Home Project #2

Introduction to RB PICO

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EML480 Introduction to Mechatronics

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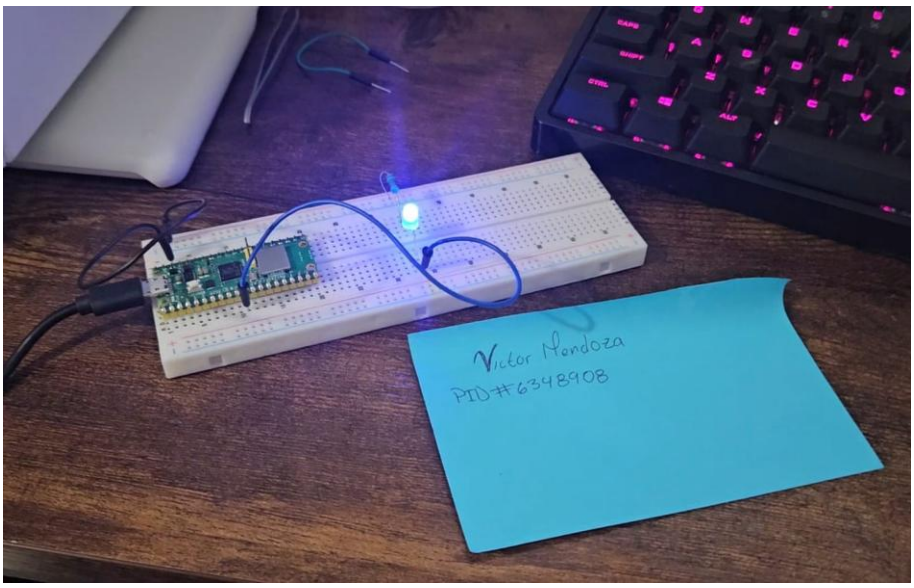
Introduction:

This project introduces the Raspberry Pi Pico by programming an LED to transmit Morse code signals. Using a breadboard, resistor, and LED, the circuit demonstrates how to control GPIO pins through Python code in Thonny.

Materials used:

1. Breadboard
2. Raspberry PICO board
3. Blue LED
4. Resistor 220-Ohm
5. 2 Wires
6. Micro USB cable

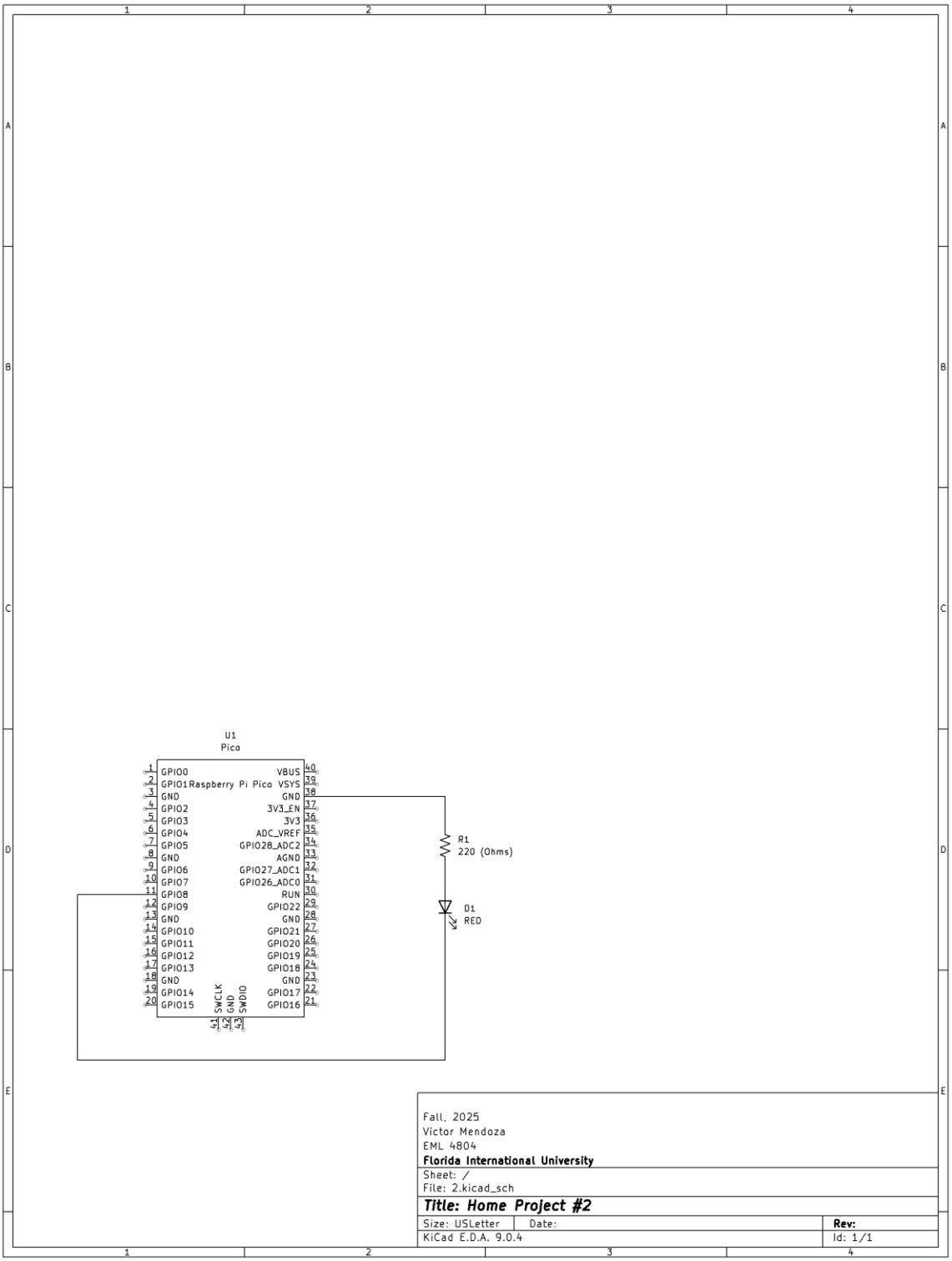
Picture:



Video link:

https://youtu.be/v1Tj91mWXWc

Diagram:


U1
Pico
GPIO0
GPIO1
GND
GPIO2
GPIO3
GPIO4
GPIO5
GND
GPIO6
GPIO7
GPIO8
GPIO9
GND
GPIO10
GPIO11
GPIO12
GPIO13
GND
GPIO14
GPIO15
VBUS
VSYS
GND
3V3_EN
3V3
ADC_VREF
GPIO28_ADC2
AGND
GPIO27_ADC1
GPIO26_ADC0
RUN
GPIO22
GND
GPIO21
GPIO20
GPIO19
GPIO18
GND
GPIO17
GPIO16
SWCLK
GND
SWDIO
Raspberry Pi Pico
R1
220 (Ohms)
D1
RED
Fall, 2025
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EML 4804
Florida International University
Sheet: /
File: 2.kicad_sch
Title: Home Project #2
Size: USLetter
Date:
Rev:
KiCad E.D.A. 9.0.4
Id: 1/1

Code:

```
from machine import Pin
import time

led8 = machine.Pin(8, machine.Pin.OUT)

#PID: 6348908
led8.on() #Turns led on
time.sleep(3)
led8.off() #Turns led off
time.sleep(1)

led8.on()
time.sleep(3)
led8.off()
time.sleep(1)

led8.on()
time.sleep(3)
led8.off()
time.sleep(1)

led8.on()
time.sleep(3)
led8.off()
time.sleep(1)

led8.on()
time.sleep(3)
led8.off() #Keeps Led off
```

Conclusions:

The project resulted in a working circuit where the LED successfully transmitted the penultimate digit of the Panther ID (0) in international Morse code using the GPIO pin corresponding to the last digit of the Panther ID (8) . The timing of the blinks matched the required dot and dash intervals, confirming that the program and circuit operated as intended. The prototype also showed stable performance after debugging, validating the correct use of the Raspberry Pi Pico, breadboard connections, and Python code execution through Thonny.

References:

- Raspberri Pi Pico Library: https://github.com/ncarandini/KiCad-RP-Pico/tree/main
- How to use a breadboard https://learn.sparkfun.com/tutorials/how-to-use-a-breadboard/all
- Raspberry Pi Pico usage
  https://www.raspberrypi.com/documentation/microcontrollers/pico-series.html