Ardubaby with flashcart
by : chuengbx 2019/01/21

This is a tiny arduboy that is smaller than half of a credit card.
 In order to shrink everything into a small foot print, I have to avoid the voltage level shifter for the 3.3V flash cart by converting the
5V Pro Micro to run in 3.3V.

Parts:
Arduino Pro Micro (or Arduino Micro)
0.9" mono OLED with SPI interface on SSD1306 controller. The 7 pin male header of the OLED is plugged into the female header.
The OLED chosen must have the 7th pin for CS. Otherwise, it'll conflict with the Flahcart,
causing screen flickering and misalignment when loading games from flashcart or when playing video stored on the flashcart
16MB serial flash to load 500+ Arudboy games to be self-programmed to Arduino Micro anytime through the Cat 3K bootloader
(original circuit, python scripts for game loading, and the Cath 3K bootloader and homemade arduby package is designed by Mr.Blinky (inks below).
3.3V regulator and battery managemeent module - 5V is taken from the RAW pin of the Arduino Pro Micro (which is sourced from the USB port).
To allow the board to be powerd off during charging, the onboard regulator need to be removed.
3.7V LiPO Battery is charged by the battery management module that also convert 3.7V to 3.3V to supply to the VCC pin of the Arduino Pro Micro,
the VCC of the OLED and the 3V serial flash.
To use the serial flash for game loading, the Cath 3K boot loader must be burnt to the Pro Micro using a modified USBasp that can burn flash to 3V MCU.
Warning: USBasp bought from the market worked on 5V. Though there is a jumper to select the VCC to work in 3V. Dendng on the board you got, the TTL signals
may still go up to 5V that may damage the serial flash during the bootloader flash.

Credits and References to original authors of Arduboy and Flashcart:

1. Original Arduboy production schametics:
   https://community.arduboy.com/t/production-arduboy-schematic/702

2. MR.Blinky's original design of flashcart:
   https://github.com/MrBlinky/Arduboy/tree/master/flashcart

3. MR. Blinky;s GITHUB with python scripts and sample flash cart image binaries for sample games :
   https://github.com/MrBlinky/Arduboy-Python-Utilities

4. MR. Blinky's homemade package (required to operate the flash cart with alternate wiring and different types of OLED other than the SSD1306 used in original Arduboy:
   https://github.com/MrBlinky/Arduboy-homemade-package

ArduBaby by cheungbx 2019/01/21
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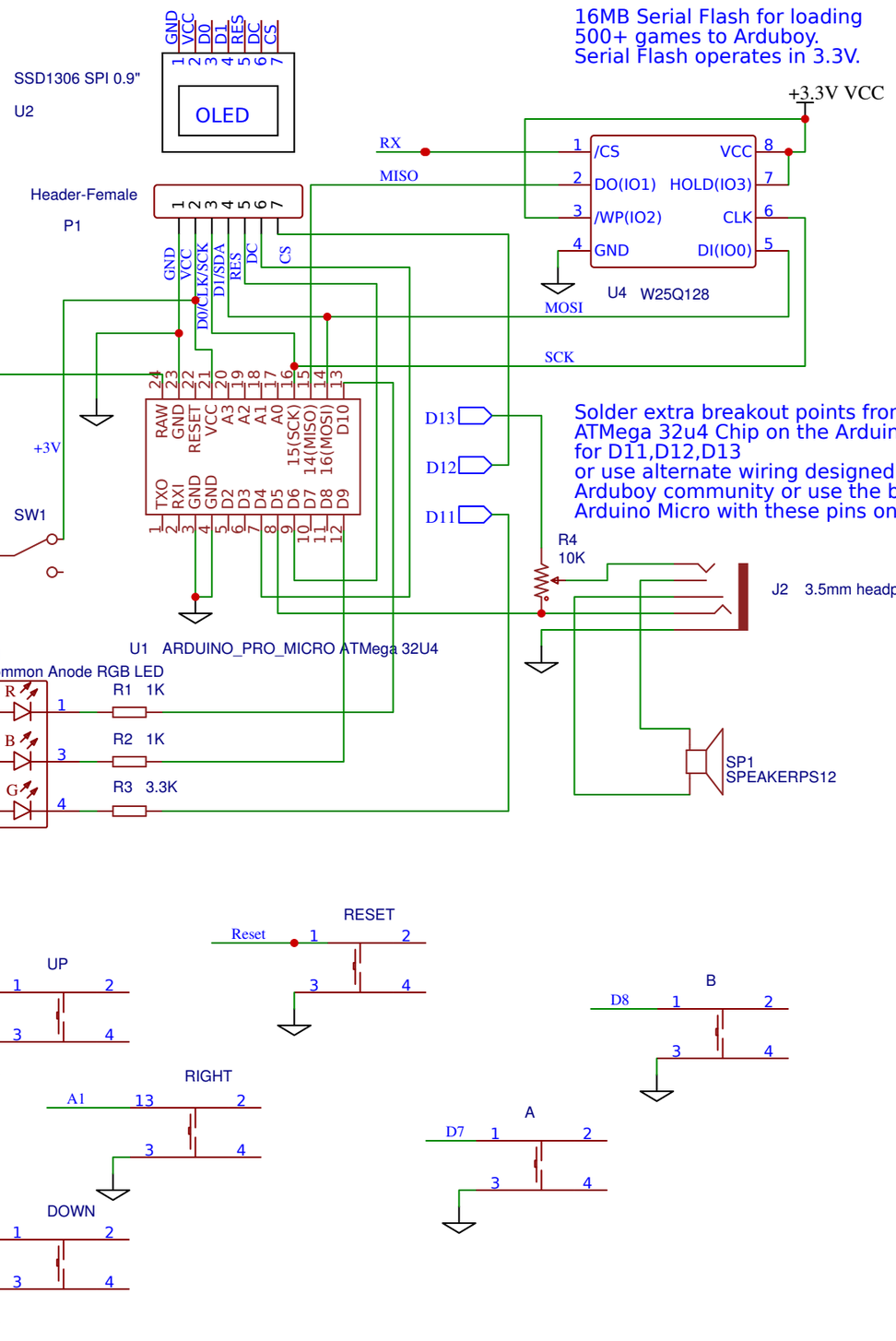
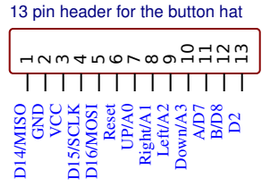
Regulator to supply 3.3V to Pro Micro

16MB Serial Flash for loading
500+ games to Arduboy.
Serial Flash operates in 3.3V.

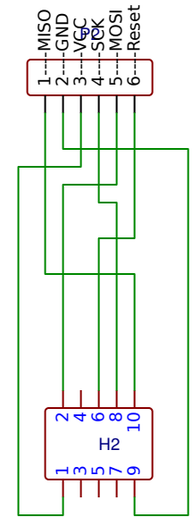
Female Header to connect to the button hat,
that can be swapped for other form of joysticks or anlog dials.
The first 6 pins doubles up as the port to connect to connect a
conversion cable to a USBasp to burn
the Cath 3K bootloader to the Pro Micro.
The USBasp conversion cable on the left can be used.



P3
13 pin header for the button hat



1x6 male header. Insert to the Arduboy Header



View from bottom of female header_2x5
insert to the male header of the USBasp Programmer