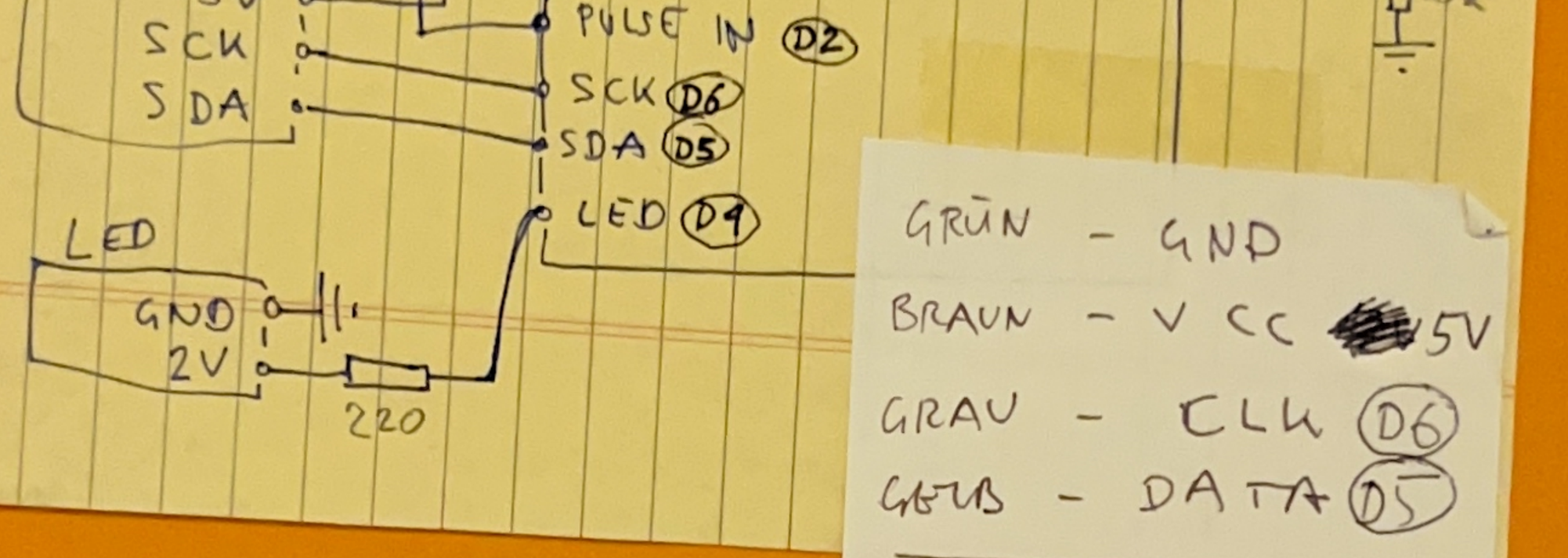
Labor für **Digitalität**

Magdeburg
Mechanisches Theater

Okt/Nov 2021

Münzzähler mit Arduino Nano direkt am Schaufenster:



GRÜN - GND
BRAUN - V CC 5V
GRAU - CLK D6
GELB - DATA D5

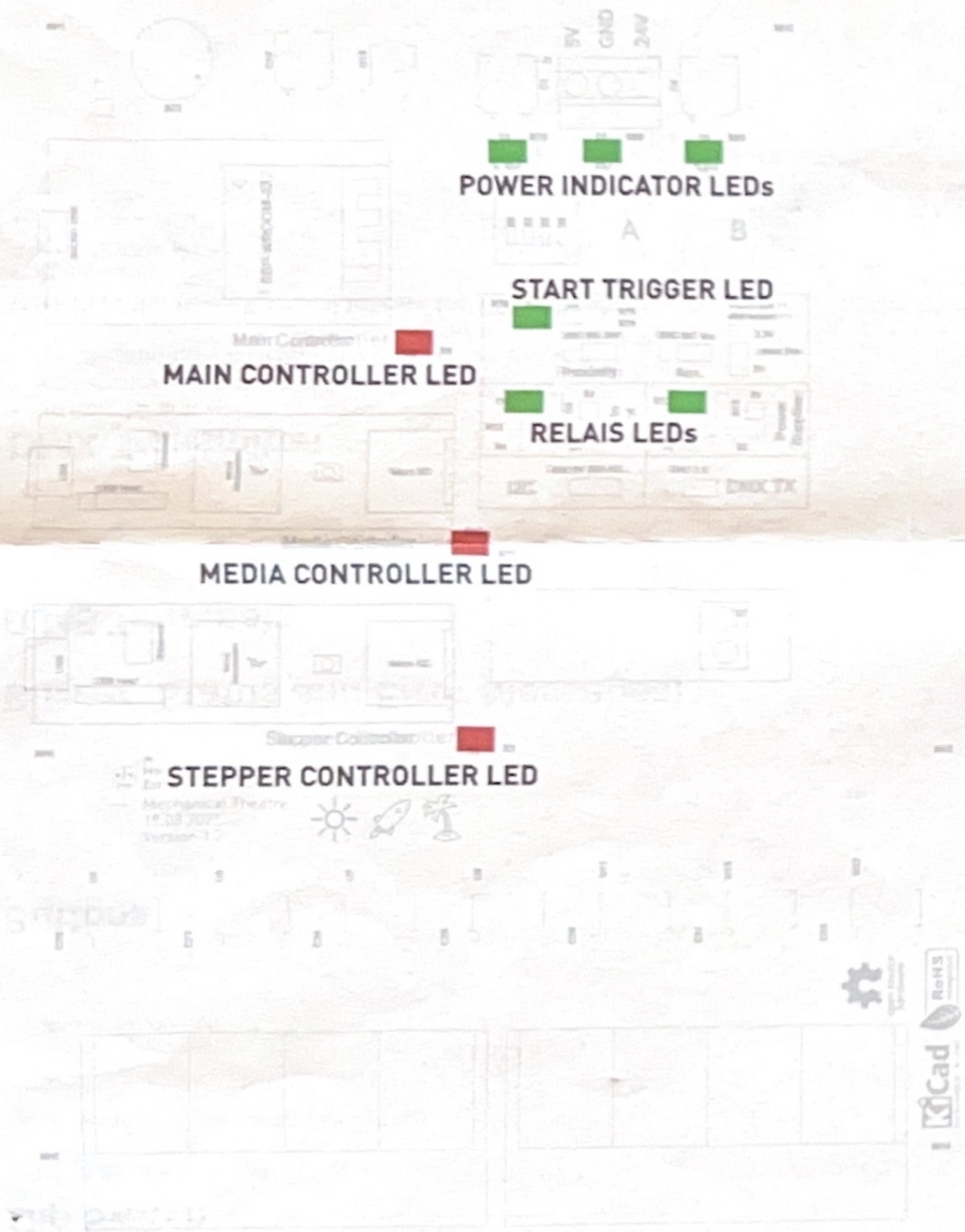
WEISS - GND
ROT/ROSA - LED D4

ABCDEFGH

Platine / “Hauptcontroller”

Power Consumption

5V, 500mA
24V, ??mA



LEDs

Green LEDs Indicators

Power Indicator LEDs	Check if Board is powered with all necessary voltages
Start Trigger LED	Lights up when the Coin-Sensor (or an auxillary sensor) is triggered
Relais LED	Corresponding LED lights up when either the Power Supply Relais or the solenoid at the coin slot is triggered

Red LED “Main Controller” Status and Error Messages

off	everything ok, waiting for start (__IDLE)
blinks fast (100ms)	ESP32 waits for teensy to reset (__WAIT_FOR_TEENSY)
blinks slow (1s)	Show is Playing (__PLAY)
blinks very slow (2s)	Stepper Controller is in test-mode (__HARDWARE_TEST)

Red LED “Media Controller” Status and Error Messages

off	everything ok, waiting for start (__IDLE)
blinks slow (1s)	Show is Playing (__PLAY)
blink codes with two seconds pause between blink-code:	
1 blink	Initialization of SD-Card failed
2 blinks	Failed to read files from SD-Card
3 blinks	Failed to write files to SD-Card

Red LED “Stepper Controller” Status and Error Messages

off	everything ok (__IDLE)
blinks fast (100ms)	Resetting Motors (__RESET, __WAIT_FOR_MOTOR_INIT)
blinks slow (1s)	Show is Playing (__PLAY)
blinks very slow (2s)	Stepper Controller is in test-mode (__HARDWARE_TEST)
blink codes with two seconds pause between blink-code:	
1 blink	Initialization of SD-Card failed
2 blinks	Failed to read files from SD-Card

Dip Switch

1	auto-repeat on / off
2	keep 24V Power Supply always on
3	
4	buzzer on / off

Buttons

A	start show
B	stop show

Buzzer (Status and Error Messages)

