



ML: Customizing the Realtek ALC AppleHDA

For ML Realtek ALC AppleHDA

Change Log

v0.1 - 10/8/2012 - Draft

v0.2 - 10/10/2012 - Procedure 8 correction

v0.3 - 10/18/12 - 0c4. Item/PathMapID Table and Item/CodecID Table correction

v0.4 - 10/25/12 - Clarify PathMap and ConfigData edits

v0.5 - 3/28/13 - encoded digital audio

Guidelines

1. This is not a how to guide. It tells what something looks like before and what it should look like after the edit. The how is left to the reader.

OS X Surround Sound

1. OS X volume control and mute (OSD, System Preferences, keyboard, mouse, Apple Remote, etc.)
 - 1a. Supports volume control/mute for connected analog stereo speakers only
 - 1b. No volume control/mute support for digital audio or aggregate devices
 - 1b1 Use the controls and/or remote for the audio device attached making sound
 - 1b2. There is no known way around this; don't ask. For DD/DTS, Windows is the same
2. Surround Sound in OS X requires
 - 2a. DD/DTS source (movies, iTunes/AC3, etc.)
 - 2b. DD/DTS player (Plex, XBMC, Boxee, VLC - see 5 below)
 - 2c. DD/DTS sound system.
3. Analog 5.1/7.1 Surround Sound - Audi MIDI Setup/Audio Devices/Create Aggregate Device
4. Audi MIDI Setup/Audio Devices/Digital Output/ always shows 2 Channel Stereo.
5. VLC encoded digital audio requires the edited Optical Surround/AppleHDA binary. (See Procedure 8)

Requirements

1. 10.8 or newer - 64 bit kernel
2. Any optimized AppleHDA.kext v2.3.0 or newer
3. Working ML Optimized AppleHDA audio

Tools

1. Property List Editor -
 - 1a. Mac OS X Retail Install Disc v10.6 or v10.6.3 (Optional Installs/Xcode)
 - 1b. http://sveinbjorn.org/install_property_list_editor_app_on_mac_os_x_lion
2. PLE Alternatives
 - 2a. PListEdit Pro Fat Cat Software – PlistEdit Pro
 - 2b. Pref Setter Pref Setter
 - 2c. Applications/TextEdit
3. zlib_terminal

Before You Begin

1. Identify PathMapID
 - 1a. Find Audio ID - System Information/Audio/Intel High Definition Audio/Audio ID
 - 1b. Find PathMapID - Property List Editor/Open layout(Audio ID).xml/Note PathMapID
2. Identify Info.plist/Platforms.xml Item
 - 2a. Find Item number from Item/PathMapID Table

Procedures

0. AppleHDA.kext Assumptions, Structure and Documents
 - 1 Add SPDIFIn
 2. Manual Mic and Front Mic Selection
 3. Manual Speaker and Headphone Selection
 4. Add Boost to input (Mic/Rear. Mic/Front and/or Line In)
 5. Substitute Gray (Side) for Black (Rear)
 6. Add Line Out (Gray/Rear -Rear Speakers) for analog 7.1 Surround Sound
 7. Substitute SPDIF-2 Wire Output
 8. SPDIF Optical Output/Encoded Digital Audio - Not available for 892 or 898
 9. HDMI audio (AMD/Nvidia/HD3000/HD4000) - Requires dsdt edits, see <https://github.com/toleda>
 10. 2x HD3000/HD4000 HDMI Audio
- Appendix:. ML Optimized AppleHDA.kext/PathMaps

Installation

1. Backup S/L/E/ApplesHDA.kext
2. Copy edited ApplesHDA.kext to Desktop
3. Run KextBeast
4. Restart

Editing Tip

1. To ensure successful pasting of printed data into a plist
 - a. paste first to TextEdit and make plain text (Format/Plain Text)
 - b. copy from TextEdit and paste into plist

Credit

The KiNG [HOW TO] Patch ApplesHDA - Knowledge Base - Project OS X Forums
VHC888 ALC889A, Gigabyte (Intel): now having a working front mic - InsanelyMac Forum
.: ErmaC:: ApplesHDA patching in Mountain Lion - Page 4 - Sound - InsanelyMac Forum
RevoGirl Not forgotten

Procedures

0. ApplesHDA.kext Assumptions, Structure and Documents

0a. ApplesHDA.kext Assumptions

0a1.CodecID= decimal (codec_vendor_device_id)
Ex. 283904137 = 10ec0889 hex

0a2. ML Audio IDs (Audio_ID = layout-id = 1, 2 or 3)

