

Examples + parts

The electronics needed for most reaction wheels:

- Servo motor
- Cpu
- Power source
- Flywheel (reaction wheel)
- Sensor

Reaction wheel balancing cube

- ESP32 controller
- Nidec24H motors
- MPU-6050
- 500 mAh 3S1P LiPo
- 3D printed frame
 - 150x150x150 mm
 - 800 g
- [E Reaction Wheel Design \(LW, WF\)](#)

Arduino Set - useful

- can use arduino instead of ESP32
- Need a calibration system (4 times)

What electronics I have already:

- Female-to-male DuPont wire
- Jumper Wire (prototyping)
- **Resistors (useful for filtering)**
 - 220R
 - 1M
 - 5K1
 - 330R
 - 2k
 - 100k
 - 10k
 - 100R
 - 10R
- Active Buzzer
- USB Cable
- Tilt switch
- 5v relay module
- Prototype expansion
- **Uno R3 controller Board (controller)**
- Hall sensor
- Ir receiver module

- **Diode rectifier (useful for filtering)**
- Passive buzzer
- Remote
- **Breadboard? (prototyping)**
- 9v battery
- **Power supply module (useful for sensor interfacing)**
- Ic 74HC595
- Battery snap
- Servo motor (SG90)
- Direct current machine
- **Npn transistor (useful for filtering)**

Parts still needed:

- A dc motor
- A LiPo battery
- A flywheel
 - Can be bought online
 - Can be 3d printed
 - Needs to be heavy
- Frame material
 - 3d printed
 - Solder
- MPU

What is unclear to me and the answers:

- Can I use a servo motor instead of a dc motor?
 - No, Servos are limited to 180 degree rotation & are position controlled
 - Reaction wheels require continuous 360 degree rotation (to store angular momentum)
 - Need a DC motor or a brushless motor
- How strong does my motor have to be?
 - The motor must be able to spin fast
 - 1000+ RPM
 - Be able to continuously rotate
 - Work w/ the flywheel mass
- What makes a LiPo battery more suitable than a zinc Carbon battery?
 - Zinc-Carbon batteries have low current output, aren't rechargeable, don't have a stable voltage, and are heavy
 - LiPo batteries have high output current (which is needed for motors), are rechargeable, have stable voltages, and don't weigh a lot
- Can I use a relay module to make the electronics easier?
 - No
 - Relay modules are used to turn a component on/off
 - Not used for precise control

- Use a motor driver
 - L298N for DC motor
 - ESC for brushless motor
- I have never soldered before.
 - Can learn later

What I need to order:

- A brushless DC motor (be able to rotate continuously upwards of several thousand RPM)
 - 12V DC motor should work
 - [AUTOTOOLHOME 6-12V Mini DC Motor High Torque Gear for Traxxas R/C and Power Wheels PCB DIY Electric Drill - Amazon.com](#)
- 2S LiPo Battery (7.4V) + charger
 - 6xAA battery pack (cheaper)
 - [Amazon.com: AMZZN 7.4V 2000mAh 35C 2S Lipo Battery with XT60 Plug and 2-in-1 Charger for RC Cars, Trucks, RC Ships, RC Drones, Quadcopter Helicopters, FPV UAV Batteries \(2PCS Battery+2-in-1 Charger\) : Toys & Games](#)
- Motor Driver
 - L298N
 - [Amazon.com: WWZMDiB 2 Pcs L298N Motor Driver Controller Board DC Dual H Bridge Module for Arduino Raspberry Pi Stepper Motor \(2 Pcs, L298N\) : Electronics](#)
- MPU-6050
 - [EPLZON 1pcs MPU-6050 GY-521 MPU6050 3 Axis Accelerometer Module 6 DOF Gyroscope Sensor Module 16 Bit AD Converter Data Output IIC I2C for Arduino: Amazon.com: Industrial & Scientific](#)
- 3D print a flywheel/ metal disk
- 3D print Frame

What parts I should have by the end:

- Arduino Uno (brain)
- MPU-6050 (sensor)
- DC motor-12V (motor)
- Driver (L298N)
- 2S LiPo battery (Power)
- Flywheel (3D printed)
- Frame (3D printed)