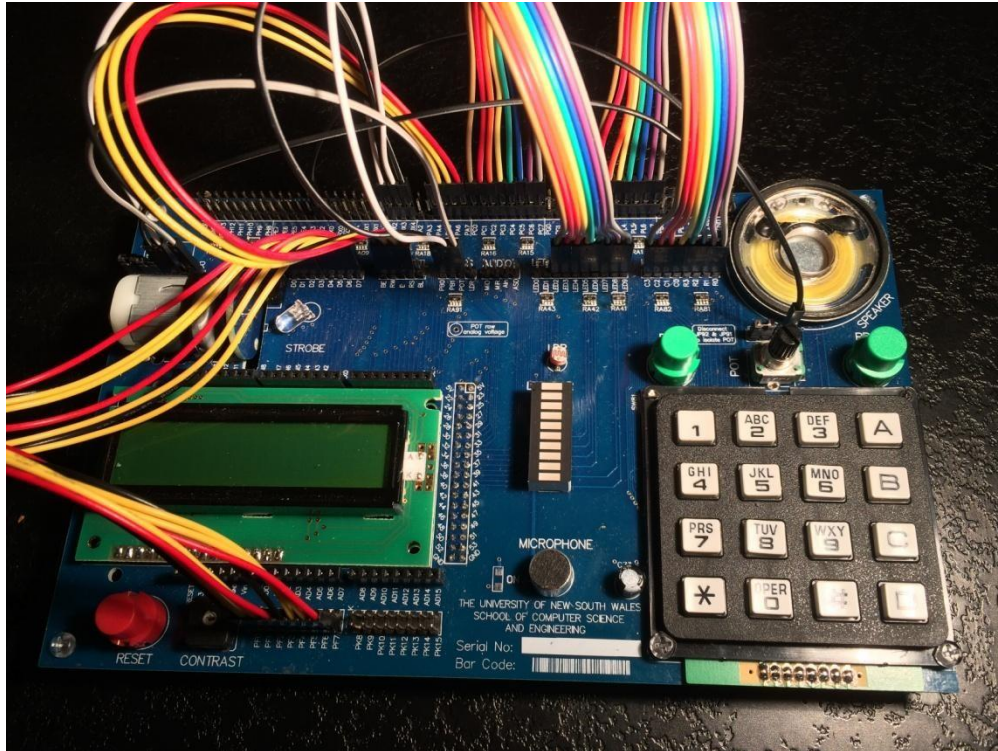


# User Manual



# Set-Up Guide

## Step 1

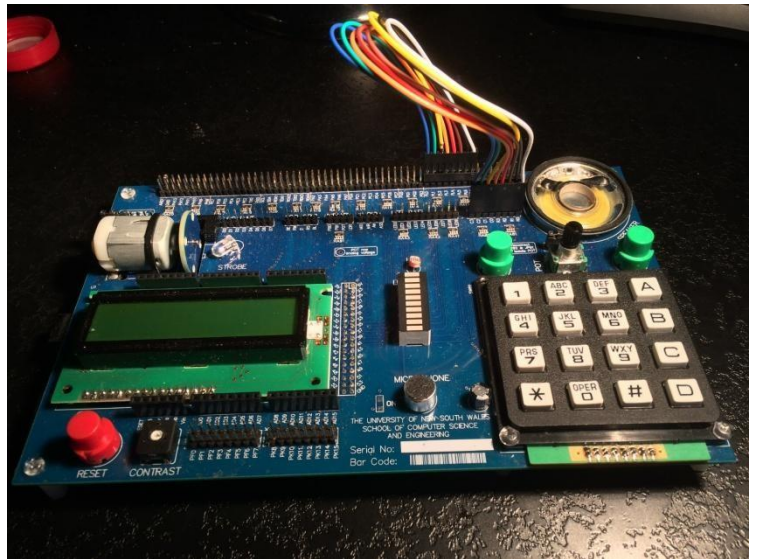
### Connect the Keypad

Port L is the output port for the keypad.

