



Mountain Lion HDMI Audio

Sandy Bridge - HD3000 Graphics/6 Series Motherboards w/AMI EFI or BIOS or Award BIOS/DSDT

A simple HDMI Audio dsdt editing tool for OS X HDMI audio on 6 Series motherboards with HD4000 graphics. Based on the MaciASL built by SJ_UnderWater, the Apply button automatically makes the HDMI audio dsdt edits.

Verify BIOS supplier:

1. Verify first line of an AMI dsdt is similar to:

DefinitionBlock (".dsdt.aml", "DSDT", 2, "ALASKA", "A M I", 0x000000..)

2. Verify first line of an Award dsdt is similar to:

DefinitionBlock (".dsdt.aml", "DSDT", 1, "GBT ", "GBTUACPI", 0x00001000)

Benefits

1. Automated HDMI audio dsdt editing
2. Installs HD4000 integrated graphics HDMI audio dsdt edits
3. Installs AMD/Nvidia discrete graphics card HDMI audio dsdt edits
4. No copy, no paste, no finding the right place to paste....

Before You Start:

1. OS X does not provide HDMI audio controls (No volume, no mute, no balance, etc.)
2. The connected HDMI device (TV, receiver, etc.) provides any and all audio controls
3. Delete any audio enablers (S/L/E/HDAEnabler1.kext)
4. Remove any property-type injection (Extra/org.chameleon.Boot.plist)

Requirements

1. Intel
 - 1a. Sandy Bridge 6 Series motherboards - H61, H67, P67, Z68
2. OS X
 - 2a. Mountain Lion - 10.8.2 and newer

3. dsdt - no compile errors
- 3a. No dsdt, extract dsdt, see **I. Preparation**
4. Motherboard onboard audio codec
- 4a. Realtek supported audio codecs (8xy): 885, 887, 888, 889, 892, 898
- 4b. Unsupported audio codecs: ML HDMI audio works with any unsupported audio codec/no onboard audio
5. AppleHDA.kext (one of the following)
- 5a. ML: MultiBeast 5.2.1 or newer/Audio/Realtek ALC8xx/With DSDT/ALC...
- 5b. ML: Native AppleHDA.kext (unsupported audio codecs)

More Information

Special HDMI Audio Considerations

Detailed Instructions

See **Mountain Lion HDMI Audio - AMI DSDT**

Or **Mountain Lion HDMI Audio - Award DSDT**

Tools

1. MaciASL [MaciASL | Free Development software downloads at SourceForge.net](https://sourceforge.net/projects/maciasl/)
2. IORegistryExplorer see [\[Guide\] How to Make a Copy of IOReg](#)
3. CarbonCopyCloner or SuperDuper
4. Download/ZIP: https://github.com/toleda/audio_hdmi_hd3000

Mountain Lion Audio IDs (10.8.2 AppleHDA.kext_v2.3.1 or newer)

1. Audio ID 1/A1: AMD/Nvidia HDMI audio with 3/5/6 port onboard audio
 2. Audio ID 3/A3: HD3000 HDMI audio with 3/5/6 port onboard audio
- Note: For Audio ID: 3 (HD3000 HDMI audio), the appropriate Patch must be edited.

Patches - github.com/toleda/audio_hdmi_hd3000/tree/master/Patches

IB1. AMI-EFI/Clean Compile - fix native EFI dsdt compiler errors for successful dsdt edits

SB2. AMI-EFI-HD3000-AMD-Nvidia-6_Series-A1 - AMD/Nvidia/HD3000 HDMI audio dsdt edits

SB3. AMI-BIOS-HD3000-AMD-Nvidia-6_Series-A1 - AMD/Nvidia/HD3000 HDMI audio dsdt edits

SB4. Award-BIOS-HD3000-AMD-Nvidia-6_Series-A1 - AMD/Nvidia/HD3000 HDMI audio dsdt edits

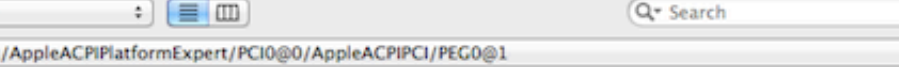
SB5. HD3000-on-7_Series_MB - HD3000 MEI dsdt edit

Attachments

N/A ML HDMI audio dsdt edits are available in MaciASL/Patch

Key Information

1. Determine graphics device names and address
- 1a. IOReg/Search display
- 1a. Example: Discrete Graphics - PEG0@1, P0P1@1, P0P3@3, NVE3@3, etc.
- 1a. Example: Integrated Graphics - GFX0@2

- 
- IOService
- IOService:/AppleACPIPlatformExpert/PCI0@0/AppleACPIPCI/PEG0@1
- PEG0@1**
- Class Inheritance:** IOPCIDevice : IOService : IORegistryEntry : OSObject
- Bundle Identifier:** com.apple.iokit.IOPCIFamily
- Registered Retain Count: 12
 Matched Busy Count: 0
 Active
- | Property | Type | Value |
|----------------|------|---------------|
| #address-cells | Data | <03 00 00 00> |
| #size-cells | Data | <02 00 00 00> |

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3. Determine integrated graphics device names and address (N/A - HD3000 is not enabled)

