

**20150223-mlug-
pi-arcade**

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Hardware

- Raspberry PI B+ (40pin GPIO)
- Mini-Wireless N USB adapter
- Sanwa Joystick (Mr Joystick 2 JL-W)
- 6 x Dimpletop buttons
- 1 x Coin button
- 1 x Player1 button
- 16mm wood for the box
- 2 x small hinges
- 40pin ribbon cable + headers
- Experimenters board from Jaycar (horizontal copper plated)
- *mlug website*

Tools

- 29mm Lenox Holesaw
- Drill
- Liquid Nails
- Saw
- Spray paint
- Good soldering with temperature settings

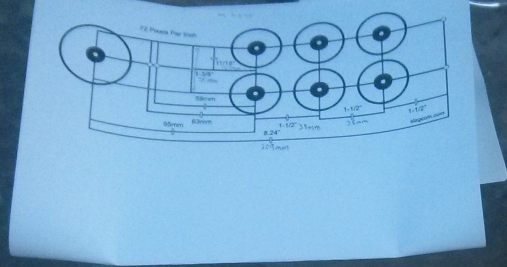
Distro

RetroPie - Built upon Raspbian or install as a script on top of Raspbian.

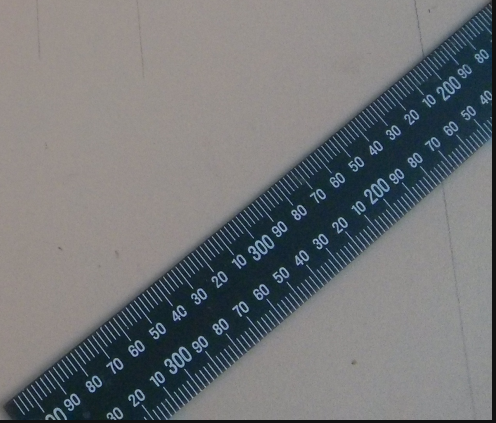
- Heaps of emulators setup for Sega, Nintendo, MAME, Amstrad, Amiga, PC, Playstation 1, neogeo, etc.

RetroPie Features

- Emulationstation - start your arcade games, themeable
- Easy script to configure emulators
- Installs all the emulators you need
- Sets up the ROM area so you can put your ROMs in there.



