14 🗉 ≿ 🚼	<b>∌ ≫ 0</b>							
No active session									
System Folders	Date/Tim	e 👻 Messag	e ID Size	e Source	Sender	Recipient	Subject		
Inbox (0 unread)	2018/05/2	22 13:53 ORPHR	UXVEXIR 413	SYSTEM	SERVICE	W7OWO	Undelivere	ed Message	
Read Items (0) Outbox (1) Sent Items (3) Saved Items (1) Deleted Items (2) Drafts (0)			·	·					
Personal Folders									
Global Folders	Message ID: Date: 2018/C From: SERVIC To: W7OWO Source: SYST Downloaded-f Subject: Unc	ORPHRUXVEXI 05/22 13:53 CE TEM From: Telnet delivered Me	R :cms.Winli ssage	nk.org					^
Contacts	Your message Message I Subject:	e of 2018/05 ID: PR30T67G //WL2K YCAR	/22 13:51 M5WO ES Winlink	Email Ne	t Initial	Member Sig	nup		J

## Configuring Winlink Express for Peer-to-Peer Communications

## **Configuring SignaLink with Computer**

This month we will be continuing from May's issue of MARC Wireless, on the topic of providing digital capabilities to an HF radio. This topic was developed from the ponderings of individuals who were supporting the April S.E.T. and their exposure to using Winlink to send emails via their radios. The May issue discussion was targeted towards determining the SignaLink parts needed to bring that to fruition with the club's ICOM IC-735 radio. In this Part II of the topic, the discussion of actions needed to assemble the pieces, connect them to the radio, and configuring the interfaces on the computer.

In the Part I, the Sound Card Radio Interface that was chosen was the SignaLink from Tigertronics. While the sound card device is identical for all transceivers, the differences between transceivers is the cabling and jumper settings to match the pin outs of the radio connection these can be even different between models from the same vendor. In Part I, it was determined that for the IC-735, the cabling needed is that which comes form part number SLUSB8PD. As this was a dedicated SignaLink, I chose to get the plug-and-play jumper.

Having received the interface and jumper, I first verified that I had what I needed. The inventory of what I had is 1) the SignaLink interface, 2) a RJ45 to 8 pin Din cable, 3) a USB A to USB B cable, 4) a small package of jumper wires, 5) a plug-and-play jumper module, 6) a mono – mono speaker cable, and 7) a hex driver that fits the screws on the front of the SignaLink device. Having the plug-and-play jumper module, there will be no need for the small package of jumper wires, and the cabling handles the audio out so there is no need for the mono speaker cable, so I put them away. I next started checking to make sure the jumper and cable are correct for the radio.

The IC-735 uses pins 5 for audio out, 4 for audio in, and 3 for push-to-talk on the 8 pin DIN connection. The SignaLink side expects pin 1 for audio out, 2, for audio in, and 3 for the push-to-talk. To access the sockets, there are 4 hex screws on the front of the SignaLink, using the provided hex driver remove the screws and pull straight out to remove the circuit board that is attached to the front panel. Looking at the plugs on the circuit board and you will see a printed rectangle with a notch on the bottom and numbers along the edge. This is where the jumpers go. Using a Ohm meter, I tested the continuity of pin matching to the jumper plug in and on the jumper. I aligned the plug-and-

SignaLink Usage	SignaLink Pin #	Pin Matching	Radio Pin #	Radio Pin Usage
Ground	8	-	8	ALC
Ground	7	-	7	13.8V DC
Ground	6	-	6	SQLS
NA	5	1 - 5	5	AF Out
NA	4	2 - 4	4	Mod In
PTT	3	3 - 3	3	Send
MIC	2	6 - 2	2	Ground
SPK	1	-	1	NA

play jumper on my desk and made contacts with pin 1 on the left and pin 5 on the right, and saw continuity. I proceeded to test for continuity for the 2 - 4 pair, and the 3 - 3 pair. I also verified ground which is a 6 - 2 pairing.