3a. IOReg/Search GFX0, Select GFX0, Cancel Search (X), Scroll up

3a. Example: GFX0@2

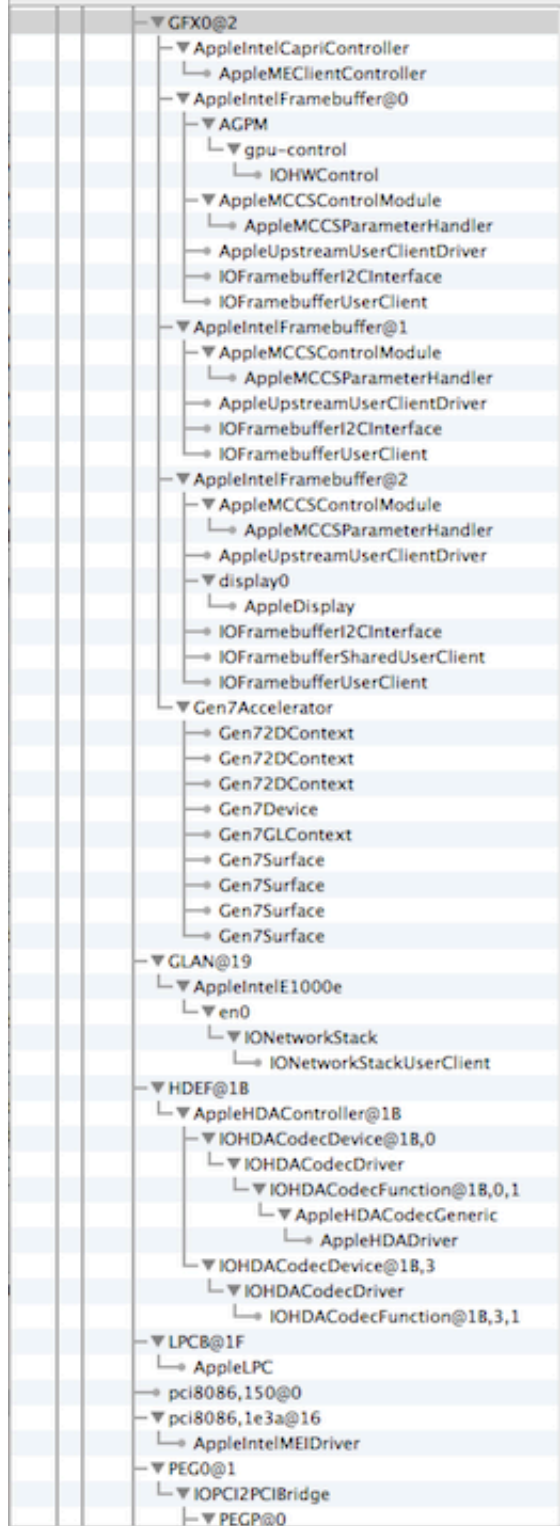


GFX0@2

Class Inheritance: IOPCIDevice : IOService : IORegistryEntry : OSObject

Bundle Identifier: com.apple.iokit.IOPCIFamily

☒ Registered Retain Count: 24
☒ Matched Busy Count: 0
☒ Active



Property	Type	Value
AAPL,gray-page	Data	<01 00 00 00>
AAPL,gray-value	Data	<c3 8c 64 00>
AAPL,ig-platform-id	Data	<0a 00 66 01>
AAPL,iokit-ndrv	Data	<20 bd db 80 7f ff ff ff>
acpi-device	String	IOACPIPlatformDevice is not serializable
acpi-path	String	IOACPIPlane:/_SB/PCI0@0/GFX0@20000
assigned-addresses	Data	<10 10 00 82 00 00 00 00 00 00 80 f7 00 00 00 00 00 00 40 00 18 10 00 c2 0f 00 00 00 00 00 00 20 00 00 00 00 00 00 10 20 10 00 81 00 00 00 00 00 00 00 00 00 40 00 00 00>
attached-gpu-control-path	String	IOService:/AppleACPIPlatformExpert/PCI0@0/ApplesACPI/PCI/GFX0@2/ApplesIntelFramebuffer@0/AGPM
built-in	Data	<00>
class-code	Data	<00 00 03 00>
compatible	Data	<"pci1043,84ca", "pci8086,166", "pci-class,030000">
device-id	Data	<66 01 00 00>
hda-gfx	Data	<"onboard-1">
IODeviceMemory	Array	3 values
IOHibernateState	Data	<00 00 00 00>
IOInterruptControllers	Array	2 values
IOInterruptSpecifiers	Array	2 values
IOName	String	display
IOPCIMSMode	Boolean	True
IOPCIResourced	Boolean	True
IOPowerManagement	Dictionary	3 values
model	Data	<"Intel HD Graphics 4000">
name	String	display
pcidebug	String	0:2:0
reg	Data	<00 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 10 10 00 02 00 00 00 00 00 00 00 00 00 00 00 00 00>

4. Verify MEIDriver (Applies only to HD3000 on 7 series)
- 4a. IOREg/Search MEI, Select MEI Cancel Search (X), Scroll up
- 4b. Example: MEI device_id 3a1e

The screenshot shows the IORegistry Explorer window with the path `IOService:/AppleACPIPlatformExpert/PCI0@0/AppleACPIPCI/pci8086,1e3a@16` selected. The device is **pci8086,1e3a@16**, which is registered, matched, and active. Its class inheritance is `IOPCIDevice : IOService : IORegistryEntry : OSObject` and its bundle identifier is `com.apple.iokit.IOPCIFamily`.

The left pane shows a tree view of the device's children, including `AppleIntelMEIDriver`, `PEG0@1`, `IOPCI2PCIBridge`, `PEGP@0`, `AMD6000Controller`, `AMDBartsGraphicsAccelerator`, `AMDAccel2DContext`, `AMDAccelDevice`, `AMDAccelSharedUserClient`, `AMDR8xxGLContext`, `AMDSupport`, `ATY,Duckweed@0`, `ATIFramebufferNI`, `AGPM`, `gpu-control`, `AMDNDRVService`, `AppleMCCSControlModule`, `AppleMCCSParameter...`, `AppleUpstreamUserClient...`, `IOFramebufferI2CInterface`, `IOFramebufferUserClient`, `ATY,Duckweed@1`, `ATIFramebufferNI`, `AMDNDRVService`, `AppleMCCSControlModule`, `AppleMCCSParameter...`, `AppleUpstreamUserClient...`, `IOFramebufferI2CInterface`, `IOFramebufferUserClient`, `ATY,Duckweed@2`, and `ATIFramebufferNI`.

