The Latest

2m FT8 on January 5th 2023

Up

Posted by AG6QV Frank
Tags: HAM

I found out earlier in the week that there is FT8 activity in the PNW area on the 2m band (144.174 MHz). I made an entry in my calendar to make sure I would at least listen to see if I could hear anyone. It should be noted that I live in a forest with ~100 ft tall trees all around and a hill blocking most traffic to the east. My antenna setup is also far from optimal for 2m SSB as I only have a dual-band vertical placed on a 4 foot pole on the top of my garage.

I tuned in about 30 min before the scheduled time and to my surprise the first station was already calling CQ. After just 3 attempts I was able to make contact and complete the QSO. Another one came in about 30 min later and then traffic increased fast. I was able to make 8 contacts from CN87 and CN88, including one in Canada and I heard a station in CN85 (Oregon) but was not able to make that contact. After an hour or so of good fun I'll return to the HF bands until the next event.

Link to this Post

Hamshack Hotline - Asterisk PBX

Up

Posted by AG6QV Frank
Tags: HAM

I've been using Asterisk PBX for a long time. It allows us to have multiple phone numbers, including a number in Denmark that all goes to the same phone system. When a fellow HAM pointed me to HamShack Hotline I wanted to expand my existing phone system and enable incoming and outgoing phone calls on the network to and from my HAM shack without adding any new hardware.

The process stared by requesting an new truck to be created on the HamShack Hotline network. This is done by creating a support ticket. The same process is used to obtain a number that can be used with a SIP phone.

A few days later I received an email with my new phone number, my secret password and the endpoint to connect my PBX to. Configuration of the system was to use the IAX protocol (or rather the IAX2 protocol) to connect my Asterisk PBX system to the system operated by HamShack Hotline. This sounds simple but since this was the first time I had to configure this type of connection I needed to do some research and as it turns out a bit of experimentation to get all the setting correct, especially since my PBX system is behind a firewall I needed to configure port forwarding to allow traffic originating from the outside to reach my server.

The first step was to enable port forwarding of the IAX2 protocol and to allow access to the same port from my internal network. The IAX2 protocol uses a single UDP port (4569) for all communication which makes the configuration simple. On the Linux server running the Asterisk PBX software I used these command to enable the port:

firewall.txt

```
sudo firewall-cmd --add-port=4569/udp --permanent
sudo firewall-cmd --reload
```

Then it was time to configure the trunk and extensions. Asterisk use a number of different configuration files, all located in /etc/asterisk (the default directory for configuration files) In this case there are two files that require changes: iax.conf and extensions.conf.

iax.conf

```
; HamShack Hotline Configuration
; Extension 12033 should be replaced with your extension
; Replace ***** with the secret provided by HamShack Hotline

register => 12033:*****@hhus.wizworks.net

[hamshack]
type = friend
host = hhus.wizworks.net
trunk = yes
username = 12033
secret = *****
context = hamshack
```

```
codecpriority = host
transfer = no
callerid = asreceived
deny = 0.0.0.0/0.0.0.0
permit = 144.202.54.216/255.255.255.255
```

extensions.conf

```
; Configure this section to dial
; replace ##### with your extension
; replace <extension> with your own extension
; replace <voicemail> with your own voicemail address

[hamshack]
exten => #####,1,GotoIfTime(8:00-22:00,*,*,*?open)
    same => n,Voicemail(<voicemail>)
    same => n,Hangup()
    same => n(oepn),Dial(<extension>, 30)
    same => n,Hangup()

; This section configures asterisk to use HamShack for outgoing numbers
; but only for 4 and 5 digit numbers and 3 digit numbers starting with 3
; replace "AG6QV" <12033> with your callsign and extension

[outbound]
...
 exten => _XXXXX,1,Set(CALLERID(all)="AG6QV" <12033>)
    same => n,Dial(IAX2/hamshack/${EXTEN})
 exten => _XXXX,1,Set(CALLERID(all)="AG6QV" <12033>)
    same => n,Dial(IAX2/hamshack/${EXTEN})
```

After making these changes to the Asterisk configuration I was able to make calls to the HamShack Hotline system but I could not receive incoming calls. Instead of waiting on someone to call me I tried to call my own extension from another phone on my system. I got the same error but now had a way to debug the system. Enabling IAX debugging on the Asterisk console revealed the problem. As seen in the output below the incoming call was trying to connect to and extension called 's' and my system was only configured with the 12033 extension I was given by HamShack Hotline.

iax.conf

```
debug => yes

Rx-Frame Retry[ No] -- OSeqno: 000 ISeqno: 000 Type: IAX     Subclass: NEW
   Timestamp: 00082ms  SCall: 06456  DCall: 00000 144.202.54.216:4569
   VERSION         : 2
   CALLED NUMBER   : s
   CODEC_PREFS     : (ulaw|alaw|gsm)
   CALLING NUMBER  : 12033
   CALLING PRESNTN : 1
   CALLING TYPEOFN : 0
   CALLING TRANSIT : 0
   CALLING NAME    : AG6QV Trunk
   LANGUAGE        : en
   FORMAT          : 4
   FORMAT2         : ulaw
```

```
CAPABILITY      : 14
CAPABILITY2     : Unknown
ADSICPE         : 2
DATE TIME       : 2021-04-12  12:27:58
CALLTOKEN       : 51 bytes
```

In order to fix this I added a new extension to my dial plan. This small change made incoming calls working. The hack works since I only have one extension on the HamShack Hotline network and there might be a better way of changing the configuration.

I created a support ticket with HamShack Hotline to verify if there was anything on their end that might fix the issue. I received phone calls from two different support engineers but they were not able to point me to a solution or to make any suggestions to changes I could make to my configuration. Since the system is able to bot make and receive phone calls I can live with the hack on using an extension called s. I'm not the only one with similar problems. I found this discussion about the topic but the suggested fix does now work and I already have that setting on my system.

Link to this Post

HackRF One

Up

Posted by AG6QV Frank
Tags: GNU Radio | HackRF One | PNW Microwave

The November meeting in the PNW Microwave group was used to discuss Gnu Radio and HackRF One. We installed the Windows version of Gnu Radio (binaries can be found here). To verify the installations we used a flowgraph for a narrow band FM receiver.

After the meeting John (W7FU) was inspired to install the latest version of GNU radio and he created 3 flowgraphs. I modified these to be used with HackRF One by adding the OsmoSDR versions of sink and source. I disabled the UHD:USRP versions but left them in the flowgraph for reference.

SSB filter simulation

This flow graph does not require any external hardware. This simulator visualize the USB, LSB or CW signal in the frequency domain. The first image below shows the flowgraph and the second is a screen shot of the output.

SSB filter simulation

SSB filter simulation output

Wide spectrum receiver

This flowgraph generates a very simple receiver and show the frequency spectrum. The HackRF One is limited to a 10 MHz bandwidth but with the use of the variables and GUI controls it can be used to show the spectrum anywhere from 10 MHz to 6GHz. A handy little spectrum analyzer although the sensitivity of the HackRF device is not that great and my version is installed in a plastic box allowing RF to get injected anywhere on the circuit board.

Wide spectrum receiver

Signal Generator

The signal generator is also very simple. It consists of a signal source and a sink (the component that communicate to the hardware. I tested this by tuning my handheld FM receiver to the same frequency and adjusting the drive until I was able to hear the signal. This can also be used on any frequency form 10 MHz to 6GHz with the HackRF One device.

Signal generator

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