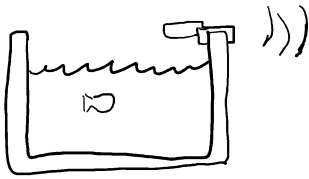


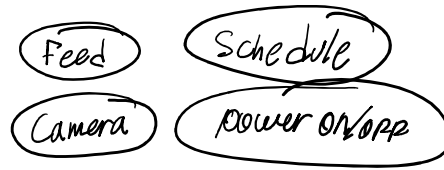
1/27/2025

Monday, January 27, 2025 7:22 PM

Brainstorming the Fish Feeder design



WIFI

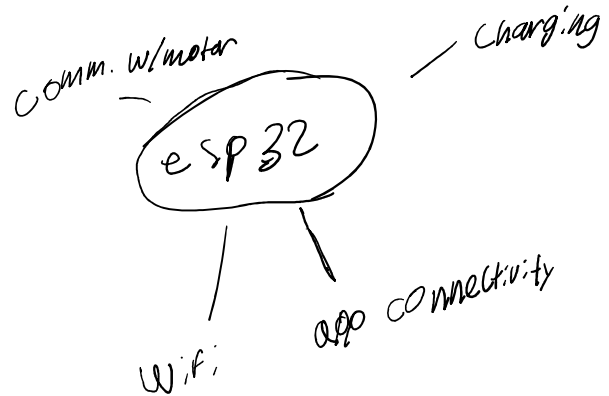


Manual Feed - opening flap
manual Power -

LEDs for food sensor, power

WIFI

WIFI releaser transmitter - micro



mech.

magnet to sense feeding

Camera - PCB

System for letting food through

Motor to rotate shell

AA = 1.5V

in reg to get down to 3.3V

batteries for charge and discharge 8mV.

1.00 battery x

Plug in system w/ backup battery

$$\frac{Whr}{W} = \frac{x}{0.6} = 24hr$$

2/10/2025 - 5PM to 7PM

Monday, February 10, 2025 5:01 PM

Determined we would use OV7670 for testing and possible final design. OV 2640 is ideal for final design.

Discussed hypothetical situation where we record videos to the camera roll.



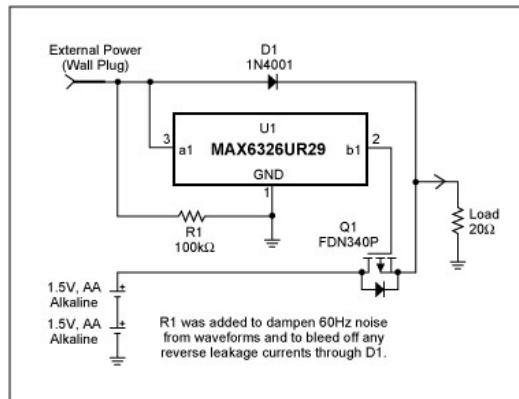
← OV7670

2/22/2025 - 9AM to 11AM

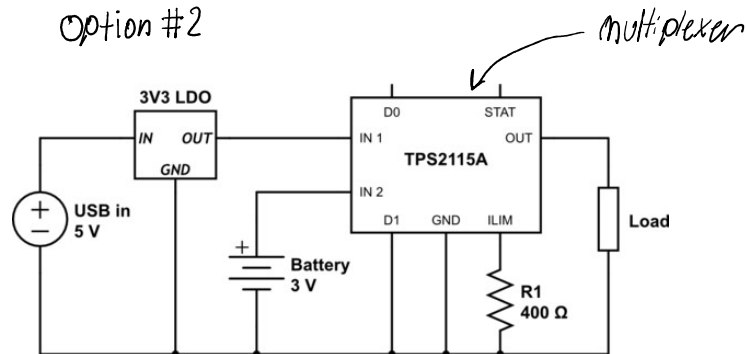
Sunday, February 23, 2025 1:28 PM

Find a way to switch between wall and battery power.

