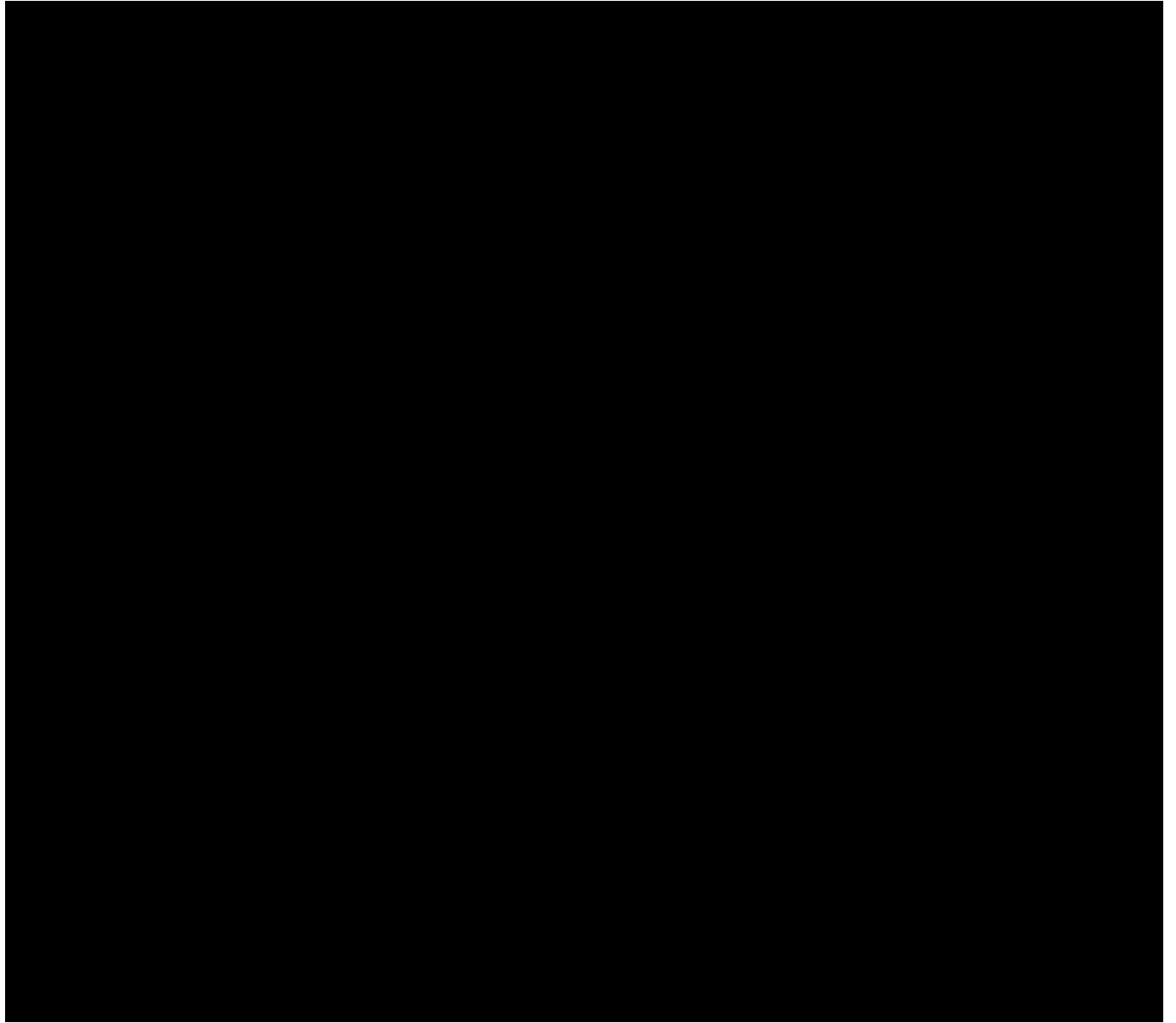


# Revell Titanic 100th anniversary – backlighting gallery

This article contains fotogallery and youtube videos from backlighting plastic model of Revell Titanic 100th anniversary.



Titanic 100th anniversary by Revell



Next video depicts process of assembling plastic model with appropriate stages of electronics assembling.

Preview of finally assembled model with remote IR control show next video.

Final version of program code is available for download [here](#).