- 1: 5/6 audio port on board with and without AMD/Nvidia HDMI audio
- 2: 3 port on board with and without AMD/Nvidia HDMI audio
- 3: 3/5/6 onboard audio with HD3000 HDMI audio (only)

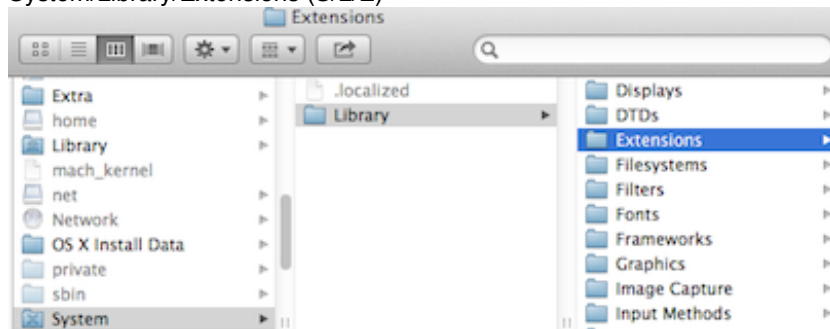
0a3. Realtek ApplesHDA.kext supports the following Realtek codecs:

ALC885
ALC887
ALC888
ALC889
ALC892
ALC898

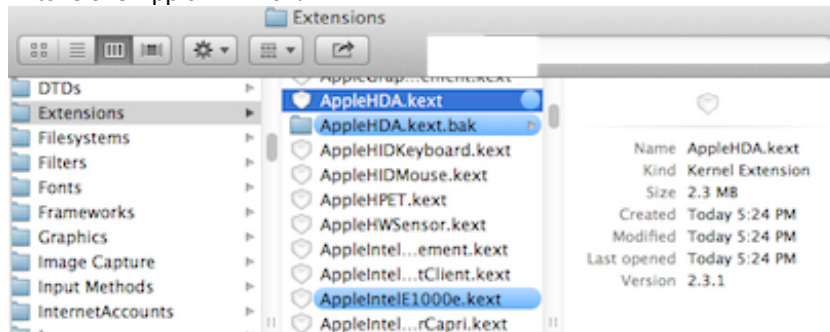
0b. AppleHDA.kext Structure

0b1. AppleHDA.kext>

System/Library/Extensions (S/L/E)

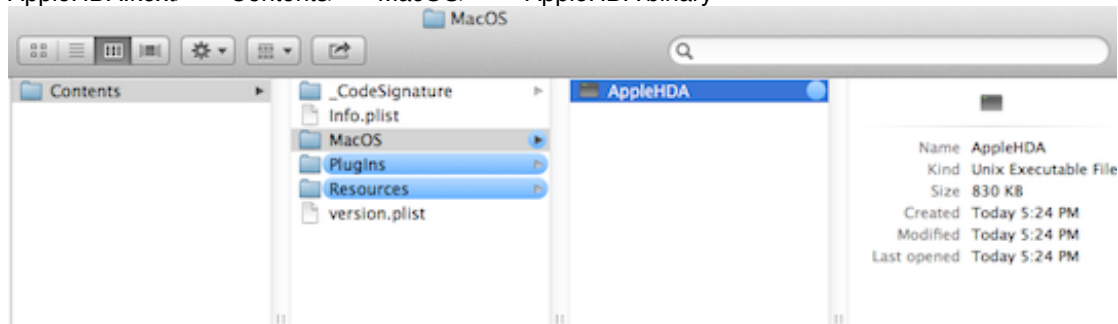


Extensions/AppleHDA.kext



0b2. AppleHDA binary

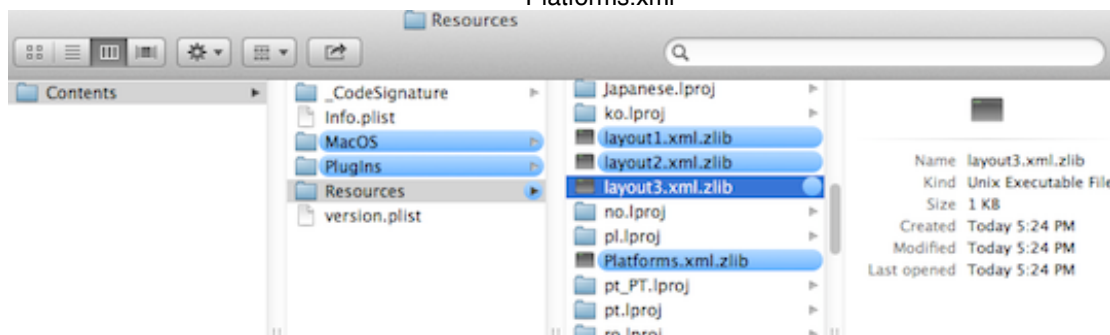
AppleHDA.kext> Contents> MacOS> AppleHDA binary



