USB-Midi-Controller Workshop

Schedule

- Presentation
  - MIDI
  - Applications
  - Signalflow
  - Electronics Basics
  - Programming
  - Mapping in Software
  - Examples: Layouts, Cases
- Hacking

MIDI

- Protocol for Musical Information
  - Note on / Note off
  - Controllchange
- Hardwarespecification
  - MIDI
  - USB-MIDI
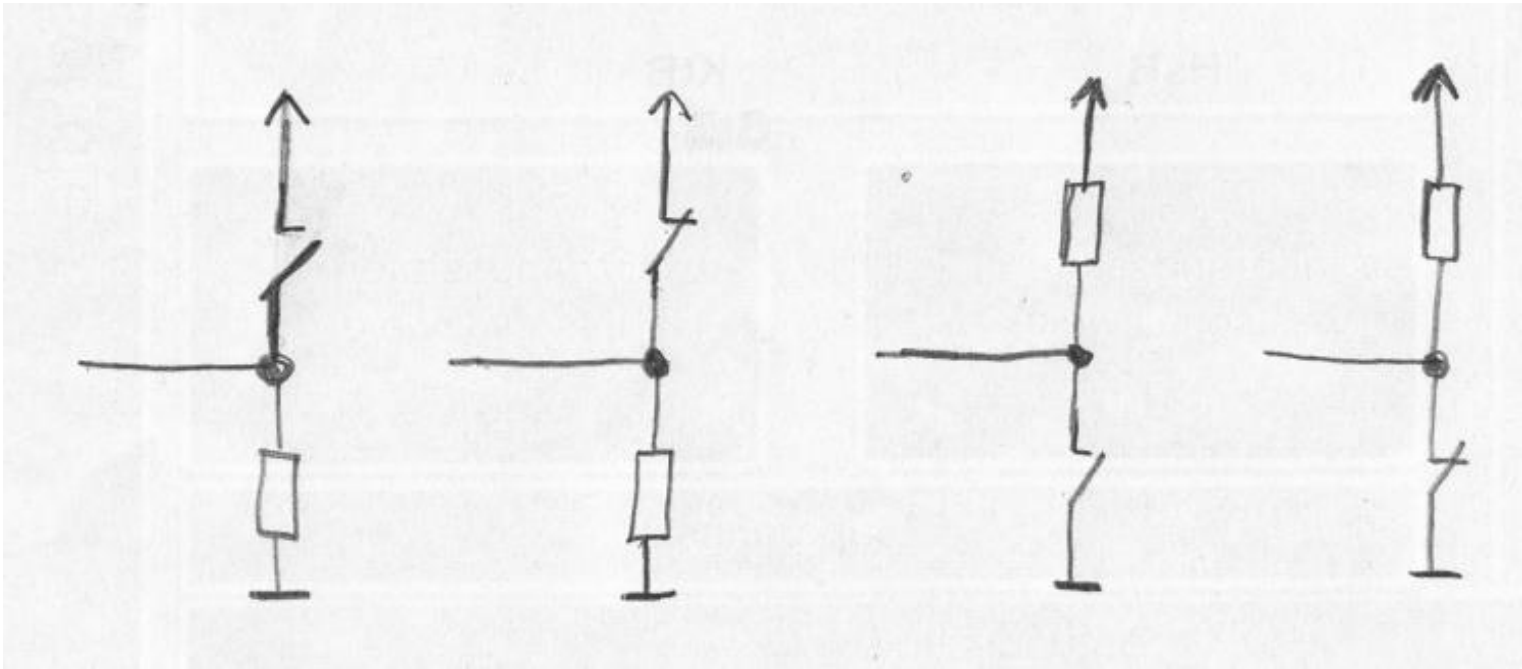 - USB-Serial with Converter

Applications

- DJ
- VJ
- Musicplayer
- ???

