

[Guide]\_HD5x0-hdmi\_audio\_(clover\_or\_ssdt)\_v1.1



## HD5x0 HDMI Audio

**Skylake/100 Series/Socket 1151: Desktop/Laptop/NUC/BRIX**

**v1.1: 4/22/2016 - HD530 Update**

v1: 4/10/2016 - Initial release

OS X HDMI audio for HD5x0 systems with either: 1. Clover enabled HDMI audio or 2. HDMI audio ssdt (any bootloader). Laptops, use NUC-BRIX Clover/ssdts.

### Requirements

1. OS X 10.11.4 and newer
2. AMI UEFI/Skylake/100 Series/Socket 1151 Intel motherboard
3. HD5x0 graphics, recognized and enabled
4. 100 Series Desktop/Laptop/NUC/BRIX configurations supported
5. 100 Series motherboard audio codecs
  - a. Supported: ALC283, ALC887, ALC892 and ALC1150
  - b. Unsupported audio codec/HDMI audio only
6. Audio ID: 3 only
  - a. 3 - HD5x0/HD4000/HD300 HDMI audio
    - 3, 5, 6 port motherboard audio (-A3)
    - Orange port removed (no 5.1 analog)
    - Supports 1x HDMI or DP device

## 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. Make a bootable backup of your system (CarbonCopyCloner/SuperDuper)

## Tools

1. [IORegistryExplorer\\_v2.1.zip](#) (View Raw)
2. [DPCIManager](#)
3. [MaciASL](#)
4. [Xcode on the Mac App Store](#)

## OS X/HD5x0 HDMI Graphics and Audio

1. HD5500 (no native HDMI audio support, framebuffer edits required)
  - a. HDMI display (SKL framebuffer 0x00001219 or 0x0002619)
    - i. AppleIntelFramebuffer@0, Port 0x5/DP
    - ii. AppleIntelFramebuffer@1, Port 0x6/DP
    - iii. AppleIntelFramebuffer@2, Port 0x7/DP (0x00002619 N/A)
  - b. DP audio supported
  - c. DVI audio supported
  - d. Three displays supported, one with HDMI audio
    - i. DP
    - ii. DVI (w/DVI2HDMI adapter)
    - iii. HDMI
2. Supported Configurations (OS X HDMI Audio)
  - a. HD5x0 only
  - b. Nvidia only
  - c. AMD only
  - d. HD5x0 and Nvidia
  - e. HD5x0 and AMD