0b3. layoutx.xml

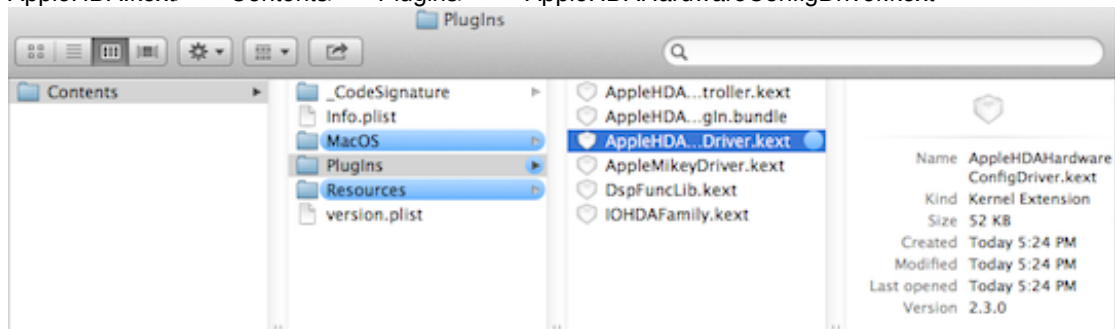
0b4. Platforms.xml

AppleHDA.kext> Contents> Resources> layoutx.xml
Platforms.xml

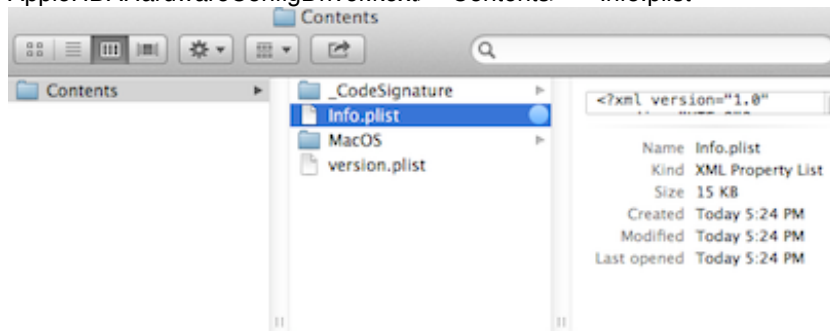


Ob5. Info.plist

AppleHDA.kext> Contents> Plugins> AppleHDAHardwareConfigDriver.kext

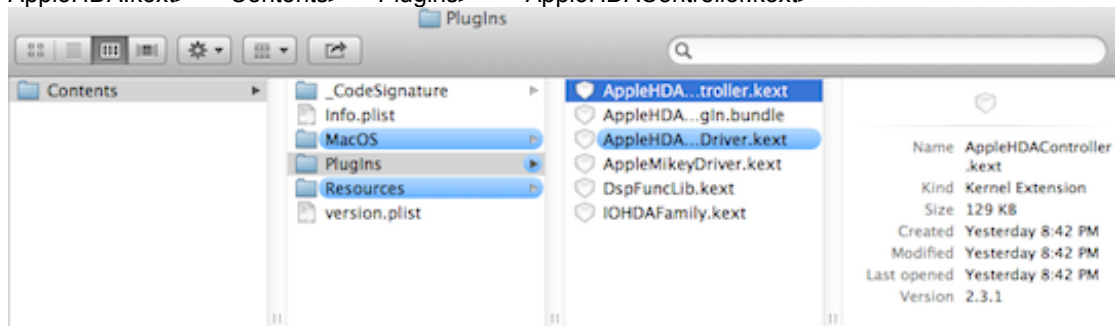


AppleHDAHardwareConfigDriver.kext> Contents> Info.plist

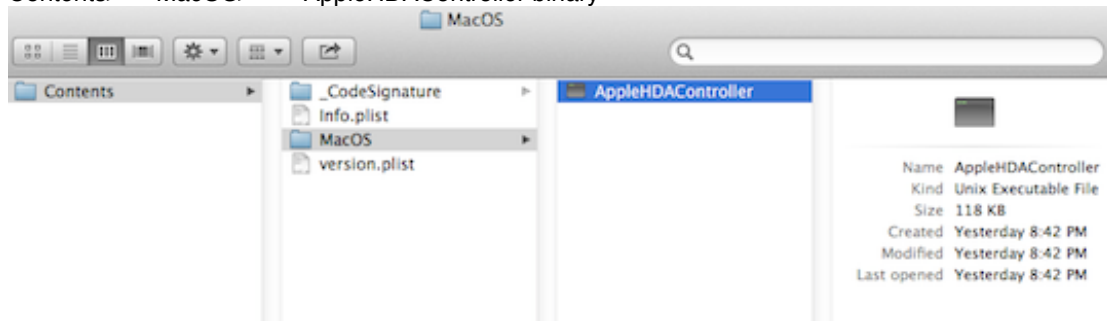


Ob6. AppleHDAController binary

AppleHDA.kext> Contents> Plugins> AppleHDAController.kext>



Contents> MacOS> AppleHDAController binary



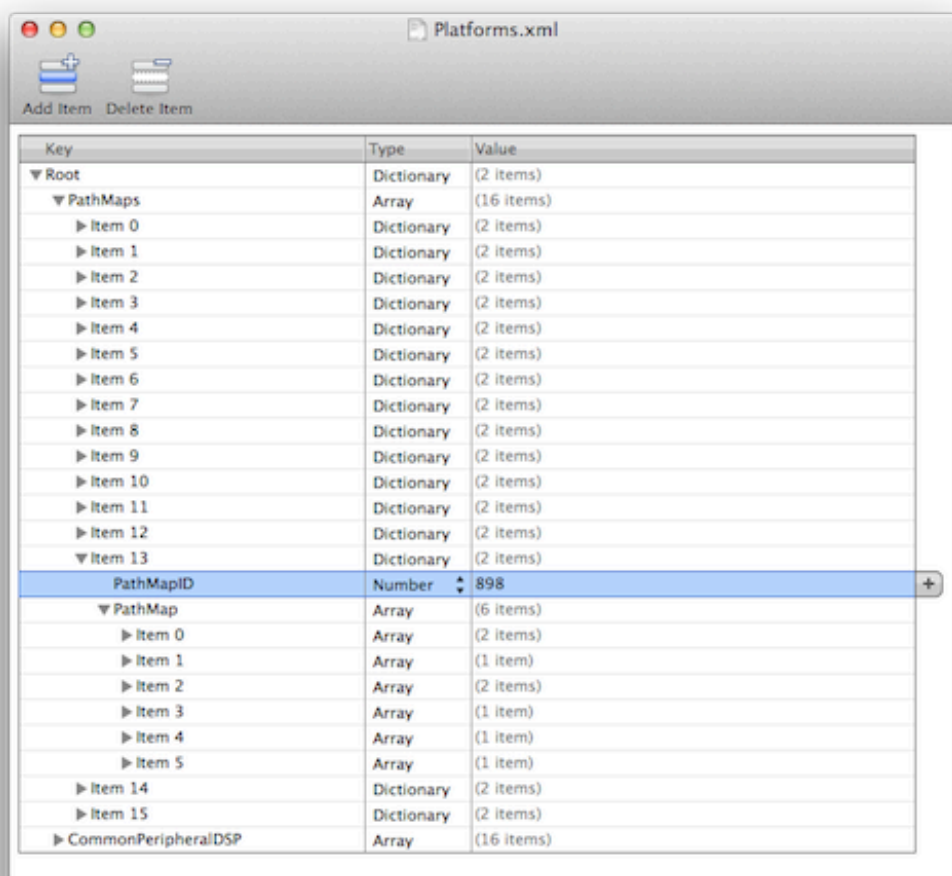
0c. AppleHDA.kext documents and their location

0c1. Info.plist AppleHDA.kext/Contents/Plugins/AppleHDAHardwareConfigDriver.kext/
Contents>info.plist



Key	Type	Value
▼ Root	Dictionary	(2 items)
LayoutID	Number	1
▼ PathMapRef	Array	(1 item)
▼ Item 0	Dictionary	(10 items)
▼ CodecID	Array	(1 item)
Item 0	Number	283904153
▶ Headphone	Dictionary	(0 items)
▶ Inputs	Array	(2 items)
▶ IntSpeaker	Dictionary	(0 items)
▶ LineIn	Dictionary	(1 item)
▶ LineOut	Dictionary	(0 items)
▶ Mic	Dictionary	(2 items)
▶ Outputs	Array	(4 items)
PathMapID	Number	898
▶ SPDIFOut	Dictionary	(0 items)

0c3. Platforms.xml AppleHDA.kext/Contents/Resources/Platforms.xml



0c4. Item/PathMapID Table and Item/CodecID Table

Item	PathMapID	CodecID	Audio ID
Item 0	885	283904133	1
Item 1	887	283904135	1
Item 2	287	283904135	2
Item 3	387	283904135	3
Item 4	888	283904136	1
Item 5	288	283904136	2
Item 6	388	283904136	3
Item 7	889	283904137	1
Item 8	289	283904137	2
Item 9	389	283904137	3
Item 10	892	283904146	1
Item 11	292	283904146	2
Item 12	392	283904146	3
Item 13	898	283904153	1
Item 14	298	283904153	2
Item 15	398	283904153	3