RJ45 Terminals

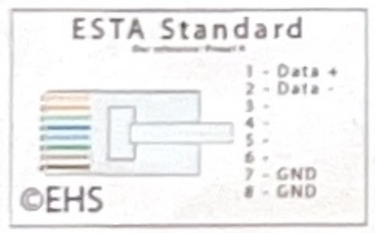
5	6	7	8	13	14	15	16
1	2	3	4	9	10	11	12

DMX Transmitter

- on Port 16 at the RJ45 terminal
- via the three-pin jumper labeled "DMX TX"
- via the green terminal on the blue MAX485 board

Port 16 at the RJ45-Terminal follows the ESTA Standard connection:

1 Data + (A)
2 Data - (B)
3-8 GND



Test Mode

Don't use the TestMode when all motors are attached at the installation. Motors will run without stopping at the end-switches!

1) Hold down button A while powering on OR hold down button A and press RST on Main Controller.
   Only the MainController is now in TestMode:
   - Three red LEDS (MainController, Relais Coinslot, Relais Power) toggle every two seconds and a short "be-beep" sounds from the speaker.
   - When a serial monitor connection is established with the ESP32, the states of the buttons are presented there
2) When in TestMode, press:
   - Button A to start Media Codntroller (plays the show)
   - Button B to start Stepper Controller in TestMode (all motors drive slowly and stop when the endswitch is pressed)

DMX-Kanäle

DMX CHANNEL

LICHTER FRONTAL

1 — ~~WEISS~~ R
2 — ~~R~~ G
3 — ~~G~~ B
4 — ~~B~~ W

- LED RÜCK-WAND

① 5 — R
6 — G
7 — B

② 8 — R
9 — G
10 — B

③ 11 — R
12 — G
13 — B

⋮

24 — 74 — R
75 — G
76 — B

STRIP	CH
4	14, 15, 16
5	17, 18, 19
6	20, 21, 22
7	23, 24, 25
8	26, 27, 28
9	29, 30, 31
10	32, 33, 34
11	35, 36, 37
12	38, 39, 40

STRIP	CH
13	41, 42, 43
14	44, 45, 46
15	47, 48, 49
16	50, 51, 52
17	53, 54, 55
18	56 57, 58
19	59, 60, 61
20	62, 63, 64
21	65, 66, 67
22	68, 69, 70
23	71, 72, 73

- LED-BARS

~~100~~ 200

77 - MASTER
78 - R
79 - G
80 - B
85 - UE7SS
86 - WE7SS

Anleitung Münzzähler

Instruction for installing and usage of

Procedure for altering the numerical value of the Interior:

Pressing the ADD key (10) and MINUS key (11)on the display panel at the same time for about 2 seconds, you will see the letter A on the display panel

1. Pressing the setting key(8),and then you will see the letter E, (choosing several currency system),after that you can press the ADD key or MINUS key to increase or decrease the numerical value. After setting up, please press the setting key to confirm.
2. Appearing the letter H (the quantity of sampling for various currency value)
3. Appearing the letter P (the numberial value for signal output of various currency value)
4. Appearing the letter F (the precision of various currency value)
5. By parity of reasoning, setting is finished with your chosen currency. When the letter E is shown, please turn off the power and it will reopen again.

P.S. E: Choosing several currency value.(1 -6)

H: Quantity of sampling for various currency value (1 - 20 pieces).

P: The numberial value for signal output of various currency value. (1-50)

F: The precision of various currency value. (1-20, the smaller the number is,the more accurate the precision is. (Suggesting number is 8)

Setting key: SET Confirming key

ADD: Numberial value "+"

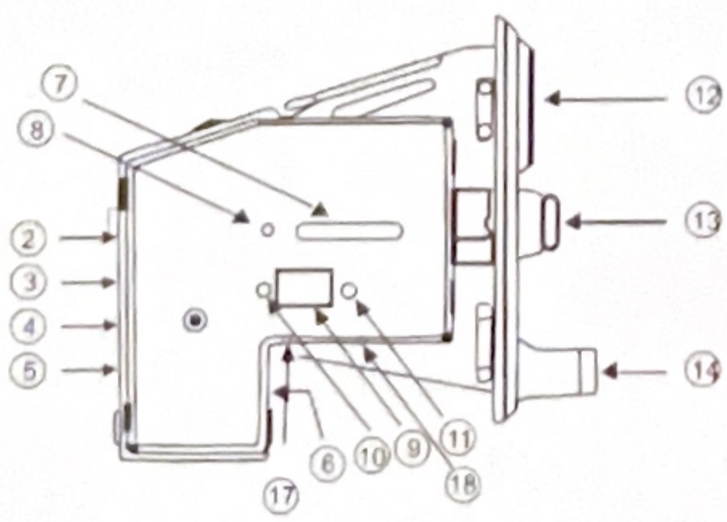
MINUS: Numberial value"-"

