

## **Final Assembly**

***Do steps then in this order after the microcontroller board has been tested***

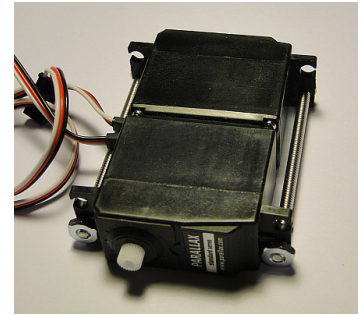
- Bolt the two servos together and mount them
- Mount the battery box (first only the cover)
- Mount the controller board
- Attach the ball and sensor mount to the *Bottom* of the platform
- Put on wheels
- Put on the IR obstacle avoidance sensor
- Attache servo and sensor leads
- Inspect Bot and move on to alignment check and programming

***Follow detailed instructions on the following pages for easiest assembly***

- The directions are designed to help you with do it right the first time 😊
- Ask a course conductor if you have any questions or need help
- It is a good idea to check off the steps as you complete them

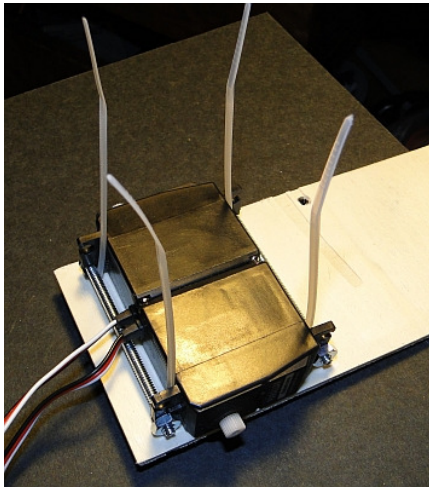
### ❑ Bolt the Two Servos Together

1. Place the servos back-to-back with their wires at the same end.
2. Bolt the servos together using only two bolts as shown.
3. Put only a few threads on the nuts at first. The screw lengths are close fit.
4. Alternately snug the nuts taking care not to over tighten.

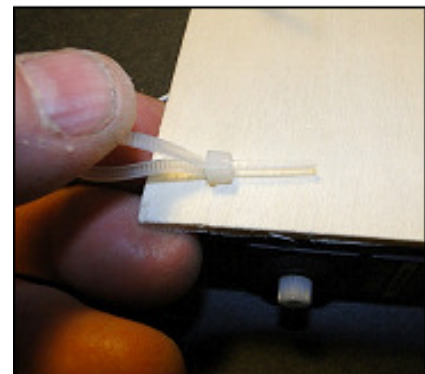
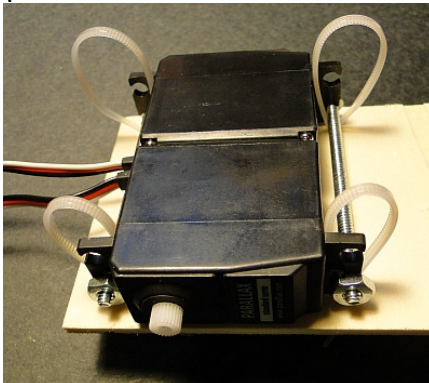


### ❑ Mount Servos to the Platform

1. Insert cable ties from the back side through the four motor mount holes
2. Place servos on the platform with bolt side down and leads to the back edge.
3. Thread all four ties between the bolts and the servo bodies.



