

Step By Step Check List for Operating Hubo KHR2

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Setup and Zeroing:

1. Make sure Hubo is lifted off the ground with the powered lifter and is still
2. Connect to Hubo via Remote Desktop (Body Computer)
3. Start the Hubo program
4. Press **CAN Start**
 - a. Put Hubo's body in the home position, be sure to spread his legs and keep them spread
5. Press **Encoder Zero**
6. Press **Third button in the Robot Test Group**
 - a. Make sure legs are still in home position
7. Press **Encoder Zero** again
8. Put your hand between Hubo's legs to make sure legs are still in home position

From this step forward New Hubo will be different:

9. Press **Home Using Z** to set the home position
 - a. Press **Search Z Phase** to find the encoders closest Z phase
 - b. Press **Go Offset** in order to the pre set offset from previous calibrations
 - c. If the lines on legs and knees do not match up press **+Rev** or **-Rev**
 - i. This will move the motor one encoder revolution according to Z
 - d. Repeat a through c for each of the leg joints
 - e. Press **OK** when finished
10. Lower Hubo Down so he has his feet firmly on the floor
 - a. This will allow the feet to be perfectly aligned with the ground
11. Lift Hubo Back up
12. Press **Encoder Zero** again to accept the newly found flattened feet values

Check Sensors:

13. Press **Nulling FT Sensor**
14. Press **Read FT**
 - a. Make sure that the feet give an output when a force is applied to them
 - b. This should be centered around zero
15. Press **Read Tilt Sensor**
 - a. Check each pitch, roll, and yaw of accelerometer has an output

- b. Press **Reset**
 - c. Press **Start**
- 16. Press **Read Foot Acc**
 - a. Make sure that the foot accelerations read
- 17. Press **Walk Ready**
 - a. Hubo will move into his walk ready position
- 18. Lower Hubo onto the ground
- 19. Press **ZMP Zero Searching**
 - a. Wait until the Acc(Roll Row), Acc(Pitch Row) are settled to zero
 - b. Press **Set**
 - c. Press **OK**
- 20. Press **Walk**
- 21. Press **Reset**
- 22. Put a **Check** in the box called **Roll Positive Feedback**
- 23. Press **Mark**
- 24. Disconnect Hubo from his protective harness

Moving:

- 25. Press **Forward** to go forward
- 26. Press **Stop** to stop
 - a. Note that Hubo will not stop until you tell him to
- 27. Press **“Enter Movement Name Here”** to perform the desired movement
- 28. Press **Stop** to stop

Gestures:

- 29. Press **Gestures** to enter the gestures page
- 30. Press **“Enter Gesture Name Here”** to perform the gesture

Shutting Down Hubo:

- 31. Reconnect Hubo’s protective harness
- 32. Lift Hubo off the ground
- 33. Press **Home**
 - a. Hubo will straighten his body and move to his home position as set previously
- 34. Press **Control Off**
- 35. Press **CAN Stop**
- 36. Power Hubo down