

REC for Cortex

1.20 Activity: Adding Components - Advanced

Name: _____ Class/Period: _____ Date: _____

Overview:

In this advanced activity, you will mount a dry erase marker to the BaseBot and direct the robot to draw shapes on the playing field using the dry erase marker.

Duration:

30 Minutes

Materials:

Qty	Description
1	BaseBot
1	REC 1 Bundle
1	Dry erase marker
1	Elastic band
1	Playing field

Procedures:

1.20.1A: Mounting the Marker

- 1 Attach the gusset to the angle bar as shown below.



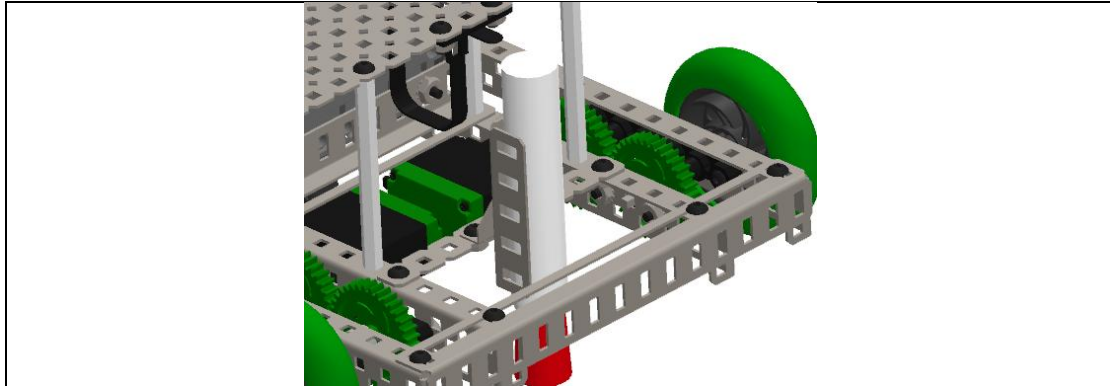
Materials

1	Gusset
1	5-hole angle bar
2	8-32 BHCS x 1/4" (6.4 mm)
2	Keps nuts

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- 2 Attach the gusset assembly to the 9-hole bar. Mount the bar on the chassis and tighten the hardware as shown below.



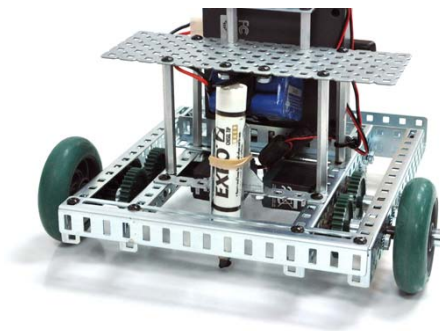
Materials

	Angle bar assembly from step 1
1	9-hole bar
4	8-32 BHCS x 1/4" (6.4 mm)
4	Keps nuts

- 3 Using the rubber band, mount the dry erase marker to the assembly as shown above.

1.20.2A: Drawing a Straight Line

- 1 Configure your BaseBot for tank control.
- 2 Verify that all motor connections are correct.
- 3 Place your BaseBot on the playing field with the cover off of the dry erase marker. Make sure the marker is in contact with the playing field surface.



- 4 Try to drive the robot so that the marker draws a straight line on the playing field.
 - How straight is your line?
 - What can you do to make the line perfectly straight?
- 5 Keep practicing until you can draw a straight line that is roughly 60 cm long.

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1.20.3A: Tank vs. Arcade Control

- 1 Configure your BaseBot for arcade control.
- 2 Try to draw the same 60 cm straight line.
 - How straight is your line?
 - What can you do to make the line perfectly straight?
 - Which control method is easier for you?

The switch between the two types of controls is relatively simple. However, practice makes perfect. If you stick with one type of control, your skill will improve as time goes on.

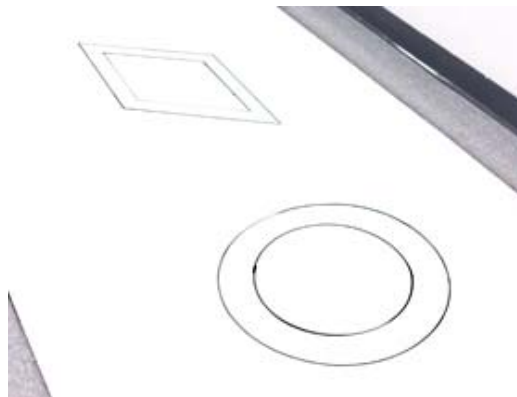
1.20.4A: Drawing Shapes

In this exercise you will use both tank and arcade control to draw shapes with the BaseBot. You will complete three time trials to compare control modes.

- 1 Set up the BaseBot for Tank control.
- 2 Place the BaseBot on the playing field with the marker touching the surface.



- 3 Have your partner time you while you draw a 45 cm parallelogram and a 45 cm circle. You may first mark the playing field with an outline of each shape to use as a guide.



- 4 Record the results in the Table 1 on your question sheet.
- 5 Erase your marks and time yourself two more times. Record the results in Table 1.

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Table 1: Tank Control

Trial	Time	
	Circle	Parallelogram
1		
2		
3		

- 6 Use a paper towel to remove any marks from the playing field so that the field is clear, then have each member of your group attempt the challenge.
 - Be sure to complete three time trials for each team member.
 - Record all results on your question sheet
- 7 Switch the BaseBot to Arcade control.
- 8 Record three time trials drawing a circle and a parallelogram in arcade control.
- 9 Record the time in Table 2 on your question sheet.

Table 2: Arcade Control

Trial	Time	
	Circle	Parallelogram
1		
2		
3		

- Which shape did you find most difficult to draw?
- 10 When you finish, clear the playing field of all marks and outlines.

1.20.5A: Engineering Notebook

Make an entry in your engineering notebook that includes:

- A sketch of the new marker attachment that you added to your BaseBot
- Notes on which control configuration you chose to draw the shapes and why you chose that option

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Questions:

Write the answers to the following questions on your question sheet. Add the completed question sheet to your robotics binder.

Question 1 Which was the hardest shape to draw? Why?

Question 2 Which driving style did you like better, Tank or Arcade? Why?

Question 3 Do you feel that one control configuration is always better, or would you choose Tank for certain driving tasks and Arcade for others? Why?