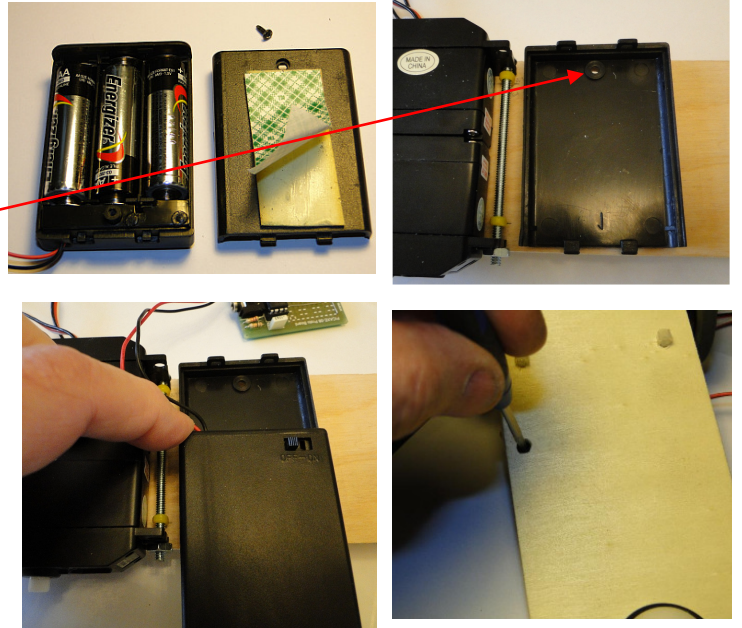
5. Orient the flat side of the tie heads away from the motors (2 towards the front, 2 to back).
6. Loop the ties over the bolts and back through the holes. It's tight.



7. Keep the tie heads against the platform and pull the ties snug.
8. Start each tie through the flat side the head .
9. Pull the ties tight while keeping the heads tight against the platform.
  - This may require needle noses pliers and three hands ☺
  - Make sure the heads end up tight against the platform and the loops are tight around the bolts. Ask for help if needed.

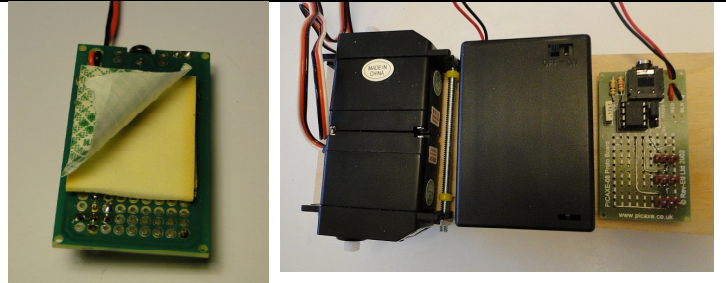
**Mount the Battery Box**

1. Unscrew the battery box cover.
2. Put double sided adhesive foam tape on the outside of the cover. Don't cover up the screw hole.
3. Peel off the backing and align the screw hole with the hole in the platform. Sticking something like a cable tie through both holes is helpful in lining them up.
4. Press down when you have good alignment
5. Slide the battery case on to the cover.
6. Flip over the platform, drop in the screw, and snug it up to keep the lid from slipping.



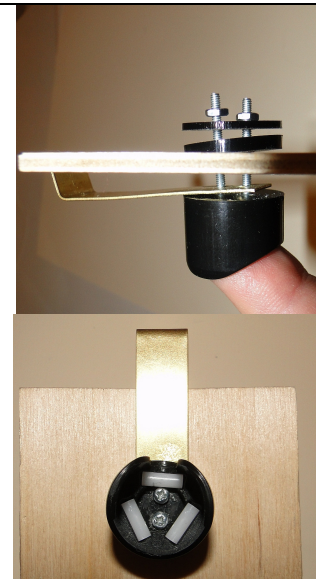
**Mount the Control Board**

1. Apply double sided adhesive foam tape to the back of the board. Try to choose an area that is no too uneven.
2. Pont the connector end as shown and mount the board between the battery box and the nose wheel screws. Push firmly.