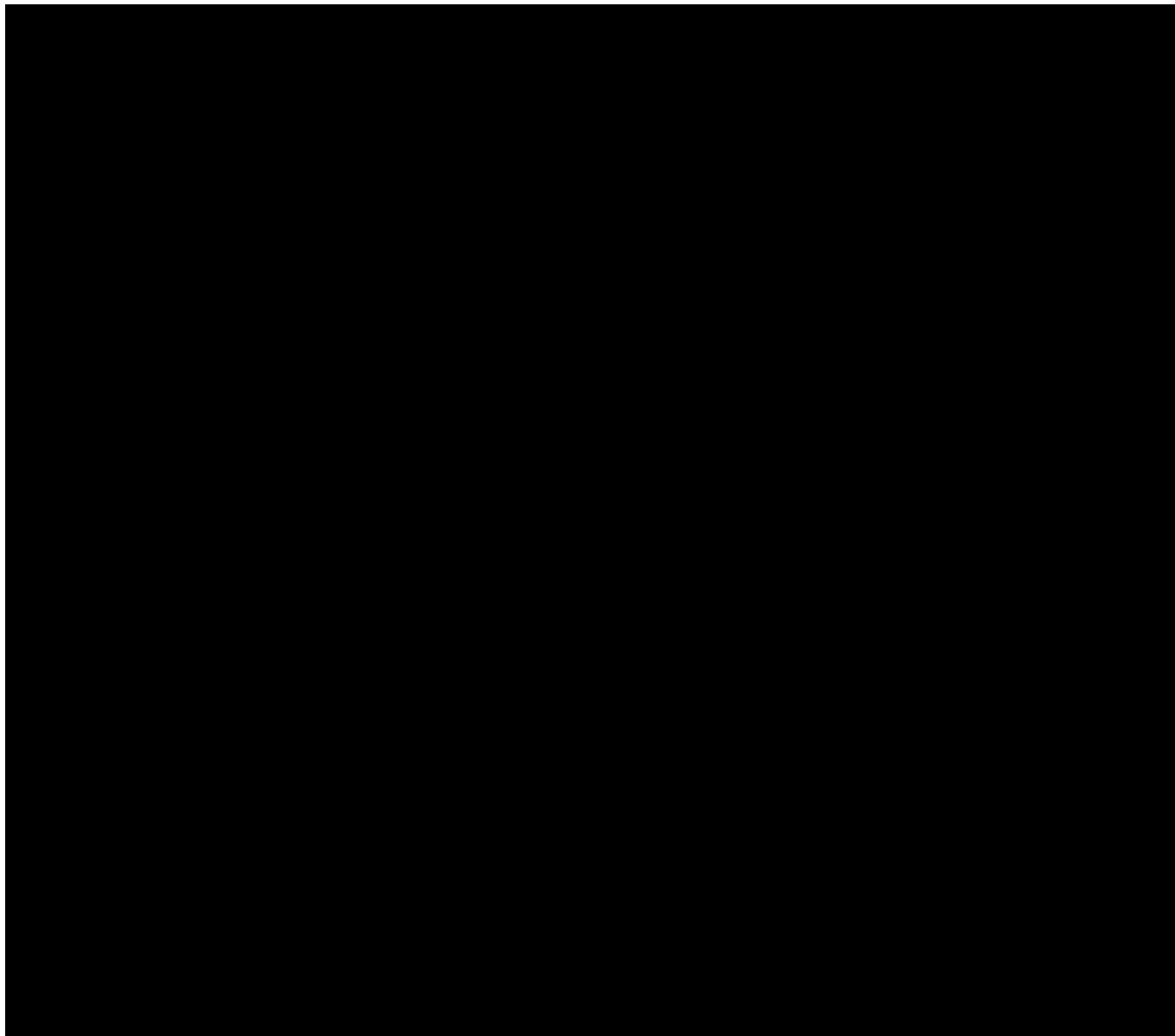
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## **Křižík T565 – vacuum tube analog oscilloscope**

The T565A oscilloscope is a universal device for observing voltage waveforms from the lowest frequencies (DC voltages) up to 2 MHz. It can monitor periodic and non-periodic (transient) events with a voltage of 10 mV to 500 V. The large frequency range of amplifiers and time base allows extensive use of the T565A oscilloscope in various fields, such as. in radio engineering, low-current and high-current electrical engineering, in physics, chemistry, biology, both in research and in operation. In all these applications, the possibility of measuring the observed voltages is fully applied.

Schematic and device description in czech language can be obtained from [here](#).





Krátka videoukážka zobrazuje odkrytované zariadenie v prevádzkovom stave.

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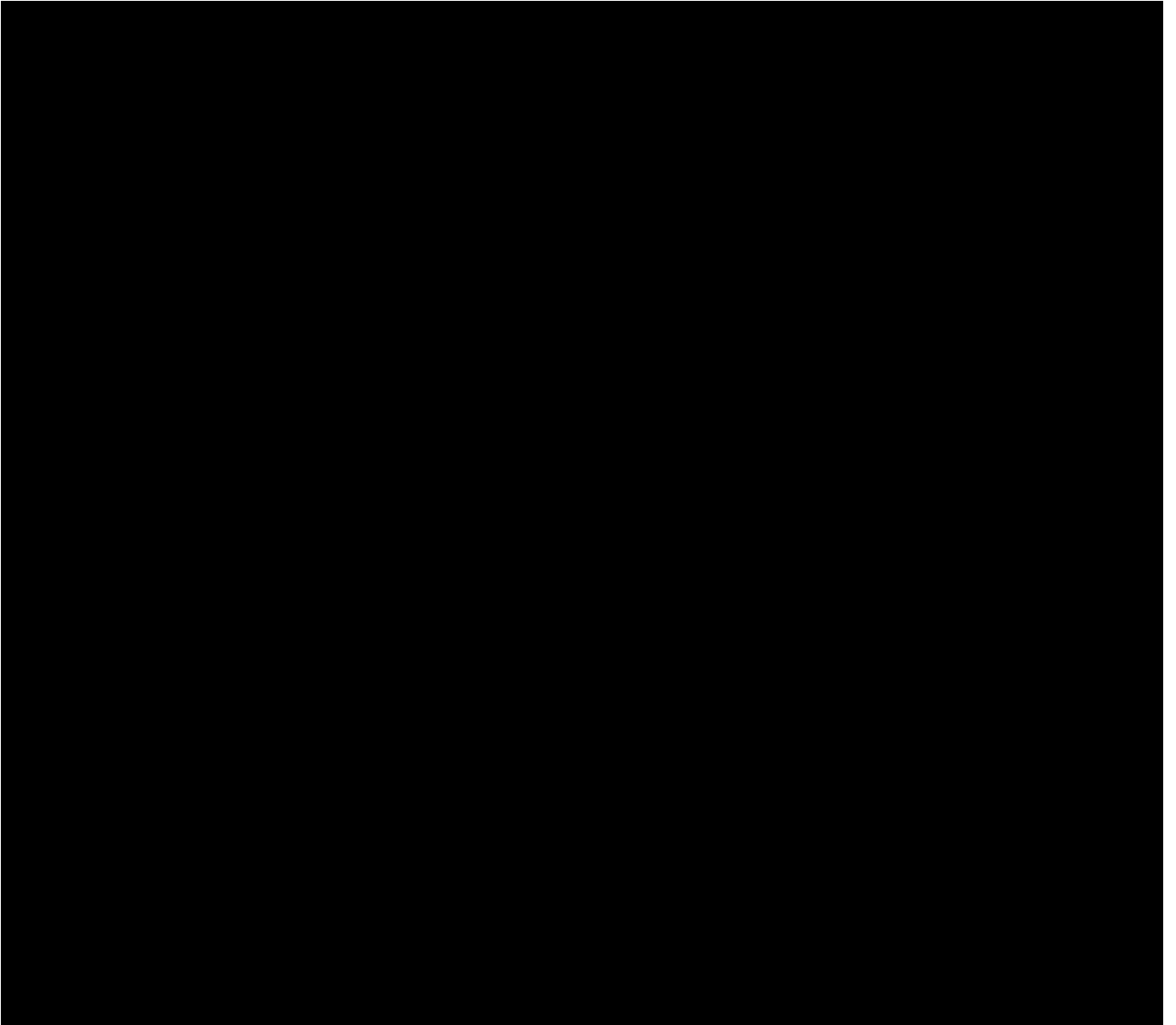
**Vacuum tube tester Tesla**

