Adafruit Circuit Playground Express as an “On Air” Light

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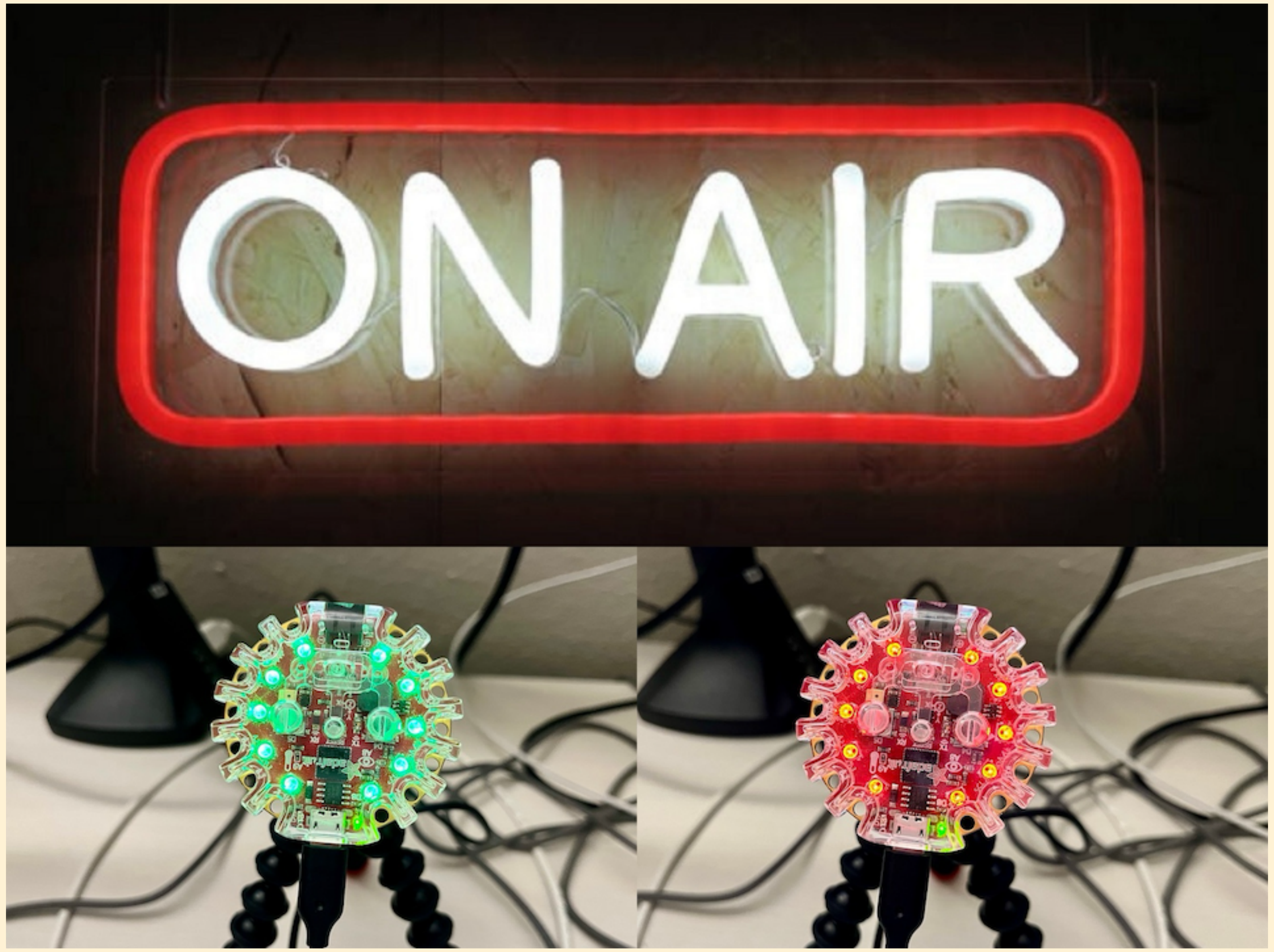
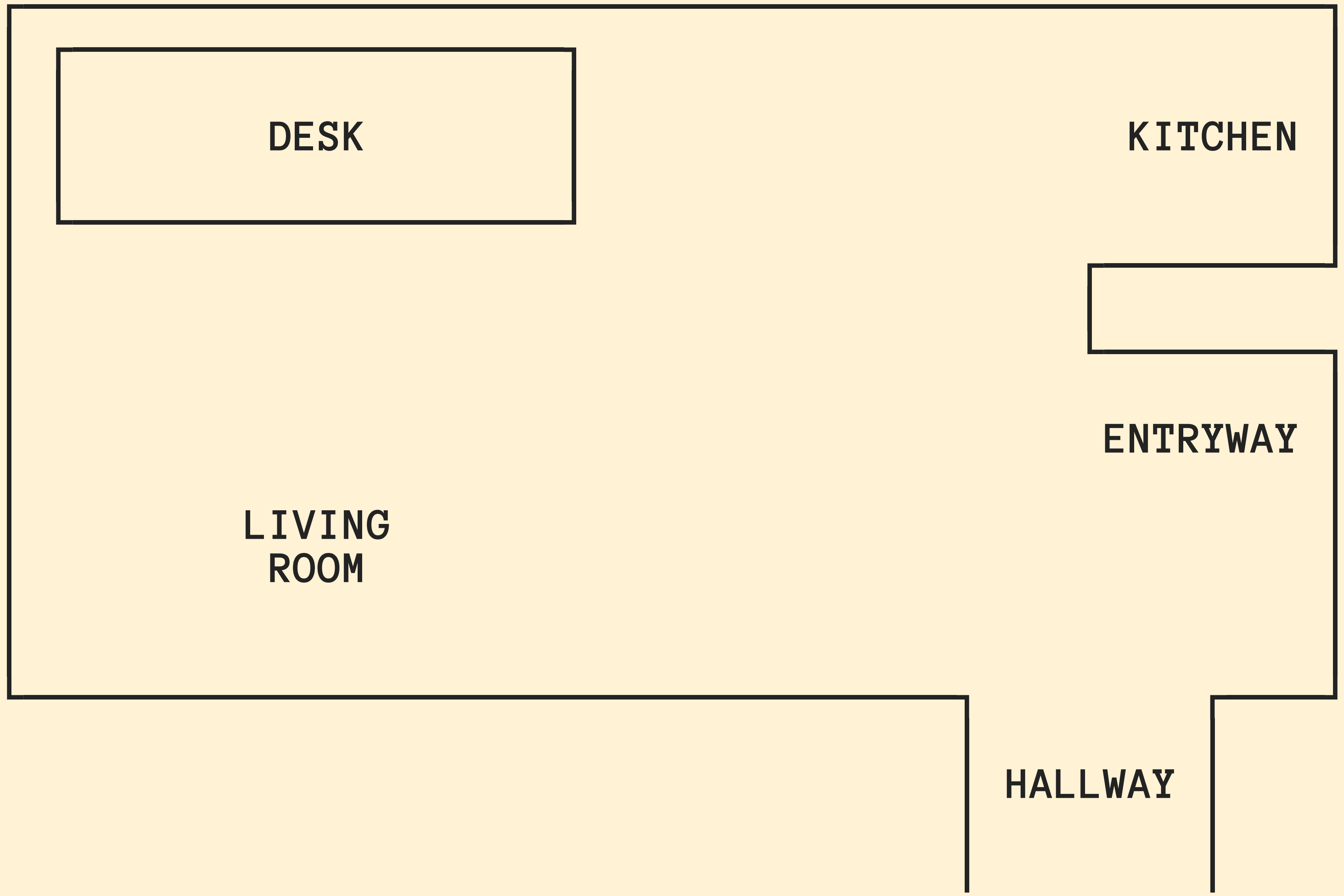
Nik Kantar

