

This document is intended to get you up and running with CentOS Linux, AllStar, and Asterisk with as little pain as possible.

It details how to create a private node (vs. a public one on the AllStar system). If you want to create a public node, the installation will have an option for you to have your configuration files created automatically, and you won't need to mess with most of the configuration stuff detailed here. Start here for public node info:

<https://allstarlink.org/>

I don't know anything about Linux, I have never seen it until a friend told me about AllStar. Many thanks to my friend Ken, KH7R for helping me get together what I needed to do the node, and helping me make it work. He suffered through this and was very willing to share what he had learned. Linux is a wee bit different than Windows, kind of like DOS on steroids.

There is a lot of documentation about AllStar and Linux and Asterisk all over the Internet, but it's fragmented and sometimes hard to find. I figured that while I was going through the installation of a node at my house, I would document it so that other people would have a basic "flow chart" to work with during their installation.

Hardware wise I used a Motorola M1225 on a VHF simplex frequency, and a UR1x interface made by DMK Engineering, which made a very clean installation. One USB cable to the UR1x from the computer, and one cable to the accessory plug on the back of the radio. Much better than my EchoLink kludges in the past.

UR1x is available here:

<http://dmkeng.com/>

So here it is. Worked for me, so hopefully it will work for you.

73, Jim KH2D

Install CentOS Linux On Your Computer:

Download the ACID version ISO from:

http://dl.allstarlink.org/installcd/acid_centos.iso

Burn the ISO file to a CD. I used a program (free) called Active@ ISO Burner.

<http://www.isoftware.net/>

It's very important that you have the hardware configured BEFORE you start the installation:

Make sure the NIC card in the computer is hooked to your LAN.

Make sure your URI is plugged into a USB port.

Boot the CD on the computer you want Linux installed on. This will format the hard disc, so Goodbye Weendoze.

First the OS will install. Don't panic when you see a blue screen. Just wait. It's not a Windows error.

356 packages to install.....

When CentOS is installed, you will get a message telling you to remove the CD and hit ENTER to reboot.

The system will reboot and then you will be asked "Do you require a static IP to be configured on eth0 for the installed system to access the Internet during the installation?" No works for me. Your mileage may vary.

The next phase of the installation requires that the system downloads files (packages) from an Internet server. Go make a sandwich; this is going to take a while.

After you finish your sandwich, the computer will reboot itself automatically and continue the installation. If everything went OK, you should see a bunch of green "OK"'s on the right side of the screen as Linux boots. Hopefully you will not see any red "Failed"'s. The install will continue after the reboot...

You will eventually be prompted twice to enter a password for root:

**New Unix Password?
Retype New Unix Password?**

Don't forget the password, or you will have to start over.

You will then be prompted:

Would you like your config files be provided by the Allstar Portal Server?

If you are configuring a private node, say NO.

If you are configuring a public node, say YES.

You will then be prompted about the system node number:

The system node number is 1999. Would you like to change it?

Say yes, and enter your private node number. If you don't know it, you can change it later.

Next prompt:

The registration password is: 1234567

Would you like to change it?

Next prompt is:

Would you like to enter a callsign for the identifier?

Say Y and enter your call.

The system will again reboot.

You will be prompted to login. Use "root" and the password you picked, after which you will be greeted with prompt:

```
[root@test ~]#
```

Congratulations. You are done the install. That took 1 hour and 5 minutes on my Compac 10 year old clunker. Now on to the configuration.....

Configure your NIC in CentOS.

Change directories to /etc by typing:

CD /etc

Then type:

system-config-network

This will run a program called "Devernet Configuration". Change your DEVICE setting to use a static IP address, and also specify the default gateway for your LAN.

Edit the DNS SETTINGS and change the "Hostname" field to your call sign. Edit DNS servers if necessary.

Don't forget to save your changes. Click SAVE to exit any screen or the software may not remember your changes.

Reboot. (Use the "reboot" command, go figure).

You now should be "root@yourcallsign" instead of "root@test".

Set Up Port Forwarding On Your Router.

Forward port 4569 to the Linux computer.

Forward port 222 to the Linux computer (for Putty, a remote terminal program).

Use the IFCONFIG command to see the IP address, MAC address and other info about your NIC in the Linux box.

Set Up Configuration Files

There are four (or five) files you need to edit for your node. They are all found in the same folder:

/etc/asterisk

These files are:

RPT.conf – Sets up node info.

USBradio.conf – radio parameters for USB interface.

EXTENSIONS.conf – configure remote console.

IAX.conf - console operation feature, for a Windows client called iaxRpt - PTT Radio Dispatch Client. You can download the client software here:

<http://www.xelatec.com/xipar/iaxrpt>

If you want to connect to the Echolink system, you will also need:

ECHOLINK.conf

Configuration files are found in /etc/asterisk. A semi colon at the beginning of a line comments the line out, it will be ignored. Notes in the line proceeded by a semi colon are also ignored.

For the sake of explanation, node number "1999" is used in this document. If you see 1999, replace it with your node number.

Configuration files are in text format. I've tried FTP'ing them to my Windows box and then editing them and putting them back to Linux again, but something in the format of the file gets hosed, so I don't recommend trying that.

