

Day 5-1

Assignment:

- HW 05, Due
Tuesday

Today's Topics:

- Booting

05-1 Booting

What's in the Beagle?

- Software
- What happens when the Beagle boots Linux?

```
U-Boot SPL 2016.03-00001-g9a81f4a (May 27 2016 - 12:25:00)
```

```
Trying to boot from MMC
```

```
bad magic
```

```
U-Boot 2016.03-00001-g9a81f4a (May 27 2016 - 12:25:00 -0500), Build: jenkins-github_Bootloader-Builder-394
```

```
    Watchdog enabled
```

```
I2C:   ready
```

```
DRAM:  512 MiB
```

```
Reset Source: Global warm SW reset has occurred.
```

```
Reset Source: Power-on reset has occurred.
```

```
MMC:   OMAP SD/MMC: 0, OMAP SD/MMC: 1
```

```
Using default environment
```

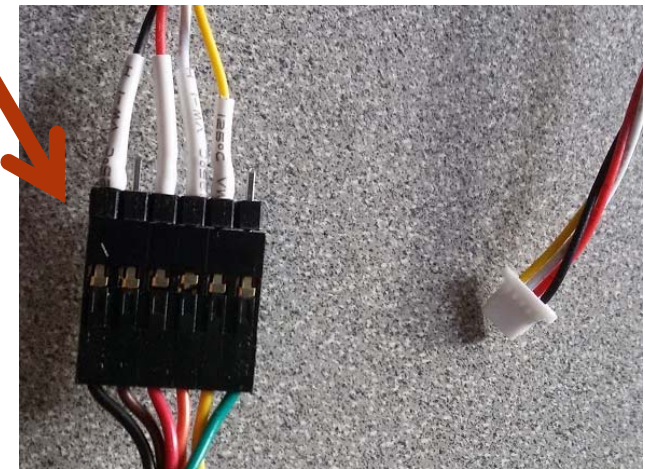
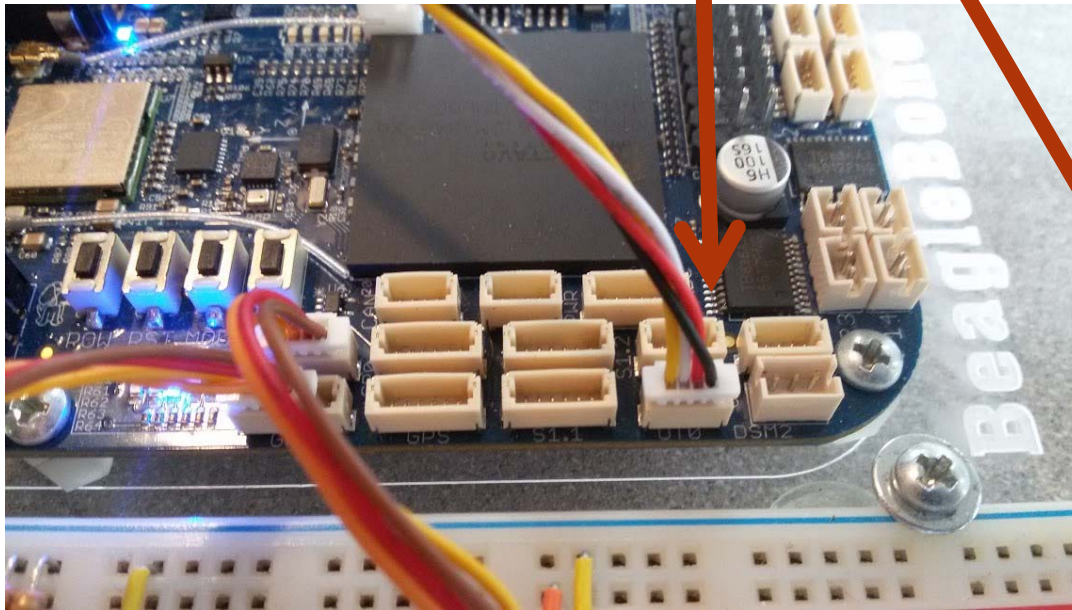
```
Net:   <ethaddr> not set. Validating first E-fuse MAC
```

```
cpsw, usb_ether
```

```
Press SPACE to abort autoboot in 2 seconds
```