Option #1



Option #2



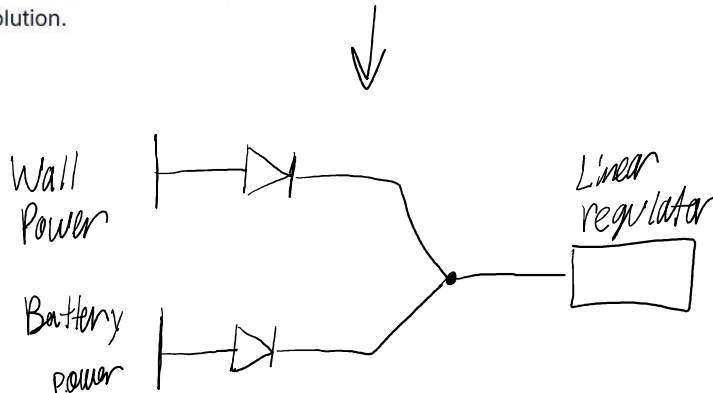
Option #3 - Decided to go with this

If your 9V adapter has a slightly higher voltage than your battery, the simple solution is to place a diode in series with both your battery and your external power adapter.

Whichever one has the highest voltage will power the circuit.

Another approach is to have a relay energised by the external power to change over the power connections from the internal battery to external power.

The latter approach will cause larger glitches when power is plugged in and removed than the diode solution.

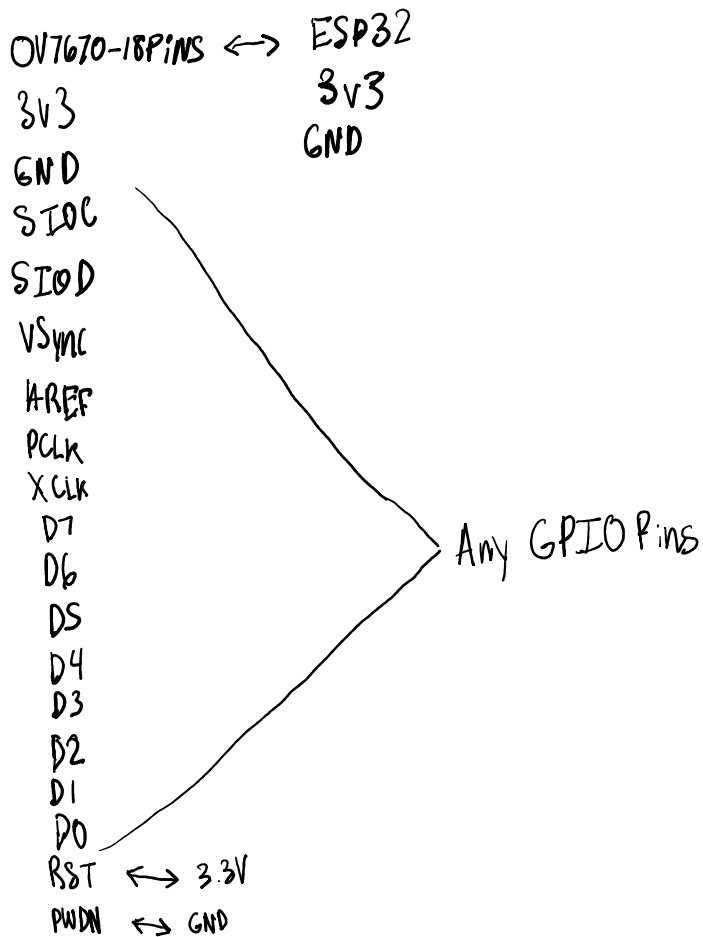
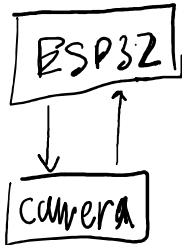
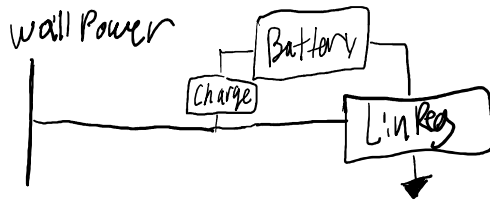


2/23/2025 - 1:30 to 2:45

Sunday, February 23, 2025 1:30 PM

Drew out very basic circuit diagrams for our systems in preparation for PCB design.