Signalflow

- Detect Input with Arduino
- Preprocessing in Arduino (Debounce etc.)
  - SerialMIDIElements-Library
- Send MIDI-Data via USB-Serial
  - SerialMIDIElements-Library
- Receive MIDI-Data at PC and convert to MIDI-Message for the Music-Software
  - Linux/Mac: Hairless MIDI
  - Linux: ttymidi
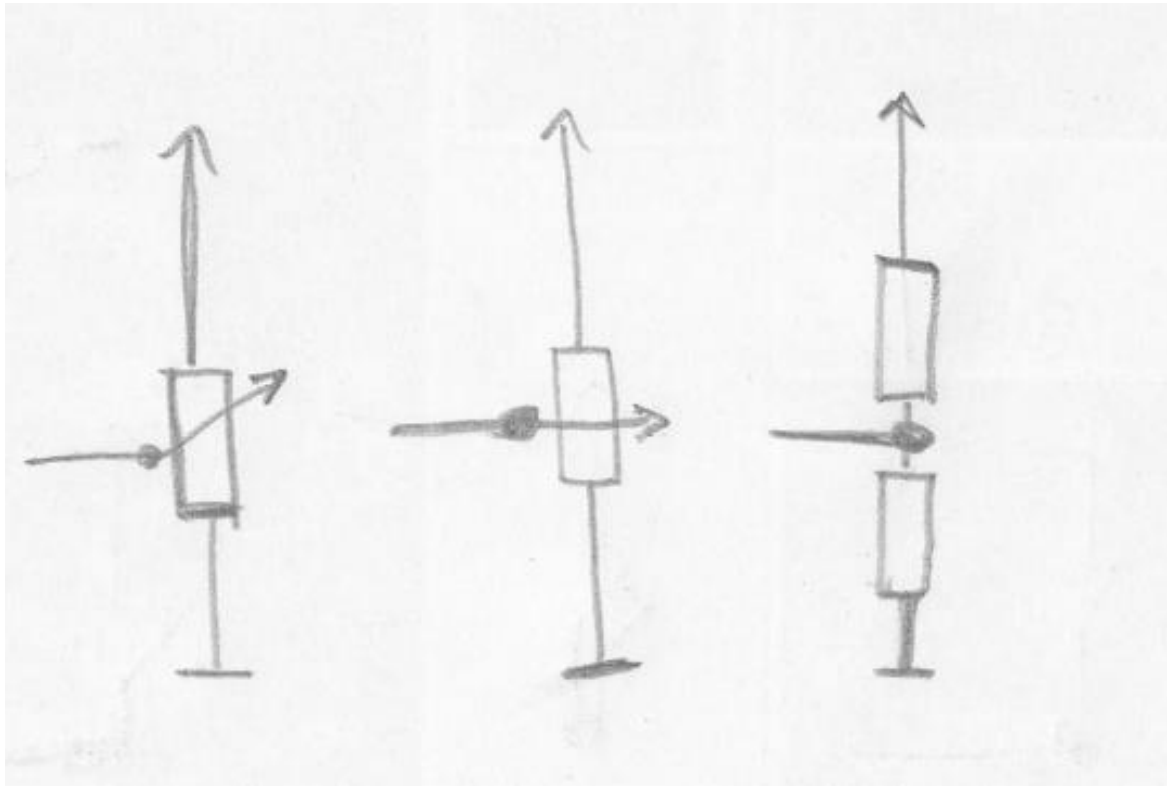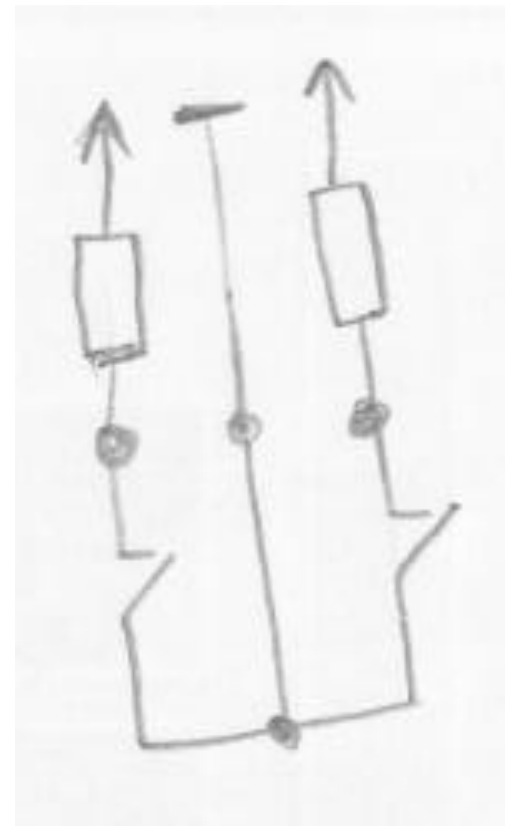 - Windows: Hairless MIDI + LoopBe Virtual Midi
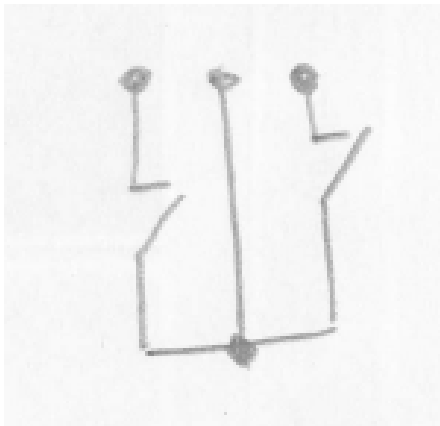
Electronics

