

# SHARI PiHat Allstar Node Setup and Configuration Guide

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## Introduction

This document describes in detail, the process to setup and configure a **SHARI PiHat** Allstar node by N8AR ([www.kits4hams.com](http://www.kits4hams.com)) and the Allstar software image you will download from the HamVOIP website ([www.hamvoip.com](http://www.hamvoip.com)). This procedure is to be used with the original SHARI PiHat Neo as well as the Unistorm and 52Pi case variants. **Do not use this procedure for the SHARI PiXX (Pi3U, Pi3V, Pi4U or Pi4V)**

When you have successfully completed this procedure, you will have a basic operating Allstar node. This document does not include the steps required to add enhancements to your node such as a WiFi connection, additional DTMF commands to your configuration, Supermon or Echolink. These can be found in the form of “How To” documents on the HamVOIP website or in the Files section of the SHARI group (<https://groups.io/g/SHARI/files>)



Figure 1-SHARI PiHatU Allstar Node

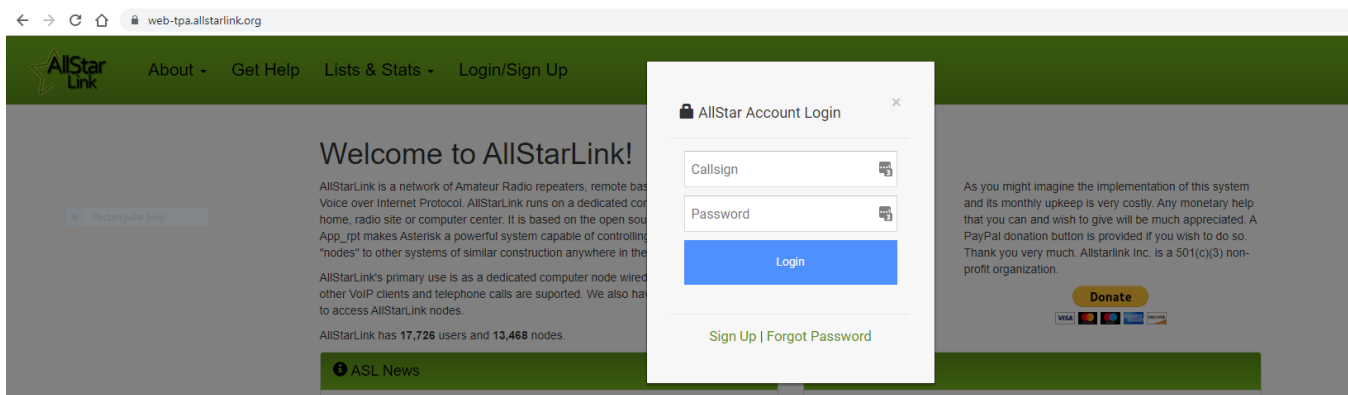
## Required Hardware

1. A fully assembled SHARI PiHat Allstar node with a Pi power supply.
2. A micro SD card – 4 GB minimum, Class 10 or better (16 or 32 GB recommended).

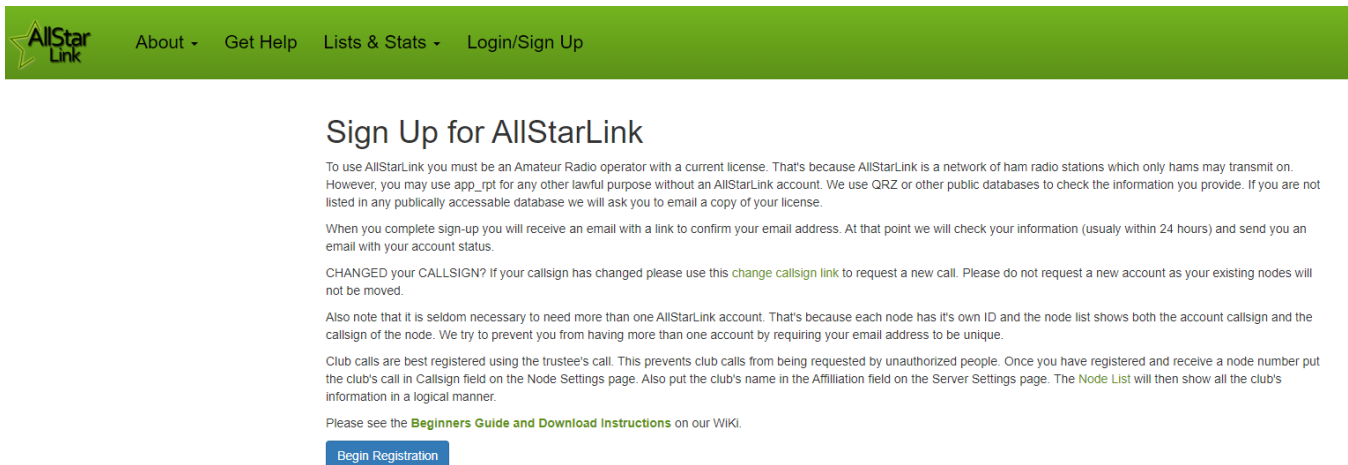
## Create an Account with Allstar

Normally, your first step is to create an account with AllstarLink. It is possible to setup a private Allstar node without an account but that is beyond the scope of this document.

Using your computer and a browser such as Chrome, go to <https://web-tpa.allstarlink.org/> and click on the “Logon/Sign up” Tab. A small Allstar Account Logon screen will appear. Click on the “Sign Up” link at the bottom of this smaller screen.



Read the information on the screen that appears and click on “Begin Registration.”



Fill in the form with your information and click “Submit.”. It may take 1 to 24 hours to receive a confirmation email.

## Create a Server and Request a Node number

This procedure assume you are new to Allstar and have never created a server. If you already have a server and node, you should extend your node number and create a server for your new node. This is beyond the scope of this procedure but is described on the AllstarLink website.

Go to <https://web-tpa.allstarlink.org/> and logon using the information you received in your confirmation email from AllstarLink.

First you need to create a server. The server is your Raspberry Pi4 in your SHARI PiHat node.

Click on the **Portal** tab. In the pull-down menu, click on **Server Settings**. Click on **Proceed with Server Setup**

### New Server Settings

**Server Name**

  
25 characters max

**Server Location**

  
City/State/Providence of server location. 30 characters max.

**Site**

  
Site Name, Bldg Number, etc. 30 characters max. Optional.

**Affiliation**

  
Affiliated with a club, etc. 30 characters max. Optional.

**Hostname**

  
Unix Hostname. 25 characters max. Optional.

**IAX Port**

  
Normally 4569 when only one server behind a NAT router.

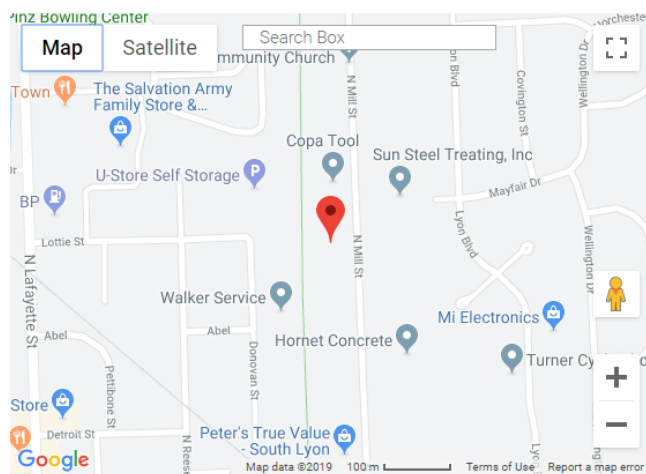
**Proxy IP**

  
Normally blank. Only needed in rare cases. Optional.

