CMPUT 274 Final Project - Breakout!

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1 About Breakout!

Breakout is an arcade classic where a player must bounce a ball around an arena at rows of 'bricks' on the upper portion of the arena. Points are awarded for hitting (which eliminates) each brick. If the player misses the ball with their paddle, they lose a 'life'. The paddle size shrinks when the player breaks through the red row, and the ball speed increases proportionally with increasing numbers of hits.

Legend has it that Steve Wozniak was inspired to build a computer he could program his own full-colour version of Breakout! on, and this computer would turn out to be the Apple][, which ultimately spawned the 'insanely great' empire that would become Apple Computer Inc. This is game is a tribute to the 'great and powerful' Woz.

Our version of Arduino Breakout! is quite close to the original in many ways, but is also our own spin on this fun classic, and as such, has a few slight differences, but doesn't take away from the fun to be had!

2 How to Build

This game requires an Arduino Mega 2560, the Adafruit ST7735 LCD module, a SparkFun 5k Analog joystick, a push-button and a speaker (if sound is desired).

Members of the CMPUT 274 class will have all the required components in their development kits to try out this addicting game!

The following connections will be required (see Figure 1 for a visual representation):

Pushbutton

- Connect one side to Pin 10 on the Arduino Mega 2560 Board

- Connect the other side to Ground

Speaker

- Connect one side to Pin 11 on the Arduino Mega 2560 Board
- Connect the other side to Ground

Joystick

- Connect VCC to +5V
- Connect GND to Ground
- Connect VERT to Pin A0 on the Arduino Mega 2560 Board
- Connect HORZ to Pin A1 on the Arduino Mega 2560 Board
- Connect SEL to Pin 9 on the Arduino Mega 2560 Board

LCD

- Connect GND to breadboard GND bus
- Connect VCC to breadboard positive bus
- Connect RESET to Pin 8 on the Arduino Mega 2560 Board
- Connect D/C (Data/Command) to Pin 7 on the Arduino Mega 2560 Board
- Connect CARD_CS (Card Chip Select) to Pin 5 on the Arduino Mega 2560 Board
- Connect TFT_CS (TFT/screen Chip Select) to Pin 6 on the Arduino Mega 2560 Board
- Connect MOSI (Master Out Slave In) to Pin 51 on the Arduino Mega 2560 Board
- Connect SCK (Clock) to Pin 52 on the Arduino Mega 2560 Board
- Connect MISO (Master In Slave Out) to 50 on the Arduino Mega 2560 Board
- Connect LITE (Backlite) to breadboard positive bus

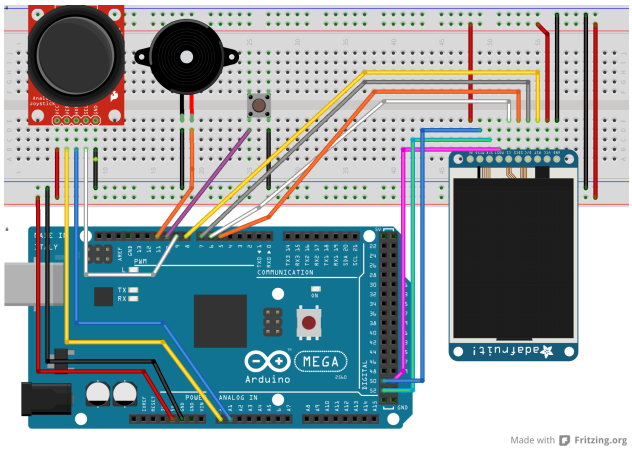

Figure 1: Connection Diagram for Arduino Breakout!

(If a schematic representation is more to your liking, refer to Figure 3.)

The end result should look something like this (Figure 2):

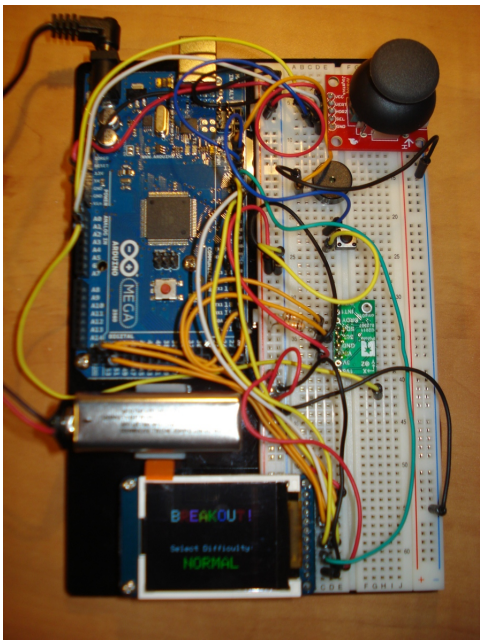

Figure 2: A completed Arduino Breakout! Setup

3 Gameplay

Upon starting Arduino Breakout!, you are first greeted with the title screen which allows you to choose difficulty level. You may select by pushing left or right on the joystick. When you have chosen your desired level, press the push-button to begin the game.

