

2. Building instructions

NUTS & BOLTS

During the build you will not use all the nuts & bolts that are supplied. Do not discard these as they can be useful when you start building your own ALLBOT creations.

To assemble the ALLBOT you will not only need the supplied screwdriver, but pliers as well. This will come in handy to keep nuts and bolts into place while screwing.

01. Start with the BACKBONE A part.



02. Slide 2 BACKBONE B and 2 BACKBONE C parts into the BACKBONE A part. Note how the ALLBOT logo's are visible on all parts. Also note the indexing notches.



03. Everything should fit flush.



04. Take 2 x M3 NUT and position them into the notches of the BACKBONE part as shown below.



05. Position a SERVO MOUNT part as shown below.



06. Use 2 M3 x 8mm BOLT to fasten the SERVO MOUNT part to the BACKBONE. You will need to put the screwdriver through the holes on the opposite sides of the SERVO MOUNT.



07. Repeat these steps on the other 3 corners of the BACKBONE part.



08. The build should now look like this.



09. Use 1 M3 x 16mm BOLT and place it into the SERVO MOUNT as shown below. Note which hole is being used.



10. Use 1 M3 LOCKING NUT to fasten the M3 x 16mm BOLT in place.



11. Repeat these steps on all the SERVO MOUNT parts.



12. The build should look like this.



13. Slide a 9G SERVO into the SERVO MOUNT.

INSERTING A 9G SERVO

First thread the wire through the hole on the side and then slide the 9G SERVO under an angle into the SERVO MOUNT until it snaps into place. Make sure the orientation of the 9G SERVO is correct!



14. Use 2 MEDIUM SERVO SCREW to fasten the servo in place.



15. Repeat this process for the remaining SERVO MOUNT pieces. Note the orientation of the servo's.



16. The build should look like this.



17. Take 1 SWINGARM A and 2 SWINGARM B pieces and slide these together. Note how the ALLBOT logo's are visible and note the indexing notches.



18. Use 2 x M3 x 8mm BOLT to fasten a SERVO MOUNT piece to the SWINGARM piece. Note the orientation of the SERVO MOUNT piece.



19. Clip the assembly to the 9G SERVO as shown in the images below.

SERVO ALIGNMENT

Make sure that the 9G SERVO is centered before attempting this step. Make sure that you clip the assembly at the same angle over the servoshaft as shown in the images below as this is critical for correct robot behavior. To learn how to center a servo you can check out the "Centering a servo" chapter in the "ARDUINO & ALLBOT" part of this manual.



20. Repeat these steps for the remaining corners of the robot. Note the orientation of all the pieces.

SERVO ALIGNMENT

Make sure that every 9G SERVO is centered before attempting these steps. Make sure that you clip the assembly at the same angle over the servoshaft as shown in the images below as this is critical for correct robot behavior. To learn how to center a servo you can check out the "Centering a servo" chapter in the "ARDUINO & ALLBOT" part of this manual.



21. Use 4 SMALL SERVO SCREW to screw all the SWINGARM pieces to the assembly.



22. Use 4 M3 LOCKING NUT to tighten all the SWINGARM pieces to the assembly at the bottom.

SMOOTH MOVING PARTS

Do not tighten these 4 M3 LOCKING NUT fully. Leave some play so the joints can move smoothly.



23. The build should look like this.



24. Use 4 M3 x 16mm BOLT and 4 M3 LOCKING NUT and assemble them as shown in the images below. Make sure you use the upper holes of the SERVO MOUNT pieces.



25. Insert 4 9G SERVO into the SERVO MOUNT pieces and screw them down with 8 MEDIUM SERVO SCREW.

INSERTING A 9G SERVO

First thread the wire through the hole on the side and then slide the 9G SERVO under an angle into the SERVO MOUNT until it snaps into place. Make sure the orientation of the 9G SERVO is correct!



26. Take a SWINGARM A and 2 SWINGARM B pieces and slide these together.



27. Mount a FLAT FOOT to the SWINGARM assembly with 2 M3 x 10mm BOLT.





28. Snap this leg assembly onto the main body of the robot as shown in the image below. Use a SMALL SERVO SCREW to screw the leg assembly to the 9G SERVO.

