



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](http://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: /AppleACPIPlatformExpert/PCI0@0/AppleACPIPCI/G...r@0/AppleMCCSControlModule/AppleMCCSParameterHandler

AppleMCCSParameterHandler

Class Inheritance: AppleMCCSParameterHandler : IODisplayParameterHandler : IOService : IORegistryEntry : OSObject

Bundle Identifier: com.apple.driver.AppleMCCSControl

Registered Retain Count: 4
Matched Busy Count: 0
Active

Property	Type	Value
CFBundleIdentifier	String	com.apple.driver.AppleMCCSControl
IOClass	String	AppleMCCSParameterHandler
IOKitDebug	Number	0x0
IOMatchCategory	String	IODisplayParameter
IOProbeScore	Number	0x0
IOProviderClass	String	AppleMCCSControlFamily
IOResourceMatch	String	IOKit

Root

- Macmini5,1
 - AppleACPIPlatformExpert
 - PCI0@0
 - AppleACPIPCI
 - GFX0@2
 - AppleIntelFramebuffer@0
 - AppleMCCSControlModule
 - AppleMCCSParameterHandler
 - AppleIntelFramebuffer@1
 - AppleMCCSControlModule
 - AppleMCCSParameterHandler
 - AppleIntelFramebuffer@2
 - AppleMCCSControlModule
 - AppleMCCSParameterHandler
 - display0
 - AppleDisplay
 - PEG0@1
 - IOPCI2PCIBridge
 - PEGP@0
 - ATY,Duckweed@0
 - ATIFramebufferNI
 - AppleMCCSControlModule
 - AppleMCCSParameterHandler
 - ATY,Duckweed@1
 - ATIFramebufferNI
 - AppleMCCSControlModule
 - AppleMCCSParameterHandler
 - ATY,Duckweed@2
 - ATIFramebufferNI
 - AppleMCCSControlModule
 - AppleMCCSParameterHandler
 - ATY,Duckweed@3
 - ATIFramebufferNI
 - AppleMCCSControlModule
 - AppleMCCSParameterHandler
 - IOResources
 - IODisplayWrangler