- Professional & unprofessional Pythonista
- Web(log): nkantar.com
- Code: @nkantar (GitHub)
- Toots: nkantar.social/@nik (Fediverse/Mastodon)
- Email: nik@nkantar.com
- Possibly available for hire!

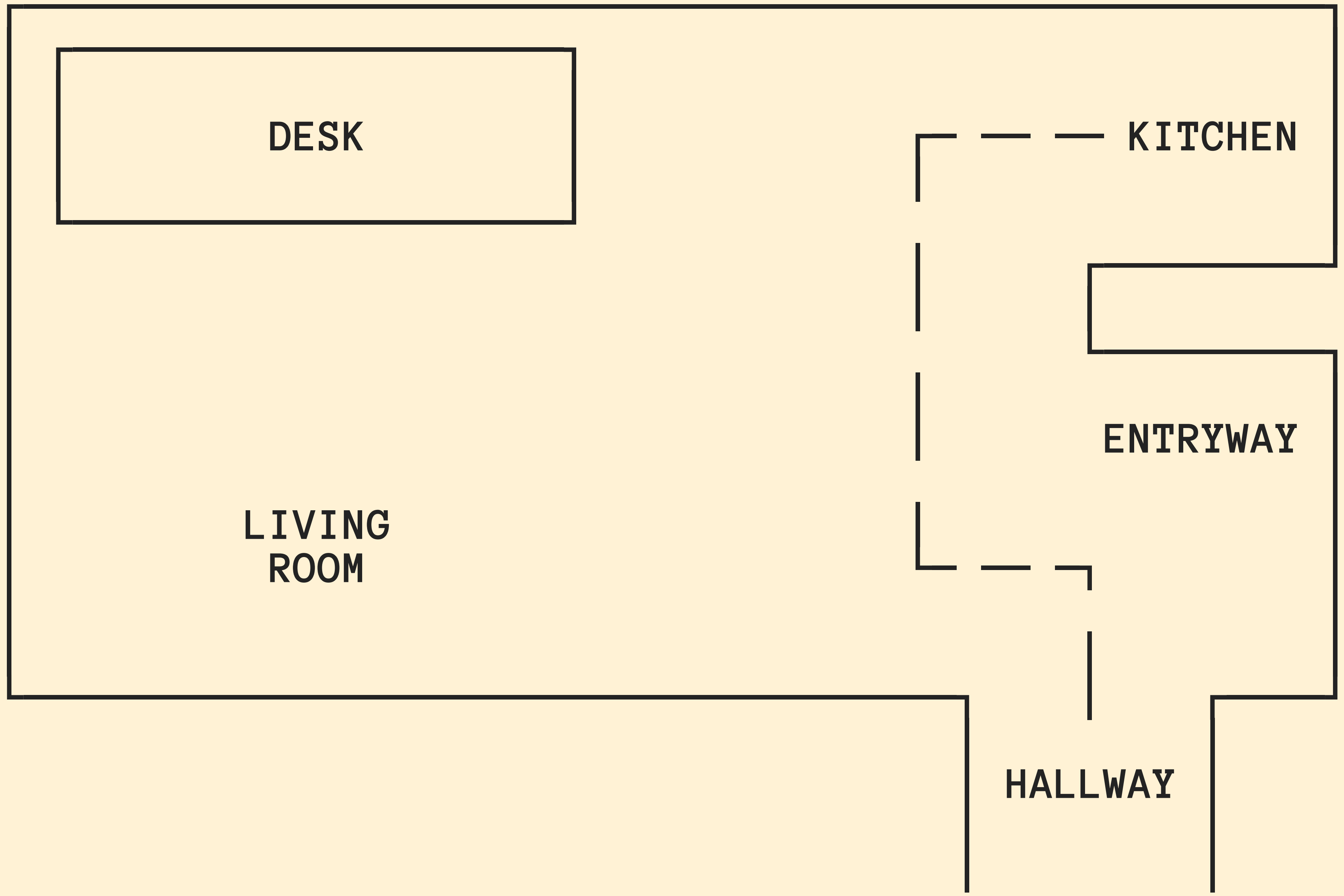
Project Overview



Background



Background



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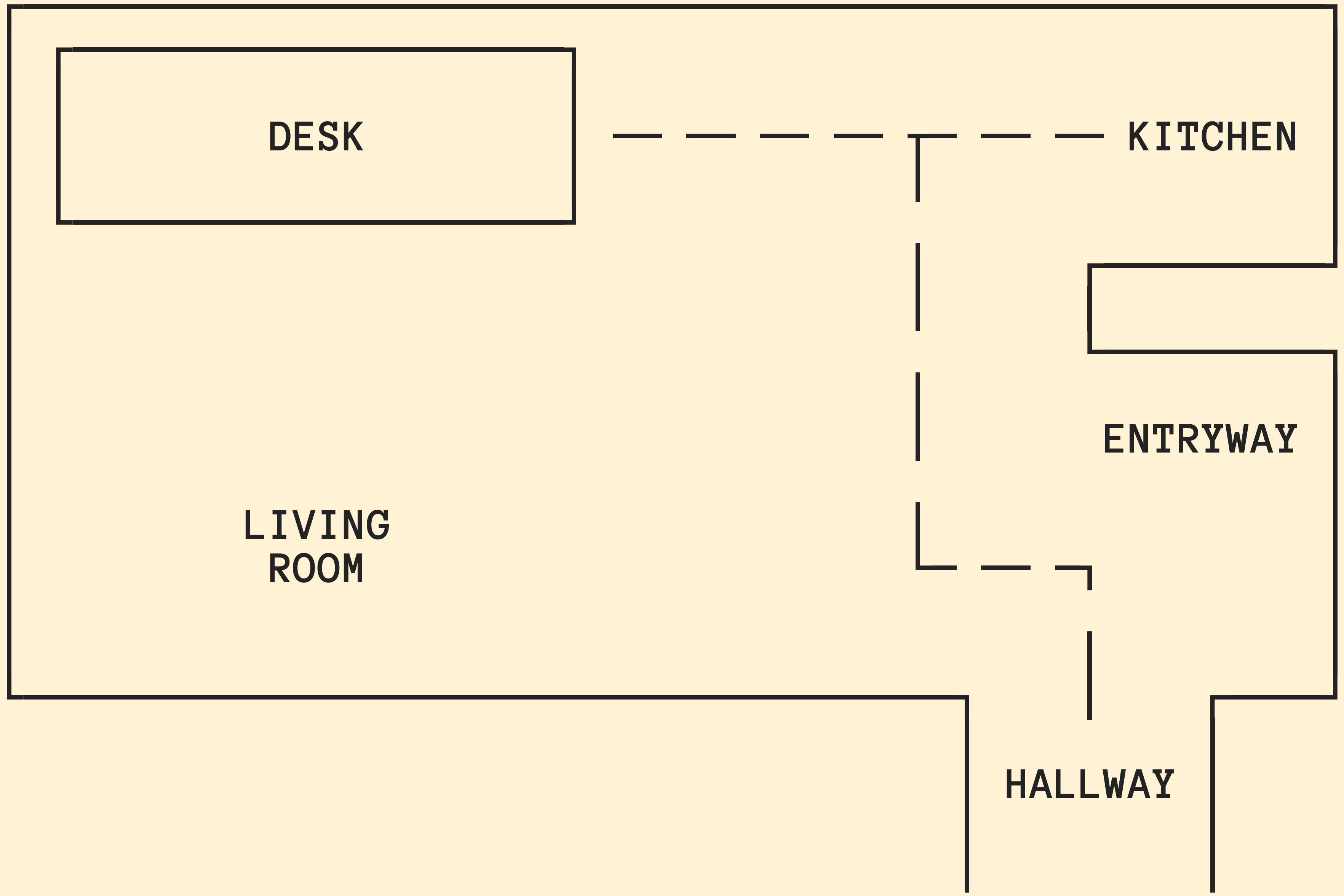

