按照官方指南 http://nano.lichee.pro/get_started/first_eye.html

具体食用过程：

1、:uboot

```
git clone https://github.com/Lichee-Pi/u-boot.git
cd u-boot
# 查看分支
git branch -a
# 切换到 Nano 分支
git checkout nano-v2018.01
# 此处告知make 采用arm-linux-gnueabi 下的所有交叉编译工具，目标架构为Arm，设定各项默认配置为 nano 的spiflash 支持版
make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi- licheepi_nano_spiflash_defconfig
# 进行可视化配置
make ARCH=arm menuconfig
```

根据指南设置 LCD

```
# 开始编译
make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi- -j24
```

得到文件:

```
1007616 u-boot-sunxi-with-spl.bin
```

执行 `sf probe 0;sf erase 0 0x100000;reset` 即可重新进入 fel 模式

然后烧写 uboot

```
./sunxi-fel -p spiflash-write 0 u-boot-sunxi-with-spl.bin
```

串口输出信息:

```
U-Boot SPL 2018.01-05679-g013ca45 (Mar 04 2019 - 17:57:53)
DRAM: 32 MiB
Trying to boot from MMC1
Card did not respond to voltage select!
mmc_init: -95, time 22
spl: mmc init failed with error: -95
Trying to boot from sunxi SPI


U-Boot 2018.01-05679-g013ca45 (Mar 04 2019 - 17:57:53 +0800) Allwinner Technology

CPU:   Allwinner F Series (SUNIV)
Model: Lichee Pi Nano
DRAM:  32 MiB
MMC:   SUNXI SD/MMC: 0
SF: Detected w25q128bv with page size 256 Bytes, erase size 4 KiB, total 16 MiB
*** Warning - bad CRC, using default environment
```

```
Setting up a 800x480 lcd console (overscan 0x0)
In:    serial@1c25000
Out:   serial@1c25000
Err:   serial@1c25000
Net:   No ethernet found.
starting USB...
No controllers found
Hit any key to stop autoboot:  0
Card did not respond to voltage select!
mmc_init: -95, time 22
starting USB...
No controllers found
USB is stopped. Please issue 'usb start' first.
starting USB...
No controllers found
No ethernet found.
missing environment variable: pxeuuid
missing environment variable: bootfile
Retrieving file: pxelinux.cfg/00000000
No ethernet found.
missing environment variable: bootfile
Retrieving file: pxelinux.cfg/0000000
No ethernet found.
missing environment variable: bootfile
Retrieving file: pxelinux.cfg/000000
No ethernet found.
missing environment variable: bootfile
Retrieving file: pxelinux.cfg/00000
No ethernet found.
missing environment variable: bootfile
Retrieving file: pxelinux.cfg/0000
No ethernet found.
missing environment variable: bootfile
Retrieving file: pxelinux.cfg/000
No ethernet found.
missing environment variable: bootfile
Retrieving file: pxelinux.cfg/00
No ethernet found.
missing environment variable: bootfile
Retrieving file: pxelinux.cfg/0
No ethernet found.
missing environment variable: bootfile
Retrieving file: pxelinux.cfg/default-arm-sunxi
No ethernet found.
```

```
missing environment variable: bootfile
Retrieving file: pxelinux.cfg/default-arm
No ethernet found.
missing environment variable: bootfile
Retrieving file: pxelinux.cfg/default
No ethernet found.
Config file not found
starting USB...
No controllers found
No ethernet found.
No ethernet found.
=> bdinfo
arch_number = 0x00000000
boot_params = 0x80000100
DRAM bank   = 0x00000000
-> start    = 0x80000000
-> size     = 0x02000000
baudrate    = 115200 bps
TLB addr    = 0x80FF0000
relocaddr   = 0x80F70000
reloc off   = 0xFF870000
irq_sp      = 0x80E65D90
sp start    = 0x80E65D80
FB base     = 0x81E89000
Early malloc usage: 118 / 400
fdt_blob = 80e65da8
=>
```

2、主线 linux

```
git clone --depth=1 -b f1c100s-480272lcd-test https://github.com/Icenowy/linux.git
```

