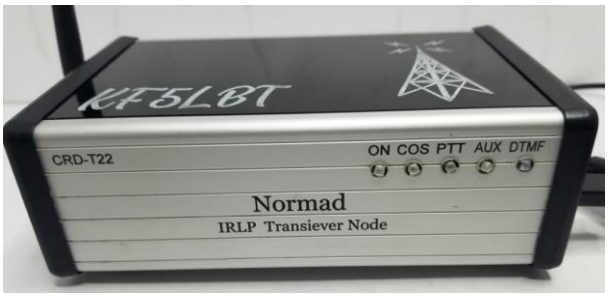
IRLP Handbook
Clicking on item listed in table of contents should take you straight to that part of the document.

I initially created this document for my own use on using IRLP. If anyone has suggestions for additional information, or see incorrect information, please pop me an email. QRZ has my email information. KF5LBT.

This document is also based on setting up and using an IRLP node built by N5ZLW. This is a complete IRLP node that has a radio module incorporated.



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Links For Getting Started

The Internet Radio Linking Project (IRLP) Information Page
This website has great information on what IRLP is, some history, hardware requirements, etc. Good overview to learn more about it.

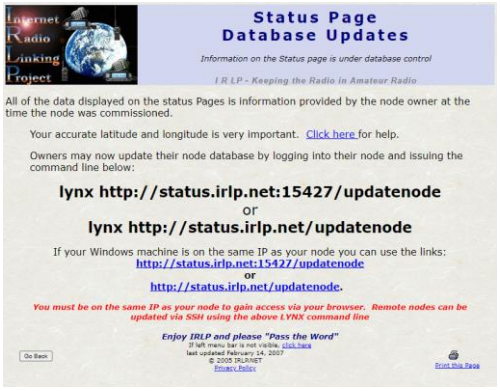
PiRLP Manual
The target audience of this manual is people who have ordered a pre-loaded SD card image from IRLP.

Radio Linking Project WiKi
This website has a lot of information, just for reference here

Live IRLP Reflector Status
This website gives live status of the IRLP Reflectors. Great tool to use to see who is connected up to the reflectors.

Status Page, Database Updates

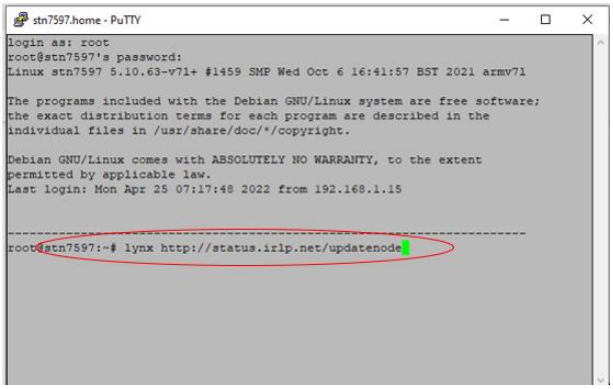
This website has information about updating the IRLP database information for your node. When you go to this site, you should see what's shown is screenshot below.



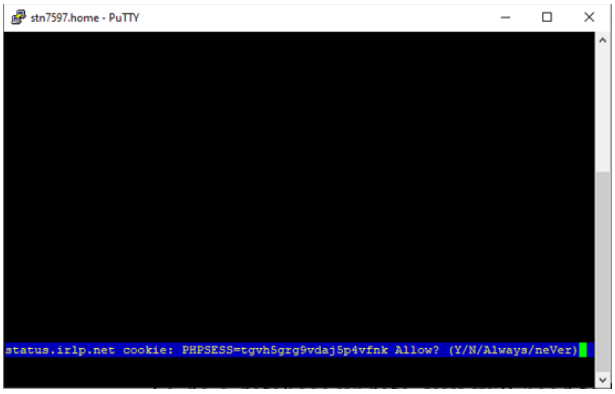
To do a database update, you will need to PuTTy into your node, and execute the command

lynx http://status.irlp.net:15427/updatenode

as shown in the screenshot of a PuTTy session below (Note I changed background of screenshots to make it easier to read what is displayed).