Click the map to select server latitude & longitude or type them in.

**Latitude**

**Server Longitude**



Submit

Fill in all the information:

1. Server name - The server name is arbitrary and will be adjusted later. Suggest [your call-1] (eg: "W8XYZ-1") for now.
2. Server location – City, State is customary.
3. Site – Suggest "Home," "Shack," "Doghouse," etc
4. Affiliation – optional.

5. IAX Port – leave this unchanged (4569).
6. Latitude and Longitude – Use the map to locate your server site. This will enter the Lat./Long. data automatically.

Click on **Submit**

Next you need to request a node number. The node number is used by Allstar running on your Server (Raspberry Pi).

Click on the **Portal** tab. In the pull-down menu, click on **Node Settings**. Click on the **Request a new node number** link

The next screen that appears will prompt you to select the server to which the node is assigned. If you have only one server, the server you just created, it will appear in the selection box. If you have more than one server, the selection box is a drop-down selector. Select the appropriate server and click on the **Submit** button. A message is optional.

You can Logout of AllstarLink.org.

## Software

In this section you will obtain the Allstar software, other apps required to install it and prepare a microSD card which you will plug into your Raspberry Pi. These instructions assume you will be using a Windows PC. The process can be completed using a Mac PC or Linux PC but is beyond the scope of this procedure. This procedure is also specific to the HamVOIP Allstar image.

1. Select a Windows computer to be used as the setup and control computer for the Raspberry Pi node and do the following steps. The computer you choose needs to be capable of reading and writing microSD memory cards (normally a microSD to SD card adapter is used with a card reader in the PC or a microSD card USB adapter is used).
2. Click on the following link (or type it into your browser)

[https://hamvoip.org/RPi2/RPi-Z2W-2-3-4\\_V1.7-01\\_Allstar.exe](https://hamvoip.org/RPi2/RPi-Z2W-2-3-4_V1.7-01_Allstar.exe)

3. This will start a download process by opening File Manager on your PC. Save the file in a well know directory – suggest - /Documents/Allstar.

This downloaded image is a self-extracting .exe file. It includes the HamVOIP image, as well as the win32disk imager and Putty applications which we do not use in this procedure.

4. Download and install the Raspberry Pi Imager

<https://www.raspberrypi.com/software/>

## Install Raspberry Pi OS using Raspberry Pi Imager

Raspberry Pi Imager is the quick and easy way to install Raspberry Pi OS and other operating systems to a microSD card, ready to use with your Raspberry Pi.

Download and install Raspberry Pi Imager to a computer with an SD card reader. Put the SD card you'll use with your Raspberry Pi into the reader and run Raspberry Pi Imager.

[Download for Windows](#)

[Download for macOS](#)

[Download for Ubuntu for x86](#)

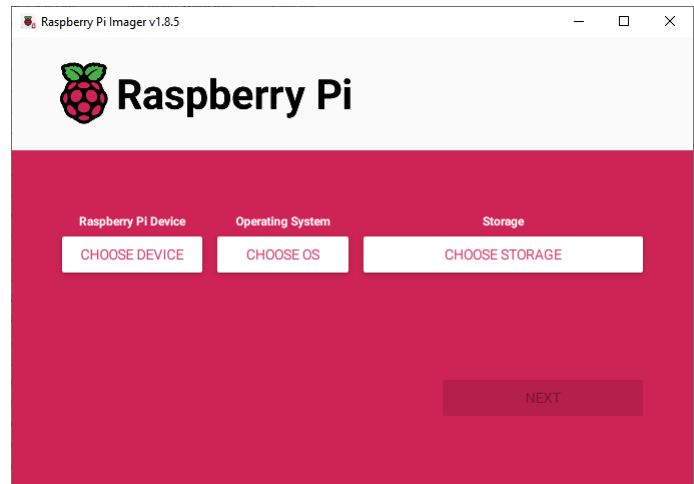


### 5. Download and install MobaXterm

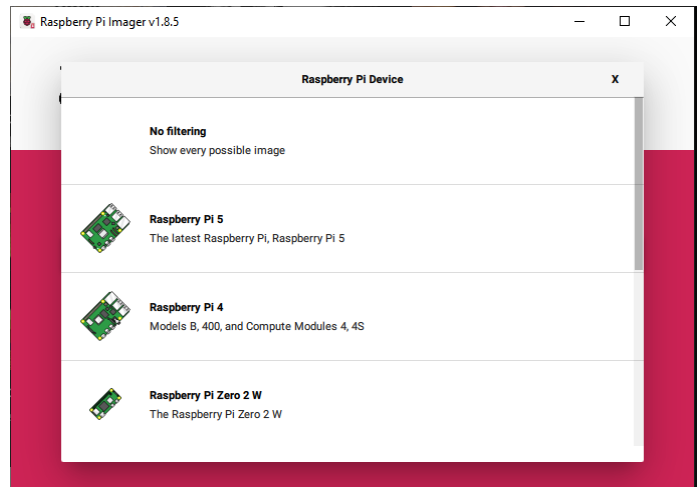
[\(https://mobaxterm.mobatek.net/\)](https://mobaxterm.mobatek.net/)

On the MobaXterm website, click on **GET MOBAXTERM NOW!** Then click on **Download Now** for the free edition and then click on the **Installer Edition**. Unzip and install the downloaded MobaXterm Zip file.

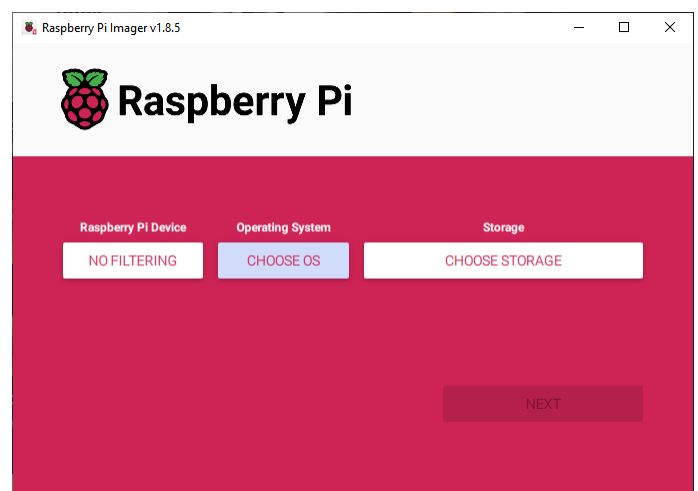
### 6. Start the Raspberry Pi Imager program. Click on **CHOOSE DEVICE**



7 . Click on **No Filtering**.

