2.1.2 Setup Operating System onto the Orange Pi 3 LTS

Foreword

The *Orange Pi 3 LTS* hardware looks to be an interesting and *available* Single Board Computer (SBC). See http://www.orangepi.org/html/hardWare/computerAndMicrocontrollers/details/orange-pi-3-LTS.html for the hardware details.

[i ordered from https://de.aliexpress.com/store/group/OPI-3-LTS-8GB-EMMC/1553371_30000000040035.html with a plastic case for 50 EUR - including delivery in April 2022]

Not working builtin components

Be aware, that following things are **NOT** working with Linux:

- Headphone Audio
- MIC recording
- TV-OUT
- Mali GPU
- Video codec

The info about that can be found - sort of hidden - in the User Manual in chapter 3.2 `Linux4.9 kernel driver adaptation situation` of the file `OrangePi_3_LTS_H6_User manual_v1.0.pdf`. I realized that, when starting setup of Linux.
Happily, none of these are necessary for the FMLIST-Scanner.

Wiring

Wiring (ATX-buttons, LEDs or Piezo-buzzer) is tested meanwhile - but with **not so good** results:

Output / LEDs

Using https://github.com/orangepi-xunlong/wiringOP can set output pins, e.g. LEDs. This does work.

Tone output / Piezo buzzer

Ideally, this is done utilizing hardware PWM support - to save CPU interrupts. But i could not find any GPIO pin, capable of hardware PWM. Software/emulated PWM for the buzzer might work - haven't tested so far.

Input / ATX-knobs

Sensing/reading GPIO input with internal pull-up/down resistors doesn't work with the WiringOP library. This, ATX-button won't give correct state - without external resistors. See https://kalitut.com/raspberrypi-gpio-pull-up-pull-down-resistor/, how external resistor would need to be wired. I didn't try for now.

Upload of result - by pressing the button - won't work.
But, shutdown and reboot can be performed with the builtin *power switch*.

Resume

Happily, at least for static (non-mobile) use, you won't need any of LEDs, buzzer or ATX-knobs. Buzzer and LEDs are nice to see/hear some progress, but you can go mobile without .. and check progress through an internet connection over phone/tablet and WiFi.

Temperature

I would recommend some heatsinks for the CPU - as temperature does temporarily rise over 80°C. Ideally, i'd also suggest a CPU fan, but couldn't find a suitable housing.

Download the image

Orange Pi does provide an *Ubuntu Image* for the *Orange Pi 3 LTS* , labeled `updated: 2021-12-27` at http://www.orangepi.org/downloadresources/.

There is also a *Debian Image* ; but i did only try the Ubuntu one.

Following the *Ubuntu* download link to Google Drive, choose
`Orangepi3-lts_2.1.6_ubuntu_focal_server_linux5.10.75.7z`

(as i did), cause the scanner doesn't need a desktop.

Write to micro-SD card

Please follow the instructions in chapter 2 `Instructions to use the development board` of the user manual to write the image to a micro-SD card.

First boot from micro-SD card

You should be able to boot and login with one of following user accounts as described in the user manual

User	Password
root	orangepi
orangepi	orangepi

i strongly recommend to change the default passwords!

Default hostname is `orangepi3-lts`.

You should be able to connect with

```
ssh orangepi@orangepi3-lts
```

Flash image to eMMC

Follow the user manual chapter *3.33* to flash the image to the builtin eMMC, to allow using the micro-SD card slot for writing scanner results. That is with the command

```
nand-sata-install
```

I would recommend to select `f2fs`, the flash friendly filesystem, as target filesystem.

When finished, you should be able to boot without inserted *micro-SD card*.

System Update & Configuration

Please continue with 2.2 Setup on a pre-installed Pi or PC