Kernel Driver Building – CA378-AOIS v1.1.5 for Jetpack3.2.1 (L4T28.2)

Hardware: Jetson TX2
OS: Ubuntu 16.04 LTS – JetPack 3.2.1 (L4T 28.2)
CSI Hardware: CenturyArks CA378-AOIS (Sony IMX378)

Notes

This instruction is for building kernel directly on a running Jetson board.
$DEVDIR is the path where you download the kernel
$ ... is the user command prompt
# ... is the super user command prompt (sudo)
References

- http://www.jetsonhacks.com/2017/03/25/build-kernel-and-modules-nvidia-jetson-tx2/
- https://elinux.org/Jetson/TX2_DTB

Prepare kernel source

Download the attached file to home directory on JetsonTX2 and run the following command.

```
$ tar zxvf CA378_2L_v1.1.5_L4T28.2_src_build.tar.gz
$ cd CA378_2L_v1.1.5_L4T28.2_src_build
$ ./PrepareKernelSources.sh
```

Install new Linux kernel

Install kernel modules

```
$ ./BuildKernelSources.sh
```

Please enter the number of connected cameras.

```
What is the number of camera connections? : 6
```

Please enter the number of framerate.

```
What is the number of framerate for 4056x3040 ? (30/24/20/15/12/10/6/5) : 30
What is the number of framerate for 3840x2160 ? (30/24/20/15/12/10) : 30
What is the number of framerate for 1920x1080 ? (120/96/80/60/48/40/30) : 60
What is the number of framerate for 640x480 ? (512/500/480/400/350/300/240/200/150/120/60) : 200
```

Flash new Device Tree Binary (DTB)

Copy compiled dtb file to the host computer

```
$ cd ~/JetPack/3.2/64_TX2/Linux_for_Tegra/
$ sudo sshpass -p 'nvidia' scp -o StrictHostKeyChecking=no nvidia@192.168.xxx.xxx:/boot/*.dtb ./kernel/dtb/
# nvidia@192.168.xxx.xxx is IP address on JetsonTX2.
$ cp ./kernel/dtb/tegra186-quill-p3310-1000-c03-00-imx378.dtb ./kernel/dtb/tegra186-quill-p3310-1000-c03-00-base.dtb
```

Put the board into force USB Recovery Mode:

1. Power down the device. If connected, remove the AC adapter from the device. The device must be powered OFF, and not in a suspend or sleep state.
2. Connect the Micro-B plug on the USB cable to the Recovery (USB Micro-B) Port on the device and the other end to an available USB port on the host PC.
3. Connect the power adapter to the device.
4. Press POWER button
5. Press and hold the RECOVERY FORCE (REC) button.
6. While pressing the RECOVERY FORCE button, press and release the RESET button.
7. Wait 2 seconds and release the RECOVERY FORCE button

Flash dtb partition

Replace this original DTB with your own build DTB

```
JetPack/3.2/64_TX2/Linux_for_Tegra/kernel/dtb/tegra186-quill-p3 310-1000-c03-00-base.dtb
```

Flash

```
$ sudo ./flash.sh -r -k kernel-dtb jetson-tx2 mmcblk0p1
```

Multi-came movie recording

Multi-camera capture (yuv)

```
$ tar zxvf demo_v1.1.5_tx2.tar.gz
$ cd ~/demo/script/
$ ./multi_yuv_capture.sh
```

* Depending on the frame rate capture may fail.
In that case please execute the following command and restart the camera.

```
$ ./camera_restart.sh
```

Multi-camera viewer (yuv)

```
$ sudo apt-get install libgstreamer1.0-0 gstreamer1.0-plugins-base gstreamer1.0-plugins-good gstreamer1.0-plugins-bad gstreamer1.0-plugins-ugly gstreamer1.0-libav gstreamer1.0-doc gstreamer1.0-tools
$ cd ~/demo/script/
$ ./multi_yuv_viewer.sh
```

Multi-camera RAW capture

```
$ sudo apt-get install v4l-utils
$ cd ~/demo/script/
$ ./multi_raw_capture.sh
```

Install OpenCV 3.4.1

Build and Install OpenCV

```
$ cd ~/CA378_2L_v1.1.5_L4T28.2.1_src_build
$ ./InstallOpenCV.sh
```