

ESP32 MultiWii FPV Drone - Circuit Diagram

MH-ET LIVE MiniKit with ESP-NOW Wireless

1S LiPo Battery

Voltage: 3.7V nominal
Capacity: 150-250mAh
Max: 4.2V charged

Terminal	Color
+ Positive	Red
- Negative	Black

MPM3610 Regulator

Input: 3.5V - 21V
Output: 3.3V @ 1.2A
Type: Buck converter

Pin	Connect To
VIN	Battery +
GND	Battery -
VOUT	ESP32 3V3
EN	VIN (enable)

Voltage Divider (VBAT)

Purpose: Scale 4.2V to 2.1V
R1: 10kΩ (to Bat+)
R2: 10kΩ (to GND)
Output: GPIO 34

Formula: $V_{out} = V_{in} \times R2 / (R1 + R2)$

MPU6050 IMU

Type: 6-Axis Gyro+Accel
Interface: I2C
Address: 0x68

Pin	ESP32
VCC	3.3V
GND	GND
SDA	GPIO 21
SCL	GPIO 22

ESP32 MH-ET LIVE MiniKit

Dual-Row Header Pinout

LEFT HEADER (Outside Edge)

3V3	POWER IN	●
GND	GROUND	●
GPIO 36	(input only)	
GPIO 39	(input only)	
GPIO 34	VBAT ADC	●
GPIO 35	(input only)	
GPIO 32	BUZZER	●
GPIO 33	LED	●
GPIO 25	MOTOR 2 (FR)	●
GPIO 26	(unused)	
GPIO 27	MOTOR 4 (FL)	●

RIGHT HEADER (Outside Edge)

ALT POWER	VIN
GROUND	GND
MOTOR 1 (RR)	GPIO 13
(strapping)	GPIO 12
MOTOR 3 (RL)	GPIO 14
(strapping)	GPIO 15
(strapping)	GPIO 2
(unused)	GPIO 4
(unused)	GPIO 16
I2C SDA	GPIO 21
I2C SCL	GPIO 22

Built-in WiFi (ESP-NOW) - No external radio needed

Wire Color Legend

● Battery + / VIN ● Ground (GND) ● 3.3V Power ● Motor PWM ● Signal (ADC/GPIO) ● I2C (SDA/SCL) ● LED

Motor 1 - Rear Right

GPIO: 13
Rotation: CW (clockwise)
Driver: Si2302 MOSFET
Flyback: 1N5819 diode

Motor 2 - Front Right

GPIO: 25
Rotation: CCW (counter-CW)
Driver: Si2302 MOSFET
Flyback: 1N5819 diode

Motor 3 - Rear Left

GPIO: 14
Rotation: CCW (counter-CW)
Driver: Si2302 MOSFET
Flyback: 1N5819 diode

Motor 4 - Front Left

GPIO: 27
Rotation: CW (clockwise)
Driver: Si2302 MOSFET
Flyback: 1N5819 diode

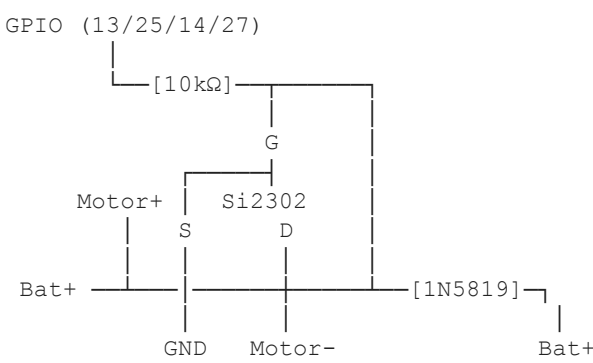
Buzzer (5V Passive)