The right pane shows the properties of the selected device:

Property	Type	Value
acpi-pmcap-offset	Number	0x50
assigned-addresses	Data	<10 b0 00 82 00 00 00 00 00 b0 f3 f7 00 00 00 00 10 00 00 00>
class-code	Data	<00 80 07 00>
compatible	Data	<"pci1043,84ca", "pci8086,1e3a", "pciclass,078000">
device-id	Data	<3a 1e 00 00>
IODeviceMemory	Array	1 value
IOInterruptControllers	Array	2 values
IOInterruptSpecifiers	Array	2 values
IOName	String	pci8086,1e3a
IOPCIMSIMode	Boolean	True
IOPCIResourced	Boolean	True
IOPowerManagement	Dictionary	3 values
name	String	pci8086,1e3a
pcidebug	String	0:22:0
reg	Data	<00 b0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 10 b0 00 02 00 00 00 00 00 00 00 00 00 00 00 10 00 00 00>
revision-id	Data	<04 00 00 00>
subsystem-id	Data	<ca 84 00 00>
subsystem-vendor-id	Data	<43 10 00 00>
vendor-id	Data	<86 80 00 00>

5. Verify HDEF
- 5a. IOREg/Search HDEF, Select HDEF, Cancel Search (X), Scroll up
- 5b. Example: HDEF/layout-id 0x00 0x00 0x00 0x00 (not valid)

The screenshot shows the IORegistry Explorer window with the path `IOService:/AppleACPIPlatformExpert/PCI0@0/AppleACPIPCI/HDEF@1B` selected. The device is **HDEF@1B**, which is registered, matched, and active. Its class inheritance is `IOPCIDevice : IOService : IORegistryEntry : OSObject` and its bundle identifier is `com.apple.iokit.IOPCIFamily`.

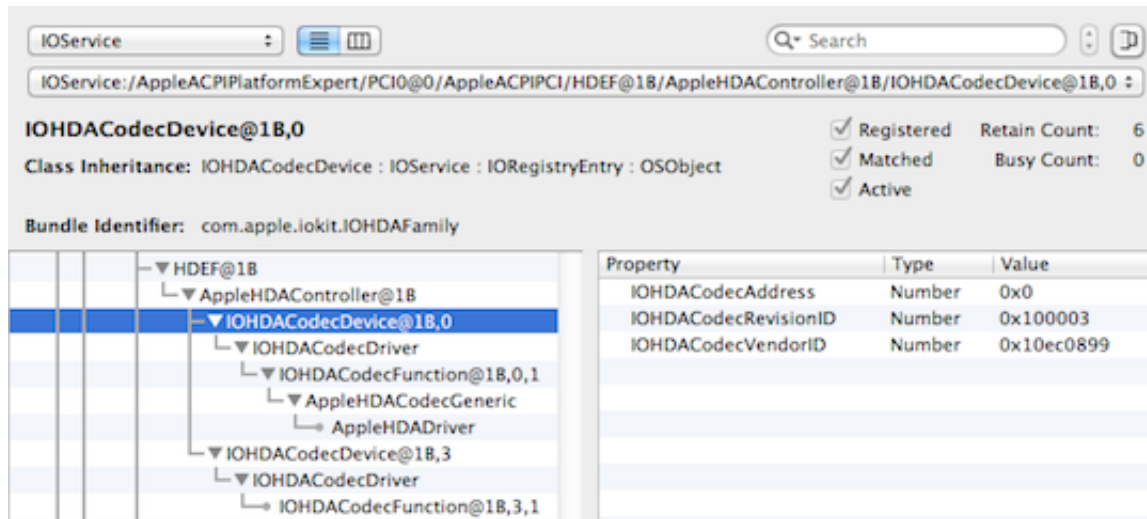
The left pane shows a tree view of the device's children, including `GLAN@19`.

The right pane shows the properties of the selected device:

Property	Type	Value
layout-id	Data	<00 00 00 00>

AppleIntelE1000e		String	IOACPIPlatformDev
en0			ice is not serializable
IONetworkStack			
IONetworkStackUserClient			
HDEF@1B			
AppleHDAController@1B			
IOHDACodecDevice@1B,0			
IOHDACodecDriver			
IOHDACodecFunction@1B,0,1			
AppleHDACodecGeneric			
AppleHDAADriver			
IOHDACodecDevice@1B,3			
IOHDACodecDriver			
IOHDACodecFunction@1B,3,1			
LPCB@1F			
AppleLPC			
pci8086,150@0			
pci8086,1e3a@16			
AppleIntelMEIDriver			
PEG0@1			
IOPCI2PCIBridge			
PEGP@0			
AMD6000Controller			
AMD6000GraphicsAccelerator			
AMDAccel2DContext			
AMDAccel2DContext			
AMDAccel2DContext			
AMDAccel2DContext			
AMDAccelDevice			
AMDAccelDevice			
AMDAccelSharedUserClient			
AMD8xxGLContext			
AMDSupport			
ATY,Duckweed@0			
ATIFramebufferNI			
AGPM			
gpu-control			
AMDNDRVService			
AppleMCCSControlModule			
AppleMCCSParameterH...			
AppleUpstreamUserClient...			
IOFramebufferI2CInterface			
IOFramebufferUserClient			
ATY,Duckweed@1			
ATIFramebufferNI			
AMDNDRVService			
AppleMCCSControlModule			
AppleMCCSParameterH...			
AppleUpstreamUserClient...			
IOFramebufferI2CInterface			
IOFramebufferUserClient			
ATY,Duckweed@2			
ATIFramebufferNI			
AMDNDRVService			
AppleMCCSControlModule			
AppleMCCSParameterH...			
AppleUpstreamUserClient...			
IOFramebufferI2CInterface			
IOFramebufferUserClient			
acpi-device	String	IOACPIPlatformDev	ice is not serializable
acpi-path	String	IOACPIPlane:/_SB/PCI0@0/HDEF@1b0000	
acpi-pmcap-offset	Number	0x50	
assigned-addresses	Data	<10 d8 00 82 00 00 00 00 00 00 F3 F7 00 00 00 00 00 40 00 00>	
built-in	Data	<00>	
class-code	Data	<00 03 04 00>	
compatible	Data	<"pci1043,851f", "pci8086,1e20", "pci-class,040300">	
device-id	Data	<20 1e 00 00>	
IODeviceMemory	Array	1 value	
IOInterruptControllers	Array	2 values	
IOInterruptSpecifiers	Array	2 values	
IOName	String	pci8086,1e20	
IOPCIExpressASPMDefault	Number	0x0	
IOPCIExpressLinkCapabilities	Number	0x0	
IOPCIExpressLinkStatus	Number	0x0	
IOPCIMSIMode	Boolean	True	
IOPCIResourced	Boolean	True	
IOPowerManagement	Dictionary	3 values	
layout-id	Data	<00 00 00 00>	
name	String	pci8086,1e20	
pcidebug	String	0:27:0	
reg	Data	<00 d8 00 00 00 00 00 00 00 00 00 00 00 00 00 00 10 d8 00 02 00 00 00 00 00 00 00 00 00 00 40 00 00>	
revision-id	Data	<04 00 00 00>	
subsystem-id	Data	<1f 85 00 00>	
subsystem-vendor-id	Data	<43 10 00 00>	
vendor-id	Data	<86 80 00 00>	

