* hardware
  + Breadboard prototype
    - ~~Uart interface~~
    - Slider input
    - ~~Sd output~~
    - Audio mux
    - Battery
    - Light
    - Indicator disp
    - Test software
      * Sd playing
      * Basic BT playing
      * Audio mixing
      * Slider test
      * Basic slider control
  + Mechanical design
    - Enclosure design
    - Transducer positioning
    - pcb outline
  + Schematic design
  + Pcb layout
    - Layout
    - Routing
    - check
* Software
  + Slider input
  + Menu system
    - Menus
    - Flow diagram
    - User output
  + Sd playing
    - Long file names
  + Bluetooth playing

PCB issues:

* USB D+ and D- swapped; incorrect schematic symbol
* Bm83 VBUS bypass cap not routed
* Cap touch mpr121 vreg capacitor can’t be 0.1uf or only max 4 elements can run at 1ms sample period or 9 at 128ms; all 12 work with 1uf at 16ms, but not 1ms

Hardware abstraction layer (drivers):

* RGB LED driver
  + setup
  + Power management- auto power off
  + Colour patterns
* TOUCH driver
  + Setup - calibration
  + Drift compensation
  + Conversion to slider
  + Power
* Power LED driver
  + Thermal sensing
  + Output - PWM
* VS1053B driver
  + SD IO
  + VS1053 config
  + Power management
  + Audio playing
* BM83 driver
  + Initialisation
  + Events
  + Controls
* System / Misc
  + Battery monitoring
  + Debug LED
  + USB status / Serial

UI system:

A picture containing graphical user interface

Description automatically generated

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

Input layers:

Switch between which input events are processed

* Buttons layer:
  + Button:
    - Singular element/ position range triggered
    - Boolean state event
  + Combo buttons:
    - Set pattern of element/ position ranges detected
    - Boolean state event
* Scroll layer:
  + Single scroll
    - One or more digits slides along the sensor.
    - Velocity based – based on touch point velocity not absolute position to prevent jumping between values
    - Value event for delta since [last event, or initial value]

Control scheme:

* Back button on element 0
* Quick access menu
  + Pause
  + Play
  + Seek
  + Volume
* Light shortcut