CUBIEBOARD
http://cubieboard.org

Cubieboard2-Cubiecreen-android-system-building

Cubiescreen

Website:http://cubieboard.org/
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Version	Author	Modification	Check
V-0.1-20150121	Payne	Init version	

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1. Abstract

Cubiescreen is a small capacitive touch screen for cubieboard1&cubieboard2, this is a guide to help you build a android image for the screen base on Cubietech android a20 sdk .The default configuration in a20 android sdk only support HDMI output display ,and without capacitive touch function, So ,you should modify the lcd&ctp configuration.

2. Hardware requirements

- Cubieboard2
- Cubieboard Cubie-Screen
- A mouse, keyboard

3. Software requirements

3.1. SDK

3.1.1. Download SDK

http://dl.cubieboard.org/model/commom/android-source/a20/

3.1.2. Download in the github

git clone https://bitbucket.org/cubietech/a20-android4.2_lichee.git
git clone https://bitbucket.org/cubietech/a20-android4.2_android.git

4. Cubieboard2 Cubie-Screen transplantate

4.1. Driver source code

4.1.1. Download driver source code

http://dl.cubieboard.org/addon/Cubiescreen/source/android-cbcs-source.tar.gz

Unzip the driver source code :

$ 7z x android-cbcs-source.7z

4.2. Copying files

Copy touchscreen driver source code
$ cp android-cbcs-source/CB2/driver/touchscreen/* a20-android/lichee/linux-3.4/drivers/input/sw_touchscreen/ft5x/

Copy disp driver source code
$ cp android-cbcs-source/CB2/driver/video/disp/* a20-android/lichee/linux-3.4/drivers/video/sun7i/disp

Copy lcd driver source code
$ cp android-cbcs-source/CB2/driver/video/lcd/* a20-android/lichee/linux-3.4/drivers/video/sun7i/lcd

Copy ctp.h
$ cp android-cbcs-source/CB2/driver/ctp.h a20-android/lichee/linux-3.4/include/linux/

4.3. System configuration

path：lichee/tools/pack/chips/sun7i/configs/android/sugar-cubieboard2/sys_config.fex
Modify: disp_init 、ctp_para and lcd0_para

detailed configuration：
[disp_init]

```
[disp_init]
disp_init_enable         = 1
disp_mode                = 0

screen0_output_type      = 1
screen0_output_mode      = 4

screen1_output_type      = 1
screen1_output_mode      = 4

fb0_framebuffer_num      = 2
fb0_format               = 10
fb0_pixel_sequence       = 0
fb0_scaler_mode_enable   = 0
fb0_width                = 0
fb0_height               = 0
```

[ctp_para]

```
[ctp_para]
ctp_used = 1
ctp_name = "ft5x_ts"
ctp_twi_id = 1
ctp_twi_addr = 0x5c
ctp_screen_max_x = 800
ctp_screen_max_y = 480
ctp_revert_x_flag = 0
ctp_revert_y_flag = 0
ctp_exchange_x_y_flag = 0
ctp_firm = 1
ctp_int_port = port:PH07<6><default><default><default>
ctp_wakeup =

;ctp_int_port            = port:PH07<6><default>
;ctp_wakeup              = port:PB13<1><default><default><1>
;ctp_io_port             = port:PH07<0><default>
;------------------------------------------------------------------------------
```

[lcd0_para]

```
[lcd0_para]
lcd_used                = 1

lcd_x                   = 800
lcd_y                   = 480
lcd_width               = 0
lcd_height              = 0
lcd_dclk_freq           = 27
lcd_pwm_not_used        = 0
lcd_pwm_ch              = 0
lcd_pwm_freq            = 10000
lcd_pwm_pol             = 0
lcd_if                  = 0
lcd_hbp                 = 50
lcd_ht                  = 920
lcd_vbp                 = 3
lcd_vt                  = 976
lcd_vspw                = 0
lcd_hspw                = 0
```

4.4. The kernel configuration

Support the driver of ft5x touchscreen need to configure the kernel, are compiled into the kernel with the way of module .