6. Determine motherboard audio codec device_id (Select 2nd line after HDEF)
- 6a. IOREG/AppleHDAController/OHDACodecDevice/IOHDACodecVendorId
- 6b. Example: IOREG/10ec0899
- 6c. Note: if CodecVendorId is not 10ec8xx, onboard audio is not supported.



Evaluate IOReg > HDMI Audio dsdt edit file Key Information

1. AMI EFI/6 Series

AMI EFI/6 Series	IOReg	HDMI Audio Edit file	After HDMI Audio Edits
discrete graphics	@	PEGO@1	PEGP@1
integrated graphics	@	GFX0@2	IGPU@2

- 1a. If IOReg shows PEGO@1, no edit is required
- 1b. If IOReg shows ABCD@n, the edits are:
- 1c. Edit Name/Find: PEG0/Replace All: ABCD
- 1d. Edit Address/Find: 0x00010000/Replace All: 0x000n0000
- 1e. If IOReg shows no GFX0@2, no edit is required
- 1f. If IOReg shows DEFG@2, the edits are:
- 1g. Edit Name/Find: GFX0/Replace All: DEFG
- 1h. If Audio ID: 1 is correct, no edit is required
- 1i. For Audio ID: 3/Find: 0x01, 0x00, 0x00, 0x00/Replace All: 0x03, 0x00, 0x00, 0x00

2. AMI BIOS/6 Series

AMI BIOS/6 Series	IOReg	HDMI Audio Edit file	After HDMI Audio Edits
discrete graphics	@	P0P1@1	PEGP@1
integrated graphics	@	GFX0@2	IGPU@2

- 2a. If IOReg shows P0P1@1, no edit is required
- 2b. If IOReg shows ABCD@n, the edits are:
- 2c. Edit Name/Find: P0P1/Replace All: ABCD
- 2d. Edit Address/Find: 0x00010000/Replace All: 0x000n0000
- 2e. If IOReg shows no GFX0@2, no edit is required
- 2f. If IOReg shows DEFG@2, the edits are:
- 2g. Edit Name/Find: GFX0/Replace All: DEFG
- 2h. If Audio ID: 1 is correct, no edit is required
- 2i. For Audio ID: 3/Find: 0x01, 0x00, 0x00, 0x00/Replace: 0x03, 0x00, 0x00, 0x00

3. Award BIOS/6 Series (Verify PEGO address, 1 or 3)

Award BIOS/6 Series	IOReg	HDMI Audio Edit file	After HDMI Audio Edits
discrete graphics	PEGO@1	PEGO@1	PEGP@1

integrated graphics	IGD0@2	IGD0@2	IGPU@2
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- 3a. IOREg shows PEGO@1 and IGD0@2 (if present)
- 3b. If Audio ID: 1 is correct, no edit is required
- 3c. For Audio ID: 3/Find: 0x01, 0x00, 0x00, 0x00/Replace All: 0x03, 0x00, 0x00, 0x00

Patch File Edits

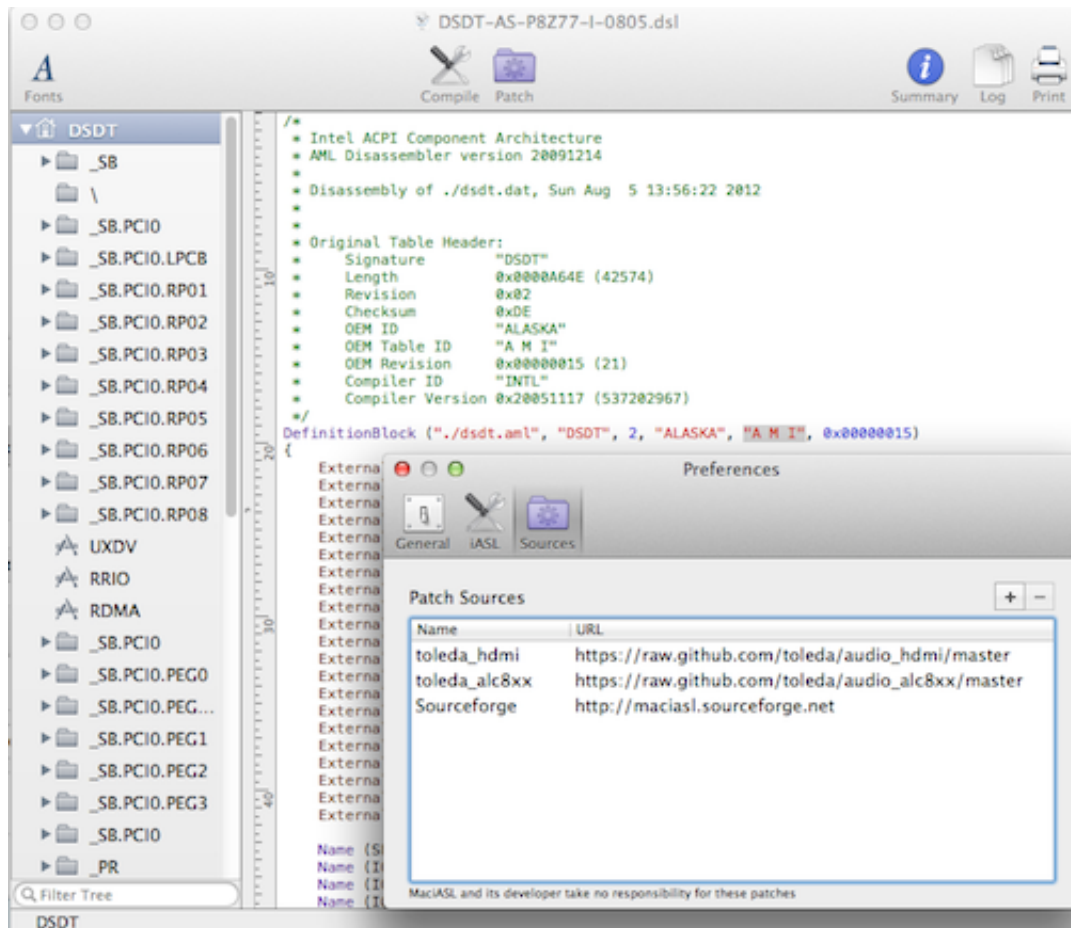
- 1. If the Patch file requires edits,
 - 1a. Edit the Patch file in MaciASL Patch window or
 - 1b. Download the Patch from:
github.com/toleda/audio_hdmi_hd3000/tree/master/Patches
 Select Folder/Select Patch/Raw/Copy/Save to Desktop
 edit with TextEdit and save to desktop.

