How to make a cubieboard system release 2

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In cubieboard forum,many people want to make their self system because they want to know why and how.Now,let me tell you how to make a linux system for Cubieboard,like busyOS,Debian.

Color:
You have to know
You may want to know
Code
Tips
That's the common text

First,That's the menu:

What you need:

- A cubieboard
- This document
- A SD card(the size of that card have to bigger than 1Gb)
- Some fingers who can type the commands(one is OK too)
- One or two eye(s) to read this document

First step you need to do

You may want to know,to boot a system,it will runs:

Power on → U-boot → Linux kernel → init → shell

So you know,"Power on" isn't a software,so we don't need to build it.
You can take a look at your SD card if there is a Cubieboard system (Not android!!).
It will show you 2 partitions(maybe one partition if that system is strange).
The first partition is a vFAT partition,it saves uImage,boot.scr or uEnv.txt,script.bin,etc.

Then the second partition is a ext partition,it's linux's rootfs,maybe ext2,maybe 3,maybe 4,etc.

OK,don't say that,let's start.

Oh,you should install a Ubuntu or Debian system because we have to use “apt-get” command.

[Make sure you just have 1 disk on your computer,if you have 2,please change “sdb” to “sdc”,etc,you can also remove a disk,that's OKay]

Run these(please do not copy because sdb may be your hard disk):

```
fdisk /dev/sdb #WARNING
p
d
#ENTER
d
#ENTER  (try d+ENTER until it says “No partition is defined yet!”)
n
p
1
2048
+100M
n
p
2
#ENTER
#ENTER
w
```

Tips:You have to replace “#ENTER” to real enter.

If it says “Calling ioctl() to re-read partition table.

Syncing disks.”,then try to eject your card and insert your card or you can try “partprobe” command

Then:

```
fdisk /dev/sdb -l
```

If you see:

```
Disk /dev/sdb: xxxx MB, xxxx bytes
xx heads, xx sectors/track, xx cylinders, total xx sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
```

```
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x xxx
   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1            2048      206847        xx   83  Linux
/dev/sdb2          206848       xxx      xx   83  Linux
```

That means OK.

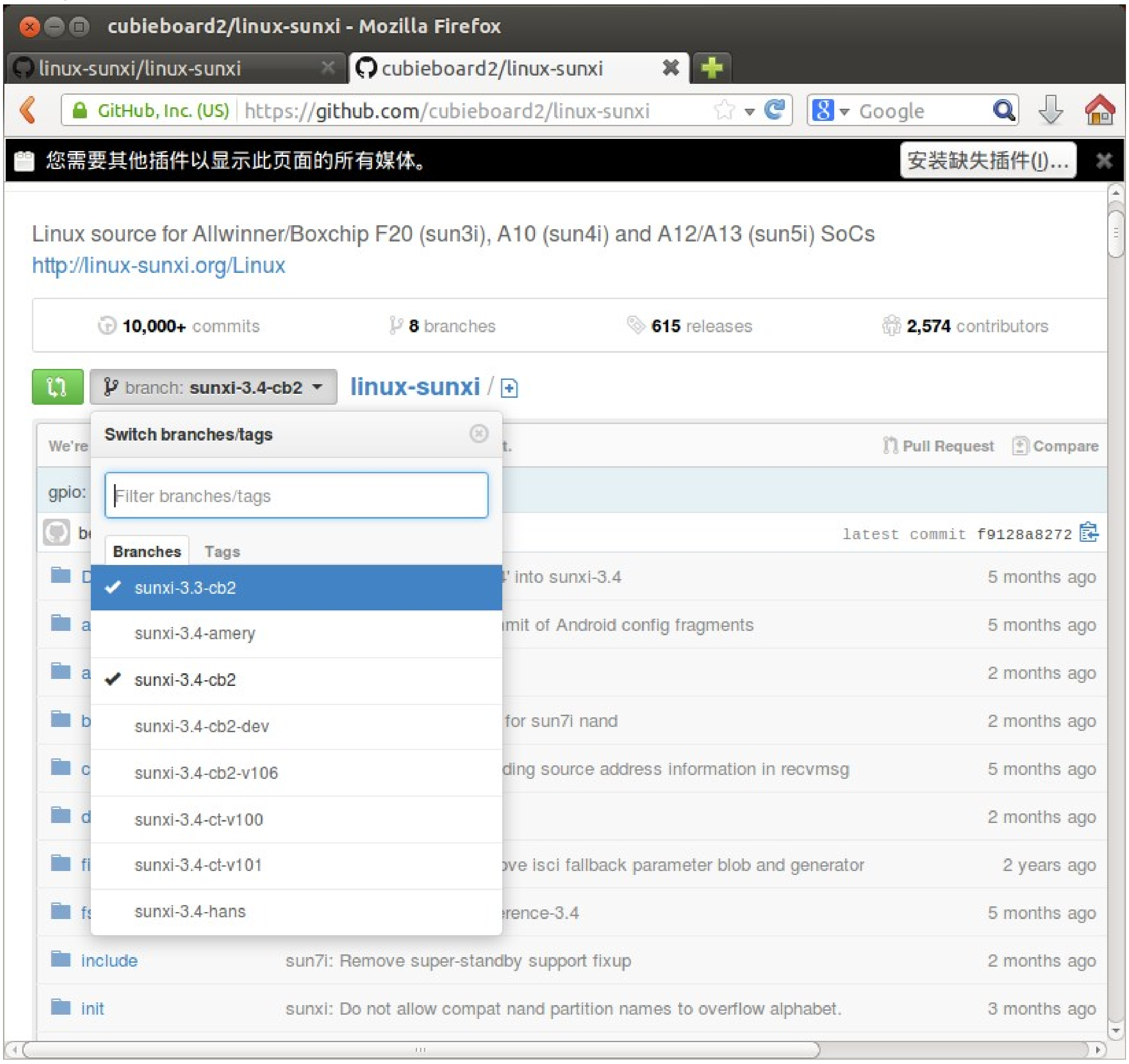
Then build filesystem:

```
mkfs.ext4 /dev/sdb2
```