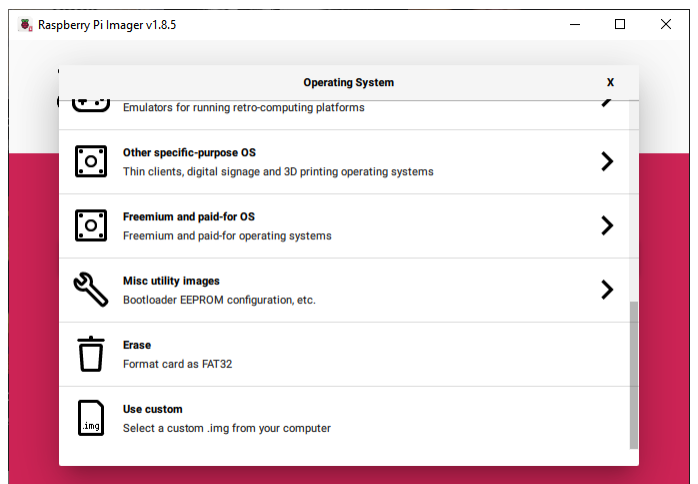


8. Click on **CHOOSE OS**.

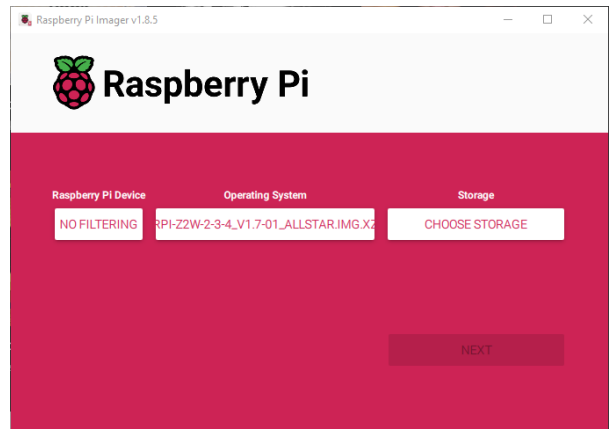


9. Scroll down and click on **Use custom**.

Browse to your image and click on it,  
then click on Open



10. Click on **CHOOSE STORAGE**. Insert a micro SD card (using SD card adapter or USB adapter) in the computer. (If a group of windows open about having to format the disk just cancel/close them.) If you have any security software running that prevents “MBR” (master boot record) access, **TURN IT OFF** before you begin the transfer process. (Turn it back on afterward.)



11. Once the transfer is completed, safely eject the microSD card by clicking on the **Safely Remove Hardware and Eject Media** in the Windows System Tray. Remove the microSD card from the PC and insert it into the microSD card slot in the Raspberry Pi (bottom side, antenna end - connector labeled “MICRO SD CARD”).
12. You now have a microSD card with the Allstar image installed in your Raspberry Pi and are ready to configure your Allstar node.

## Configuring Allstar

In this step you will configure Allstar to work with SHARI PiHat. You have a choice as to how to communicate with your Raspberry Pi. You can connect a keyboard to a USB port on the Pi (do not use the USB port in which you have installed the port filler plug as it is used internally for the SHARI PiHat) and a monitor to the HDMI port. Alternately, you can use an SSH program to connect to your Pi via an ethernet connection

In this procedure we will open a terminal emulation session using the SSH protocol by running the MobaXterm program which you have installed on your PC.

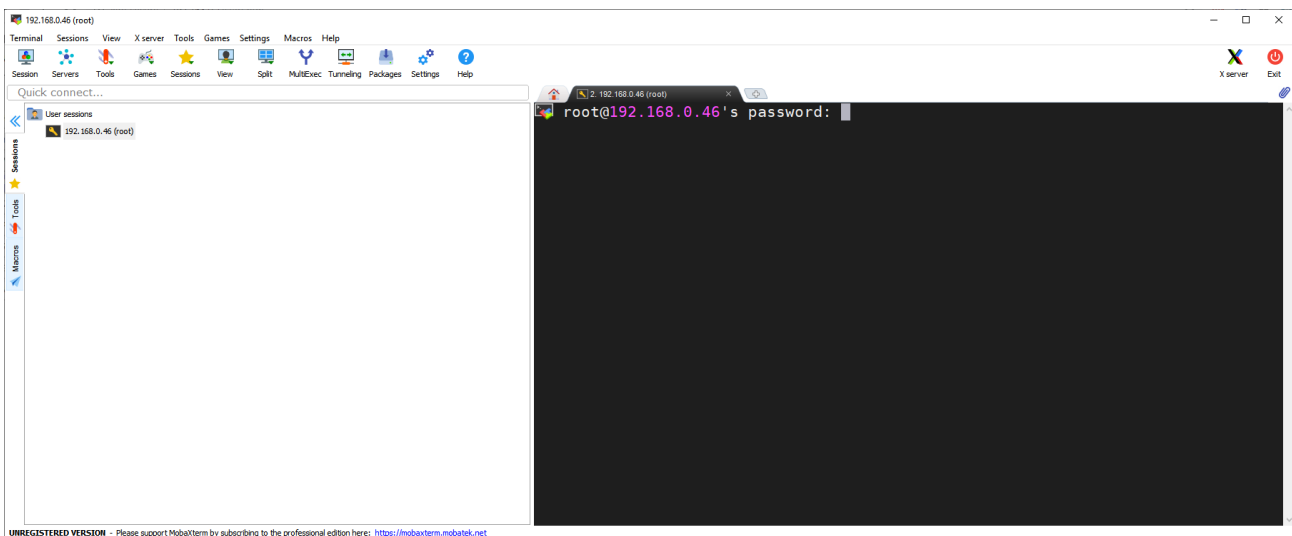
1. Begin by connecting your SHARI PiHat and your PC to the same network and router using CAT 5E or better cables.
2. You need the IP address that the router assigns to your Pi so that we can connect to the Pi from the PC using MobaXterm. To find this, turn on a radio and tune it to 446.100 MHz (UHF) or 146.54 MHz (VHF) with **no receive CTCSS**. Plug the power supply into the SHARI PiHat and wait for the green LED (the one on SHARI, not the one on the Pi) to begin blinking. You should then hear the IP address assigned to your PI announced on the radio.

If that does not work you can also cycle power and observe the green LED on the Pi. It is visible near the bottom of the case in the lower right corner of the antenna end just to the left of the brighter red LED. If you know Morse code, you may recognize it is sending a message. It sends HI HI followed twice by the IP address that has been assigned by the