# BM215

Vacuum tube tester Tesla BM215 is well know testing device used in supply shops in socialistic Czechoslovakia. For further reading you can visit pages <http://www.olddradio.cz/meraky/bm215.htm> .

Photogallery of my device during cleaning process and first mesaurment:





List of measurement cards is available from link <http://www.olderadio.cz/meraky/bm215/karty001.htm> . For new or some exotic types of vacuum tubes can be used online generator of measurement cards <http://sroll.net/ok1srd/technika/bm215/>.

Next video show measurement device in partially disassembled state.



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# Program-controlled backlight of the Witcher figure series

The project of program-controlled backlighting of collector's figurines combines the practical use of arduino IOT modules to provide program-controlled lighting effects as well as the application of LED lighting.



## Requirements for the final proposal:

- the ability to independently control the light intensity and color tone of the light in a group of 6 collector's figures,

- the selection of the backlight program mode must be possible by means of the IR remote control,
- the control module must be compactly integrated in the protective cover,
- the power supply is solved by means of a small pulse source,
- the output power must be sufficient for backlighting consisting of 2 \* 3 RGB leds with a consumption of about 10mA per segment (expandable to 9 or 12 collector figures).

The control electronics module consists of a pulse power supply with an output of approximately 30VA. The Arduino Mega module was used as a control module due to the sufficient number of programmable PWM outputs. The PWM output makes it possible to ensure the gradual switching on and off of the individual light strips placed in the packaging of the collector's figures.

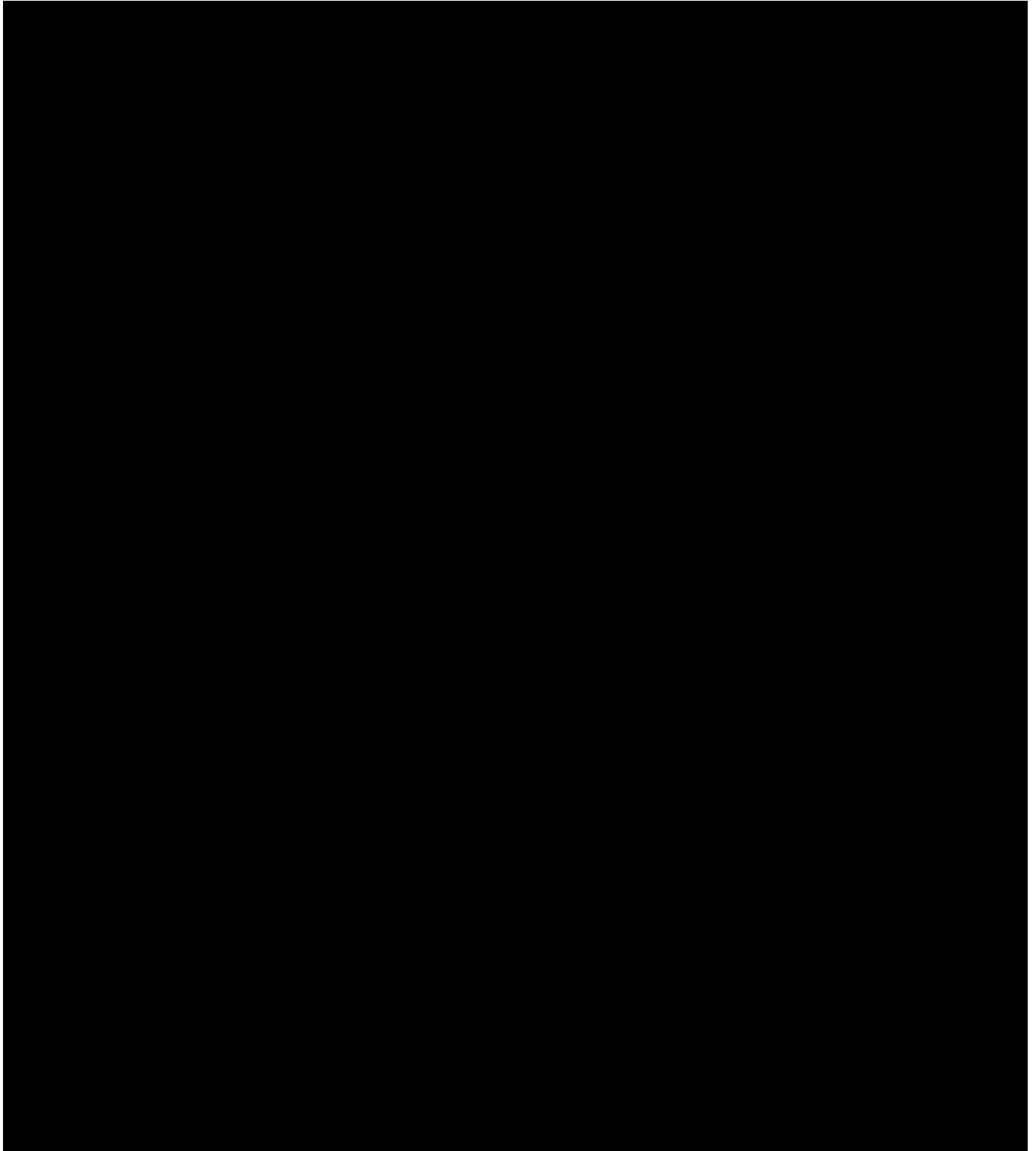
## **Problems in the implementation phase and their solutions**

