Pinball Mega Shield - for Arduino Mega 2560

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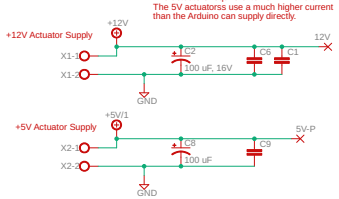
Designed for the SAMS Pinball Lab, June 2019.
https://courses.ideate.cmu.edu/SAMS/2019/pinball

Actuator Power Input

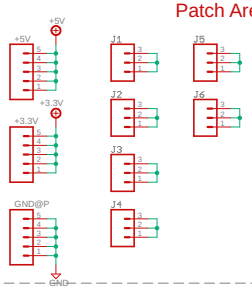
Logic +5V is supplied by the Arduino.
The actuators require external 12V and 5V.
The 5V actuatorss use a much higher current than the Arduino can supply directly.



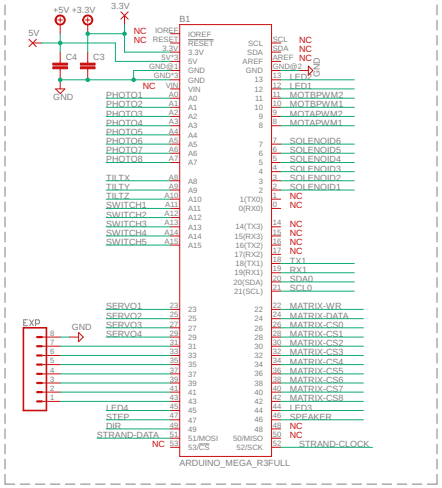
Tilt Accelerometer

Header for GY-61 three-axis analog accelerometer to detect machine 'tilt'.

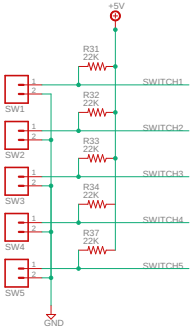
Patch Area



Arduino Mega 2560 Microcontroller Board

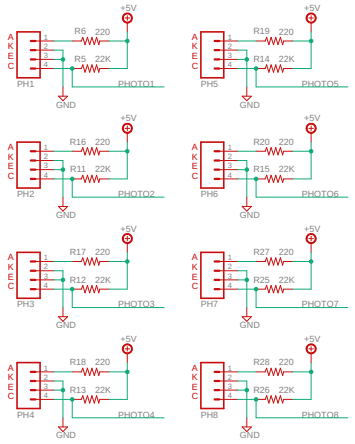


Switch Interface

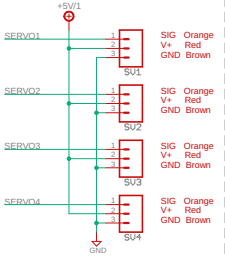


Photosensor Interface

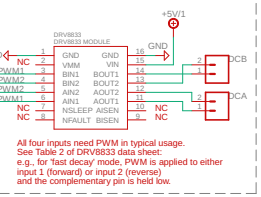
Each header connects to one photointerruptor (reflective or transmissive) as follows:
A = LED anode (positive)
K = LED cathode (negative)
E = NPN phototransistor emitter (negative)
C = NPN phototransistor collector (positive)



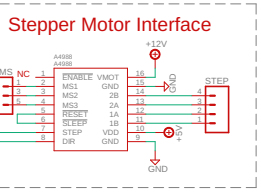
Hobby Servo Interface



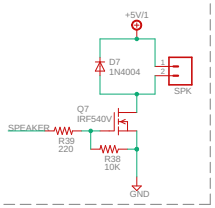
Dual DC Motor Interface



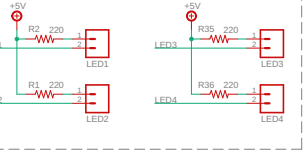
Stepper Motor Interface



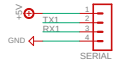
Tone Speaker Interface



Individual LED Interface

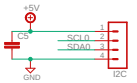


External Serial



Logic-level serial port, e.g. for audio co-processor.

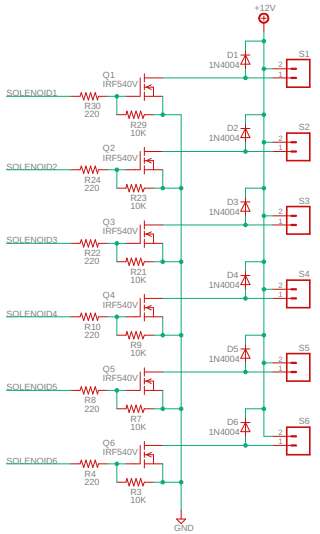
I2C Expansion



Solenoid Interface

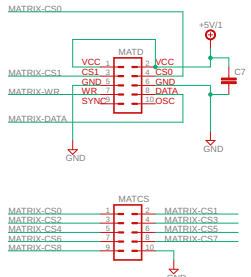
The MOSFET gate bias resistors act to limits the current from the Arduino and keep the MOSFETs off while the control circuit is powering up.

The rectifier diodes protect the MOSFETs by absorbing the negative 'flyback' voltages created by the solenoid coils when the currents switch off.



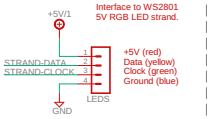
LED Matrix Interface

Interface to up to nine Adafruit HT1632 monochrome LED matrix displays.



LED Strand Interface

Interface to WS2801 5V RGB LED strand.



H1 MOUNT-HOLE3.2
H2 MOUNT-HOLE3.2

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