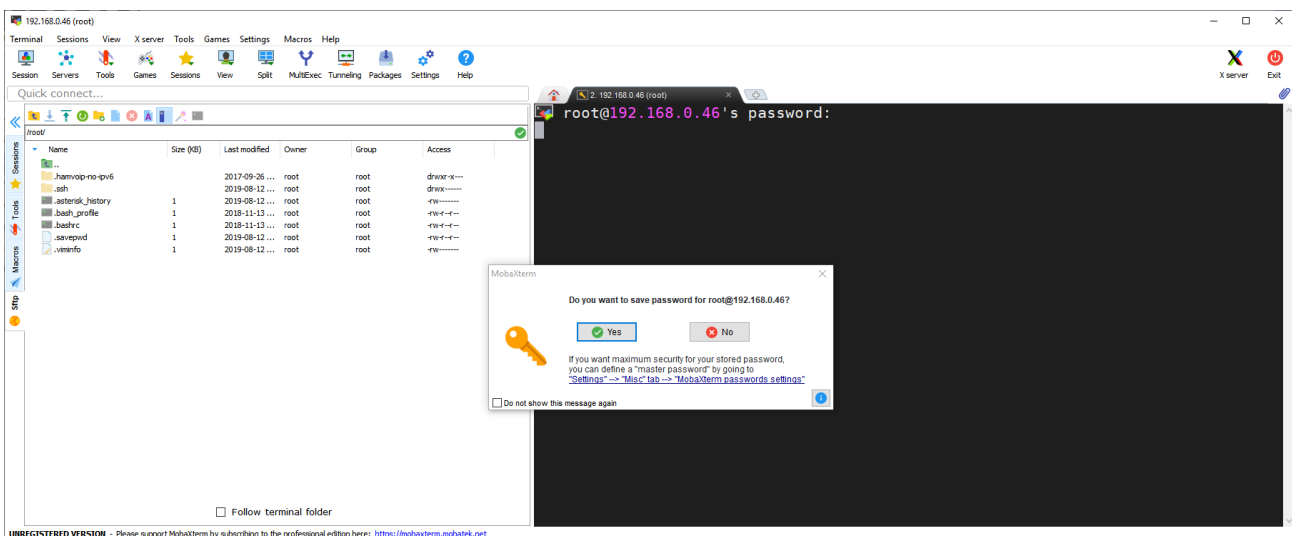
DHCP function in your router.

If you can't copy the Morse code from the blinking LED, you can log into your router and see the IP address that has been assigned to the Pi by checking the attached devices. Look for a device called "alampri".

3. Start the MobaXterm app. Click on the **Session** icon. This opens a new window. Click on the **SSH** icon. Enter the following:
  - a. Remote host = the IP address assigned to the PiHat by your router
  - b. Put a check in the Specify Username checkbox
  - c. Enter *root* for the username
  - d. Change the Port to 222
4. Click on **OK**. You should now be connected to your PiHat and see a window similar to this.

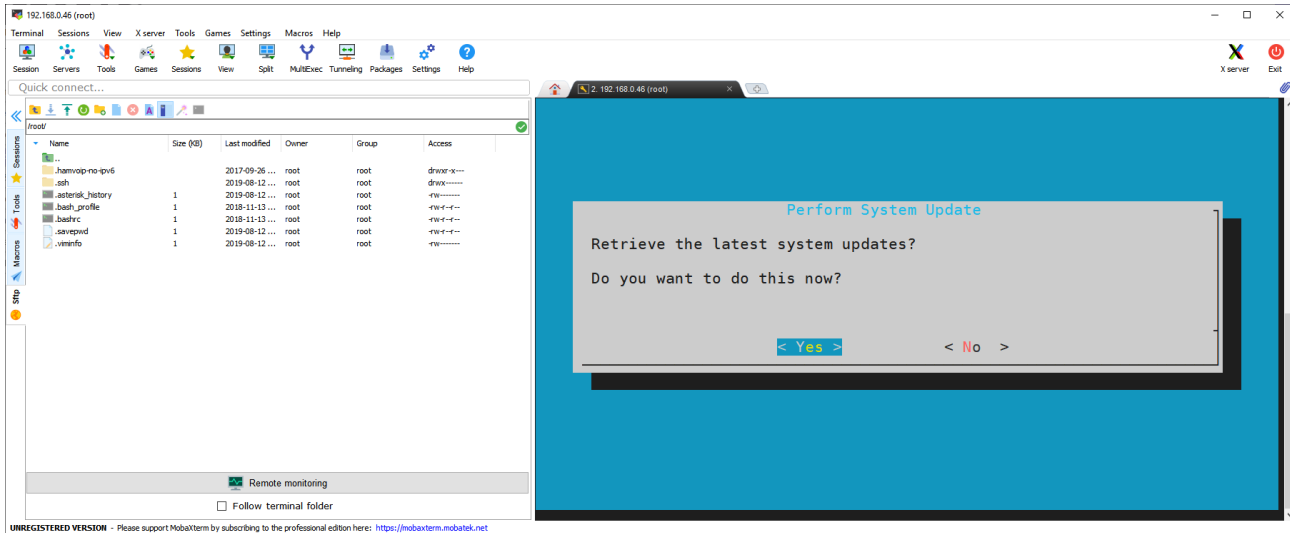


5. Enter *root* for the password and press **<enter>**. The password does not type on the screen so you should see the following.