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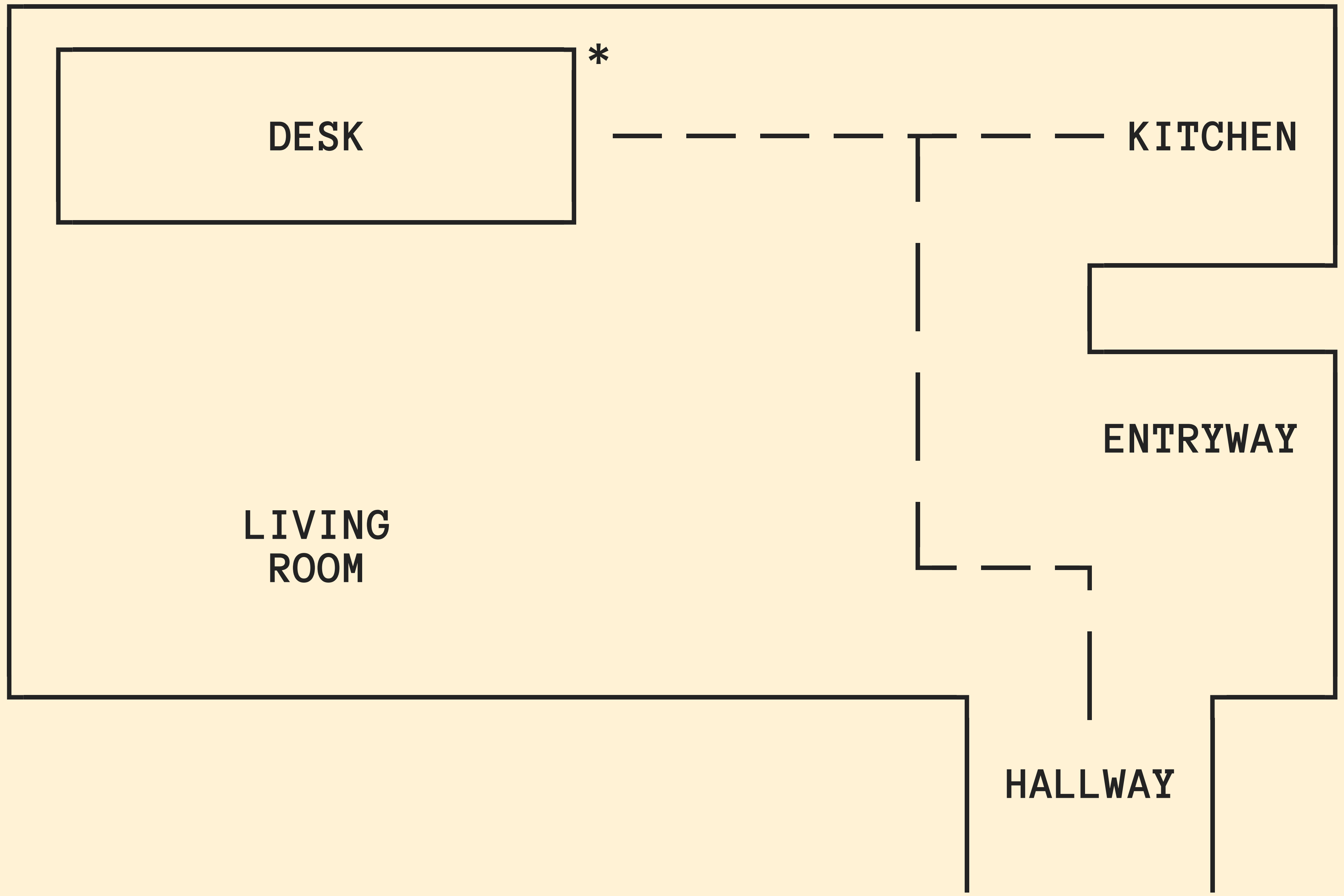

Platform Overview

- Circuit Playground Express
- macOS
- Zoom

Hardware

- Circuit Playground Express
- Long USB cable
- Optional: enclosure

Software

- Python
- launchd

Software Components

1. Status file
2. LED changer script
3. Call detection script
4. launchd service

Status File

```
# /Volumes/CIRCUITPY/state
```

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```
# /Volumes/CIRCUITPY/state
---
0
```

LED Changer Script