1 - Measure



2 - Create controller box

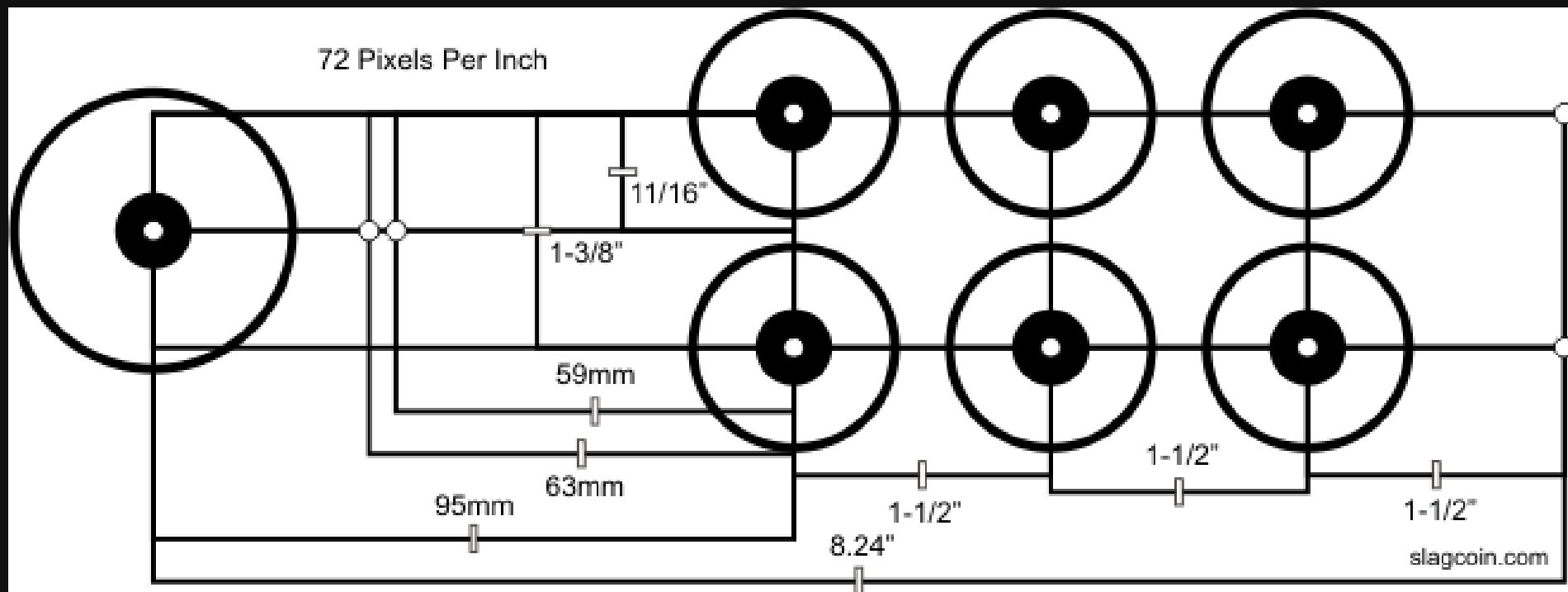




3 - Drill holes

The Holes

- Good quality drill
- Start slow
- 29mm hole saw used
- Choose Street Figher 1 layout



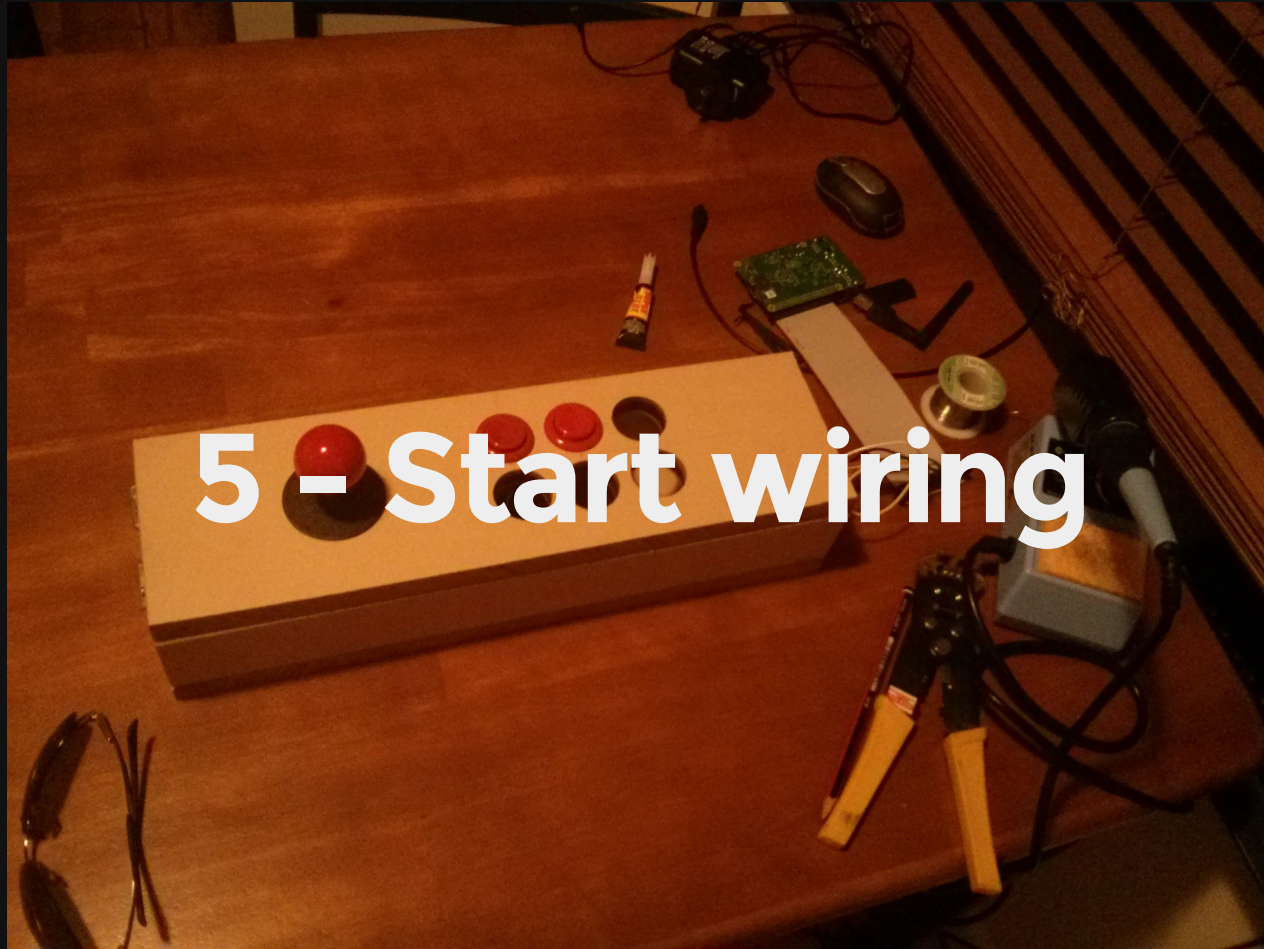
A square table with a light-colored wooden top and a chrome metal frame, sitting on a concrete surface. The frame consists of four legs and a top rail. The text "4 - Construct Table" is overlaid in white on the table.