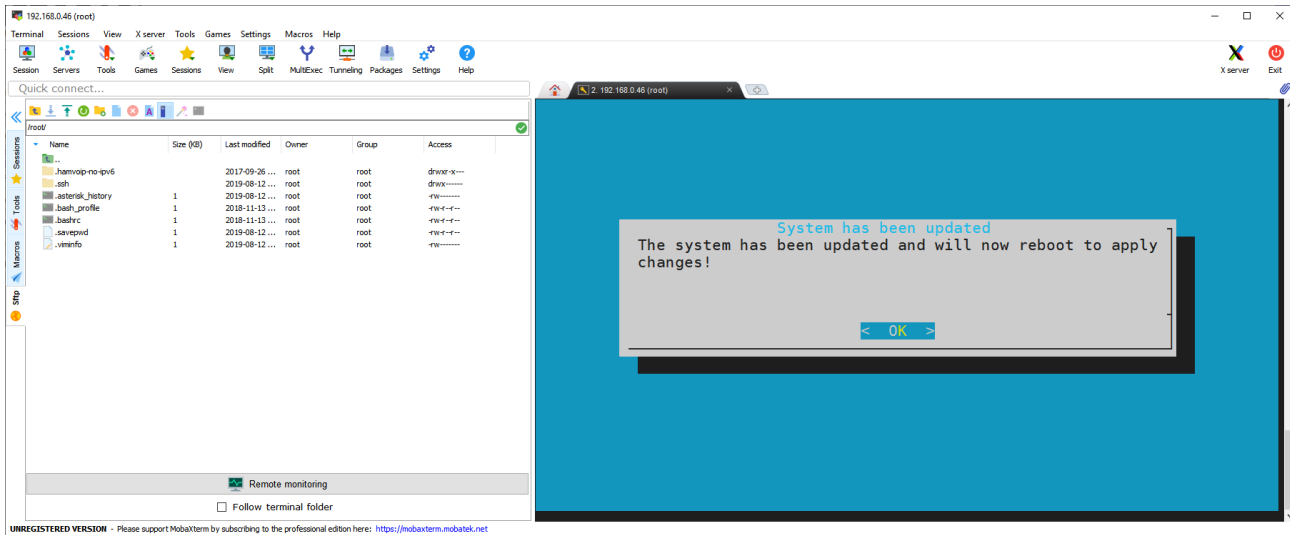




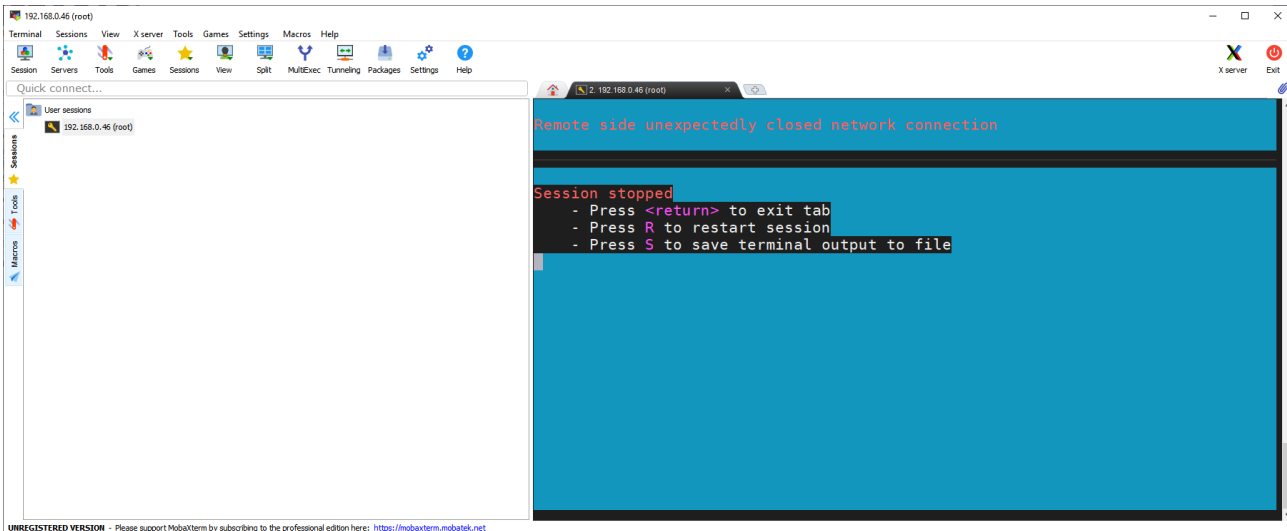
6. Click on **NO** because you will be changing the password in the following setup steps. You should now see the following screen



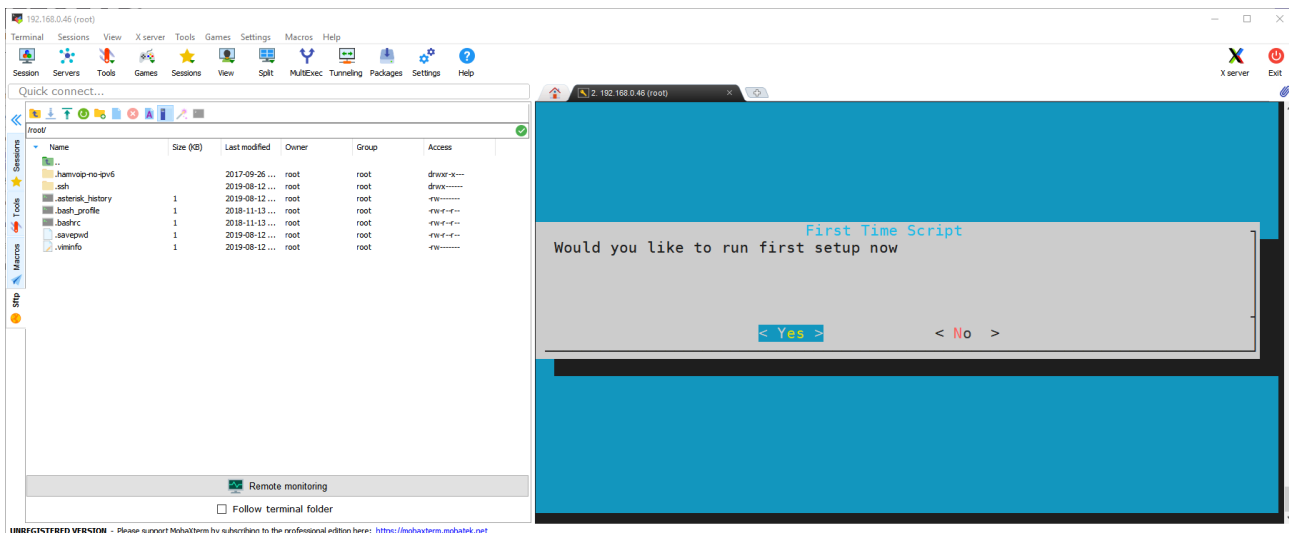
7. Click on **Yes** to retrieve the latest system updates. You will see the latest system updates being installed on your Pi. Wait until the screen indicates that the System has been updated. Click on **OK**



8. Click on **OK** to reboot and apply the changes. The Pi will reboot (watch the blinking green LED). MobaXterm will indicate that the Remote Side has unexpectedly closed the network connection.



9. Press **R** to restart the session then enter **root** for the password. Click on **NO** to not save the stored password. You will be asked if you want to retrieve the latest system updates. Click **No**. You will see the following screen.



10. Click **Yes** to run the first setup now script.

If, for any reason, you exit the “firsttime.sh” script before reaching its end, you will need to rerun the “firsttime.sh” script again in order to complete the node configuration. If this happens, follow these steps to rerun the “firsttime.sh” script.

- From the “Admin” screen, select item 9 “Start Bash shell interface” by typing 9 (**top row numeric keys ONLY!**) or scrolling to item 9. Click on the **<Run Selected Item>** or press **<enter>**.
- Type *firsttime.sh* and press **<enter>**

When entering numbers in the “firsttime.sh” setup script, **DO NOT USE THE NUMERIC KEYPAD. ENTER NUMBERS ONLY BY USING THE NUMBERS ALONG THE TOP**

**ROW OF KEYS ON THE KEYBOARD!!!!** The numeric keypad may cause the script to terminate abruptly or to skip questions, resulting in an incomplete setup and a need to re-run the script.

11. You will now be prompted to change the password for the root login account. **Change the password** and **write down the new password**. It is the **ONLY** way you can log back into the Pi, unless you want to start over with a **NEW** image load to the SD card! Remember, the password is case sensitive
12. The next screen asks if you are setting up a private node. Answer **NO**
13. Enter your assigned node number in the next screen and press **OK**
14. The script will next ask if you want to set up the node configuration for asterisk – respond – **YES**. You will be notified that some configurations will continue after reboot, but the system will not reboot at this time. Confirm the notification.
15. Next the script asks if you wish to change the time zone. The default time zone is “America/New York” or Eastern USA. Answer **NO** if you are in the Eastern time zone, otherwise answer **YES**. Scroll to the proper time zone and select your time zone by **pressing the space bar**.
16. On the next screen, the script will display the “hostname” of the Pi computer and ask if you wish to change to a new name. While any name is OK, it is suggested that you change the name to *[your call]-[node number]* ( eg: W8XYZ-12345 ). To change the hostname answer **Yes**
17. The script will display a screen asking you to enter the new hostname. Enter the new name and respond – **OK**.
18. The next screen displays the Pi’s IP address and whether it is dynamic or static, asking if you wish to change these parameter. For most applications, it is recommended that you use a dynamic IP. Answer **No**.
19. The script then asks if you want to change the SSH port number. At this point it is not suggested that you change the port number from 222. Answer **No**.
20. The next screen will prompt you to reboot the Pi system, reminding you to use the new password that you entered earlier. It also displays the IP address and SSH port numbers that must be used to log in.. Respond – **REBOOT**.
21. Again, as the system reboots, you will lose terminal communication with it through MobaXterm. In MobaXterm, press **R** to restart the session.
22. Log into the Pi. Password is the **NEW** password that you earlier in this procedure. MobaXterm will ask if you want to save the password. This time answer **Yes**