2. Determine discrete graphics device names and address

2a. IOREg/Search PEG0

2a. Example: PEG0@1

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> |

pci8086,1e3a@16

- AppleIntelMEIDriver
- PEG0@1

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|--------|---|-----------|--------|--|-------------------|--------|------|----------|------|------|------------|------|---------------|------------|------|--|-----------|------|---------------|-------------|------|----|--------------------------|-------|---------|-------------------------|-------|---------|--------|--------|------------|-----------------|---------|------|-------------------------|--------|-----|------------------------------|--------|-----------|------------------------|--------|--------|----------------|---------|------|---------------------|------------|----------|------|--------|------------|----------|--------|------------|--------|------|--|-----|------|---|-------------|------|---------------|--------------|------|---------------|---------------------|------|---------------|-----------|------|---------------|
| <div><div><div><div><div><div></div><div>▼ IOPCI2PCIBridge</div></div><div><div><div>▼ PEGP@0</div><div><div>→ AMD6000Controller</div><div>▼ AMDBartsGraphicsAccelerator</div><div><div>→ AMDAccel2DContext</div><div>→ AMDAccel2DContext</div><div>→ AMDAccel2DContext</div><div>→ AMDAccel2DContext</div><div>→ AMDAccelDevice</div><div>→ AMDAccelDevice</div><div>→ AMDAccelSharedUserClient</div><div>→ AMDR8xxGLContext</div></div><div>→ AMDSupport</div><div>▼ ATY,Duckweed@0</div><div><div>▼ ATIFramebufferNI</div><div><div>▼ AGPM</div><div><div>→ gpu-control</div></div><div>→ AMDNDRVService</div><div>▼ AppleMCCSControlModule</div><div><div>→ AppleMCCSParameterH...</div></div><div>→ AppleUpstreamUserClient...</div><div>→ IOFramebufferI2CInterface</div><div>→ IOFramebufferUserClient</div></div></div><div>▼ ATY,Duckweed@1</div><div><div>▼ ATIFramebufferNI</div><div><div>→ AMDNDRVService</div><div>▼ AppleMCCSControlModule</div><div><div>→ AppleMCCSParameterH...</div></div><div>→ AppleUpstreamUserClient...</div><div>→ IOFramebufferI2CInterface</div><div>→ IOFramebufferUserClient</div></div></div><div>▼ ATY,Duckweed@2</div><div><div>▼ ATIFramebufferNI</div><div><div>→ AMDNDRVService</div><div>▼ AppleMCCSControlModule</div><div><div>→ AppleMCCSParameterH...</div></div><div>→ AppleUpstreamUserClient...</div><div>→ IOFramebufferI2CInterface</div><div>→ IOFramebufferUserClient</div></div></div><div>▼ ATY,Duckweed@3</div><div><div>▼ ATIFramebufferNI</div><div><div>→ AMDNDRVService</div><div>▼ AppleMCCSControlModule</div><div><div>→ AppleMCCSParameterH...</div></div><div>→ AppleUpstreamUserClient...</div><div>→ IOFramebufferI2CInterface</div><div>→ IOFramebufferUserClient</div></div></div></div></div><div>→ PEGP@0,1</div></div></div><div><div>▼ RP01@1C</div><div>→ IOPCI2PCIBridge</div></div><div>▼ RP07@1C,6</div><div><div>▼ IOPCI2PCIBridge</div><div>→ PXSX@0</div></div></div><div>▼ RP08@1C,7</div><div><div>▼ IOPCI2PCIBridge</div><div>→ PXSX@0</div></div></div><div>▼ SAT0@1F,2</div></div> | <table><tr><td>acpi-device</td><td>String</td><td>IOACPIPlatformDev
ice is not
serializable</td></tr><tr><td>acpi-path</td><td>String</td><td>IOACPIPlane:/_SB/
PCI0@0/
PEGP@10000</td></tr><tr><td>acpi-pmcap-offset</td><td>Number</td><td>0x80</td></tr><tr><td>built-in</td><td>Data</td><td><00></td></tr><tr><td>class-code</td><td>Data</td><td><00 04 06 00></td></tr><tr><td>compatible</td><td>Data</td><td><"pcif,0", "pci8086
,151", "pciclass,06
0400"></td></tr><tr><td>device-id</td><td>Data</td><td><51 01 00 00></td></tr><tr><td>IODTPersist</td><td>Data</td><td><></td></tr><tr><td>▶ IOInterruptControllers</td><td>Array</td><td>1 value</td></tr><tr><td>▶ IOInterruptSpecifiers</td><td>Array</td><td>1 value</td></tr><tr><td>IOName</td><td>String</td><td>pci-bridge</td></tr><tr><td>IOPCIConfigured</td><td>Boolean</td><td>True</td></tr><tr><td>IOPCIExpressASPMDefault</td><td>Number</td><td>0x0</td></tr><tr><td>IOPCIExpressLinkCapabilities</td><td>Number</td><td>0x261ad03</td></tr><tr><td>IOPCIExpressLinkStatus</td><td>Number</td><td>0x5101</td></tr><tr><td>IOPCIResourced</td><td>Boolean</td><td>True</td></tr><tr><td>▶ IOPowerManagement</td><td>Dictionary</td><td>3 values</td></tr><tr><td>name</td><td>String</td><td>pci-bridge</td></tr><tr><td>pcidebug</td><td>String</td><td>0:1:0(1:1)</td></tr><tr><td>ranges</td><td>Data</td><td><00 00 00 82
00 00 00 00
00 00 e0 f7
00 00 00 82
00 00 00 00
00 00 e0 f7
00 00 00 00
00 00 10 00
00 00 00 c2
0f 00 00 00
00 00 00 10
00 00 00 c2
0f 00 00 00
00 00 00 10
00 00 00 00
00 00 00 10
00 00 00 81
00 00 00 00
00 e0 00 00
00 00 00 81
00 00 00 00
00 e0 00 00
00 00 00 00
00 10 00 00></td></tr><tr><td>reg</td><td>Data</td><td><00 08 00 00
00 00 00 00
00 00 00 00
00 00 00 00
00 00 00 00></td></tr><tr><td>revision-id</td><td>Data</td><td><09 00 00 00></td></tr><tr><td>subsystem-id</td><td>Data</td><td><00 00 00 00></td></tr><tr><td>subsystem-vendor-id</td><td>Data</td><td><0f 00 00 00></td></tr><tr><td>vendor-id</td><td>Data</td><td><86 80 00 00></td></tr></table> | acpi-device | String | IOACPIPlatformDev
ice is not
serializable | acpi-path | String | IOACPIPlane:/_SB/
PCI0@0/
PEGP@10000 | acpi-pmcap-offset | Number | 0x80 | built-in | Data | <00> | class-code | Data | <00 04 06 00> | compatible | Data | <"pcif,0", "pci8086
,151", "pciclass,06
0400"> | device-id | Data | <51 01 00 00> | IODTPersist | Data | <> | ▶ IOInterruptControllers | Array | 1 value | ▶ IOInterruptSpecifiers | Array | 1 value | IOName | String | pci-bridge | IOPCIConfigured | Boolean | True | IOPCIExpressASPMDefault | Number | 0x0 | IOPCIExpressLinkCapabilities | Number | 0x261ad03 | IOPCIExpressLinkStatus | Number | 0x5101 | IOPCIResourced | Boolean | True | ▶ IOPowerManagement | Dictionary | 3 values | name | String | pci-bridge | pcidebug | String | 0:1:0(1:1) | ranges | Data | <00 00 00 82
00 00 00 00
00 00 e0 f7
00 00 00 82
00 00 00 00
00 00 e0 f7
00 00 00 00
00 00 10 00
00 00 00 c2
0f 00 00 00
00 00 00 10
00 00 00 c2
0f 00 00 00
00 00 00 10
00 00 00 00
00 00 00 10
00 00 00 81
00 00 00 00
00 e0 00 00
00 00 00 81
00 00 00 00
00 e0 00 00
00 00 00 00
00 10 00 00> | reg | Data | <00 08 00 00
00 00 00 00
00 00 00 00
00 00 00 00
00 00 00 00> | revision-id | Data | <09 00 00 00> | subsystem-id | Data | <00 00 00 00> | subsystem-vendor-id | Data | <0f 00 00 00> | vendor-id | Data | <86 80 00 00> |
| acpi-device | String | IOACPIPlatformDev
ice is not
serializable | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| acpi-path | String | IOACPIPlane:/_SB/
PCI0@0/
PEGP@10000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| acpi-pmcap-offset | Number | 0x80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| built-in | Data | <00> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| class-code | Data | <00 04 06 00> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| compatible | Data | <"pcif,0", "pci8086
,151", "pciclass,06
0400"> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| device-id | Data | <51 01 00 00> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IODTPersist | Data | <> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▶ IOInterruptControllers | Array | 1 value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▶ IOInterruptSpecifiers | Array | 1 value | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IOName | String | pci-bridge | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IOPCIConfigured | Boolean | True | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IOPCIExpressASPMDefault | Number | 0x0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IOPCIExpressLinkCapabilities | Number | 0x261ad03 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IOPCIExpressLinkStatus | Number | 0x5101 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| IOPCIResourced | Boolean | True | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▶ IOPowerManagement | Dictionary | 3 values | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| name | String | pci-bridge | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pcidebug | String | 0:1:0(1:1) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ranges | Data | <00 00 00 82
00 00 00 00
00 00 e0 f7
00 00 00 82
00 00 00 00
00 00 e0 f7
00 00 00 00
00 00 10 00
00 00 00 c2
0f 00 00 00
00 00 00 10
00 00 00 c2
0f 00 00 00
00 00 00 10
00 00 00 00
00 00 00 10
00 00 00 81
00 00 00 00
00 e0 00 00
00 00 00 81
00 00 00 00
00 e0 00 00
00 00 00 00
00 10 00 00> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| reg | Data | <00 08 00 00
00 00 00 00
00 00 00 00
00 00 00 00
00 00 00 00> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| revision-id | Data | <09 00 00 00> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| subsystem-id | Data | <00 00 00 00> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| subsystem-vendor-id | Data | <0f 00 00 00> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| vendor-id | Data | <86 80 00 00> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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