Build Kernel

Linux kernel is very important because you will need it on booting and it will runs init then init runs shell,etc.Let's build linux 3.4 kernel for CB,CT

First,use your browser to visit "https://github.com/cubieboard2/linux-sunxi".Then,select branch "sunxi-3.4-ct-v101" if you have a Cubietruck(Like picture 1),then you can see kernel files you need.



cubieboard2/linux-sunxi - Mozilla Firefox

linux-sunxi/linux-sunxi | cubieboard2/linux-sunxi

GitHub, Inc. (US) https://github.com/cubieboard2/linux-sunxi

您需要其他插件以显示此页面的所有媒体。 安装缺失插件(I)...

Linux source for Allwinner/Boxchip F20 (sun3i), A10 (sun4i) and A12/A13 (sun5i) SoCs
http://linux-sunxi.org/Linux

10,000+ commits | 8 branches | 615 releases | 2,574 contributors

branch: sunxi-3.4-cb2 | linux-sunxi / +

Switch branches/tags

Filter branches/tags

Branches | Tags

- ✓ sunxi-3.3-cb2
- sunxi-3.4-amery
- ✓ sunxi-3.4-cb2
- sunxi-3.4-cb2-dev
- sunxi-3.4-cb2-v106
- sunxi-3.4-ct-v100
- sunxi-3.4-ct-v101
- sunxi-3.4-hans

Pull Request | Compare

latest commit f9128a8272

	' into sunxi-3.4	5 months ago
	mit of Android config fragments	5 months ago
		2 months ago
	for sun7i nand	2 months ago
	ding source address information in recvmsg	5 months ago
		2 months ago
	ove isci fallback parameter blob and generator	2 years ago
	erence-3.4	5 months ago
include	sun7i: Remove super-standby support fixup	2 months ago
init	sunxi: Do not allow compat nand partition names to overflow alphabet.	3 months ago

Picture 1

Do NOT click “Download Zip” because there are some links.

Open your “Terminal”,type “sudo su” and type password to use the super user – root.

Tips:When you are typing password,it will not show you that,that's good.