Once you enter the command, will see the following:



Type Y to allow. Will see the following:

From here you can select what you want to update.

Backup PGP Keys

Once you have your node setup, is it recommended to immediately backup your PGB Keys to have in the event you ever have to rebuild the node.
To do this, putty into the node and execute the following command below and follow the prompts.

/home/irlp/scripts/backup_for_reinstall

SD Cards

The information below is from Arm Allstar by Doug Crompton.

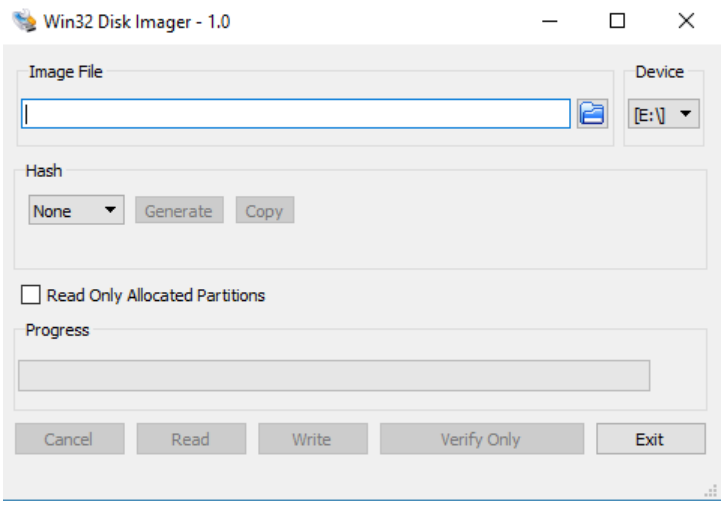
Just a reminder though that the read/write performance of the SD cards in a Linux application like Asterisk Allstar is immaterial after boot. So using a faster card is not going to make your system run faster. It would allow faster creation of the initial image and possibly faster boots

(measured in a few seconds) but in most cases it would not be practical economically to purchase a super fast SD card.
The speed which a card writes is also heavily effected by the type of writer (usb2/3) and the SW used to write. So while the relative differences in these tests might be valid the absolute values of these tests could differ greatly based on the hardware and SW used to write.

Tried and true my choice is still the SanDisk Ultra but I am sure there are other cards in it's class that could be used. Also as I mentioned on the web page unless you have a compelling reason it is **NOT a good idea to expand the filesystem on these cards after installing the image**. Doing so makes total image backup a time-consuming process especially on 16GB and larger cards and does nothing to improve performance or longevity.

Clone Pi SD Card

1. Get everything set up just the way you want it on your Node. Then shut down and remove the SD card. Insert the SD card into your computer.
2. Start up Win32DiskImager, a program that you probably have from when you first set up your Pi. (If you're on OS X or Linux, you'll have to use the dd command as described here instead of these steps).



3. In the "Image File" box, enter the path of your soon-to-be image file. For example, I put mine in C:\Users\hause\Documents\Node\Backup
4. Under the "Device" box, select your SD card.
5. Click the "Read" button to create the image file from your card.
6. When it's done creating the image file, you can eject your SD card and put it back in your Raspberry Pi. Keep that IMG file in a safe place.

Now, if anything ever goes wrong with your Pi, you can restore your fully-set-up image using the reverse instructions:

1. Insert the SD card back into your computer.

2. Head to the start menu or screen and type "disk management." Open the disk management program and find your SD card in the list.
3. Right-click and delete all the partitions on your SD card. When it's empty, right-click on it and format it (it doesn't matter what filesystem you format it to, your computer just needs to recognize it).
4. Open Win32DiskImager again and browse for your image file. Select your device from the Device dropdown just as you did before.
5. This time, click "Write" to write the image to the SD card.
6. When it finishes, eject the SD card and re-insert it into your Raspberry Pi. When you boot it up, it should be in the exact same state it was in when you first cloned the SD card.