23. A screen will be displayed that indicates that the first time node configuration will now proceed. This is the continued configuration that was indicated after reboot notified previously. Answer **Yes**.
24. A screen prompts you to enter the node number. This is the number assigned to your node by AllstarLink.org. **DO NOT USE THE NUMERIC KEYPAD TO ENTER THIS NUMBER!** After entering the number, respond – **OK**.
25. You will be asked if it is a private node. Answer - No
26. The next screen asks for entry of your station call. Enter your call and respond – **OK**. **DON'T USE THE NUMERIC KEYPAD!**
27. The next screen asks if you want to report the status of your node to AllstarLink.org. This is very useful for the organization and does not compromise you in any way. You are encouraged to respond – **YES**.
28. Next, you choose a voice ID or a CW ID that will be broadcast by your node. If you respond – **NO**, a CW ID will be used. If you respond – **YES**, a voice ID will be created and used.
29. The next screen asks if you need to change the default iax protocol port number. Leave this at 4569 if this is your first node. It is customary to decrease this number by 1 for each additional server and node (i.e. 4568, 4567....) Respond – **OK**.
30. The next screen chooses the duplex mode for your node. The choices are presented and explained on the screen. Normal simplex nodes select the default choice of “1” and respond – **OK**.
31. Next, you must enter the password that was assigned to your node by AllstarLink.org. This was obtained by you from the Allstar Link website. Enter this password carefully and **DO NOT USE THE NUMERIC KEYPAD** for any numbers that appear in the string. Respond – **OK**.
32. On the next screen you are asked if you would like to set a password for iaxRpt. Explaining iaxRpt is beyond the scope of this document, but this password can be entered at another time if you chose to use this program. Respond – **YES** if you want to enter a password, and respond to the prompts that will be presented by the script in that case. Otherwise, respond – **NO**.
33. Next, you will be prompted to configure the “Simple USB” settings. These settings can be reviewed and adjusted once the Asterisk Admin menu is up and running. Respond – **NO**.
34. The next asks if you want to restart Asterisk. Respond **Yes**
35. The next screen that should appear is the “Admin Menu List for: [host-name]” followed by a menu of choices for configuring and controlling the host node.

## Configuring SimpleUSB-Tune-Menu for SHARI PiHat

In order to work correctly, settings used in SimpleUSB depend on how the SA818 in your SHARI PiHat are configured.

The SA818 module in your SHARI kit or assembled unit has been pre-configured as follows:

RF Frequency – 446.100 MHz UHF or 146.54 MHz VHF

CTCSS Frequency – 110.9 Hz

Reverse Burst – No

Squelch – 1

Volume – 6

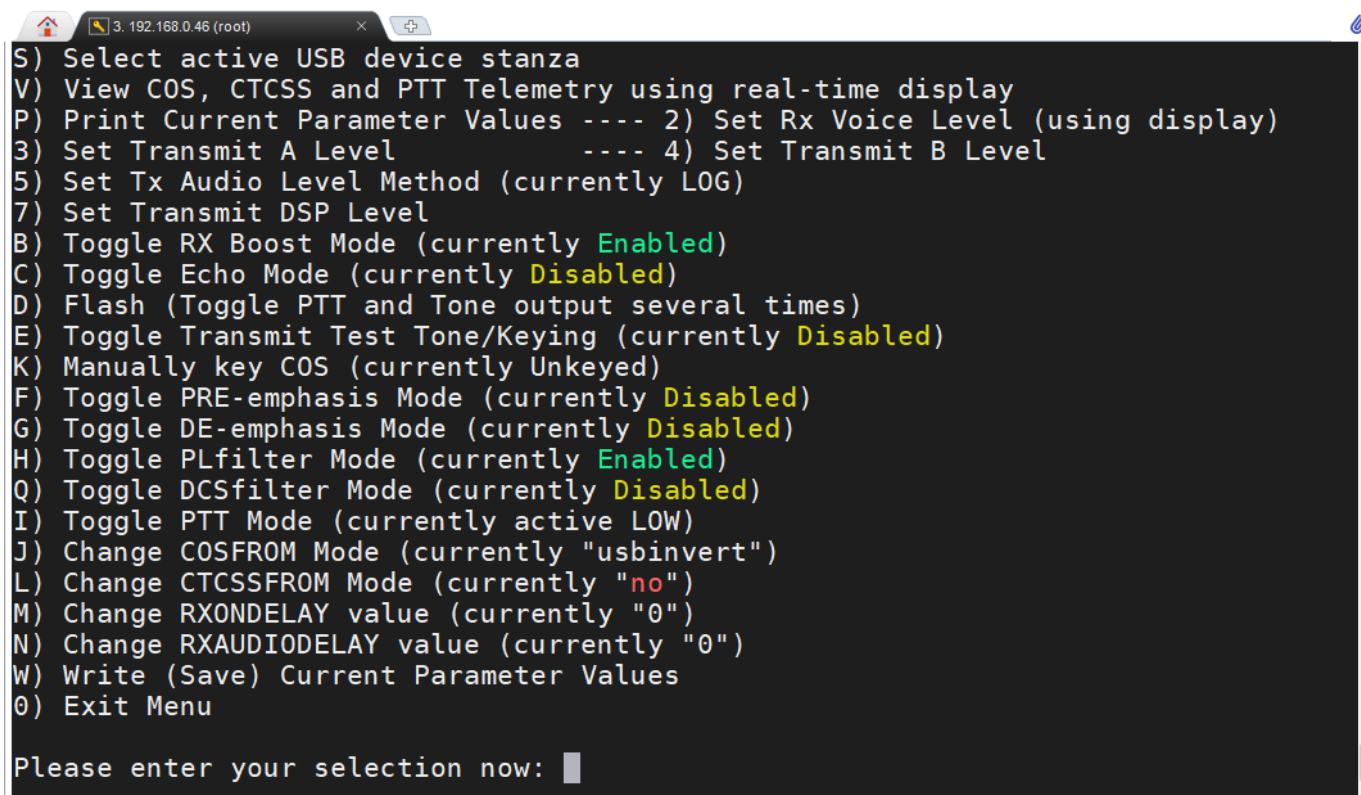
PreEmphasis Enabled – Yes

High Pass Enabled – Yes

Low Pass Enabled – Yes

The following SimpleUSB Settings are recommended to work with the above SA818 settings.

