



USB Audio Cards with a Raspberry Pi

Created by Ladyada



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Instructions



The Raspberry Pi has an on-board audio jack, which is super handy for all kinds of sound effects and speech, just plug and go! However, for when you want better audio for music playback, a USB audio card can greatly improve the sound quality and volume, this tutorial will show you how...

This tutorial is only for getting the audio output jack working. We don't have a tutorial for the microphone input (yet!)

Pre-requisites

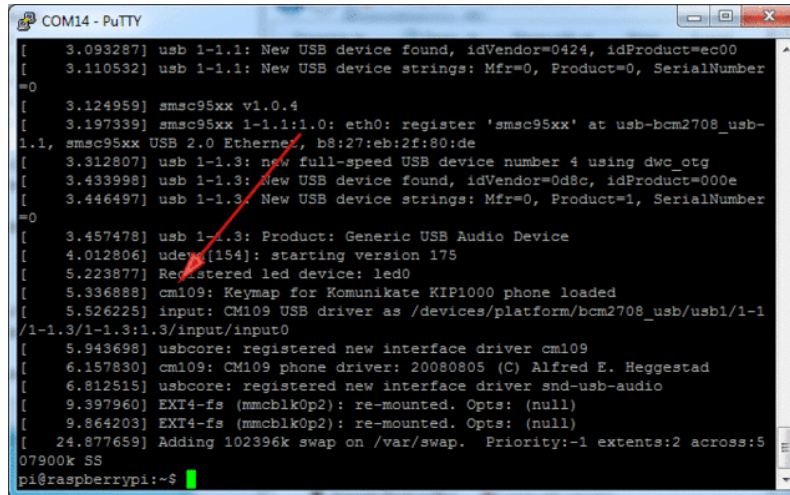
First up, you will need a fully set up Raspberry Pi that is otherwise working and you can log into. We have tons of tutorials on that front (<http://adafru.it/ckb>), so get your SD card loaded with Raspbian (<http://adafru.it/aWq>) (that's what we're using in this tutorial), and either (<http://adafru.it/aUB>)ssh (<http://adafru.it/aUB>) in, log in with a monitor and keyboard, or a USB console cable (<http://adafru.it/aUA>)

Just a reminder, this tutorial is only known good for the USB audio card in the Adafruit shop. Audio cards all use different chipsets so if you have another card, it may not work here! You'll have to figure out what's different for your model.

Let's go!

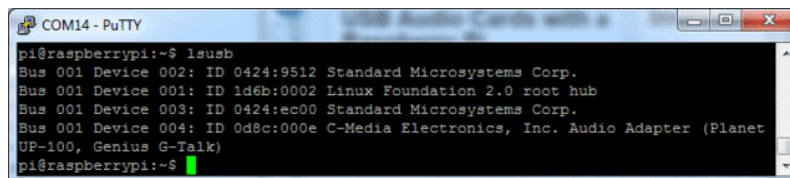
Start by having your Raspi **turned off/shutdown** (perform a clean shutdown!) and then

plugging in your USB audio card. Then boot the Pi as normal. Once you log in, type **dmesg** to look at the boot messages. You should see a bunch of lines that talk about **cm109**



```
COM14 - PuTTY
[ 3.093287] usb 1-1.1: New USB device found, idVendor=0424, idProduct=ec00
[ 3.110532] usb 1-1.1: New USB device strings: Mfr=0, Product=0, SerialNumber
=0
[ 3.124959] smsc95xx v1.0.4
[ 3.197339] smsc95xx 1-1.1:1.0: eth0: register 'smc95xx' at usb-bcm2708_usb-
1.1, smc95xx USB 2.0 Ethernet, b8:27:eb:2f:80:de
[ 3.312807] usb 1-1.3: new full-speed USB device number 4 using dwc_otg
[ 3.433998] usb 1-1.3: New USB device found, idVendor=0d8c, idProduct=000e
[ 3.446497] usb 1-1.3: New USB device strings: Mfr=0, Product=1, SerialNumber
=0
[ 3.457478] usb 1-1.3: Product: Generic USB Audio Device
[ 4.012806] udev[154]: starting version 175
[ 5.223877] Registered led device: led0
[ 5.336888] cm109: Keymap for Komunikate KIP1000 phone loaded
[ 5.526225] input: CM109 USB driver as /devices/platform/bcm2708_usb/usb1/1-1
/1-1.3/1-1.3:1.3/input/input0
[ 5.943698] usbcore: registered new interface driver cm109
[ 6.157830] cm109: CM109 phone driver: 20080805 (C) Alfred E. Heggstad
[ 6.812515] usbcore: registered new interface driver snd-usb-audio
[ 9.397960] EXT4-fs (mmcblk0p2): re-mounted. Opts: (null)
[ 9.864203] EXT4-fs (mmcblk0p2): re-mounted. Opts: (null)
[ 24.877659] Adding 102396k swap on /var/swap. Priority:-1 extents:2 across:5
07900k SS
pi@raspberrypi:~$
```

And if you type in **lsusb** you should see a reference to **C-Media Electronics Audio Adapter**