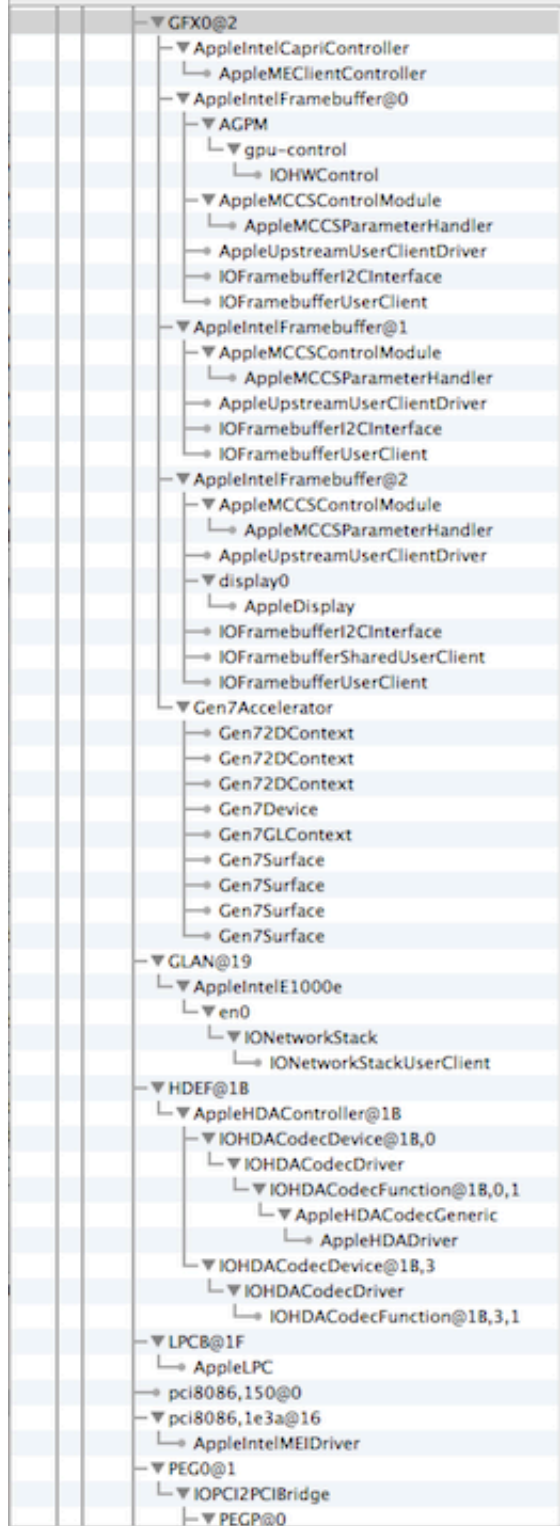


GFX0@2

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,lg-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 |
| IOPCIMSIMode | 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 search bar set to "IOService". The selected path is "IOService:/AppleACPIPlatformExpert/PCI0@0/AppleACPIPCI/pci8086,1e3a@16".

