

beginners

Build a Robot and Play a Simple Game

- 1 Review the basic safety instructions in Appendix A**
 Always work safely. Although the Vex robot and parts are not dangerous under most circumstances, there are still safety precautions that you must follow.



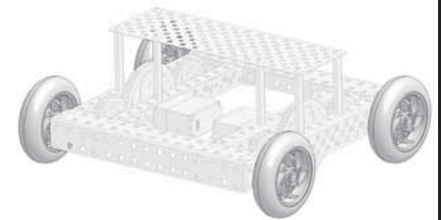
- 2 Begin by breaking your team into six groups, one for each subsystem in the Vex system**

If you don't have a team, or there are not enough people to make six groups, feel free to give multiple responsibilities to the same group or person. It is often advantageous for individual team members to have specialized knowledge of the different subsystems when working on the robot together, but it is not unreasonable for one person to be able to perform several or even all of the functions needed to work on the robot at this point.



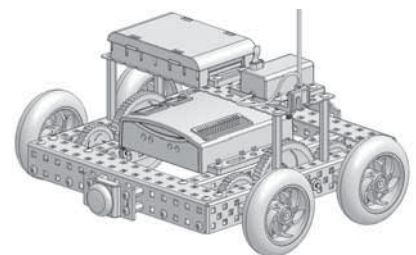
- 3 Build the Squarebot Chassis using the instructions in the Inventor's Guide**

At the beginning of the Structure Subsystem chapter, you will find a list of materials, a short introduction to the subsystem, and then building instructions for the chassis of the Squarebot. The Structure and Motion teams should pay special attention to this portion of the robot, but everybody can help build it by collecting the parts and tools as they are needed.



If desired, the non-chassis (Power, Sensor, Logic, and Control) teams can work ahead and try to hook together their subsystems without the chassis, and use the third Motor Module in the kit (which is not needed for the Squarebot design) to test their setup. Teams may want to remove and separate their respective sections of the Inventor's Guide temporarily while doing this, but any sections removed should be replaced immediately afterward!

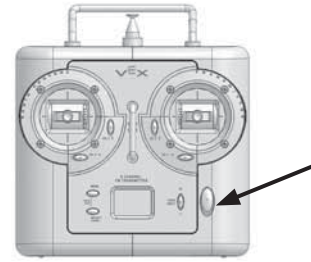
- 4 Combine the subsystems into the completed robot**
 Once you complete the chassis, the remaining subsystems (Power, Sensor, Logic, and Control) can now turn to their respective chapters and use those building instructions to attach their components to the basic Squarebot chassis. This includes both physically attaching the subsystems to the chassis and connecting the cables.



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5 Test the robot

Once you have completed the robot, extend the antenna on the Radio Control Transmitter and turn it on by flipping the power switch on the front of the transmitter.

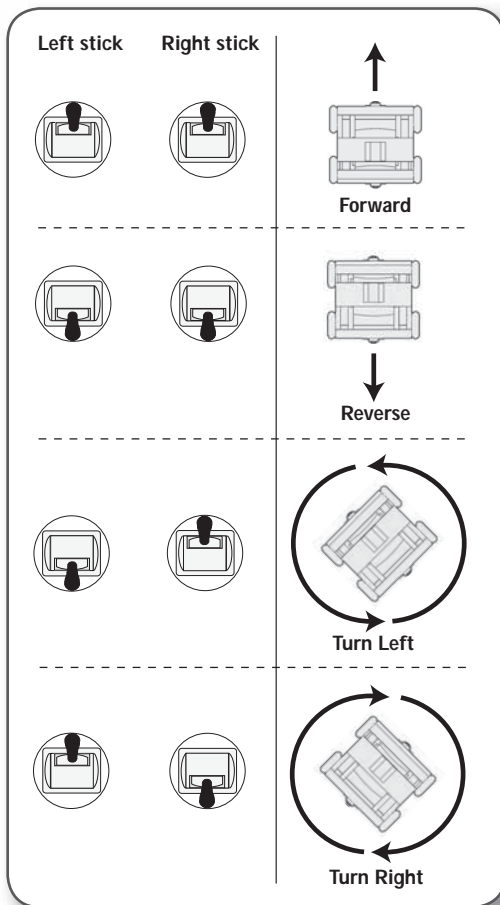


Once the Transmitter is on, you can turn on the Vex Micro Controller module on the robot by flipping its power switch (located next to the battery port).



