



Artbotics – Drawing with Cricket Cars

In this exercise, you and your partner will be programming a robot to draw shapes and patterns. You will be programming a Super Cricket microcontroller, which will control two motors for the wheels of a car. Please follow these instructions and the workshop assistants will be here to help as you need it. You will be programming in Cricket Logo...let's get started!

1. Cricket Logo is written in **procedures**. Procedures start with **to** and finish with **end**

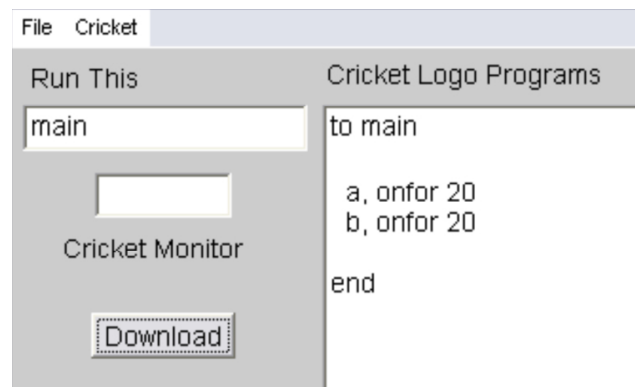
Procedures must also be named. Let's call this procedure **main**. In the *Run This* box you must also put **main**. Now the **main** procedure will be run when you press the *Run/Stop* button on the Super Cricket.

Each motor on the Super Cricket is controlled by the letter of the port that it is plugged in to.

They can be selected by typing **a**, and **b**, (commas are very important!)

The command **onfor** turns on a motor for a specific amount of time (10 = 1 second).

Copy the program to the right into Cricket Logo. Turn on your Cricket, line up the Cricket eyes with the beamer eyes, and hit **Download**. When it is done downloading, press the **Run/Stop** button.



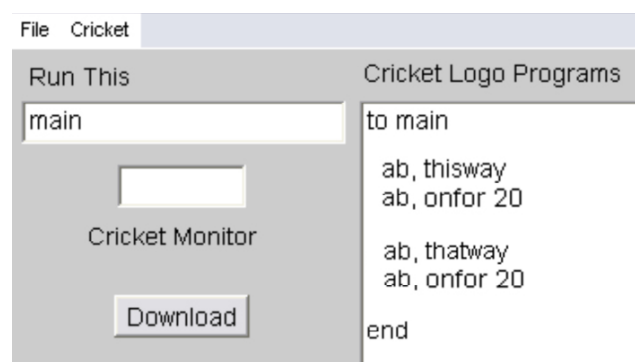
Your car should rotate one motor for 2 seconds and then the other motor for 2 seconds.

2. The motors can be controlled simultaneously, and their directions can be set.

In the previous example each motor was controlled separately. You can control both of them at the same time by typing **ab**,

You can set the motor's direction by using **thisway** and **thatway**. For this workshop, thisway is forward and thatway is backward.

Copy the program to the right into Cricket Logo. Turn on your Cricket, line up the Cricket eyes with the beamer eyes, and hit **Download**. When it is done downloading, press the **Run/Stop** button.



Your car should drive forward for 2 seconds and then backward for 2 seconds.



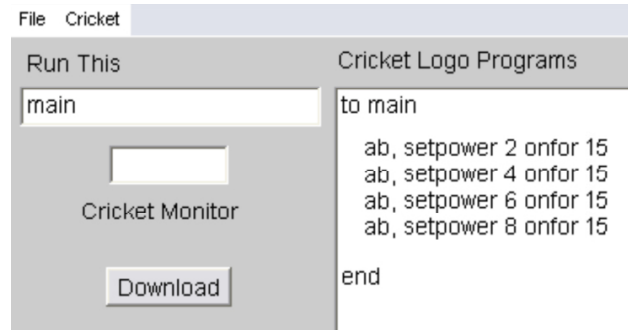
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3. You can also control each motor's speed.

To control a motor's speed use the command **setpower** followed by a number between 0-8.

setpower 8 is the fastest and **setpower 1** is the slowest (0 is off)

Copy the program to the right into Cricket Logo. Turn on your Cricket, line up the Cricket eyes with the beamer eyes, and hit **Download**. When it is done downloading, press the **Run/Stop** button.



Your car should drive slow for 1.5 seconds, then faster for 1.5 seconds, then faster, then faster.

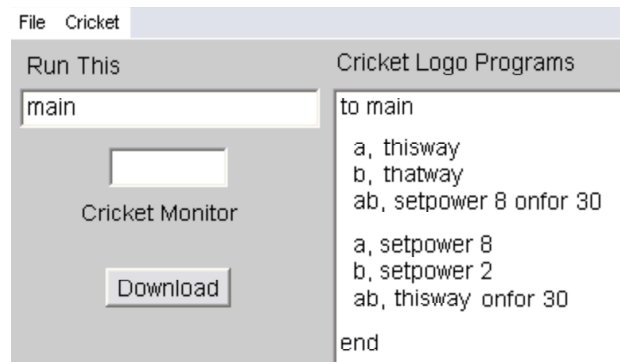
4. By changing the direction on each motor, or the speed on each motor, you can make the car turn, spin, and arc.

To make the car spin in place, set each motor to a different direction but the same speed. To make the car turn in an arc, set each motor to a different speed by the same direction.

The first half of this procedure will make the car spin in place.