pci8086,1e3a@16

Class Inheritance: IOPCIDevice : IOService : IORegistryEntry : OSObject

Bundle Identifier: com.apple.iokit.IOPCIFamily

Properties:

- Registered: ☒
- Matched: ☒
- Active: ☒
- Retain Count: 9
- Busy Count: 0

Left pane tree structure:

- pci8086,1e3a@16
 - AppleIntelMEIDriver
 - PEG0@1
 - IOPCI2PCIBridge
 - PEGP@0
 - AMD6000Controller
 - AMDBartsGraphicsAccelerator
 - AMDAccel2DContext
 - AMDAccel2DContext
 - AMDAccel2DContext
 - AMDAccel2DContext
 - AMDAccelDevice
 - 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
 - ATIFramebufferNI

Right pane table:

| 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
00 00 00 00
10 b0 00 02
00 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 search bar set to "IOService". The selected path is "IOService:/AppleACPIPlatformExpert/PCI0@0/AppleACPIPCI/HDEF@1B".

HDEF@1B

Class Inheritance: IOPCIDevice : IOService : IORegistryEntry : OSObject

Bundle Identifier: com.apple.iokit.IOPCIFamily

Properties:

- Registered: ☒
- Matched: ☒
- Active: ☒
- Retain Count: 10
- Busy Count: 0

Left pane tree structure:

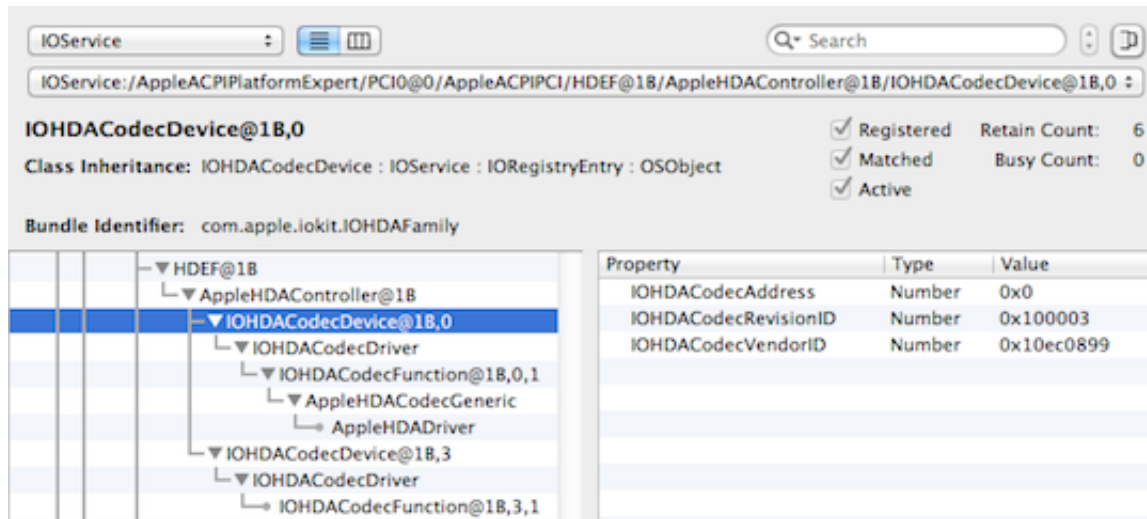
- GLAN@19

Right pane table:

| Property | Type | Value |
|----------|------|-------|
|----------|------|-------|

| | | | |
|------------------------------|------------|--|-------------------------|
| 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 |
|----------------------------|--------|--------|--------|