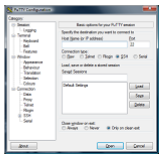
PC Software for Node Maintenance

PuTTY

PuTTY is an SSH and telnet client, developed originally by Simon Tatham for the Windows platform. PuTTY is open source software that is available with source code and is developed and supported by a group of volunteers. Link to download: https://www.putty.org/

PuTTy Setup

To download PuTTy go to: https://www.putty.org/
Should see something like screenshot below

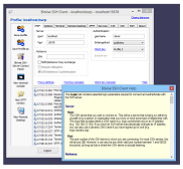


Download PuTTY

PuTTY is an SSH and telnet client, developed originally by Simon Tatham for the Windows platform. PuTTY is open source software that is available with source code and is developed and supported by a group of volunteers.

You can download PuTTY here.

Below suggestions are independent of the authors of PuTTY. They are *not* to be seen as endorsements by the PuTTY project.

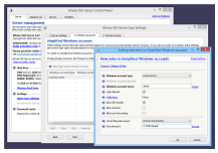


Bitvise SSH Client

Bitvise SSH Client is an SSH and SFTP client for Windows. It is developed and supported professionally by Bitvise. The SSH Client is robust, easy to install, easy to use, and supports all features supported by PuTTY, as well as the following:

- graphical SFTP file transfer;
- single-click Remote Desktop tunneling;
- auto-reconnecting capability;
- dynamic port forwarding through an integrated proxy;
- an FTP-to-SFTP protocol bridge.

Bitvise SSH Client is **free to use**. You can download it here.

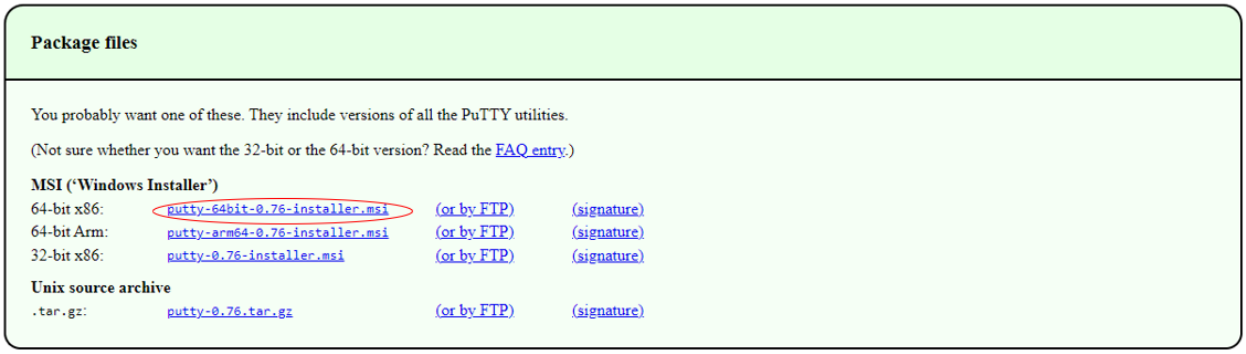


Bitvise SSH Server

Bitvise SSH Server is an SSH, SFTP and SCP server for Windows. It is robust, easy to install, easy to use, and works well with a variety of SSH clients, including Bitvise SSH Client, OpenSSH, and PuTTY. The SSH Server is developed and supported professionally by Bitvise.

You can download Bitvise SSH Server here.

Select the option at top Download PuTTy
Will see following:



Package files

You probably want one of these. They include versions of all the PuTTY utilities.

(Not sure whether you want the 32-bit or the 64-bit version? Read the FAQ entry.)

MSI ('Windows Installer')

64-bit x86:	putty-64bit-0.76-installer.msi	(or by FTP)	(signature)
64-bit Arm:	putty-arm64-0.76-installer.msi	(or by FTP)	(signature)
32-bit x86:	putty-0.76-installer.msi	(or by FTP)	(signature)

Unix source archive

.tar.gz:	putty-0.76.tar.gz	(or by FTP)	(signature)

If you're running a Windows system, clicking on option circled above should work.

Package files

You probably want one of these. They include versions of all the PuTTY utilities.

(Not sure whether you want the 32-bit or the 64-bit version? Read the FAQ entry.)