## HD5x0 HDMI Audio Installation

### Step 1: HD5x0 HDMI Audio kext edits (see Step 2/Clover)

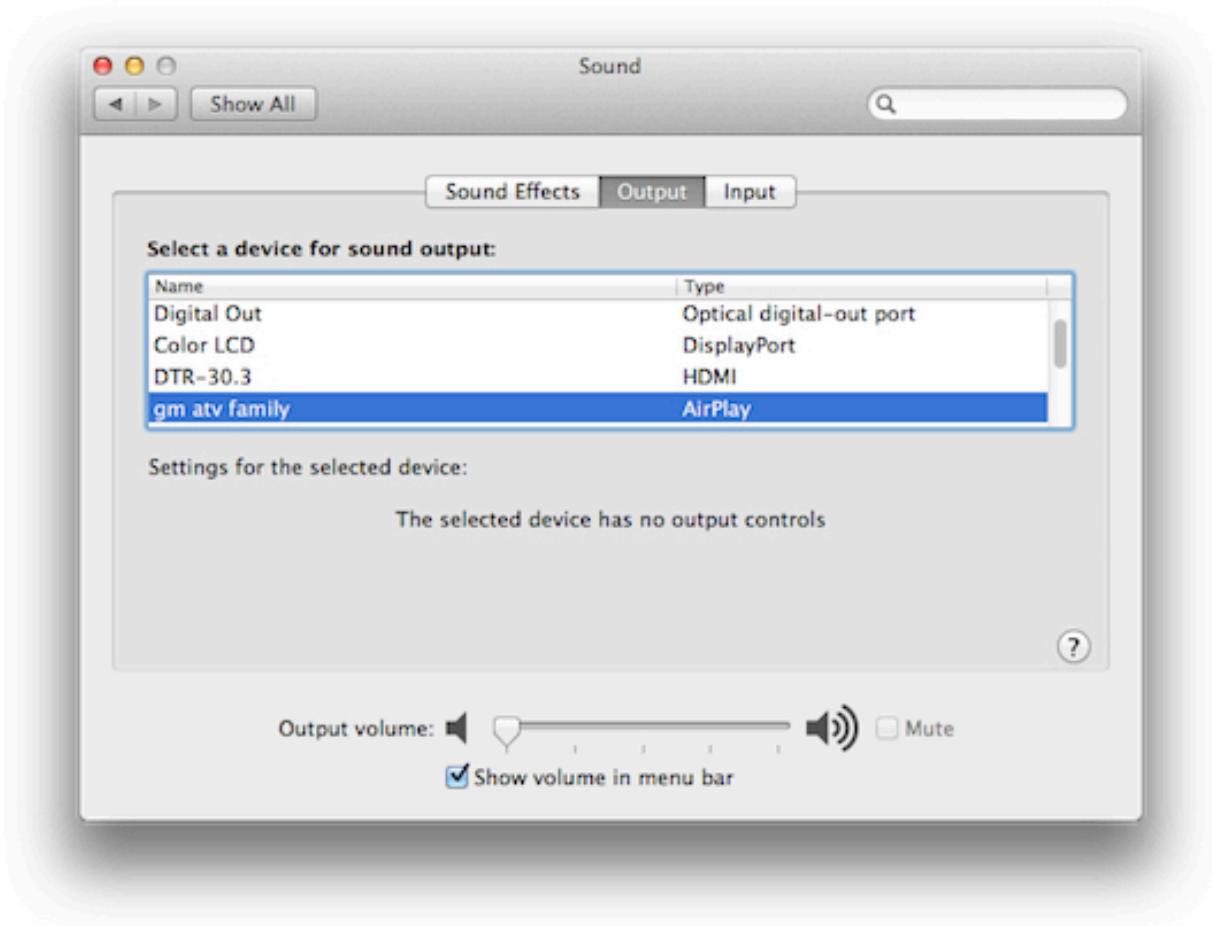
1. AppleIntelSKLGraphicsFramebuffer.kext (select one)
  - a. HD530 Only (copy and paste to config.plist)
    - i. [config-hdmi\\_hd5x0-110.plist](#) (config.plist/  
KernelAndKextPatches/KextsToPatch)
      - 10.11.4+-SKL-1912000-4\_displays

### Step 2: OS X HDMI Audio Guides- select Clover or ssdt

1. Clover:
  - a. config-hdmi\_hd5x0-110.plist
    - i. Use Xcode, plist editor, etc.
    - ii. Copy and paste each patch
  - b. All Skylake: config.plist/
    - i. ACPI/DSDT/Patches
      - 10.8+-Rename-GFX02IGPU
      - 10.11+-Rename-HDAS2HDEF
      - 10.11+-Rename-HECI2IMEI
    - ii. Device/Arbitrary/
      - 10.8+-Intel-IGPU-HDMI-HDA
  - c. HD530/Desktop: config.plist
    - i. Device/Arbitrary/
      - 10.11.4+-Intel-HDA-Desktop
    - ii. Graphics/
      - ig-platform-id/19120000 (remove " # HD530")
    - iii. KernelAndKextPatches/KextsToPatch
      - 10.11.4+-SKL-1912000-4\_displays
      - If no motherboard DP connector, add one HDMI port patch
        - 10.11.4-SKL-1912000-Port\_0x5-DP2HDM
        - 10.11.4-SKL-1912000-Port\_0x6-DP2HDM
        - 10.11.4-SKL-1912000-Port\_0x7-DP2HDM
  - d. HD540/NUC: config.plist
    - i. Device/Arbitrary/
      - 10.11.4+-Intel-HDA-NUC
    - ii. Graphics/
      - ig-platform-id/19260000 (remove " # HD540")

2. ssdt: [\[Guide\]-OSX-hdmi\\_audio-hdef\\_audio-ssdt\\_v3.pdf.zip](#)
  - a. ssdt\_v3: [ssdt\\_hdmi\\_hd5x0](#)
    - i. ssdt\_hdmi-hd530
    - ii. ssdt\_hdmi-hd540
  - b. ssdt - [ssdt\\_hdef](#) (onboard audio, if needed)
    - i. ssdt\_hdef-3-100-hdas
3. dsdt edits: not available
4. Restart with HDMI device connected