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,

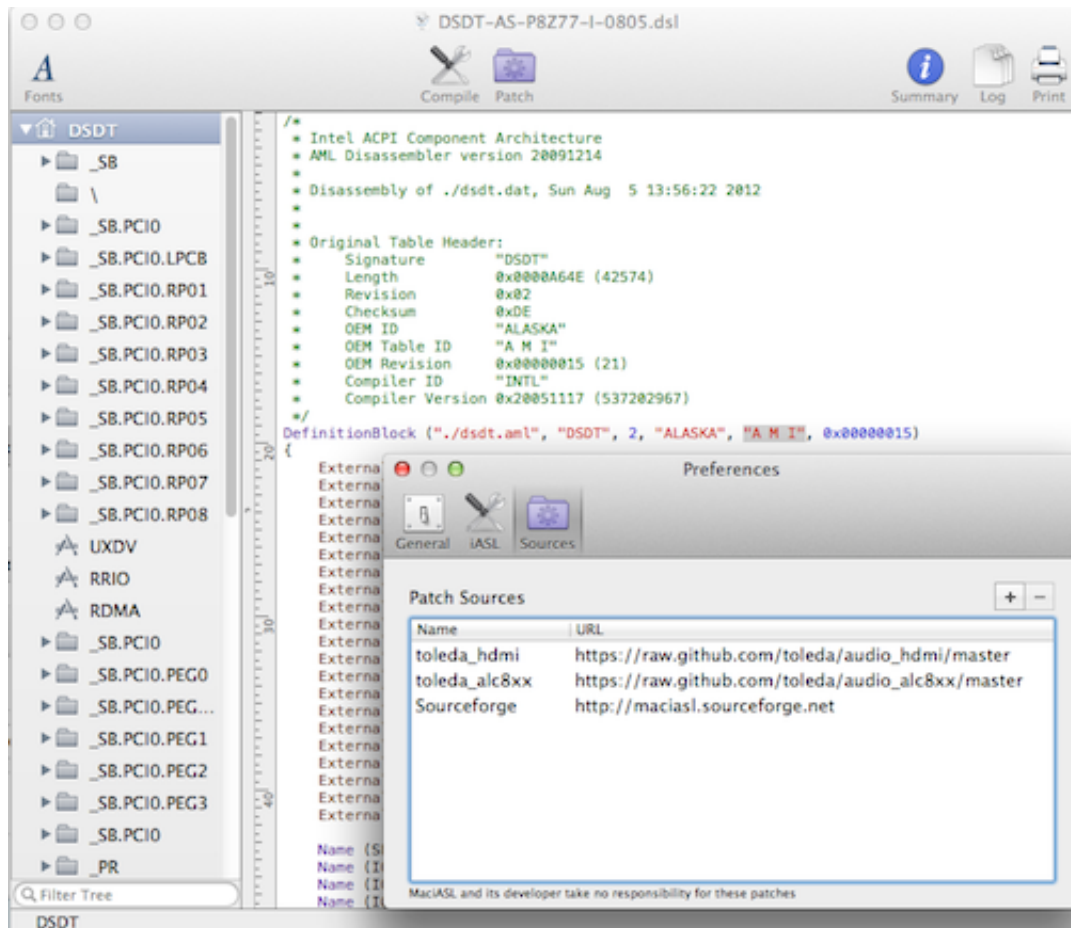
5. Download MaciASL and install/Applications, see **Tools**/1.

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

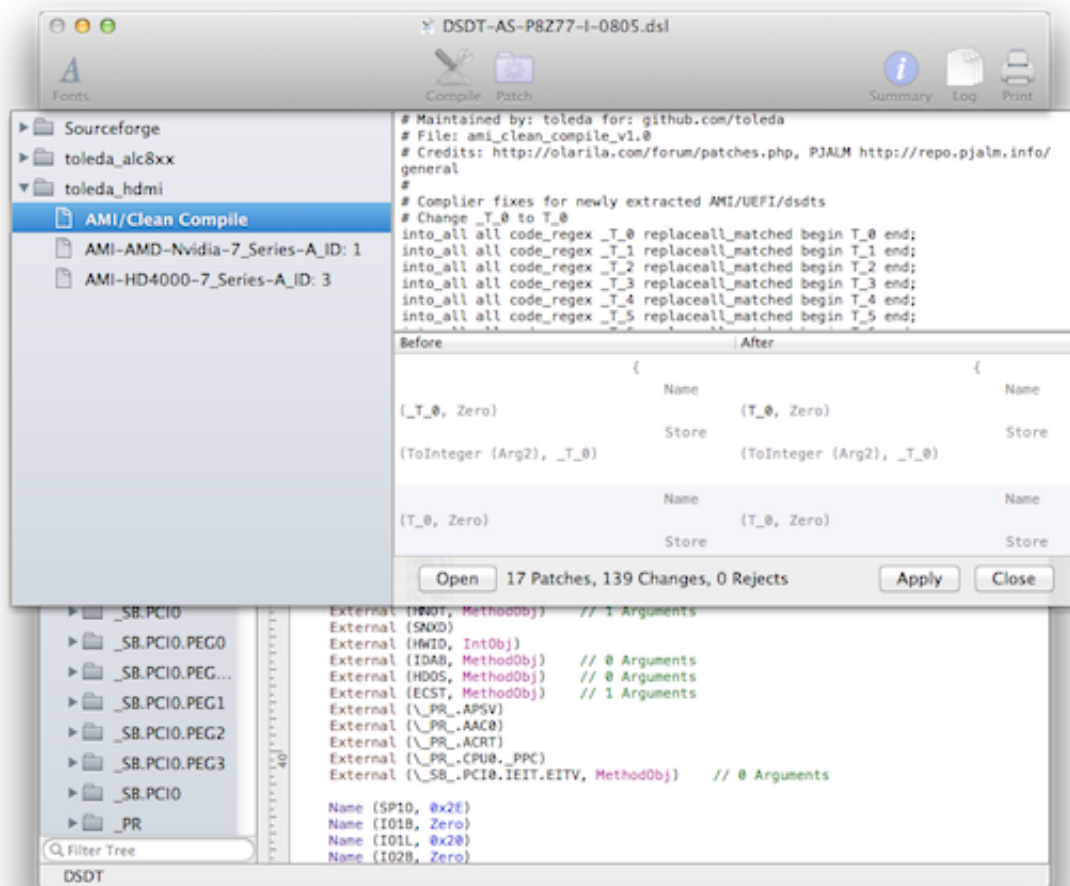


8. With dsdt,
 - 8a. Copy Extra/dsdt.aml to Desktop
 - 8b. MaciASL/File/Open/Desktop/dsdt.aml
 - 8c. jump to **II. Native Compile**
9. If no dsdt,
 - 9a. MaciASL/File/New from ACPI/DSDT
 - 9b. MaciASL/File/Save As../Desktop/dsdt-motherboard-native.dsl