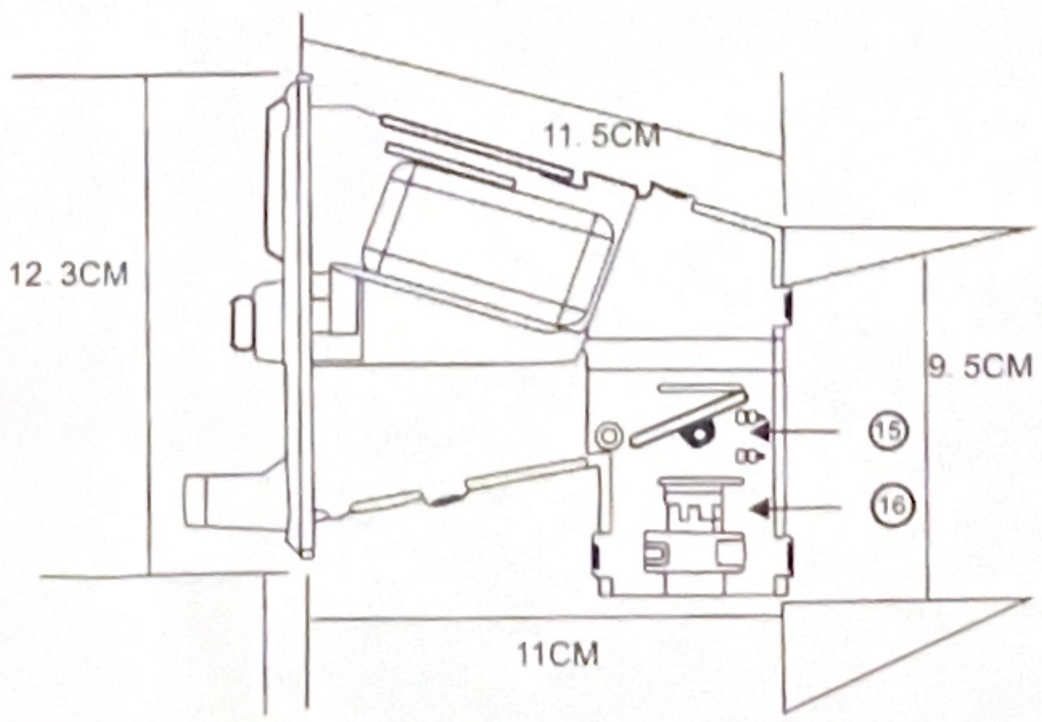
Methods for setting coin samples:

1、 Pressing the setting key, the letter A is shown. Then press the setting key again, the letter A1 is show,and the first LED light is always on, so at this moment, inputting 20 first sample coins by constant velocit.(When the setting numberial value of H 1 is 20)

2、 After inputting the coins, LED lights will flicker. When the letter A2 is shown and the first two LED lights are on, please inputting 20 second sample coins by constant velocit. (When the setting numberial value of H 2 is 20)

3、 After inputting the coins, LED lights will flicker. When the letter A3 is shown and the first three LED lights are on, please inputting 20 third sample coins by constant velocit. (When the setting numberial value of H 3 is 20) ,By parity of reasoning, please finish the setting. After finishing setting all the needed numberial value coins, all the LED lights will flicker several times, it can be uesd normally.