GPIO: 32
Driver: 2N2222 NPN
Base R: 1kΩ
±: 3.3V or 5V

Status LED

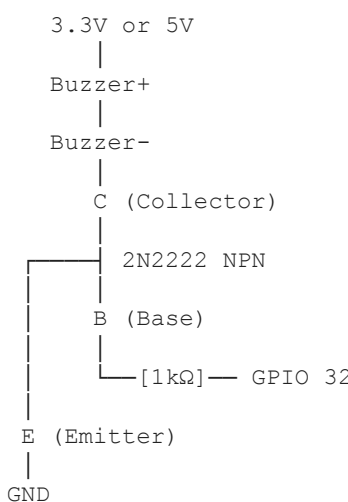
GPIO: 33
Resistor: 220Ω
Color: Green/Blue

Motor Driver Circuit (x4)



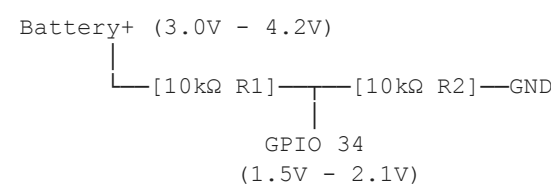
Note: 10kΩ gate resistor limits current
1N5819 Schottky protects MOSFET

Buzzer Driver Circuit



Note: 1kΩ limits base current
NPN switches buzzer ground

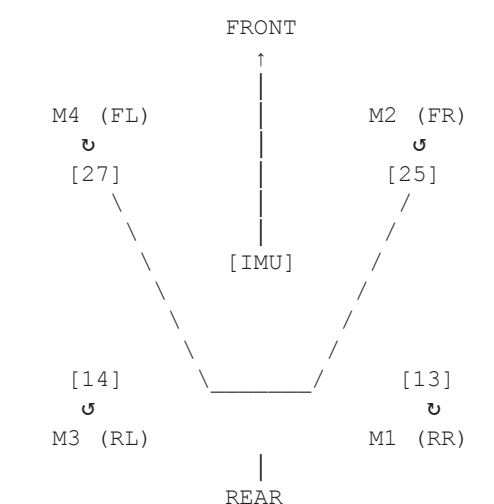
Voltage Divider (Battery Monitor)



Formula: $V_{out} = V_{in} \times (R2 / (R1 + R2))$
 $V_{out} = V_{in} \times 0.5$

Example: 4.2V battery → 2.1V at GPIO
3.7V battery → 1.85V at GPIO
3.0V battery → 1.5V at GPIO

Motor Layout (Quad X - Top View)



↺ = Clockwise ↻ = Counter-CW
[##] = GPIO pin number

Pin Assignment Summary

Function	GPIO	Side
Motor 1 (RR)	13	Right
Motor 2 (FR)	25	Left
Motor 3 (RL)	14	Right
Motor 4 (FL)	27	Left
Buzzer	32	Left
LED	33	Left
Battery ADC	34	Left
I2C SDA	21	Right
I2C SCL	22	Right

Bill of Materials

- 1× ESP32 MH-ET LIVE MiniKit
- 1× MPU6050 6-axis IMU module
- 1× MPM3610 3.3V regulator
- 4× 8.5mm brushed motors
- 4× Si2302 N-MOSFET (SOT-23)
- 4× 1N5819 Schottky diode
- 4× 10kΩ resistor (gate)
- 2× 10kΩ resistor (VBAT div)
- 1× 1kΩ resistor (buzzer)
- 1× 220Ω resistor (LED)
- 1× 2N2222 NPN transistor
- 1× 5V passive buzzer
- 1× LED (3mm or 5mm)
- 1× 1S LiPo 150-250mAh

Important Notes

Strapping pins: Avoid GPIO 0, 2, 12, 15 for outputs
Input-only: GPIO 34-39 cannot output
ADC range: 0-3.3V (12-bit, 0-4095)
PWM freq: 32kHz for motors
I2C pullups: Usually on MPU6050 module
Flyback diodes: Required for motor protection
Power sequence: MPM3610 enables on power
VBAT cal: Adjust in config.h if needed