Assemble and Test mBot

Time required: 60 minutes

"A robot is an autonomous system which exists in the physical world, can sense its environment, and can act on it to achieve some goals." Maja J. Mataric

The mBot is an Arduino based robot. An Arduino board is an open-source hobbyist and prototyping microcontroller with a wide variety of uses from small robots to 3d printers, to electric scooters.

The mBot can be programmed with Scratch based blocks, a mobile device, and Arduino C. It is a fun platform for learning the structures of programming. The mBot allows you to see your "code in motion".

NOTE: Batteries Not Included (Unless you buy the mBot from the WNCC bookstore, you will need batteries.)

STICKY TIP: There is a piece of Velcro to hold the battery pack in. The battery pack fits tight, you really don't need the velcro. If you wish to use the velcro, cut the velcro in half, put it toward the front of the battery pack and the robot. Otherwise, it is hard to get the battery pack out.
Video demonstration

1. Only use AA rechargeable batteries with the robot. Regular alkaline batteries wear down quickly and don't maintain a consistent voltage.
2. Assemble mBot per instructions with kit.
3. Put a battery (**CR2025**) in the remote. You can use the remote to control the robot.

Test the Factory Default Program

This built-in program has three functions.

Remote Control

1. The robot starts in remote control mode. Press the arrow keys on the remote to move the robot.
2. To return to remote control, press A, or press the button on the robot. This also serves to stop the robot when it is in either obstacle avoidance, or line following mode.

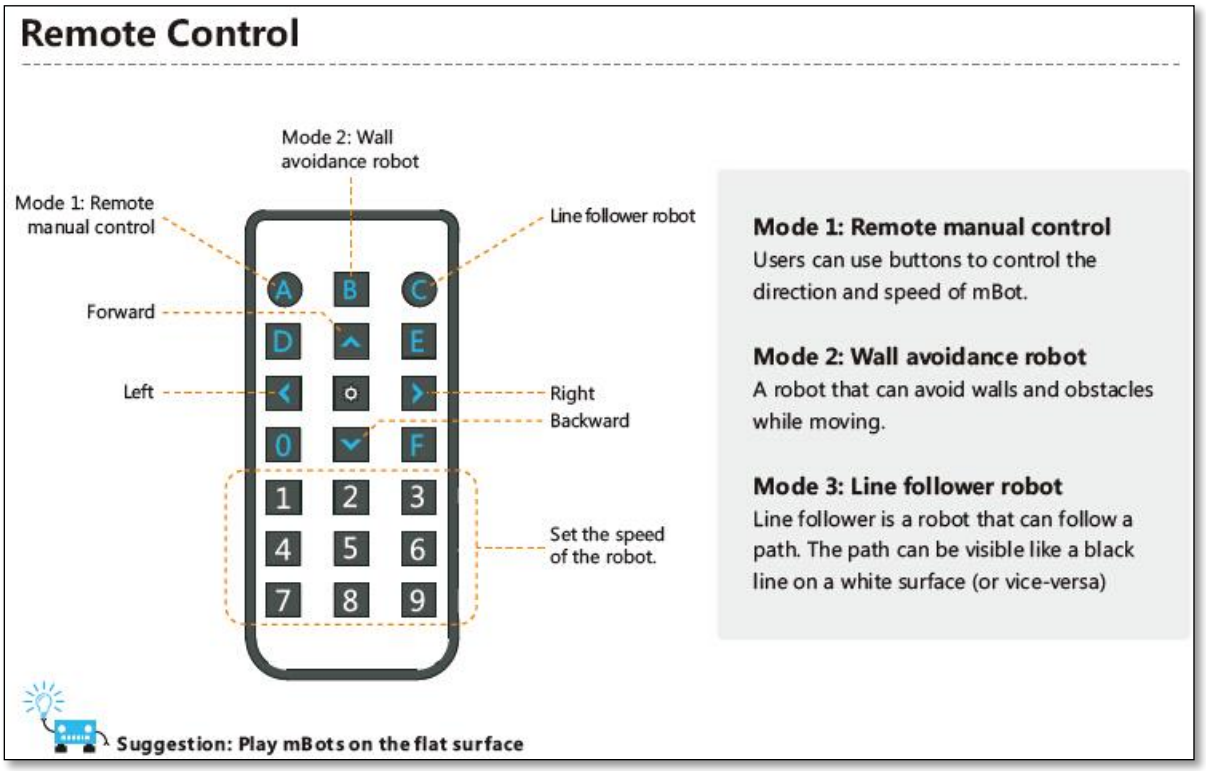
3. 1-9 changes the speed of the robot.

Obstacle Avoidance

1. Press B on the remote or press the button on the robot.
2. Put your hand in front of the robot while holding it, the "eyes" (ultrasonic sensor) will detect your hand and the wheels should change speed.
3. Put the robot on the floor. It should avoid obstacles, such as furniture, your foot, walls, etc.

Line Following

1. Press C on the remote or press the button again on the robot.
2. Unfold the line follower diagram that came with your mBot. Place the robot on the black line. It should follow the line. And follow the line. And follow the line . . .



Requirements

- Use the remote on the robot to switch modes.
- With the arrow keys, navigate a square and return to the starting point. Change speeds.

- Obstacle avoidance: Show the robot avoiding obstacles. You can use your foot to guide it.
- Line Following: Follow the line on the paper track.

Assignment Submission

- **In class assignment submission** → Demonstrate in person.
- **Online submission** → A link to a YouTube video recording showing the assignment placed in the submission area in BlackBoard.