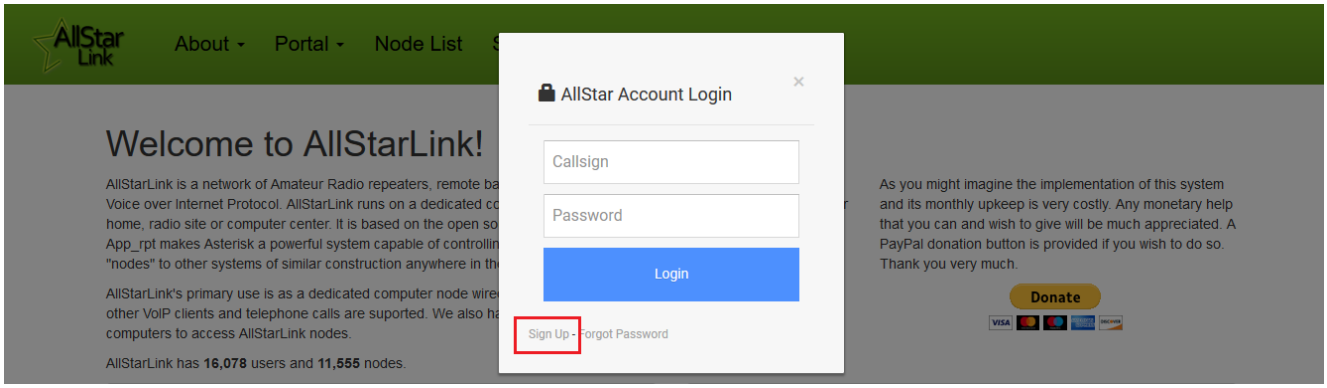
HotSpotRadio - USB Configuration with Allstarlink

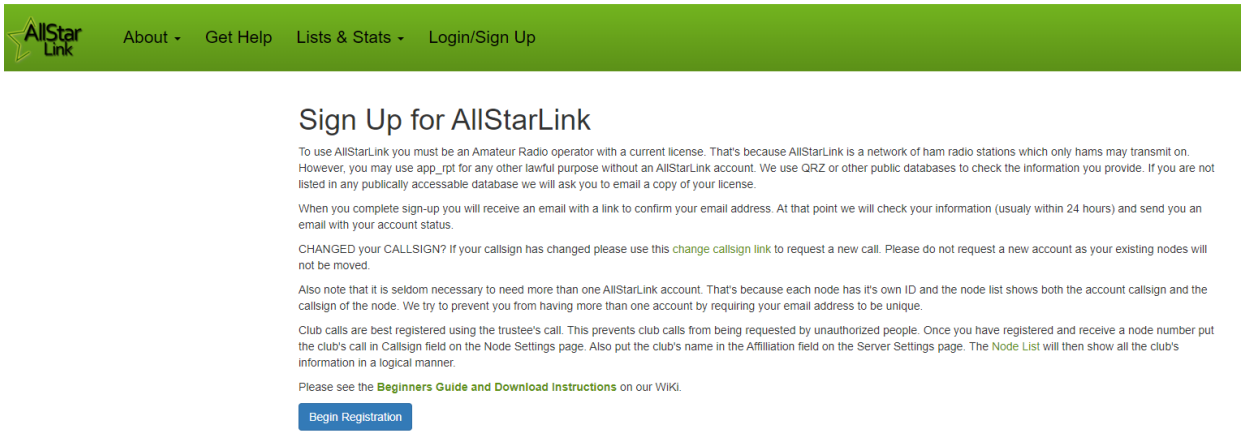
Creating an Account with Allstarlink

If you have already created and account on Allstarlink website and have already a node number for your node you can skip to the **Node Configuration** section of this document in the middle of page 6.

Use your computer and a browser such as Chrome, go to 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 will take 1 to 24 hours to receive confirmation email.