II. Native Compile

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

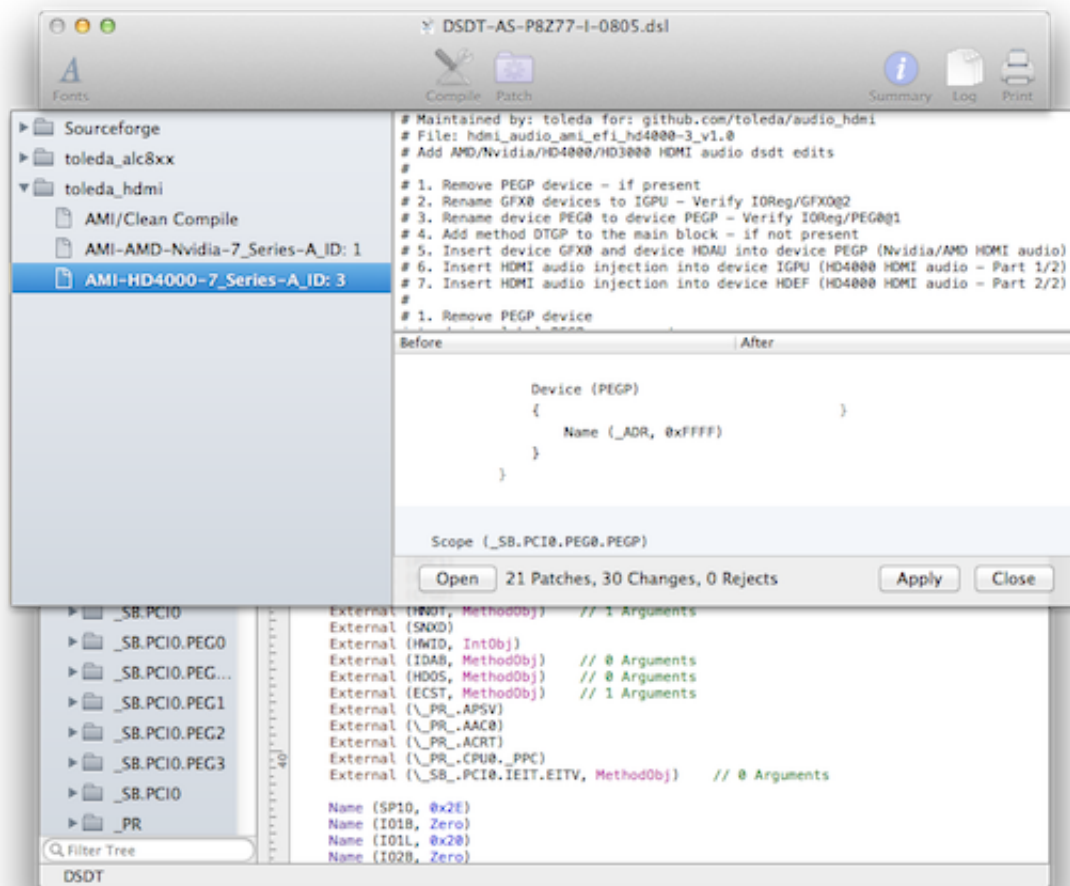
OR
 10. Verify Award dsdt (1st line)
 - 10a. DefinitionBlock ("./dsdt.aml", "DSDT", 1, "GBT ", "GBTUACPI", 0x00001000)
 - 10b. If dsdt is not AMI or Award, this method will not work. Full Stop.
11. MaciASL/Patch/Select AMI-EFI/Clean Compile (AMI-EFI only)
 - 11a. Screenshot



