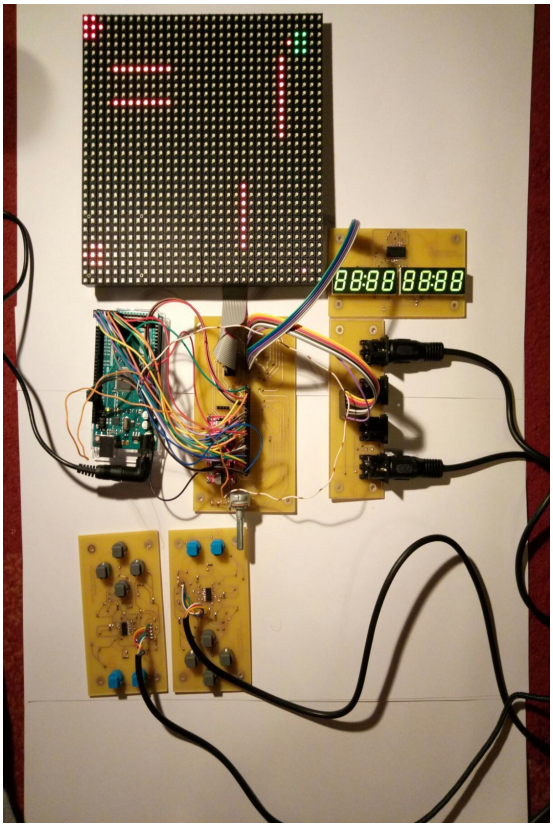
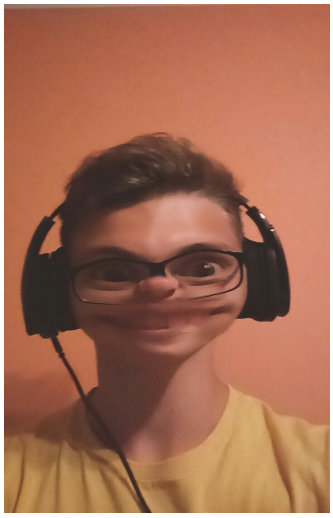
RGB-LED-Matrix-Console



CONTENTS

1) project team

Mujic Haris, builder of boards,



Karayanov Vitaliy, programmer and support,

Pucher Jonas, drawer of diagrams and layouts,

2) project description, idea

2.1) basic concept

We want to construct a game-console using a 32x32 RGB-LED-Matrix for graphics and four controllers with four controlbuttons and two actionbuttons each. We also want to add a 7-segments-display for scores, health etc.

2.2) final product

It's like the basic concept said, but the 7-segments-display doesn't work while controling the matrix. There is no package.

2.3) feedback

// TODO

3) daily construction records

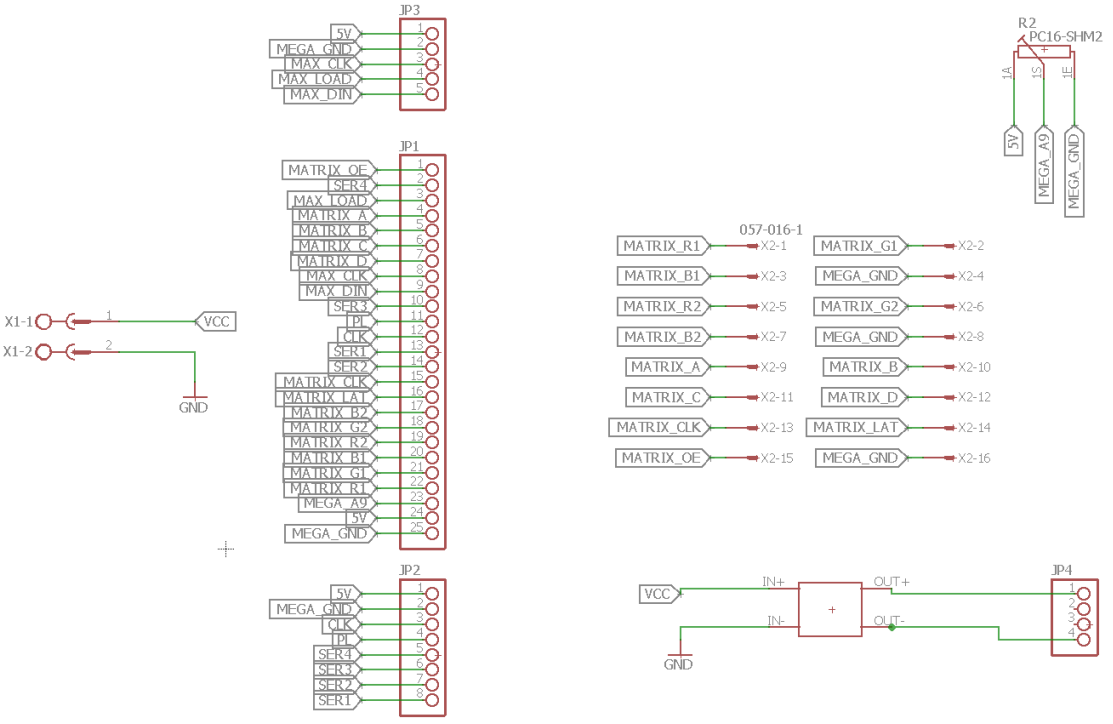
03.03.2017, creating the concept, searching for parts
03.10.2017, splitting the 6-man-group into two 3-man-groups, starting to create the circuit diagram
03.31.2017, completed partslist and controller-layout
04.21.2017, completed boards and soldering of contacts between top and bottom
05.05.2017, programming and mounting of the parts
// TODO: KW9, KW11, KW12, KW14, KW15, KW17, KW19, KW20