You will receive a validation email to the email address that you used to create your Allstarlink page. You will need to click on the link in the email to validate your email address

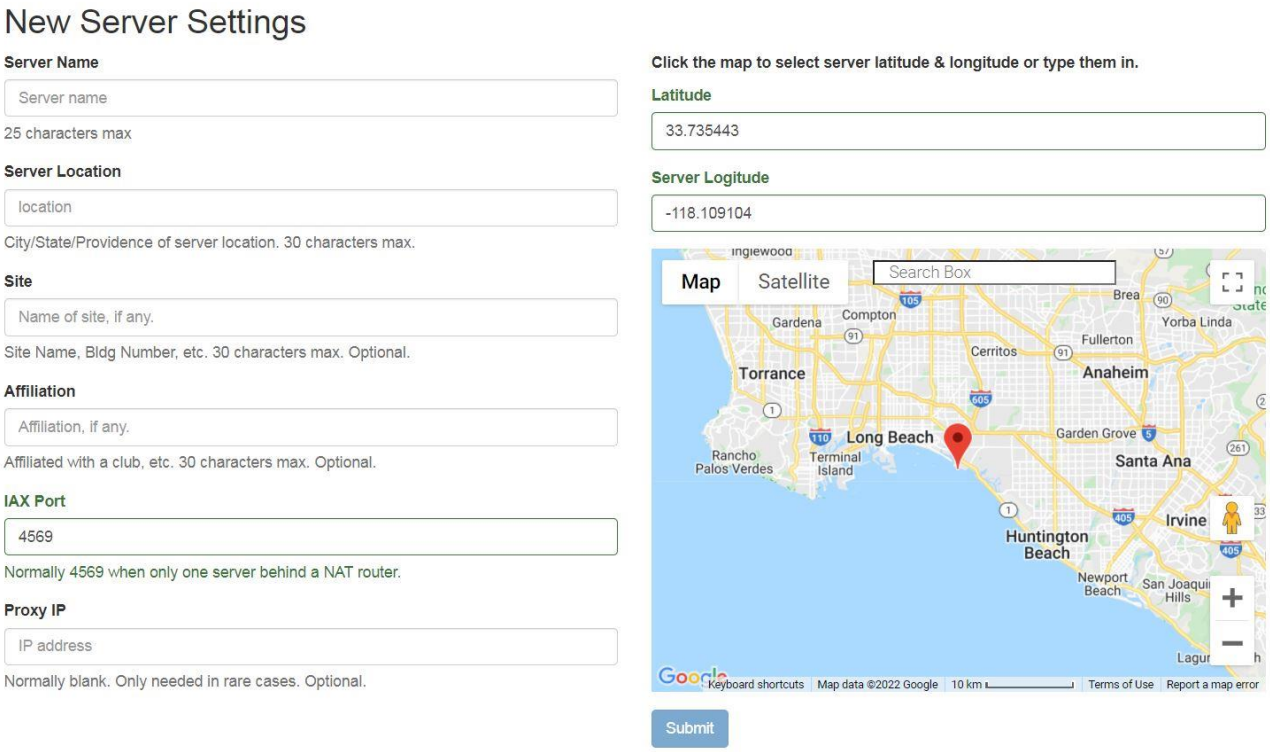
so that your account can be validated. Check your email spam filter if you do not receive this validation email.

Creating a Server

Go to allstarlink.org web portal and logon with your callsign and password that you used to create your account.

First you need to create a server.

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



Fill in all the information:

Server Name - The server is your HSR *HotSpotRadio* node.
I like to use "HotSpotRadio" as the server name but you can call it whatever you like.

Server location – City, State is what most people use.

Affiliation - Optional entry.

IAX Port - Leave this at **4569**

Proxp IP - Normally blank. Optional

Site – "Home," "Vehicle," Garage," are examples for the site field.

Note: Server Latitude and Longitude numbers will be automatically populated if you click on the Red pin on the map and drag it to the location of your server.

Once you have entered all your information in the fields you will need to click on the **Submit** button bellow the map.