- Buttons

Electronics

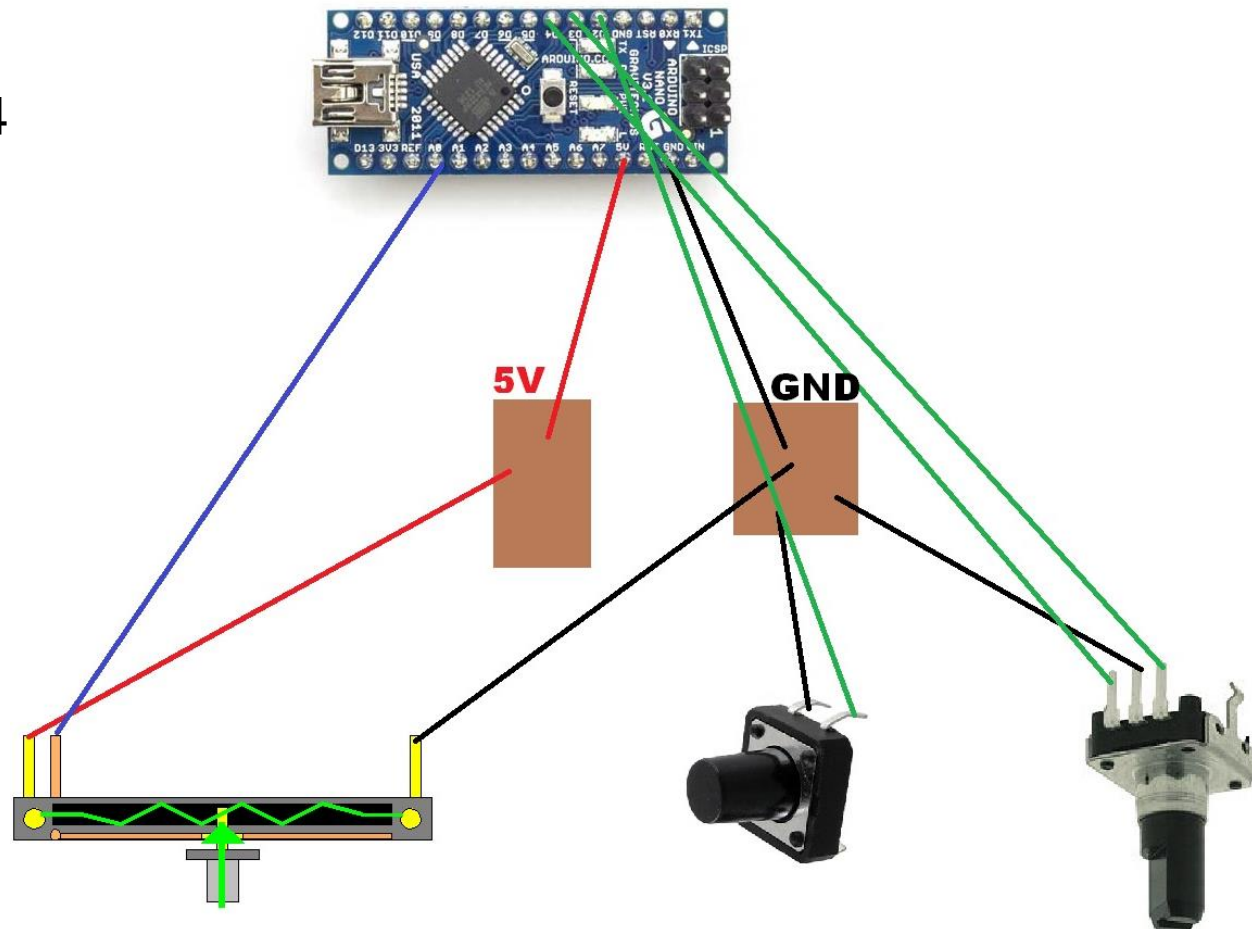- Potentiometers

Electronics

- Encoders

Electronics

- ## Basic-Circuit

- Button on Pin 2

- Encoder on Pins 3,4

- Pot on Pin A0

(A6 & A7) analog only!

Programming

- SerialMIDIElements-Library
  - Classes which handle everything
  - Buttons, Potentiometers, Encoders
- Just three steps needed:
    1. Include MIDIElementsFSA header
    2. Setup a Button/Pot/Encoder
    3. Read specific Button/Pot/Encoder in Loop