MSI ('Windows Installer')

64-bit x86:	putty-64bit-0.76-installer.msi	(or by FTP)	(signature)
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32-bit x86:	putty-0.76-installer.msi	(or by FTP)	(signature)

Unix source archive

.tar.gz:	putty-0.76.tar.gz	(or by FTP)	(signature)

Alternative binary files

The installer packages above will provide versions of all of these (except PuTTYtel), but you can

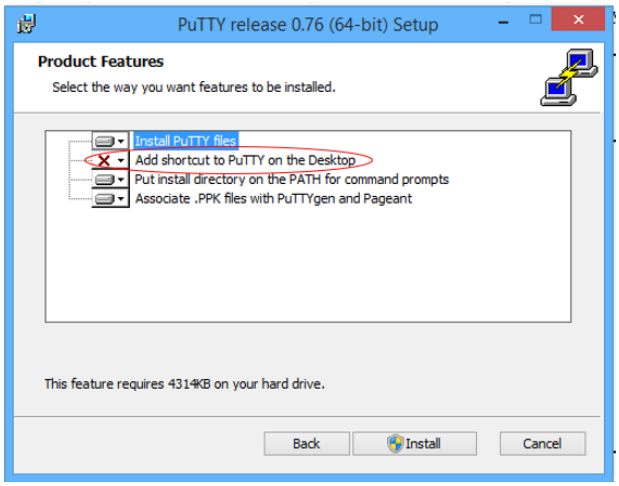
(Not sure whether you want the 32-bit or the 64-bit version? Read the FAQ entry.)

putty.exe (the SSH and Telnet client itself)

64-bit x86:	putty.exe	(or by FTP)	(signature)
64-bit Arm:	putty.exe	(or by FTP)	(signature)

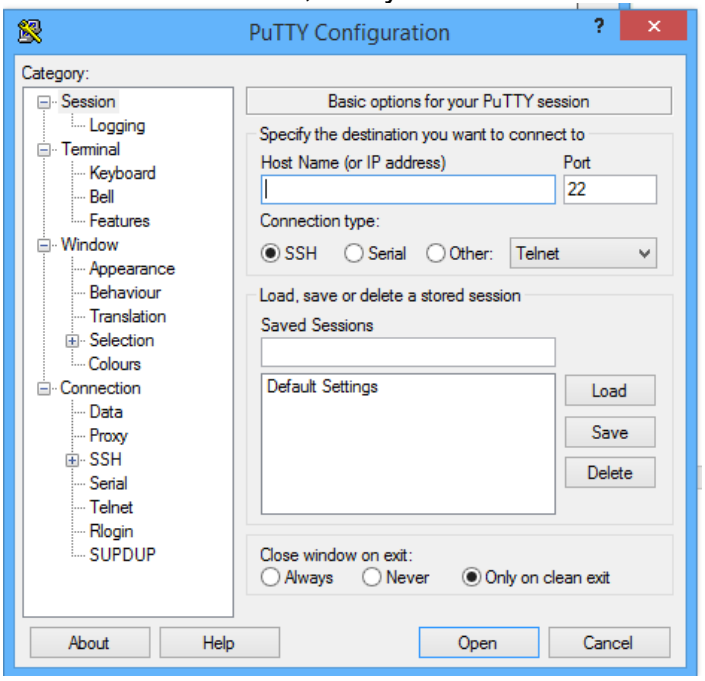
Click on keep if you get the warning message shown above

Click on the download and follow instructions on popups, when the popup shown below comes up, click on the selection box next to Add shortcut to select option to put icon on desktop


PuTTY release 0.76 (64-bit) Setup
Product Features
Select the way you want features to be installed.
Install PuTTY files
Add shortcut to PuTTY on the Desktop
Put install directory on the PATH for command prompts
Associate .PPK files with PuTTYgen and Pageant
This feature requires 4314KB on your hard drive.
Back
Install
Cancel

You should now have a desktop icon to launch PuTTy

Double Click the icon, and you will have the initial setup screen



PuTTy for Node Shutdown

It's not recommended to just remove the power to the node to shut it down. This could corrupt the software image. To safely shutdown the node, PuTTy into it, and execute the command Shutdown -h now Can also use DTMF command, see DTMF Setup

File Transfers

Note: Using the WinSCP provides a simple method to transfer files.