Requesting a Node Number

Next you need to request a node number. This will be the node number you use for your *HotSpotRadio.*

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 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.

You can now logout of the AllstarLink.org web portal. (It will take 1 to 24 hours to receive confirmation email.)

Downloading the Image

1.You can download the HamVOIP zipped up image at the following location. This is a self extracting exe for windows. By clicking on the link below this will start the download process. It will open your file manager on you computer. Make sure a save the file into a directory that you can remember.

https://hamvoip.org/RPi2/RPi-Z2W-2-3-4_V1.7-01_Allstar.exe

2. Once the exe file image has been downloaded and is complete double click on the exe file.
If you have virus protection you may be presented with a warning about the unrecognized app. Click okay to continue with the installation. The exe file is a self-extracting file that will expand the following files into your folder.

Putty.exe
RPi2-3_V1.7-01.img
Win32diskimager 1.0.0-install.exe

3. Once the files have been extracted, run the win32diskimager installer to install the imaging program onto your computer.

4. Insert a blank micro SD card into the computer. Start win32diskimager. It should point to your Micro SD card as the destination. Browse to the directory containing the RPi2-3_V1.7-01.img file and select it as the source to be transferred. Click Write. The process should take 5 to 10 minutes depending on your computer.

5. Once the transfer is completed, you will need to safely eject the microSD card. This is done 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 - connector labeled “MICRO SD CARD”).

Node Setup Configuration

Step 1

Prior to applying power to your node **make sure that you have installed an antenna on the HotSpotRadio – USB and plugged in the USB cable to your Pi.** This will protect the radio module from transmitting without an antenna. Make sure your network cable is plugged into the Pi or computer as well.

When your node first boots up it will automatically transmit and announce the local IP address your node is using over the air. This feature lets you easily figure out what local IP address your node is using so you can login to your node via SHH on your local network for node configuration if you do not what to physically connect up a monitor and keyboard to the node raspberry pi.

Your HotSpotRadio – USB board has been programmed and tested before shipment to insure proper operation of the hardware. The radio module on the HSR - USB has been programmed to the default simplex frequency of 439.000 MHz with a PL of 67.0 Hz.

1. The easiest way to set up your Pi is to use a monitor and keyboard connected to your Pi.

2. You may also connect to your Pi using an SSH connection over your network (hard wired) with Putty, WinSCP or MobaXterm software. (NOTE: you will need to know the IP address to your Pi.) We recommend MobaXterm. https://mobaxterm.mobatek.net/download.html select the free Home Addition.

3. The default username & password are both: **root**

4. Would you like to configure setup now: **YES**

5. Enter a New Root password (you can make this what you want, **DON’T FORGET IT**…)

6. Re-enter the root password for verification.

7. Are you setting up a private node. **NO**

Enter your assigned node number. **OK**

8. Do you want to set up your node configuration for Asterisk: **YES**

9. Change Time Zone: change this timezone to your timezone. Select **NO** to leave the default timezone to Los Angeles. Select Yes to change your timezone. Cursor down to find your timezone, hit the spacebar to place a * in front of your selected timezone. Then select OK.

10.The current hostname is “alarmpi”: This is the Pi’s name and how it will be viewed on the network, you can change it or simply leave it. I like to change the host name to my node number.

11. IP: Most people leave this as Dynamic, but you can change it to Static if you choose.

12. SSH: Most leave this as **222,** so simply select **NO**.

13. Reboot your Pi and log back in using root as the username and your new password.

14. You will see a screen that indicateds that the firstime node confuiguration will now proceed,This script configures Asterisk, Select **YES**.

15. Enter your node number: (Do not use the numeric keypad for node number entry). This will be the node number that you were issued by Allstarlink.org

16. Is this a private node? Since you have a node number that was supplied to you by Allstarlink.org , you will select **NO**, (this will be a public node.)

17. Enter station Call-Sign for your node: Enter the call-sign that was issued to you by the FCC. (or call-sign for the owner of this node.)