1 Add SPDIFIn - Not supported

2. Manual Mic/Rear and Mic /Front Selection

Displays both Internal Microphone and Line In (Mic/Front) audio output devices

For 892, see below

885, 887, 888, 889, 892, 898

2a. Edit Platforms.xml

Open Item/PathMapID

Verify PathMapID

Copy and paste the current Rear Mic /Front Mic so there are two of the same (usually Item 0)

Open Item 0 and Item 0 and Item 1 appear; delete Item 1 (front mic).

Open Item 1 and Item 0 and Item 1 appear; delete Item 0 (rear mic).

Edit this path map as follows:

Current:

Item 0/NodeID/Number/9

Item 1/NodeID/Number/34

Item 2/NodeID/Number/25

New:

Item 0/NodeID/Number/7

Item 1/NodeID/Number/36

Item 2/NodeID/Number/25

2b. Save, install and restart

892

2a. Edit Platforms.xml

Open Item/PathMapID

Verify PathMapID

Line In (Blue/Rear) is not available

open Item 0, Item 0 and Item 1 appear; delete Item 1 (front mic)

open Item 1

Current:

Item 0/NodeID/Number/8

Item 1/NodeID/Number/35

Item 2/NodeID/Number/26

New:

Item 0/NodeID/Number/8

Item 1/NodeID/Number/35

Item 2/NodeID/Number/25

2b. Save, install and restart

3. Manual Internal Speaker and Headphone Selection

Displays both Internal Speaker and Headphones audio output devices

Note: An existing audio output device must be deleted to add Headphones as an audio output device.

See Procedure 10.

3a. Edit Platforms.xml

Open Item/PathMapID

Verify PathMapID

Copy and paste the current speaker/headphone so there are two of the same (Item 2)

Note: Paste on top of PathMap

Drag Item 2 up to PathMap - 2 times (moves new item to correct position)

In Item 2, open next level and there are Item 0 and Item 1; delete Item 1 (headphones).

In Item 3, open next level and there are Item 0 and Item 1; delete Item 0 (speakers).

Edit this path map as follows:

Current:

Item 0/NodeID/Number/27

Item 1/NodeID/Number/12

Item 2/NodeID/Number/2

New:

Item 0/NodeID/Number/27

Item 1/NodeID/Number/38

Item 2/NodeID/Number/37

3b. Save, install and restart.

4. Add Boost to input (Mic/Rear. Mic/Front and/or Line In)

Increase audio level for audio input devices

4a. Edit Platforms.xml (add to audio input devices as appropriate)

Open Item/PathMapID

Verify PathMapID

i. Mic/Rear

Current:

Item 0/NodeID/Number/9

Item 1/NodeID/Number/34

Item 2/NodeID/Number/24

Select Item1

Select Add Item

Enter Boost

Select Number

Enter 3

New

Item 0/NodeID/Number/9

Item 1

Boost/Number/3

NodeID/Number/34

Item 2/NodeID/Number/24

Save

ii. Mic/Front (displayed as Line In/Built-In)

Note: NodeIDs are different if 2. Manual Mic/Rear and Mic /Front Selection (above) is implemented

Current:

Item 0/NodeID/Number/9

Item 1/NodeID/Number/34

Item 2/NodeID/Number/25

Select Item1

Select Add Item

Enter Boost

Select Number

Enter 3

New

Item 0/NodeID/Number/9

Item 1

Boost/Number/3

NodeID/Number/34

Item 2/NodeID/Number/25

Save

iii. Line In

Current:

Item 0/NodeID/Number/8

Item 1/NodeID/Number/35

Item 2/NodeID/Number/26

Select Item1

Select Add Item

Enter Boost

Select Number

Enter 3

New

Item 0/NodeID/Number/8

Item 1

Boost/Number/3

NodeID/Number/35

Item 2/NodeID/Number/26

4b. Save, install and restart.

5. Substitute Gray (Side Speakers) for Black (Rear Speakers)

Allows configuring Side Speakers in 5.1 analog surround sound.