WinSCP

Download this to PC, allows an easy way to transfer files between the Raspberry Pi and the PC. I had installed the PuTTY before hand and saved a session for my Allstar Pi. The WinSCP detected the PuTTY on the PC, and allowed loading in of the Allstar Pi session into it.
Link for WinSCP: https://winscp.net/eng/index.php

IRLPvCON Software Package

The website link for information on a Visual Point & Click User Interface & Monitor For IRLP Nodes is https://www.irlp.net/IRLPvCON_4_manual.pdf
This package gives control over the node, and allows for others to see the node status, and location on the internet.
This link shows Live IRLP Reflector Status: Live IRLP Reflector Status

Initial Setup of NORMAD Node

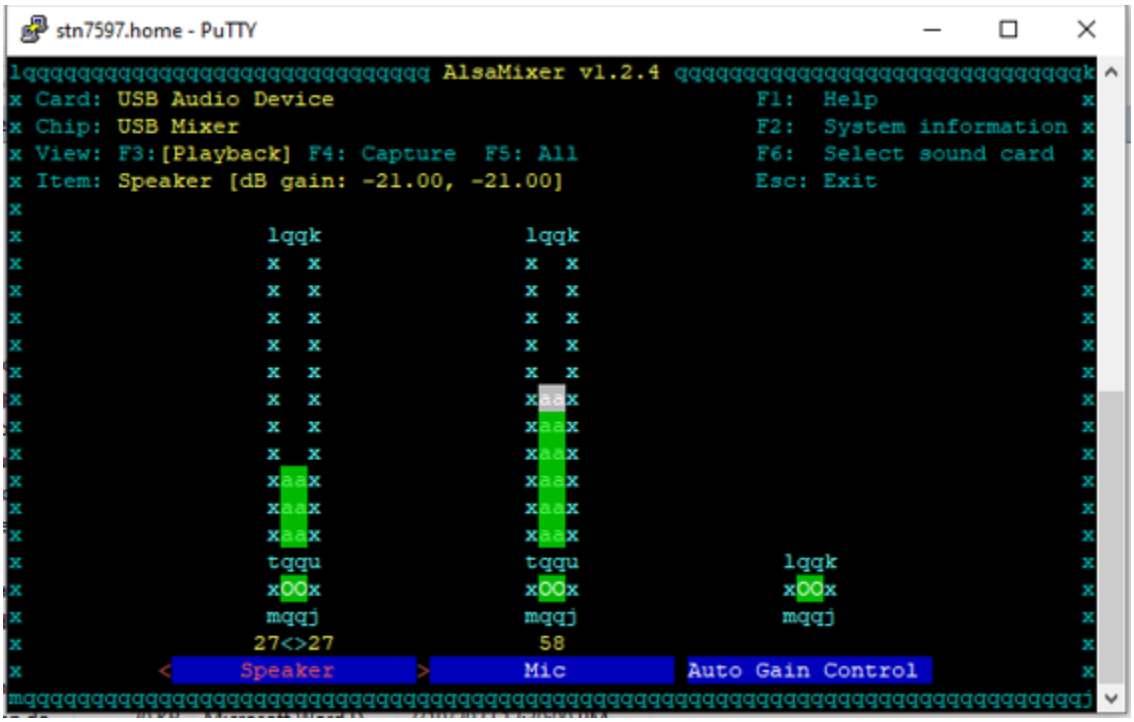
Connect the node via ethernet cable to router.
Set up a radio to the frequency and tone for the node.
Supply power to the node
Monitor radio set to node frequency, node will announce it's ip address on power up.

