

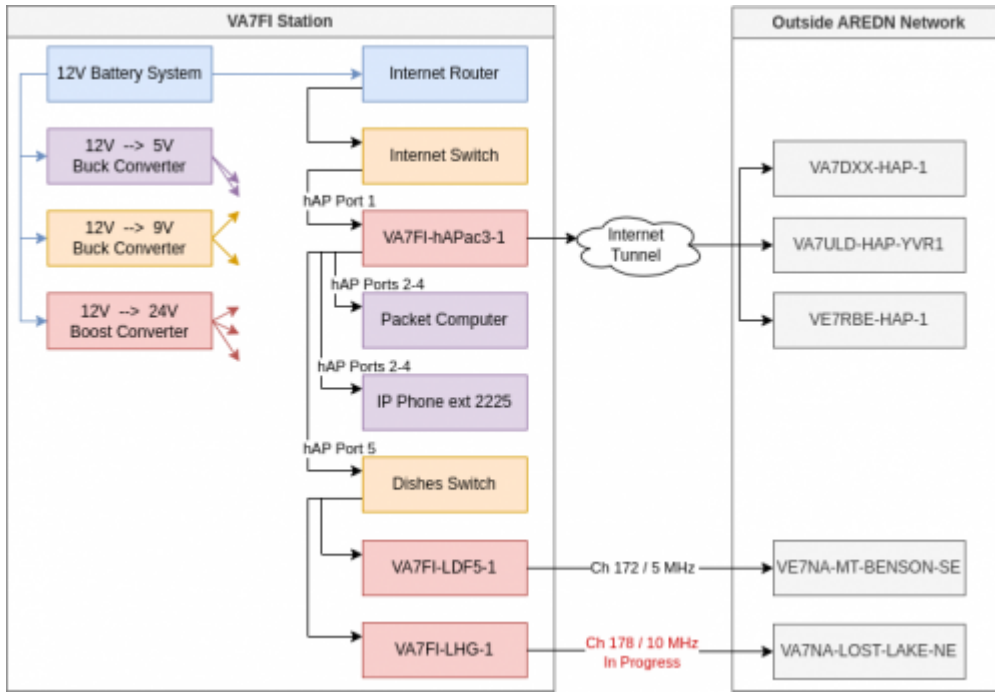
# Patrick (VA7FI)

The goal is for my computers and IP phone<sup>1)</sup> to connect to other AREDN nodes. Currently, I achieve this via two different paths:

1. via internet tunnels to VA7DXX, VA7ULD, and VE7RBE (which is not really ham radio), and
2. via the 5.8 GHz band to one of the Mount Benson nodes on Vancouver Island.

My system also runs off of 12 V batteries so it (and my internet connection) continues to work during power outages. To easily connect different equipment in different ways, I created a “patch panel” using ethernet female-female connectors:





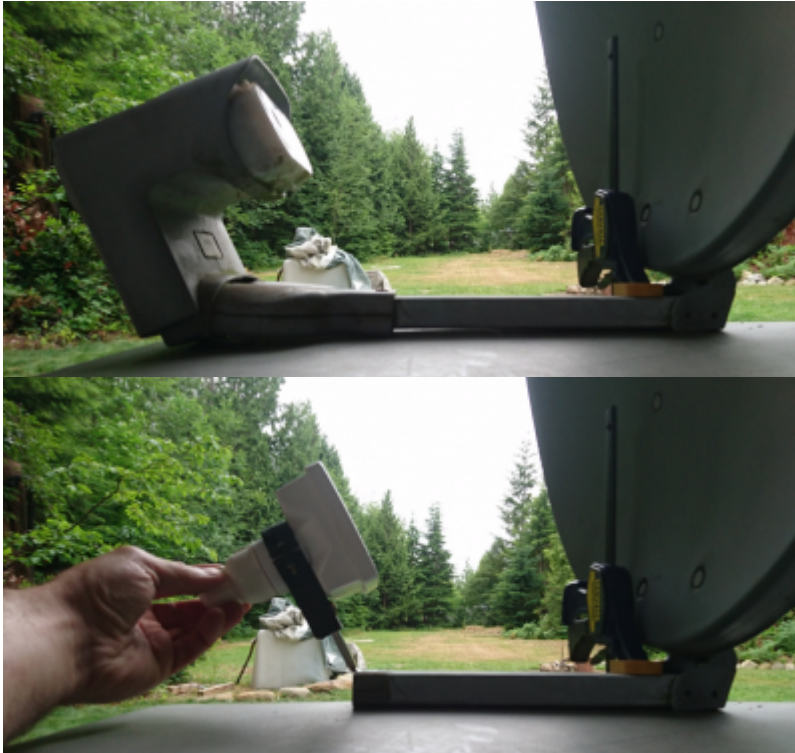
In the default configuration, everything is connected to the hAP. But I can very quickly connect my Winlink computer or the phone directly to the dishes to ensure I'm using RF.

## July 1, 2021

I installed a Mikrotik LDF-5 (the n model, not the ac model) on a used TELUS satellite TV dish.