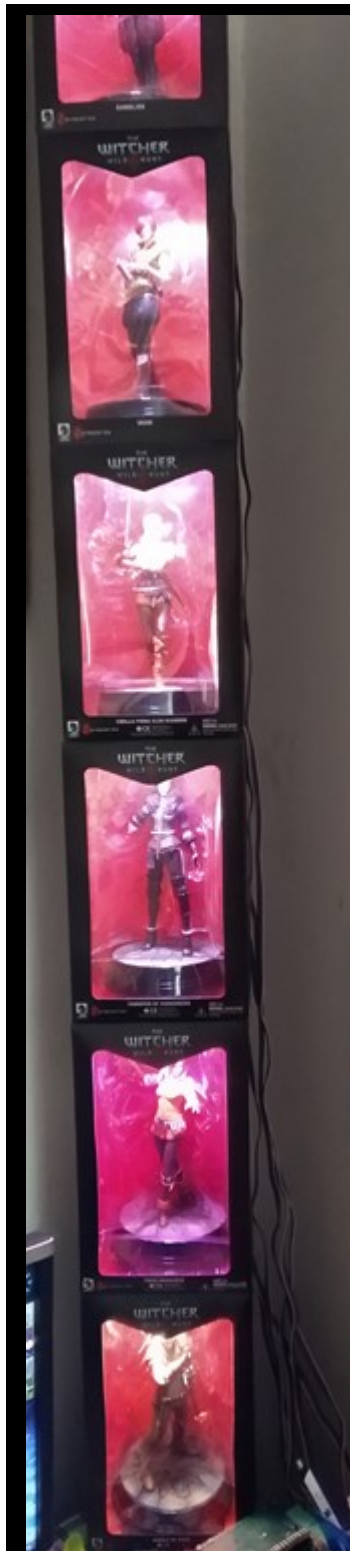
In the conceptual design phase, despite the selected module, I encountered the problem of insufficient number of PWM outputs, which I solved by introducing a two-state control for the red backlight component (this is a compromise solution).

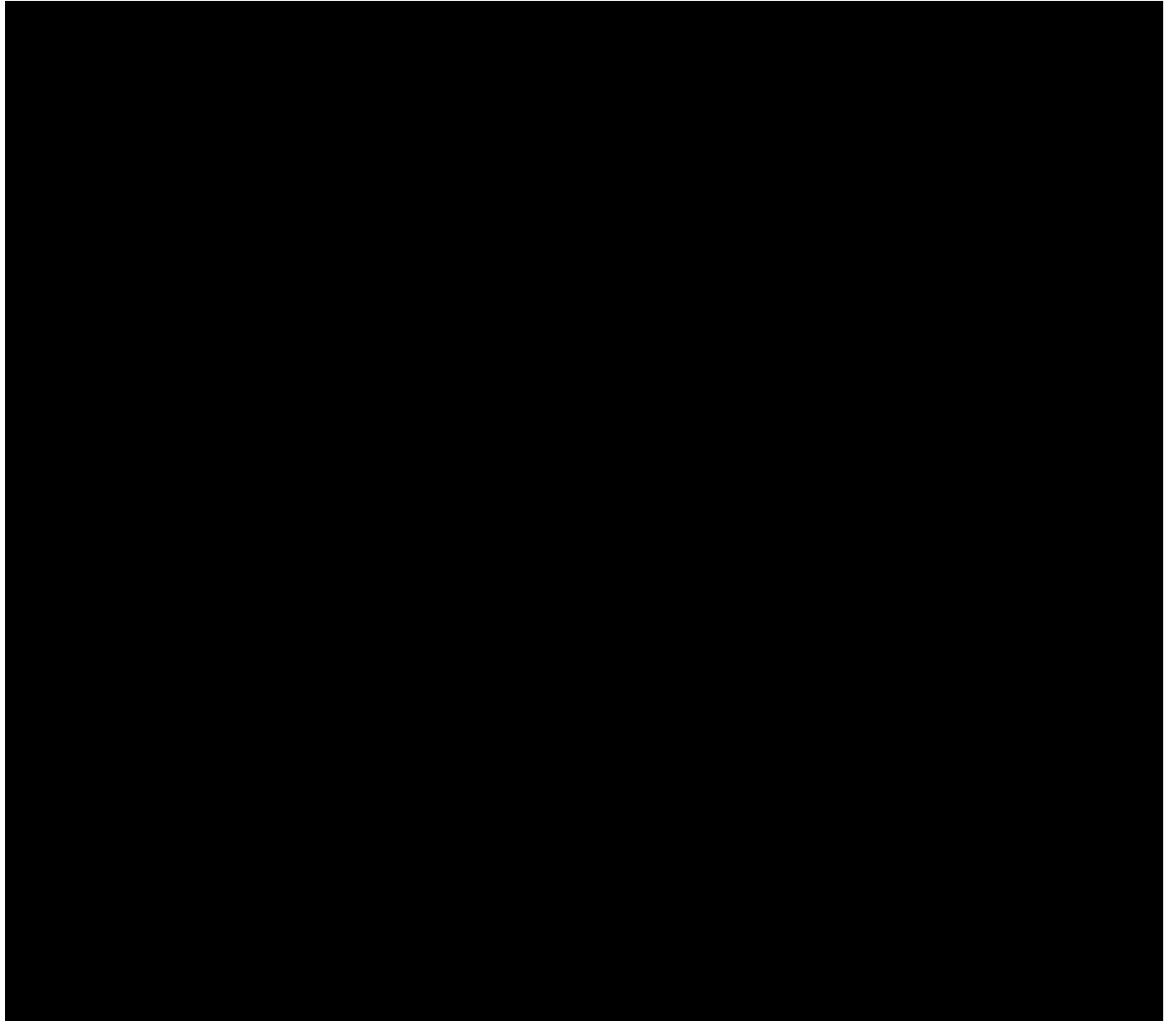
Power amplification of the outputs is achieved by using Darlington transistors TIP120 purchased from e-bay.