1. From the “Admin Menu” select item 12 – Run the SimpleUSB-tune-menu Application, by clicking on item 12 or scrolling to item 12 with the arrow keys, and then clicking on **<Run Selected Item>** or by pressing **<enter>**
2. The “SimpleUSB-tune-menu” will be displayed as shown below.



```
S) Select active USB device stanza
V) View COS, CTCSS and PTT Telemetry using real-time display
P) Print Current Parameter Values ---- 2) Set Rx Voice Level (using display)
3) Set Transmit A Level ---- 4) Set Transmit B Level
5) Set Tx Audio Level Method (currently LOG)
7) Set Transmit DSP Level
B) Toggle RX Boost Mode (currently Enabled)
C) Toggle Echo Mode (currently Disabled)
D) Flash (Toggle PTT and Tone output several times)
E) Toggle Transmit Test Tone/Keying (currently Disabled)
K) Manually key COS (currently Unkeyed)
F) Toggle PRE-emphasis Mode (currently Disabled)
G) Toggle DE-emphasis Mode (currently Disabled)
H) Toggle PLfilter Mode (currently Enabled)
Q) Toggle DCSfilter Mode (currently Disabled)
I) Toggle PTT Mode (currently active LOW)
J) Change COSFROM Mode (currently "usbinvert")
L) Change CTCSSFROM Mode (currently "no")
M) Change RXONDELAY value (currently "0")
N) Change RXAUDIODELAY value (currently "0")
W) Write (Save) Current Parameter Values
0) Exit Menu

Please enter your selection now: █
```

simpleusb-tune-menu **before** modification for SHARI PiHat

To setup the node for SHARI PiHat, we need to change the following settings by making the indicated selections:

- Item **B** – Change RX Boost to **Disabled**
- Item **H** – Change PRE-emphasis mode to **Disabled**

3. Enter **W** to save the changed settings then enter **0** to exit the SimpleUSB-Tune-Menu

## Configuring the SHARI PiHat Serial Port

SHARI PiXX uses a serial connection via USB to program the SA818 radio module. This has been changed for the SHARI PiHat. In SHARI PiHat, the Raspberry Pi primary UART is used. This UART is called ttyAMA0. The **818-prog** has been modified to use this UART. The new program is called **SA818-prog**. It is included with the HamVOIP image in the /usr/local/sbin directory

The physical serial connection uses the TX (pin 8) and RX (pin 10) of the Pi4 GPIO connector. The programming connection is automatically made when the SHARI PiHat is plugged into the Pi GPIO connector during construction of your SHARI PiHat node.

## Connecting and Configuring SHARI PiHat

In this section you will use the **SA818-prog** program to setup the SA818 radio module in the SHARI PiHat.

1. Use MobaXterm to connect to your SHARI PiHat.
2. Scroll down to Admin Menu Item 9 and press **<enter>**. This will start a Bash Shell session. You should now see the following command line prompt on your screen -  
**[root@<your call> - <your node> ~]#**
3. Type **cd /usr/local/sbin** and press **<enter>**. You should now see the following command line prompt on your screen -  
**[root@<your call> - <your node> sbin]#**
4. Type **SA818-prog** and press **<enter>**. This will run a program to setup the radio module (SA-818) in SHARI PiHat. You will then be prompted by the program to enter information. The program does extensive error checking. If you make a mistake, you can press **CTRL+ C** at any time to exit the program and return to the command prompt. Press the **UP-Arrow** key to retype the command and start over.
5. If you get an error trying to start the SA818-prog program, return to the Admin Menu by typing **exit** and do an update using Admin Menu, Item 1. Then return to step 4 above.



6. The following screen clips show a typical programming session for a SHARI PiHat (UHF).

```
SA818-prog, Version 1.08x
Programming SHARI PiXX / SHARI PiHat / SA818(U/V) Module
Programming Device name:
  /dev/ttyAMA0
-----
No previous programming data available.
Testing serial communications
Serial communications with the SA818 module are OK
What are you programming?
Enter 1,2 or 3 where SHARI PiXX=1, SHARI PiHat=2, SA818 Module=3: 2
    Programming a SHARI PiHat
    Wide channel spacing
Enter band (VHF=1, UHF=2): 2
    You chose UHF
Enter transmit frequency in MHz (xxx.xxxx): 446.1000
    The transmit frequency is 446.1000 MHz
Enter receive frequency in MHz(xxx.xxxx): 446.1000
    The receive frequency is 446.1000 MHz
Do you want to use a sub audible tone? (0 = No, 1 = CTCSS, 2= DCS): 1
    You chose CTCSS
Enter Tx CTCSS Frequency in Hz(xxx.x): 110.9
    You entered 110.9 Hz
    The Tx CTCSS code is 0015
Enter Rx CTCSS Frequency in Hz(xxx.x): 110.9
    You entered 110.9 Hz
    The Rx CTCSS code is 0015
Enable Reverse Burst (y/[n]): n
    Reverse burst is not enabled
Enter Squelch Value (1-8): 1
    Squelch is set to 1
Enter Volume (0-8): 6
    Volume is set to 6
Enable Pre/De-Emphasis (y/[n]): y
    Pre/De-emphasis is enabled
Enable High Pass Filter (y/[n]): y
    High pass filter is enabled
Enable Low Pass Filter (y/[n]): y
    Low pass filter is enabled
```



```

Verify:
-----
Channel Spacing: 1
Tx Frequency: 446.1000
Rx Frequency: 446.1000
Tx CTCSS code: 0015 Frequency: 110.9 Hz
Rx CTCSS code: 0015 Frequency: 110.9 Hz
CTCSS Reverse Burst: n
Squelch Value: 1
Volume Value: 6
PreEmphasis Enabled: y
High Pass Enabled: y
Low Pass Enabled: y
-----
Is this correct ([y]/n, or a to abort) ?y

Sending Frequency, Sub Audible Tone, and Squelch Information...
Frequency, Sub Audible Tone, and Squelch information correct

Setting Volume - 6
Setting Reverse Burst
Setting Filters

Programming Successful

Configuration log written to /root/SA818.log

[root@N8AR-40270 sbin]# █

```

7. Configure a radio you will use to communicate with SHARI PIHAT (an HT is perfect) to the RF and CTCSS frequencies you have selected.
8. Reboot your Raspberry Pi by typing **reboot.sh<enter>** at the command line prompt in MobaXterm. You will hear your node send your callsign ID and the IP address of the node to your radio.
9. Type **R** in MobaXterm to re-establish your connection to your node and return to the Admin Menu List.

## Setting Receive and Transmit Voice Levels

1. From the “Admin Menu” select item 12 – Run the SimpleUSB-tune-menu Application, by clicking on item 12 or scrolling to item 12 with the arrow keys, and then clicking on <Run Selected Item> or by pressing <enter>
2. In the SimpleUSB-Tune-Menu, select item 2. This will start the procedure to set the receive voice level for your node.

```
Please enter your selection now: 2
RX VOICE DISPLAY:
v -- 3KHz          v -- 5KHz
█
```

3. Key up your radio and speak into your microphone at normal levels. You will see a bar emerge from the left side of the screen. Its length will vary with the level of your voice in real time. You want to set the RX level so that the bar just extends slightly beyond “5 KHz” on the screen. Press <enter> and you will see the following screen.

```
Please enter your selection now: 2
RX VOICE DISPLAY:
v -- 3KHz          v -- 5KHz

Current setting on Rx Channel is 500
Enter new value (0-999, or CR for none): █
```

4. Follow the instructions entering new values for the setting until the level shown by the moving bar as seen on the display is correct. Then press <return> to return to the SimpleUSB-Tune-Menu. Most users find a level of around 500 is required for an HT with the Mic gain set correctly.

Also, node 5553 is a special node that records what you say when you transmit to your node and then plays it back when you unkey. It also verbally comments on your audio level. You can connect to it using DTMF from your keypad by dialing \*355553. You can use it to help set your audio level. Be sure to disconnect after you have finished by dialing \*155553

5. Selection 3 is used to adjust the audio level from your node that you hear on your radio. The current setting is 500. This should not require any or much adjustment but if you notice that the audio level you hear from your node differs from what you hear on your local repeaters or simplex, you can adjust it.
6. Select 0 to exit the SimpleUSB-Tune-Menu and return to the Admin Menu. Press **W** and <enter> to save your current configuration before exiting if required.