Start of Procedure

Sandy Bridge/HD3000/6 Series Motherboards - Mountain Lion HDMI audio edits

I. Preparation

- 1. Make bootable backup of system (CarbonCopyCloner or SuperDuper)
- 2. Make a copy of IOREg, see **Tools**/2.
- 3. Verify no audio enablers (S/L/E/HDAEnabler1.kext, HDAEnabler8xx.kext, etc.)
- 4. MultiBeast 5.2.1 or newer - Select/Drivers & Bootloaders/Drivers/Audio/Realtek ALC8xx/With DSDT/ALC8--, if Realtek ALC8xx audio,
- 5. Download MaciASL and install/Applications, see **Tools**/1.
- 6. Applications/MaciASL
- 7. MaciASL/Preferences/Sources/+/https://raw.githubusercontent.com/toleda/audio_hdmi_hd3000/master
 - 7a. URL: https://raw.githubusercontent.com/toleda/audio_hdmi_hd3000/master
 - 7b. Screenshot

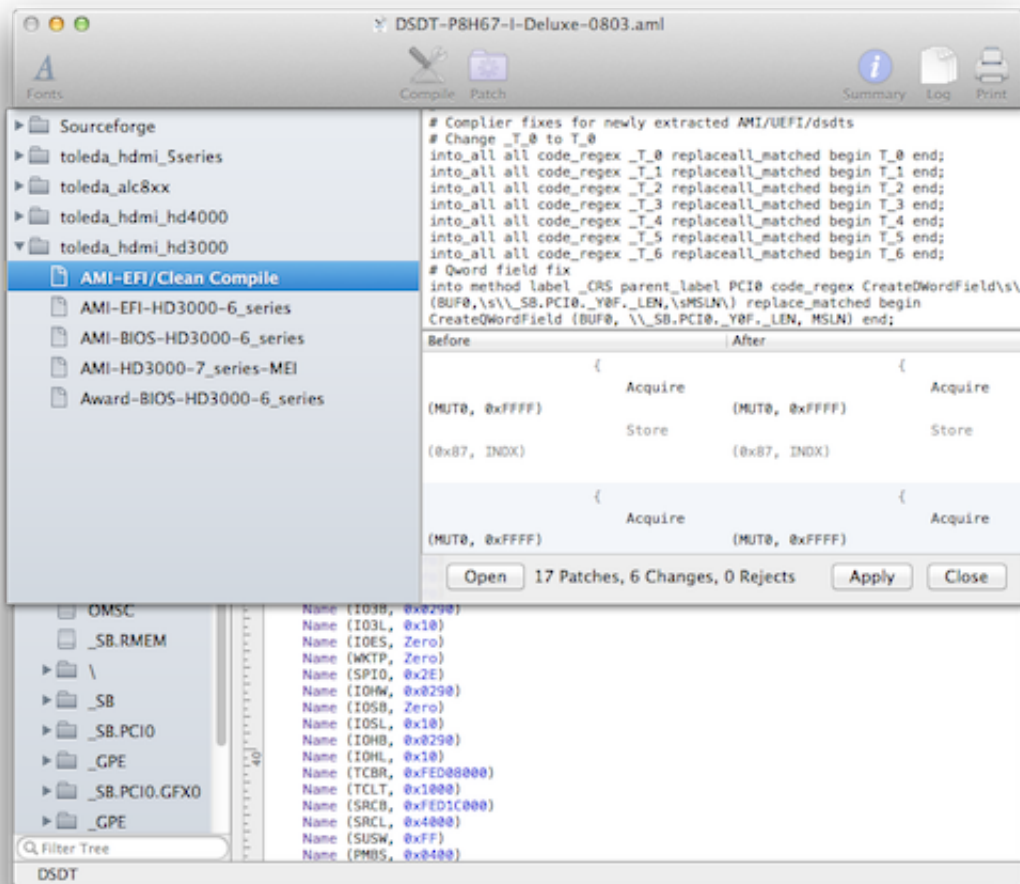


8. With dsdt,
 - 8a. Copy Extra/dsdt.aml to Desktop
 - 8b. MaciASL/File/Open/Desktop/dsdt.aml
 - 8c. jump to **II. Native Compile**
9. If no dsdt,
 - 9a. MaciASL/File/New from ACPI/DSDT
 - 9b. MaciASL/File/Save As../Desktop/dsdt-motherboard-native.dsl

