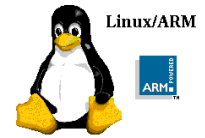


Audio & Webcam Installation Guide for EM2440-III



By Group ArmTalk

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This document guides the user through:

1. Getting the Audio Installed
2. Getting the Microphone Installed
3. Getting the Webcam Installed

Formatting:

1. Commands starting with `>` are Linux console commands:
`> echo "Hello world!"`
2. Commands starting with `uboot>` are U-Boot console commands:
`uboot> printenv`
3. Almost all commands are case sensitive in Linux and U-Boot.

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Audio Driver Setup

1. Install Driver

1.1 Configure the kernel's makefile using its configuration menu:

1. use menuconfig to enable the driver

- Launch the menuconfig tools

> make menuconfig

```
[matthew@matthew-ubuntu]~/private/linux-2.6.30.4  
>make menuconfig
```

- Go to

-> "Device Driver"

```
.config - Linux Kernel v2.6.30.4 Configuration  
  
Linux Kernel Configuration  
Arrow keys navigate the menu. <Enter> selects submenus  
--->. Highlighted letters are hotkeys. Pressing <Y>  
includes, <N> excludes, <M> modularizes features. Press  
<Esc><Esc> to exit, <?> for Help, </> for Search. Legend:  
  
  General setup --->  
[*] Enable loadable module support --->  
-* Enable the block layer --->  
  System Type --->  
  Bus support --->  
  Kernel Features --->  
  Boot options --->  
  CPU Power Management --->  
  Floating point emulation --->  
  Userspace binary formats --->  
  Power management options --->  
[*] Networking support --->  
  Device Drivers --->  
    File systems --->  
    Kernel hacking --->  
    Security options --->  
  {*} Cryptographic API --->  
    Library routines --->  
  ---  
  Load an Alternate Configuration File  
  Save an Alternate Configuration File  
  
<Select>  < Exit >  < Help >
```

-> "Sound Card Support"

```
.config - Linux Kernel v2.6.30.4 Configuration

Device Drivers
Arrow keys navigate the menu. <Enter> selects submenus
--->. Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press
<Esc><Esc> to exit, <?> for Help, </> for Search. Legend:
^(-)
< > Power supply class support --->
< > Hardware Monitoring support --->
< > Generic Thermal sysfs driver --->
[*] Watchdog Timer Support --->
    Sonics Silicon Backplane --->
    Multifunction device drivers --->
    Multimedia devices --->
    Graphics support --->
[*] Sound card support --->
[*] HID Devices --->
[*] USB support --->
<*> MMC/SD/SDIO card support --->
< > Sony MemoryStick card support (EXPERIMENTAL) --->
[ ] Accessibility support --->
[ ] LED Support --->
<*> Real Time Clock --->
[ ] DMA Engine support --->
[ ] Auxiliary Display support --->
[ ] Voltage and Current Regulator Support --->
< > Userspace I/O drivers --->
[ ] Staging drivers --->

<Select> < Exit > < Help >
```

-> "Advanced Linux Sound Architecture"

```
.config - Linux Kernel v2.6.30.4 Configuration

                          Sound card support
Arrow keys navigate the menu. <Enter> selects submenus --->.
Highlighted letters are hotkeys. Pressing <Y> includes, <N>
excludes, <M> modularizes features. Press <Esc><Esc> to exit,
<?> for Help, </> for Search. Legend: [*] built-in [ ]

-- Sound card support
<*>  Advanced Linux Sound Architecture --->
< >  Open Sound System (DEPRECATED) --->

<Select>  < Exit >  < Help >
```

-> "ALSA for SoC audio support"

