

Circuit #8 Single Servo

1.

How is this circuit, or a circuit like it, used in everyday life? Provide at least three examples.

Got your servo running? Great.

Upload Circ04Expansion to your RedBoard and add a temperature sensor (pin 0) to your circuit so it controls the position of the servo depending on the temperature.

2.

Decide what the parameters of your temperature gauge will be in Celsius. Find the line of code that controls this and change as necessary.

3.

Using the `delay()` command change the code so that the speed of the servo is also controlled by the temperature. You can make it move faster or slower depending on the temperature sensor input. Ideally you will only need to change a single line of code to do this. Write the line of code you used below.

4.

Add a button to the schematic on the right which allows the user to change what aspect of the servo the temperature sensor controls. Extra credit if you can modify the code so your circuit does this in real life.

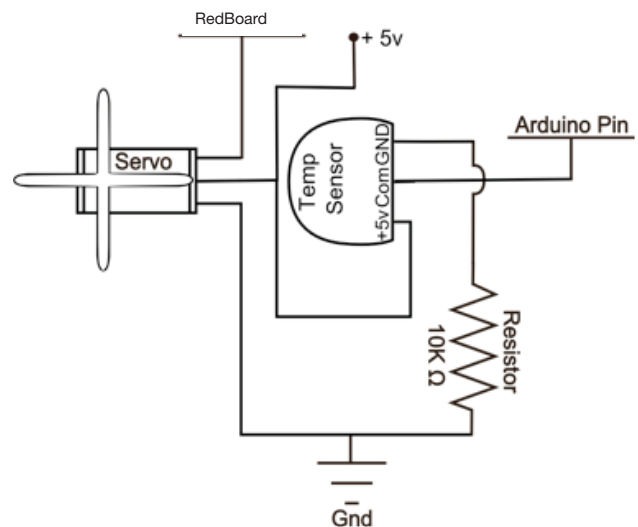
5.

Define a servomechanism in your own words.

6.

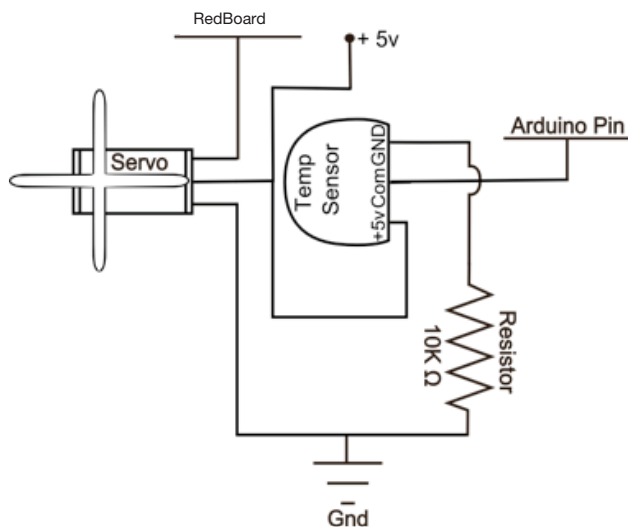
There are many types of servomechanisms that are not simple motors with position feedback, what is the most complicated servo you can think of?

Circuit:



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Circuit:



7.

In your own words explain what this transistor does and the ways in which the motor's action would change if it were hooked up directly to a 5V power source and a ground?

8.

Instead of a temperature sensor you could have added almost any sensor or interface component to your servo. Document at least three other options and explain briefly how you would control the servo.

9.

It is possible to do amazing things with servomechanisms. In your own words, explain below how you could use the servo to create an autonomous marshmallow (because they are soft) launcher that corrects its angle depending on where the previous shot landed. Don't worry about how to get data about where the previous marshmallow landed, just explain how the servo would react to a marshmallow that went too far or too short.