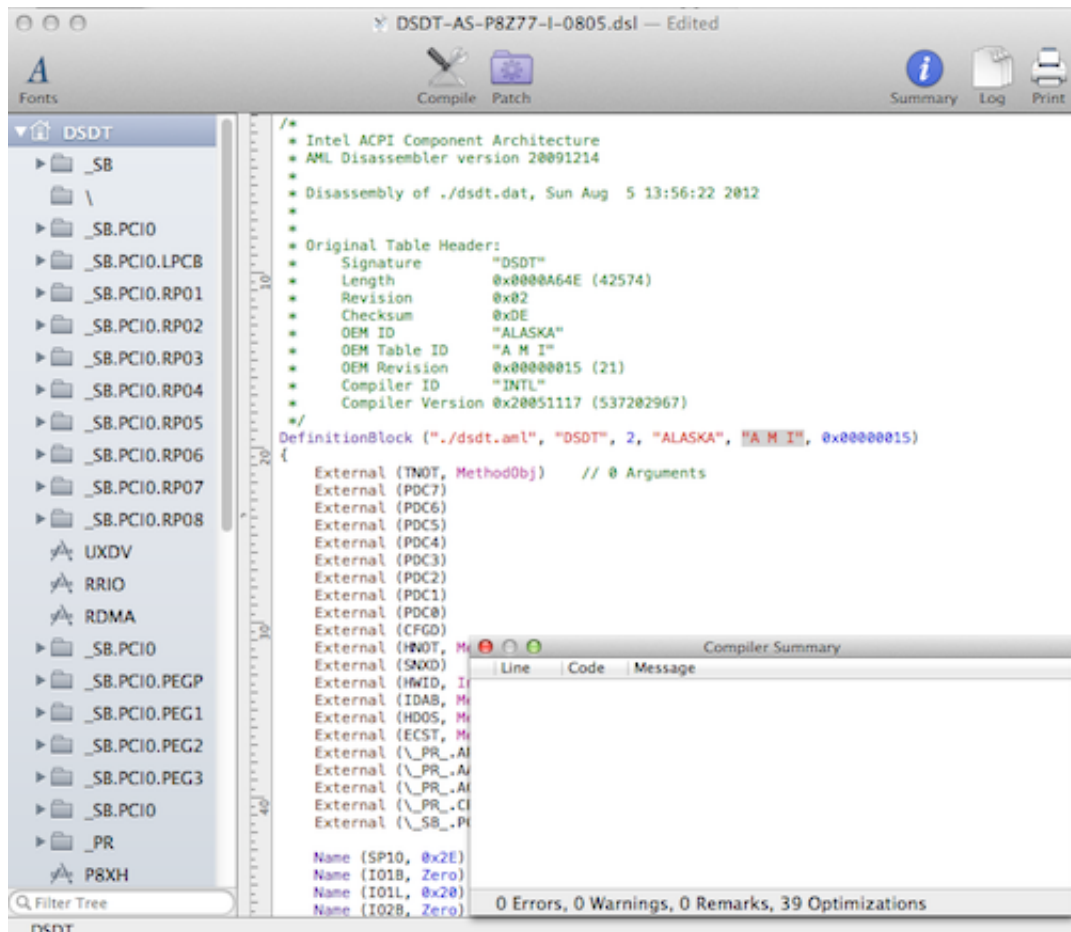
12. MaciASL/Patch/Apply
13. MaciASL/Patch/Close
14. MaciASL/Compile
- 14a. See Screenshot at 19a
15. If no errors, jump to **III. Apply Patch file - MaciASL**
- 15a. Errors, see Troubleshooting/Problem Reporting/4.

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



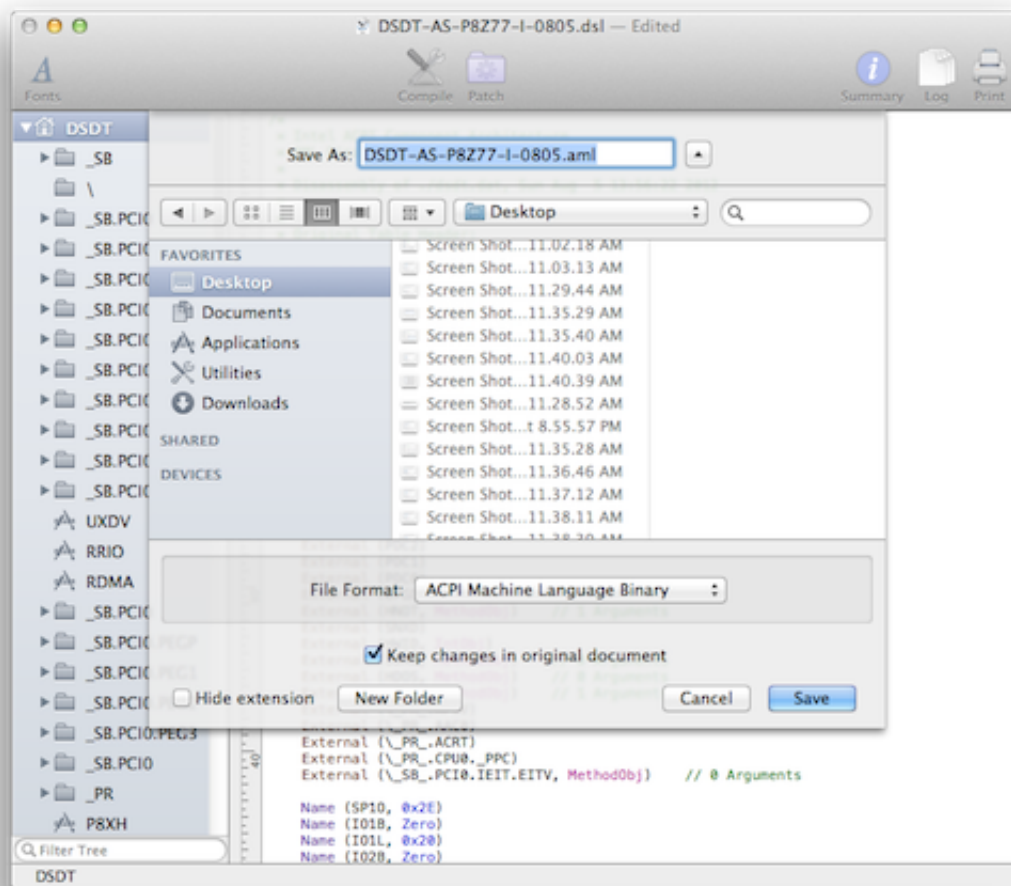
20. If no errors, jump to **IV. Save dsdt.aml - MaciASL**