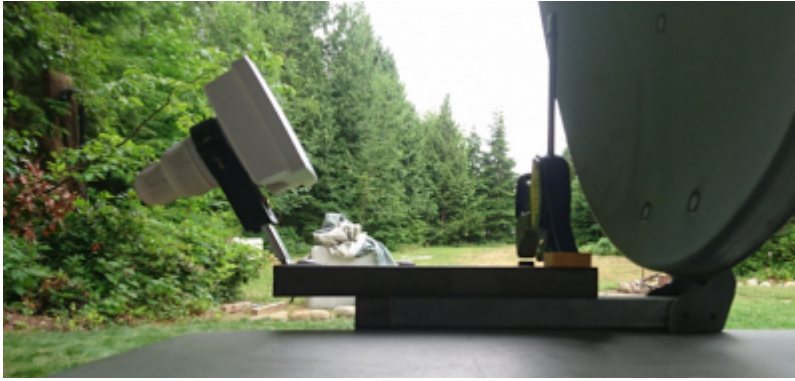
- The first task was to mount the LDF-5 to the dish roughly where the old receiver was. Unfortunately, the arm and the LDF-5 mounting bracket were both a bit too short so the LDF-5 was too close to the dish, and it was too low:





- So I bolted a second arm on top of the first to raise the LDF-5 and move it a bit further away:





- Initially, the dish was mounted on a post with a 45° angle, but after field testing it, it was found to be a bit much (an angle of 20° would be ideal, but I used a vertical post later).