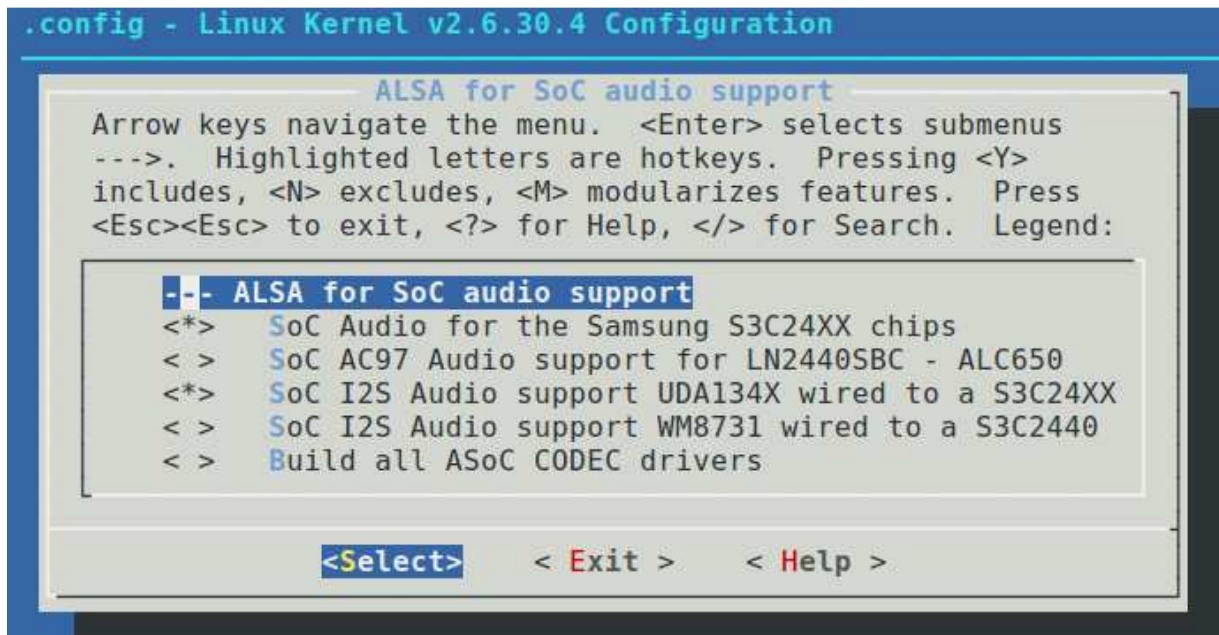
```
.config - Linux Kernel v2.6.30.4 Configuration

                          Advanced Linux Sound Architecture
Arrow keys navigate the menu. <Enter> selects submenus --->.
Highlighted letters are hotkeys. Pressing <Y> includes, <N>
excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?>
for Help, </> for Search. Legend: [*] built-in [ ] excluded

-- Advanced Linux Sound Architecture
< >  Sequencer support
<*>  OSS Mixer API
<*>  OSS PCM (digital audio) API
[ ]   OSS PCM (digital audio) API - Include plugin system
[ ]   Dynamic device file minor numbers
[ ]   Support old ALSA API
[*]   Verbose procfs contents
[ ]   Verbose printk
[ ]   Debug
[ ]   Generic sound devices --->
[ ]   ARM sound devices --->
[ ]   USB sound devices --->
<*>  ALSA for SoC audio support --->

<Select>  < Exit >  < Help >
```

- Enable the "Soc Audio for the Samsung S3C24XX chips"
and "SoC I2S Audio support Wm8731 wired to a S3C2440"



- Press the right arrow key to exit button and exit menuconfig. Make sure you have the file.

2. build zImage
 - > make zImage
3. copy zImage to the share directory
 - > cp \$HOME/cmpt433/private/Linux-2.6.30.4/arch/arm/boot/zImage \$HOME/cmpt433/public/
4. on the Target, enter uboot, and download the zImage
 - uboot> tftpboot 0x30008000 \${TFTP_ROOT}/zImage
 - uboot> nand erase kernel; nand write.jffs2 0x30008000 kernel \${filesize}

2. Testing the Audio Driver

2.1 Testing the speaker

0. plugin speaker to the speaker port (labelled with green)
1. on the Target make sure dsp exist
 - > ls /dev/dsp
2. Launch madplay to play audio (Step 1 must be done before this step)
 - > madplay test.mp3

2.2 Testing the Microphone Driver

0. Plug in microphone to the mic port (labelled with red)

1. cat the microphone driver

```
> cat /dev/dsp
```

2. talk to the microphone, and now, you should be able to hear yourself from the speaker