4) instruction manual

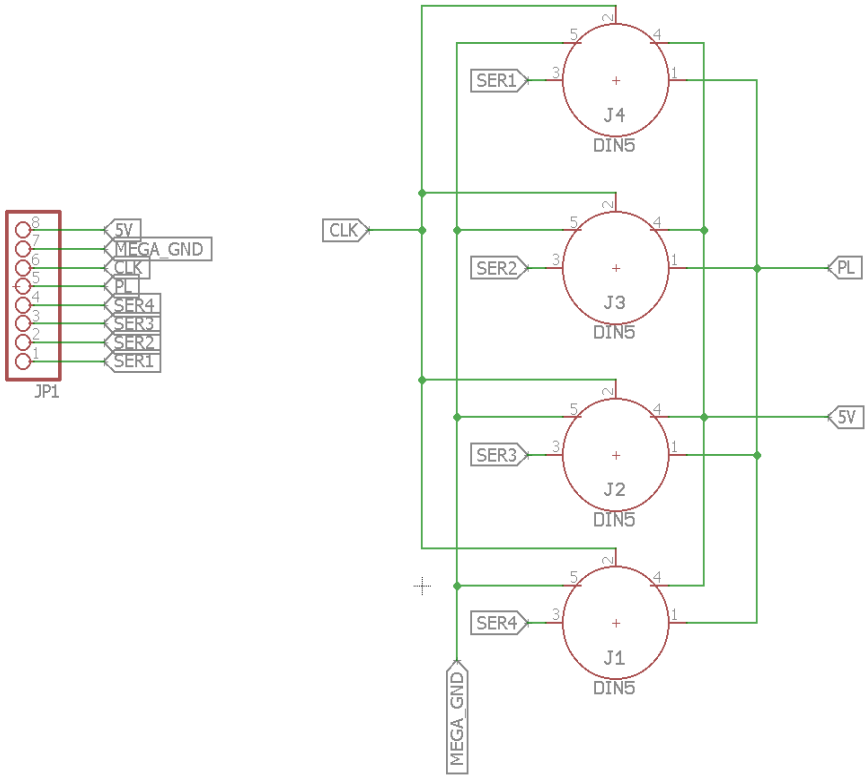
1. You just have to connect the power supply with a 230V 50Hz supply.
2. You will land in the game-selection-menu
    1. There you can navigate through the different games with the left and right control-buttons (gray).
    2. To choose a game you simply push the lower blue button.
3. Now you are in a game
    1. Tanks
        1. It's a four player game. You control a tank with the gray buttons and you can shoot with the lower blue button.
        2. To win a game you have to hit the other tanks until you are the last one.