Seeing boot messages

- Attach FDTI cable
- Look for triangle and black lead
- Plug into **UT0**



<https://www.sparkfun.com/products/9717>

Seeing boot messages

- On Host

```
host$ ls -ls /dev/ttyUSB0
```

```
0 crw-rw---- 1 root dialout 188, 0 Sep 22 09:36  
/dev/ttyUSB0
```

```
host$ sudo adduser $USER dialout
```

```
host$ screen /dev/ttyUSB0 115200
```

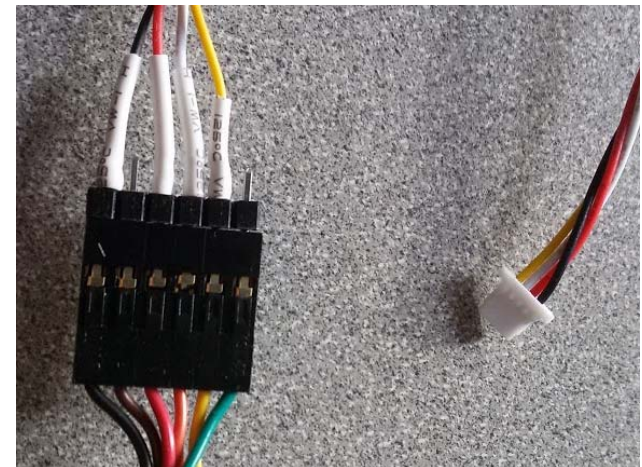
- Capture log file with

^A H

- Then reboot

```
bone$ reboot
```

Baud rate



<https://www.sparkfun.com/products/9717>

What happens when the Beagle powers up?

```
U-Boot 2017.03-rc3-00002-g16d7481d17 (Mar 09 2017 - 14:55:03 -0600), Build: jenkins-github_Bootloader-Builder-529
```

```
CPU   : AM335X-GP rev 2.1
```

```
I2C:   ready
```

```
DRAM:  512 MiB
```

```
Reset Source: Global external warm reset has occurred.
```

```
Reset Source: Global warm SW reset has occurred.
```

```
Reset Source: Power-on reset has occurred.
```

```
MMC:   OMAP SD/MMC: 0, OMAP SD/MMC: 1
```

```
Using default environment
```

```
Model: BeagleBone Blue
```

```
<ethaddr> not set. Validating first E-fuse MAC
```

```
BeagleBone Black:
```

```
Model: BeagleBoard.org BeagleBone Blue:
```

```
BeagleBone: cape eeprom: i2c_probe: 0x54:
```

```
BeagleBone: cape eeprom: i2c_probe: 0x55:
```

```
BeagleBone: cape eeprom: i2c_probe: 0x56:
```

```
BeagleBone: cape eeprom: i2c_probe: 0x57:
```

```
Net:    eth0: MII MODE
```

```
Could not get PHY for cpsw: addr 0
```

```
cpsw
```

```
Press SPACE to abort autoboot in 2 seconds
```

What happens when the Beagle powers up?

```
switch to partitions #0, OK
mmc0 is current device
Scanning mmc 0:1...
gpio: pin 56 (gpio 56) value is 0
gpio: pin 55 (gpio 55) value is 0
gpio: pin 54 (gpio 54) value is 1
gpio: pin 53 (gpio 53) value is 0
```

```
bone$ ./findGPIO.js 54
Looking for gpio 54
{ name: 'USR1',
  gpio: 54,
  led: 'usr1',
  mux: 'gpmc_a6',
  key: 'USR1' }
```

```
switch to partitions #0, OK
mmc0 is current device
```

```
gpio: pin 54 (gpio 54) value is 1
Checking for: /uEnv.txt ...
1179 bytes read in 9 ms (127.9 KiB/s)
```