18. Do you want to report the status of your node to AllstarLink.org. YES

19. Pick either Voice or CW id. Voice: An audible voice will announce your call-sign or CW (morse code) ID of your call-sign will be played. We like the Voice ID, select. **YES**

20. Port 4569: (unless you have multiple servers running) Leave this as 4569 and select **OK**.

21. Duplex Mode: **Select 1** for a simplex node as your HotSpotRadio – USB is a simplex radio.

22. Node Password: Enter the node password that was supplied to you by Allstarlink.org, whichever node number you chose for this node you will need to use the password that was

assigned for that node number.

(Note: again, this is the password that was issued for your specific node number and **not** the computer, #5 from above.)

23. IAXPRT: If you are ever planning on connecting to the system with your smartphone, then you would need to set up a password. Most people will not, so the answer to this is **NO**.

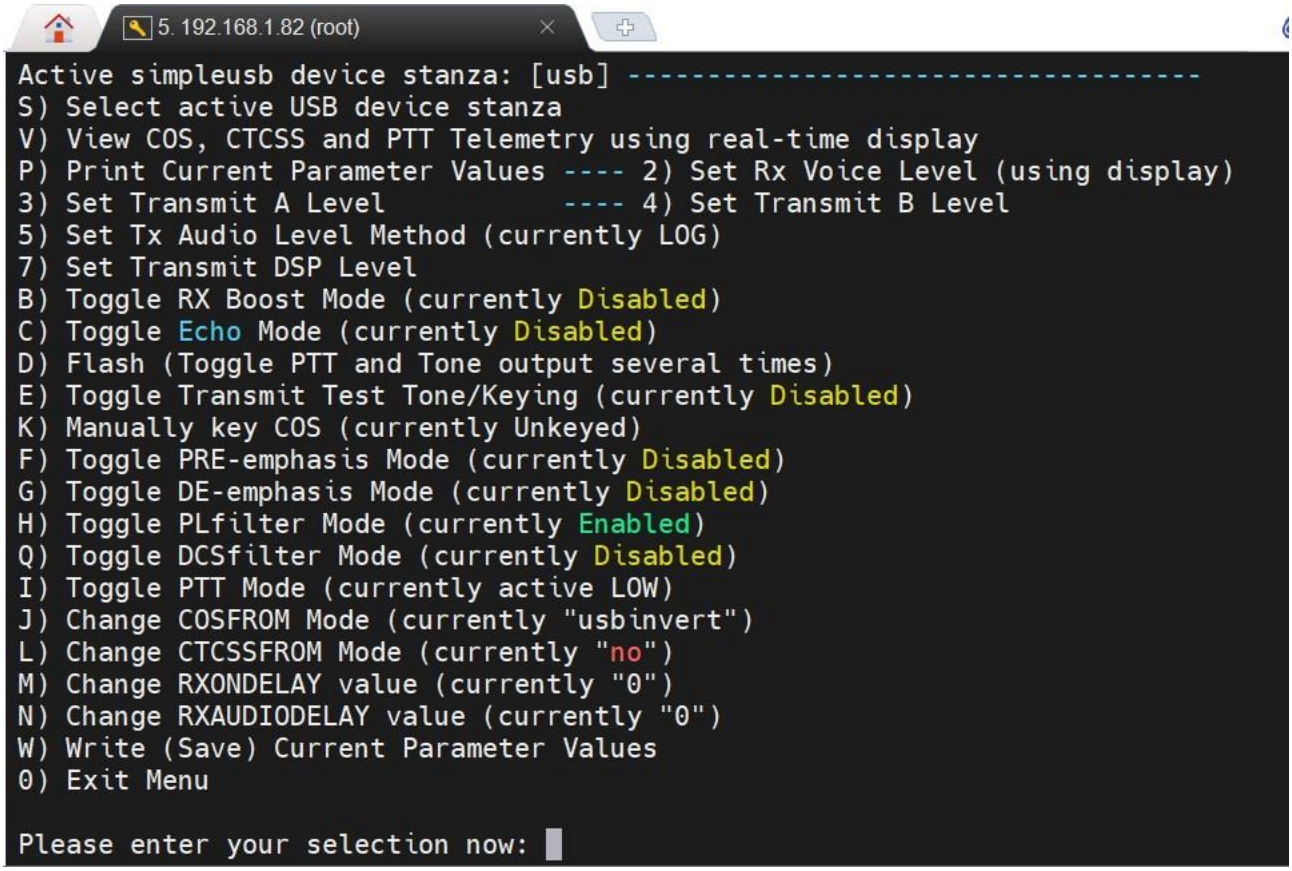
24.You will be prompted to configure the “Simple USB” settings. **NO**
We will configure these settings and adjustment from the Admin menu later.