To be on the safe side I verified the values of the pin on the jumper connector for the radio matched the cable pins. I plugged the RJ45 jack on the radio to SignaLink cable into the SignaLink, and then test pins 2, 3, 4, and 5 on the Din connection and verified I had continuity on sockets 2, 3, 4, and 5.

After verify I had continuity, inserted the jumper module, making sure all the pins were straight, fit into the correct sockets, and the printed notch on the board matched the notch on the module. Since the circuit board is only connected to the front panel, make sure the back of the circuit board is supported when pushing in the module or the wires if you choose that method. Again verify that you have the jumper connections correct, you can put the circuit back into the case and fasten the screws.

Now it is time to get the computer and the interface working together. To the computer the SignaLink is an external sound card. This means it adds a microphone and speaker to the computers Sounds configuration. Before proceeding make sure your computer has the latest updates and note which Recording and Playback devices are already present on your system. These can be found on the Task Bar by right clicking the Speaker Icon. A USB cable is provided with the device, it has a Type A (thin rectangle) on one end and a Type B on the other. Connect the Type B end into the SignaLink, and the type A into your computer, preferably USB 2.0 port. If you are using a desktop, it preferred to use the ports on the back, again USB 2.0. USB 2.0 ports usually have a white coloring, and USB 3.0 have blue coloring. It can take several minutes for the drivers to be installed. Be patient. You may or may not get a "Hardware Ready To Use" notification. When the drivers are installed you will see a new device under Recording Device and a new device under Playback device. You need to configure both for the proper use of the SignaLink to insure good decodes by the software and sufficient gain for the SignaLink to set the radio to transmit.

Your digital software will send its synthesized sounds to the recording device. To configure, open the Recording Devices menu when you right click on the speaker icon in the task bar. You will see a new Microphone device that was installed by connecting to the SignaLink. This new device can be aided in identity by the "USB Audio Codec" text underneath its name. Select this device and click Properties, you will be able to edit the name. Give it a unique name, I used "SignaLink IC735 Microphone". Click on the Levels Tab. Right click on the text box next to the speaker icon, and select decibels. Set the value to 0.0 or as close to it as you can get. Next select the Advanced tab, select the format to provide 48000 Hz (DVD Quality) if possible. If you want to hear the sounds on your computer's speakers, select the Listen tab, and click on the "Listen to this device" check box. Click OK to save your changes. While not necessary, make sure your computers microphone is the default recording device. Click OK to save settings. I include the radio name in the sound device name as I also have other SignaLink devices on this computer for VHF/UHF.

Your digital software will receive the audio from the radio over the playback device. With the Sounds Dialog still open from configuring the recording device, click on the Playback tab. Again, you should see a new Speaker device. This also can be aided in identity with the "USB Audio Codec" text under its name. Select this device and click on properties. You will be presented a text box that will allow you to change it's name. Give it a unique name, I used

"SignaLink IC735 Speaker". Click on the Levels tab, again change it to display in decibels and adjust the level as close to 0.0 as you can. Click on the Advanced tab and set the format to 48000 Hz (DVD Quality). Click OK to save you changes. It is best to make sure you computers speakers are the default device. This will prevent Windows sounds from being sent to your software which may interfere with the decoding of the received software. Click OK to save settings. As before, I include the radio name in the sound device name as I also have other SignaLink devices on this computer for VHF/UHF.

On your SignaLink device front panel set you TX control to 50%, RX control to 50%, and the DLY control to 0%. This is a good default setting for immediate use.