5) circuit, layout

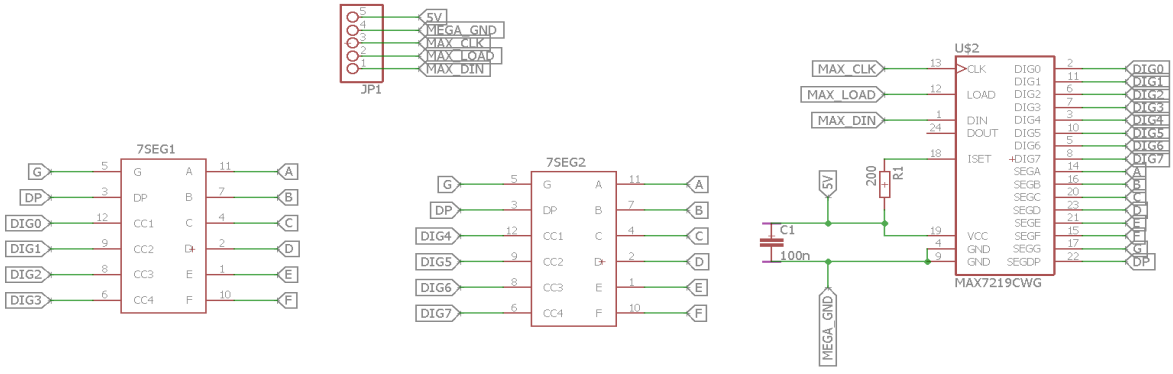
5.1) circuit



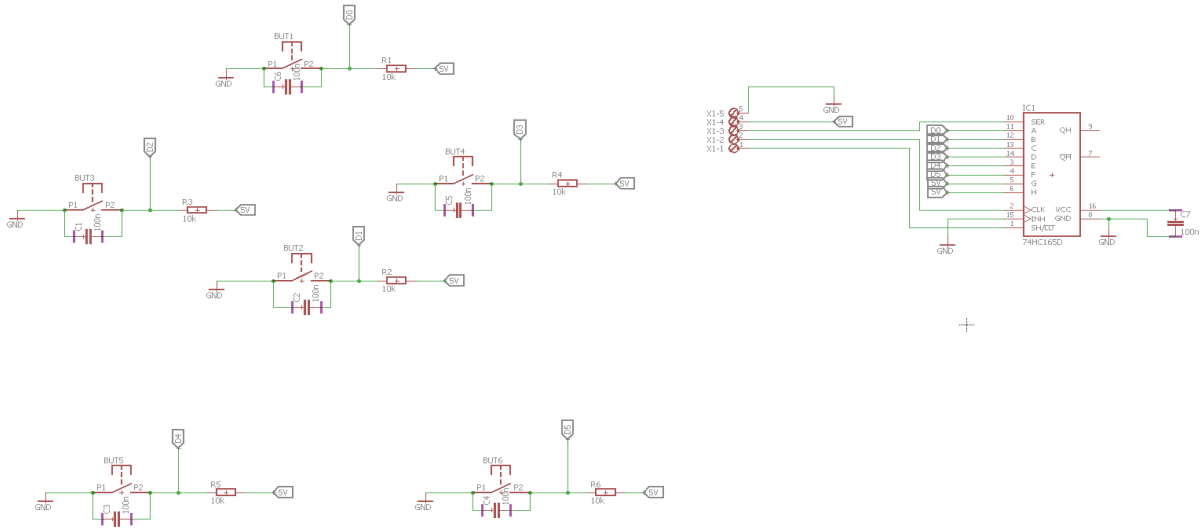
console.sch
This is the main board which consists of a power supply, a voltage stabilizer and a few pin header to connect everything.



console1.sch
This board consists of the controller-jacks and a pin header to connect it with the main board.



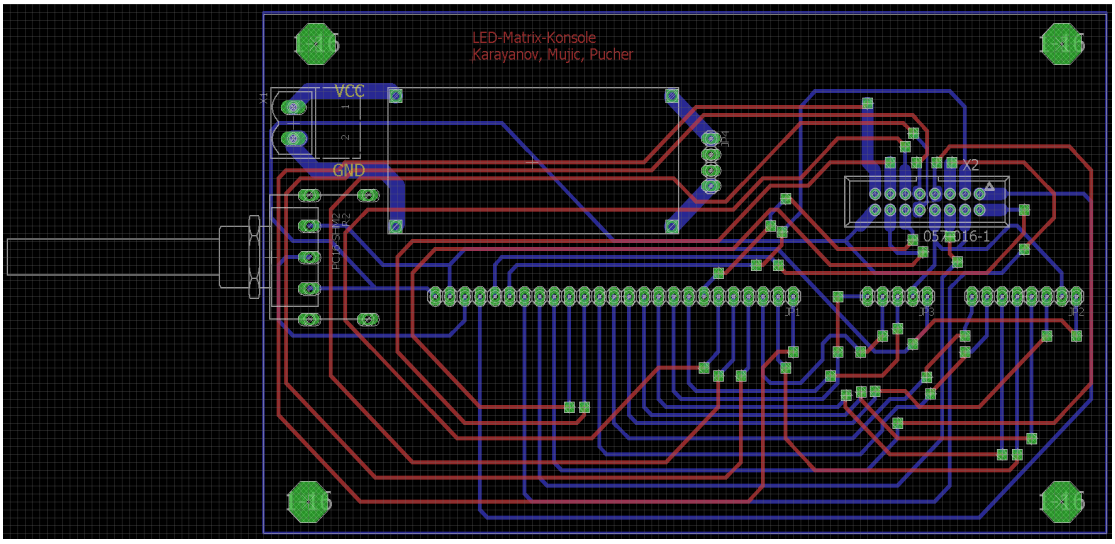
console2.sch
This board consists of two 4-digit-7-segments-displays, a MAX71219-IC to control these and a pin header to connect it with the main board.