Programming

```
#include <SerialMIDIElements.h>

boolean debug       = false;    // print to serial instead of midi
boolean secondary   = false;    // disabled secondary midi messages
int     midiChannel = 1;        // midi  channel number

// setup a button on Arduino-pin 2 on for ControlChange 1
Button          but1(2,    midiChannel,1,secondary,debug);
// setup a Encoder on Arduino-pin 6 and 7 for ControlChange 11
MIDIEncoder     enc1(3,4,  midiChannel,11,secondary, debug);
// setup a Potentiometer on Arduino-pin analog0 on for ControlChange 21
Potentiometer pot1(A0,    midiChannel,21,secondary,debug);

void setup(){
  Serial.begin(115200);
}

void loop(){
  // add here all the input component reads
  but1.read();
  enc1.read();
  pot1.read(); // read knob and send midi messages

}
```
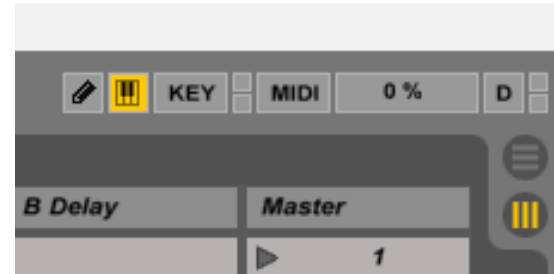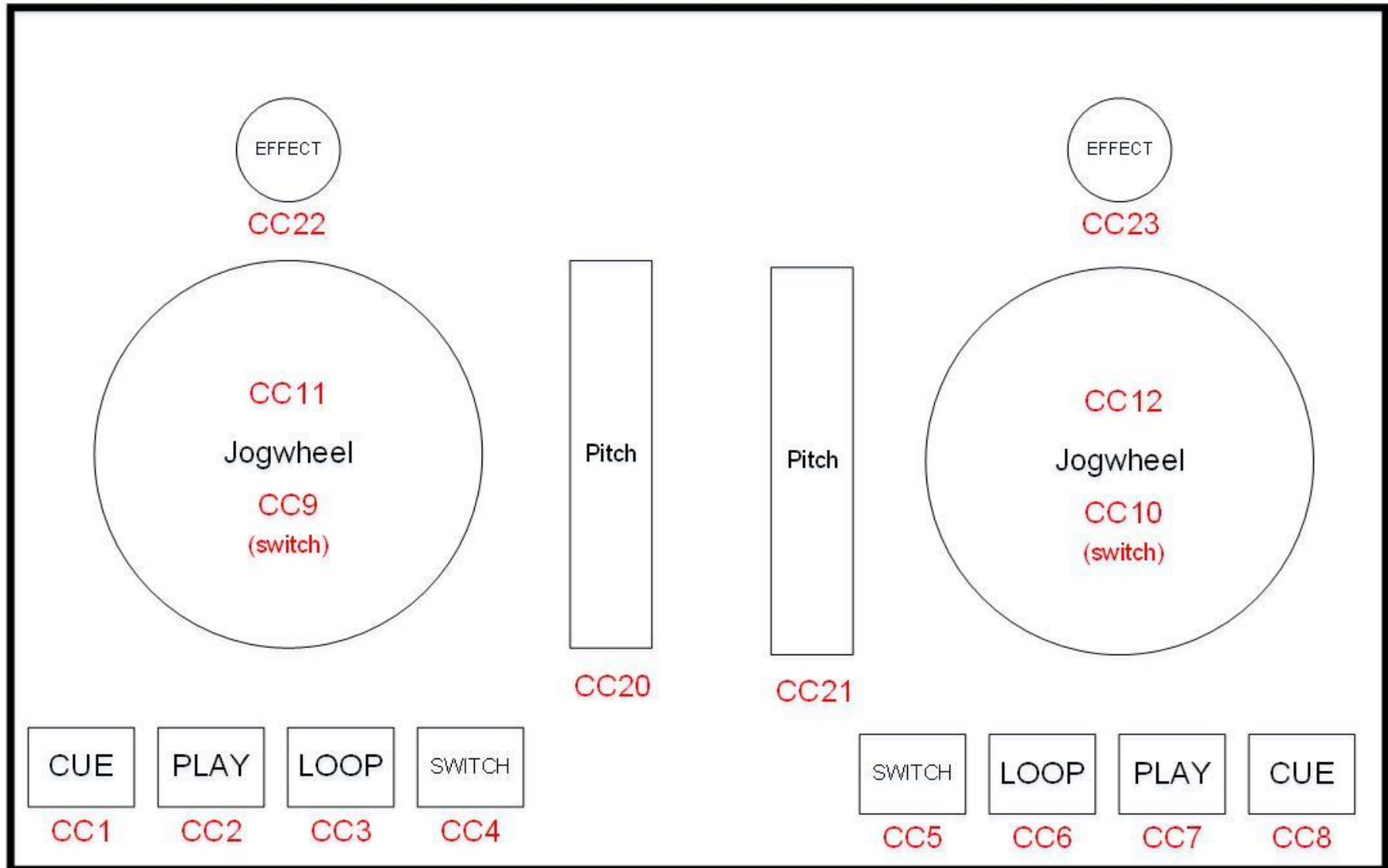
Mapping

