Configuring
UZ7HO SoundModem
as a
Simple
Digipeater

By

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Purpose

This document is to show you how to configure a not so obvious setting to enable UZ7HO SoundModem to act as a simple packet radio digipeater.

A digipeater is a digital repeater that temporarily stores and then re-transmits the packet data it receives. Similar to a simplex 'store and forward' voice repeater, it can help extend the range of digital packet communications between two stations that normally cannot communicate directly with each other.

To do this, you will need to edit the first instance of the 'MyDigiCall=' parameter in the soundmodem.ini file and append your digipeat call letters. Now when your station is running with SoundModem active it will act as a digipeater and repeat appropriate Winlink traffic.

This document will also show in detail how to setup Winlink Sessions to make use of a digipeater.

To make Winlink traffic appropriate to send through a digipeater station, the sending station will set up their Winlink 'Packet P2P' or 'Packet Winlink' Session by changing the 'Connection type' from 'Direct' to 'Digipeater' and enter on the same line after the ' Via' the desired Digipeater Station's call (usually with "-7" appended).

Table of Contents

Editing the Soundmodem.ini File

This section will step you through how to add your call letters to the "MyDigiCall=" line under the "[AX25_A]" section of the soundmodem.ini file which is used to store SoundModem settings.

This file only shows up only if you have used SoundModem at least once previously. If this is a new SoundModem install, you will need to setup and configure it as detailed in the SoundModem setup document located on the CARES website, clackamasares.org before continuing.

First, you will need to know where your copy of SoundModem is installed.

If you do not remember where your copy of SoundModem is located and happen to have Winlink setup to launch it automatically, you could check the Winlink packet settings to find it. To do so, open a packet session (either Packet Winlink or Packet P2P) and click on Settings from the session screen. Be sure to close the session when you are done.
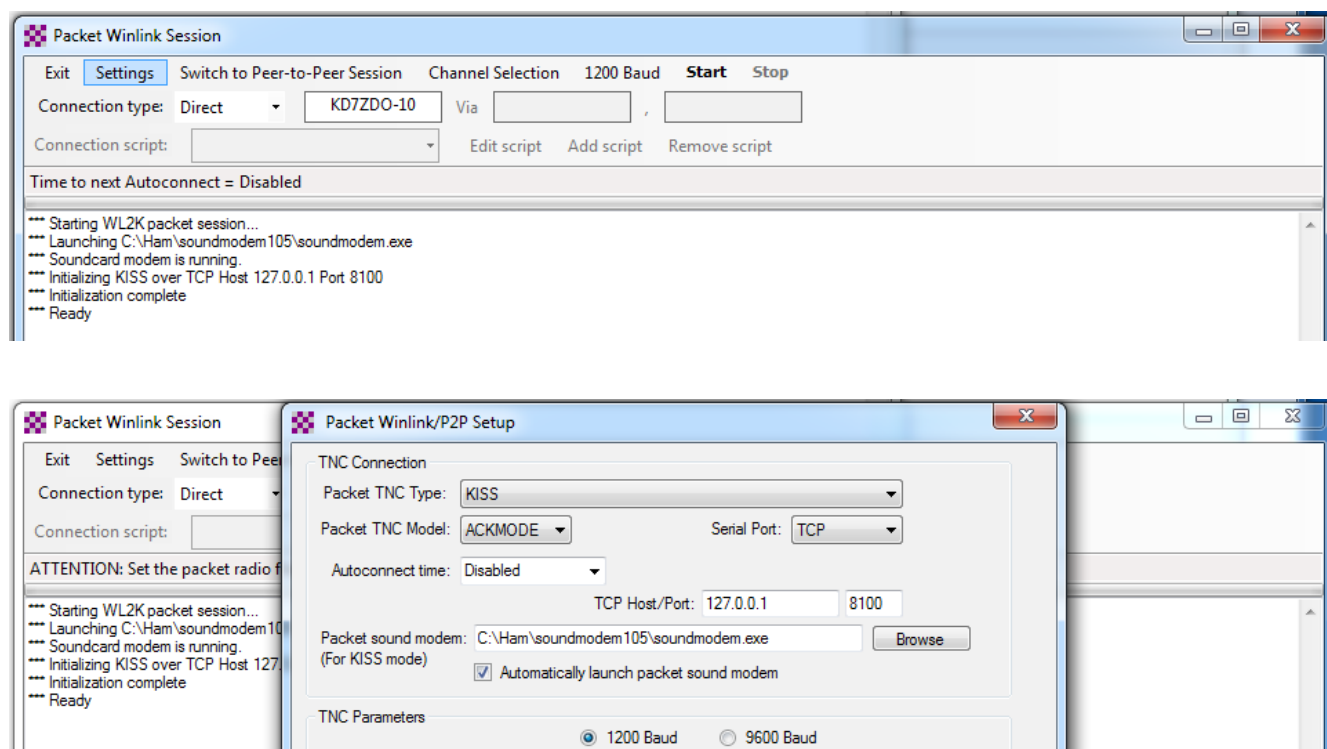

Figure 1: Locating SoundModem by checking Winlink Packet settings.

Please note: The path shown above happens to be where my copy of SoundModem was installed. Your location will likely be different than what is shown.

Before continuing, please make sure that SoundModem is not running either in an open window or minimized in the system tray since it will not recognize any changes made until it is relaunched. It could also overwrite the changes you are about to make since it saves to the settings file when closed if any menus were altered while running.