To launch your ball, press down on the joystick. The objective is simple: eliminate all bricks from the arena without letting the ball hit the floor, or running out of 'lives'.

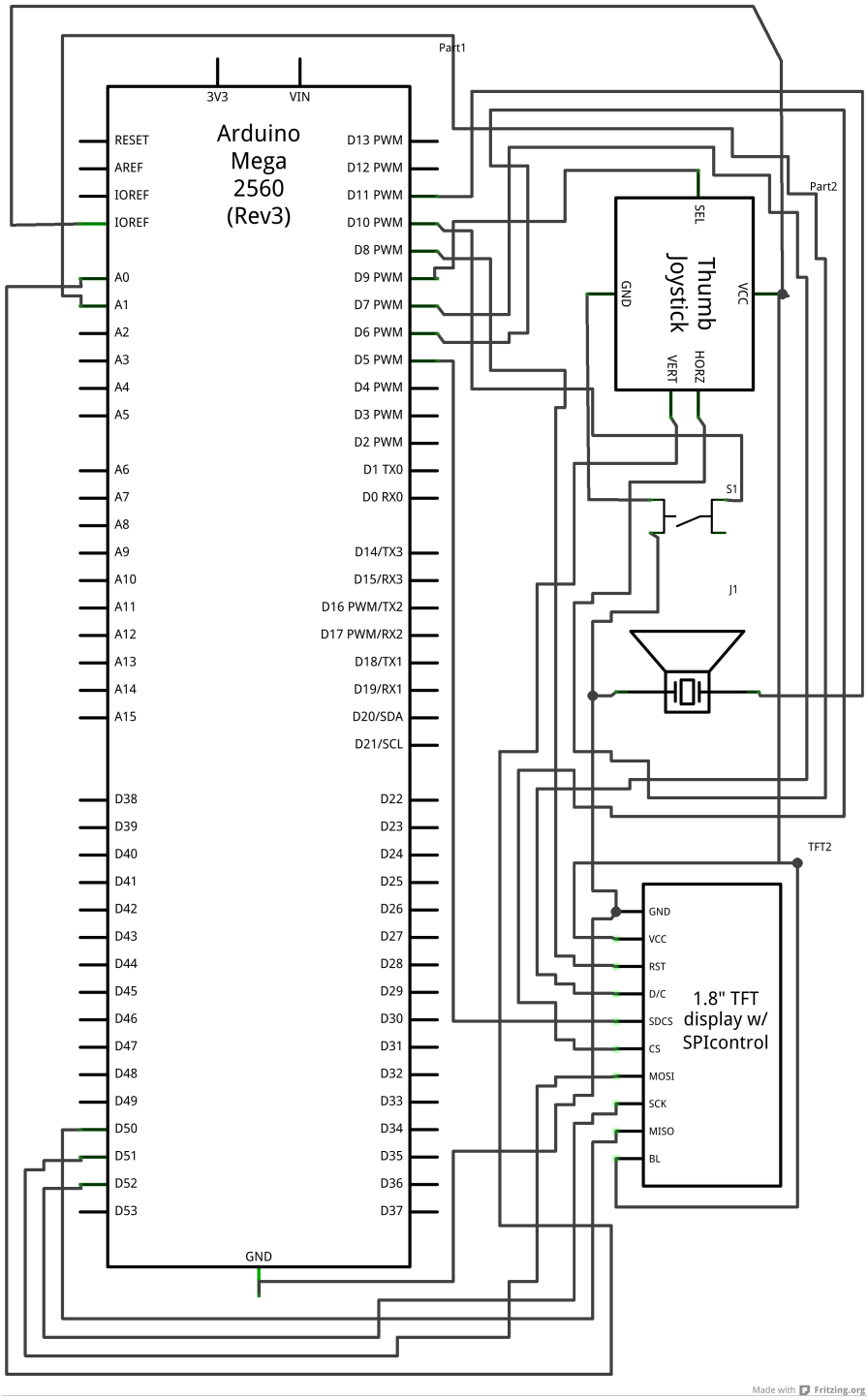

Figure 3: Schematic Diagram for Arduino Breakout!