## **Configuring Winlink Express Modes with a SignaLink**

Most users are more familiar with a hardware TNC for Packet mode or PACTOR modem for PACTOR modes, but Winlink Express installs software TNC's for WINMOR and ARDOP. The Winlink.org site also provides a link to a third party speed limited VARA software TNC and there are several third party Packet TNC's (my favorite is Dire Wold) that can work with a SignaLink. When you start either WINMOR or ARDOP modes, it attempts to initialize the software TNC. Since it is software TNC, it will open an additional window and use the last configured sound card. If you haven't configured a sound card, it will use the system defaults. When you install the SignaLink, it is best not to have it as the default device, as Windows sound can be transmitted by your radio. So you will need to open the *Settings* Menu Item and click on *ARDOP TNC Setup* as seen to below. Which opens the ARDOP Setup

😹 Ar	dop Winlink Session - W7OWO		🕵 Ardop Setup			$\times$
Exit	Settings Switch to Peer-to-Peer	Channel Selection		Identify with Morse	e Code 🗹	
	Ardop TNC Setup	0.000	Ardop Capture De	evice: Primary Sou	ind Capture Driver-00	$\sim$
Favor	Radio Setup	- Select	Ardop Playback De	evice: Primary Sou	ind Driver-00	$\sim$
Channe	Transmit Level Test	Disconnected	Virtual TNC host address/n	name: 127.0.0.1		
*** Using	DSP Speed Test Best channel setup		Virtual TNC Command	d Port: 8200	Data Port:	8201
*** Read	y to start calling.		Session Bandy	width: 2000	V Drive Level:	90 🖨
windo	w you see to the right. This	screen capture		Update	Cancel	

window you see to the right. This screen capture shows my default capture device (microphone)

and the default playback device (speaker). To make ARDOP work, you will need to select from the Device drop downs the SignaLink Microphone and SignaLink Speakers configured in the earlier section of this article. Fortunately they only list **attached accessable** microphones for the capture devices and speakers for the playback devices. If you don't see it make sure your USB cable is plugged in to the computer and SignaLink and the power switch is turned on. If you are want to use rig control for changing the frequencies, you will also need to select the *Radio Setup* menu item, and select the appropriate Radio Model, and Icom Address for Icom radios. If the rig control uses a serial port on the computer, set the Radio Control port to the serial port defined with the computer to radio cabling Since a SignaLink provides PTT via VOX, no PTT Port setting should be set.

In standard Winlink sessions the Radio Operator communicates with a radio at an RMS Gateway, which it in turn passes the received emails from the connected station to the CMS network on the Internet. For emails sent to the recipient, the RMS server retrieves and transmits emails destined for the connected station from the CMS network. The RMS gateways have fixed known frequencies that can be selected from configured Winlink Express clients, along with propagation forecasts by station within the list of RMS Gateways. When using P2P sessions the emails are transmitted directly between the radios of the sender and receiver. This requires a coordination between peers for the frequency of use. In the SET, phone communications initiated via the ARES Net, will be used to perform this coordination of frequencies. The frequency agreed upon should be within the digital range of the band used.

To open a P2P session within Winlink, select the session type drop down and select the session type desired. For this SET, only the yellow highlighted sessions shown in Figure 1 should be selected. After the mode is selected clicking on the Open Session text will bring up the selected session window. Figure 2 displays the controls section for the Packet P2P session window. The very

		Figure 2 displays the controls section for the Packet P2P session window. The ver						
Open Session:	Telnet Winlink 🛛 🗸	I first time you select this session, it will provide a configuration window that you						
	Telnet Winlink	need to provide your TNC information. This should be identical to your						
	Packet Winlink	configuration for your Packet Winlink session. For a typical packet P2P session,						
	Robust Packet Winlink	you should leave the connection type to Direct. The blank text box is for the						
Desisient	Winmor Winlink	station recipient of the email, this must match the call sign of the recipient in the						
Recipient	Iridium GO Winlink	_ "To:" line of the email. It also must match the call sign used by the recipient in						
	Packet P2P	their Winlink Express Properties under "My Callsign".						
	Pactor P2P	Packet Peer-to-Peer Session (W7OWO)						
	Kobust Packet P2P	Exit Settings Switch to Winlink Session Channel Selection 1200 Baud Start Stop						
	Telnet P2P	Connection type: Direct  Via ,						
	Pactor Radio-only Winmor Radio-only	Connection script:   Edit script Add script Remove script						
	Telnet Radio-only	Time to next Autoconnect = Disabled						
	Telnet Post Office	*** Starting peer-to-peer packet session						
		*** Initializing ; port ; 9600 baud *** Initialization complete						
FIGURE 1		FIGURE 2						