There is an editor called "NANO" that included with the Linux distribution. Use that to edit your configuration files.

Type "nano <file name>" to edit a file.

Changes To File RPT.conf

Edit - Enter your node number on this line:

```
[1999] ; Change this to your assigned node number
```

Edit – Remove the “;” at beginning of the line in this line:

```
;controlstates=controlstates ; system control state list
```

Edit – Put your call sign (for ID'er) on this line:

```
idrecording = |iYOURCALL ; id recording or morse string
```

After this line:

```
politeid=30000 ; time in milliseconds before ID timer
```

Add a line:

```
duplex=1
```

In the [CONF] section, add the nodes you want to connect to:

```
1999 = radio@127.0.0.1/1999,NONE ; Change to your node number
```

```
1900 = radio@<ip number>/1900,NONE ; Add one node per line
```

Changes To File IAX.conf

Add a semi colon in front of this line (private nodes only):

```
;register=1999:1234567@register.allstarlink.org
```

After this line, in the [radio] stanza:

```
disallow=all
```

Add this line:

```
allow=ulaw (makes your audio pretty)
```

At the end of the file, add this:

```
[gui]
```

```
type = user
```

```
context = radio-gui
```

```
auth = md5
```

```
secret = <Your Password for Gui>
```

```
host = dynamic
```

```
disallow = all
```

```
allow = ulaw
```

```
allow = gsm
```

```
transfer = no
```

Changes To File Extensions.conf

Add your area code and node number in this section:

```
[globals]
HOMENPA=904      ;Number is your area code
NODE=1999       ;Number is your node number
```

At the end of the file add:

```
[radio-gui]
exten = 1999,1,Rpt,1999|X
```

Changes To File USBRadio.conf

Set your tone configuration if you plan on using CTCSS tones. You don't need to set the node radio to use tones; tones are handled by the software.

```
;txctcssdefault=100.0    ; default tx ctcss freq, any frequency permitted
rxctcssfreqs=100.0      ; rx ctcss freqs in floating point. must be in table
;txctcssfreqs=100.0     ; tx ctcss freqs, any frequency permitted
;rxctcssoverride=0; Set to 1 or yes to start out in carrier squelch mode
```

Change this line:

```
duplex=1          ; Full Duplex
```

To:

```
duplex=0          ; Full Duplex
```

Change this line:

```
;rxondelay=20      ; Uncomment and/or adjust for simplex nodes to eliminate
```

TO

```
rxondelay=25      ; Uncomment and/or adjust for simplex nodes to eliminate
```

That completes the edits to the configuration files.

Stop Asterisk using this command:

```
astdn.sh
```

And then start it again using:

```
astup.sh
```

You should now be ready to do radio audio level adjustments. There is documentation available on how to properly adjust levels using test equipment elsewhere. I don't have test equipment, so this is the Wing It method of adjusting levels so you can use your node.

Start the Asterisk command line interface:
`asterisk -r`

Type the command:
`radio tune rxnoise`

Ignore the warning message about insufficient high frequency noise. It does that. Why, I dunno.

Type the command:
`radio tune rxsqlch 900`

Set the CTCSS tone in another radio (not the node radio). Key the other radio and then type the command:
`radio tune rxtone`

Turn CTCSS off in the other radio, and key it and send a "5" DTMF tone. While sending the "5", type the command:
`radio tune rxvoice`

Type the following command to set your TX CTCSS tone if you plan on using one (0 or your tone freq).
`radio tune txtone 0`

The next setting sets transmit deviation – audio level for transmitted audio. Since we have no test equipment, we guess at the level.
`radio tune txvoice 500`

Finally, type the command:
`radio tune save`

This creates a file with your level settings that is named `usbradio_tune_usb.conf`

At this point you should be ready to try a connection test with another node.

Common DTMF Commands

- *1 <Node Number> = Disc Node Number
- *2 <Node Number> = Monitor another node
- *3 <Node Number> = Conn Node Number

- *70 Node Status
- *71 DISC ALL Links
- *72 Last Node To Key Up
- *73 FULL LINK STATUS
- *74 RECONNECT ALL LINKS
- *75 Link Connect Local Monitor Only

- *80 ID
- *81 TIME
- *980 AP RPT VERSION

Connecting to the EchoLink System

Allstar is capable of connecting to nodes on the EchoLink system.

In order for your node to show up on the EchoLink server, you need to create a file called "echolink.conf" and put it in the same folder as the other configuration files. Use Nano to create the file.

The basic file content is as follows:

[e!0]

```
confmode=no
call=<your call>
pwd=<your Echolink password>
name=<your name>
qth=<your QTH>
email=<your email>
maxstns=6
rtcptimeout=10
node=<your node number>
recfile=/tmp/recorded.gsm
astnode=<your Allstar node number>
context=radio-secure
server1=naeast.echolink.org
server2=nasouth.echolink.org
server3=servers.echolink.org
permit=<list of calls who can connect to you separated by commas>
```

In order to use the Echolink system, the Echolink ports will need to be forwarded on your router. Forward ports 5198-5199 on your router to your Allstar Linux box.

Once the Echolink.conf file has been created, and port forwarding is set up, you can stop Asterisk and start it again, and you should then show up on the Echolink server's list of connected stations.