If you are using Cubieboard2,please type:

git clone https://github.com/cubieboard2/linux-sunxi

If you are using CubieTruck,type:

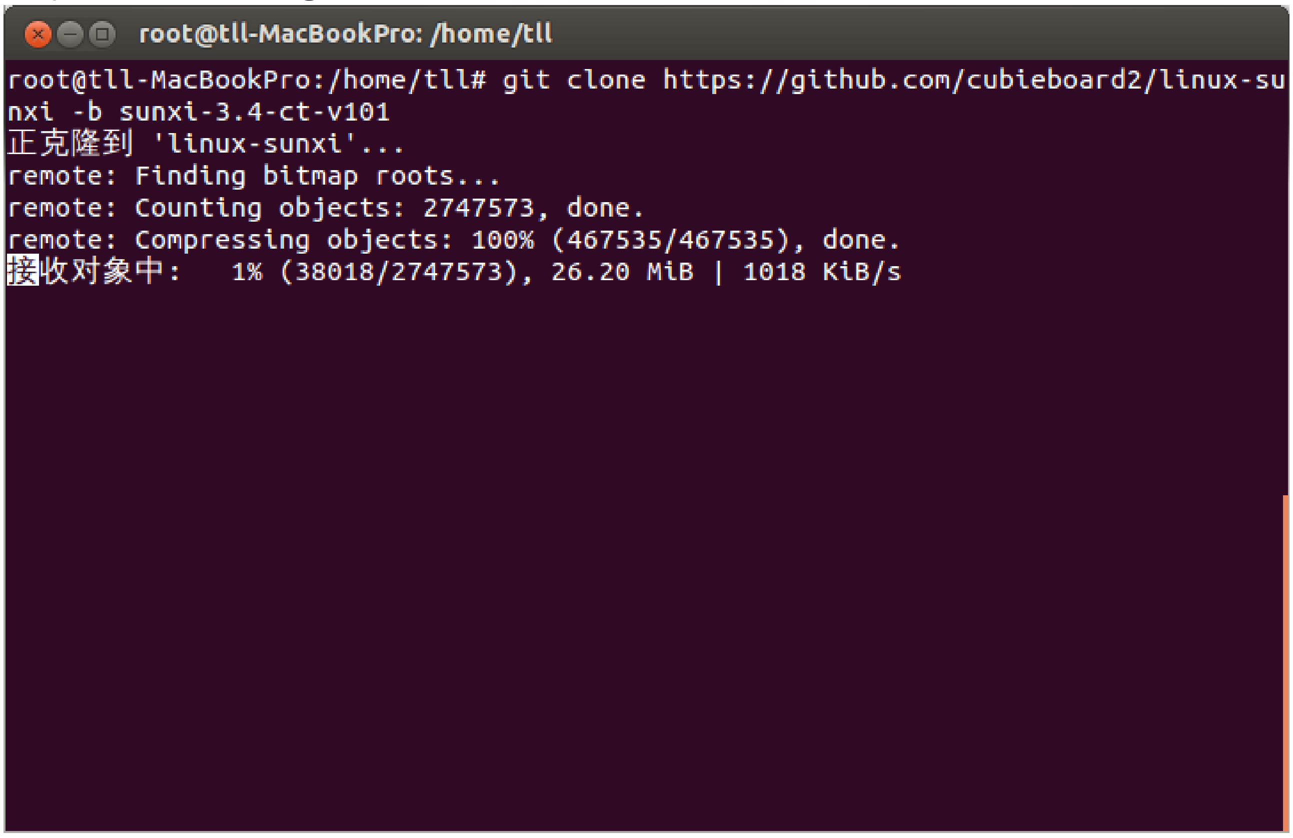
git clone https://github.com/cubieboard2/linux-sunxi -b sunxi-3.4-ct-v101

Wait,wait and wait,Chinese network has a big problem – too slow.

And Chinese people have a big wall – Great Fire Wall(That's GFW),it's too bad.

I can't understand why Chinese government build this!

OK,just wait,no talking,like picture 2.



```
root@tll-MacBookPro: /home/tll
root@tll-MacBookPro:/home/tll# git clone https://github.com/cubieboard2/linux-su
nxi -b sunxi-3.4-ct-v101
正克隆到 'linux-sunxi'...
remote: Finding bitmap roots...
remote: Counting objects: 2747573, done.
remote: Compressing objects: 100% (467535/467535), done.
接收对象中:   1% (38018/2747573), 26.20 MiB | 1018 KiB/s
```

Picture 2

Github on ubuntu in Chinese is not very good,you can take a look “Picture 2”.There are 50% Chinese and 50% English(Maybe 60%?).

