One■Leg Hexapod — Serial Command Reference

Connection

• Board: Arduino Mega 2560
• Port: USB (Arduino IDE → Tools → Port)
• Baud: 115200 • Line ending: Newline (\n)
• Library: Adafruit PWM Servo Driver (PCA9685)

Top■Level Commands (type then press Enter)

cal — Enter calibration mode
test — Run the sample motion sequence

Calibration Mode Commands

c+ / c- — Nudge Coxa zero by +1 / –1 degree (auto■centers to 90° when adjusted)
f+ / f- — Nudge Femur zero by +1 / –1 degree (auto■centers to 90° when adjusted)
t+ / t- — Nudge Tibia zero by +1 / –1 degree (auto■centers to 90° when adjusted)
save — Store current offsets to EEPROM
exit — Leave calibration mode

Recommended Workflow

1) Power servos (UBEC → PCA9685 V+) and connect USB to the Mega.
2) Open Serial Monitor (115200 baud, newline), type 'cal'.
3) Use c+/c-, f+/f-, t+/t- to center each joint mechanically at 90°.
4) Type 'save' to write offsets to EEPROM, then 'exit'.
5) Type 'test' to verify smooth motion; adjust offsets if required.

Notes & Safety

• Keep the leg supported during first power■up to avoid unexpected swings.
• Ensure common ground between UBEC, PCA9685, servos, and Arduino.
• Typical servo range is ~0–180°. Code clamps angles to protect hardware.
• If servos chatter, verify UBEC voltage (5–6 V) and add the 2200 µF cap at PCA input.
• Re■run 'cal' after any mechanical changes (horn re■position, linkage changes).

This sheet matches the provided Arduino sketch template (Mega + PCA9685, CH0 Coxa, CH1 Femur, CH2 Tibia).