5a. Edit Platforms.xml

Open Item/PathMapID

Verify PathMapID

Open 2nd to last item

Edit this path map as follows:

Current:

Item 0/NodeID/Number/21

Item 1/NodeID/Number/13

Item 2/NodeID/Number/3

New:

Item 0/NodeID/Number/23

Item 1/NodeID/Number/15

Item 2/NodeID/Number/5

5b. Edit Hardware Config/info.plist

Open Item/PathMapID

Verify PathMapID

PinConfig

Find: 21771cf0 21771d00 21771e00 21771f40

Replace: 21771c80 21771d20 21771e01 21771f01

Find: 21571c80 21571d20 21571e01 21571f01

Replace: 21571cf0 21571d00 21571e00 21571f40

5c. Save, install and restart

6. Add Line Out (Rear Speakers) for analog 7.1 Surround Sound

Adds side speaker for 7.1 analog surround sound

Note: Not available for Audio ID: 2 or Audio ID: 3

6a. Edit Platforms.xml

Open Item/PathMapID

Verify PathMapID

Delete Item 5

Copy and paste the Line Out so there are two of the same. (Item 4)

Note: Paste on top of PathMap

Drag Item 4 up to PathMap - 4 times (moves new item to correct position)

Edit this path map as follows:

Current:

Item 0/NodeID/Number/21

Item 1/NodeID/Number/13

Item 2/NodeID/Number/3

New:

Item 0/NodeID/Number/23

Item 1/NodeID/Number/15

Item 2/NodeID/Number/5

6b. Edit Hardware Config/info.plist

Open Item/PathMapID

Verify PathMapID

PinConfig

Find: 21771cf0 21771d00 21771e00 21771f40

Replace: 21771c80 21771d20 21771e01 21771f01

Find: 21e71c90 21e71d61 21e71e4b 21e71f01

Replace: 21e71ca0 21e71d01 21e71e43 21e71f99

6c. Save, install and restart

7. Substitute SPDIF-2 Wire Output

Replaces SPDIFOut Optical with motherboard SPDIF 2 wire SPDIF audio output device

7a. Edit Platforms.xml

Open Item/PathMapID

Open the current SPDIFOut (last item)

Edit this path map as follows:

Current:

Item 0/NodeID/Number/30

Item 1/NodeID/Number/6

New:

Item 0/NodeID/Number/17

Item 1/NodeID/Number/16

7b. Edit Hardware Config/info.plist

Open Item/PathMapID

Fix PinConfig

Find: 21171cf0 21171d00 21171e00 21171f40

Replace: 21171ca0 21171d01 21171e43 21171f99

Find: 21e71c90 21e71d61 21e71e4b 21e71f01

Replace: 21e71ca0 21e71d01 21e71e43 21e71f99

7c. Save, install and restart

8. SPDIF OpticalOut/Encoded Digital Audio - Not available for 892 or 898, not needed for 885.

Required for VLC Encoded Digital Audio Option

Alternative AppleHDA binary edit

Note: popping may occur with attached analog speakers.

Note: In ML , only the 10.8 AppleHDA.kext supports Encoded Digital Audio, see ML: Optimized Realtek AppleHDA - Preview/Alpha, Download ML_AppleHDA-885-Alpha.zip

Example: 889 patch

8a. Make a backup of your installed MLOptimized AppleHDA

8b. Copy Downloads/ML_AppleHDA-885-Alpha/AppleHDA.kext to Desktop

8c. Open Applications/Utilities/Terminal

```
$ cd Desktop
```

```
$ ls (optional to verify AppleHDA.kext is on the desktop
```

**** The following commands varies for each codec. Copy and paste the correct command below ****

```
$ sudo perl -pi -e 's/\x85\x08\xec\x10\x89\x08\xec\x10lg' AppleHDA.kext/Contents/MacOS/AppleHDA
```

Enter Password

```
$ exit
```

8d. Edit layout1.xmll

8e. Edit Hardware Config/info.plist

Open Item/PathMapID

Verify PathMapID

Fix PinConfig

For SPDIFIn

Find: 21e71c90 21e71d61 21e71e4b 21e71f01

Replace: 21e71ca0 21e71d01 21e71e43 21e71f99

8d. Save, install and restart

Use the terminal command appropriate for your codec.

i. 887 SPDIFOut/Encoded Digital Audio (887 Legacy Only)

```
$ sudo perl -pi -e 's/\x85\x08\xec\x10\x87\x08\xec\x10lg' AppleHDA.kext/Contents/MacOS/AppleHDA
```

ii. 888 SPDIFOut/Encoded Digital Audio (888 Legacy Only)

```
$ sudo perl -pi -e 's/\x85\x08\xec\x10\x88\x08\xec\x10lg' AppleHDA.kext/Contents/MacOS/AppleHDA
```

iii. 889 SPDIFOut/Encoded Digital Audio

```
$ sudo perl -pi -e 's/\x85\x08\xec\x10\x89\x08\xec\x10lg' AppleHDA.kext/Contents/MacOS/AppleHDA
```

iv. 892 SPDIFOut/Encoded Digital Audio

Applying this edit for the 892 disables audio. Do not try.

iv. 898 SPDIFOut/Encoded Digital Audio

Applying this edit for the 898 disables audio. Do not try.