Once you have located where the SoundModem application is installed, look for the following two files as pictured.
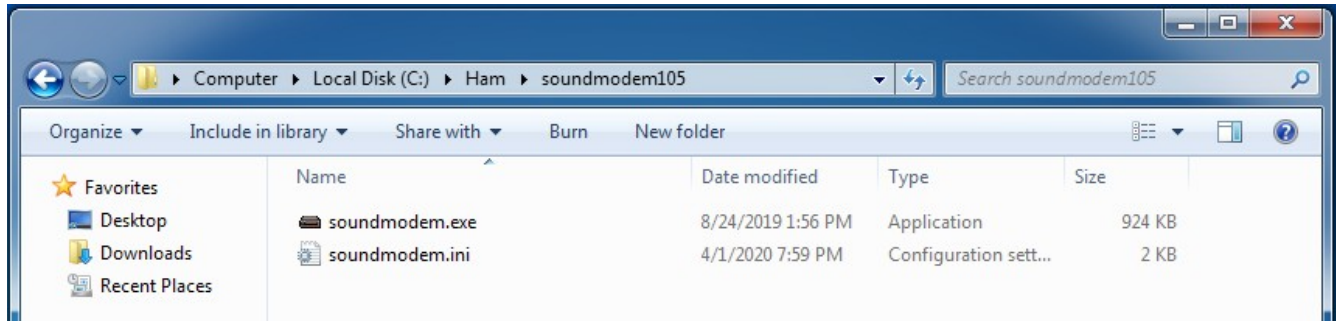

Figure 2: Files with extensions.

You will see them listed as soundmodem.exe and soundmodem.ini if you have Windows set to display file extensions. If Windows does not show the extensions, then you can check the Type description, or hover your mouse over the files to check the descriptions as shown below.
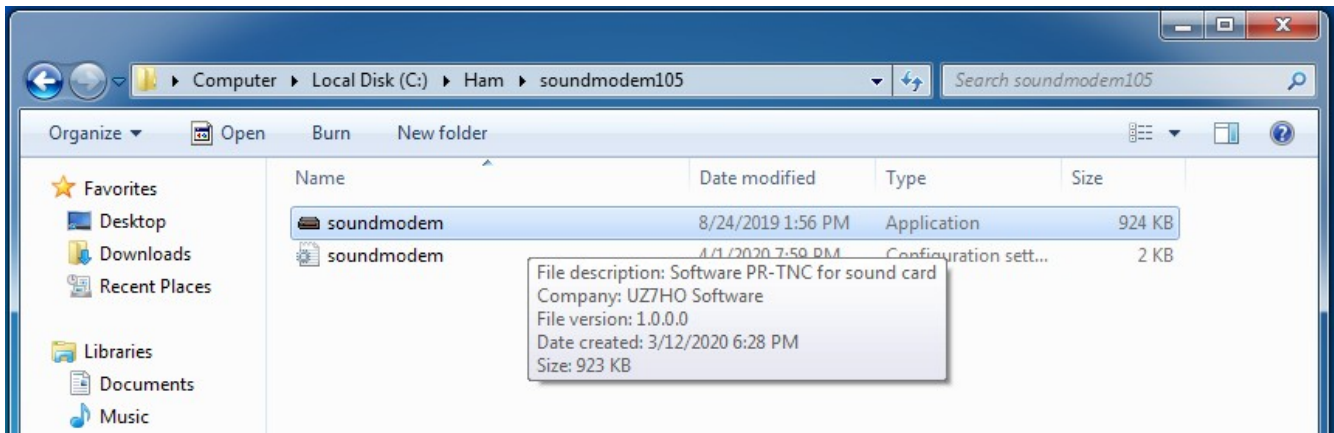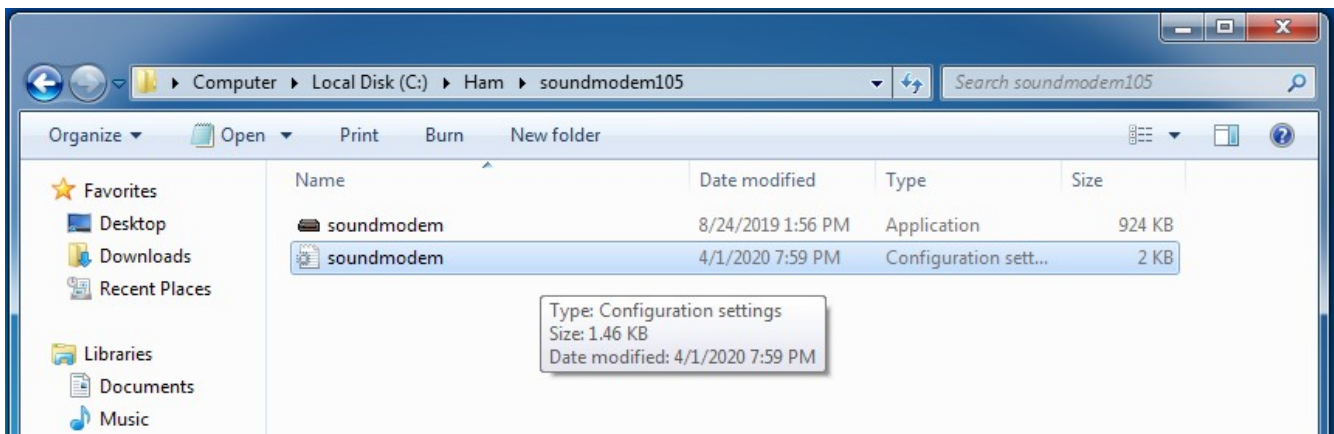
Figure 3: soundmodem.exe Type description.