Adjusting Audo Levels

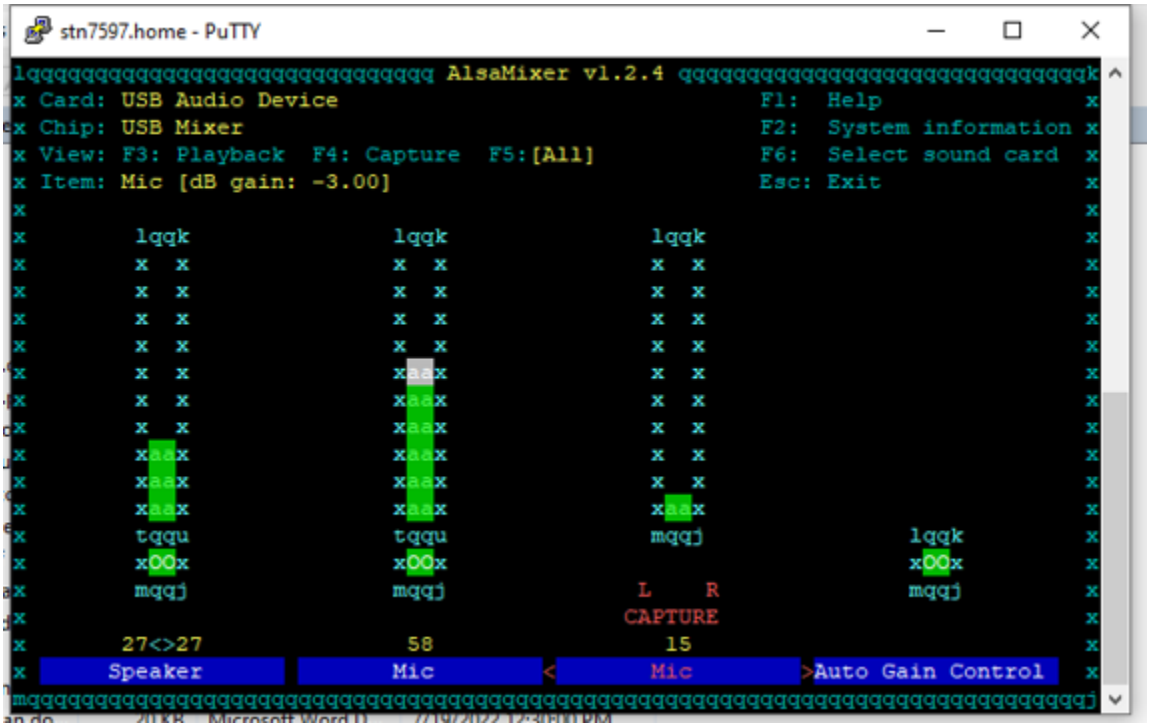
To adjust audio levels do the following:
Putty into the node, and from terminal session type

alsamixer

Should see the following



Press the tab key on your keyboard two times, will see the following



The Auto Gain Control is like an RX Boost. I disabled it. To disable it, use the arrow keys to select it and press the M key to toggle it on or off. Next use the arrow keys to select the CAPTURE Mic level to adjust the audio level that others will hear when your connected up to them.
After you have completed changes, press your Esc key to exit, then at the command line type alsactl store. This will save your changes.
Here is a link to a youtube video on setting up audio levels. [Setting Audio Levels]

DTMF

Setup

Again, thanks to K5TRY for development of the scripts.
To set up the node to accept DTMF tones for some of the special functions, you will need to run an installer script created by K5TRY to be able to reboot and do a shutdown with DTMF tone. To download it and run it bring up a PuTTy session on the node and execute the following commands.

cd /home/irlp/scripts

wget http://27597.asnode.org/tryit/tryINSTALLER
chmod +x tryINSTALLER
./tryINSTALLER

Once the script has completed the node should reboot.
The following DTMF tones should now be available.