Enter the kernel directory :

```
le@le:/work/le/a20-android$
le@le:/work/le/a20-android$ cd lichee/linux-3.4/
```

Copy the file of the kernel configuration to kernel root directory and changed the name as .config.

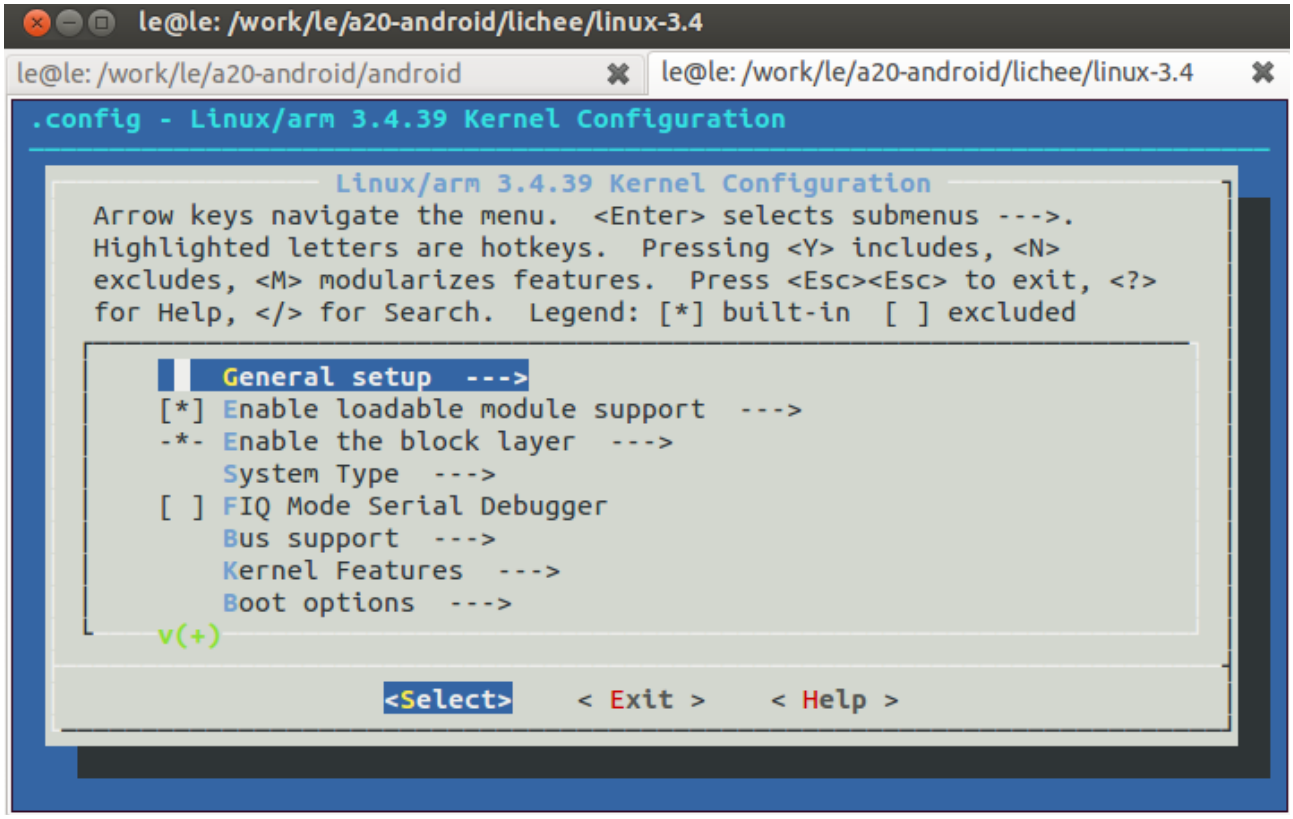
As below:

```
le@le:/work/le/a20-android/lichee/linux-3.4$ cp arch/arm/configs/cubieboard2_config
 .config
```