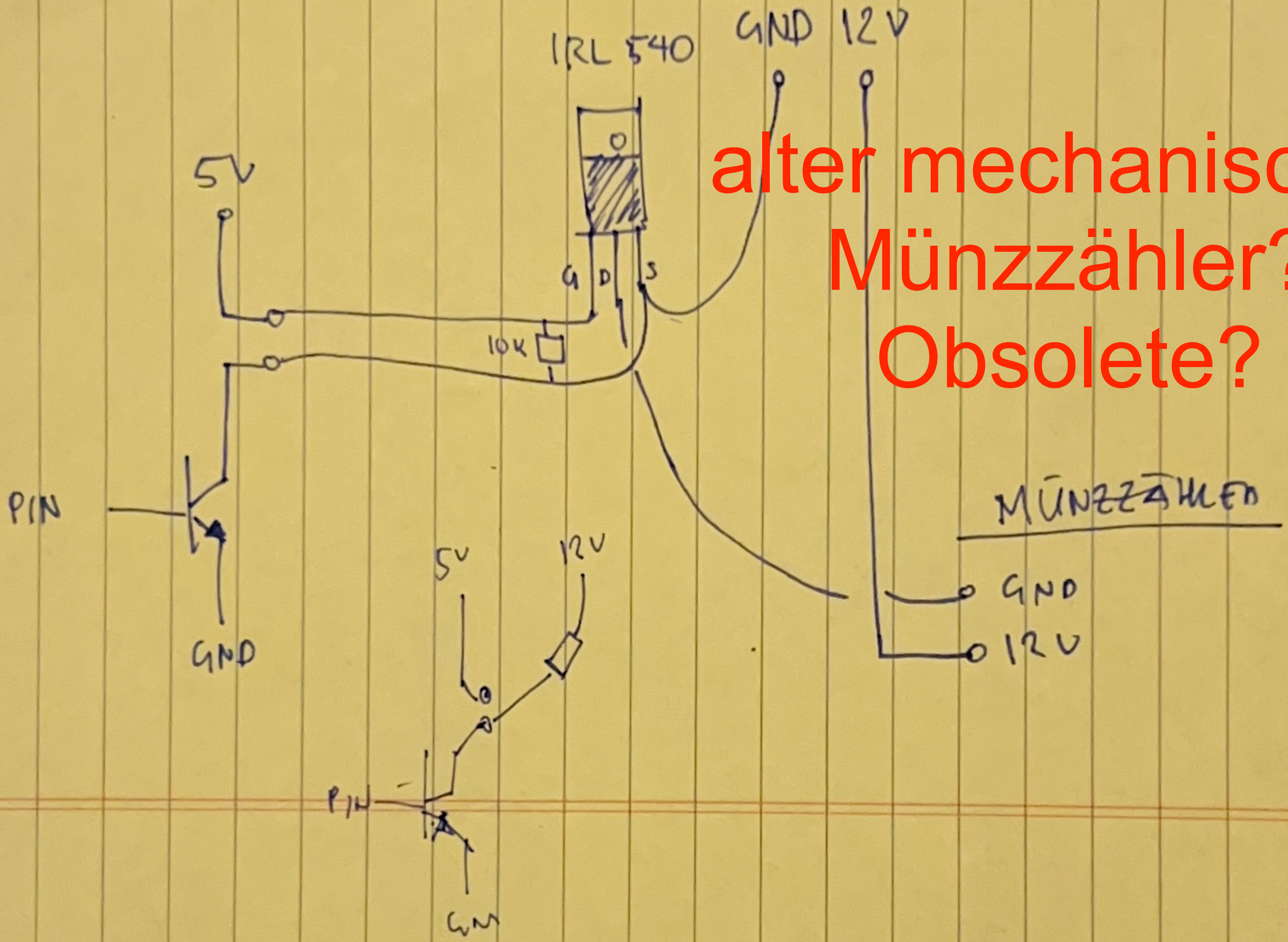


Instruction for position of function

Name	Functions
② 4pin socket	
③ 2 section switch	NO(always on) NC (always off)
④ 3 section switch	Signal width: 20ms (fast) 50ms (medium) 70ms (slow)
⑤ 2pin socket	Signal of forbidden energy inputting, Up PIN means signal inputting. voltage is more than 4V means OK. 0V means forbidden. Down PIN means ground wire.
⑥ 2pin socket	Electromagnetism gate DC 12V
⑦ LED light	Matching up the instruction of the light 8
⑧ Inching button	Setting key SET
⑨ Changing 8 Nixie tube	Showing display status
⑩ inching button	Status shows the numberial value "+"
⑪ inching button	Status shows the numberial value?-?
⑫ slit	
⑬ Coins returning Key	
⑭ Coins returning mouth	
⑮ electromagnetism gate	Eliminating false coins
⑯ Cheat-defending function	Defending speculation
⑰ RS232 communication port	By connecting 232 transfer slab externally, it can output 232 level imformations (select and use)
⑱ paralleling outlet	Signal paralleling outlet (select and use)

Numberial value forproduct quality

Identify accuracy rate	95%
Identify speed	0.6second
Power source	DC12+10%
Working current	50ma
Moment maximum current	350ma (less than 0.5S)
Net weight	g
Operating temperature	-10-60°C
Storing temperature	-20-85°C
Operating humidity	≤95%
barometric pressure	85Kpa-106Kpa
Applying coin diameter	15mm-32mm
Applying coin thickness	1.8mm-3.5mm
canning material	PC plastic



alter mechanischer Münzzähler? Obsolete?