下载.config 文件放入 linux 文件夹

```
make ARCH=arm menuconfig    #这里好像没什么改的吧？

make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi- -j24    #请自行修改编译线程数
```

得到文件:

```
10695412 3 月   4 18:14 Image*
3837040 3 月   4 18:14 zImage*
```

3、设备树添加节点

根据指南内修改 LCD 和加入 LED

```
make ARCH=arm CROSS_COMPILE=arm-linux-gnueabi- dtbs -j24
```

得到文件:

```
DTC       arch/arm/boot/dts/suniv-f1c100s-licheepi-nano.dtb
```

4、使用 buildroot 构建根文件系统

```
wget https://buildroot.org/downloads/buildroot-2017.08.tar.gz
tar xvf buildroot-2017.08.tar.gz
cd buildroot-2017.08/
```

下载 buildroot 的 .config 文件，重命名为 .config 后放到 buildroot 目录下

```
make menuconfig
```

配置下

```
Target options   --->

    Target Architecture Variant (arm926t)   --->    // arm926ejs 架构
[ ] Enable VFP extension support                    // Nano 没有 VFP 单元，勾选会导致某些应用无法运行
    Target ABI (EABI)   --->
    Floating point strategy (Soft float)   --->    // 软浮点

System configuration   --->

    (Lichee Pi) System hostname                    // hostname
    (licheepi) Root password                       // 默认账户为 root 密码为 licheepi
    [*] remount root filesystem read-write during boot   // 启动时重新挂在文件系统使其可读写
```

编译：

```
make BR2_JLEVEL=24
```

得到文件：

```
98129920 3 月    4 19:21 rootfs.tar
```

5、spi-flash 启动适配

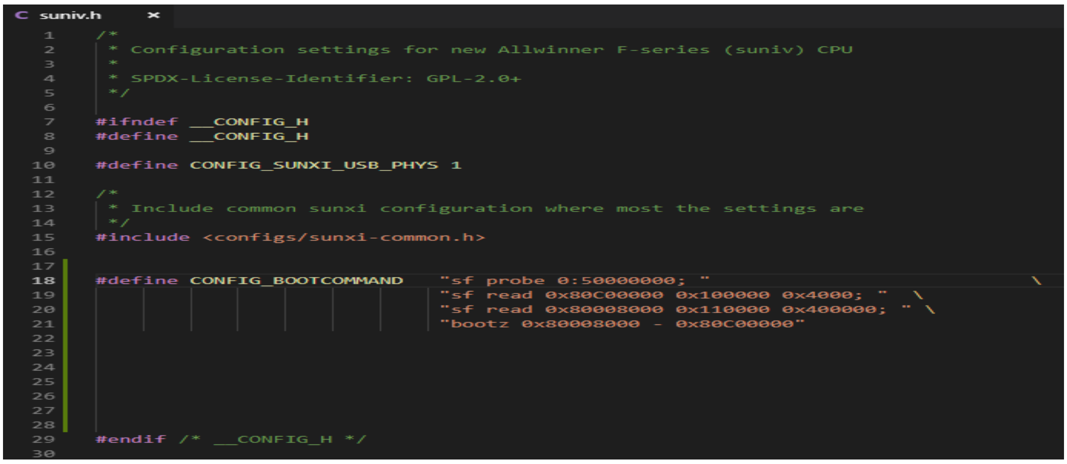
在 uboot 源码目录下 进入 ./include/configs/

修改 suniv.h¶

```
 #define CONFIG_BOOTCOMMAND     "sf probe 0:50000000; "                              \
                         "sf read 0x80C00000 0x100000 0x4000; "   \
```

"sf read 0x80008000 0x110000 0x400000; " \

"bootz 0x80008000 - 0x80C00000"



```c
/*
 * Configuration settings for new Allwinner F-series (suniv) CPU
 *
 * SPDX-License-Identifier: GPL-2.0+
 */

#ifndef __CONFIG_H
#define __CONFIG_H

#define CONFIG_SUNXI_USB_PHYS 1

/*
 * Include common sunxi configuration where most the settings are
 */
#include <configs/sunxi-common.h>

#define CONFIG_BOOTCOMMAND    "sf probe 0:50000000; "                  \
                              "sf read 0x80C00000 0x100000 0x4000; "   \
                              "sf read 0x80008000 0x110000 0x400000; " \
                              "bootz 0x80008000 - 0x80C00000"








#endif /* __CONFIG_H */
```

不知道对不对哦 这里…..