Figure 4: soundmodem.ini Type description.

The file we are interested in is the soundmodem.ini file, the one listed as Type "Configuration settings" if you don't see the extension.

It's worth noting at this point that you may want to make a backup of the settings file before editing it, just in case something does not work afterwards. Since the soundmodem.ini file is quite small, you could simply copy it into a new folder named something like "soundmodem-backup" to make a backup. If something does not seem to be working correctly afterwards, just copy the file from the backup folder you created and paste it over the original to restore.

Right click on the soundmodem.ini file to display the contextual menu and hover over the "Open with" option, and you should see a new menu with options appear to the right.
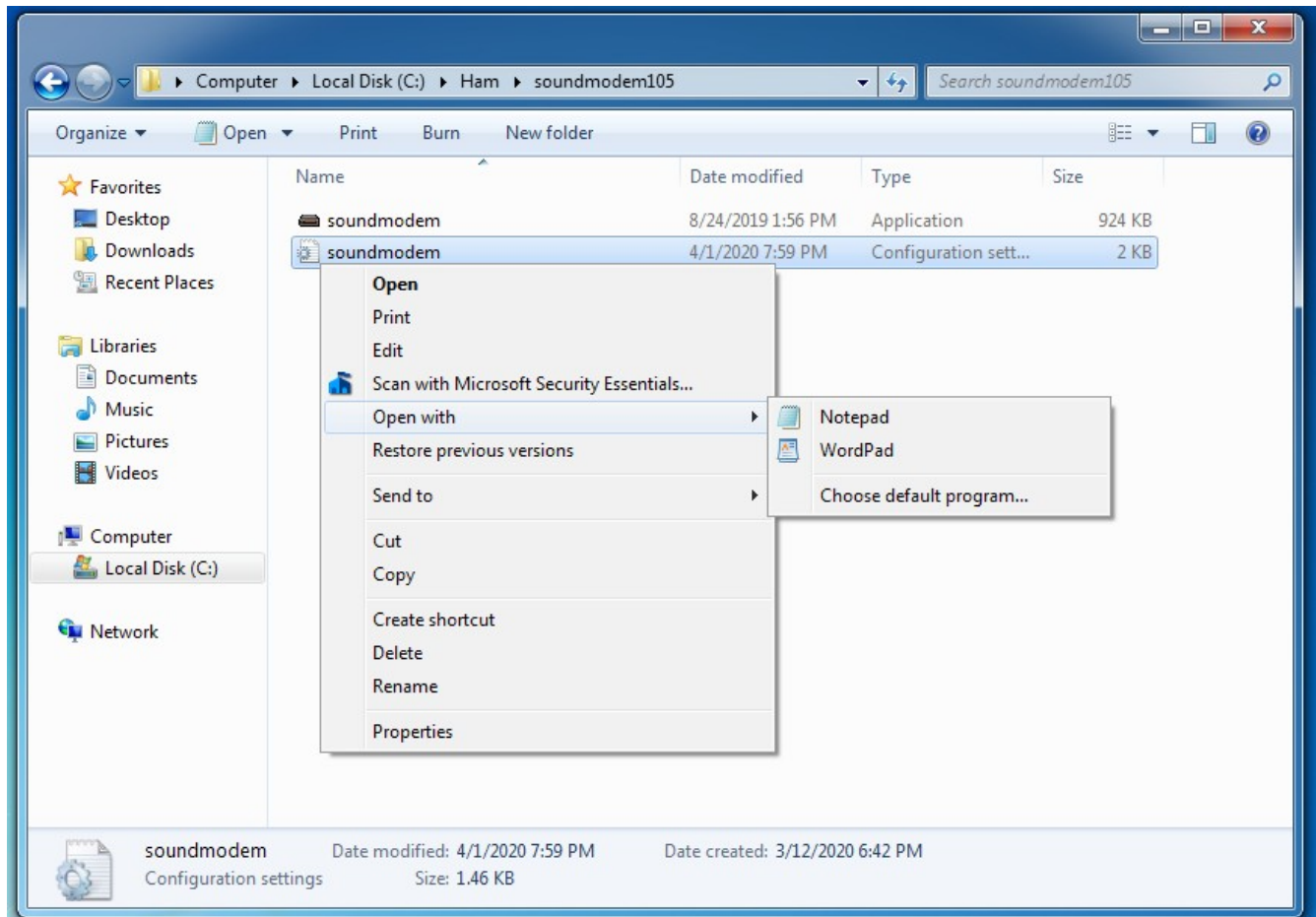

Figure 5: "Open with" contextual menu.

Select Notepad from the list to open the soundmodem.ini settings file.