**Step 3: Verify HDMI Audio** (Ex., HDMI/DP/AirPlay audio enabled)



### **kext edit** (ex.,HD530)

1. AppleIntelSKLGraphicsFramebuffer.kext
  - a. HD530 Only
    - i. Hex Editor
      - binary: AppleIntelSKLGraphicsFramebuffer
      - find: 01030303
      - repl: 01030403
      - cmt: 10.11.4+-SKL-1912000-4\_displays
    - ii. Hex Editor (ex., connector edit)
      - binary: AppleIntelSKLGraphicsFramebuffer
      - find: 01050900 00040000 87010000
      - repl: 01050900 00080000 87010000
      - cmt: 10.11.4-SKL-1912000-Port\_0x5-DP2HDM

### **ssdt edit** (ex.,HD530)

1. Name (GFX0.\_STA, Zero)  
Device (IGPU)  
{  
    Name (\_ADR, 0x00020000)  
    Method (\_INI, 0, NotSerialized)  
    {  
        Store (Zero, \\_SB.PCI0.GFX0.\_ADR)  
    }  
  
    Method (\_DSM, 4, NotSerialized)  
    {  
        If (LEqual (Arg2, Zero))  
        {  
            Return (Buffer (One)  
            {  
                0x03  
            }))  
        }  
  
        Return (Package (0x04)  
        {  
            "AAPL,ig-platform-id",  
            Buffer (0x04)  
            {  
                0x00, 0x00, 0x12, 0x19  
            }  
        })  
    }

```

        },
        "hda-gfx",
        Buffer (0x0A)
        {
            "onboard-1"
        }
    })
}
}

```

2. Name (HECI.\_STA, Zero)  
 Name (HECI.\_STA, Zero)  
 Device (IMEI)  
 {  
     Name (\_ADR, 0x00160000)  
     Method (\_INI, 0, NotSerialized)  
     {  
         Store (Zero, \\_SB.PCI0.HECI.\_ADR)  
     }  
  
     Method (\_DSM, 4, NotSerialized)  
     {  
         If (LEqual (Arg2, Zero))  
         {  
             Return (Buffer (One)  
             {  
                 0x03  
             })  
         }  
  
         Return (Package (0x02)  
         {  
             "device-id",  
             Buffer (0x04)  
             {  
                 0x3A, 0xA1, 0x00, 0x00  
             }  
         })  
     }

```
}
```

3. Name (HDAS.\_STA, Zero)

Device (HDEF)

```
{
```

```
    Name (_ADR, 0x001F0003)
```

```
    Method (_INI, 0, NotSerialized)
```

```
    {
```

```
        Store (Zero, \_SB.PCI0.HDAS._ADR)
```

```
    }
```

```
    Method (_DSM, 4, NotSerialized)
```

```
    {
```

```
        If (LEqual (Arg2, Zero))
```

```
        {
```

```
            Return (Buffer (One)
```

```
            {
```

```
                0x03
```

```
            })
```

```
        }
```

```
        Return (Package (0x06)
```

```
        {
```

```
            "hda-gfx",
```

```
            Buffer (0x0A)
```

```
            {
```

```
                "onboard-1"
```

```
            },
```

```
            "layout-id",
```

```
            Unicode ("\x03"),
```

```
            "PinConfigurations",
```

```
            Buffer (Zero) {}
```

```
        })
```

```
    }
```

```
}
```

## Troubleshooting

1. Verify HDMI device connected
  - a. System Information/Graphics/Display/HDMI device/Television/Yes
2. Run IOReg/IOJones/Verify Devices HDEF, IGPU (native/GFX0) and HDAU
  - a. Ex. IOReg/Search: HDEF
  - b. Select HDEF
  - c. Cancel Search (x)
  - d. Scroll up to view HDEF device and properties
3. IOReg/IOJones/Verify HDEF@1B
  - a. If Credits, delete S/L/E/HDAEnabler1.kext or HDAEnabler2.kext
  - b. Verify layout-id = 3
  - c. Verify hda-gfx = <onboard-1>
  - d.

