

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



## HD5x0 HDMI Audio

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

**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

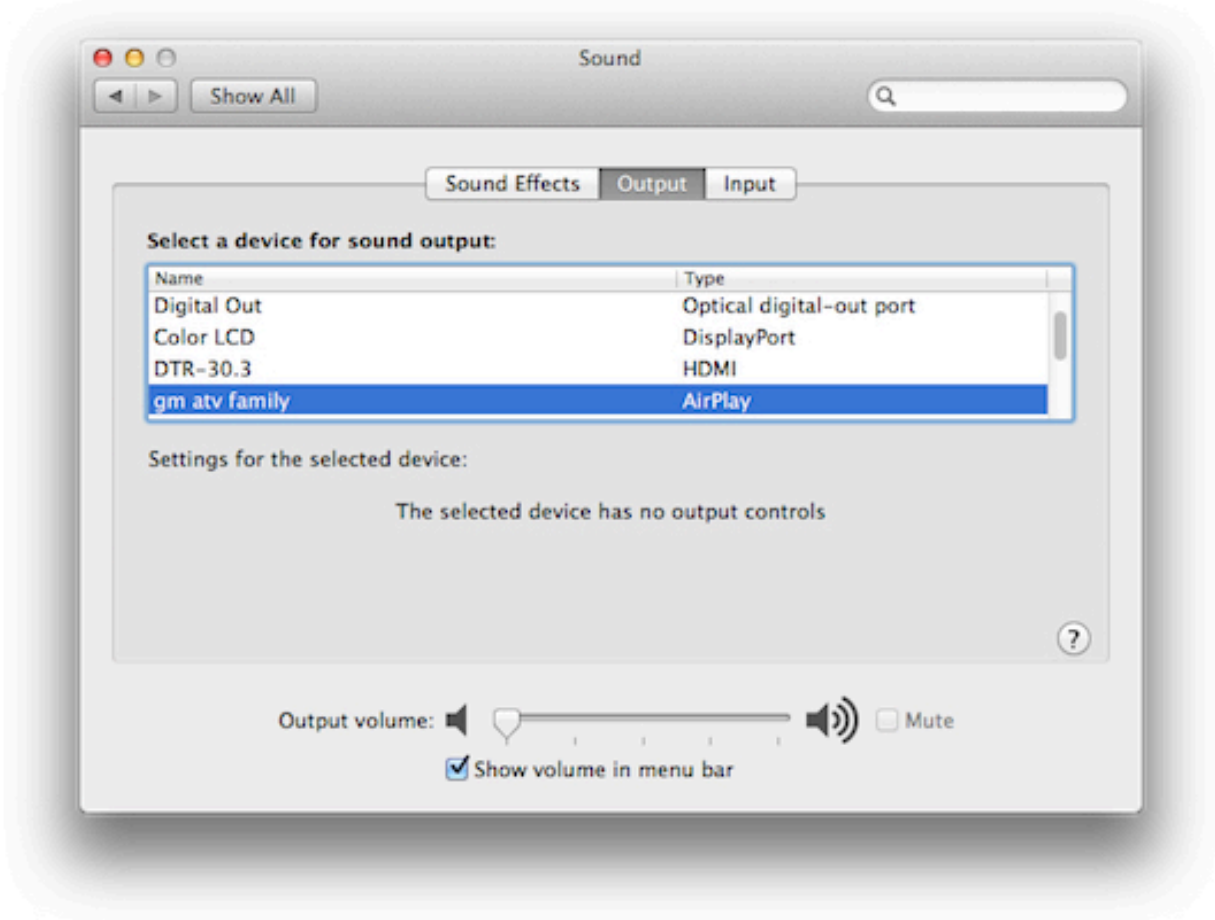
### Step 1: HD5x0 HDMI Audio kext edits (see Step 2/Clover)

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
  - 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

### **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 IOREg utility window. The search bar at the top contains "HDEF@1B". The left pane displays a tree view of the device hierarchy under "HDEF@1B". The right pane shows the properties of the selected device.

**HDEF@1B**

Class: IOPCIDevice : IOService : IORegistryEntry : OSObject  
 Bundle: com.apple.iokit.IOPCIFamily

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

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	<86 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>



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. The top bar displays 'IOService' and a search field. The address bar shows the path: 'IOService:/AppleACPIPlatformExpert/PCI0@0/AppleACPIPCI/IGPU@2'. The main window is titled 'IGPU@2' and shows the class 'IOPCIDevice : IOService : IORegistryEntry : OSObject' with status 'Registered', 'Matched', and 'Active'. The bundle is 'com.apple.iokit.IOPCIFamily'. The left pane shows a tree view of the device's children, including 'AppleIntelAzulController', 'AppleMEClientController', 'IntelFBClientControl', 'AppleIntelFramebuffer@0', 'AGPM', 'AppleMCCSControlModule', 'AppleMCCSParameterHandler', 'AppleUpstreamUserClientDriver', 'display0', 'AppleDisplay', 'IOFramebufferI2CInterface', 'IOFramebufferSharedUserClient', 'IOFramebufferUserClient', 'AppleIntelFramebuffer@1', 'AppleMCCSControlModule', 'AppleMCCSParameterHandler', 'AppleUpstreamUserClientDriver', 'IOFramebufferI2CInterface', 'IOFramebufferUserClient', 'AppleIntelFramebuffer@2', 'AppleMCCSControlModule', 'AppleMCCSParameterHandler', and 'AppleUpstreamUserClientDriver'. The right pane shows the properties of the selected device, 'IGPU@2'.

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

- 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>