ESP 32 example used has 36 pins. Ours has 40.



2/24/25 - 5PM to 7PM

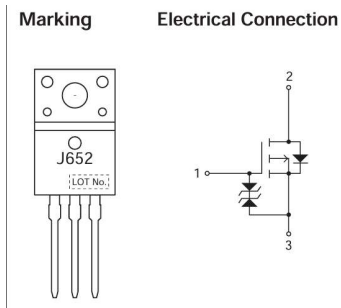
Monday, February 24, 2025 6:33 PM

Looking for MOSFETS fit for switching

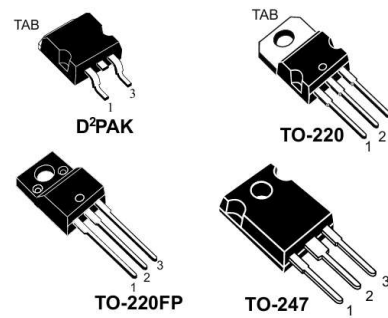
MMDP02HD MOSFET - $V_T = \sim 1.5V$ ($V_{n\text{acceptable}}$, needs 3.3V)



2SJ652 - $V_T = \sim 2.6V$ (acceptable, close to 3.3V)



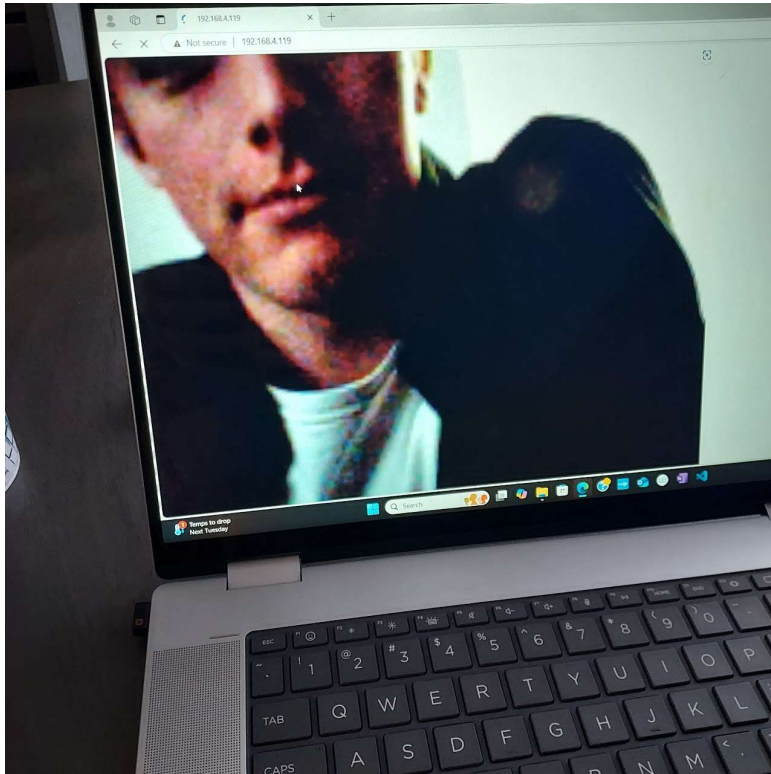
SuperMESH Power MOSFET - $V_T = \sim 3.75V$ ($V_{n\text{acceptable}}$, too high)



2/28/25 2PM-7:30PM

Friday, February 28, 2025 7:20 PM

Attempting to get the OV7670 to communicate



← OV7670 feed
on local server

3/24/2025 - 4:00-8:30PM

Monday, March 24, 2025 7:40 PM

Looking into how to set up mobile app so that the feeder can be accessed anywhere. Firebase is decided as the best.