PCB aktuellste Version 1.2

Teensy 4.1
"StepperController"

SCL = TEENSY IS READY
SDA = PLAY!

ESP 32
"MainController"

MAGD
VORHANG
PFERDE 2
REITER 1
REITER 2
LUFTPUMPE
HALBKUGEL

PFERDE 1
SCHWÄNE TAUCHEN
SCHWÄNE SCHWIMMEN
UFO Y
UFO X

STOP-SCHILD
S1 Start Show
S2 Stop Show
START_STOP_TRIGGER
210 Ω
HIGH FOR 20ms
PROX_SENSOR
STEPPER_13_STEP
STEPPER_13_DIR
STEPPER_13_END
RELAIS_E-MAGNET
RELAIS_24V+5V

START_TRIGGER_SENSOR
PROX_SENSOR (3.3V Signal)

I2C_Display_20x4
I2C Peripheral

POWER_SECTION
Power In 5V/24V
+24V
+3.3V

RELAIS-CONNECTOR
RELAIS_E-MAGNET
RELAIS_24V+5V

RJ45 8x Socket
RJ45 8x Socket

DMX-TX
DMX_TX

Teensy 4.1
"MediaController"

Two Teensy Audio Shield (Rev. D) are stacked on top of the Teensy 4.1 to enable quadrophonic audio.
https://forum.pjrc.com/threads/61123-Teensy-4-1-and-4-channel-audio-(AudioInput12Quad)
(https://www.sparkfun.com/news/2055)

250mA@600MHz

160mA@24MHz

simple high/low signal that triggers start/stop on rising/falling edge (from ESP32 IO13)

START_STOP_TRIGGER

v 1.2

Sheet: /
File: MechanicalTheatre.sch

Title: Mechanical Theatre

Size: A3 | Date: 2021-08-19 | Rev: 1.2
KiCad E.D.A. kicad (5.1.9-0-10_14) | Id: 1/14

HEINRICH BÖLL STIFTUNG

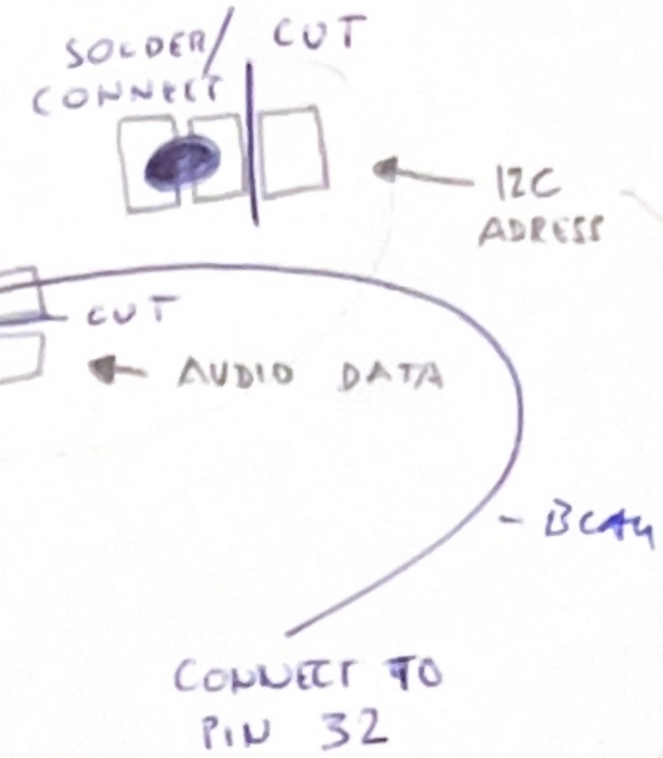
Audio-Shield füs Teensy

Heinrich-Böll-Stiftung e.V. Schumannstr. 8 10117 Berlin T 030.285 34-0 F 030.285 34-109 I www.boell.de E info@boell.de

AUDIO

AUDIOSHIELD 1: NO CHANGES

AUDIOSHIELD 2:



PUT SD-CARD IN AUDIOSHIELD 1

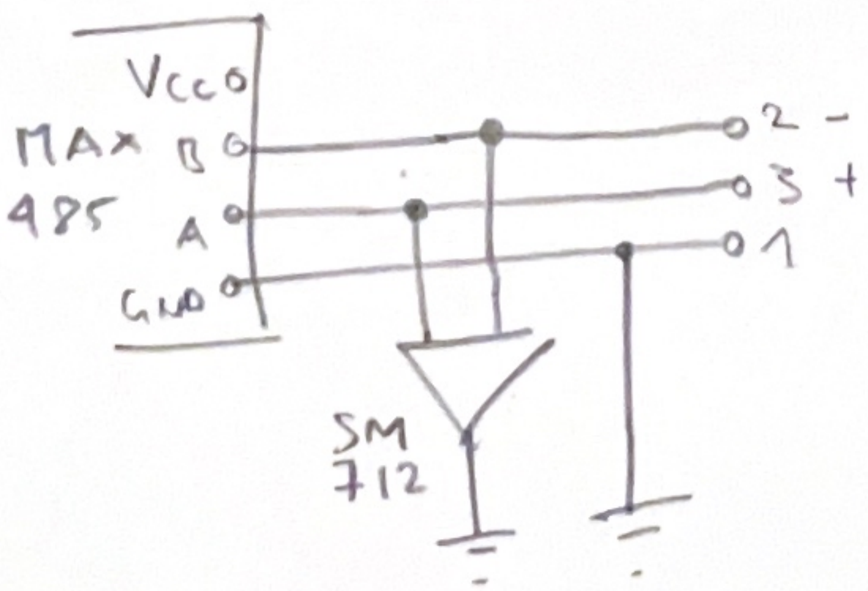
IN CODE, SET ADDRESS OF AUDIOSHIELDS:

SGTL5000_1. SETADDRESS (LOW)
SGTL5000_2. SETADDRESS (HIGH)