II. Native Compile

10. Verify AMI dsdt (1st line)
 - 10a. DefinitionBlock ("./dsdt.aml", "DSDT", 2, "ALASKA", "A M I", 0x000000..)

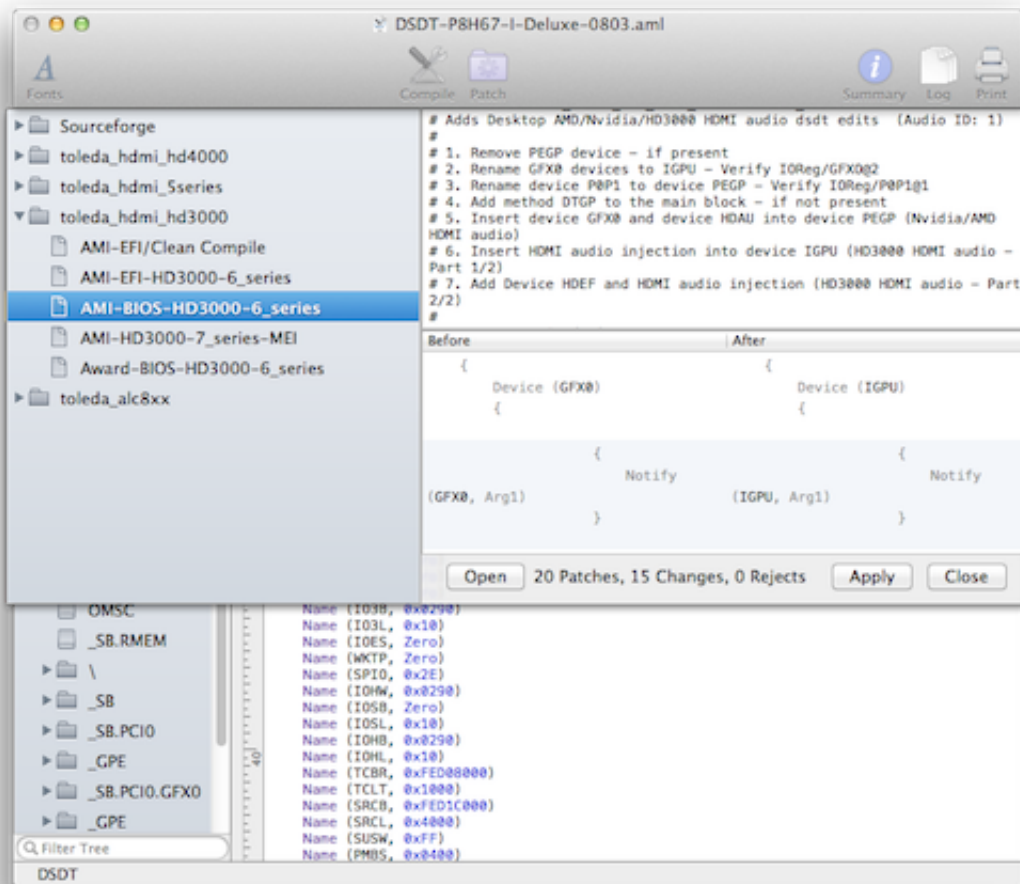
OR
 10. Verify Award dsdt (1st line)
 - 10a. DefinitionBlock ("./dsdt.aml", "DSDT", 1, "GBT ", "GBTUACPI", 0x00001000)
 - 10b. If dsdt is not AMI or Award, this method will not work. Full Stop.
11. MaciASL/Patch/Select AMI-EFI/Clean Compile (AMI-EFI only)
 - 11a. Screenshot



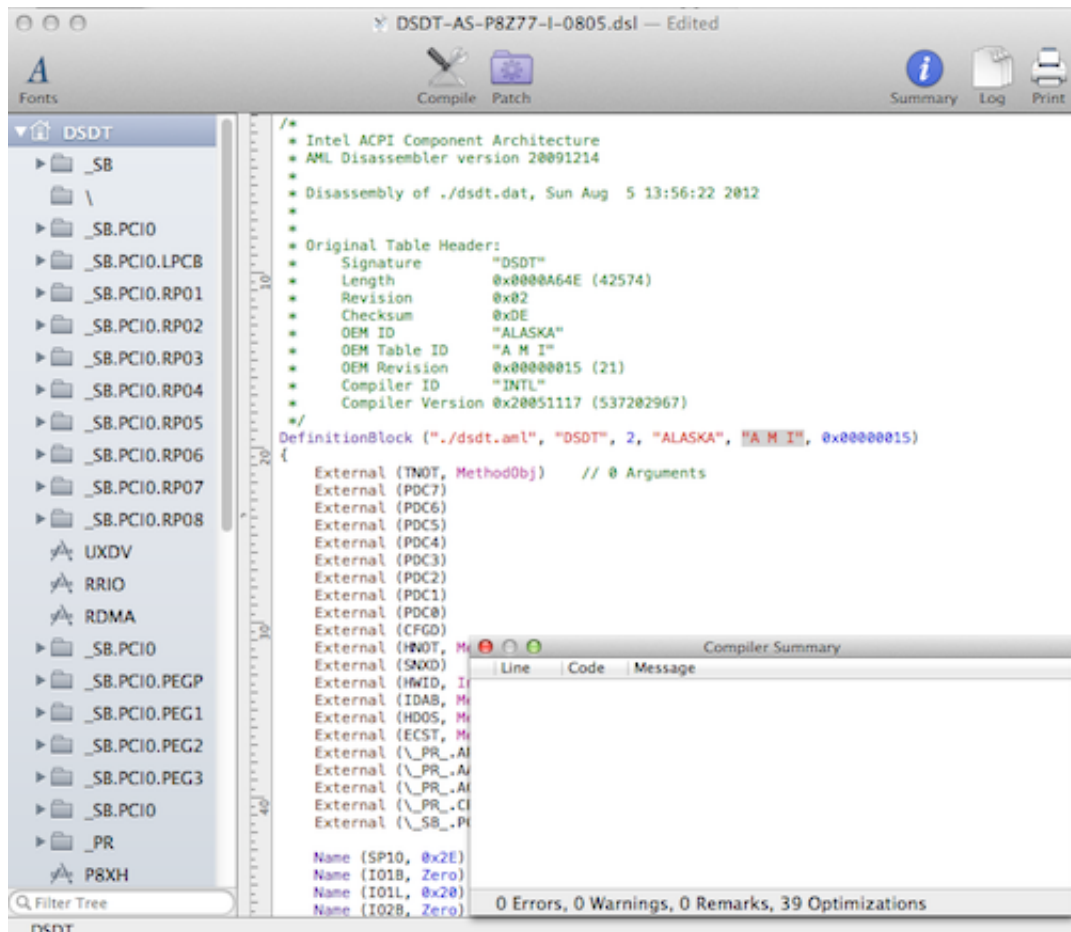
12. MaciASL/Patch/Apply
13. MaciASL/Patch/Close
14. MaciASL/Compile
- 14a. See Screenshot at 19a
15. If no errors, jump to **III. Apply Patch file - MaciASL**
- 15a. Errors, see Troubleshooting/Problem Reporting/4.