然后再进入 u-boot 文件夹

`make ARCH=arm menuconfig #配置`

取消勾选 [ ] Enable a default value for bootcmd

bootargs 修改

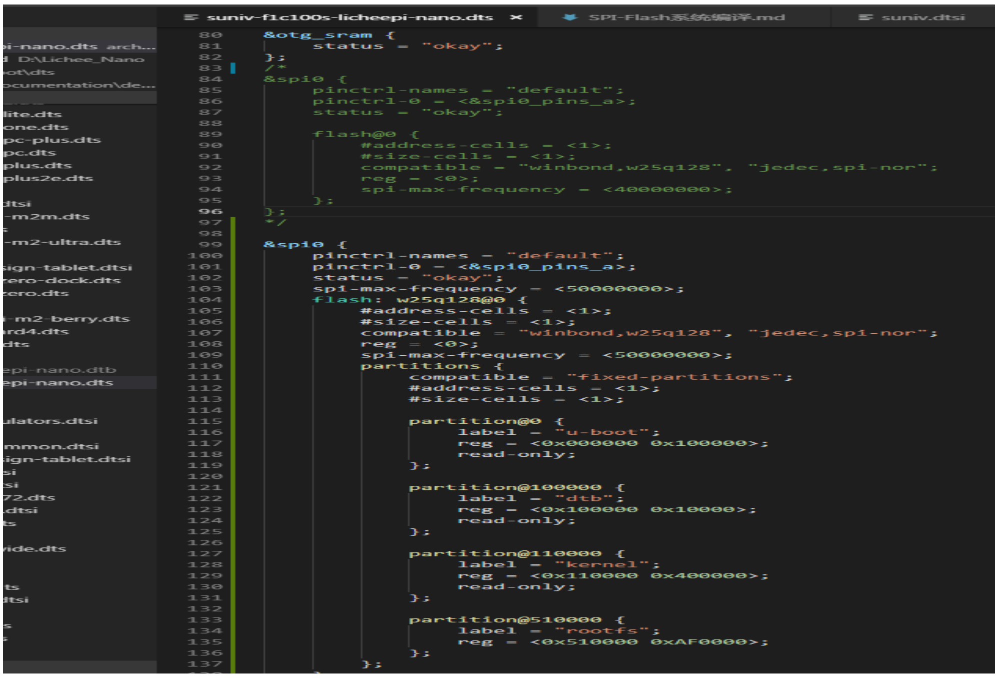
勾选 [*] Enable boot arguments；

在下方一项中填入 bootargs 参数:

console=ttyS0,115200 panic=5 rootwait root=/dev/mtdblock3 rw rootfstype=jffs2

接着 dts 修改 （这里是进入 linux 文件夹吧？）

修改内核源码目录下的 ./arch/arm/boot/dts/suniv-f1c100s-licheepi-nano.dts



```
&otg_sram {
	status = "okay";
};
/*
&spi0 {
	pinctrl-names = "default";
	pinctrl-0 = <&spi0_pins_a>;
	status = "okay";

	flash@0 {
		#address-cells = <1>;
		#size-cells = <1>;
		compatible = "winbond,w25q128", "jedec,spi-nor";
		reg = <0>;
		spi-max-frequency = <40000000>;
	};
};
*/

&spi0 {
	pinctrl-names = "default";
	pinctrl-0 = <&spi0_pins_a>;
	status = "okay";
	spi-max-frequency = <50000000>;
	flash: w25q128@0 {
		#address-cells = <1>;
		#size-cells = <1>;
		compatible = "winbond,w25q128", "jedec,spi-nor";
		reg = <0>;
		spi-max-frequency = <50000000>;
		partitions {
			compatible = "fixed-partitions";
			#address-cells = <1>;
			#size-cells = <1>;

			partition@0 {
				label = "u-boot";
				reg = <0x000000 0x100000>;
				read-only;
			};

			partition@100000 {
				label = "dtb";
				reg = <0x100000 0x10000>;
				read-only;
			};

			partition@110000 {
				label = "kernel";
				reg = <0x110000 0x400000>;
				read-only;
			};

			partition@510000 {
				label = "rootfs";
				reg = <0x510000 0xAF0000>;
			};
		};
```