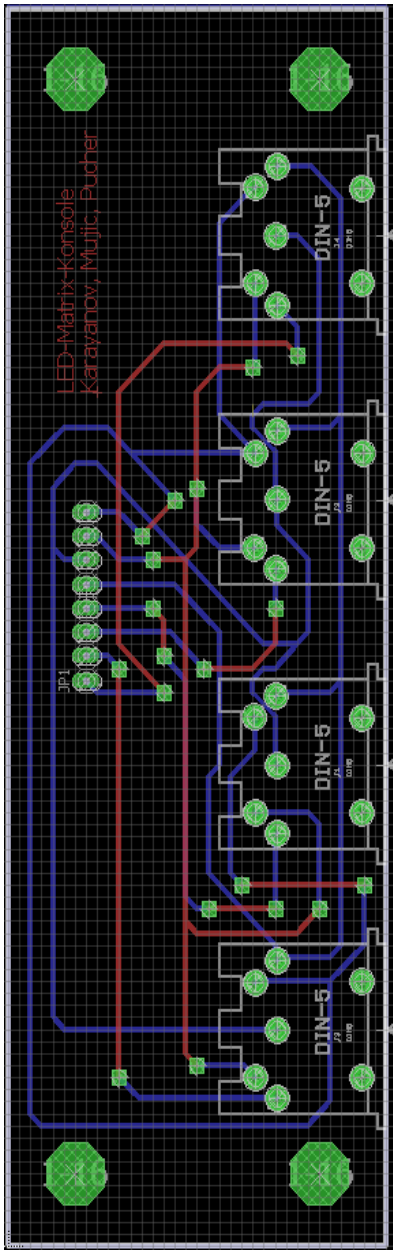
controller.sch

This is the board of the controller which consists of 6 buttons with the pull-up-resistors and debouncing capacitors. There is also a 74HC165-shift register totransmit the button states to the arduino.