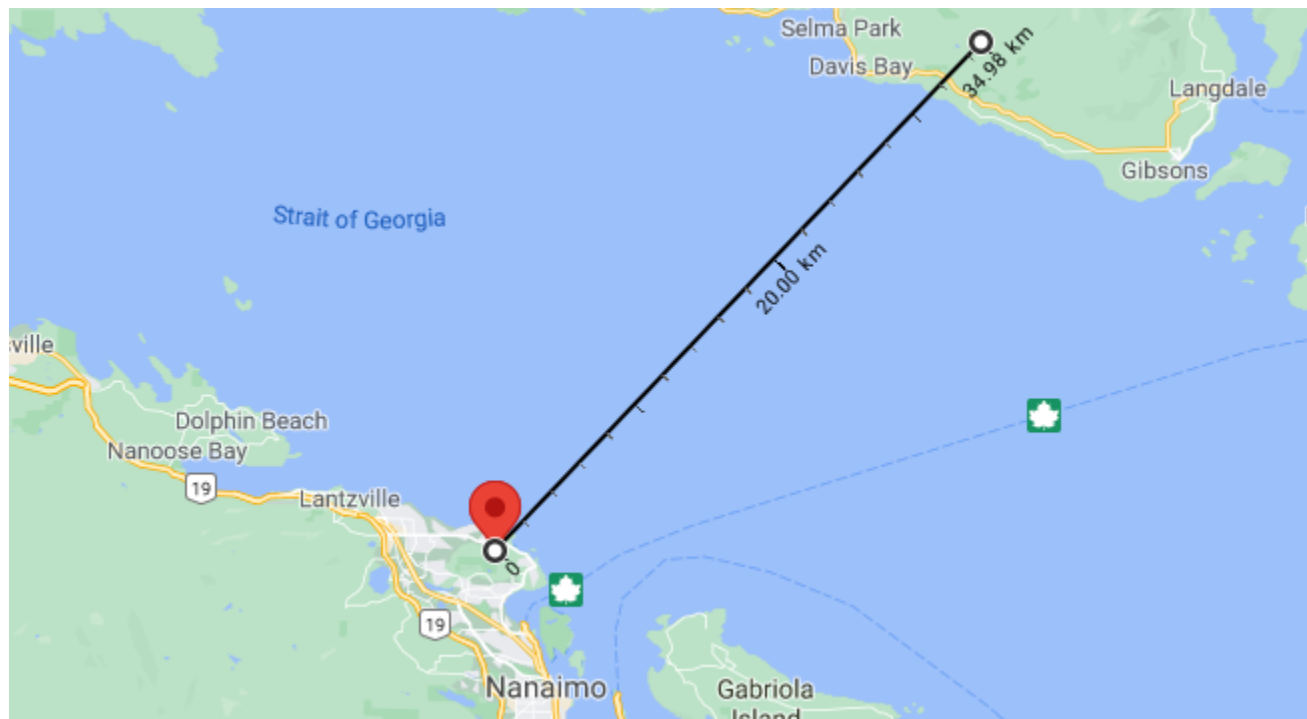


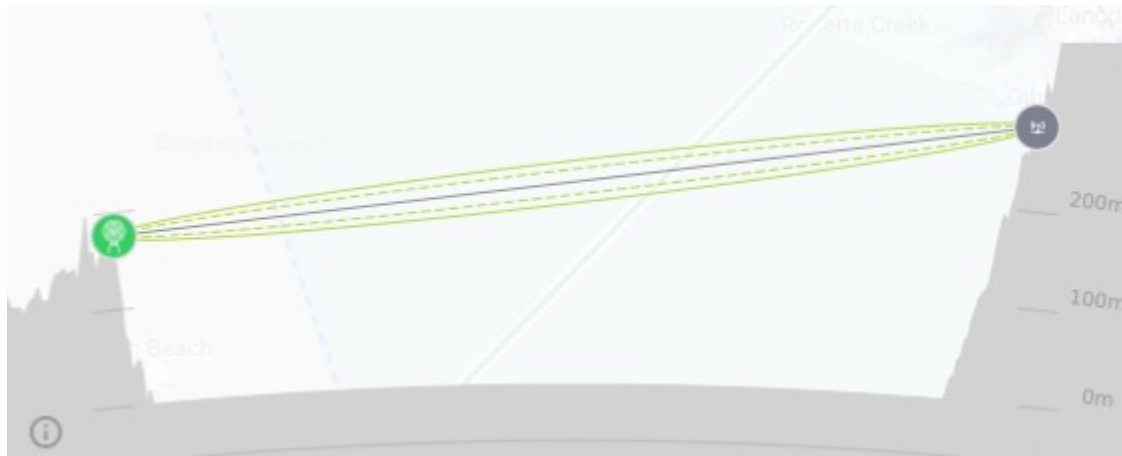




## July 4, 2021 Test

A few days later, Chris (VE7TOP) and I made a successful connection on 5.860 GHz (Ch. 172) between Nanaimo (49.227263, -123.975836) and Roberts Creek (49.45465, -123.64199): a distance of 35 km.





- Here's my setup and the view from the dish. The red circle marks the spot where Chris is. The [log periodic](#) was so Chris and I could talk on VHF to perform the adjustments.





- Here are my settings:

A screenshot of a network configuration web interface. The interface has a dark background with white text and buttons. At the top, there are navigation tabs: Node Status, Basic Setup, Port Forwarding, DHCP, and Services, Tunnel Server, Tunnel Client, Administration, and Advanced Configuration. Below the tabs are buttons for Help, Save Changes, Reset Values, Default Values, and Reboot. The main configuration area is divided into three columns: Mesh RF, LAN, and WAN. The Mesh RF section has fields for Enable (checked), IP Address (10.171.240.5), Netmask (255.0.0.0), SSID (AREDN), Channel (172 (5860)), and Channel Width (5 MHz). The LAN section has fields for LAN Mode (5 host Direct), IP Address (10.95.128.41), Netmask (255.255.255.248), DHCP Server (checked), DHCP Start (42), and DHCP End (46). The WAN section has fields for Protocol (DHCP), DNS 1 (8.8.8.8), and DNS 2 (8.8.4.4). There are also checkboxes for Advanced WAN Access: Allow others to use my WAN and Prevent LAN devices from accessing WAN. At the bottom of the Mesh RF section, there are fields for Tx Power (23 dBm) and Distance to FARTHEST Neighbor (0.00 mi).

- For the first test, Chris used a dish ( : add details). After adjusting the dish's directions and elevations, the best signal strength I received was above -60dBm (which is pretty impressive!) with an SNR of over 35dB:

# VA7FI-LDF5-1

Location: 49.43316 -123.65199

Roberts Creek, BC

[Help](#)

[Refresh](#)

[Mesh Status](#)

[WiFi Scan](#)

[Setup](#)

[Select a theme](#) ▼

Wifi address 10.171.240.5 / 8

Signal/Noise/Ratio -60 / -95 / 35 dB

[Charts](#)

LAN address 10.95.128.41 / 29

firmware version 3.21.4.0

WAN address none

system time Sat May 8 2021  
20:53:14 PDT

default gateway none

uptime 8 min  
load average 0.56, 0.19, 0.08

SSID AREDN-20-v3

flash = 8824 KB  
free space /tmp = 29940 KB  
memory = 44540 KB

Channel 172

Bandwidth 20 Mhz

OLSR Entries Total = 6  
Nodes = 2

## VA7FI-LDF5-1

[Archive](#) [Realtime](#) [Quit](#)

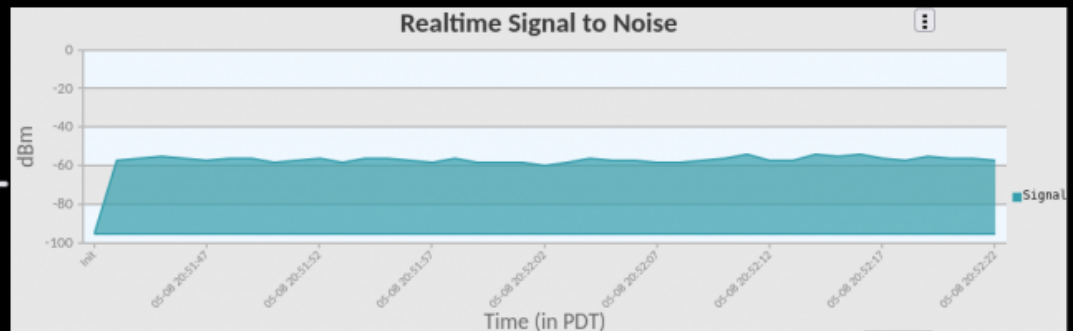
Selected Device: Average signal for all connected stations ▼