If for some reason you don't see Notepad listed as an option as shown, select the "Choose default program..." option and select Notepad from the list of items shown.
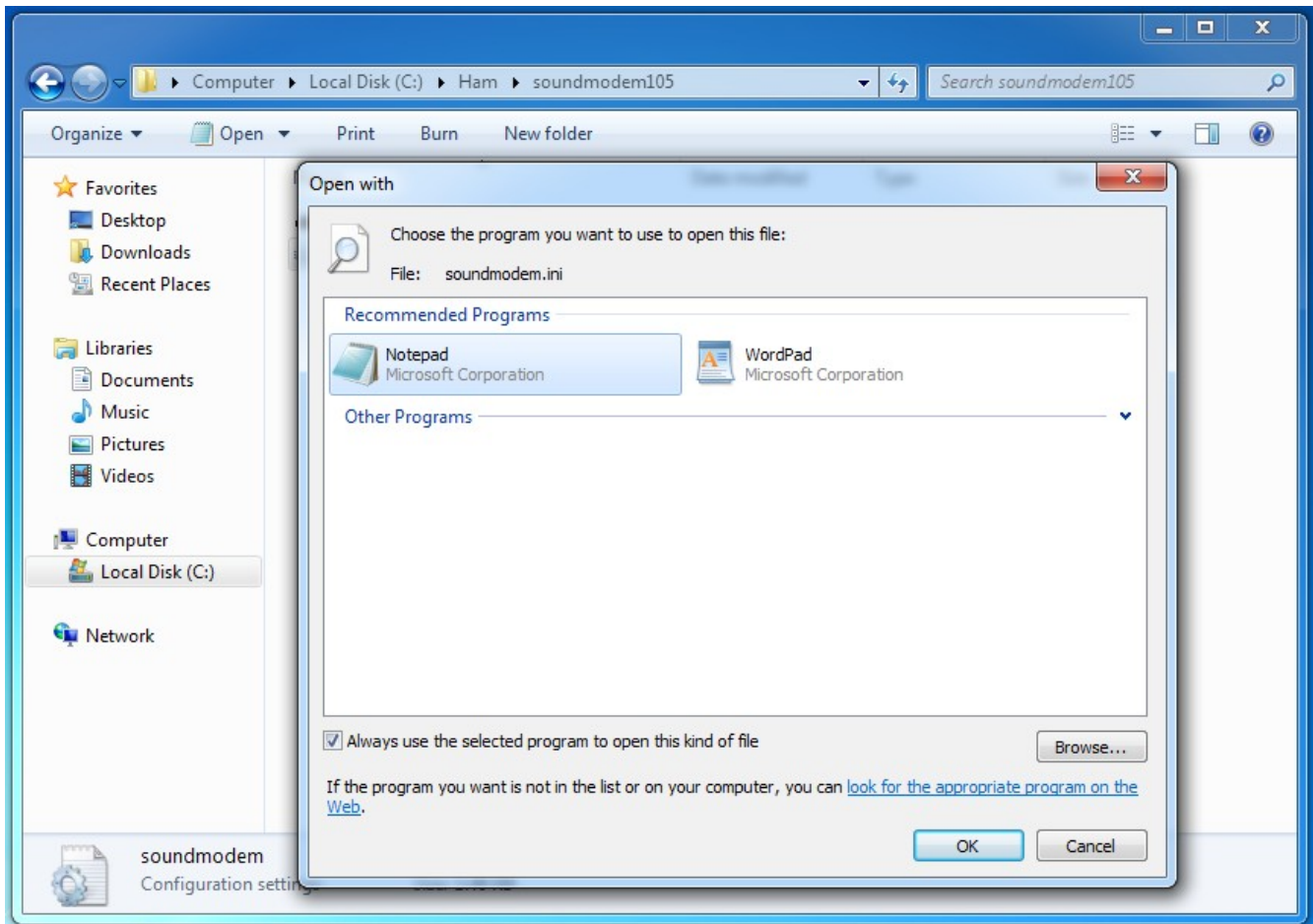
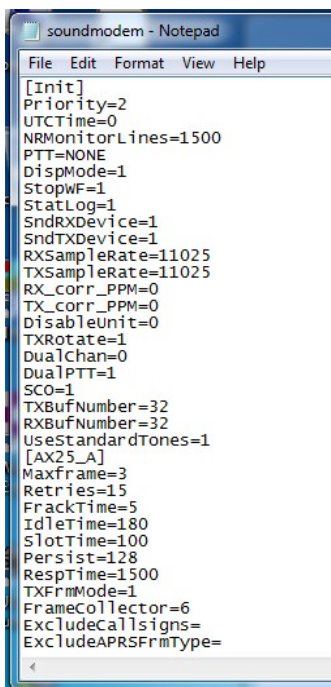*Figure 6: "Choose default program" window.*

Figure 7: soundmodem.ini open in Notepad.

After selecting Notepad, you should now see a window with some random looking text.

Note: Be sure to NOT edit anything else in this file as it could result in unexpected behavior.

Each entry in this file represents all the various settings configured from the menus in SoundModem from when it was first setup, as well as some extra defaults that should not be changed. More information about each of these entries can be obtained from the manual for SoundModem on the UZ7HO website.

If you feel you have made any other unintentional alterations then close this window without saving and reopen it to start again.

Notice that certain fields are within brackets such as [ ] to denote subsections. Look for the [AX25_A] section shown highlighted in the next image.

If you scroll down far enough, you should also notice an [AX25_B] field with the same options as the [AX25_A] section. This is because SoundModem is capable of running two modems at once. We only make use of the [AX25_A] section when setting up SoundModem according to the documentation on the CARES website, so be sure to edit the option listed under this section. If you only edit the same option listed under the [AX25_B] section, then your station will not digipeat when addressed.

Figure 8: [AX25_A] and [AX25_B] subsections.

Figure 9: "MyDigiCall=" setting.

The option to look for is: MyDigiCall=
By default, this field is blank after the equal sign.