## Description of the technical solution of the backlight

The backlight of each figure consists of a pair of LED strips, a part with warm white and an RGB strip. The pictures in the photo gallery show a more detailed link.





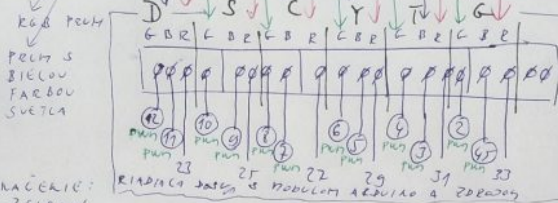
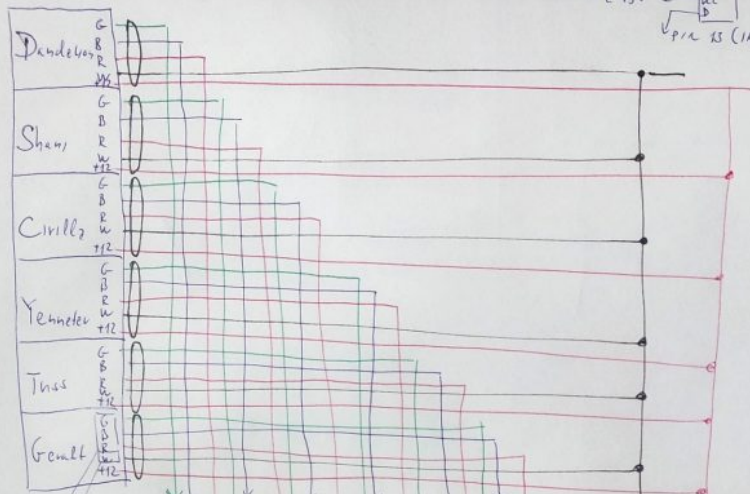


## **Block diagrams of electronics modules**

The connection of the control module with the block of Darlington transistors is shown in the following figures (block interconnection diagrams).

PODSVIETENIE ZBIERKY FIGUROK ZAKLACIII - KATA POVLANIE PIAOU MODULU ARDUINO MEGA

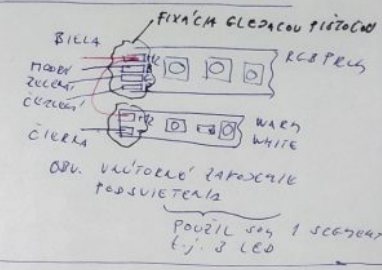
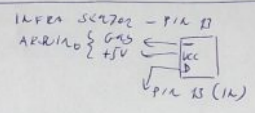
ROZMIESTANIE FIGUROK



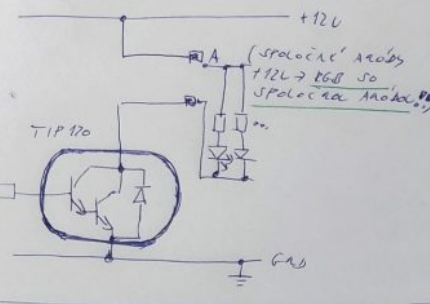
- OZNAČENIE:  
 G - ZELENÁ  
 B - MODRÁ  
 R - ČERVENÁ  
 W - BIELA  
 BL - ČIERNA

PIA - 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 44, 45 - VÝSTUPY PIA S PŮVODNÝM ANALOGOVÝM (PIA, 0=21)  
 PINY - 23, 27, 27, 29, 31, 33 - KLASICKÉ DIGITÁLNE VÝSTUPY PIA (MUSÍ POUŽÍT Z JEDNÉHO OBMEZOVANÉHO TOČTU PIA VÝSTUPU :-)

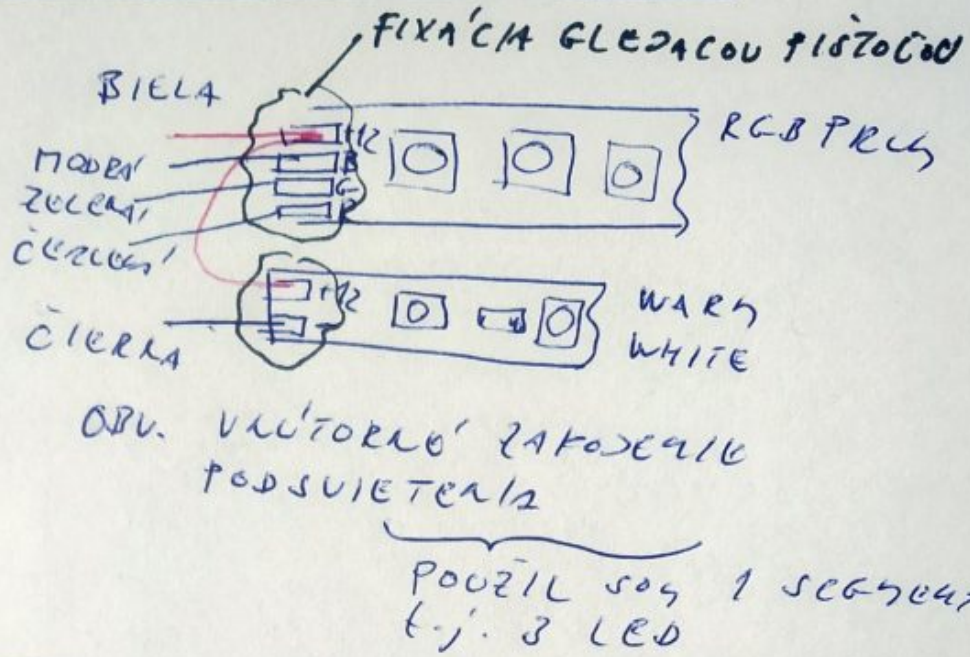
POZOR: ZBERO - IMPULZY DO PIA NE 12V, JA (PŘEKROČÍ PŘÍMÉ POUŽITÍ) POUŽÍVAT  
 ODBER PŮVODNÝCH FIGUROK MAX 50mA → CELKOVÝ 6x10=300mA, REZERVA DO  
 BUDÍCÍ