The second half of this procedure will make the car turn in an arc.

Copy the program to the right into Cricket Logo. Turn on your Cricket, line up the Cricket eyes with the beamer eyes, and hit **Download**. When it is done downloading, press the **Run/Stop** button.



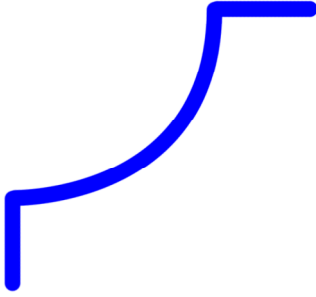
Your car should spin in place for 3 seconds, and then it should turn in an arc for 3 seconds.

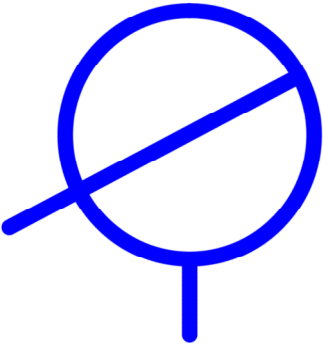


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5. Now you can begin drawing with your Cricket car. On this page are 3 examples of shapes you can draw and the code you need to draw them. (shapes may vary slightly)

	<div><p>File Cricket</p><p>Run This</p><input type="text" value="main"/><p>Cricket Monitor</p><p>Download</p><p>Cricket Logo Programs</p><pre>to main ab, setpower 4 thatway onfor 10 a, thisway b, thatway ab, onfor 10 end</pre></div>
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	<div><p>File Cricket</p><p>Run This</p><input type="text" value="main"/><p>Cricket Monitor</p><p>Download</p><p>Cricket Logo Programs</p><pre>to main ab, setpower 4 thisway onfor 5 a, setpower 8 b, setpower 0 ab, onfor 10 ab, setpower 4 thatway onfor 5 end</pre></div>
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	<div><p>File Cricket</p><p>Run This</p><input type="text" value="main"/><p>Cricket Monitor</p><p>Download</p><p>Cricket Logo Programs</p><pre>to main ab, setpower 4 thisway onfor 5 a, thatway b, thisway ab, setpower 8 onfor 30 ab, setpower 4 thisway onfor 15 end</pre></div>
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On the next page you will add a **loop** command to draw a spiral pattern with that shape (or one you create; feel free to experiment!)

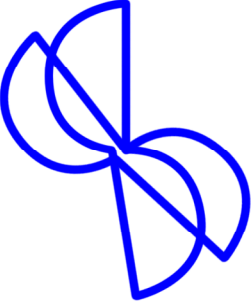


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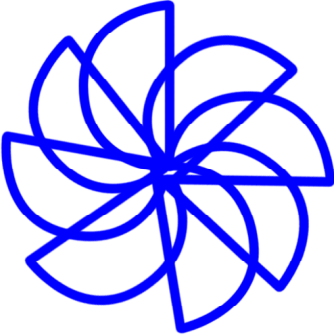
6. In order to use these shapes (and any other ones that you create) into patterns, you must make the shapes repeat. There are two ways of doing this: **repeat** and **loop**.

Let's repeat the first shape on the previous page. You can repeat it by using

repeat # [commands] by specifying a number of times to repeat the commands:

	<p>File Cricket</p> <table border="1"><tr><td><p>Run This</p><input type="text" value="main"/> <p>Cricket Monitor</p><input type="button" value="Download"/></td><td><p>Cricket Logo Programs</p><pre>to main repeat 4 [ab, setpower 4 thatway onfor 10 a, thisway b, thatway ab, onfor 10] end</pre></td></tr></table>	<p>Run This</p> <input type="text" value="main"/> <p>Cricket Monitor</p> <input type="button" value="Download"/>	<p>Cricket Logo Programs</p> <pre>to main repeat 4 [ab, setpower 4 thatway onfor 10 a, thisway b, thatway ab, onfor 10] end</pre>
<p>Run This</p> <input type="text" value="main"/> <p>Cricket Monitor</p> <input type="button" value="Download"/>	<p>Cricket Logo Programs</p> <pre>to main repeat 4 [ab, setpower 4 thatway onfor 10 a, thisway b, thatway ab, onfor 10] end</pre>		

Or you can use **loop [commands]** to repeat a set of commands indefinitely:

	<p>File Cricket</p> <table border="1"><tr><td><p>Run This</p><input type="text" value="main"/> <p>Cricket Monitor</p><input type="button" value="Download"/></td><td><p>Cricket Logo Programs</p><pre>to main loop [ab, setpower 4 thatway onfor 10 a, thisway b, thatway ab, onfor 10] end</pre></td></tr></table>	<p>Run This</p> <input type="text" value="main"/> <p>Cricket Monitor</p> <input type="button" value="Download"/>	<p>Cricket Logo Programs</p> <pre>to main loop [ab, setpower 4 thatway onfor 10 a, thisway b, thatway ab, onfor 10] end</pre>
<p>Run This</p> <input type="text" value="main"/> <p>Cricket Monitor</p> <input type="button" value="Download"/>	<p>Cricket Logo Programs</p> <pre>to main loop [ab, setpower 4 thatway onfor 10 a, thisway b, thatway ab, onfor 10] end</pre>		

At this point you can begin drawing your own patterns and shapes. Write a set of commands to draw a shape, then repeat or loop those commands to get a pattern!