请问这里对吗？是这样操作吗？

接着下一步

内核配置修改

我是用 主线 linux 编译里的配置指令(不知道对否？)

```
make ARCH=arm menuconfig
```

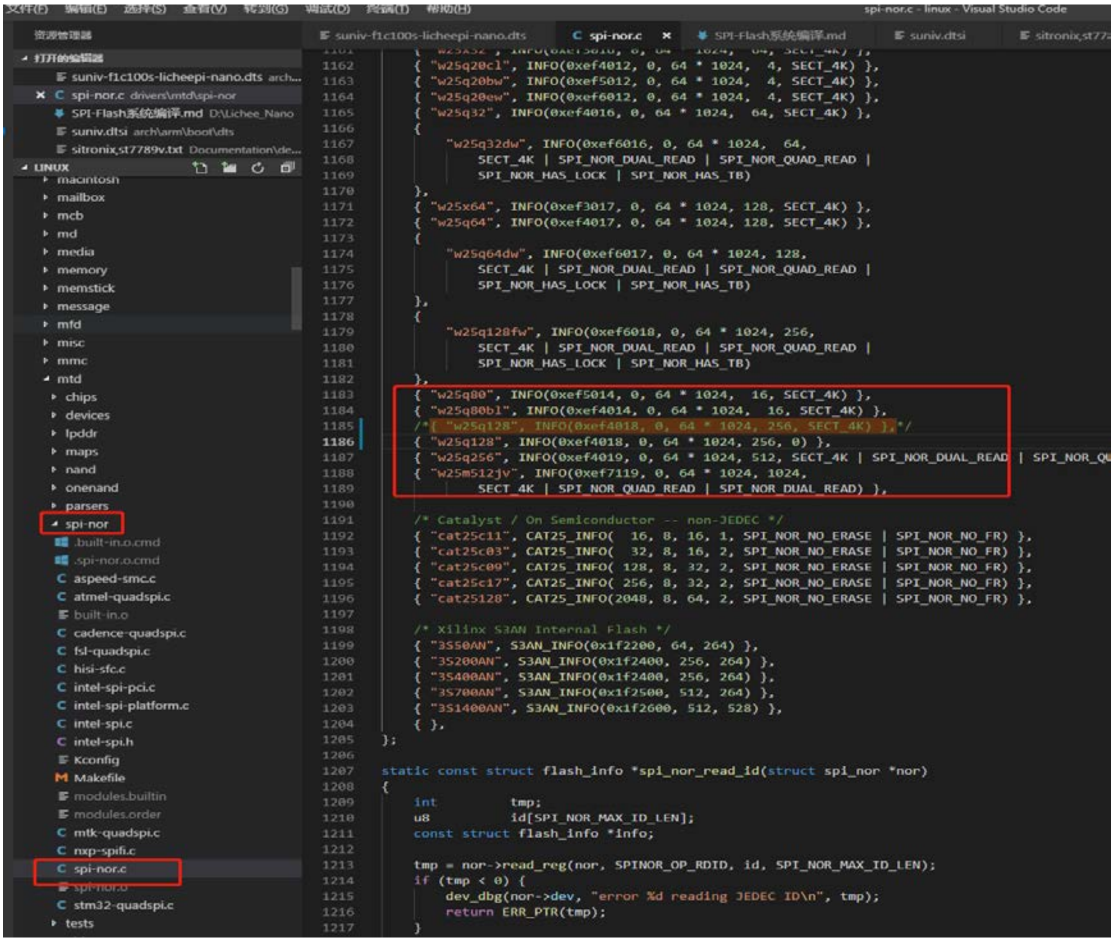
勾选 File systems ‣ Miscellaneous filesystems ‣ Journalling Flash File System v2 (JFFS2) support