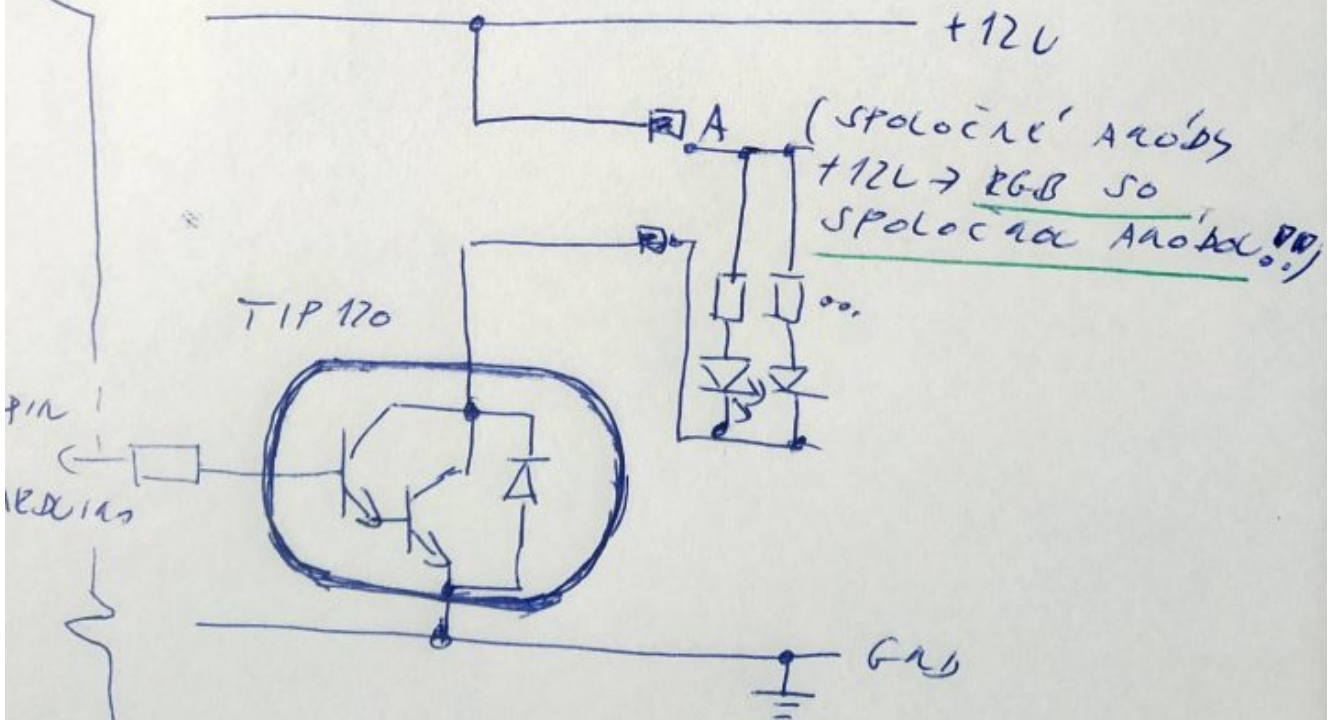
POZICIE VÝSTUPU MODULU ARDUINO S TRANZISTOROM (DARLETONOVA DVOJICOU) TIP120 SA, NE LED