9. HDMI audio (AMD/Nvidia/HD3000/HD4000)

See <https://github.com/toleda>

10. 2x HD3000/HD4000 HDMI Audio/Delete Audio Output Device

Deletes an existing audio output device to allow an additional HDMI audio output to be present.

Note: AppleHDA supports a total of 4 audio output devices. For Audio ID: 3, the orange port/line out audio device is removed for HD3000/HD4000 HDMI audio

For Audio ID:3, Select the audio output device to delete:

Item 3: Black port/rear/line out

Item 4: SPDIFOut

For Audio ID:1, Select the audio output device to delete:

Item 3: Orange port/rear/line out/center and sub speakers

Item 4: Black port/rear/line out/rear speakers

Item 5: SPDIFOut

10a. Edit Platforms.xml

Verify PathMapID

Open Item/PathMapID

Delete Item (Selected from Audio ID above)

10b. Edit Hardware Config/info.plist

Open Item/PathMapID

Verify PathMapID

Fix PinConfig

If Orange deleted

Find: 21671c30 21671d60 21671e01 21671f01

Replace: 21671ca0 21671d01 21671e43 21671f99

If Black deleted

Find: 21571c20 21571d10 21571e01 21571f01

Replace: 21571ca0 21571d01 21571e43 21571f99

If SPDIFOut deleted

Find: 21e71c90 21e71d61 21e71e4b 21e71f01

Replace: 21e71ca0 21e71d01 21e71e43 21e71f99

10c. Save, install and restart

Appendix:. ML Optimized AppleHDA.kext/PathMaps

PathMapID 898/All Audio Devices

Item	Sub Item	I/O	Device	Color	Location	NodeID
Item 0	Item 0	Input	Mic	Pink	Rear	24
	Item 1	Input	Mic	Pink	Front	25
Item 1		Input	Line In	Blue	Rear	26
Item 2	Item 0	Output	Speakers	Green	Rear	20
	Item 1	Output	Headphones	Green	Front	27
Item 3		Output	Line Out	Orange	Rear	22
Item 4		Output	Line Out	Black	Rear	21
Item 5		Output	SPDIFOut	N/A	Rear	30

Platforms.xml		
Add Item Delete Item		
Key	Type	Value
▼ Root	Dictionary	(2 items)
▼ PathMaps	Array	(16 items)
▶ Item 0	Dictionary	(2 items)
▶ Item 1	Dictionary	(2 items)
▶ Item 2	Dictionary	(2 items)
▶ Item 3	Dictionary	(2 items)
▶ Item 4	Dictionary	(2 items)
▶ Item 5	Dictionary	(2 items)
▶ Item 6	Dictionary	(2 items)
▶ Item 7	Dictionary	(2 items)
▶ Item 8	Dictionary	(2 items)
▶ Item 9	Dictionary	(2 items)
▶ Item 10	Dictionary	(2 items)
▶ Item 11	Dictionary	(2 items)
▶ Item 12	Dictionary	(2 items)
▶ Item 13	Dictionary	(2 items)
PathMapID	Number	898
▼ PathMap	Array	(6 items)
▼ Item 0	Array	(2 items)
▶ Item 0	Array	(1 item)
▶ Item 1	Array	(1 item)
▼ Item 1	Array	(2 items)
▶ Item 0	Array	(1 item)
▶ Item 1	Array	(1 item)
▶ Item 3	Array	(1 item)
▶ Item 4	Array	(1 item)
▶ Item 5	Array	(1 item)
▶ Item 14	Dictionary	(2 items)
▶ Item 15	Dictionary	(2 items)
▶ CommonPeripheralDSP	Array	(16 items)

PathMapID 898/Input Audio Devices

Item	Sub Item	I/O	Device	Color	Location	NodeID
Item 0	Item 0	Input	Mic	Pink	Rear	24
	Item 1	Input	Mic	Pink	Front	25
Item 1		Input	Line In	Blue	Rear	26