## Testing DTMF Decoding

In this section you will verify that all of your DTMF tones are being properly decoded and explore some of the available DTMF commands.

1. In the Admin Menu, scroll down and select item 11. This will start the Asterisk client.

```
Erase is backspace.

Starting Asterisk client. Please type: exit<ENTER>
when done and you will return to the admin menu.

Asterisk 1.4.23-pre.hamvoip-V1.5.4-03-app_rpt-0.327-10/22/2019, Copyright (C) 1999 - 2019
HamVoIP.org and others.
Created by Mark Spencer <markster@digium.com>
Asterisk comes with ABSOLUTELY NO WARRANTY; type 'core show warranty' for details.
This is free software, with components licensed under the GNU General Public
License version 2 and other licenses; you are welcome to redistribute it under
certain conditions. Type 'core show license' for details.
=====
Connected to Asterisk 1.4.23-pre.hamvoip-V1.5.4-03-app_rpt-0.327-10/22/2019 currently run
ning on N8AR-44230 (pid = 329)
Verbosity is at least 4
N8AR-44230*CLI> █
```

2. Key your transmitter and send all 16 DTMF characters in sequence. Verify that they are all correctly decoded. If some do not decode correctly please refer to the PDF document titled “Setting the RX Level in HamVOIP Allstar “ in the SHARI group Files section.

```
[Oct 30 16:25:29] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char 1
[Oct 30 16:25:29] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char 2
[Oct 30 16:25:30] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char 3
[Oct 30 16:25:31] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char 4
[Oct 30 16:25:31] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char 5
[Oct 30 16:25:32] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char 6
[Oct 30 16:25:33] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char 7
[Oct 30 16:25:33] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char 8
[Oct 30 16:25:34] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char 9
[Oct 30 16:25:36] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char 0
[Oct 30 16:25:36] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char *
[Oct 30 16:25:37] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char #
[Oct 30 16:25:38] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char A
[Oct 30 16:25:39] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char B
[Oct 30 16:25:39] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char C
[Oct 30 16:25:40] NOTICE[355]: chan_simpleusb_generic.c:2717 simpleusb_read: Got DTMF char D
-- Hungup 'DAHDI/pseudo-488850447'
N8AR-44230*CLI> █
```

3. Key your radio and send \*A1. Verify that you hear the IP address of your node played back by SHARI PiHat to your radio.

4. The following table contains most of the DTMF commands preconfigured in the HamVOIP Allstar distribution. Watch what is displayed by the Asterisk client as you test them.

Command	DTMF Example	Function
*1<node>	*129789	Disconnect an Allstar node
*10	*10	Disconnect the last node connected
*2<node>	*229789	Connect an Allstar node – monitor only
*3<node>	*329789	Connect an Allstar node (note 1)
*51	*51	Macro to announce time and ID repeater
*70	*70	Announce the system status
*71<node>	*7129789	Disconnect a permanently connected node
*72<node>	*7229789	Permanently connect specified node - monitor only
*73<node>	*7329789	Permanently connect specified node - transceive
*75	*75	Announce complete system status
*76	*76	Disconnect all nodes
*77	*77	Reconnect nodes disconnected with "disconnect nodes"
*78<node>	*7829789	Permanently connect specified node - local monitor only
*79	*79	Last node to key up
*80	*80	Play N8SL repeater ID
*81	*81	Announce time of day
*82	*82	Say 24 hour time
*A1	*A1	Announce IP address assigned to your node
*A5	*A5	Say registration status of your node
*B6	*B6	Restart Asterisk

**Note1** – Node 29789 is the N8SL Repeater in South Lyon, Michigan.

5. Type **exit** to exit the Asterisk client and return to the Admin Menu.

If your DTMF tones are not decoding correctly either you have configured the filters and/or preEmphasis in SA818/SimpleUSB incorrectly or the RX setting needs to be modified. Please refer to the following document located in the Files section of our SHARI group for a method to more accurately set RX levels.

<https://groups.io/g/SHARI/files/Setting the RX Level in HamVOIP Allstar.pdf>

## Enabling the COS LED

SHARI has three status LEDs on her front panel. They are;

COMMS: BLINKING GREEN – Indicates that Allstar is communicating properly with SHARI

COS: YELLOW – Lights when SHARI is receiving an RF signal

PTT: RED – Lights when SHARI is transmitting

You also may have noticed that the YELLOW LED is not lighting up when a signal is being received. The YELLOW COS LED is driven by Allstar to show the presence of a received signal. This uses bit 4 of the CM108B/119B. To use it you must configure your Allstar to use the bit defined for the COS LED. The current HamVOIP image has the required code already installed in the config files but they must be uncommented to be active. If the lines are not already installed you must add them. Check first! Here is the procedure to enable the COS LED.

1. In MobaXterm, in the left “File Browser” panel, note that the window at the top shows `/root/`  
Left click on the green folder icon with the up-arrow in it until you have a `/` in the window.  
Double click on the `etc` folder. Double click on the asterisk folder. You will now have `/etc/asterisk/` in the window.
2. Double click on the `rpt.conf` file to open it in the MobaXterm editor.
3. Verify that there is a statement near line 159 which says **events=eventsXXXXX** where XXXX is your node number. If there is a semi-colon in front of it, remove it.
4. Verify that there is a statement near line 906 which reads **[eventsXXXXX]** where XXXXX is your node number. If there is a semi-colon in front of it, remove it.
5. Look for two lines below the **[eventsXXXXX]** which state  
**cop,62,GPIO4:1 = c|t|RPT\_RXKEYED**  
**cop,62,GPIO4:0 = c|f|RPT\_RXKEYED**  
They will probably have semi-colons in front of them. If so, remove them.
6. In the MobaXterm editor click on File>Save and click on Yes to save the file to your Allstar node.
7. In the Admin Menu, reboot the node (Item 15)
8. Transmit to your node and verify that the YELLOW COS LED is operational.

## Address Reservation and Port Forwarding

At this point, your node is operational and can make outgoing connections. However, other nodes will not be able to connect to you until you log into your router and forward the IAX port to your Raspberry Pi. If this is your first node, as described earlier, this port is 4569 (UDP). Also, unless you reserve the IP address assigned to your Raspberry Pi by your router's DHCP function, it might change at a later time.

Address reservation and port forwarding is router specific. Consult your router documentation for specific instructions.

## Document Attribution:

The document was created by N8AR. Many of the detailed steps were extracted verbatim from the “AllStar Node Setup and Configuration Guide” by KG8MM. Portions of this document were also extracted from “SHARI – Quick Setup Guide” by W8DSB.

## Release Notes:

Release	Date	Changes
1.00	7/26/20	Initial release
1.01	8/27/20	Incorporate changes by beta tester reviewers
1.02	10/11/20	Modified to use the SA818-prog program
1.02.1	11/6/20	Page 13. Changed ‘Root=’ to ‘root=’ in two places
1.02.2	12/25/20	Change link to HamVOIP image and added note about config.txt
1.03	02/28/21	Added <b>SA818-prog</b> example session
1.04	03/17/21	Fixed a mistake in cmdline.txt and added info about using for PiHat only