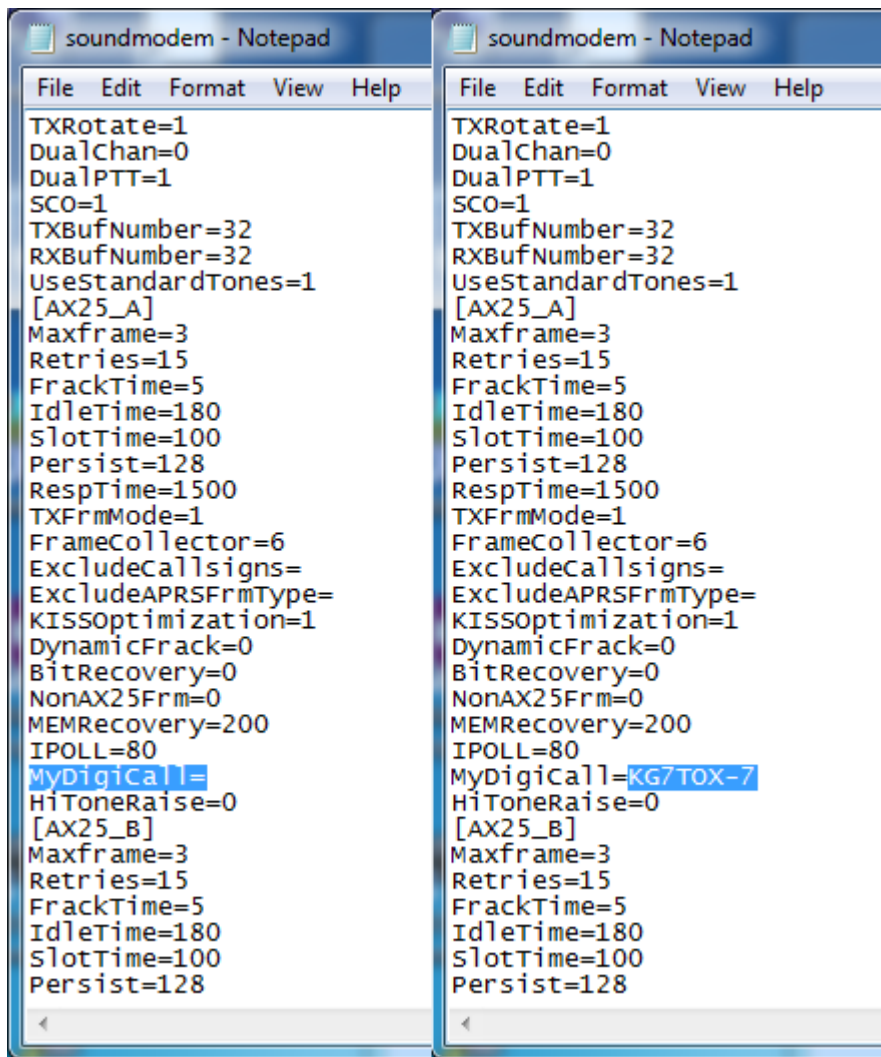To enable this option, simply enter your callsign with an SSID, i.e. KG7TOX-7

SSID is short for Service Set Identifier. In this case, it's a way to have unique variations of your callsign for different purposes, such as a digipeater. It is also more commonly used to identify Wi-Fi network names.

I chose to use -7 for my SSID since I read somewhere that it may have been a standard naming convention for packet digipeaters. It also avoids looking similar to the Winlink gateways that usually start at -10, and may include -11 or -12 for additional stations.

I believe setting it too low may also be an issue with legacy packet routing and personal BBS mailboxes in some TNCs that use an SSID of -1 by default. The important thing is that whatever you choose is a unique and distinct version of your callsign that is not in use somewhere else.

```
soundmodem - Notepad
File  Edit  Format  View  Help
    New              Ctrl+N
    Open...           Ctrl+O
    Save              Ctrl+S
    Save As...

    Page Setup...
    Print...          Ctrl+P

    Exit

Persist=128
RespTime=1500
TXFrmMode=1
FrameCollector=6
ExcludeCallsigns=
ExcludeAPRSFrmType=
KISSoptimization=1
DynamicFrack=0
BitRecovery=0
NonAX25Frm=0
MEMRecovery=200
IPOLL=80
MyDigiCall=KG7TOX-7
HiToneRaise=0
[AX25_B]
Maxframe=3
Retries=15
FrackTime=5
IdleTime=180
SlotTime=100
Persist=128
```
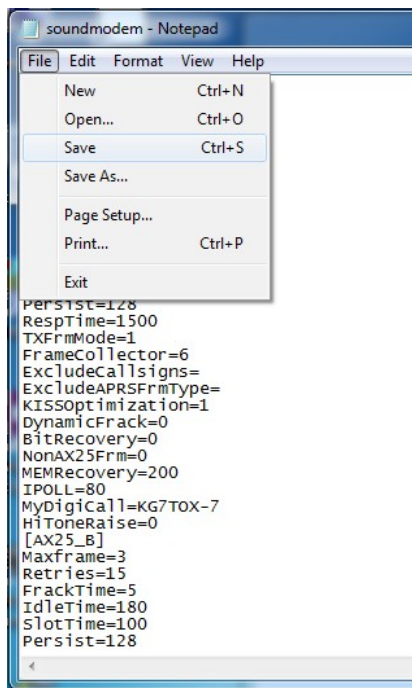
Figure 10: Saving changes to the soundmodem.ini file.

Once you have entered your callsign with an SSID, select File, then Save to save the changes and then close the window.

Your SoundModem program should now be set to digipeat when open and called for by the callsign-SSID you set in the soundmodem.ini options file.

In order to test if everything is working as expected, you will either need someone else with a Winlink station to help you, or a second complete and separate station if you want to check it yourself.