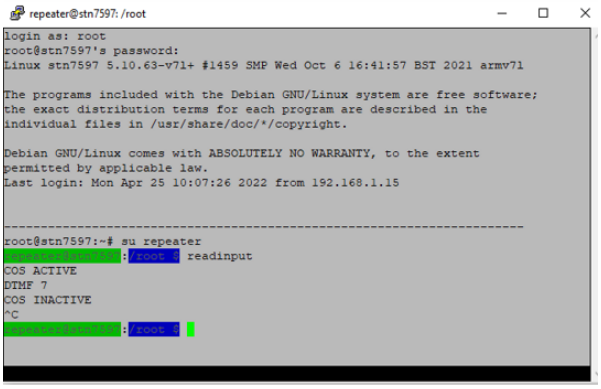
DTMF	Command Executed
888	Reboot
*99	Shutdown
1234	Audio Level Test
*80	Speak Time
*81	Speak Date
*69	Star89 (Call back a node)
00	Speak In Use

Method to Verify DTMF Tones Received

To see status such as DTMF digits being decoded, ptt and cos state PuTTy into node then execute the following commands.

su repeater
readinput

After you have entered the readinput command, send DTMF tones to the node, if they are being decoded, they will be displayed. For example, screen below shows executing the command, then I sent a DTMF of 7 to the node.



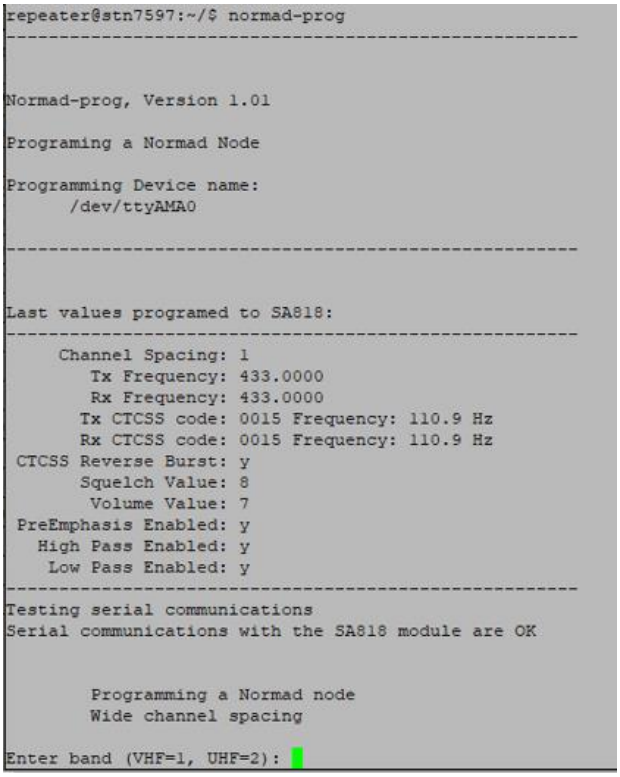
When done do a Ctrl+C to exit readinput

IRLP Node Frequency Setting

The Normad Node has the capability to change the frequency of the radio module.
To do this, putty into the node as root. Next type in command:

su - repeater

Note: there is a space between su and -, and a space between - and repeater
Next type in command norman-prog as shown in screenshot below.



The current settings are displayed, advise taking a screen shot or write down what the settings are set to currently.

INSTALL WIREGUARD ON DEBIAN 12 IRLP NODE

Log in as root and run the commands below (using putty or a terminal)