III. Apply Patch file - MaciASL

16. Choose Patch:
 - 16a. Patch/toleda_hdmi_hd3000/Select appropriate Patch file and make any edits
OR Patch/Open/Desktop/Edited Patch file from **Patch File Edits** above
 - 16b. Screenshot



17. MaciASL/Patch/Apply
18. MaciASL/Patch/Close
19. MaciASL/Compile
- 19a. Screenshot



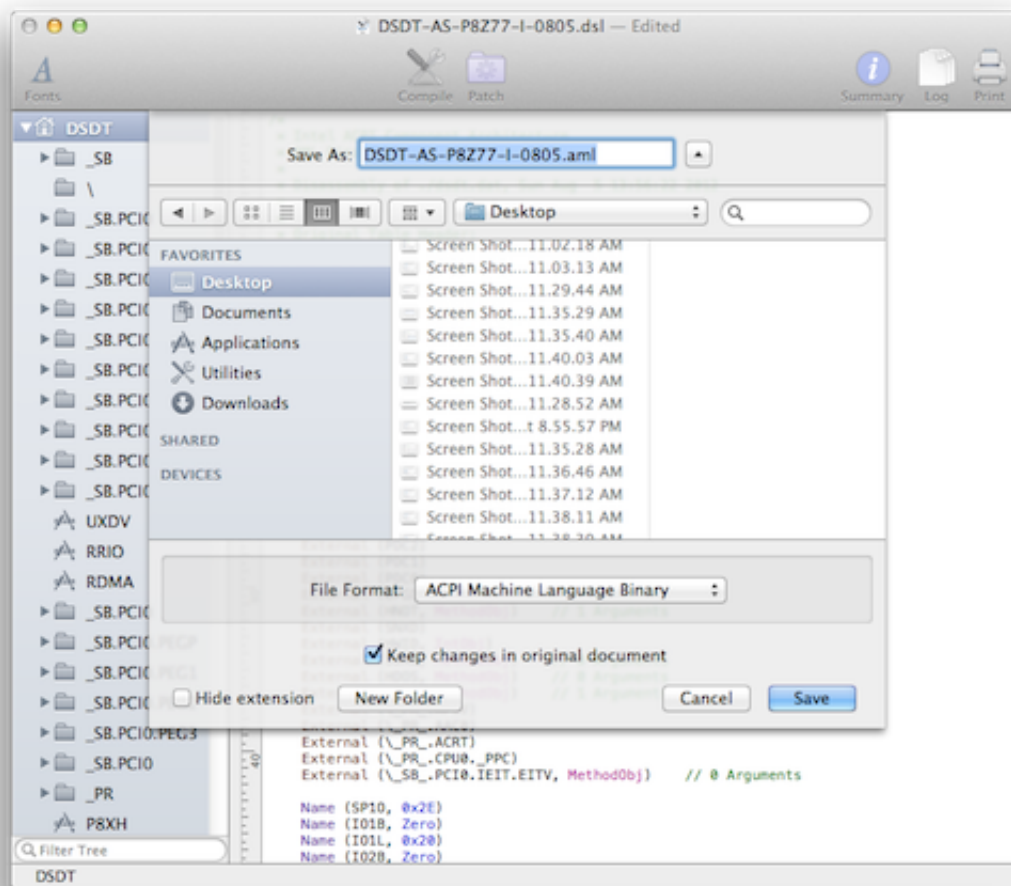
20. If no errors, jump to **IV. Save dsdt.aml - MaciASL**

20a. Errors, see Troubleshooting/Problem Reporting/4.

IV. Save dsdt.aml - MaciASL

21. MaciASL/File/Save As... /ACPI Machine Language Binary/Desktop/dsdt.aml (add extension)

21a. Screenshot



V. Install dsdt.aml - MaciASL

22. MaciASL/File/Save As... /ACPI Machine Language Binary/Extra/dsdt.aml (add extension)

VI. Restart

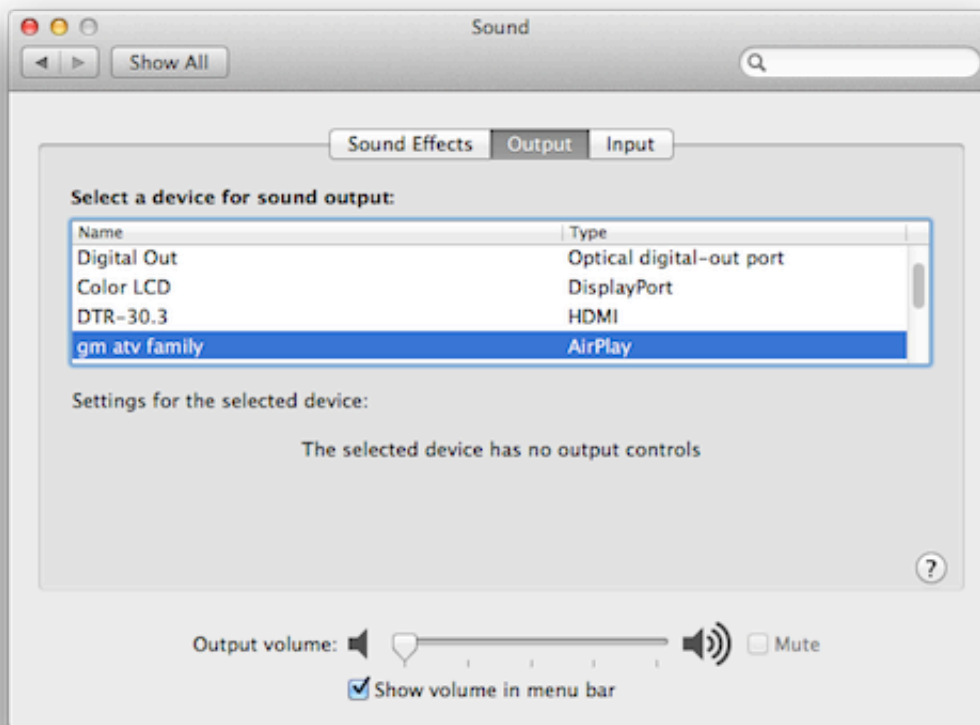
23. Repair permissions and cache (Ex., Disk Utility, Kext Beast, Kext Utility, Kext Wizard, etc.)