```
# /Volumes/CIRCUITPY/code.py
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from adafruit_circuitplayground.express import cpx
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COLORS = (
    (0, 255, 0),  # green
    (255, 0, 0),  # red
)
```

LED Changer Script

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from adafruit_circuitplayground.express import cpx


COLORS = (
    (0, 255, 0),  # green
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cpx.pixels.brightness = 0.01
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LED Changer Script

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from adafruit_circuitplayground.express import cpx


COLORS = (
    (0, 255, 0),  # green
    (255, 0, 0),  # red
)


cpx.pixels.brightness = 0.01


while True:
    with open("state") as state_file:
        state = int(state_file.readline())
        color = COLORS[state]
        cpx.pixels.fill(color)
```

Call Detection Script

```
# /Users/nik/bin/detect.py
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def detect():
    lsof_output = subprocess.check_output(["lsof", "-i", "4UDP"]).decode().split("\n")
    zoom_rows = [row for row in lsof_output if "zoom" in row]
```

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    current_state = int(len(zoom_rows) > 1)  # 1 zoom process isn't a meeting
    device_state = None
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    current_state = int(len(zoom_rows) > 1)  # 1 zoom process isn't a meeting
    device_state = None

    with open("/Volumes/CIRCUITPY/state", "r") as state_file:
        device_state = int(state_file.read())
```

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def detect():
    lsof_output = subprocess.check_output(["lsof", "-i", "4UDP"]).decode().split("\n")
    zoom_rows = [row for row in lsof_output if "zoom" in row]

    current_state = int(len(zoom_rows) > 1)  # 1 zoom process isn't a meeting
    device_state = None

    with open("/Volumes/CIRCUITPY/state", "r") as state_file:
        device_state = int(state_file.read())

    if device_state != current_state:
        with open("/Volumes/CIRCUITPY/state", "w") as state_file:
            state_file.write(str(current_state))
```

Call Detection Script

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# /Users/nik/bin/detect.py
---
import subprocess


def detect():
    lsof_output = subprocess.check_output(["lsof", "-i", "4UDP"]).decode().split("\n")
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    if device_state != current_state:
        with open("/Volumes/CIRCUITPY/state", "w") as state_file:
            state_file.write(str(current_state))


if __name__ == "__main__":
    detect()
```

launchd Service

```
# /Users/nik/Library/LaunchAgents/com.nik.OnAir.Detector.plist
```

launchd Service

```
# /Users/nik/Library/LaunchAgents/com.nik.OnAir.Detector.plist
---
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN"
 "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
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 "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Label</key>
  <string>com.nik.OnAir.Detector.plist</string>
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launchd Service

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<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN"
 "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Label</key>
  <string>com.nik.OnAir.Detector.plist</string>

  <key>ProgramArguments</key>
  <array>
    <string>/opt/homebrew/bin/python3</string>
    <string>/Users/nik/bin/detect.py</string>
  </array>
```

launchd Service

```
# /Users/nik/Library/LaunchAgents/com.nik.OnAir.Detector.plist
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<!DOCTYPE plist PUBLIC "-//Apple//DTD PLIST 1.0//EN"
 "http://www.apple.com/DTDs/PropertyList-1.0.dtd">
<plist version="1.0">
<dict>
  <key>Label</key>
  <string>com.nik.OnAir.Detector.plist</string>

  <key>ProgramArguments</key>
  <array>
    <string>/opt/homebrew/bin/python3</string>
    <string>/Users/nik/bin/detect.py</string>
  </array>