接着就是：

修改源码下的 ./drivers/mtd/spi-nor.c （是在 linux 文件夹下吧？但是我这边还多了层文件夹 spi-nor）

修改对应 spi-flash；如 w25q128：

```
{ "w25q128", INFO(0xef4018, 0, 64 * 1024, 256, SECT_4K) },
// 修改为 （不使用 sector，使用块擦除）：
{ "w25q128", INFO(0xef4018, 0, 64 * 1024, 256, 0) },
```



```
	{ "w25q20cl", INFO(0xef4012, 0, 64 * 1024,  4, SECT_4K) },
	{ "w25q20bw", INFO(0xef5012, 0, 64 * 1024,  4, SECT_4K) },
	{ "w25q20ew", INFO(0xef6012, 0, 64 * 1024,  4, SECT_4K) },
	{ "w25q32", INFO(0xef4016, 0, 64 * 1024,  64, SECT_4K) },
	{
		"w25q32dw", INFO(0xef6016, 0, 64 * 1024,  64,
			SECT_4K | SPI_NOR_DUAL_READ | SPI_NOR_QUAD_READ |
			SPI_NOR_HAS_LOCK | SPI_NOR_HAS_TB)
	},
	{ "w25x64", INFO(0xef3017, 0, 64 * 1024, 128, SECT_4K) },
	{ "w25q64", INFO(0xef4017, 0, 64 * 1024, 128, SECT_4K) },
	{
		"w25q64dw", INFO(0xef6017, 0, 64 * 1024, 128,
			SECT_4K | SPI_NOR_DUAL_READ | SPI_NOR_QUAD_READ |
			SPI_NOR_HAS_LOCK | SPI_NOR_HAS_TB)
	},
	{
		"w25q128fw", INFO(0xef6018, 0, 64 * 1024, 256,
			SECT_4K | SPI_NOR_DUAL_READ | SPI_NOR_QUAD_READ |
			SPI_NOR_HAS_LOCK | SPI_NOR_HAS_TB)
	},
	{ "w25q80", INFO(0xef5014, 0, 64 * 1024,  16, SECT_4K) },
	{ "w25q80bl", INFO(0xef4014, 0, 64 * 1024,  16, SECT_4K) },
	/*{ "w25q128", INFO(0xef4018, 0, 64 * 1024, 256, SECT_4K) },*/
	{ "w25q128", INFO(0xef4018, 0, 64 * 1024, 256, 0) },
	{ "w25q256", INFO(0xef4019, 0, 64 * 1024, 512, SECT_4K | SPI_NOR_DUAL_READ | SPI_NOR_QU
	{ "w25m512jv", INFO(0xef7119, 0, 64 * 1024, 1024,
			SECT_4K | SPI_NOR_QUAD_READ | SPI_NOR_DUAL_READ) },

	/* Catalyst / On Semiconductor -- non-JEDEC */
	{ "cat25c11", CAT25_INFO(  16, 8, 16, 1, SPI_NOR_NO_ERASE | SPI_NOR_NO_FR) },
	{ "cat25c03", CAT25_INFO(  32, 8, 16, 2, SPI_NOR_NO_ERASE | SPI_NOR_NO_FR) },
	{ "cat25c09", CAT25_INFO( 128, 8, 32, 2, SPI_NOR_NO_ERASE | SPI_NOR_NO_FR) },
	{ "cat25c17", CAT25_INFO( 256, 8, 32, 2, SPI_NOR_NO_ERASE | SPI_NOR_NO_FR) },
	{ "cat25128", CAT25_INFO(2048, 8, 64, 2, SPI_NOR_NO_ERASE | SPI_NOR_NO_FR) },

	/* Xilinx S3AN Internal Flash */
	{ "3S50AN", S3AN_INFO(0x1f2200, 64, 264) },
	{ "3S200AN", S3AN_INFO(0x1f2400, 256, 264) },
	{ "3S400AN", S3AN_INFO(0x1f2400, 256, 264) },
	{ "3S700AN", S3AN_INFO(0x1f2500, 512, 264) },
	{ "3S1400AN", S3AN_INFO(0x1f2600, 512, 528) },
	{ },
};

static const struct flash_info *spi_nor_read_id(struct spi_nor *nor)
{
	int			tmp;
	u8			id[SPI_NOR_MAX_ID_LEN];
	const struct flash_info *info;

	tmp = nor->read_reg(nor, SPINOR_OP_RDID, id, SPI_NOR_MAX_ID_LEN);
	if (tmp < 0) {
		dev_dbg(nor->dev, "error %d reading JEDEC ID\n", tmp);
		return ERR_PTR(tmp);
	}
```