Open the interface of kernel configuration

```
le@le:/work/le/a20-android/lichee/linux-3.4$
le@le:/work/le/a20-android/lichee/linux-3.4$ sudo make ARCH=arm menuconfig
```

AS follow:



The drive path of ft5x touchscreen :

--->Device Drivers

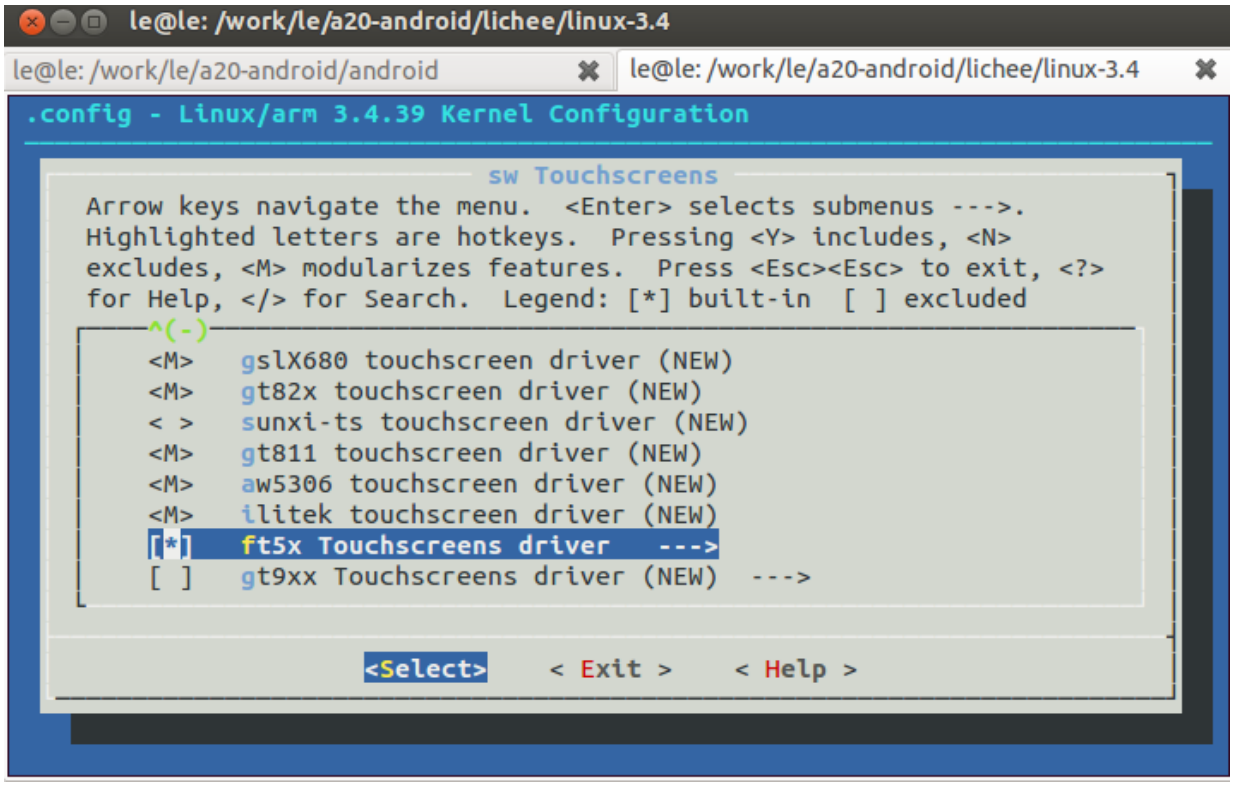
--->Input device support

---> sw Touchscreens

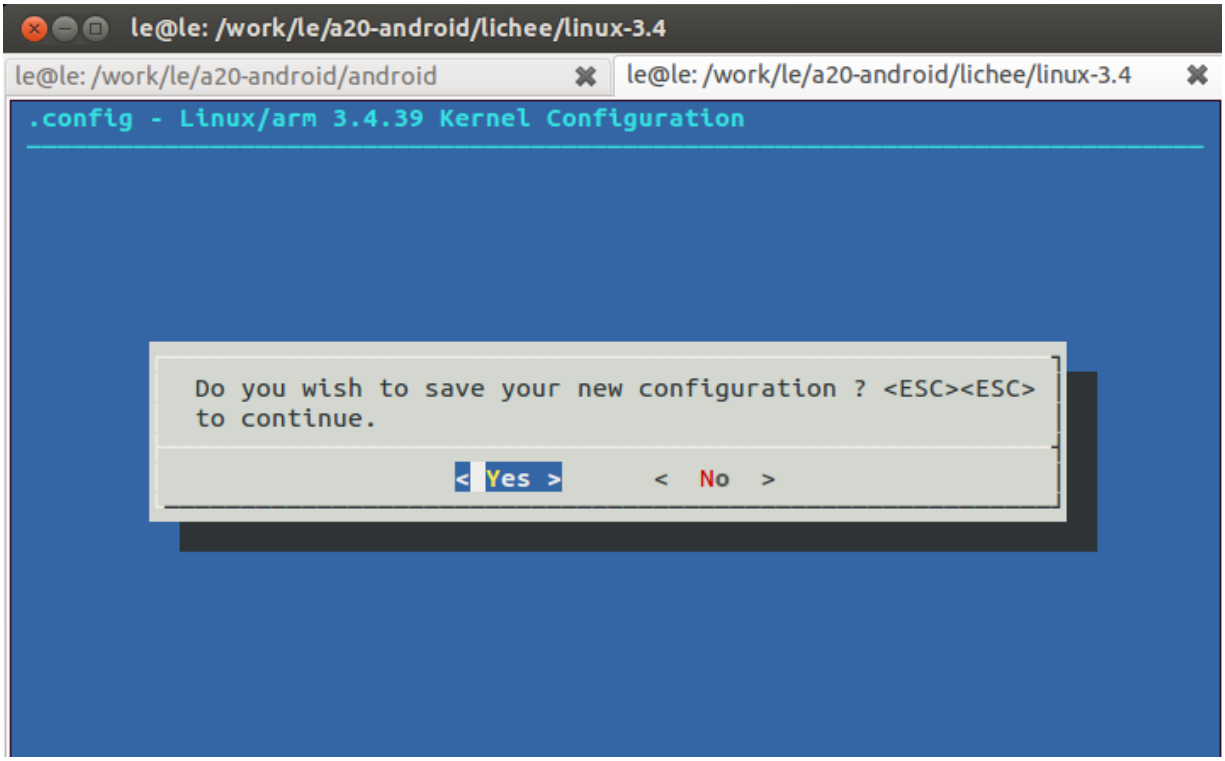
---> ft5x Touchscreens driver

The default did not choose "SW Touchscreens", need to be selected as the "*", into the next layer will be "ft5x touchscreen driver" option is selected as the "*", which will be compiled into the kernel

As follow:



Exit saving, select "Yes"



Note: The path is the file of ft5x touchscreen driver:

```
le@le:/work/le/a20-android/lichee/linux-3.4$ ls drivers/input/sw_touchscreen/ft5x/
built-in.o            ft5x_ts.ko            ft_app.i
.built-in.o.cmd       .ft5x_ts.ko.cmd       ini.c
ft5x02_config.c       ft5x_ts.mod.c         ini.h
ft5x02_config.h       ft5x_ts.mod.o         ini.o
ft5x02_config.o       .ft5x_ts.mod.o.cmd    .ini.o.cmd
.ft5x02_config.o.cmd  ft5x_ts.o             Kconfig
ft5x02_ini_config.h   .ft5x_ts.o.cmd        Makefile
ft5x.c                ft5x_ts-ppp.c         modules.builtin
ft5x.o                ft5x_ts-ppp.h         modules.order
.ft5x.o.cmd           ft5x_ts-yuan.h
ft5x_ts.h             ft5x-yuan.c
le@le:/work/le/a20-android/lichee/linux-3.4$ ls drivers/input/sw_touchscreen/ft5x/
```