Connect from PORTL to the pins labelled KEYPAD:

PL0 to C3  
PL1 to C2  
PL2 to C1  
PL3 to C0  
PL4 to R3  
PL5 to R2

PL6 to R1 PL7 to R0



## Step 2

### Connect the LCD Screen

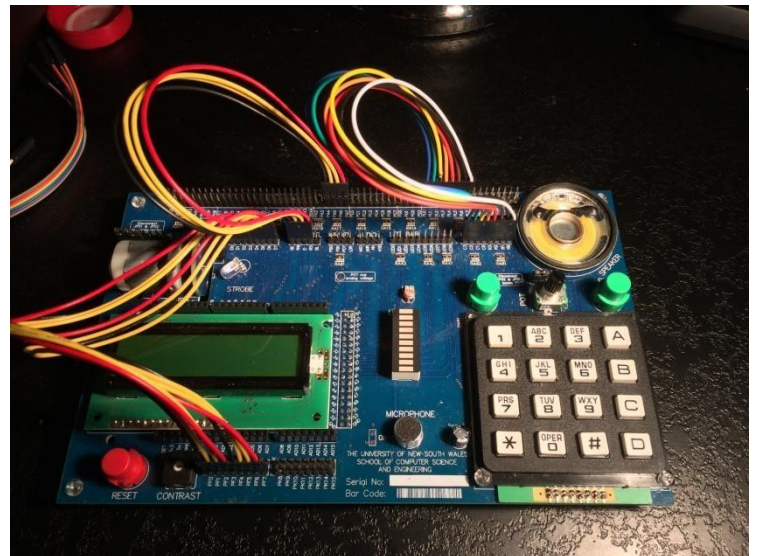
Port A is for LCD Control, Port F is for LCD Data output.

Connect from PORTA to the pins labelled LCD CTRL:

PA4 – BE  
PA5 – RW  
PA6 – E  
PA7 - RS  
BL –

Connect from PORTF to the pins labelled LCD DATA:

PF0 to D0	PF4 to D4
PF1 to D1	PF5 to D5
PF2 to D2	PF6 to D6
PF3 to D3	PF7 to D7



The backlight for the LCD is connected to Port G, connect the pin labelled BL to PG3.

### *Step 3*

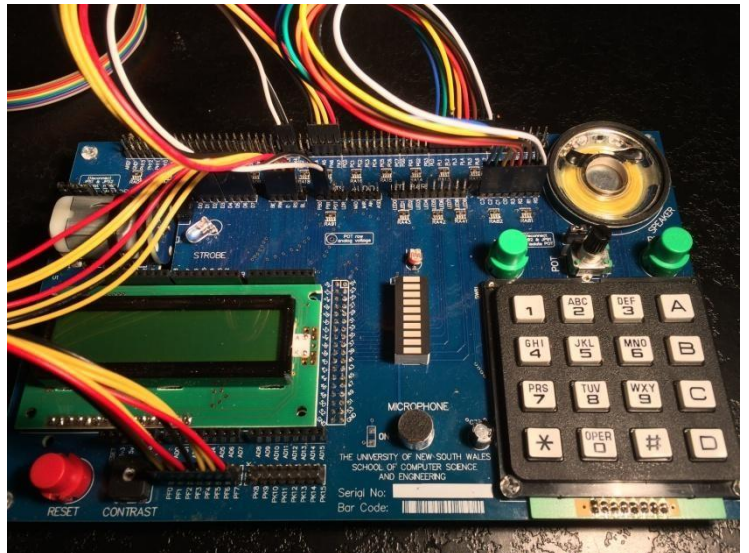
#### **Connect the Output Pins – PB0 and PB1**

PB1 acts as the open door button, while PB0 is for closing the door.

Connect from PORTD the pins labelled:

RDX3 – PB1

RDX4 – PB0



### *Step 4*

#### **Connect the LED Bar**

PORT C is the output port for the LED Bar

Connect from PORTC to the pins labelled

LED BAR:

PORTC0 – LED2

PORTC1 – LED3

PORTC2 – LED4

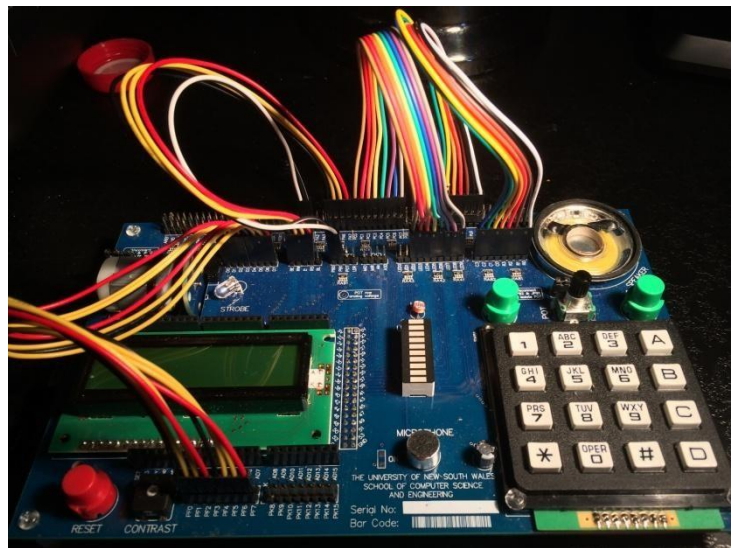
PORTC3 – LED5

PORTC4 – LED6

PORTC5 – LED7

PORTC6 – LED8

PORTC7 – LED9



### *Step 5*



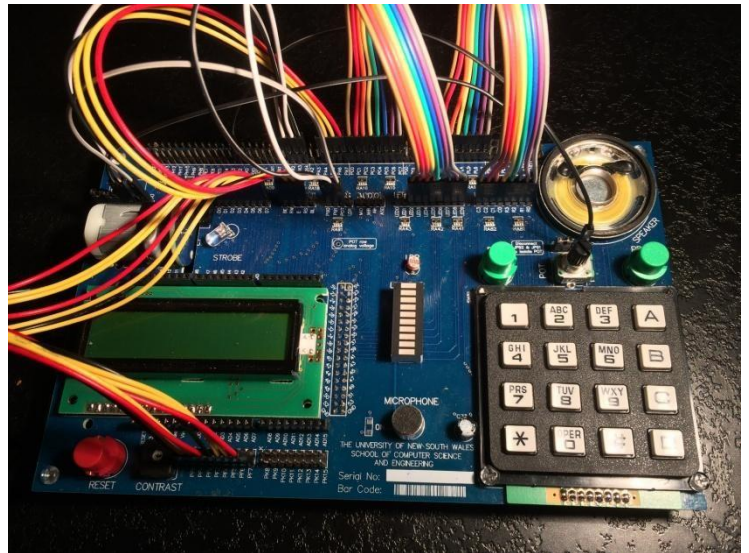
### Connect the Motor

First, provide the motor with power by connecting the pin labelled OpE (in the pins labelled MOTOR (top left hand corner of the board)) to one of the +5v pins in the top right hand corner of the board

To prevent crashing, disconnect the jumper connecting the two pins labelled JP91 (between the speaker and POT). Connect a wire from the right pin of JP91 to PE2 in Port E.

Connect the Mot pin in MOTOR to the POT pin in INPUTS (next to the PB0 and PB1 pins from above)

Now, connect the pin labelled OpO to TDX2 in Port E.



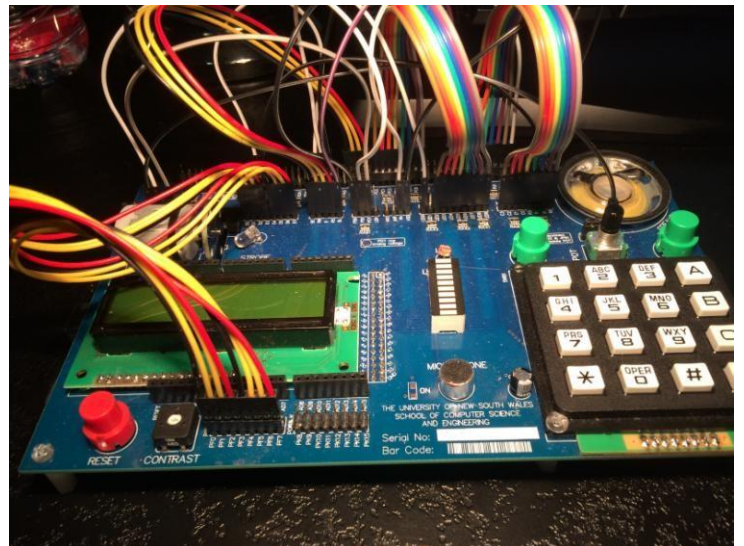
### Step 6

#### Connect the Speaker

The speaker is connected to Port B.

Connect from PORTB to the pins labelled AUDIO:  
PB0 – AIn

Then connect the pin labelled ASD to a grounded power pin (labelled GND) in the top right corner of the board.



## Modes

This microwave operates in 4 different modes:

Mode 0 – Entry mode  
Mode 1 – Running Mode  
Mode 2 – Paused Mode  
Mode 3 – Finished Mode

## Motor

The motor acts as a magnetron would in a real microwave.