是这样吗？

接下来

接下来就是把 uboot , dtb ,linux, 根文件系统 重新编译一次吧？

然后就是 合成 bin 文件

```
YOUR_IMG_FILE=flashimg.bin

YOUR_UBOOT_FILE=~/Works/LicheeNano/1.SYSKIT/u-boot/u-boot-sunxi-with-spl.bin

YOUR_DTB_FILE=~/Works/LicheeNano/1.SYSKIT/linux/arch/arm/boot/dts/suniv-f1c100s-licheepi-nano.dtb

YOUR_KERNEL_FILE=~/Works/LicheeNano/1.SYSKIT/linux/arch/arm/boot/zImage

YOUR_ROOTFS_FILE=~/Works/LicheeNano/1.SYSKIT/buildroot-2017.08/output/images/rootfs.tar


dd if=/dev/zero of=flashimg.bin bs=1M count=16

dd if=$YOUR_UBOOT_FILE of=flashimg.bin bs=1K conv=notrunc

dd if=$YOUR_DTB_FILE of=flashimg.bin bs=1K seek=1024   conv=notrunc

dd if=$YOUR_KERNEL_FILE of=flashimg.bin bs=1K seek=1088   conv=notrunc

mkdir rootfs

tar -xzvf $YOUR_ROOTFS_FILE -C ./rootfs

#cp -r $YOUR_MOD_FILE   rootfs/lib/modules/
```

（这个文件不知道是指哪个..所以就没管他了）

```
mkfs.jffs2 -s 0x100 -e 0x10000 --pad=0xAF0000 -d rootfs/ -o jffs2.img

dd if=jffs2.img of=$YOUR_IMG_FILE   bs=1K seek=5184   conv=notrunc
```

做成.sh 脚本 LF 行尾 运行

得到文件：

```
16777216 3 月     4 20:05 flashimg.bin
```

这回应该对了吧

执行

```
sf probe 0;sf erase 0 0x100000;reset
```

进入 FEL 模式

烧写

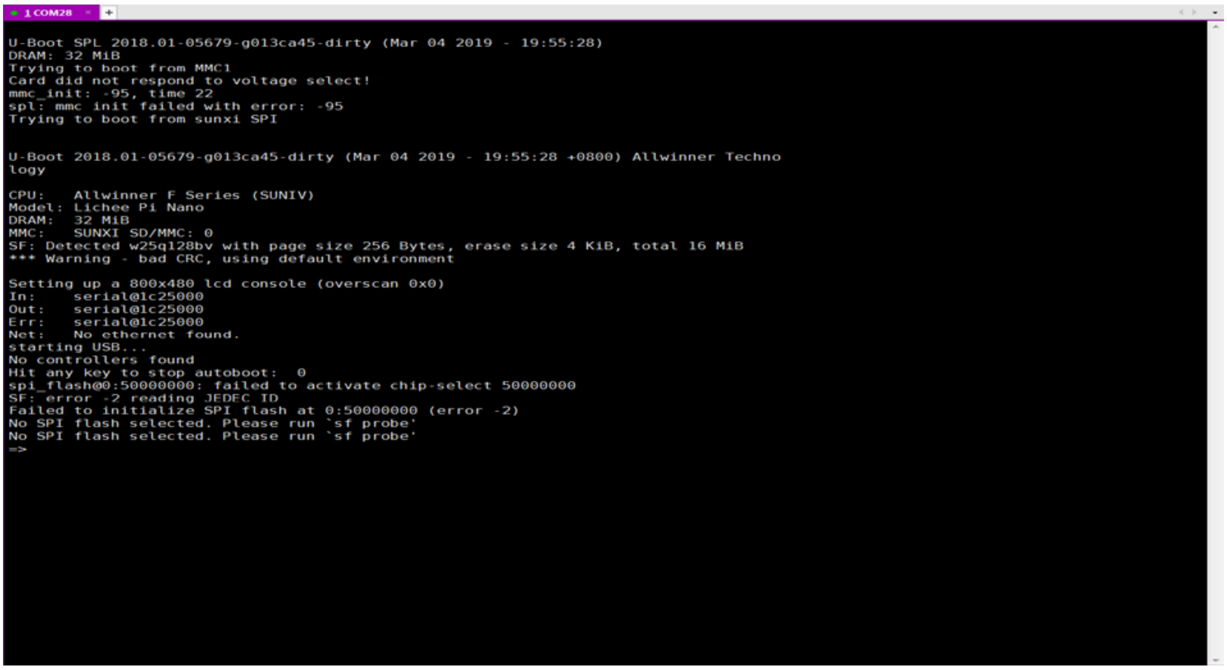
```
./sunxi-fel.exe   -p spiflash-write 0 z:/~/Works/LicheeNano/1.SYSKIT/FLASHTOOL/flashimg.bin
```