Webcam Setup

1. Install Driver

1.1 Configure the kernel's makefile using its configuration menu:

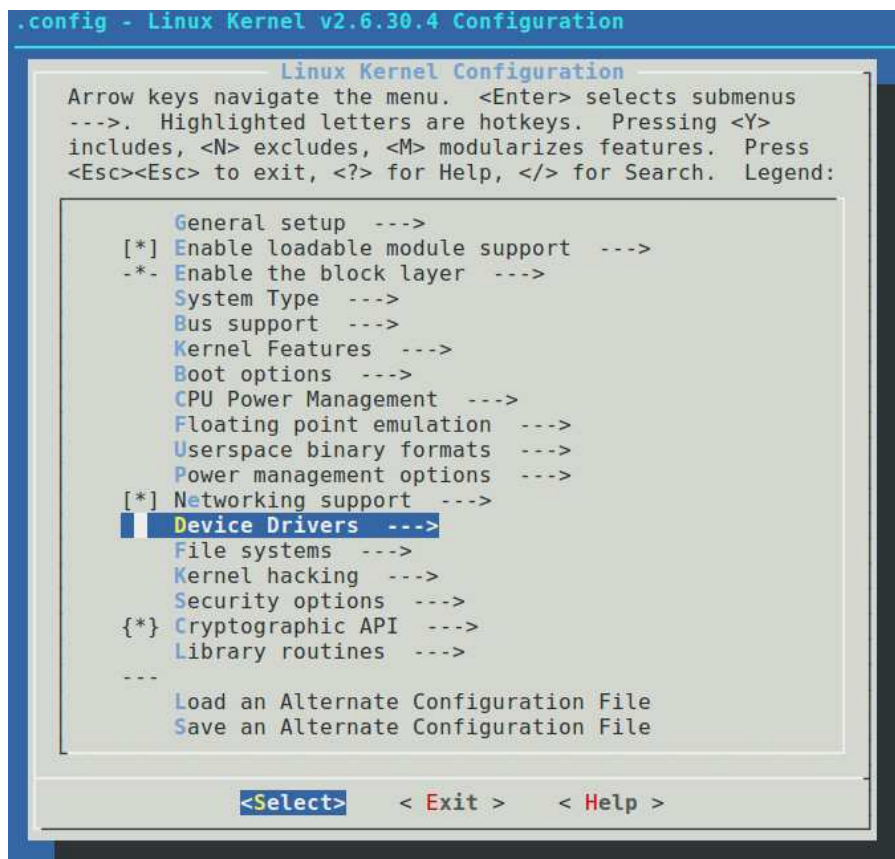
1. use menuconfig to enable the driver

- Launch the menuconfig tools

```
> make menuconfig
```

- Go to

-> "Device Driver"



```
.config - Linux Kernel v2.6.30.4 Configuration

Linux Kernel Configuration
Arrow keys navigate the menu. <Enter> selects submenus
--->. Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press
<Esc><Esc> to exit, <?> for Help, </> for Search. Legend:

  General setup --->
  [*] Enable loadable module support --->
  -*. Enable the block layer --->
  System Type --->
  Bus support --->
  Kernel Features --->
  Boot options --->
  CPU Power Management --->
  Floating point emulation --->
  Userspace binary formats --->
  Power management options --->
  [*] Networking support --->
  Device Drivers --->
  File systems --->
  Kernel hacking --->
  Security options --->
  {*} Cryptographic API --->
  Library routines --->
  ---
  Load an Alternate Configuration File
  Save an Alternate Configuration File

  <Select> < Exit > < Help >
```

->"Multimedia Devices"

```
.config - Linux Kernel v2.6.30.4 Configuration

Device Drivers
Arrow keys navigate the menu. <Enter> selects submenus --->.
Highlighted letters are hotkeys. Pressing <Y> includes, <N> excludes,
<M> modularizes features. Press <Esc><Esc> to exit, <?> for Help, </>
for Search. Legend: [*] built-in [ ] excluded <M> module <> module
^(-)
< > Hardware Monitoring support --->
< > Generic Thermal sysfs driver --->
[*] Watchdog Timer Support --->
    Sonics Silicon Backplane --->
    Multifunction device drivers --->
[*] Multimedia devices --->
    Graphics support --->
    <*> Sound card support --->
    [*] HID Devices --->
    [*] USB support --->
    <*> MMC/SD/SDIO card support --->
    < > Sony MemoryStick card support (EXPERIMENTAL) --->
    [ ] Accessibility support --->
    [ ] LED Support --->
    <*> Real Time Clock --->
    [ ] DMA Engine support --->
v(+)

<Select> < Exit > < Help >
```

Enable "video For Linux" and "Enable Video For Linux API 1"

Go to

-> "Video capture adapters"

```
.config - Linux Kernel v2.6.30.4 Configuration

Multimedia devices
Arrow keys navigate the menu. <Enter> selects submenus --->.
Highlighted letters are hotkeys. Pressing <Y> includes, <N> excludes,
<M> modularizes features. Press <Esc><Esc> to exit, <?> for Help, </>
for Search. Legend: [*] built-in [ ] excluded <M> module <>
*** Multimedia core support ***
<*> Video For Linux
[*] Enable Video For Linux API 1 (DEPRECATED)
< > DVB for Linux
    *** Multimedia drivers ***
    [ ] Load and attach frontend and tuner driver modules as needed
    [ ] Customize analog and hybrid tuner modules to build --->
[*] Video capture adapters --->
    [*] Radio Adapters --->
    [ ] DAB adapters

<Select> < Exit > < Help >
```