Using a Digipeater with Packet Winlink

Now that you have a station with SoundModem setup to act as a digipeater, here is how to use it with Winlink.

First, select either a Packet Winlink or a Packet P2P session and open it. You should now have an open session window based on what type of session you selected. The following images depict a Packet Winlink session setup.
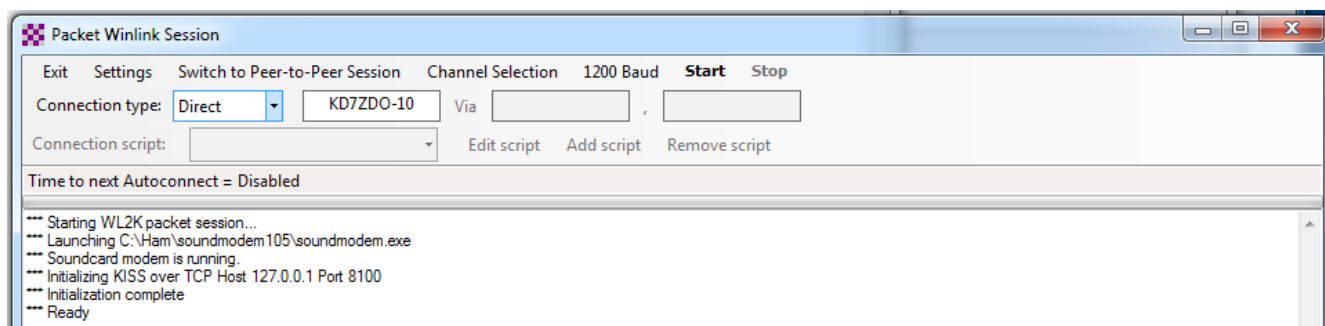

Figure 11: Packet Winlink Session with Direct Connection type.

If you click on the box that is labeled "Direct" at the top far left, you should get a drop down menu with the following options: Direct, Digipeater, Script.
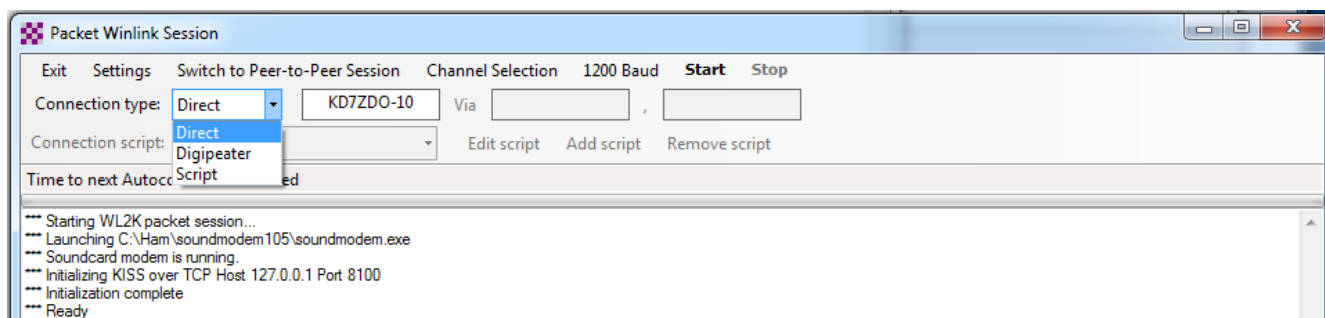

Figure 12: Packet Winlink Session showing Connection type selections.

Select "Digipeater" and you should now notice the two boxes past the word "Via" become active.
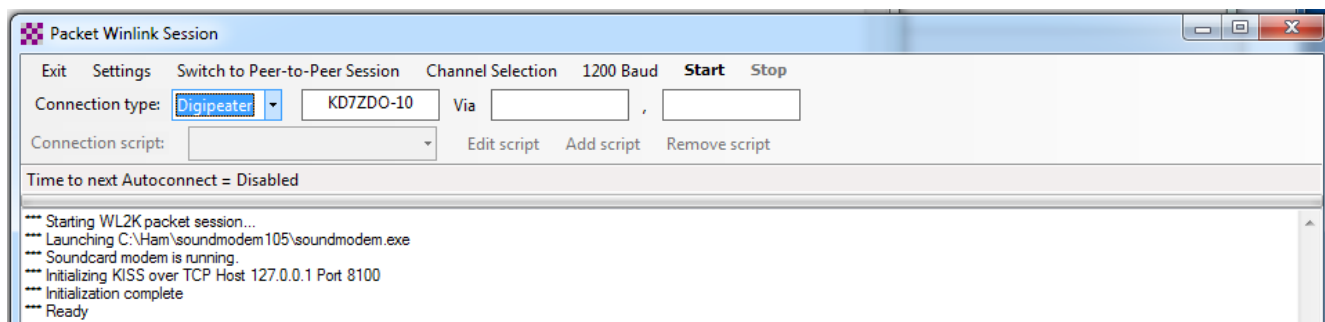

Figure 13: Packet Winlink Session with Digipeater Connection type selected.

The box to the left of "Via" is for the destination or final receiving station. The two boxes to the right of "Via" are for a maximum of two digipeaters that can be addressed in a path between the sending and receiving stations. The first box to the right of "Via" is for the first digipeater. The second box to the far right is for a second digipeater. It may be hard to see, but there should be a small comma that separates the two boxes.

If you are only using one digipeater, then enter its callsign in the first box after the word "Via". Only use the second box on the far right for a second digipeater if you are going to use two of them.