# UŠTANIE PINOV MODULU ARDUINO MEGA

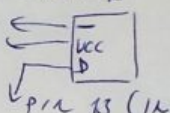


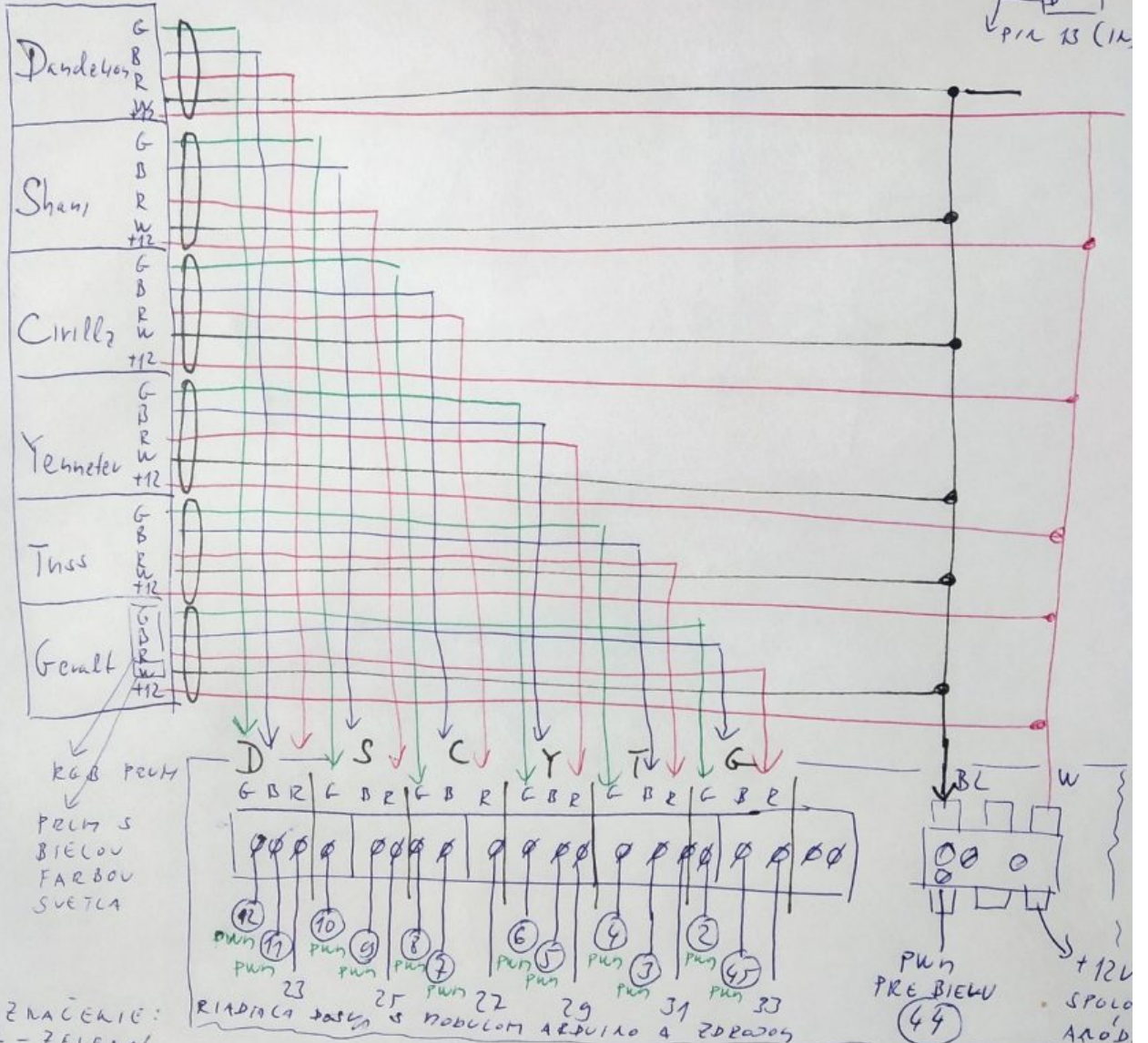
## POSILNENIE VÝSTUPU MODULU ARDUINO S TRANZISTOROM (DARLINGTONOVOU DVOJICOU) TIP 120 SA, MAX 60V



# PODSVIETENIE ZBIERKY FIGUROK ZAKLÁČIII - NAMA P

## ROZMIESTANIE FIGUROK

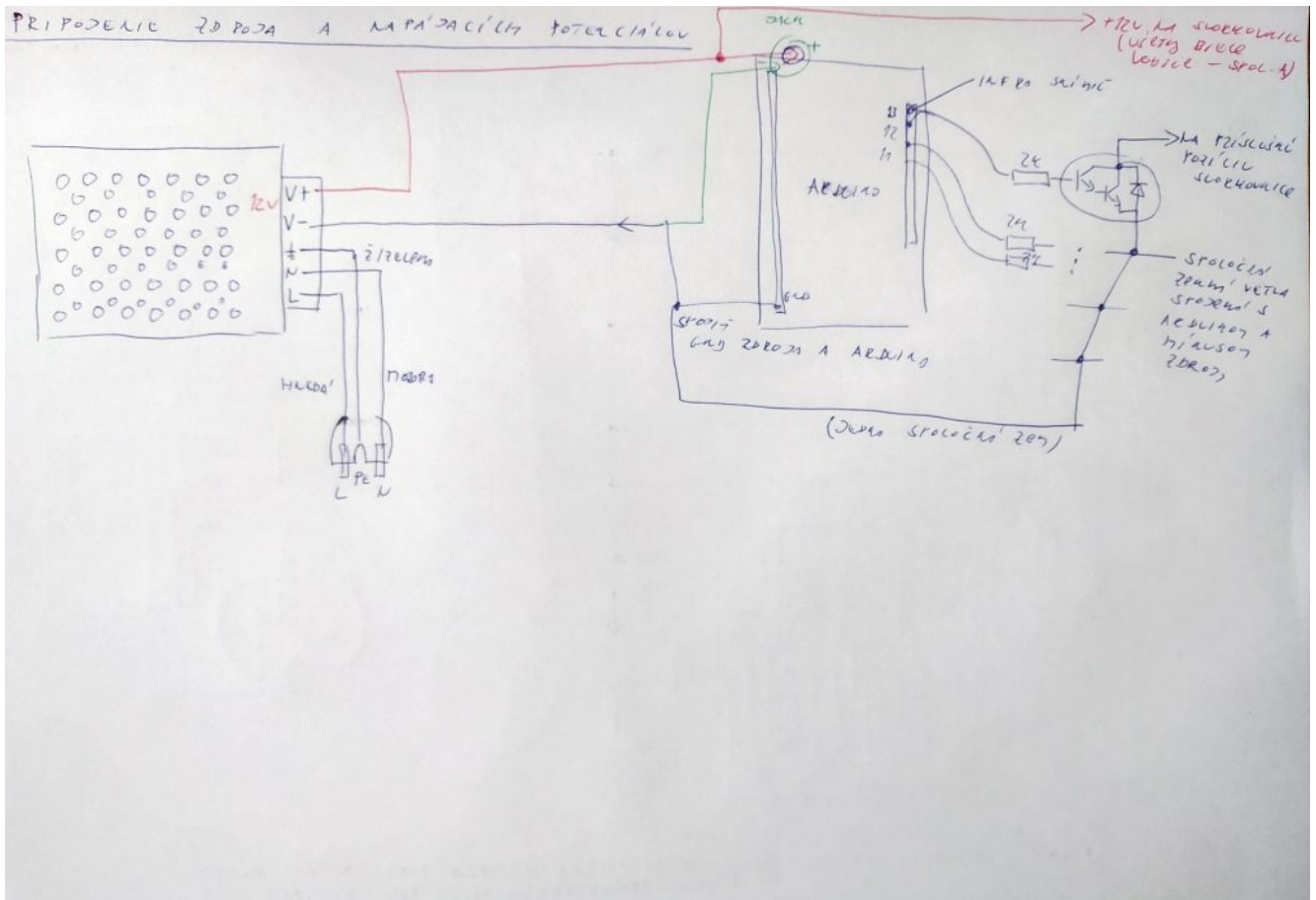
INFRASENOR - PIR 13  
 ARDUINO { GND, +5V }  