  <key>KeepAlive</key>
  <true/>
</dict>
</plist>
```
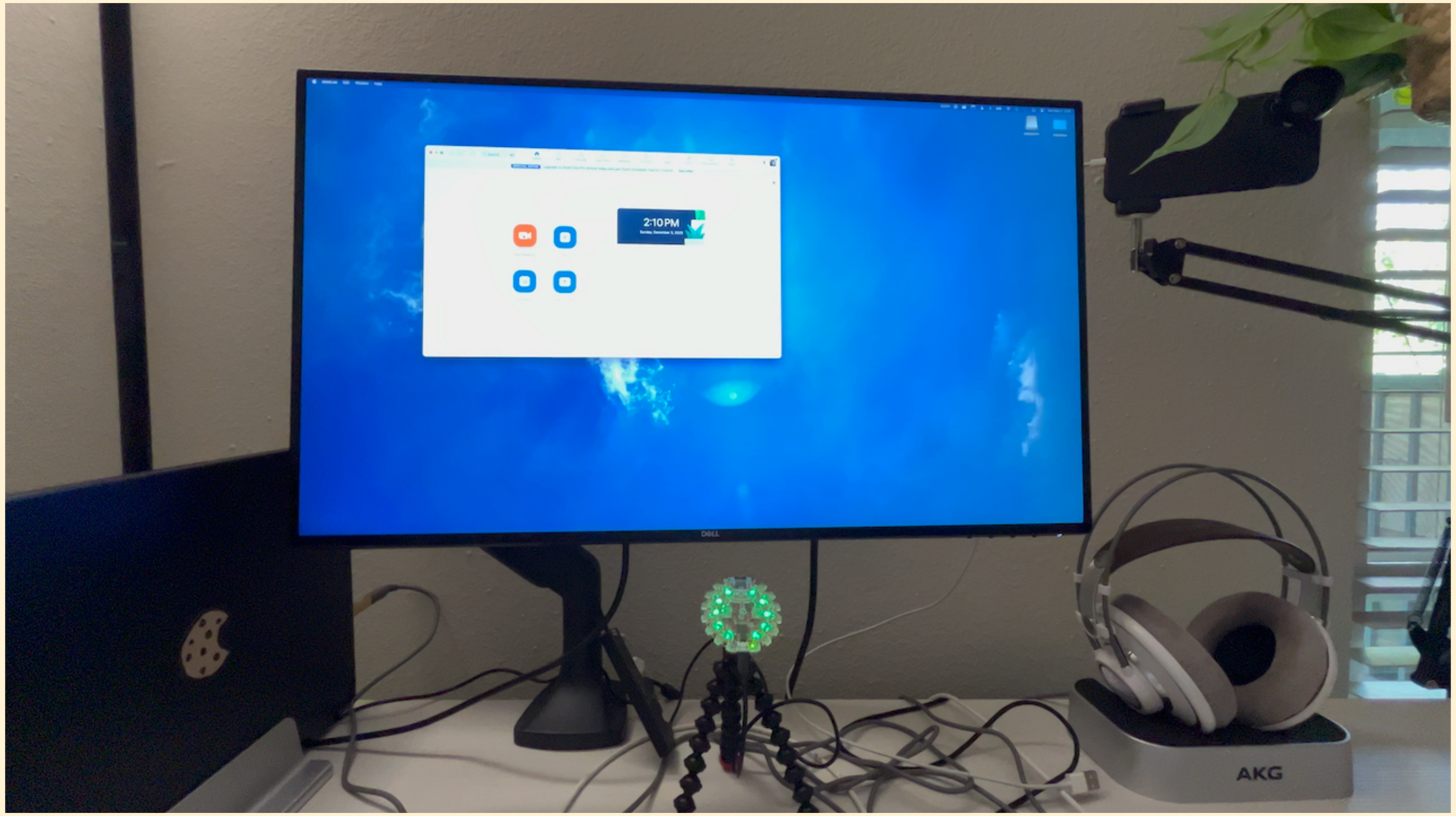

Run!

```
$ launchctl enable com.nik.OnAir.Detector.plist
```

Shiny



Considerations

- Call detection alternatives: detect camera/microphone use instead?
  - Could be off intentionally
- Manual switch: not covered due to time constraints, but useful!
  - I used xbar + shell script
- Other statuses?
  - Yellow: “not on call, but trying to focus”.

Future

- Decommissioned, because office = door
- Hang on door?
- Batteries = anxiety

Takeaways

- I had no meaningful hardware experience before doing this.
- You can *totally* do this too!
- Small gizmos with inputs and outputs are fantastic toys.
- Play is important.
- Play more.

Thank You!

- Hope you had a good time.
- Slides + code: nkantar.com/talks
- Questions, comments, job offers:
    - Discord: @Nik Kantar
    - Fediverse/Mastodon: nkantar.social/@nik
    - Email: nik@nkantar.com
- Bonus: PyBeach 2024, Los Angeles, CA 😎 (pybeach.org)