4.5. Compile

4.5.1. Compile the kernel

Enter the source directory of lichee:

$cd A20-android/lichee/

Compile

$./build.sh -p sun7i_android

Completed:

```
arm-linux-gnueabi-objcopy -O srec u-boot u-boot.srec
arm-linux-gnueabi-objcopy --gap-fill=0xff -O binary u-boot u-boot.bin
make[1]:正在离开目录 `/work/le/a20-android/lichee/u-boot'
INFO: build u-boot OK.
INFO: build rootfs ...
INFO: skip make rootfs for android
INFO: build rootfs OK.
INFO: build lichee OK.
le@le:/work/le/a20-android/lichee$
```

4.5.2. Android Compile

Enter the source directory of android:

$cd ../android/

Removing compiled product:

$make clean

Initialize the compiler environment, and introduce some auxiliary Shell functions:

$source build/envsetup.sh

Note: the "source build/envsetup.sh" into build/envsetup.sh scripts, including the next step using the lunch function

Use lunch Function and the specified parameter is “cubieboard2-eng”

$lunch 15

Copy the kernel and module:

$extract-bsp

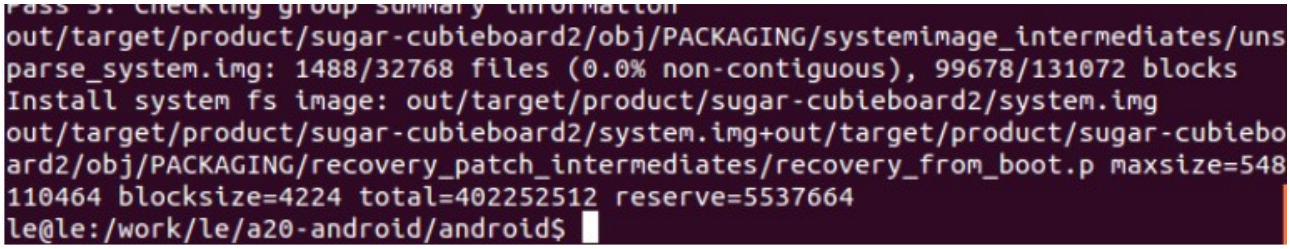
Compile:

$make -j8

Note: "8" for the number of CPU threads, according to his PC machine change

Waiting.....

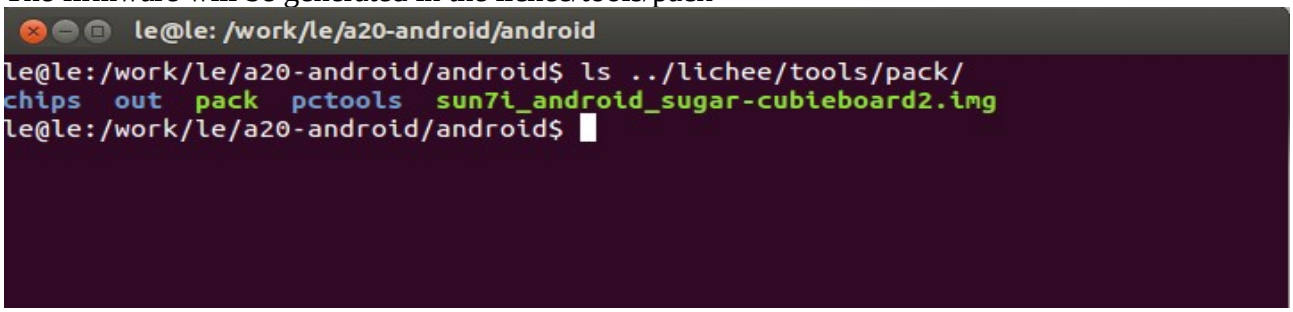
Completed:



4.5.3.Pack after completed

$pack

The firmware will be generated in the lichee/tools/pack



4.6. Install system

http://dl.cubieboard.org/model/cubieboard2/Doc/android/Android-Nand-Installation-Guide.pdf