23. Restart Asterisk? Select **YES**.

24. Wait for asterisk to restart and you should see the admin menu list. Go to the next section for configuration of the SimpleUSB settings.

SimpleUSB Settings

1. Select item 12 from the admin menu Run the “SimpleUSB-tune-menu Application”



2. Change or verify the following values in the SimpleUSB Tune menu for your HotSpotRadio-USB board.

   2) Set RX Voice Level = **560**
   3) Set Transmit A Level = **920**
   4) Set Transmit B Level = **0**
   7) Set Transmit DSP Level = **400**
   B) Set RX Boost = **Disabled**
   F) Set PRE-emphasis mode = **Disabled**
   G) Set DE- emphasis mode = **Disabled**
   J) COSFORM = **usbinvert**

3. Save all the settings, by entering **W**, the **0** (zero) to exit back to the Admin Menu.

How To Enable the COS light on your HotSpotRadio-USB

The COS LED can be driven by Allstar to show the presence of a received signal. This uses bit 4 of the CM119B. Using the COS LED is optional. If you decide to use it you must configure your Allstar to use the bit defined for the COS LED. Current HamVOIP image downloads may have 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 are the lines required:

1. In /etc/asterisk/rpt.conf in the node stanza you want to activate the COS LED add the following in the CONTEXT MAPPING section if it is not already there. The xxxxx is the node number for that stanza.

events=eventsxxxxx

2. Add the event stanza if it is not already there. If it is there it will look like this, where xxxxx is your node number. This can be located anywhere after the node stanzas. Typically between the [schedule] stanza and the [functions] stanza.

[eventsxxxxxx]

3. Add the following after the above line. If the lines are already there but commented, remove the ';' semicolon from the beginning of the line.

cop,62,GPIO4:1 = c|t|RPT_RXKEYED
cop,62,GPIO4:0 = c|f|RPT_RXKEYED

If you are typing this in please pay attention to the exact syntax including case or better yet cut and paste from here to the file.

4. Save the rpt.conf file.

5. Edit the /etc/asterisk/simpleusb.conf file. In the stanza for the node you want to indicate the COS add the following.

gpio4=out0

6. Save the simpleusb.conf file.

7. Restart asterisk (Admin Menu Number 13)

Programming Your HotSpotRadio- USB Radio Module

The *HotSpotRadio-USB c*an be programmed with frequency and CTCSS of your choice. If you need to change this, it is very easy.

Login in to your *HotSpotRadio node* with your favorite SHH program or connect up a keyboard and display to your node. Login as user root, then your password that you created when you configured your node.

Unplug the USB-C connector from the HotSpotRadio-USB unit and rotate the USB-C connector 180 degrees so that the "Program" word is facing up and you can see the word Program. Only the Blue LED on the bottom of the board should be on, this is letting you know that your HotSpotRadio-USB board is in programming ONLY mode.

After logging in you will be taken to a menu. Select item 9 **Start Bash Shell Interface**. The *HotSpotRadio - USB* program is located if the following directory.
Type the following at the prompt to get to this directory

cd /usr/local/sbin/

Once you are in the sbin directory you can open the program. Type the following.