SNR: 38dB

Sound:  On  Off

Pitch:

Volume:



# VA7FI-LDF5-1 mesh status

**Location: 49.43316 -123.65199**

Roberts Creek, BC

Refresh   Auto   Quit

Local Hosts	Services	Current Neighbors	LQ	NLQ	TxMbps	Services
VA7FI-LDF5-1		<u>VE7NA-ROCKETM5-1</u>	75%	100%	23.2	


  

Remote Nodes	ETX	Services	Previous Neighbors	When
<u>VE7TOP-HAP1</u>	1.44		none	

**OLSR Entries**

Total	6
Nodes	2

- For the second test, Chris switched to a 120° sector antenna (: add details). Here, the best signal strength I received was a bit above 80dBm with with an SNR of about 17dB:

# VA7FI-LDF5-1

Location: 49.43316 -123.65199

Roberts Creek, BC

[Help](#)

[Refresh](#)

[Mesh Status](#)

[WiFi Scan](#)

[Setup](#)

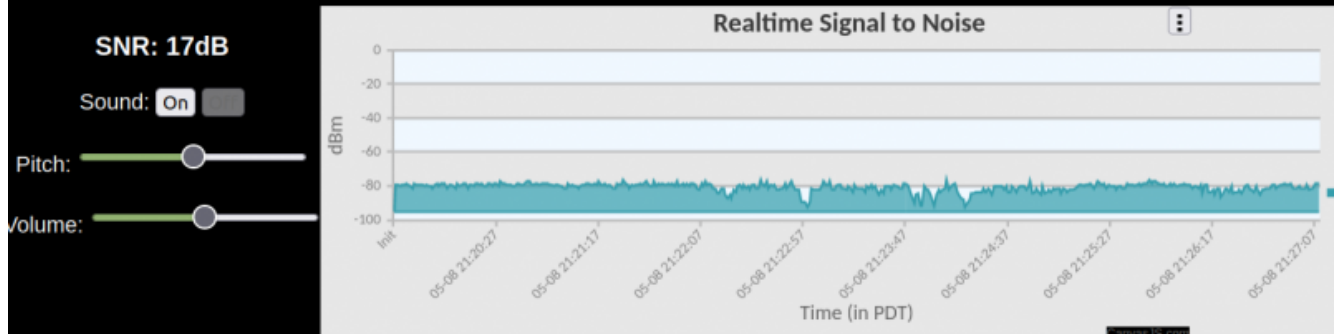
[Select a theme](#) ▼

<b>Wifi address</b>	10.171.240.5 / 8	<b>Signal/Noise/Ratio</b>	-79 / -95 / 16 dB	<a href="#">Charts</a>
<b>LAN address</b>	10.95.128.41 / 29	<b>firmware version</b>	3.21.4.0	
<b>WAN address</b>	none	<b>system time</b>	Sat May 8 2021 21:27:30 PDT	
<b>default gateway</b>	none	<b>uptime</b>	22 min	
<b>SSID</b>	AREDN-5-v3	<b>load average</b>	0.14, 0.25, 0.18	
<b>Channel</b>	172	<b>free space</b>	flash = 8824 KB /tmp = 29940 KB memory = 45048 KB	
<b>Bandwidth</b>	5 Mhz	<b>OLSR Entries</b>	Total = 6 Nodes = 2	

# VA7FI-LDF5-1

[Archive](#) [Realtime](#) [Quit](#)

Selected Device: VE7TOP-8-ROCKETM5-1.local.mesh ▼



# VA7FI-LDF5-1 mesh status

**Location:** 49.43316 -123.65199  
Roberts Creek, BC

Local Hosts	Services	Current Neighbors	LQ	NLQ	TxMbps	Services
VA7FI-LDF5-1		VE7TOP-8-ROCKETM5-1	100%	89%	0.0	

Remote Nodes	ETX	Services	Previous Neighbors	When
VE7TOP-HAP1	1.23		VE7NA-ROCKETM5-1	15 minutes ago

These two tests show that it is possible to establish a connection between Nanaimo and the Sunshine Coast. The 120° sector antenna might be pushing it a little bit, but a 60° sector antenna would be enough to cover Gibsons through Halfmoon Bay and would offer an additional 4dB of gain over the 120° sector antenna.



## Aug 1, 2021

Today, I managed to install my AREDN dish up the tree, run the CAT5 to the house, and connect it to the HAP. I started working at 7:45 this morning and finished around 5pm (after climbing up and down three times).