等待……….

伤心…..

还是不行…

看下图

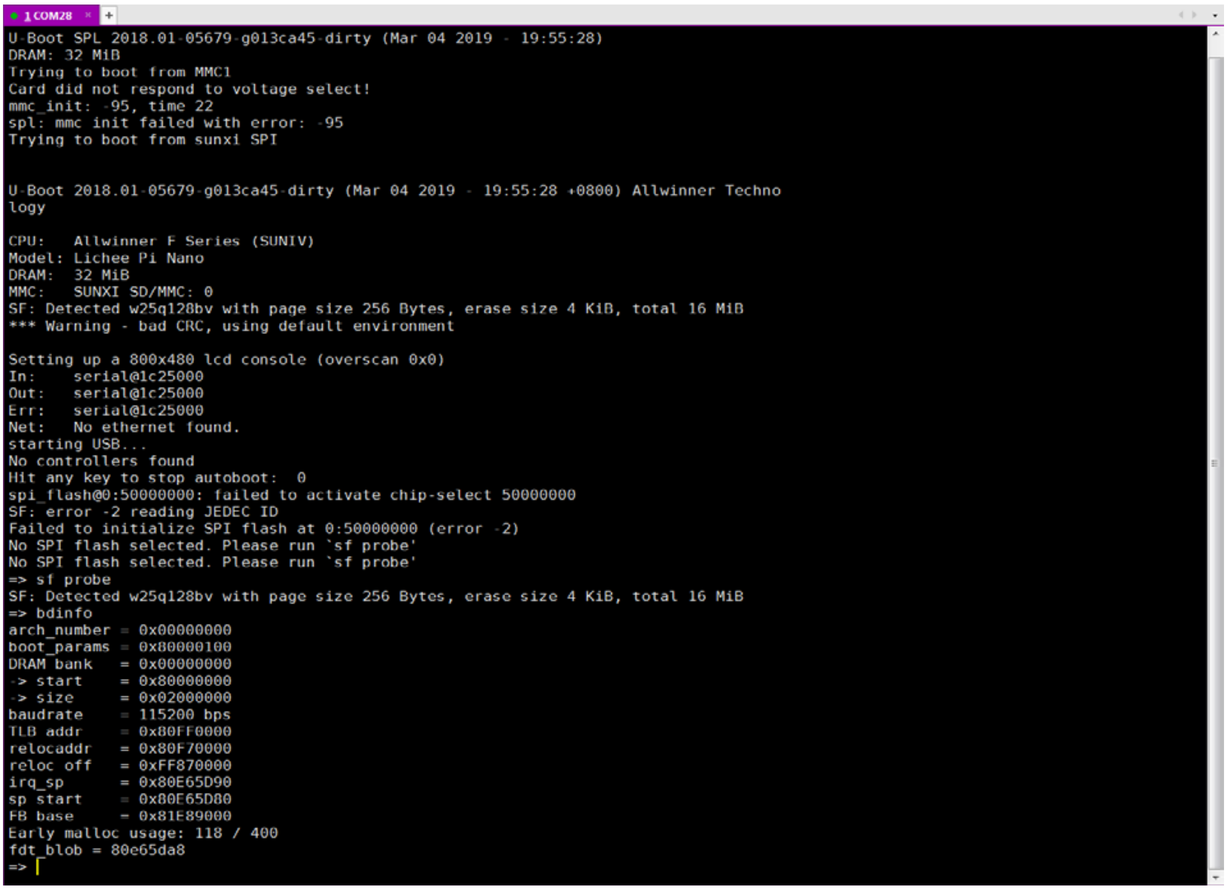


```
U-Boot SPL 2018.01-05679-g013ca45-dirty (Mar 04 2019 - 19:55:28)
DRAM: 32 MiB
Trying to boot from MMC1
Card did not respond to voltage select!
mmc_init: -95, time 22
spl: mmc init failed with error: -95
Trying to boot from sunxi SPI


U-Boot 2018.01-05679-g013ca45-dirty (Mar 04 2019 - 19:55:28 +0800) Allwinner Techno
logy

CPU:   Allwinner F Series (SUNIV)
Model: Lichee Pi Nano
DRAM:  32 MiB
MMC:   SUNXI SD/MMC: 0
SF: Detected w25q128bv with page size 256 Bytes, erase size 4 KiB, total 16 MiB
*** Warning - bad CRC, using default environment

Setting up a 800x480 lcd console (overscan 0x0)
In:    serial@1c25000
Out:   serial@1c25000
Err:   serial@1c25000
Net:   No ethernet found.
starting USB...
No controllers found
Hit any key to stop autoboot:  0
spi_flash@0:50000000: failed to activate chip-select 50000000
SF: error -2 reading JEDEC ID
Failed to initialize SPI flash at 0:50000000 (error -2)
No SPI flash selected. Please run `sf probe'
No SPI flash selected. Please run `sf probe'
=>
```



```
U-Boot SPL 2018.01-05679-g013ca45-dirty (Mar 04 2019 - 19:55:28)
DRAM: 32 MiB
Trying to boot from MMC1
Card did not respond to voltage select!
mmc_init: -95, time 22
spl: mmc init failed with error: -95