You can use this command to install something you need:

apt-get install build-essential u-boot-tools uboot-mkimage gcc-arm-linux-gnueabihf ncurses-dev -y

Then “cd” to linux-sunxi directory:

```
cd linux-sunxi
```

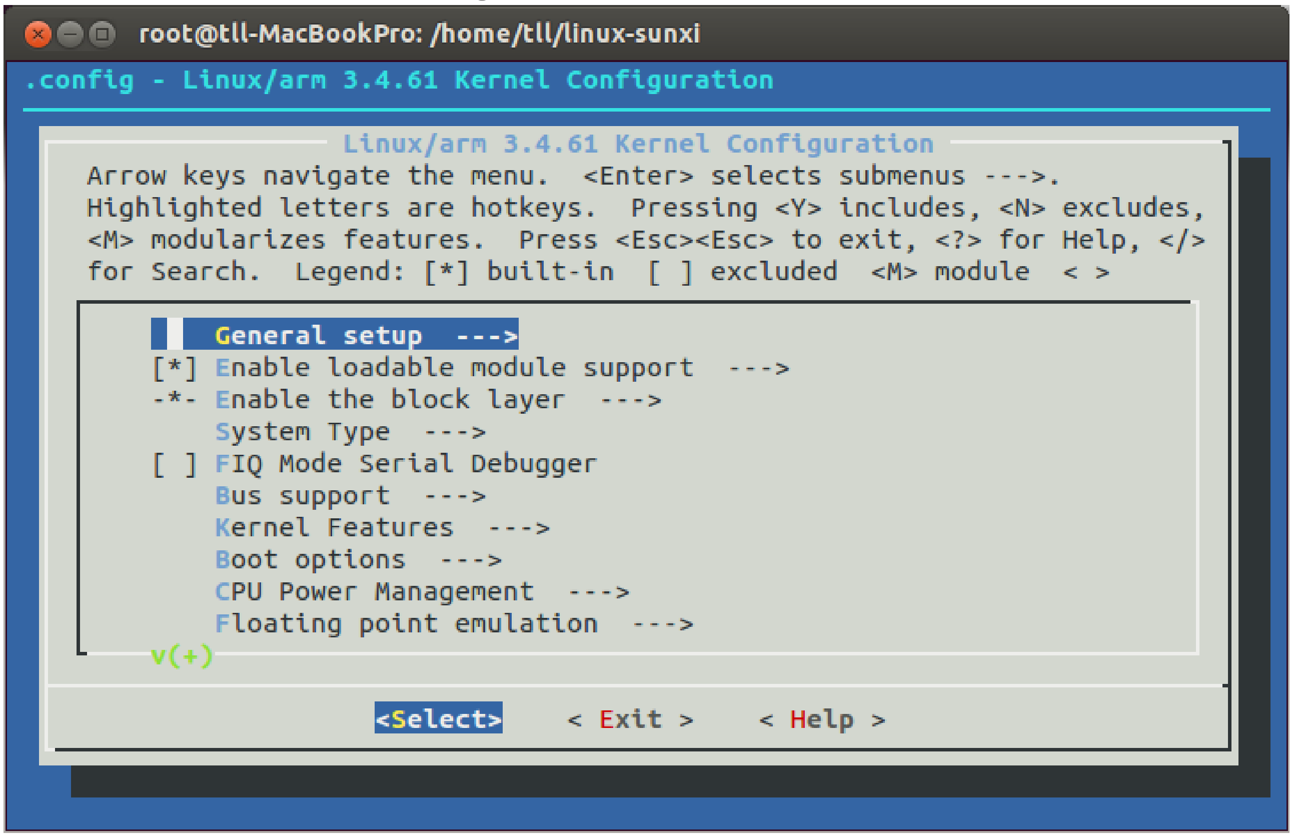
Use sun7i(A20) config:

```
make sun7i_defconfig ARCH=arm
```