4 - Construct Table

The Table

- Table is second hand (reuse)
- Melbourne Free Cycle sometimes has free tables
- Look for something which fits a screen
- Prefer wood as it's easier to work with.

5 - Start wiring



Soldering

Soldering ribbon headers

- Use an experimenters board
- Cut to size
- Use a very hot iron (400C)

6 - More wiring



7 - First Full Test



The screen

- Old 19" LCD with DVI & inbuilt speakers
- 4:3 ratio

A black octagonal table with a metal chair back on top, set against a stone wall. The table has a hole in the center of its top surface. The chair back has a circular hole in its upper rail. The scene is set on a concrete floor against a stone wall.

8 - Painting

Paint

I used a gloss black spray paint.

- Gloss for easy cleaning & style
- 4 to 5 layers to stop wear & tear

Finished Machine



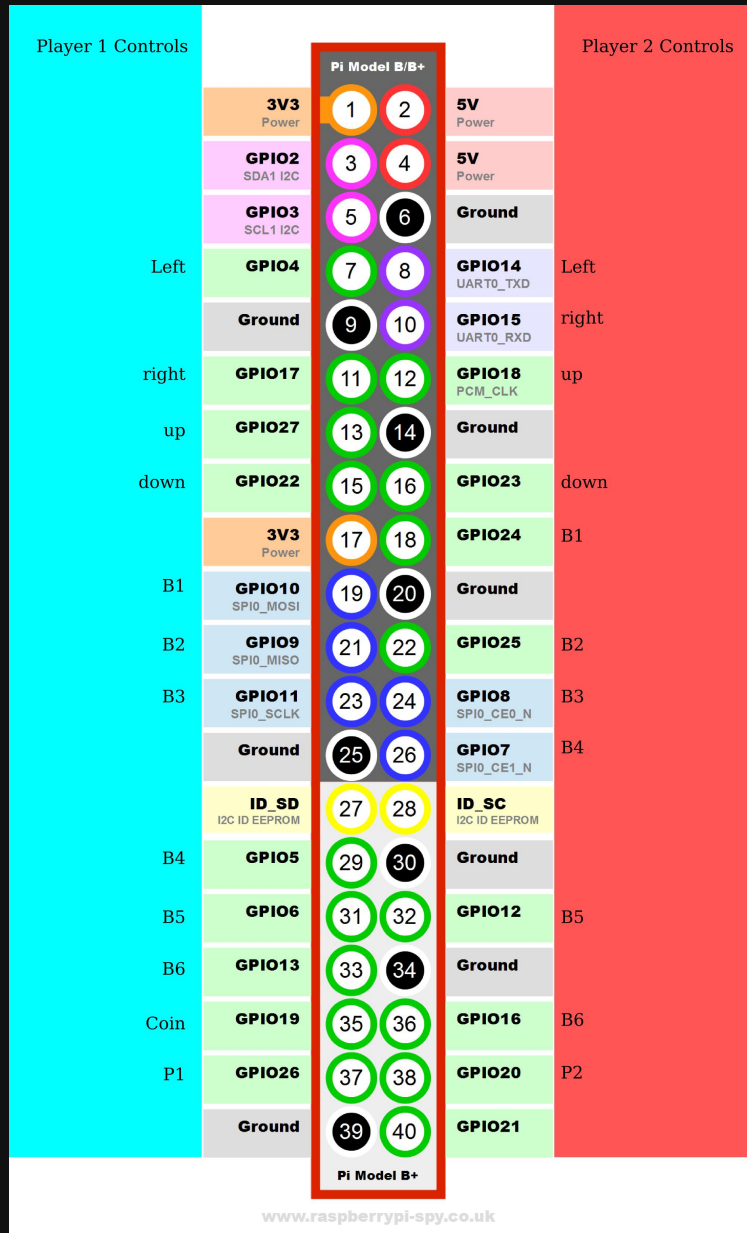
Network setup

- Mini Wireless N Device
- DHCP settings in /etc/network/interfaces

```
auto wlan0
iface wlan0 inet dhcp
    wpa-ssid "myssid"
    wpa-psk "password"
```

GPIO to Buttons

- First looked at expensive options (I-PAC \$74 JS/BTN -> KB)
- Choose Raspberry PI B+ (for the 40pin GPIO)
- Require 23 GPIO for two players w/6 buttons



Testing the buttons

testbutton.py

```
#!/usr/bin/env python

import RPi.GPIO as GPIO
import time

GPIO.setmode(GPIO.BCM)

GPIO.setup(18, GPIO.IN, pull_up_down=GPIO.PUD_UP)

while True:
    input_state = GPIO.input(18)
    if input_state == False:
        print('Button Pressed')
        time.sleep(0.2)
```

Mapping the keys

- Adafruit tutorial - Adding Arcade Controls
- Adafruit C program to map the buttons to keyboard keys
- Change ioStandard hash eg:

```
ioStandard[] = {
    // This pin/key table is used when the PiTFT isn't found
    // (using HDMI or composite instead), as with our original
    // retro gaming guide.
    // Input      Output (from /usr/include/linux/input.h)
    { 4,         KEY_LEFT    }, // Joystick (4 pins)
    { 17,        KEY_RIGHT   },
    { 27,        KEY_UP      },
    { 22,        KEY_DOWN    },
    { 10,        KEY_LEFTCTRL}, // 1 A/Fire/jump/primary
    { 9,         KEY_LEFTALT }, // 2 B/Bomb/secondary
    { 11,        KEY_SPACE   }, // 3 B/Bomb/secondary
    { 5,         KEY_LEFTSHIFT}, // 4 B/Bomb/secondary
    { 6,         KEY_Z       }, // 5 B/Bomb/secondary
    { 13,        KEY_X       }, // 6 B/Bomb/secondary
    { 19,        KEY_5       }, // Credit
    { 26,        KEY_1       }, // Start 1P
    // For credit/start/etc., use USB keyboard or add more buttons.
    { -1,        -1         } }; // END OF LIST, DO NOT CHANGE
```


Adding ROMs

- Add your ROMs to the /home/pi/RetroPi/ROM
- Each emulator has it's own directory
- Emulationstation will show emulator if ROMs exist

Legal Games

- **Retrode** - Legally backup your Sega Megadrive & SNES
- **Internet Arcade**
- **mamedev roms**
- **Legal Bubble Bobble Remake for Amstrad CPC**
- MAME cannot be used commercially

Future

- Create a 2nd player link between my machine & my mates
- Put wheels on the table
- Make the controller box easier to remove (wing nuts)

Questions