SERVO ALIGNMENT

Make sure that every 9G SERVO is centered before attempting these steps. Make sure that you clip the assembly at the same angle over the servoshaft as shown in the images below as this is critical for correct robot behavior. To learn how to center a servo you can check out the "Centering a servo" chapter in the "ARDUINO & ALLBOT" part of this manual.



29. Use an M3 LOCKING NUT to tighten the leg assembly to the main body.

SMOOTH MOVING PARTS

Do not tighten this M3 LOCKING NUT fully. Leave some play so the joint can move smoothly.



30. Repeat all these steps so you have a leg assembly on each corner of the robot.

SERVO ALIGNMENT

Make sure that every 9G SERVO is centered before attempting these steps. Make sure that you clip the assembly at the same angle over the servoshaft as shown in the images below as this is critical for correct robot behavior. To learn how to center a servo you can check out the "Centering a servo" chapter in the "ARDUINO & ALLBOT" part of this manual.



31. The build should now look like this.



32. Use 4 M3 NUT and insert them from the bottom into the BACKBONE part.



33. Flip the robot and place the PCB MOUNT on top of the BACKBONE. Note the orientation of the parts as the PCB MOUNT is not symmetric!



34. Use 4 M3 x 8mm BOLT to fasten the PCB mount to the BACKBONE part.



35. The build should now look like this.



36. Use 4 SELFTAPPING SCREW to fasten the ARDUINO UNO to the PCB MOUNT. Do not overtighten these screws.



37. Place the VRSSM SHIELD onto the ARDUINO UNO, Make sure the pins are matched.

VRSSM SHIELD

The VRSSM SHIELD is compatible with ARDUINO UNO and ARDUINO MEGA. To fully understand how this shield operates and what you can do with it, please read the "VRSSM SHIELD" chapter in the "ARDUINO & ALLBOT" part of this manual.

Things to check when using the VRSSM SHIELD:

- Are all the 12 shunts placed correctly (more on these below).
- Orientation when placing the VRSSM SHIELD onto an ARDUINO UNO or ARDUINO MEGA. **Quick tip: Check the 5V GND VIN PINS on both boards.**



38. Follow the guide below to attach all the servo connectors and the shunts.

ATTACHING SERVO CONNECTORS

The ARDUINO UNO needs to know which servo is connected to what pin so it can control its limbs. This is described in the ARDUINO SKETCH, each moving part (9G SERVO) of a limb gets a pin number assigned to it. To learn more about this please read the "Understanding the firmware" chapter in the "ARDUINO & ALLBOT" part of this manual . We supply a VR408 ARDUINO ARDUINO SKETCH so you can get started without writing a single line of code but then you have to connect each servo connector in the correct way (shown in the diagram below)

Servo connectors have 3 wires each: SIGNAL, 5V, GND. When you plug a connector in the wrong way (turned 180°) you will not break anything but the servo will not work. On the yellow top. **So when plugging in servo connectors always make sure the yellow wire is on top.** The diagram below in the CUSTOMER INSTRUCTIONS will come out of the box with our moving parts of the robot is connected to what pin. **ARDUINO SKETCH** so the Arduino knows which

Do not forget to connect the 12 shunts (blue) as shown in the image below if you are using an ARDUINO UNO.



39. Place the VRBS1 SHIELD onto the VRSSM SHIELD, Make sure the pins are matched.

VRBS1 SHIELD

To fully understand how this shield operates and what you can do with it, please read the "VRBS1 SHIELD" chapter in the "ARDUINO & ALLBOT" part of this manual.

Things to check when using the VRBS1 SHIELD:

- Orientation when placing the VRBS1 SHIELD onto any board. **Quick tip: Check the 5V GND VIN PINS on both boards.**



40. The mechanical part of the assembly is done! Congratulations!

You can now start loading software onto the ARDUINO UNO. Check out the [ARDUINO & ALLBOT](#) and start experimenting with your robot.



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