Wiring Instructions

Global Power Distribution (The Backbone)

- **12V Battery Positive (+)** -> Connects to the **B+** terminal on **ALL 6 Drivers.**
- **12V Battery Negative (-)** -> Connects to the **B-** terminal on **ALL 6 Drivers** AND the **Arduino Mega GND.**
- **Arduino 5V Pin** -> Connects to the **VCC** pin on **ALL 6 Drivers.**
- **Arduino GND Pin** -> Connects to the **GND** pin on **ALL 6 Drivers** (Logic Ground).

Block 1: Left Leg Assembly

1. Left Yaw Motor (Driver 1)

- Control (Arduino <-> Driver):
  - Arduino Pin 46 -> Driver RPWM (Forward Speed)
  - Arduino Pin 45 -> Driver LPWM (Reverse Speed)
  - Arduino Pin 22 -> Driver R_EN (Enable Forward)
  - Arduino Pin 23 -> Driver L_EN (Enable Reverse)
- Safety (Driver -> Arduino):
  - Driver R_IS -> 4.7kΩ Resistor -> Arduino A4
  - Driver L_IS -> 4.7kΩ Resistor -> Arduino A5
- Feedback (Motor Encoder -> Arduino):
  - Encoder Phase A -> Arduino Pin 18 (Interrupt)
  - Encoder Phase B -> Arduino Pin 19
  - Encoder VCC -> Arduino 5V
  - Encoder GND -> Arduino GND

2. Left Hip Linear Actuator (Driver 2)

- Control:
  - Arduino Pin 4 -> Driver RPWM (Extend/Up)
  - Arduino Pin 5 -> Driver LPWM (Retract/Down)
  - Arduino Pin 26 -> Driver R_EN
  - Arduino Pin 27 -> Driver L_EN
- Safety:
  - Driver R_IS -> Resistor -> Arduino A8
  - Driver L_IS -> Resistor -> Arduino A9
- Feedback (Potentiometer):
  - Potentiometer Signal (Middle Pin) -> Arduino A0
  - Potentiometer VCC -> Arduino 5V
  - Potentiometer GND -> Arduino GND

3. Left Knee Linear Actuator (Driver 3)

- Control:
  - Arduino Pin 6 -> Driver RPWM
  - Arduino Pin 7 -> Driver LPWM
  - Arduino Pin 28 -> Driver R_EN
  - Arduino Pin 29 -> Driver L_EN
- Safety:
  - Driver R_IS -> Resistor -> Arduino A10
  - Driver L_IS -> Resistor -> Arduino A11
- Feedback (Potentiometer):
  - Potentiometer Signal -> Arduino A1
  - Pot VCC -> 5V, GND -> GND

Block 2: Right Leg Assembly

4. Right Yaw Motor (Driver 4)

- Control:
  - Arduino Pin 2 -> Driver RPWM
  - Arduino Pin 3 -> Driver LPWM
  - Arduino Pin 24 -> Driver R_EN
  - Arduino Pin 25 -> Driver L_EN
- Safety:
  - Driver R_IS -> Resistor -> Arduino A6
  - Driver L_IS -> Resistor -> Arduino A7
- Feedback (Encoder):
  - Encoder Phase A -> Arduino Pin 20 (Interrupt)
  - Encoder Phase B -> Arduino Pin 21
  - Encoder VCC -> 5V, GND -> GND

5. Right Hip Linear Actuator (Driver 5)

- Control:
  - Arduino Pin 8 -> Driver RPWM
  - Arduino Pin 9 -> Driver LPWM
  - Arduino Pin 30 -> Driver R_EN
  - Arduino Pin 31 -> Driver L_EN
- Safety:
  - Driver R_IS -> Resistor -> Arduino A12
  - Driver L_IS -> Resistor -> Arduino A13
- Feedback (Potentiometer):
  - Potentiometer Signal -> Arduino A2
  - Pot VCC -> 5V, GND -> GND

6. Right Knee Linear Actuator (Driver 6)

- Control:
  - Arduino Pin 10 -> Driver RPWM
  - Arduino Pin 11 -> Driver LPWM
  - Arduino Pin 32 -> Driver R_EN
  - Arduino Pin 33 -> Driver L_EN
- Safety:
  - Driver R_IS -> Resistor -> Arduino A14
  - Driver L_IS -> Resistor -> Arduino A15
- Feedback (Potentiometer):
  - Potentiometer Signal -> Arduino A3
  - Pot VCC -> 5V, GND -> GND