Examples of how this would work:

One Digipeater

KG7TOX <===========> K7TME-7 <===========> KD7ZDO
[Sending Station]   [Digipeater]   [Receiving Station]

This example shows KG7TOX sending Packet P2P traffic to KD7ZDO through the digipeater K7TME-7.

Two Digipeaters

KG7TOX <====> KE7GXC-7 <===> W7MDB-7 <===> KD7ZDO-10
[Sending Station]   [1st Digipeater]   [2nd Digipeater]   [Receiving Station]

This example shows KG7TOX sending Packet Winlink traffic to the gateway station KD7ZDO-10 through two digipeaters, the first one being KE7GXC-7, which then forwards to W7MDB-7, which then passes the traffic to its final destination of KD7ZDO-10.

Packets will move back and forth along this path one hop at a time until the transaction is completed or times out. It should be noted that any errors encountered along the way will NOT get checked by the digipeaters. Only the destination station at the receiving end will error check the message. If the receiving station needs a packet resent, the request will have to move all the way back down the path to the sending station before being sent again.

Each digipeater introduced into the path will double the time it takes for a transaction to complete and effectively half the total throughput. So a message sent through one digipeater will take twice as long compared to a direct connection, while a message sent through two digipeaters will take four times as long and will have a quarter of the throughput compared to a direct connection.

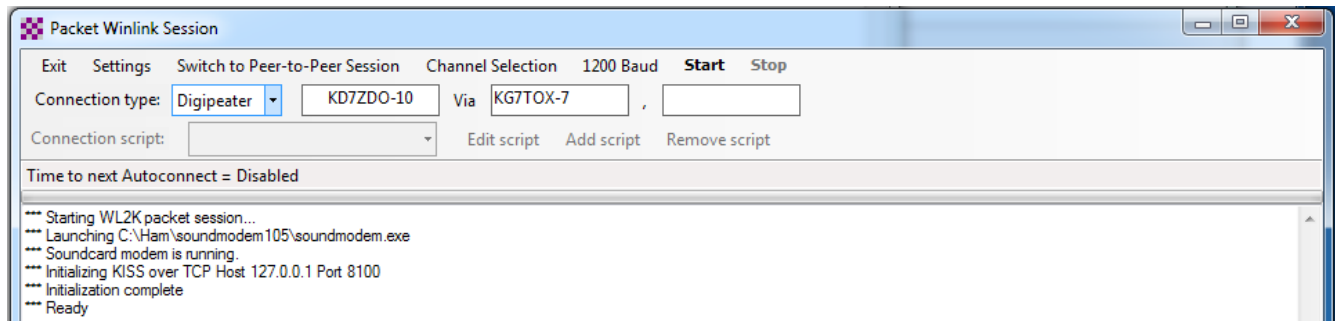Your setup should now look like this for use with a single digipeater:

Figure 14: Packet Winlink Session setup to connect to gateway KD7ZDO-10 through digipeater KG7TOX-7.

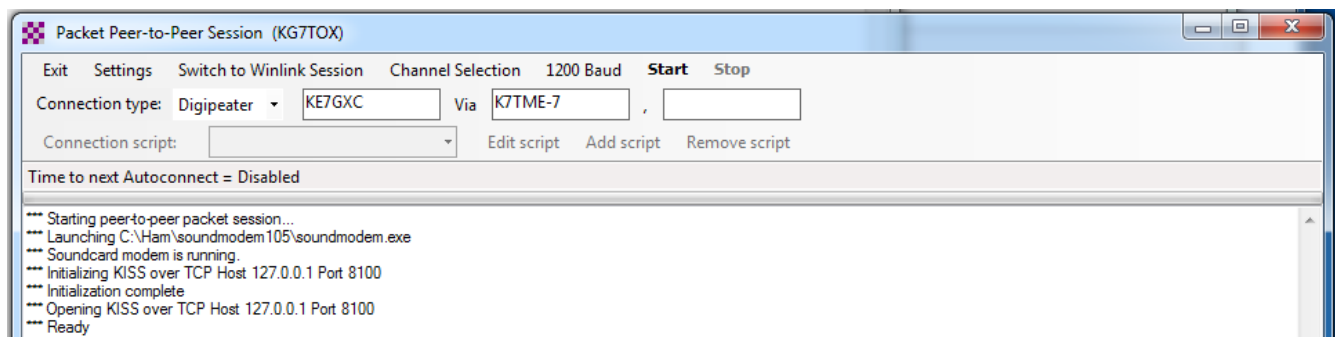An example of a Packet Peer-to-Peer session setup to use a digipeater:

Figure 15: Packet Peer-to-Peer Session setup to connect to KE7GXC through digipeater K7TME-7.

Note: In a Packet Peer-to-Peer Session if you select the Channel Selection menu, you will see a list of stations that you have previously sent traffic, including any combinations of digipeaters addressed in-between. This may be useful for recalling past setups if they need to be reused frequently.

Once you are setup correctly, select Start and everything else should be automatic. Winlink will begin sending and receiving traffic through the digipeating station to reach the destination station or gateway.

To receive Packet P2P traffic via digipeater, you will not have to do anything different from normal session use. It does not matter what stations are entered into any of the "Connection type" boxes to just receive. Only the sending station initiating a connection will have to set up the session as described above.

Note that a digipeater station cannot receive traffic via its own digipeater. Example: W7TOX via W7TOX-7 will not work on the same station.

At a minimum only the SoundModem program itself needs to be running for a digipeater station. If you see the message "KISS port is busy" you may have more than one instance of SoundModem running. You should only have one SoundModem session running at a time.