In entry mode, it is inactive.

In running mode, it spins at the desired rate set by user input

In paused mode, it is inactive.

In finished mode, it is inactive.

## LCD Screen

The LCD provides information to the user via the timer, open/closed status of the door, as well as current rotation of the turntable.

In entry/paused/running mode, the LCD displays the current position of the turntable as well as the open/closed status of the door.

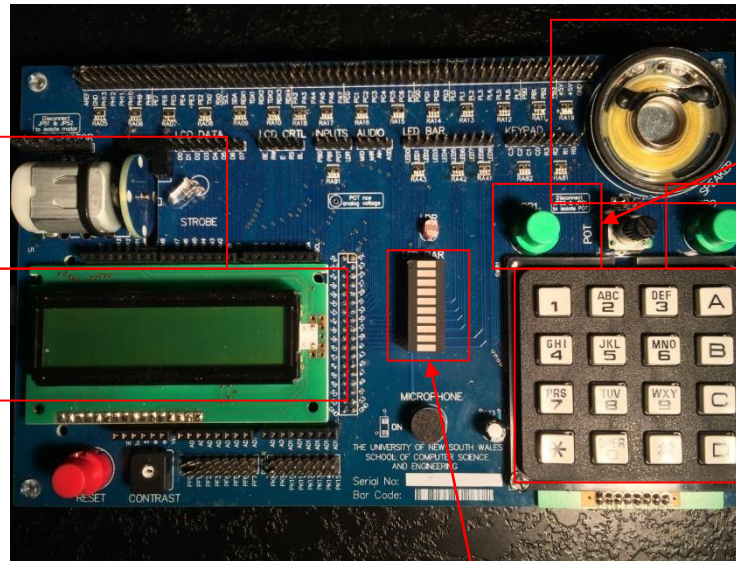
In entry mode, the timer displays the current input timer, ranging from 00:00 to 99:99.

In running mode, the timer will tick down, and the turntable will rotate.

In paused mode, the LCD will freeze on the last known information.

In finished mode, the LCD will display "Done, Remove food"

## How to Use



## Speaker

When the microwave is done cooking, the speaker plays 3 short beeps.

The speaker also plays short beeps when keys are pressed.

## Open Door

The left button acts as the open door button. When closed, pressing this button will change the display to "O" and any further key presses apart from the Close Door button will be ignored.

When the microwave enters finished mode, it will stay in finished mode until either the door is opened, or the stop key is pressed.

## Close Door

The right button acts as the close door button. When opened, pressing this button will change the display to "C"

## LED Bar

The LED bar shows the current power level selected, as well as the opened/closed status of the door.

The bottom 8 bits will show the current power, with all 8 bits on for full power (mode 1), the bottom 4 bits on for half power (mode 2), and the bottom 2 bits on for quarter power (mode 3).

The top LED will illuminate when the door is open.

## Keypad

See next page

# Keypad

## 0-9 Digits

In entry mode, the microwave will take up to 4 inputs of the 0-9 digits, to make up the running timer. After the 4<sup>th</sup> input, any further 0-9 input is ignored.

In running/paused/finished mode, no input is taken from the 0-9 digits.

## Power Selection Key

In running/paused/finished mode, the A key will do nothing.

In entry mode, pressing the A key will cause the microwave to go into Power Selection Mode, and wait until 1, 2 or 3 is pressed. All other key presses will be ignored.

When a valid input is given, the desired power level is set.

## Add 30 Seconds Key

In entry/paused/finished mode, pressing D will do nothing.

In running mode, pressing D will subtract 30 seconds from the current timer.

## Subtract 30 Seconds Key

In entry/paused/finished mode, pressing D will do nothing.

In running mode, pressing D will add 30 seconds to the current timer.



## Start Key

In entry mode, pressing the start key after giving input will start the microwave with the input timer. If no input has been given, pressing the start key will start the microwave with a timer of 1 minute.

In running mode, pressing the start key will add 1 minute to the timer.

In paused mode, pressing the start key will start the microwave running again.

In finished mode, no input is taken from the start key until the microwave has been reset by either opening the door or pressing the stop key.

## Stop/Reset Key

In entry mode, pressing the stop key will clear the current input timer.

In running mode, pressing the stop key once will pause the microwave's operation.

In paused mode, pressing the stop key will send the microwave back to input mode and will clear the timer.

In finished mode, pressing the stop key will return the