BrailleMate

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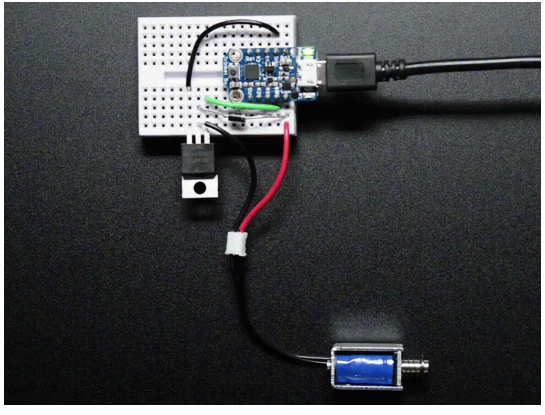
Project Overview

- A 2x3 actuator grid (using solenoids) to teach and read braille.
- Two modes of operation:

1. Learning mode: Select an alphanumeric character, hear it on a speaker, feel it on the solenoid grid.
2. Reading mode: Display characters from a text file on host or SD card, one after another on the solenoid grid.



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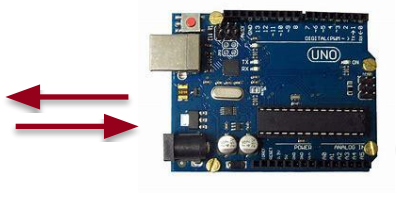
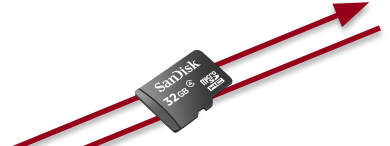
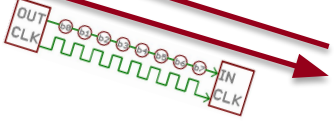


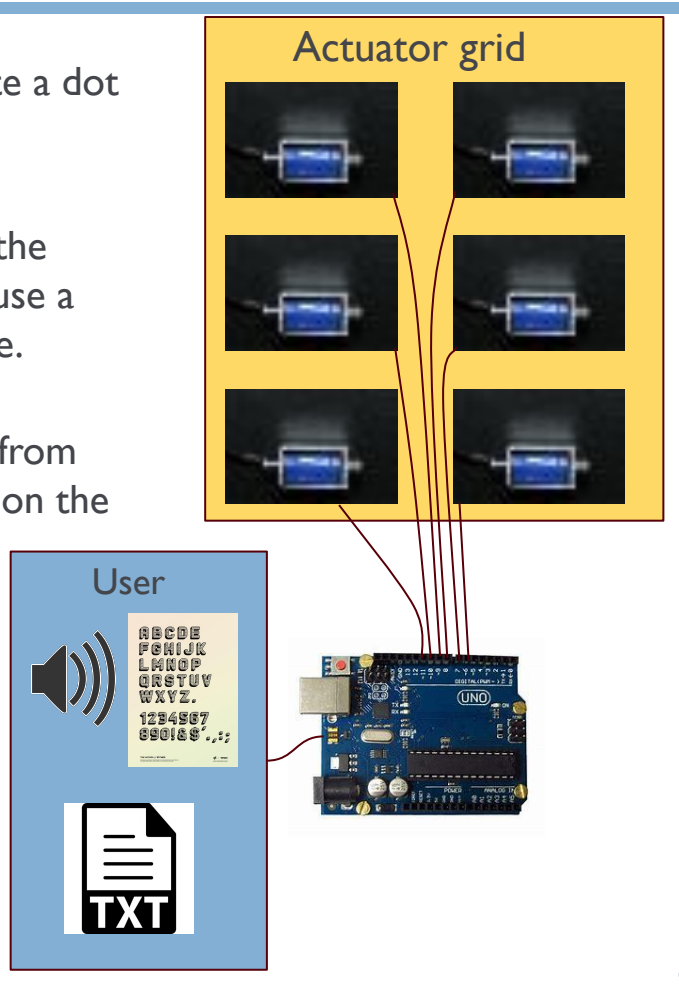




Implementation Overview

- Use a 2x3 array of actuators that can "pop up" to activate a dot in the grid. Solenoids or servos, most likely the former.
- Atmega controls the actuator grid using BJTs.
- Learning mode: Joystick selects character, speaker reads the character out loud from microSD card and plays it. Will use a MP3-speaker control module to select the right audio file. Arduino projects that character onto the actuator grid.
- Reading mode: Script sends a text file over serial comm. from host/SD card to Arduino. Timers will refresh a character on the grid each second.

- This project covers the following topics: Timers, Interrupts, ADC, Serial communication



Component List

No.	Description	Quantity	Description	Cost (estimate)
1	Solenoid switch	6+2	Braille cell imprint (2x3)	$44
2	Micro SD card module	1+1	SD card integration with Arduino UNO	$10.4
3	SD card	2	1 for mp3 files for learning mode + 1 for storing text file for reading mode	$10.5
4	MP3 player	1+1	For playing mp3 files used in learning mode	$11.8
5	Speaker module	1+1	For playing the mp3 file in learning mode	$7.9
6	Power BJTs	6+3	For supplying current to the solenoids	$7.5
7	Connectors	7+3	For connecting solenoids and speaker	$1.47
	Total			$88.37

Project Schedule

- Week 1: Interface SD card with MCU, firmware to send characters to ATMega over serial communication, joystick control firmware. Unit testing.
- Week 2: Develop drivers for MP3 module and speaker. Firmware development for actuator grid, along with making the hardware setup. Unit testing.
- Week 3: Integration of reading and learning modes. Integration testing.
- Week 4: Debugging and fine tuning to make it more usable. Functional testing.
- Final Demo: Demonstrate project in allotted time