SA818-prog

You should see the program open and it should look like the following.

```
-----------------------------------------------------
SA818-prog, Version 1.08x

Programing SHARI PiXX / SHARI PiHat / SA818(U/V) Module

Programming Device name:
      /dev/ttyUSB0
Last values programed to SA818:
```

```
-----------------------------------------------------
     Channel Spacing: 1
        Tx Frequency: 445.0000
        Rx Frequency: 445.0000
       Tx CTCSS code: 0014 Frequency: 107.2 Hz
       Rx CTCSS code: 0014 Frequency: 107.2 Hz
 CTCSS Reverse Burst: y
       Squelch Value: 3
        Volume Value: 8
 PreEmphasis Enabled: y
   High Pass Enabled: n
    Low Pass Enabled: n
-----------------------------------------------------
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:

Enter 3 SA818 Module

Programming a generic SA818 module
Enter Channel Spacing (Narrow=0 or Wide=1):

Enter 1 for Wide

Enter band (VHF=1, UHF=2): 2
    You chose 2 for UHF

Enter transmit frequency in MHz (xxx.xxxx): 443.4000
    The transmit frequency is 443.4000 MHz

Enter receive frequency in MHz(xxx.xxxx): 443.4000
    The receive frequency is 443.4000 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): 100.0
    You entered 100.0 Hz
    The Tx CTCSS code is 0012

Enter Rx CTCSS Frequency in Hz(xxx.x): 100.0
    You entered 100.0 Hz
    The Rx CTCSS code is 0012

Enable Reverse Burst (y/[n]): y
    Reverse burst is enabled

Enter Squelch Value (1-9): 3
    Squelch is set to 3

Enter Volume (0-8): 8
    Volume is set to 8
```

```
Enable Pre/De-Emphasis (y/[n]): y
    Pre/De-emphasis is enabled

Enable High Pass Filter (y/[n]): n
    High pass filter is not enabled

Enable Low Pass Filter (y/[n]): n
    Low pass filter is not enabled


Verify:
-----------------------------------------------------
     Channel Spacing: 1
        Tx Frequency: 445.0000
        Rx Frequency: 445.0000
       Tx CTCSS code: 0012 Frequency: 100.0 Hz
       Rx CTCSS code: 0012 Frequency: 100.0 Hz
 CTCSS Reverse Burst: y
       Squelch Value: 3
        Volume Value: 8
 PreEmphasis Enabled: y
   High Pass Enabled: n
    Low Pass Enabled: n
-----------------------------------------------------
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 - 8
Setting Reverse Burst
Setting Filters

Programming Successful

Configuration log written to /root/SA818.log

[root@2068 asterisk]#
```

If your are successful you should see at the very end "Programming Successful"

Unplug the USB-C connector from the HotSpotRadio-USB unit and rotate the USB-C connector 180 degrees so that the “Program” word is facing Down and you can not see the word Program. Your HotSpotRadio-USB board should now have the green LED flashing for normal use.

Connecting your node to the network

You are now ready to use your node and connect. Using another radio that has a keypad. You will use the commands listed below to connect. (NOTE: You never use the radio connected to the Pi to enter commands, always use another radio.)

Let's try and connect to the 2000 HUB.

While holding down the PTT (Push-to-Talk) button, press the keys listed below.
The asterisk (*) enters the command mode.

Example: *32000 - This will connect you to the HUB 2000.

a. *1(node number) - This Disconnects the node you are currently connected to..
b. *2(node number) - This is Monitor mode only. You can listen, but will not be able to talk.
c. *3(node number) - This will Connect you to the node you entered after the *3.

Again, if you would press and hold the PTT button in, and dial *3200 this will connect you to the 2000 HUB. If you want to disconnect from the 2000, you would press and hold the PTT and dial *12000.

Sometimes the Internet and/or the Network can have hiccups. Those hiccups can disconnect you from a HUB. You would just have to reconnect.