Port Forwarding x

Complex Setup

Need Router Information

Firebase ✓

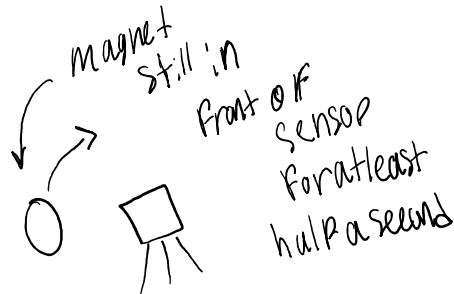
Easy Setup

Webapp Setup on Google services

3/26/2025 5PM-9:30PM

Wednesday, March 26, 2025 9:12 PM

Set up motor in code so that it only moves when feed is triggered. Add a 1-second delay before reading hall effect sensor.



```
if (feedButton == 1 && !motorRunning) { // Else if the feed button is pressed, activate the motor
  startMotor();
}
if(waitingForMagnet && !delayElapsed && millis() - motorStartTime >= 1500){
  delayElapsed = true;
}
if(motorRunning && waitingForMagnet && !magnetPreviouslyDetected && magnetDetected && delayElapsed){
  stopMotor();
  stopTime = millis();
  unsigned long x = stopTime - motorStartTime;
  unsigned long t1 = calTimes[0][1];
  unsigned long t2 = calTimes[1][1];
  float y = (float)(x-t1)/(float)(t2-t1);
  if (x<t1){
    Firebase.RTDB.setFloat(&fbdo, foodPath, 0);
  } else {
    Firebase.RTDB.setFloat(&fbdo, foodPath, min(y*100, 100.0f));
  }
  Firebase.RTDB.setFloat(&fbdo, "board1/outputs/digital/t1", t1);
  Firebase.RTDB.setFloat(&fbdo, "board1/outputs/digital/t2", t2);
}
```

→ waits 1.5s before detecting magnet again

```
void startMotor(){
  digitalWrite(45, LOW); //PMOS is opposite, so on startup, the motor will actually be HIGH
  motorRunning = true;
  waitingForMagnet = true;
  delayElapsed = false;
  motorStartTime = millis();
  Firebase.RTDB.setFloat(&fbdo, feedingPath.c_str(), 1);
}

void stopMotor(){
  digitalWrite(45, HIGH);
  motorRunning = false;
  waitingForMagnet = false;
  Firebase.RTDB.setFloat(&fbdo, feedingPath.c_str(), 0);
}
```

Variables used to stop and start motor

reset variables

3/27/2025 4:30PM-8PM

Thursday, March 27, 2025 7:35 PM

Figured out digital feed button. Need to make it so manual feed button updates the database.

```
}  
Firebase.RTDB.setFloat(&fbdo, "board1/outputs/digital/t1", t1);  
Firebase.RTDB.setFloat(&fbdo, "board1/outputs/digital/t2", t2);
```

} updates
values in database

4/20/25

Tuesday, May 6, 2025 11:19 PM

Setting up Camera Web Server



```
from flask import Flask, request
import subprocess

app = Flask(__name__)

@app.route('/upload', methods=['POST'])
def upload_image():
    frame_data = request.data
    with open('frame.jpg', 'wb') as f:
        f.write(frame_data)
    return 'Frame received', 200

if __name__ == '__main__':
    app.run(host='0.0.0.0', port=5000)
```

← python script to accept frames from ESP32

```
HTTPClient http;
http.begin(serverUrl);
http.addHeader("Content-Type", "application/octet-stream");

int httpResponseCode = http.POST(fb->buf, fb->len);
```

← ESP32 code to Post framedata to the VM

Filter Enter property name or value

<input type="checkbox"/> Status	Name ↑	Zone	R
<input type="checkbox"/>	camera-server	us-central1-c	