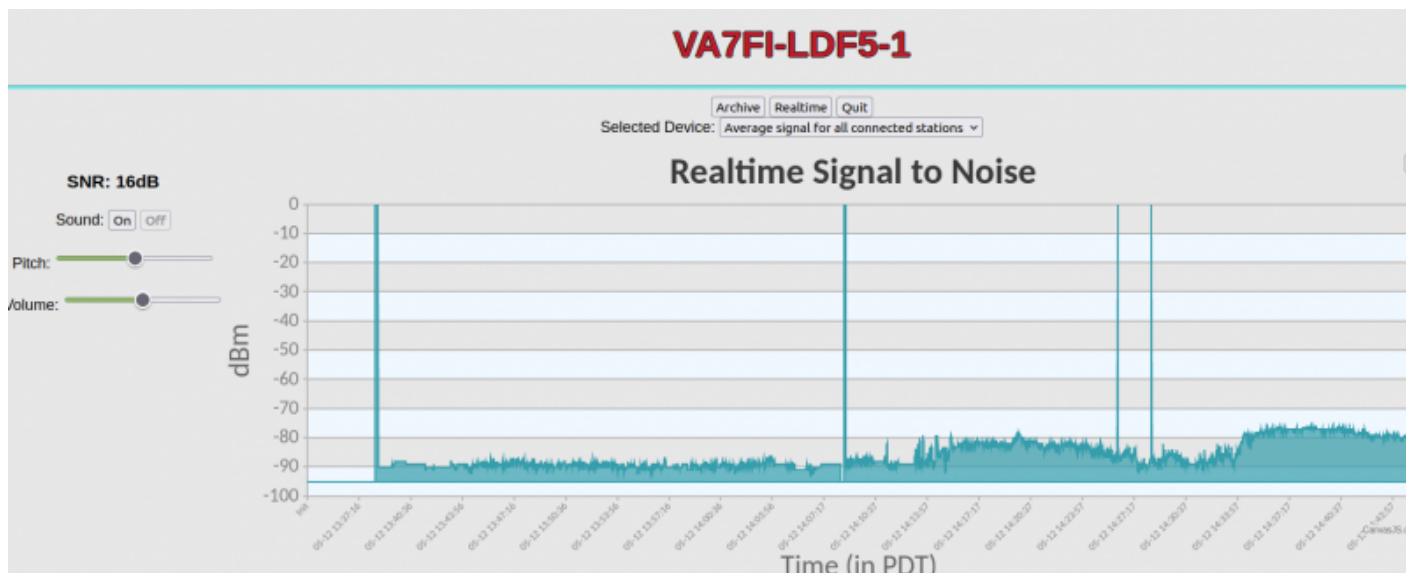
I aimed the dish roughly towards Mount Benson (222°), but unfortunately, I didn't manage to make a connection to the node there.