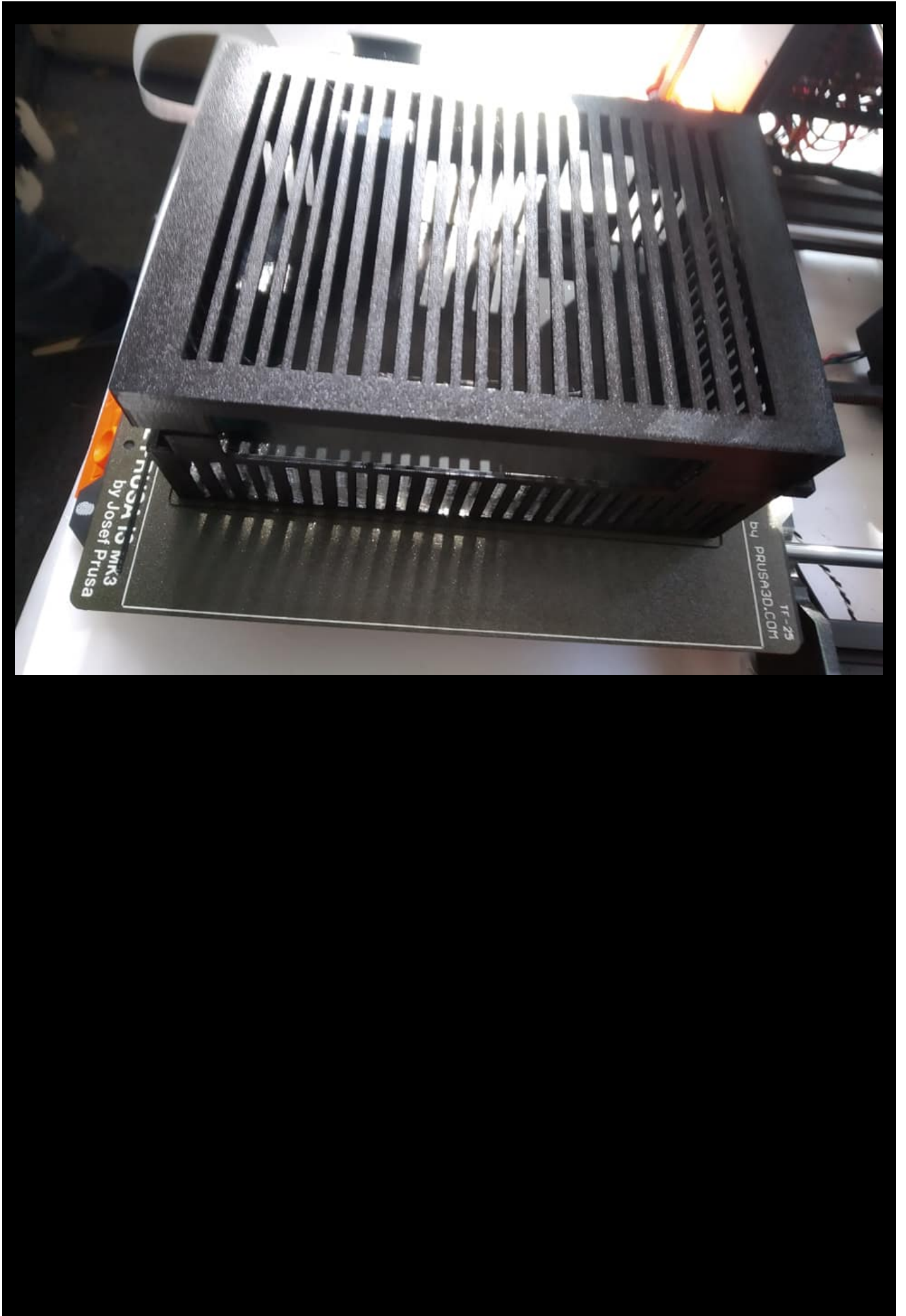
OZNAČENIE:  
 G - ZELENÁ  
 B - MODRÁ  
 R - ČERVENÁ  
 W - BIELA  
 BL - ČIERNA

PIR - 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 44, 45 - UHOĽOVÉ PWR S P  
 PINY - 23, 27, 27, 29, 31, 33 - KLASICKÉ DIGITÁLNE W'STUP  
 Z JÓVOJU OBMEDZENÉHO P  
 POZNÁMKA: ZDROJ - IMPULZNÝ ZDROJ PLE 12V, 3A  
 ODBER PVE ZDROJ FIGUROK MAX 50mA →  
 BUDÍČKA)





The procedure for 3D printing of the protective cover is shown in the following photo gallery.



Tom and bottom part aligned for testing purposis

## **Demonstration of the control program**

You can download one of the driver versions as an arduino sketch.

I firmly believe that this text will serve as inspiration for the backlighting of other collector's collections.