Related actions

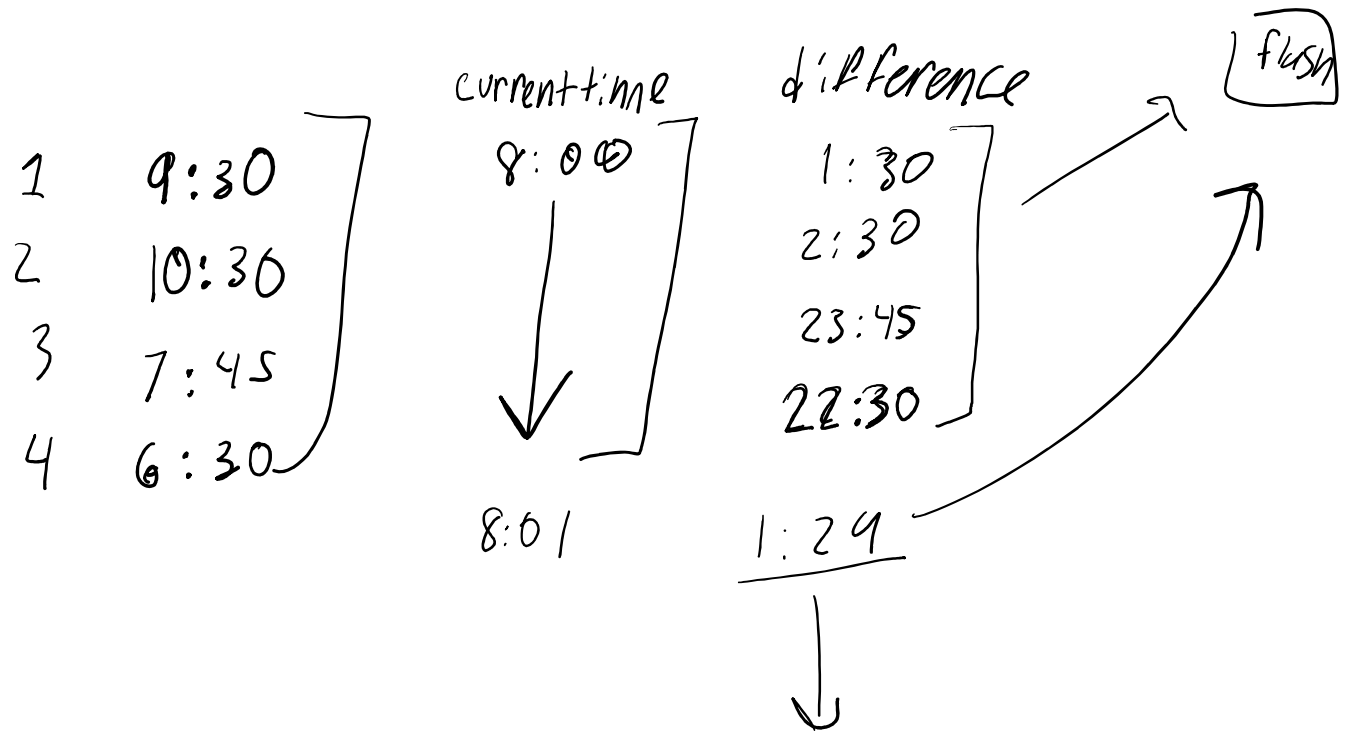
← Google Cloud Virtual machine

4/25/2023

Tuesday, May 6, 2025

10:33 PM

Diagram for scheduled feed times being stored on the ESP32 flash memory

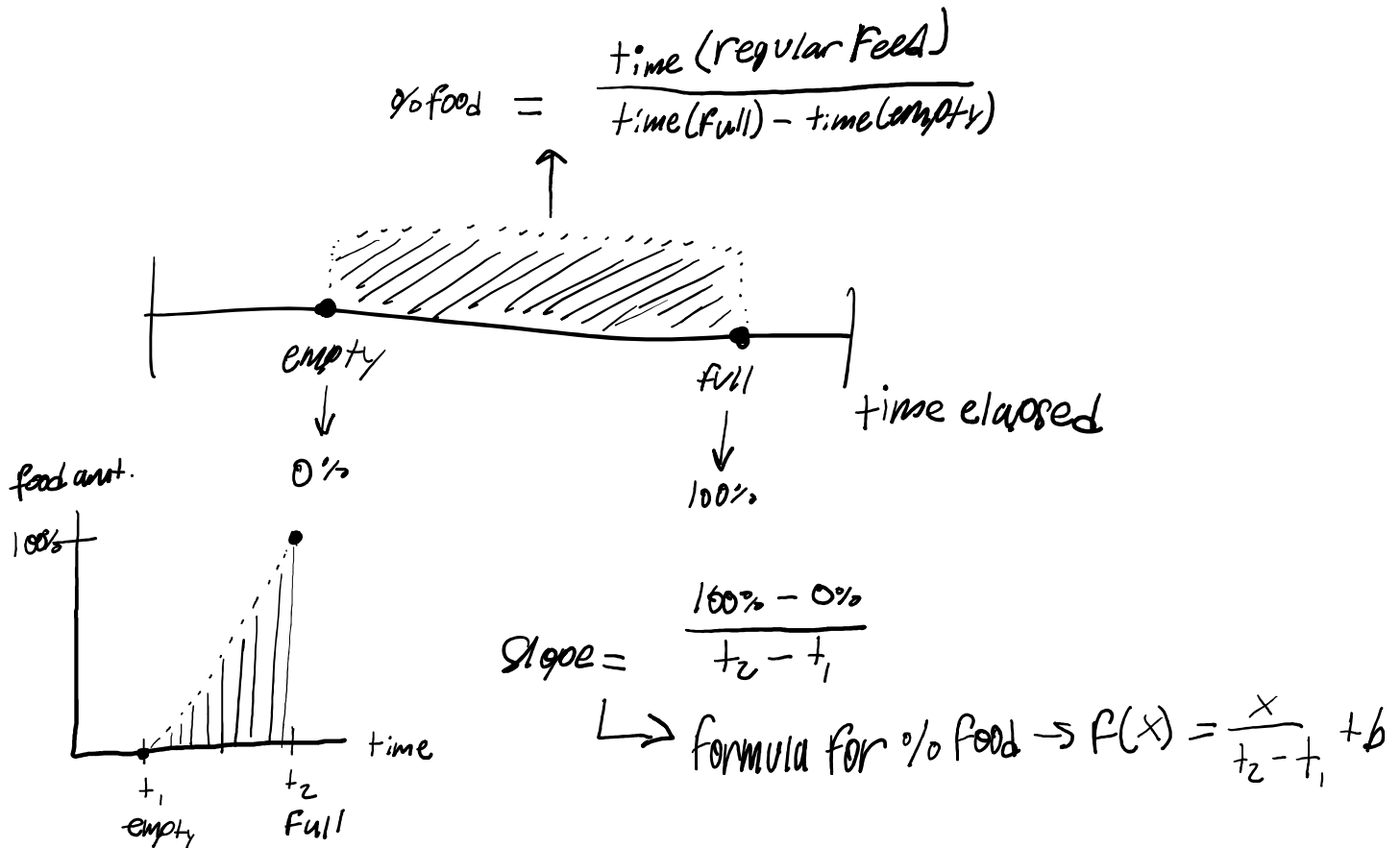


4/26/2025

Saturday, April 26, 2025

9:27 PM

Deriving equation for determining remaining food percentage



$$x_{int} = t_1$$

$$f(x) = \frac{x - t_1}{t_2 - t_1} + b \rightarrow f(t_1) = \frac{t_1 - t_1}{t_2 - t_1} + b = 0 \rightarrow b = \frac{-t_1}{t_2 - t_1}$$

Final Equation $\rightarrow f(x) = \frac{x - t_1}{t_2 - t_1}$