Related Links

CARES Website:
http://clackamasares.org/

CARES SoundModem setup document:
http://clackamasares.org/wp/wp-content/uploads/2019/04/SoundModem-Installation-rev-4.pdf

SoundModem Website:
http://uz7.ho.ua/packetradio.htm

SoundModem Manual:
http://uz7.ho.ua/modem_beta/user_guide_v105_EN.pdf

Winlink Express:
https://winlink.org/WinlinkExpress

Revision History

Version 1.0 initial public release

If you find any errors or have any suggestions to improve the quality of this document, please let us know by sending feedback through the link below:
http://clackamasares.org/comments-contact/

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K7TME Larry Bever and NL7GN Jerry Crosby for initial testing.
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W7MDB Mitch Bayersdorfer for additional feedback.

Winlink/SoundModem Digipeater Modes Cheat Sheet
Author: Arnie Chase W7CRI with help from Danny Phelps KG7TOX; Clackamas County Oregon ARES or CARES

Purpose of this cheat sheet is to exploit the digipeater modes in Winlink via the UZ7HO SoundModem. Experience with Winlink and the SoundModem is required as well as current releases to use this Cheat Sheet. Ver:1.5 4/14/20

1) **Digipeat Peer-to-Peer**
   a) In Winlink '**Open Session**' => 'Packet P2P'; set radio to desired frequency for P2P traffic, not gateway
   b) Change '**Connection type**' from 'Direct' to 'Digipeater'; next on the same line:
   c) Enter the destination call letters in the first box (to the left of the '**Via**'); cannot be the digipeaters station
   d) Enter the digipeater call letters in the second box (1st box to the right of the '**Via**')
   e) Optional: 2nd digipeater enter in third box (2nd box to the right of the '**Via**')
   f) Push the '**Start**' button to send the appropriate P2P Winlink traffic via a digipeater(s)
   g) Once you have used the to and via box entries in the session window they, are stored in the 'Packet P2P Channel Selector' and can be accessed by the 'Channel Selection' button then double click on previous peer or digipeater entries.
   h) Next, here is an example (Note: KD7ZDO is a real "Peer" but W7AAA-7 and W7BBB-7 are made up):
      i) Compose a test message to send to peer KD7ZDO
      ii) Send a message To: KD7ZDO, Send as: 'Peer-to-Peer Message' and Post to Outbox
      iii) Open a 'Packet P2P' Session, set type to 'Digipeater', to "KD7ZDO" Via "W7AAA-7", "W7BBB-7"
      iv) After pressing 'Start' the message to KD7ZDO would digipeat via W7AAA-7 and then W7BBB-7
      v) This is only an example but KD7ZDO could be used as a real peer to test with, set radio for 145.52
2) **Digipeat to a Gateway**
   a) In Winlink '**Open Session**' => 'Packet Winlink'; set radio to desired frequency for gateway traffic; see: 2)g)
   b) Change '**Connection type**' from 'Direct' to 'Digipeater'; next on the same line:
   c) Enter the gateway destination call letters in the first box (left of the '**Via**'), use 'Channel Selection' table
   d) Enter the digipeater call letters in the second box (1st box to the right of the '**Via**')
   e) Optional: 2nd digipeater enter in third box (2nd box to the right of the '**Via**')
   f) Unlike the 'Packet P2P' session the 'Packet Winlink' session's 'Packet Channel Selector' does not store any 'Digipeater' 'Via' entries, only the gateway table that you download via internet or radio
   g) Make sure radio is set to correct gateway frequency, reference 'Packet Channel Selector' window table.
   h) Push the '**Start**' button to send the gateway messages via digipeater
   i) Here is an example (Note: KD7ZDO-10 is a real "Gateway" but W7AAA-7 and W7BBB-7 are made up):
      i) Compose a test message to send to a peer (say your email address) via a gateway (say KD7ZDO-10)
      ii) Send message To: "your@e-mail", Send as: 'Winlink Message' and Post to Outbox
      iii) Open a 'Packet Winlink' Session, set type to 'Digipeater', to "KD7ZDO-10" Via "W7AAA-7", "W7BBB-7"
      iv) After pressing 'Start' the message to KD7ZDO would digipeat via W7AAA-7 and then W7BBB-7
      v) This is only an example but KD7ZDO-10 could be used as a real gateway to test with, set radio for 145.57 and check your e-mail app for a successful connection
3) **Setting up a station as a Digipeater with UZ7HO Soundmodem Software**
   a) Before proceeding, make sure SoundModem by UZ7HO is not running, otherwise edits may be deleted
   b) Find the soundmodem.ini file, make a backup copy of it with a different name (say soundmodem_copy.ini)
   c) Open the .ini file with a text editor like Notepad on a PC (do not use a document editor)
   d) Find the first instance of 'MyDigiCall=' which is between lines [AX25_A] and a few lines above [AX25_B]
   e) Edit this line; after the equal sign add your call with "-7" appended
   f) As an example the edit should end up looking something like this: "MyDigiCall=W7AAA-7"
   g) Save to original 'soundmodem.ini' file
   h) To use your station as a digipeater for Winlink traffic, you only need to have the UZ7HO Soundmodem software running and a radio connected and tuned to the desired frequency of operation.
   i) Optionally Winlink can be opened for use but externally someone using your station as a digipeater cannot send you P2P traffic via your digipeater; example: to W7AAA via W7AAA-7 will not pass traffic to W7AAA