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

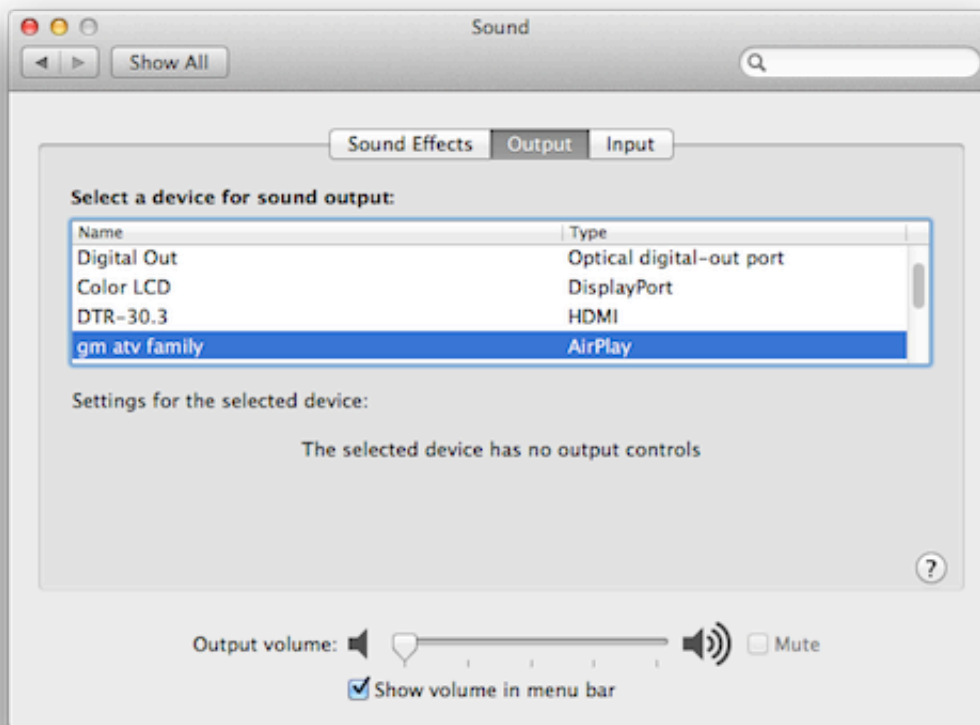
23. Repair permissions and cache (Ex., Disk Utility, Kext Beast, Kext Utility, Kext Wizard, etc.)

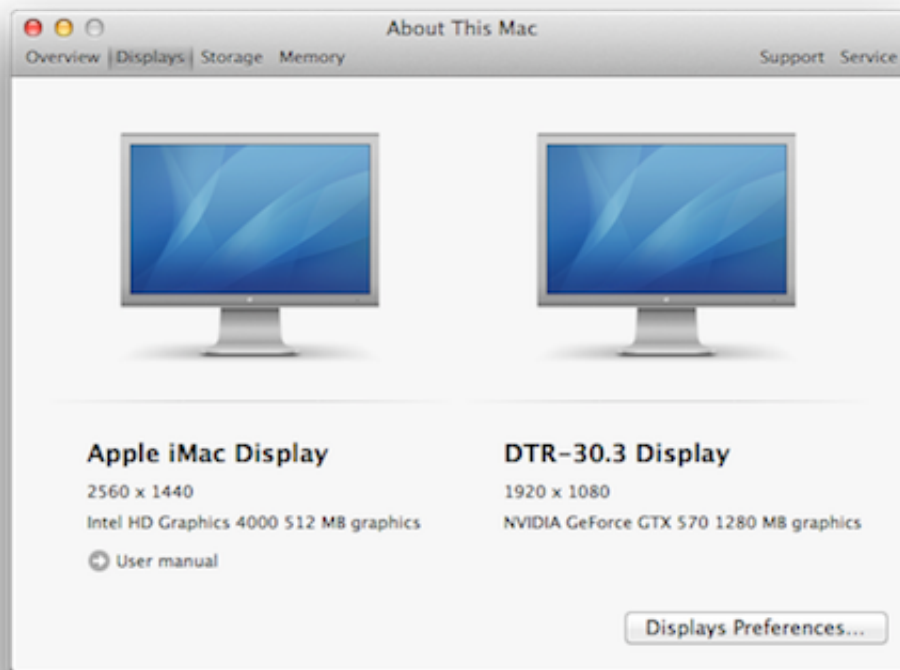
24. Restart

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

https://github.com/toleda/audio_hdmi_hd3000

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