/boot/uEnv.txt

Remove **quiet**

```
cmdline=coherent_pool=1M net.ifnames=0 quiet
```

```
#In the event of edid real failures, uncomment this next line:
```

```
#cmdline=coherent_pool=1M net.ifnames=0 quiet video=HDMI-A-  
1:1024x768@60e
```

```
##Example v3.8.x
```

```
#cape_disable=capemgr.disable_partno=
```

```
#cape_enable=capemgr.enable_partno=
```

```
##Example v4.1.x
```

```
#cape_disable=bone_capemgr.disable_partno=
```

```
#cape_enable=bone_capemgr.enable_partno=
```

```
##enable Generic eMMC Flasher:
```

```
##make sure, these tools are installed: dosfstools rsync
```

```
#cmdline=init=/opt/scripts/tools/eMMC/init-eMMC-flasher-v3.sh
```


U-boot

```
gpio: pin 55 (gpio 55) value is 1
Loaded environment from uEnv.txt
Importing environment from mmc ...
Checking if uenvcmd is set ...
```

```
gpio: pin 56 (gpio 56) value is 1
Running uenvcmd ...
1198 bytes read in 29 ms (40 KiB/s)
debug: [/boot/vmlinuz-4.4.19-ti-r41] ...
7792440 bytes read in 453 ms (16.4 MiB/s)
debug: [/boot/initrd.img-4.4.19-ti-r41] ...
5076716 bytes read in 299 ms (16.2 MiB/s)
debug: [/boot/dtbs/4.4.19-ti-r41/am335x-boneblack.dtb] ...
61581 bytes read in 108 ms (556.6 KiB/s)
debug: [console=tty0 console=ttyO0,115200n8 root=/dev/mmcblk0p1
rootfstype=ext4 rootwait coherent_pool=1M quiet cape_universal=enable]
...
debug: [bootz 0x82000000 0x88080000:4d76ec 0x88000000] ...
```