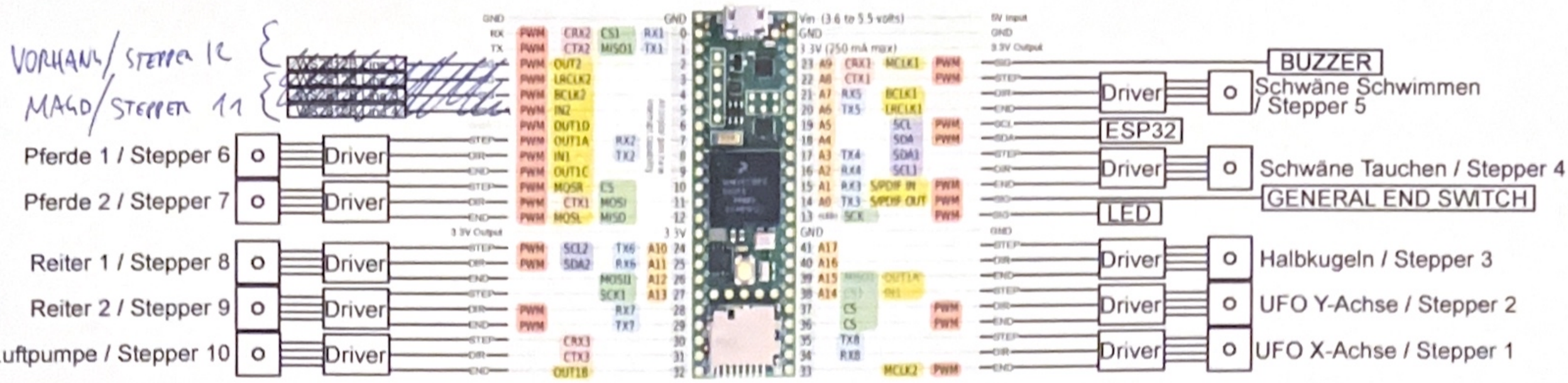
+ DMX

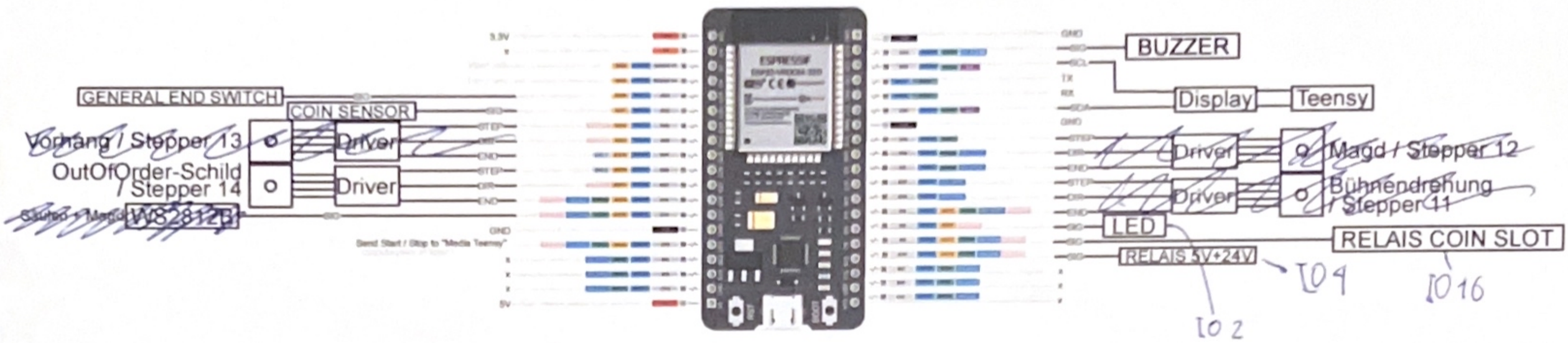
DMX

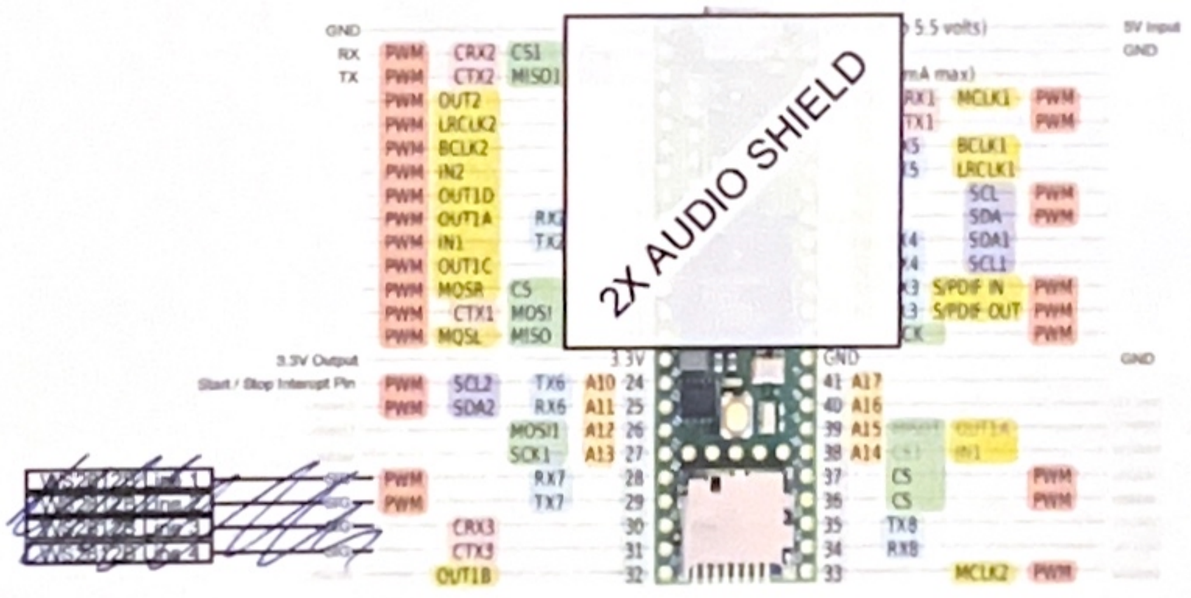
- USE TEENSYDMX LIBRARY FROM SSILVERMAN ON GIT
- USE SERIAL6 AND PIN 24
- (THE LIB USES REAL SERIAL CONNECTION)



PROTECT MAX 485 WITH TRANSIENT VOLTAGE SUPPRESSOR (TVS) DIODE ** SM712


VORHANG / STEPPER 12
MAGD / STEPPER 11
Pferde 1 / Stepper 6
Pferde 2 / Stepper 7
Reiter 1 / Stepper 8
Reiter 2 / Stepper 9
Luftpumpe / Stepper 10
Driver
BUZZER
Schwäne Schwimmen / Stepper 5
ESP32
Schwäne Tauchen / Stepper 4
GENERAL END SWITCH
LED
Halbkugeln / Stepper 3
UFO Y-Achse / Stepper 2
UFO X-Achse / Stepper 1


GENERAL END SWITCH
COIN SENSOR
Vorhang / Stepper 13
OutOfOrder-Schild / Stepper 14
Driver
BUZZER
Display
Teensy
Magd / Stepper 12
Bühnendrehung / Stepper 11
LED
RELAIS COIN SLOT
RELAIS 5V+24V
IO 9
IO 16
IO 2


2X AUDIO SHIELD