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:** IOPCIDevice : IOService : IORegistryEntry : OSObject

**Bundle:** com.apple.iokit.IOPCIFamily

**Properties:**

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

**Property List:**

Property	Type	Value
Credits	String	2008 (c) Kabyl/Taruga
subsystem-vendor-id	Data	<58 14 00 00>
IOPCIMSIMode	Boolean	True
IOInterruptControllers	Array	2 values
name	Data	<"pci8086,1e20">
vendor-id	Data	<05 00 00 00>
IOPCIResourced	Boolean	True
acpi-pmcap-offset	Number	0x50
IOPCIExpressASPMDefault	Number	0x0
device-id	Data	<20 1e 00 00>
compatible	Data	<"pci1458,a002", "pci8086,1e20", "pciclass,040300", "HDEF">
layout-id	Data	<02 00 00 00>
IOPCIExpressLinkCapabilities	Number	0x0
acpi-path	String	IOACPIPlane:/_SB/PCI0@0/HDEF@1b0000
subsystem-id	Data	<02 a0 00 00>
revision-id	Data	<04 00 00 00>

The left pane shows the device hierarchy:

- HDEF@1B
  - AppleHDAController@1B
    - IOHDACodecDevice@1B,2
      - IOHDACodecDriver
        - IOHDACodecFunction@1B,2,1
          - AppleHDACodecGeneric
            - AppleHDADriver
              - AppleHDAEngineInput@...
                - AppleHDAStream
                - IOAudioEngineUserCl...
                - IOAudioEngineUserCl...
                - IOAudioEngineUserCl...
                - IOAudioEngineUserCl...
                - IOAudioEngineUserCl...
                - IOAudioLevelControl
                  - IOAudioControlUs...
                - IOAudioLevelControl
                  - IOAudioControlUs...
                - IOAudioSelectorControl
                  - IOAudioControlUs...
                - IOAudioToggleControl
                  - IOAudioControlUs...
                  - IOAudioControlUs...
                  - IOAudioControlUs...



4. IOREG/IOJones/Verify IGPU@2 (or GFX0@2)
  - a. If no IGPU@2 verify HD5x0 HDMI audio ssdt
  - b. Verify hda-gfx = <onboard-1>
  - c. If no AppleIntelSKLController, verify HD5x0 HDMI audio ssdt
  - d. Verify HD530/AAPL,ig-platform-id=<00 00 12 19> OR
  - e. Verify HD540/AAPL,ig-platform-id=<00 00 26 19>
  - f.

The screenshot shows the IORegistryExplorer application with the path `IOService:/AppleACPIPlatformExpert/PCI0@0/AppleACPIPCI/IGPU@2` selected. The device is identified as `IGPU@2` with class `IOPCIDevice : IOService : IORegistryEntry : OSObject` and bundle `com.apple.iokit.IOPCIFamily`. It is registered, matched, and active, with a retain count of 17 and a busy count of 0.

| Property                            | Type    | Value  |
|-------------------------------------|---------|--|
| <code>IOPCIMSI</code>               | Boolean | True   |
| <code>IOInterruptControllers</code> | Array   | 2 values   |
| <code>hda-gfx</code>                | Data    | <"onboard-1">  |
| <code>name</code>                   | Data    | <"display">  |
| <code>vendor-id</code>              | Data    | <86 80 00 00>  |
| <code>IOPCIResourced</code>         | Boolean | True   |
| <code>device-id</code>              | Data    | <12 84 00 00>  |
| <code>graphic-options</code>        | Data    | <0c 00 00 00>  |
| <code>compatible</code>             | Data    | <"pci1043,8534<br>"pci8086,412",<br>"class,030000",<br>GPU"> |
| <code>AAPL,iokit-ndrv</code>        | Data    | <f0 0c 1c 81<br>7f ff ff ff>                                 |
| <code>acpi-path</code>              | String  | IOACPIPlane:/_SI<br>PCI0@0/<br>IGPU@20000                    |
| <code>model</code>                  | Data    | <"Intel Iris Pro">   |
| <code>AAPL,gray-value</code>        | Data    | <00 00 00 00>  |
| <code>IOPCIPMCState</code>          | Number  | 0x0  |
| <code>AAPL,ig-platform-id</code>    | Data    | <03 00 22 0d>  |

- d.



## Problem Reporting

1. Problem Reporting/Post to:
2. Problem Reporting/Attached requested files

## Credit

RehabMan

bcc9, Post #11 <http://www.insanelymac.com/forum/top...ort/?p=1934889>