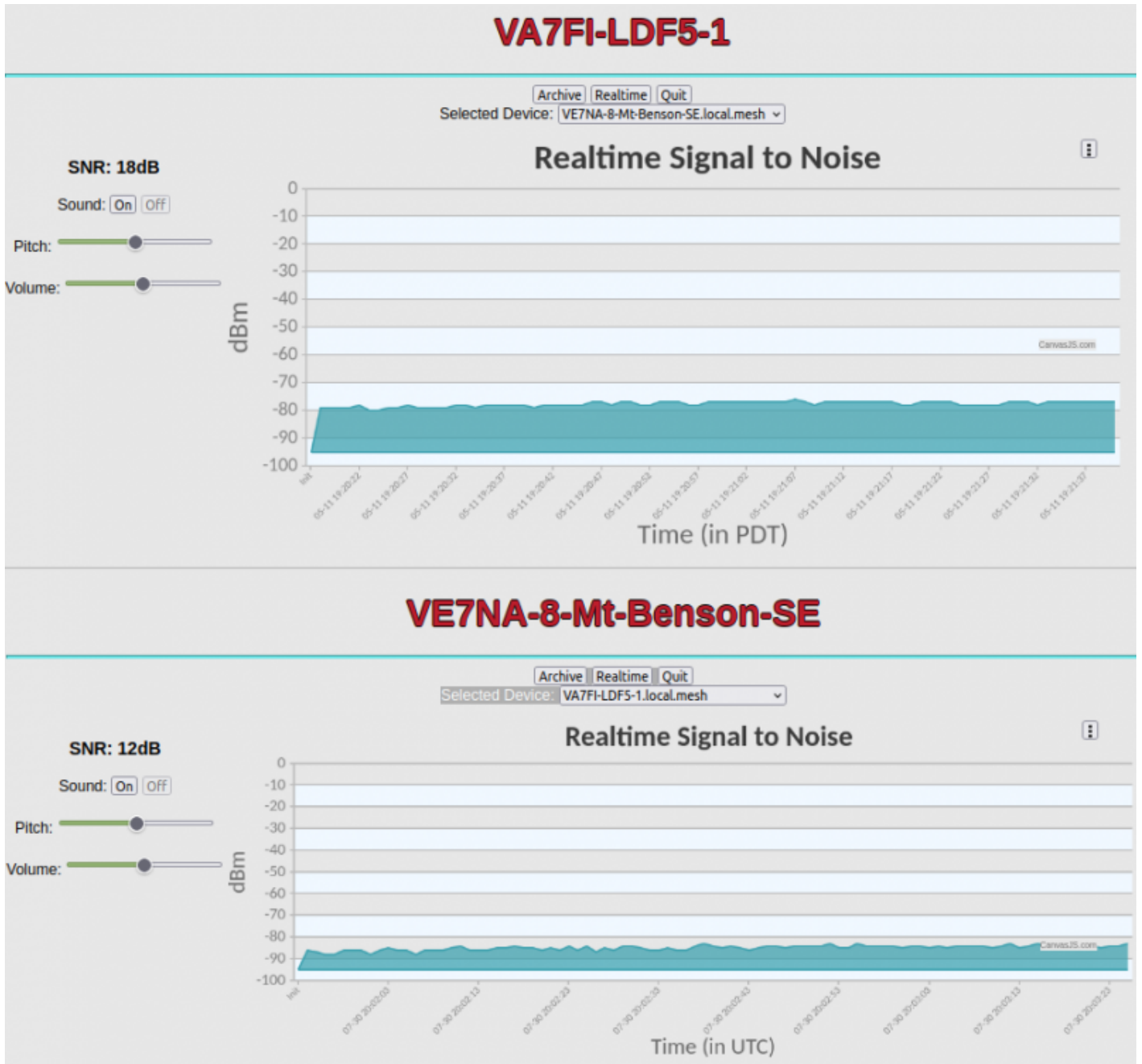


## Oct 31, 2021

Yesterday, the folks on the Island went back to Mount Benson and adjusted the tilt on their antennas. After the adjustment, I started getting an intermittent signal. So today, I went back up the tree and used that signal to fine-tune the adjustment of my dish and managed to squeeze an extra 5-10 dB! Here's a graph of the signal before, during, and after the adjustment:



Unfortunately, it looks like I can hear the Mount Benson node 6-7 dB more strongly than it can hear me. I'm transmitting at 25 dBm. The equipment on mount Benson can transmit at 27 dBm.<sup>2)</sup>



Here's the status report pages for both nodes. It looks like I might be able to reach 1.6 Mbps, which is pretty impressive compared to VHF packet, but still pretty slow compared to the other stations.

# VA7FI-LDF5-1 mesh status

Location: 49.43316 -123.65199  
Roberts Creek, BC

Local Hosts	Services	Current Neighbors	LQ	NLQ	TxMbps	Services	
VA7FI-LDF5-1		<a href="#">VA7FI-HAP-1</a> (dtd)	100%	100%			
		<a href="#">VE7NA-8-Mt-Benson-SE</a>	100%	40%	1.6		
Remote Nodes	ETX	Services	Previous Neighbors				When
<a href="#">VE7NA-3-Mt-Benson-NE</a>	2.62						

# VE7NA-8-Mt-Benson-SE mesh status

Location: 49.149815 -124.050796  
Mount Benson 120 Degree Sector South East BW 5  
Mhz CH 172

Local Hosts	Services	Current Neighbors	LQ	NLQ	TxMbps	Services	
VE7NA-8-Mt-Benson-SE		<a href="#">VA7DXX-BENSON-LINK</a>	92%	100%	19.5		
		<a href="#">VA7FI-LDF5-1</a>	56%	100%	6.5		
Remote Nodes	ETX	Services	Previous Neighbors				When
<a href="#">VE7GDE-HAP-1</a>	1.10						
		<a href="#">VE7GDE-BENSON-LINK</a>	100%	100%	22.0		
		<a href="#">VE7NA-3-Mt-Benson-NE</a> (dtd)	100%	100%			
		<a href="#">VE7ODG-BENSON-LINK</a>	63%	100%	4.9		

## Sept 29, 2022

This afternoon, Chris (VE7TOP), Devan (VE7LSE) and I ran a few tests with a 60° sector antenna in Nanaimo and an LHG dish in Roberts Creek:



The results were very promising:

The sector antenna was at 24 dB SNR:

While point-to-point with another dish was 38 dB SNR:

### VA7FI-LHG-1 WiFi scan

Stop Quit

SNR	Signal	Chan	Enc	SSID	Hostname	MAC/BSSID	802.11 Mode
24	-71	178		AREDN-5-v3	VE7TOP-RocketM5-3	04:18:D6:AA:7B:AE	Connected Ad-Hoc Station