Once you've set your radio to the agreed upon frequency, you can click on the **Start** menu item. If all is well with propagation between you and the recipient, you should get a connection, and any Peer-to-Peer configured email with the recipients station call sign will be sent. If the recipient has any P2P configured email address to your call sign, they will be received by you. To send any emails to another recipient, you need to set the recipient text box to that call sign and change your radio to the frequency they are waiting on. If you need to be a recipient, you need to provide a frequency for others to use to connect to you. Good ad-hoc frequencies in 2 meters should be inclusively between 144.910 and 145.090 preferably on multiples of 10 kilohertz. You just need to select that frequency on your radio, open a Packet P2P session and wait for the connections, only the station initiating the connection needs to have the recipient text box populated.

Pactor Peer-to	-Peer Session						
Exit Settings	Switch to Winlink Session	Channe	el Selection	Start	Stop	Abort	
	Center Freq. (kHz):	0.000	Dial Freq	. (kHz):	0.000	Bearing:	
Favorites:		Select	Add to favori	ites Re	emove fror	m favorites	
In: 0 Out: 0 Discon	nected						
*** Starting peer-to-pe *** Initializing the TNC	er Pactor session. 2, Pactor 3 Port , 57600 baud						



Figure 3 above, displays the controls section for the P2P PACTOR Session window. The blank text box is for the recipient of the email, and follows the same set of rules as Packet. Unlike Packet, PACTOR, WINMOR, ARDOP, and VARA sessions usually expect Rig Control to be configured. In addition for some reason these modes work off the center frequency which is 1500 Hz higher than the dial frequency. In peer-to-peer modes you will need to have an agreed upon Center Frequency, that then must be entered into Center Freq text box, Winlink will then calculate the Dial Frequency and set your radio to that frequency. (Though in a pinch you can set the dial frequency manually on

your radio) In a standard Winlink session, you can use the Channel Selection to pick a known RMS Gateway for your mode. If you are sending an email that has been configured for P2P, you only need to click on the **Start** menu item. If you need to be a recipient of an email just leave the Pactor P2P session window open and wait for the connection.

Figure 4 below, displays the controls section for the P2P WINMOR Session window. It behaves identically the same as the Pactor P2P Session window, except and additional window appears containing content of the Virtual TNC uses to communicate via the sound card mode, identical to the one in Winlink WINMOR standard sessions.

WINMOR WL2K Session							
Exit Settings Switch to Winlink Session	Channel Select	ion Forecast	Best chan.	Next chan.	Hide TNC	Start Stop	Abort
Center Freq. (kHz):	0.000	Dial Freq. (kHz)	. 0.000	Bearing:	Qua	ality:	
Favorites:	▼ Select	Add to favorite	es Remov	e from favor	ites		
Channel Free In: 0/0 Out: 0/0 BPM: 0/0 Ir	itializing the W	INMOR TNC					

FIGURE 4

You may have noted that it is mentioned only P2P configured emails are sent or received. By default emails generated within Winlink are configured as a Winlink Message. To configure as a Peer-to-Peer message, before sending the message, you must select the Peer-to-Peer Message option under the "Send As" option box as seen in the yellow highlight in the figure below. Fortunately this can be changed at any time, even after it has been posted to the Outbox. When looking at the contents of the Outbox, Peer-to-Peer configured messages will be shown with a (P2P) following the recipient's ID.

Enter a new message		-
Close Select Template	Attachments Post to Outbox Spell Check Save in Drafts	
From: W70W0 To: Cc: Subject: Attach:	✓ Send as: Winlink Message ✓ ☐ Request read receipt Winlink Message Radio-Only Message Peerto-Peer Message	Set Defaults