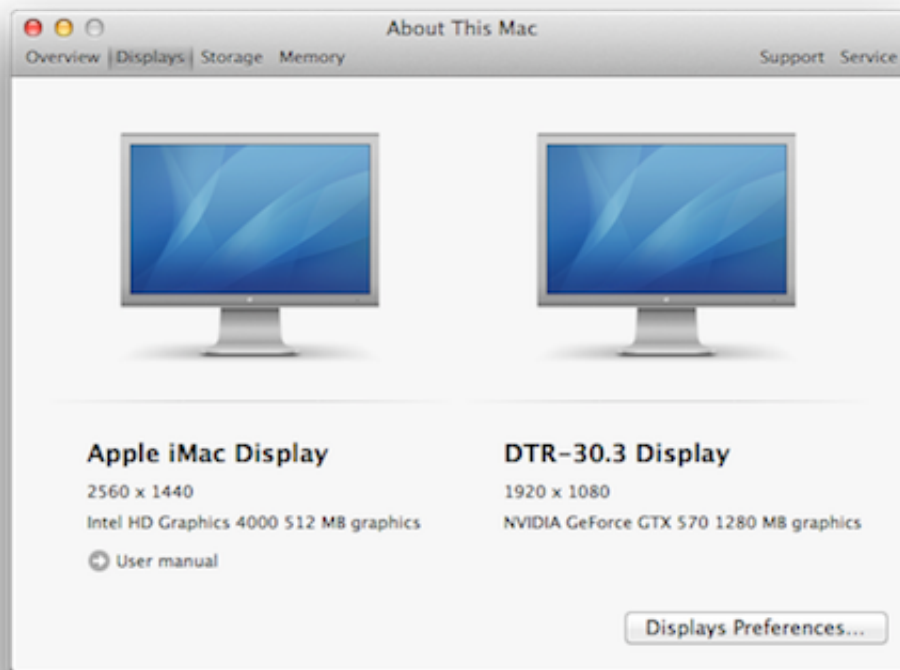
24. Restart

VII. Verify HDMI Audio

P8Z77 I Deluxe/i7-3770K/HD4000 DP audio/NVidia HDMI audio/AirPlay Mirroring

25. System Preferences/Sound/Outputs/Select HDMI





Mac mini				
▼ Hardware	Video Card ▲			
	Intel HD Graphics 4000	GPU	Built-In	
	NVIDIA GeForce GTX 570	GPU	PCIe	PCIEX16
ATA				
Audio				
Bluetooth				
Card Reader				
Diagnostics				
Disc Burning				
Ethernet Cards				
Fibre Channel				
FireWire				
Graphics/Displays	Intel HD Graphics 4000: Chipset Model: Intel HD Graphics 4000 Type: GPU Bus: Built-In VRAM (Total): 512 MB Vendor: Intel (0x8086) Device ID: 0x0166 Revision ID: 0x0009 Displays: iMac: Display Type: LCD Resolution: 2560 x 1440 Pixel Depth: 32-Bit Color (ARGB8888) Main Display: Yes Mirror: Off Online: Yes Rotation: Supported Connection Type: DisplayPort			
Hardware RAID				
Memory				
PCI Cards				
Parallel SCSI				
Power				
Printers				
SAS				
Serial-ATA				
Thunderbolt				
USB				
▼ Network				
Firewall				
Locations				
Modems				
Volumes				
WWAN				
Wi-Fi				
▼ Software				
Accessibility				
Applications				
Components				
Developer				
Extensions				
Fonts				
Frameworks				
Installations				
Logs				
Managed Client				
Preference Panes				
Printer Software				
Profiles				
Startup Items				
Sync Services				
	NVIDIA GeForce GTX 570: Chipset Model: NVIDIA GeForce GTX 570 Type: GPU Bus: PCIe Slot: PCIEX16 PCIe Lane Width: x16 VRAM (Total): 1280 MB Vendor: NVIDIA (0x10de) Device ID: 0x1086 Revision ID: 0x00a1 ROM Revision: preset 1.0.0 Displays: DTR-30.3: Resolution: 1920 x 1080 @ 60 Hz Pixel Depth: 32-Bit Color (ARGB8888) Mirror: Off Online: Yes Rotation: Supported Television: Yes			

Troubleshooting

1. Verify HDMI device connected
 - 1a. System Information/Graphics/Display/HDMI device name/Television/Yes
2. Verify Extra/dsdt.aml is
 - 2a. .aml file
 - 2b. edited
3. Run IOREg/Verify Devices (PEGP, GFX0, HDAU, HDEF and IGPU)
 - 3a. Device (IGPU) may not be present if HD4000 Graphics is not enabled
 - 3b. Device (GFX0) and Device (HDAU) may not be present if no discrete graphics
4. Problem Reporting/AMI dsdt/Post to Mountain Lion HDMI Audio - AMI DSDT
4. Problem Reporting/Award dsdt/Post to Mountain Lion HDMI Audio - Award DSDT
 - 4a. Motherboard/BIOS version/processor/graphics/OS and version
 - 4b. dsdt
 - 4c. copy of IOREg

References

[Mountain Lion HDMI Audio - AMI DSDT](#)
[Mountain Lion HDMI Audio - Award DSDT](#)
[toleda/audio_hdmi_hd3000 · GitHub](#)

Credits:

VCH888: [ALC889A, Gigabyte \(Intel\): now having a working front mic - Page 38 - Sound - InsanelyMac Forum](#)
SJ_UnderWater: [Native DSDT/AML IDE & Compiler: MaciASL Open Beta](#)

[Guide] ML-Sandy_Bridge-HD3000-6_series-hdmi_audio_dsdt_edits_v1.0