Then select something you want:

```
make menuconfig ARCH=arm
```

If all OK,it will show you something like picture 3.



```
root@tll-MacBookPro: /home/tll/linux-sunxi
.config - Linux/arm 3.4.61 Kernel Configuration
                 Linux/arm 3.4.61 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: [*] built-in  [ ] excluded  <M> module  < >

        General setup  --->
    [*] Enable loadable module support  --->
    -*- Enable the block layer  --->
        System Type  --->
    [ ] FIQ Mode Serial Debugger
        Bus support  --->
        Kernel Features  --->
        Boot options  --->
        CPU Power Management  --->
        Floating point emulation  --->
    v(+)

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

Picture 3

Select “General setup” → “Cross-compliter tool prefix” and write “arm-linux-gnueabihf-”

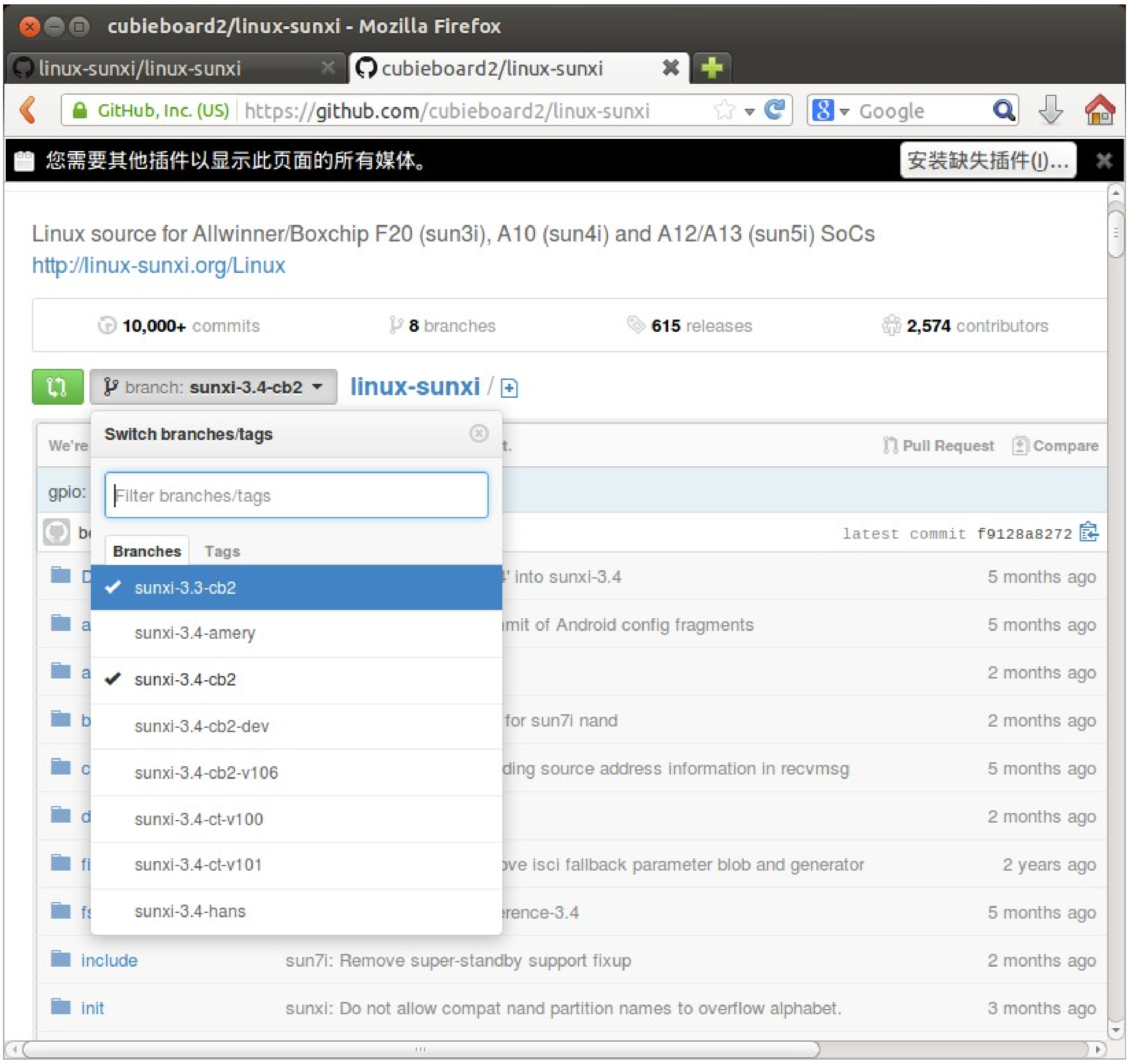
Tips,there is a “-” after “gnueabihf”!

Use these command to build kernel:

```
make uImage CROSS_COMPILE=arm-linux-gnueabihf- -j2 ARCH=arm

make ARCH=arm CROSS_COMPILE=arm-linux-gnueabihf- -j2 INSTALL_MOD_PATH=output modules

make ARCH=arm CROSS_COMPILE=arm-linux-gnueabihf- -j2 INSTALL_MOD_PATH=output modules_install

mv arch/arm/boot/uImage output
```

Then,cd to output:

cd output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linux-sunxi/linux-sunxi | cubieboard2/linux-sunxi

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	erence-3.4	5 months ago
include	sun7i: Remove super-standby support fixup	2 months ago
init	sunxi: Do not allow compat nand partition names to overflow alphabet.	3 months ago

OK,that's your kernel

A very very important tips:If you enabled the pwm-sunxi,you need to edit "./drivers/misc/pwm-sunxi.c" and change "#include <pwm-sunxi.h>" to '#include "pwm-sunxi.h"' because pwm-sunxi.h is a local file,not in "include" file.

You have to remove links of source code in output files or you want to copy them to your board:

```
rm lib/modules/*/build lib/modules/*/source
```

Build U-boot

U-boot is a kernel-booter like grub,if you are using windows,it likes bootmgr or ntldr.

Let's build it now.

Download files from github:

```
git clone https://github.com/linux-sunxi/u-boot-sunxi -b wip/a20
```

Aha,it's faster because it's smaller than linux kernel.

Then.cd to u-boot-sunxi directory

```
cd u-boot-sunxi
```

You can edit include/config_cmd_default.h to add something,it's useful

For cubieboard1:

```
make cubieboard ARCH=arm CROSS_COMPILE=arm-linux-gnueabihf-
```

For cubieboard2/cubieboard3(cubietruck):

```
make cubieboard2 ARCH=arm CROSS_COMPILE=arm-linux-gnueabihf-
```

Write it:

```
dd if=spl/sunxi-spl.bin of=/dev/sdb bs=1024 seek=8
dd if=u-boot.bin of=/dev/sdb bs=1024 seek=32
mkfs.vfat /dev/sdb1
```

WARNING TOO,PLEASE REPLACE SDB TO SDC IF YOU HAVE 2 HARD DISKS ON YOUR COMPUTER

Build script.bin

script.bin is a config file.

You can use these command to build it:

```
apt-get install libusb-1.0-0-dev libusb-dev -y
git clone https://github.com/linux-sunxi/sunxi-boards
git clone https://github.com/linux-sunxi/sunxi-tools
cd sunxi-tools
make
mount /dev/sdb1 /opt
./fex2bin ../sunxi-boards/sys_config/a20/cubieboard2.fex /opt/script.bin
cd ..
```

Build rootfs [Choose one from three systems]

BusyOS

Do you know busybox?May not,ok,that's a light linux program,all of the commands but busybox make a link to busybox program.It means you type cd,then it run busybox's cd.Run init is run busybox too.You will say,what a stupid guy,why he makes this.And I will tell you,because many program use some same codes.But many program means many same codes,so he decides to make this program,it's more light than common linux like debian,but it supports dpkg(not apt-get)!Openwrt,dd-wrt and TP-Link wirless router are using it too[TP-Link's router's busybox dosen't have ls!you can visit http://see.sl088.com/wiki/WR703_%E5%AE%98%E6%96%B9%E5%9B%BA%E4%BB%B6/TTL%E7%99%BB%E9%99%86 to take a look].

OKOK,let's start.

First,download busybox:

```
wget http://busybox.net/downloads/busybox-1.21.1.tar.bz2
tar jxvf busybox-1.21.1.tar.bz2
cd busybox-1.21.1
make menuconfig ARCH=arm
```

Then,set busybox settings → build option → Cross Compiler prefix to "arm-linux-gnueabihf"

And:

```
make
make install
```

If success:

```
mount /dev/sdb2 /mnt
cp -Rv _install/* /mnt
cp -Rv examples/bootfloppy/etc /mnt
cd /mnt
mkdir dev proc sys var home tmp mnt run boot boot2 dev/pts
```

Then,remove and edit fstab

```
rm etc/fstab;nano etc/fstab;chmod 777 etc/fstab
```

Enter:

```
proc /proc proc nosuid,noexec,nodev 0 0
sysfs /sys sysfs nosuid,noexec,nodev 0 0
devpts /dev/pts devpts gid=4,mode=620 0 0
tmpfs /tmp tmpfs defaults 0 0
devtmpfs /dev devtmpfs mode=0755,nosuid 0 0
/dev/mmcblk0p1 /boot2 vfat defaults 0 2
/dev/mmcblk0p2 / ext4 defaults,noatime 0 1
```

Debian

You can get a copy of Debian via debootstrap command,let's do that.

First,install debootstrap:

```
apt-get install debootstrap -y
```

And mount,download,install some system packages:

```
mount /dev/sdb2 /mnt

cd /mnt

debootstrap --verbose --arch armhf --variant=minbase --foreign testing mnt
http://ftp.debian.org/debian wheezy .
```

Burn and run

Mount files:

```
nano /opt/boot.cmd
```

And type:

```
setenv bootargs console=ttyS0,115200 root=/dev/mmcblk0p2 init=/sbin/init rootwait
panic=10 ${extra}

fatload mmc 0 0x43000000 script.bin

fatload mmc 0 0x48000000 uImage

bootm 0x48000000
```

And cd,build:

```
cd /opt

mkimage -C none -A arm -T script -d boot.cmd boot.scr
```

And copy files:

```
cp {where kernel is}/output/uImage /opt

cp -Rv {where kernel is}/output/lib /mnt

cp -Rv /usr/arm-linux-gnueabihf/lib /mnt
```

Then umount:

```
umount /mnt /opt
```

Try to boot it!

TTL listener install:

```
apt-get install cu -y

chmod 777 /dev/ttyUSB0

cu -s 115200 -l /dev/ttyUSB0
```

OR use minicom:

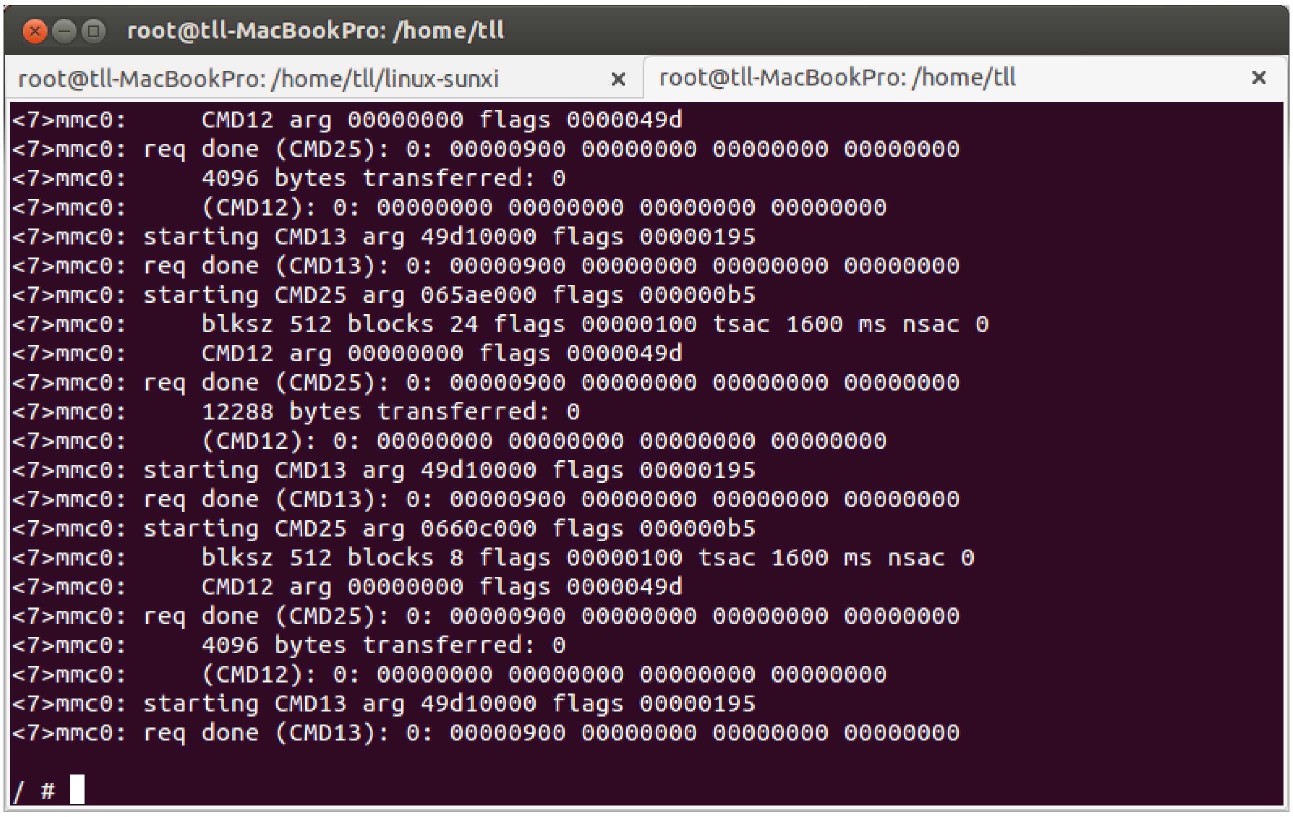
```
apt-get install minicom -y
```

```
minicom -s
#Serial port setup
#Serial device → /dev/ttyUSB0
#Bps 115200 8N1
#Exit
```

OR use screen:

```
apt-get install screen -y
screen /dev/ttyUSB0 115200
```

Then power on,linux kernel start.


root@tll-MacBookPro: /home/tll
root@tll-MacBookPro: /home/tll/linux-sunxi
root@tll-MacBookPro: /home/tll

```
<7>mmc0:     CMD12 arg 00000000 flags 0000049d
<7>mmc0: req done (CMD25): 0: 00000900 00000000 00000000 00000000
<7>mmc0:     4096 bytes transferred: 0
<7>mmc0:     (CMD12): 0: 00000000 00000000 00000000 00000000
<7>mmc0: starting CMD13 arg 49d10000 flags 00000195
<7>mmc0: req done (CMD13): 0: 00000900 00000000 00000000 00000000
<7>mmc0: starting CMD25 arg 065ae000 flags 000000b5
<7>mmc0:     blksz 512 blocks 24 flags 00000100 tsac 1600 ms nsac 0
<7>mmc0:     CMD12 arg 00000000 flags 0000049d
<7>mmc0: req done (CMD25): 0: 00000900 00000000 00000000 00000000
<7>mmc0:     12288 bytes transferred: 0
<7>mmc0:     (CMD12): 0: 00000000 00000000 00000000 00000000
<7>mmc0: starting CMD13 arg 49d10000 flags 00000195
<7>mmc0: req done (CMD13): 0: 00000900 00000000 00000000 00000000
<7>mmc0: starting CMD25 arg 0660c000 flags 000000b5
<7>mmc0:     blksz 512 blocks 8 flags 00000100 tsac 1600 ms nsac 0
<7>mmc0:     CMD12 arg 00000000 flags 0000049d
<7>mmc0: req done (CMD25): 0: 00000900 00000000 00000000 00000000
<7>mmc0:     4096 bytes transferred: 0
<7>mmc0:     (CMD12): 0: 00000000 00000000 00000000 00000000
<7>mmc0: starting CMD13 arg 49d10000 flags 00000195
<7>mmc0: req done (CMD13): 0: 00000900 00000000 00000000 00000000

/ #
```

Aha~ash~

Enjoy using it.