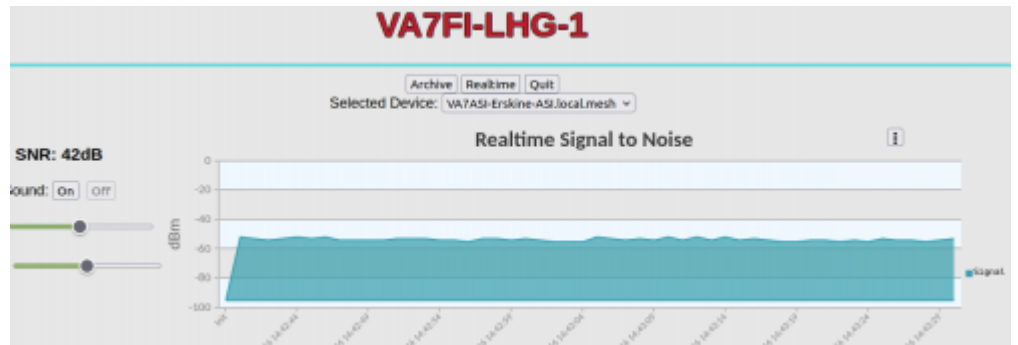
### VA7FI-LHG-1 WiFi scan

Refresh Auto Quit

SNR	Signal	Chan	Enc	SSID	Hostname	MAC/BSSID	802.11 Mode
38	-57	135		AREDN-5-v3	VE7TOP-RBLHD5HPNDx1	2C:C8:1B:DC:3E:B8	Connected Ad-Hoc Station

While I was there, I scanned the portion of the Island that I could see for other signals and was incredibly surprised that I could connect to a few other stations. From south to north:

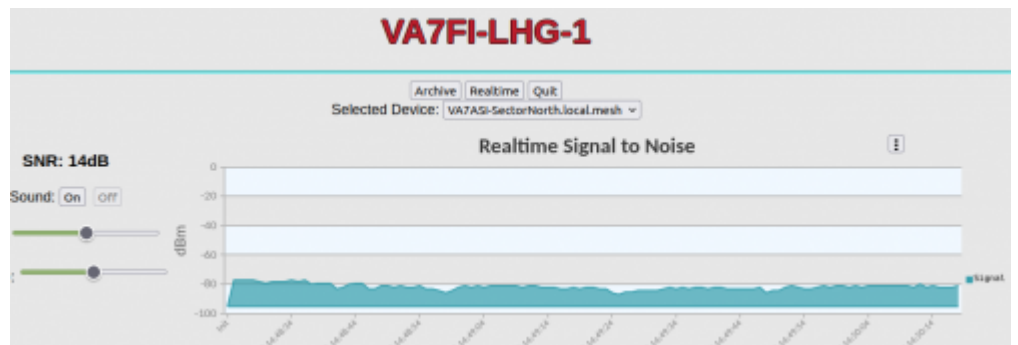
### VA7ASI-Erskine-ASI



- Ch: 140
- Bearing: 217°

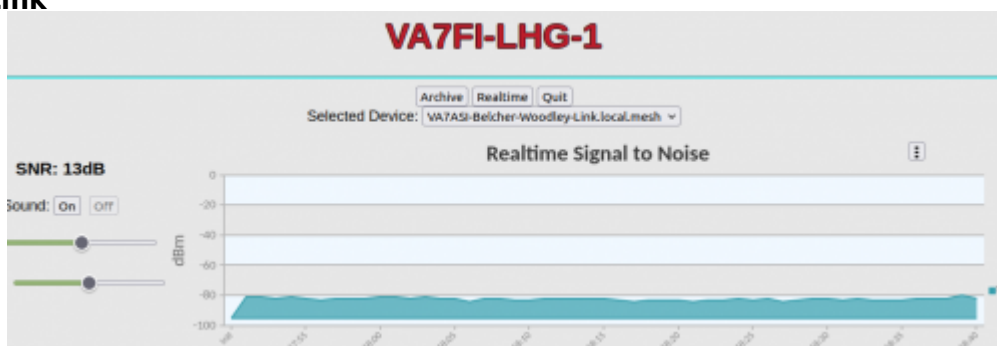
- SNR: 42 dB 🙄 ! !