Trying to boot from sunxi SPI


U-Boot 2018.01-05679-g013ca45-dirty (Mar 04 2019 - 19:55:28 +0800) Allwinner Techno
logy

CPU:   Allwinner F Series (SUNIV)
Model: Lichee Pi Nano
DRAM:  32 MiB
MMC:   SUNXI SD/MMC: 0
SF: Detected w25q128bv with page size 256 Bytes, erase size 4 KiB, total 16 MiB
*** Warning - bad CRC, using default environment

Setting up a 800x480 lcd console (overscan 0x0)
In:    serial@1c25000
Out:   serial@1c25000
Err:   serial@1c25000
Net:   No ethernet found.
starting USB...
No controllers found
Hit any key to stop autoboot:  0
spi_flash@0:50000000: failed to activate chip-select 50000000
SF: error -2 reading JEDEC ID
Failed to initialize SPI flash at 0:50000000 (error -2)
No SPI flash selected. Please run `sf probe'
No SPI flash selected. Please run `sf probe'
=> sf probe
SF: Detected w25q128bv with page size 256 Bytes, erase size 4 KiB, total 16 MiB
=> bdinfo
arch_number = 0x00000000
boot_params = 0x80000100
DRAM bank   = 0x00000000
-> start    = 0x80000000
-> size     = 0x02000000
baudrate    = 115200 bps
TLB addr    = 0x80FF0000
relocaddr   = 0x80F70000
reloc off   = 0xFF870000
irq_sp      = 0x80E65D90
sp start    = 0x80E65D80
FB base     = 0x81E89000
Early malloc usage: 118 / 400
fdt_blob = 80e65da8
=>
```