Enable "AutoSelect Pertinent encoders/decoders and other helper chips"

Go to

-> "V4L USB devices"

```
.config - Linux Kernel v2.6.30.4 Configuration

Video capture adapters
Arrow keys navigate the menu. <Enter> selects submenus --->.
Highlighted letters are hotkeys. Pressing <Y> includes, <N>
excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?>
for Help, </> for Search. Legend: [*] built-in [ ] excluded

--- Video capture adapters
[ ] Enable advanced debug functionality
[*] Enable old-style fixed minor ranges for video devices
[*] Autoselect pertinent encoders/decoders and other helper
< > Virtual Video Driver
< > CPiA Video For Linux
< > CPiA2 Video For Linux
< > SAA5246A, SAA5281 Teletext processor
< > SAA5249 Teletext processor
<M> SoC camera support
<M>   mt9m001 support
<M>   mt9m111 and mt9m112 support
<M>   mt9t031 support
<M>   mt9v022 support
<M>   tw9910 support
< >   platform camera support
< >   ov772x camera support
< > SuperH Mobile CEU Interface driver
<M> OV9650 Drivers for EmbedSky SKY2440/TQ2440 Board
[*] V4L USB devices --->

<Select> < Exit > < Help >
```

Enable "UVC input events device support"

note: match the driver for your webcam and the list, enable the one matches

```
.config - Linux Kernel v2.6.30.4 Configuration
                                     V4L USB devices
Arrow keys navigate the menu. <Enter> selects submenus --->.
Highlighted letters are hotkeys. Pressing <Y> includes, <N>
excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?>
for Help, </> for Search. Legend: [*] built-in [ ] excluded

-- V4L USB devices
< > USB Video Class (UVC)
[*]   UVC input events device support
<M>  GSPCA based webcams --->
< >  Hauppauge WinTV-PVR USB2 support
< >  Hauppauge HD PVR support
< >  Empia EM28xx USB video capture support
< >  Conexant cx231xx USB video capture support
< >  USB video devices based on Nogatech NT1003/1004/1005
< >  USB 3com HomeConnect (aka vicam) support (EXPERIMENTAL)
< >  USB IBM (Xirlink) C-it Camera support
< >  USB Konica Webcam support
< >  USB Logitech Quickcam Messenger
< >  USB ET61X[12]51 PC Camera Controller support
< >  OmniVision Camera Chip support
< >  USB OV511 Camera support
< >  USB SE401 Camera support
< >  USB SN9C1xx PC Camera Controller support
< >  USB STV680 (Pencam) Camera support
< >  USB ZC0301[P] Image Processor and Control Chip support
< >  USB Philips Cameras
v(+)

<Select> < Exit > < Help >
```

- Press the right arrow key to exit button and exit menuconfig. Make sure you have the file.

2. build zImage

> make zImage

3. copy zImage to the share directory

> cp \$HOME/cmpt433/private/Linux-2.6.30.4/arch/arm/boot/zImage \$HOME/cmpt433/public/

4. on the Target, enter uboot, and download the zImage

uboot> tftpboot 0x30008000 \${TFTP_ROOT}/zImage

uboot> nand erase kernel; nand write.jffs2 0x30008000 kernel \${filesize}

2. Testing the Webcam

2.1 Find the webcam driver in the target

0. plugin Webcam to the USB port

note: make sure plug in the bottom of the USB port, the top USB is typeA and Bottom of the USB is type hostUSB, the Webcam only works in the hostUSB

1. on the Target make sure video1 exist

> ls /dev/video1

note: if video1 does not exist, the webcam driver you installed is not correct, repeat step 1 to find the correct webcam driver

2.2 Testing the webcam driver in the target

0. find the ipaddress of the target

> ifconfig

1. on the target: Launch uvc stream to test the camera capture

> uvc_stream -d /dev/video1

note: now the LED on the webcam is should turn on, indicates the webcam is recording

2. on the host: launch firefox go to:

<IPADDRESS>:8080

note: replace <IPADDRESS> with your target's IP address

- and now you should able to stream video though the web from the webcam that plug in to the target