**Attach the Ball and Sensor Mount**

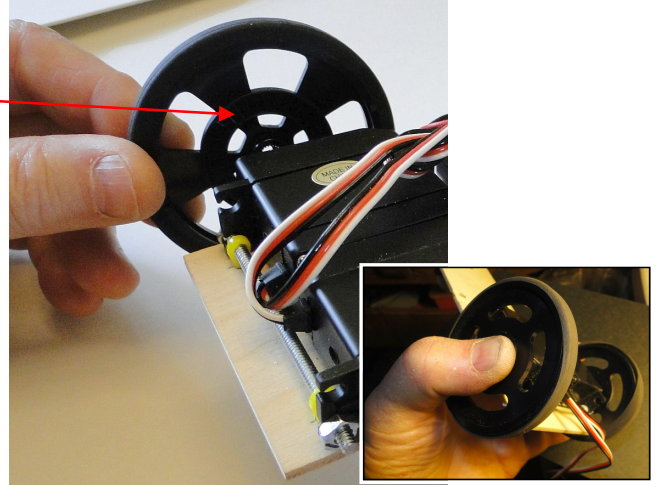
1. These parts attach to the bottom of the platform (opposite from the servos).
2. The Sensor Mount is sandwiched between the ball mount and the platform, with its "foot" pointing up.
3. Put the longer screws from the ball kit in from the inside of the base, through the sensor mount and through the platform.
4. Slide on the spacers on from the top one at a time.
5. Put the nuts on the screws and snug them down firmly. Be sure the sensor mount points straight out.
6. Put the three white plastic rollers in the ball mount slots and snap in the ball.





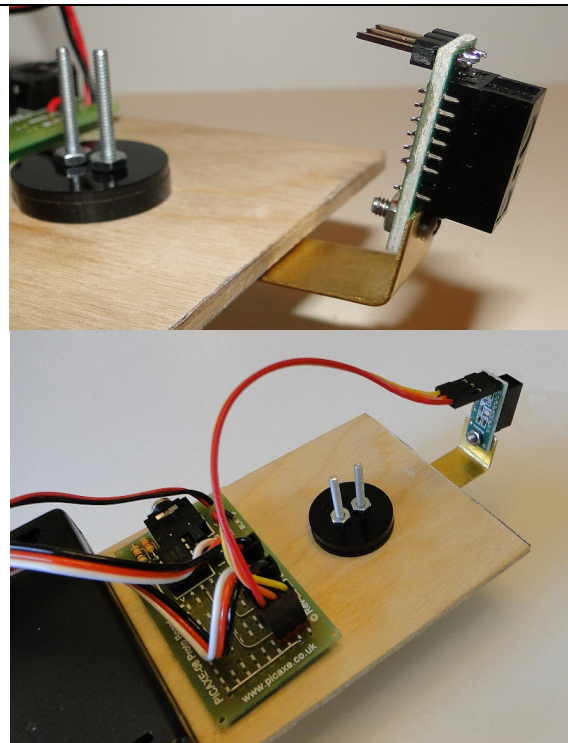
### ❑ Put Wheels on the Servos and Connect

1. The side of the wheel with the ribbed circle pattern will go towards the servo.
2. Rotate the hub against the servo spline using only a little pressure until you feel them mating, then push the wheel on.
3. With both wheels on, press them down the splines until they bottom out.
4. Insert and snug hub screws
5. Push the servo connectors onto the headers, red wire closest to board edge.
6. Do not use the header closest to the short side of the board. It is for the sensor cable.



### ❑ Attach the IR Sensor

1. Position the IR Sensor on the back of the mounting bracket with the black sensor block pointing forwards.
2. Align the mounting holes. Put the shorter screw from the ball mount kit through from the sensor side (front).
3. Slide the provided locking washer on to the screw, then tightly secure the sensor with the provided nut.
4. Plug the jumper cable into the sensor with the Yellow wire on the left looking from the back of the board (header side).
5. Plug the jumper cable into the Picaxe board with the Yellow wire closest to the board edge.
6. The sensor mount arm may later be adjusted for detection height by gently bending the arm up or down, being careful not to pull on the sensor board.



## Congratulations! You have fully Assembled your Bot!

**Now go see if it works.** Remember there is a 5 second delay from when you turn on the switch until the Bot starts to move.

You can change this delay and do more programming of your Bot with a Picaxe USB Download cable model AXE027.

The Picaxe Programming Editor is free to download at

<http://www.picaxe.com/Software/PICAXE/PICAXE-Programming-Editor>