U-boot

Debian GNU/Linux 8 yoder-debian-bone ttyS0

BeagleBoard.org Debian Image 2016-08-28

Support/FAQ: http://elinux.org/Beagleboard:BeagleBoneBlack_Debian

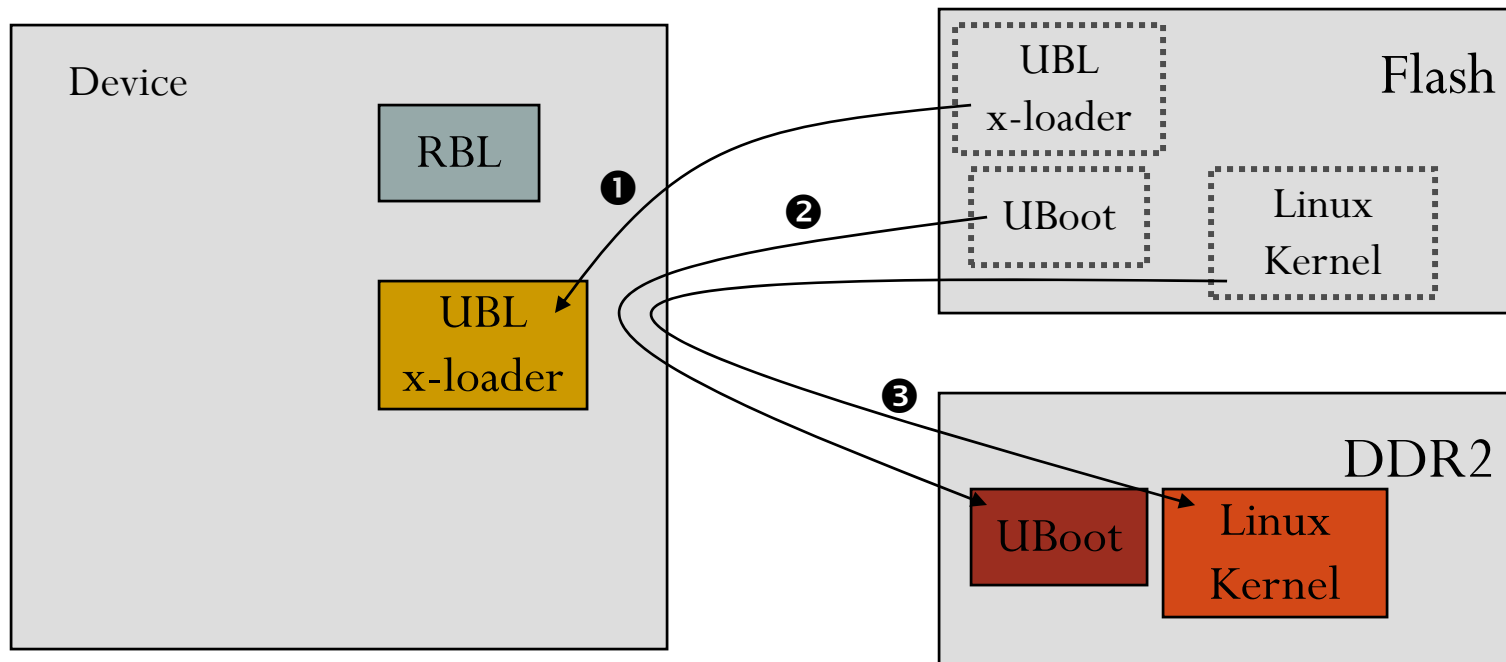
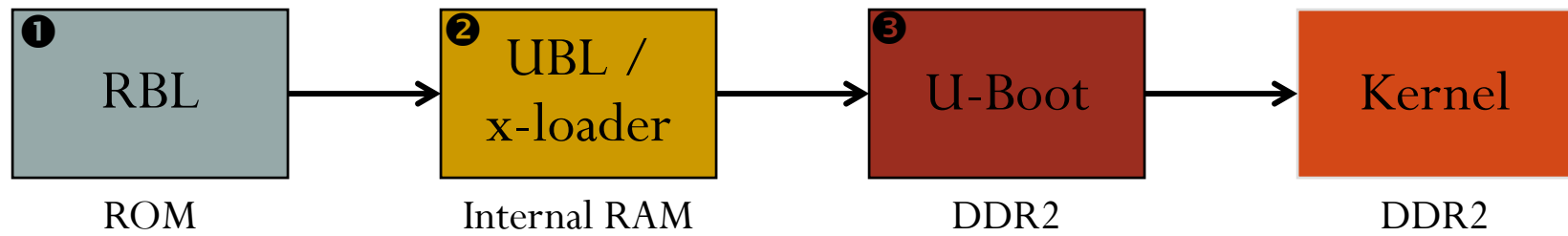
default username:password is [debian:temppwd]

The IP Address for usb0 is: 192.168.7.2

yoder-debian-bone login:

```
[ 34.136664] platform 48300180.eqep: Cannot lookup hwmod 'eqep0'
[ 34.184747] platform 48302180.eqep: Cannot lookup hwmod 'eqep1'
[ 34.234955] platform 48304180.eqep: Cannot lookup hwmod 'eqep2'
```

Booting Linux – ROM to Kernel



U-boot

=> **help boot**

boot - boot default, i.e., run 'bootcmd'

=> **print bootcmd**

bootcmd=run findfdt; run distro_bootcmd

=> **print findfdt**

```
findfdt=if test $board_name = A335BONE; then
setenv fdtfile am335x-bone.dtb; setenv fdtbase
am335x-bone; fi; if test $board_name = A335BNLT;
then if test $board_rev = BLA0; then setenv
fdtfile am335x-boneblue.dtb; setenv fdtbase
am335x-boneblue; elif test $board_rev = BBG1; then
setenv fdtfile am335x-bonegreen.dtb; setenv
fdtbase am335x-bonegreen; elif test $board_rev =
GW1A; then setenv fdtfile am335x-bonegreen-
wireless.dtb; setenv fdtbase am335x-bonegreen-
wireless; elif test $board_rev = AIA0; then setenv
fdtfile am335x-abb
```

U-boot

```
=> print distro_bootcmd
```

```
distro_bootcmd=  
for target in ${boot_targets};  
do  
    run bootcmd_${target};  
done
```