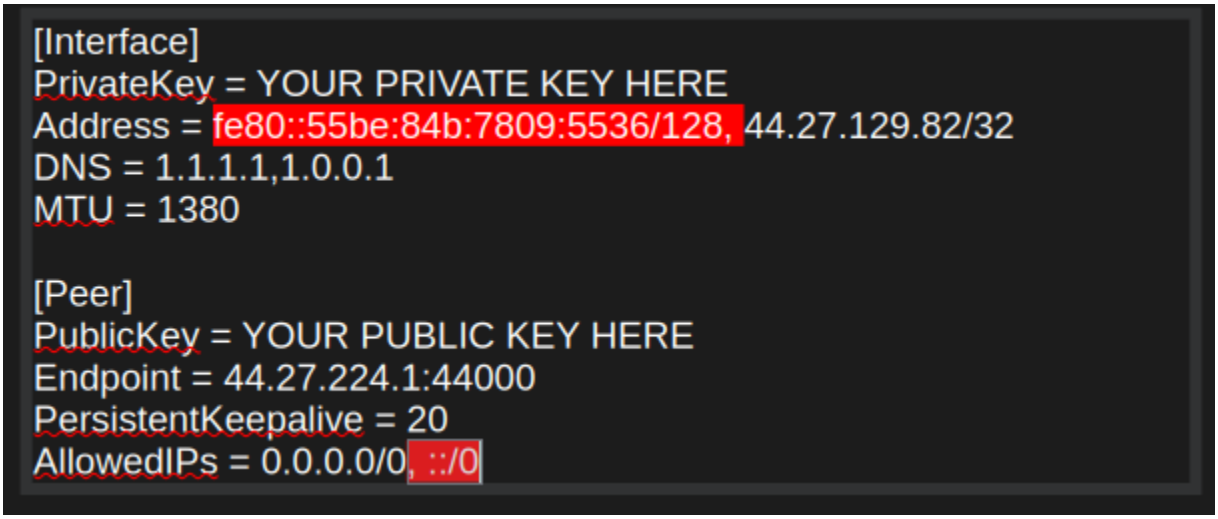
apt update

apt install wireguard

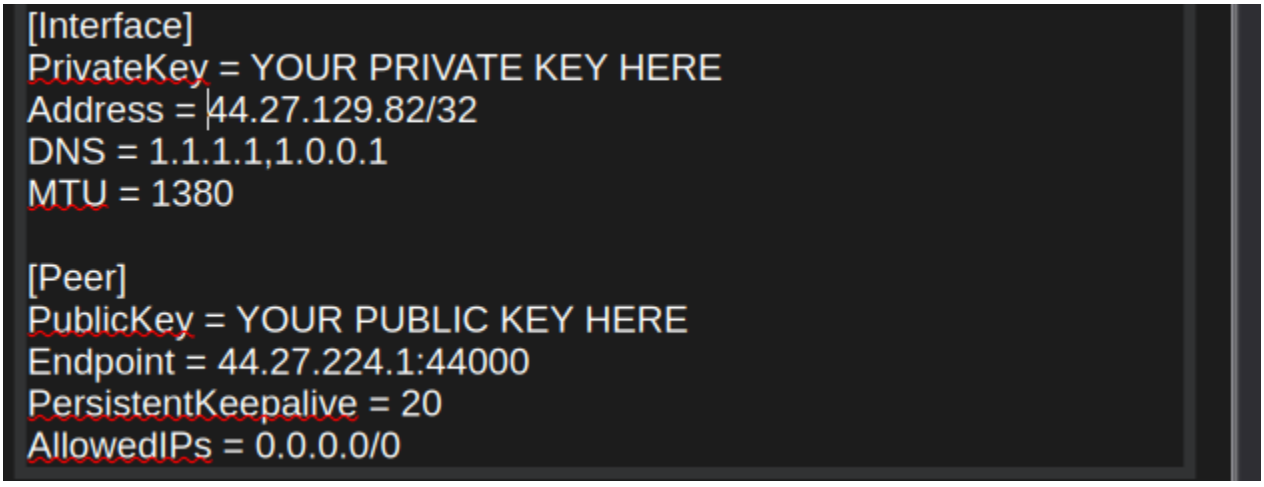
apt install resolvconf

You should have received an email from noreply@44net.cloud This email has 3 files attached, one of them is named wg-quick. Save the wg-quick file to your desktop.

Once saved you'll need to delete the IVP6 addressing out of the file. Look at the example file below and delete the text that is highlighted in red in your file.



After you've deleted the text highlighted in red, your file should look like the example below.



MAKE SURE YOU CLICK FILE AND THEN CLICK SAVE TO SAVE YOUR CHANGES

Rename the file wg0.conf and place it in the /etc/wireguard directory on your node.

If you're running openvpn go into your /etc/openvpn folder and delete your client.conf file.
(your's may have another name besides client.conf) (it could be stnxxxx.conf)

Run the command below. (using putty or a terminal)

systemctl disable openvpn

To activate wireguard run the following commands (using putty or a terminal)

wg-quick up wg0

systemctl enable wg-quick@wg0.service (this command enables wireguard on boot up)

telnet irlp.net 10000 (this command will reveal your 44 ip address if you followed this guide)