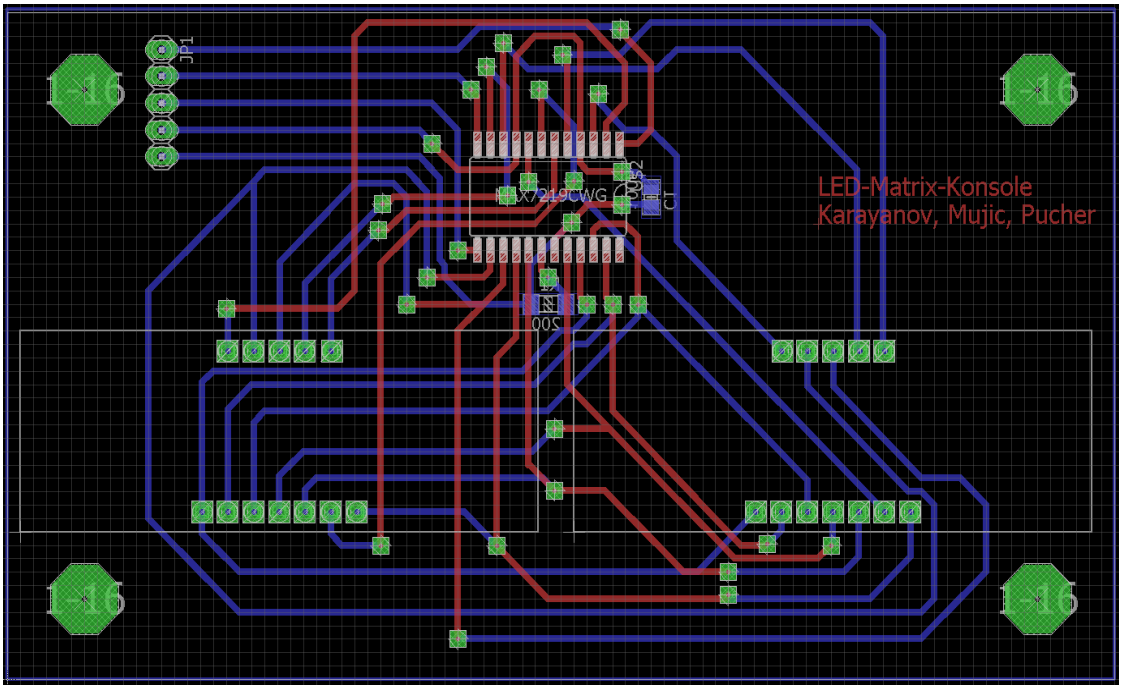
5.2) layout



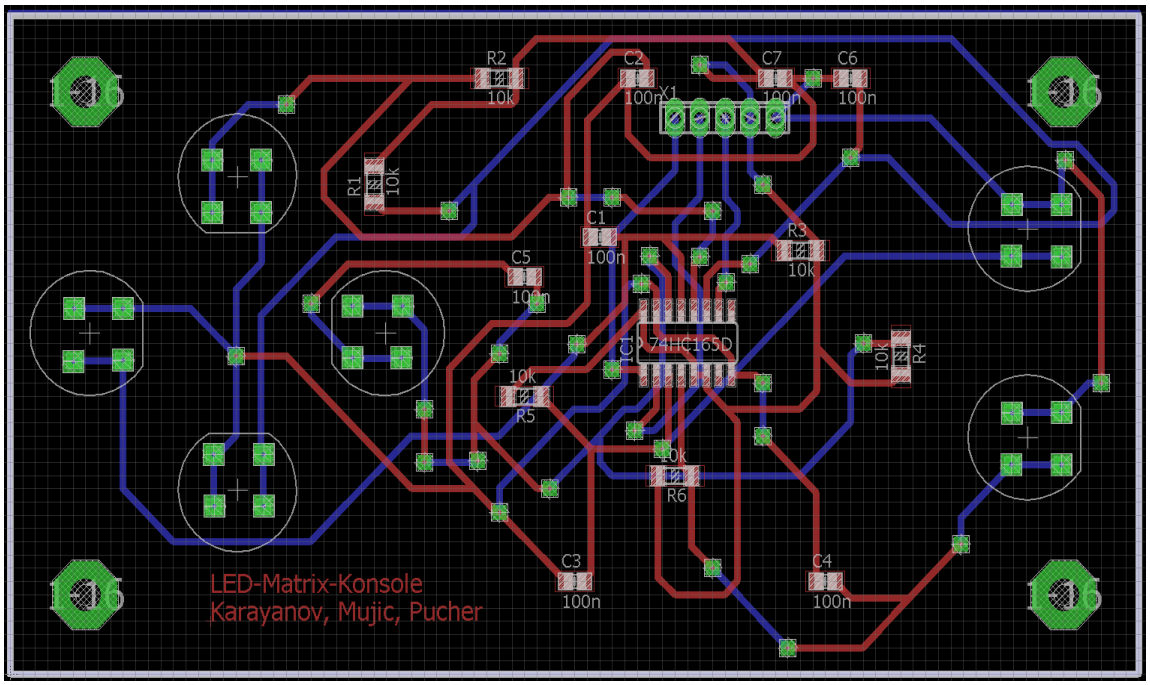
console.brd



console1.brd



console2.brd



controller.brd

6) plans, calculations, parts list

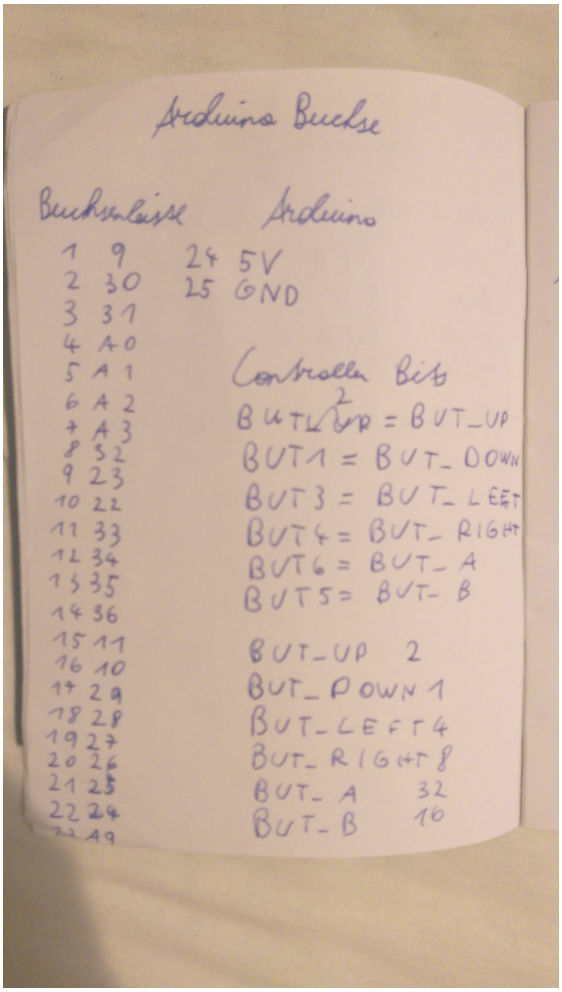
6.1) parts list

name	amount	prize	website
32x32 Matrix	1	€ 63,02	www.adafruit.com
Arduino Mega	1	€ 35,28	www.arduino.cc
7-segments-display	2	€ 5,94	at.rs-online.com
controlbuttons	16	€ 23,84	at.rs-online.com
actionbuttons	8	€ 11,44	at.rs-online.com
potentiometer	1	€ 1,92	reichelt.at
74HC165	4	€ 1,28	at.rs-online.com
MAX7219	1	€ 7,44	at.rs-online.com
DIN-jack	4	€ 2,40	reichelt.at
DIN-cable	4	€ 5,64	reichelt.at
25x1 pinheader	1	€ 3,71	at.rs-online.at
8x1 pinheader	2	€ 3,08	at.rs-online.at
5x1 pinheader	2 (5)	€ 0,90 (2,26)	at.rs-online.at
8x2 pinstrip	1	€ 0,49	at.rs-online.at
voltage stabalizer	1	€ 2,95	neuhold-elektronik.at
100n capacitor	29	€ 1,16	reichelt.at
10k resistor	24	€ 0,48	reichelt.at
200 resistor	1	€ 0,02	reichelt.at
power supply	1	€ 13,85	amazon.de
	Sum	€ 186,20	

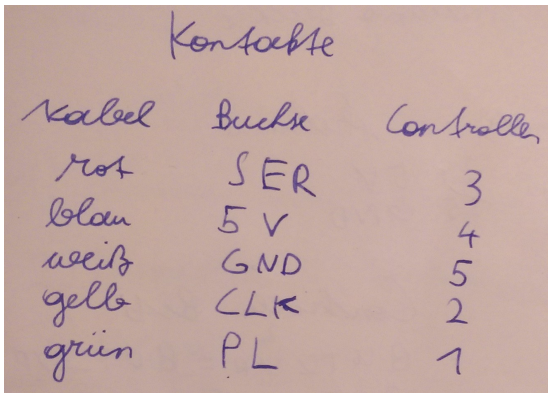
6.2) plans

1. Think out how we can do it
2. Search for fitting parts
3. Draw the circuit diagram
4. Draw the circuit layout
5. Print the boards
6. Solder the connection from top to bottom
7. Mount the parts
8. Test the main board
9. Design the package
10. Print out the controller package with the 3D printer
11. Build the main package in the KUV
12. Connect everything and test it
13. Finished!

6.3) calculations



A photo of some notes. There are the pins of the 25x1 pinheader with their corresponding arduino pin and the bits for the different buttons in the program.



A picture of some notes about the contacts of the controller. There are the pins of the controller and their corresponding cable-color and function in the program.

7) check list

Appointments:	03.03.2017	start
	03.24.2017	ZT1, circuit finished, order components
	04.28.2017	ZT2, control work progress
	05.12.2017	test - presentation
	06.09.2017	presentation

before presentation on 06.09.2017:
documentation (1x on paper, 1 x data medium) to teacher

every unit: upload work report to moodle