- Ableton
  - Use Midi-Map Button
- Traktor
  - Mapping in „Controller Manager"
- Mixxx
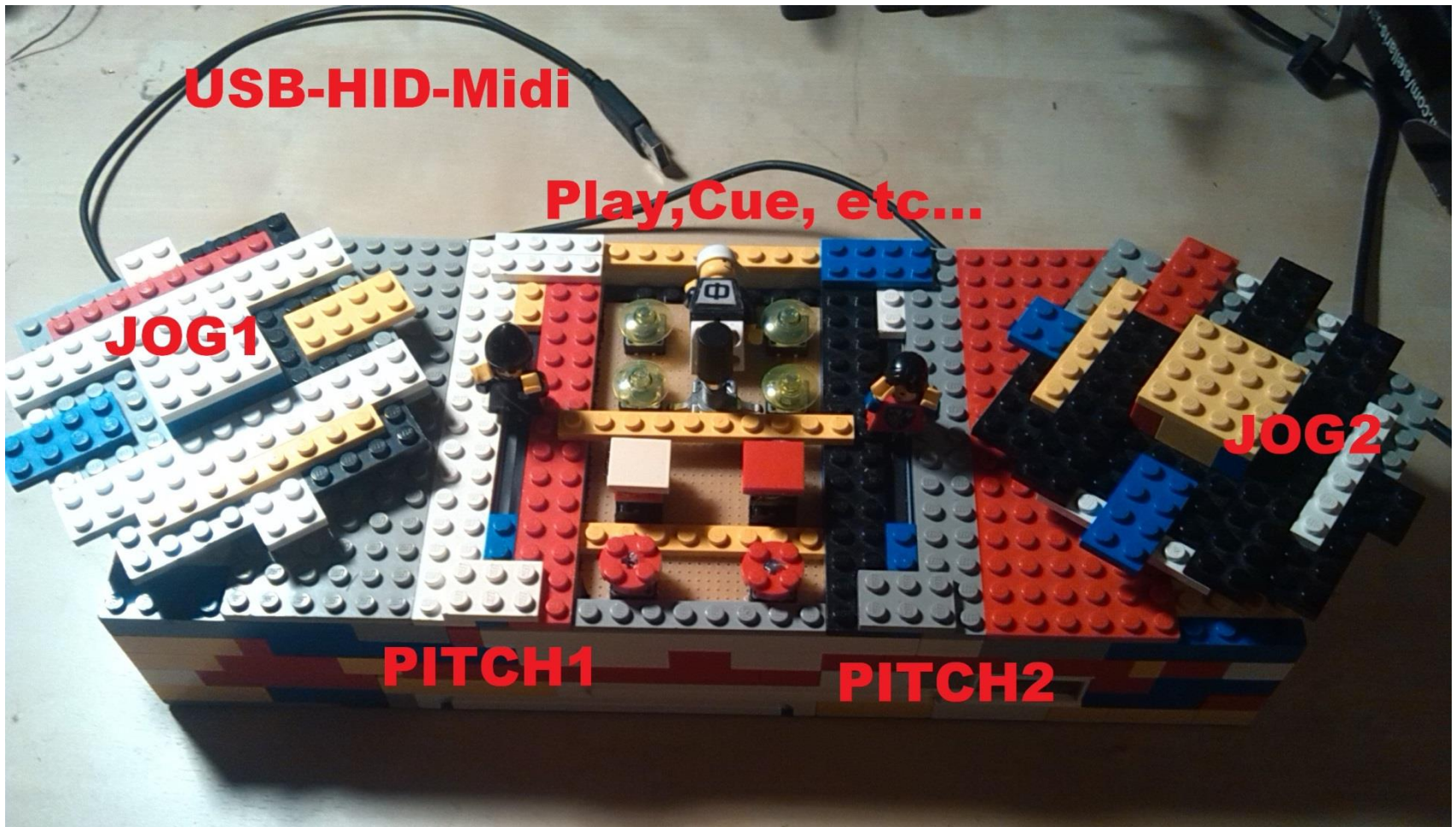 - Learning-Assistant in Controller-Options

Examples

Examples

Examples

– Happy Hacking!