You should see green lights for the Power Status and Rx1, and the large light blinking occasionally.

If you built and connected everything according to the instructions, you should now be able to drive the robot around using the sticks on your Radio Control Transmitter. The controls are as follows:



In addition, the bumper switch sensors on the front and rear of your robot are configured to act as "tag points." When they are hit by another robot or obstacle, your robot will be temporarily disabled.

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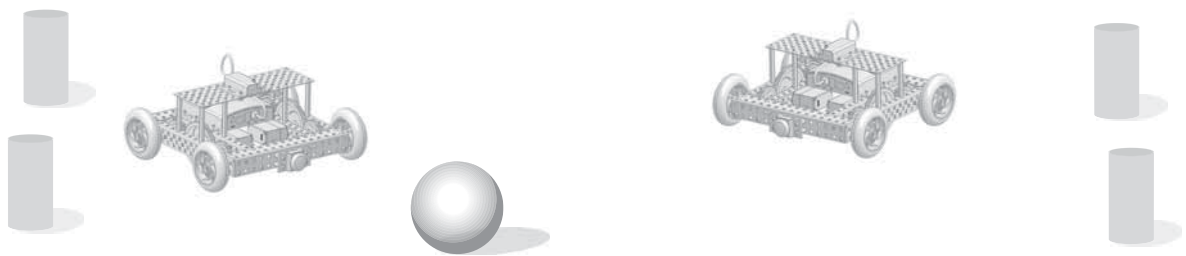
6 Solo Soccer Challenge

Your first challenge awaits you in Appendix C, the Challenges section of the Inventor's Guide. Turn to Appendix C, and read the challenge titled "Solo Soccer".

First, find a usable area of floor space. Tables are not recommended for challenges because they are too small, and they pose a danger for robots which may accidentally run off the edges. A carpeted playing surface will make the game easier (the ball will not roll away as easily), while a hard, smooth surface will make for quite a challenge, indeed!

Place the two goal uprights (empty soft drink cans or toilet paper tubes work well for this) about a foot apart, and place the ball on the ground three or four feet away. Drive the robot so that it pushes the ball through the goal, without driving the robot through as well. Don't hit the bumper on the front of the robot, or you will lose control for a few seconds... it's soccer, you're going to have to dribble!

The first few times you try this challenge, you may want to simplify the task a little by starting the ball and robot in line with the goal. You can work your way up to the actual challenge. Once you have succeeded a few times, try the challenge as written by starting the ball and robot in different positions that are not lined up with the goal mouth.



beginners, continued

7 Improve your Design

Just like with stock car racing, the generic all-purpose design of the Squarebot is a good starting point, but you can do much, much better! Think about how you might want to customize or “soup-up” your design to solve a problem. For example: Did you notice how difficult it was to get the ball to turn with the robot once it was moving? Can you think of any ways you might be able to fix that problem? Implement your solution and play the game again!

8 Challenges

When you’re ready to move on to new, more challenging scenarios, turn to the challenges in Appendix C. Pick one of the other challenges there, and go for it! Formulate a strategy to accomplish the goals in the game, and implement your robotic solutions. As you plan and build your robot, consult the Inventor’s Guide for background information about the components you have available, and refer to the Squarebot subsystems you built for ideas. Good luck!

9 Venture Forth

The Vex Robotics website provides a wealth of support and challenge ideas beyond the starter set supplied in this kit.

If you need a hand with your robot, or you want to learn about new accessories and challenges, visit <http://www.vexrobotics.com>.

Inventor’s Guide Resources visited in this track:

- Safety in Appendix A
- Glossary in Appendix B
- Challenges from Appendix C
- Squarebot Parts & Assembly in each subsystem chapter
- The System Map poster included in the Starter Kit
- The Registration Card included in the Starter Kit