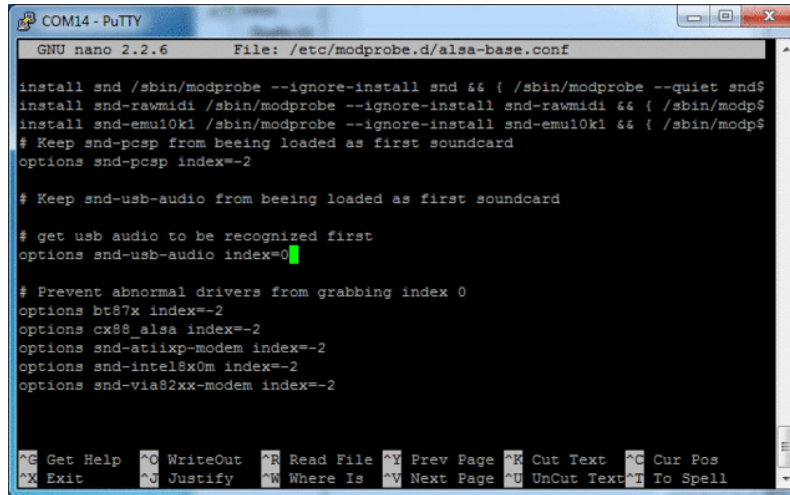
```
COM14 - PuTTY
pi@raspberrypi:~$ lsusb
Bus 001 Device 002: ID 0424:9512 Standard Microsystems Corp.
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 001 Device 003: ID 0424:ec00 Standard Microsystems Corp.
Bus 001 Device 004: ID 0d8c:000e C-Media Electronics, Inc. Audio Adapter (Planet
UP-100, Genius G-Talk)
pi@raspberrypi:~$
```

We'll edit the audio system configuration file with
sudo nano /etc/modprobe.d/alsa-base.conf

and find the line that says
#options snd-usb-audio index=0

We'll edit that and change it to
options snd-usb-audio index=0

Note we removed the **#** !



```
COM14 - PuTTY
GNU nano 2.2.6      File: /etc/modprobe.d/alsa-base.conf

install snd /sbin/modprobe --ignore-install snd && { /sbin/modprobe --quiet snd$
install snd-rawmidi /sbin/modprobe --ignore-install snd-rawmidi && { /sbin/modp$
install snd-emul0k1 /sbin/modprobe --ignore-install snd-emul0k1 && { /sbin/modp$
# Keep snd-pcsp from being loaded as first soundcard
options snd-pcsp index=-2

# Keep snd-usb-audio from being loaded as first soundcard

# get usb audio to be recognized first
options snd-usb-audio index=0

# Prevent abnormal drivers from grabbing index 0
options bt87x index=-2
options cx88_alsa index=-2
options snd-atiixp-modem index=-2
options snd-intel8x0m index=-2
options snd-via82xx-modem index=-2

^G Get Help  ^O WriteOut  ^R Read File  ^Y Prev Page  ^K Cut Text   ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page  ^U UnCut Text ^T To Spell
```

That's it! Now reboot with **sudo reboot** and log in again, you can test with **speaker-test** by running

```
speaker-test -c2 -D hw:0,0
```

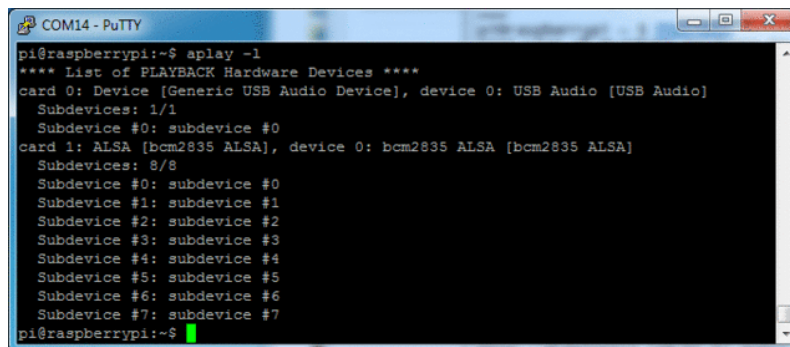
Which will play white noise through the left and right 'speakers' on the audio card. Once you've got something coming out, try to play an audio file with **aplay** (for WAV files, not MP3)

```
aplay /usr/share/scratch/Media/Sounds/Animal/Bird.wav
aplay /usr/share/sounds/alsa/Front_Center.wav
```

If you want to play MP3's, check out this tutorial which covers how to set that up (<http://adafruit.it/aTD>)

Headphone vs Audio card

Don't forget, you still have the built in headphone jack on the Pi, called **card 1** now (not the default **card 0**)



```
COM14 - PuTTY

pi@raspberrypi:~$ aplay -l
**** List of PLAYBACK Hardware Devices ****
card 0: Device [Generic USB Audio Device], device 0: USB Audio [USB Audio]
  Subdevices: 1/1
  Subdevice #0: subdevice #0
card 1: ALSA [bcm2835 ALSA], device 0: bcm2835 ALSA [bcm2835 ALSA]
  Subdevices: 8/8
  Subdevice #0: subdevice #0
  Subdevice #1: subdevice #1
  Subdevice #2: subdevice #2
  Subdevice #3: subdevice #3
  Subdevice #4: subdevice #4
  Subdevice #5: subdevice #5
  Subdevice #6: subdevice #6
  Subdevice #7: subdevice #7
pi@raspberrypi:~$
```

If you want to **aplay** through that jack again, specify **card 1** with **-D hw:1,0** instead of **-D hw:0,0**

```
speaker-test -c2 -D hw:1,0
```