Permanently Connect:

You may find a time that you want to permanently connect to a specific node or HUB. This can also be done by entering a 7 before the command to connect or disconnecting. A Perk :-), if your node for whatever reason was disconnected from a HUB, this command will usually reconnect you automatically to the HUB you were previously connected to.

a. *71 (node number) - Permanently disconnects you.
b. *72 (node number) - Permanently puts you in monitor-only mode.
c. *73 (node number) - Permanently connects.

Important Note:

Make sure that when you are changing to another Node/HUB or Room, that you **ALWAYS** disconnect from the Node/HUB or Room/ you were connected to before connecting to a different Node/HUB.

Additional (*) Commands:

*A1 Announce local IP address of your node.
*A3 Announce public IP address assigned to your node.
*A5 Announcce registration status of your node.
*A9 One time parrot mode. (*See Note Below)

*B6 Restart Asterisk
*80 Play local ID
*81 Play Time and Voice ID.
*82 Play local time in 24 Hour format

(* NOTE: The One Time Parrot mode will allow you to key up your mic, say something and it will repeat what you said, allowing you to hear what you sound like over the system. Each time you want to do this you need to enter the command before you speak. Example: Press and hold the PTT button, enter ***A9** and then speak your message. Then release the PTT button to hear the playback of your audio transmission.)

Ports:

The port to access your Pi using the Putty, WinSCP or MobaXterm software is **222**. (NOTE: the **default in most programs is 22**; Make sure to change this in your SSH program of choice.

Asterisk uses port 4569 UDP for node communication and will need to be added to your internet router for incoming connections. No ports need to be added for outgoing connections.

Supermon, is a very useful tool and can be added to you HSR *HotSpotRadio-USB* (the "Status Page") port 80 TCP, needs to be added to your internet router to view your Status Page if you choose to use it.

***HotSpotRadio* Status LEDs**

Blue LED - Power to HSR – USB board.

Orange LED - COR activity, when on the *HotSpotRadio - USB* is receiving a signal
Green LED Flashing (USB Heartbeat - Sound chip is talking to software correctly)

Red LED - PTT when on the *HotSpotRadio* – USB is transmitting

After configuration of your node plug it into a network cable for internet access before applying power to the node. Note: Upon first powering up your node, it needs to report your node IP address to the registration servers. Then the registration servers will send your node IP address information to the rest of the nodes. This usually takes around 10-15 minutes for the process to be completed. During that time you will not be able to make any connections to other nodes. Once your node has been connected to the internet for 15 minutes, you will be able to make connections to other Allstar nodes.

Powering Down your *HotSpotRadio-USB* Node

Use item menu 16 to power down you node. Your node will power down in about 20 seconds. Watch the red and green LEDs on the Raspberry Pi board which are located underneath the antenna on the actual Raspberry Pi board. (Do not confuse the Pi board LEDs with the *HotSpotRadio – USB* status LEDs)

Once the Raspberry Pi has powered down the green LED on the raspberry Pi will no longer flash intermittently. The green LED is actually showing when information is being written to the Micro-SD card and you **NEVER** want to remove power from the raspberry pi when the Micro-SD card is being accessed as this can corrupt the Micro-SD card on your node.

When your node has powered down you will only see a steady solid red LED on the Raspberry Pi board. It is now safe to remove power from your Pi. I recommend removing the wall-wart from the AC outlet and not unplugging the micro-USB power connector from the Pi to power down your *HotSpotRadio* node. The micro-USB connector on the Raspberry Pi board is very fragile and you can easily wear out this connector or even break. It is just better practice to use the AC wall-wart to remove power as it will not wear out or break when removed many times from an AC outlet.

Note: You must **always enable Pre/De-Emphasis with a "Y"** when programming or changing any or your radio parameters. You must **always set the Volume at 8** as well. This controls the receiver audio level to the Allstarlink network from your *HotSpotRadio* node.

If you have any questions regarding the *HotSpotRadio* hardware or configuration please join our mailing list at:

https://groups.io/g/*HotSpotRadio*s

Click on the subscribe link to join the group.

You can any questions that you may have. There are several folks on this group who can offer help to you.

73

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