Platforms.xml		
Add Item Delete Item		
Key	Type	Value
▼ Root	Dictionary	(2 items)
▼ PathMaps	Array	(16 items)
▶ Item 0	Dictionary	(2 items)
▶ Item 1	Dictionary	(2 items)
▶ Item 2	Dictionary	(2 items)
▶ Item 3	Dictionary	(2 items)
▶ Item 4	Dictionary	(2 items)
▶ Item 5	Dictionary	(2 items)
▶ Item 6	Dictionary	(2 items)
▶ Item 7	Dictionary	(2 items)
▶ Item 8	Dictionary	(2 items)
▶ Item 9	Dictionary	(2 items)
▶ Item 10	Dictionary	(2 items)
▶ Item 11	Dictionary	(2 items)
▶ Item 12	Dictionary	(2 items)
▶ Item 13	Dictionary	(2 items)
PathMapID	Number	898
▼ PathMap	Array	(6 items)
▼ Item 0	Array	(2 items)
▼ Item 0	Array	(1 item)
▼ Item 0	Array	(3 items)
▼ Item 0	Dictionary	(2 items)
▶ Amp	Dictionary	(5 items)
NodeID	Number	9
▼ Item 1	Dictionary	(1 item)
NodeID	Number	34
▼ Item 2	Dictionary	(1 item)
NodeID	Number	24
▼ Item 1	Array	(1 item)
▼ Item 0	Array	(3 items)
▼ Item 0	Dictionary	(2 items)
▶ Amp	Dictionary	(5 items)
NodeID	Number	9
▼ Item 1	Dictionary	(1 item)
NodeID	Number	34
▼ Item 2	Dictionary	(1 item)
NodeID	Number	25
▼ Item 1	Array	(1 item)
▼ Item 0	Array	(1 item)
▼ Item 0	Array	(3 items)
▼ Item 0	Dictionary	(2 items)
▶ Amp	Dictionary	(5 items)
NodeID	Number	8
▼ Item 1	Dictionary	(1 item)
NodeID	Number	35
▼ Item 2	Dictionary	(1 item)
NodeID	Number	26
▶ Item 2	Array	(2 items)
▶ Item 3	Array	(1 item)
▶ Item 4	Array	(1 item)
▶ Item 5	Array	(1 item)
▶ Item 14	Dictionary	(2 items)
▶ Item 15	Dictionary	(2 items)
▶ CommonPeripheralDSP	Array	(16 items)

PathMapID 898/Output Audio Devices

Item	Sub Item	I/O	Device	Color	Location	NodeID
Item 2	Item 0	Output	Speakers	Green	Rear	20
	Item 1	Output	Headphones	Green	Front	27
Item 3		Output	Line Out	Orange	Rear	22
Item 4		Output	Line Out	Black	Rear	21
Item 5		Output	SPDIFOut	N/A	Rear	30

Platforms.xml		
Add Item Delete Item		
Key	Type	Value
▼ Item 13	Dictionary	(2 items)
PathMapID	Number	898
▼ PathMap	Array	(6 items)
▶ Item 0	Array	(2 items)
▶ Item 1	Array	(1 item)
▼ Item 2	Array	(2 items)
▼ Item 0	Array	(1 item)
▼ Item 0	Array	(3 items)
▼ Item 0	Dictionary	(1 item)
NodeID	Number	20
▼ Item 1	Dictionary	(2 items)
▶ Amp	Dictionary	(5 items)
NodeID	Number	12
▼ Item 2	Dictionary	(1 item)
NodeID	Number	2
▼ Item 1	Array	(1 item)
▼ Item 0	Array	(3 items)
▼ Item 0	Dictionary	(1 item)
NodeID	Number	27
▼ Item 1	Dictionary	(2 items)
▶ Amp	Dictionary	(5 items)
NodeID	Number	12
▼ Item 2	Dictionary	(1 item)
NodeID	Number	2
▼ Item 3	Array	(1 item)
▼ Item 0	Array	(1 item)
▼ Item 0	Array	(3 items)
▼ Item 0	Dictionary	(1 item)
NodeID	Number	22
▼ Item 1	Dictionary	(2 items)
▶ Amp	Dictionary	(5 items)
NodeID	Number	14
▼ Item 2	Dictionary	(1 item)
NodeID	Number	4
▼ Item 4	Array	(1 item)
▼ Item 0	Array	(1 item)
▼ Item 0	Array	(3 items)
▼ Item 0	Dictionary	(1 item)
NodeID	Number	21
▼ Item 1	Dictionary	(2 items)
▶ Amp	Dictionary	(5 items)
NodeID	Number	13
▼ Item 2	Dictionary	(1 item)
NodeID	Number	3
▼ Item 5	Array	(1 item)
▼ Item 0	Array	(1 item)
▼ Item 0	Array	(2 items)
▼ Item 0	Dictionary	(1 item)
NodeID	Number	30
▼ Item 1	Dictionary	(1 item)
NodeID	Number	6
▶ Item 14	Dictionary	(2 items)
▶ Item 15	Dictionary	(2 items)
▶ CommonPeripheralDSP	Array	(16 items)