How to Setup SimpleUSB

Note that this how-to applies to the Allstar Acid PC release as the BBB release already comes stock with simpleusb and the fixes shown below

The Allstar Acid release (not BeagleBone Black) installs by default with the usbradio channel driver thus basically forcing new installs to use this driver. The usbradio driver has many features that make it attractive but unfortunately there is a downside. The code is old and inefficient and even on modest speed processors when using the DSP features distortion is introduced into the transmitted audio. The user often does not realize this because he does not hear it. I can usually pick out a node using usbradio just by listening to the audio.

While there is ongoing work to rewrite the channel driver in my opinion until that happens it is desirable to use the simpleusb channel driver whenever possible. I realize there are cases where required features in the usbradio driver may make it difficult to use simpleusb. In the case of the BeagleBone Black I would not recommend using the usbradio channel driver.

Is is relatively easy to switch to simpleusb. Here is how to switch to the simpleusb channel driver in the Acid release.

First you need to get the simpleusb.config file into the /etc/asterisk directory.

cp /usr/src/astsrc/configs/simpleusb/simpleusb.conf /etc/asterisk

Then edit simpleusb.conf in its new location to satisfy your needs. Most of the simple radio settings like carrierfrom and invertptt are the same as in usbradio.

The simpleusb.conf file is divided into contexts which denote the node it is controlling. In its simplest form it just has a [general] and a [usb] section for one node. It is a good idea to specify the node you are controlling in the name. So if the node was 1999 then you might use something like [usb1999]

Once the file is configured you need to modify the rpt.conf file to properly call it.

If you are using usbradio in the beginning of the node definition you will find a line like this -

rxchannel=Radio/usb1999

The 1999 would be your node number. You would comment this line by adding a semicolon at the beginning of the line and then add the following line -

rxchannel = SimpleUSB/usb1999

There is no functional requirement to rename or remove the usbradio.conf file but to eliminate confusion I would recommend renaming it to usbradio.conf.old

Thats it! Just restart Asterisk – astres.sh – and you should be running simpleusb. Make sure it is

working and that you can key the transmitter and you have audio in both directions even though it is not set correctly yet.

You can check keying and unkeying in the asterisk client -

CLI> susb key

CLI> susb unkey

Then at the linux prompt run **simpleusb-tune-menu**

This program should be located in **/usr/sbin/simpleusb-tune-menu** but if not look in **/usr/src/astsrc/asterisk/utils/simpleusb-tune-menu** and copy it there.

Select (1) to select the usb device (node) to configure. If there is only one node no selection is necessary. Then select (2) to set the RX level. This is the level coming into your node radio from your handheld or source radio. There is a display roughly marked in kHz. You can change the level while viewing the display. Peaks should not go much beyond the 5 kHz mark. Likewise the setting for transmit level can be set with selection (3). This is what you hear transmitted from your node radio. Of course levels can be set more accurately if desired with a calibrated station monitor or deviation meter.

When you are satisfied with the levels select the (W) key to write the parameters and the (0) [zero] to exit.

A couple of more items you should consider for the best possible performance are -

There was code written to relax the DTMF timing parameters. This changes the DTMF timing that originally appeared in the Asterisk PBX code. The Acid release is distributed with this relax "feature" turned ON. Unfortunately this causes false DTMF decoding on voice signals. When this happens the audio is muted for a brief time causing a hole in the audio which some interpret as digital dropouts. It is very annoying and the relax is not necessary for proper DTMF decoding. To eliminate this you need to recompile asterisk with the radio_relax feature turned off. Here is how you do it -

cd /usr/src/astsrc/asterisk/
make menuselect
    select item (10) – compiler flags, uncheck item (6) – radio_relax, hit the (x) key to save and exit
make
make install
restart Asterisk – **astres.sh**

This change is in all BBB image releases.

**NOTE – THE ALLSTAR ACID RELEASE HAS
BEEN UPDATED WITH THIS BUG FIX AS OF 9/24/2014
The following changes would not be necessary if you updated after that date**

The PC Acid release version uses a Centos kernel version that has a stable USB BUT the simpleusb

code unlike the usbradio code will not recover from a usb failure. That is if you pull the usb cable going to the URI and reinsert it it will not recover. This is a bug in the simpleusb code that can be fixed with a one line patch. Because versions can differ it is best to manually find the location in the C file and edit in the one line, then recompile. Here is how to do it -

cd /usr/src/astsrc/asterisk/channels
cp chan_simpleusb.c chan_simpleusb.old
vi chan_simpleusb.c

  Note – you can use whatever editor you feel comfortable with.

Find the following lines. They will be approximately these line numbers but they will vary depending on your version.

```
1595          ast_mutex_lock(&o->eepromlock);
1596          if (o->wanteeprom) o->eepromctl = 1;
1597          ast_mutex_unlock(&o->eepromlock);
1598          mixer_write(o);

1600          o->hasusb = 1;
1601          while((!o->stophid) && o->hasusb)
```

   Notice that in the above line 1599 is missing. Don't worry about the actual line numbers. This is just to show you where the added line goes. Here is the same code with the needed line added -

```
1595          ast_mutex_lock(&o->eepromlock);
1596          if (o->wanteeprom) o->eepromctl = 1;
1597          ast_mutex_unlock(&o->eepromlock);
1598          mixer_write(o);
1599          setformat(o,O_RDWR);          // KB4FXC 2014-08-24
1600          o->hasusb = 1;
1601          while((!o->stophid) && o->hasusb)
```

You do not insert the line number. That is for reference only. Save the file and then back up one directory to **/usr/src/astsrc/asterisk**

cd ..
make
make install
astres.sh

If anything goes wrong you can always revert to the old simpleusb.c file that you made a copy of.

Now your simpleusb interface should be much more stable.

Note this patch and a more stable kernel (required to make it work) are already in the BBB release starting at the 1.2 version.