### VA7ASI-SectorNorth



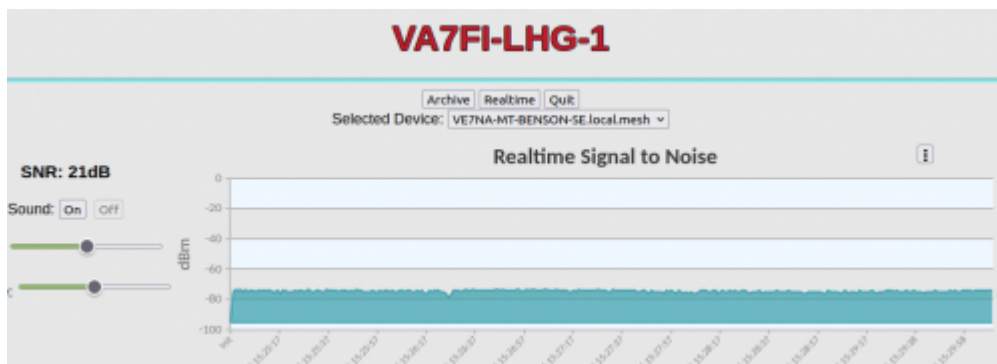
- Ch: 133
- Bearing: 219°
- SNR: 14 dB

### VA7ASI-Belcher-Woodley-Link



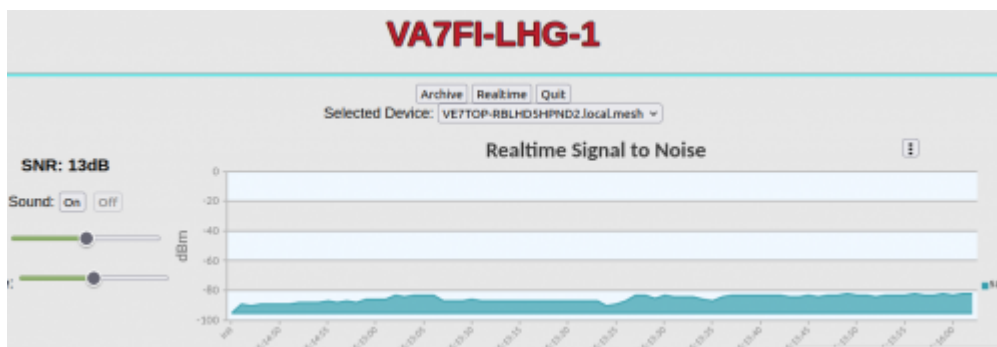
- Ch: 135
- Bearing: 219°
- SNR: 13 dB

### VE7NA-MT-BENSON-SE



- Ch: 172
- Bearing: 238°
- SNR: 21 dB

### VE7TOP-RBLHD5HPND2



- Ch: 133
- Bearing: 243°
- SNR: 12 dB

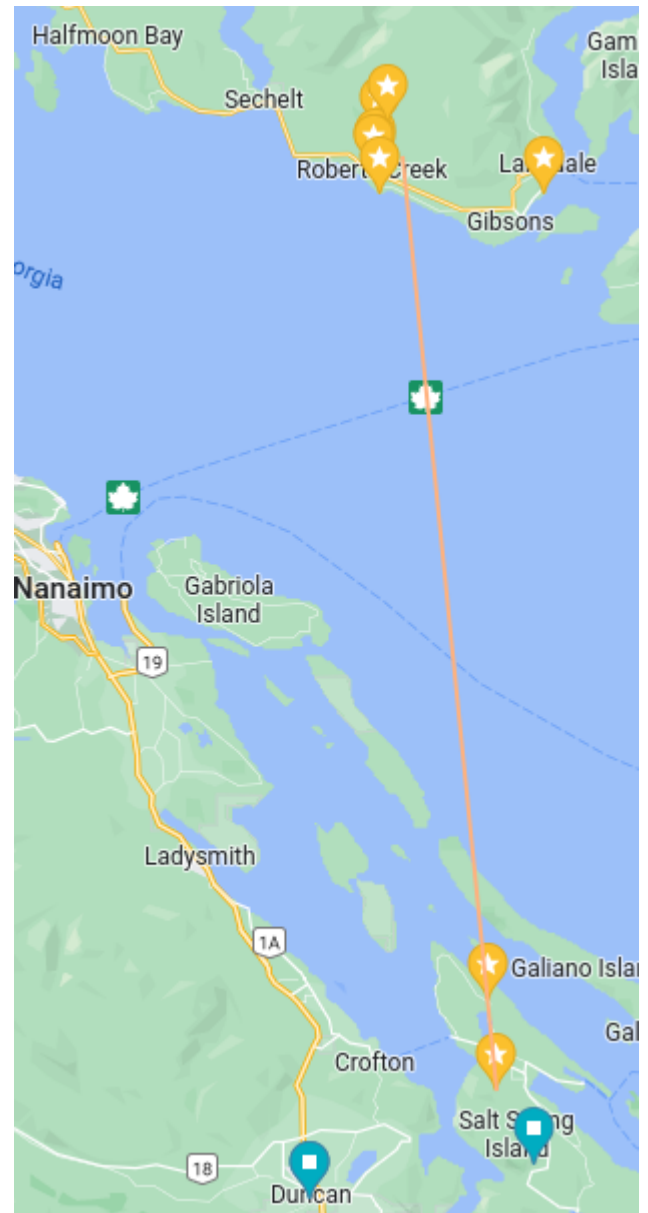
Big thanks to Chris and Devan for their time and patience!



Next test will be when the sector antenna is installed at Lost Lake. To be continued...

## Footnote

Using the coordinates for [VA7ASI-Erskine-ASI](#) and [VA7ASI-Fernwood-Erskine](#), I can now see why I got such a good signal from the dish that's pointed north.



1)

One of these computers is a cheap laptop that I use as a [Linux Server](#) to host different [services](#) on AREDN.

2)

$$25 \text{ dBm} = 10^{2.5} \text{ mW} \approx 320 \text{ mW}$$

$$27 \text{ dBm} = 10^{2.7} \text{ mW} \approx 500 \text{ mW}$$

From:  
<https://wcairedn.ca/> - **West Coast  
AREDN**

Permanent link:  
<https://wcairedn.ca/setups/va7fi/home>

Last update: **2023/10/14 12:10**

