Tinkering with an RC Car

For this tinkering exercise we are going to use an inexpensive radio control car. The car used in this example was purchased at Wal–mart for less than $10.00. These cars are so cheap that teams can experiment with several of them without spending a lot of extra money.

Inexpensive RC cars usually operate in one of two radio frequencies (27 mHz or 49 mHz). Something to keep in mind is that if you have several cars using the same frequency they will all be controlled by the same controller (whether you want them to or not). If you want to experiment and try several things at once you may want to purchase a couple of cars at each frequency. Some RC cars come with the ability to select one of several channels at a given frequency. This provides the ability for several cars that operate at the same frequency to be controlled independently by selecting different channels. (Teams can do their own tinkering to decide if they can take advantage of those independent channels.)

RC cars in this price range share one common trait. They do not have proportional control for steering or for speed. Either the front wheels are turned or they are not. The rear wheels are either turning forward or backward. You must move up to more expensive cars to find proportional steering or proportional speed control.

Proportional steering in more expensive rc cars is generally provided through the use of RC servos. Proportional speed control is often provided through some type of Pulse Width Modulation.

The steps in this tinker are based on an inexpensive car that does not have proportional control. You will have to adapt these steps for the particular rc car that you purchase.

In most cases you can click on the thumbnail images for larger pictures.

The first step is to remove the body from the rc car so that you can see the motors and control board. Removing the body from this car required disconnecting the antenna. The antenna was reconnected after the body was removed.
In this RC car the mechanism that controls the steering is hidden in the body of the car. This picture shows a car with the body cut away to reveal the steering mechanism. This steering uses a form of a rack and pinion. A small gear (the rack) is attached to the motor shaft. When power is applied to the motor to make it turn in either direction, the small gear turns until it reaches a stall position (it no longer turns). As it turns it moves the rack gear (the small flat gear in an arc) which moves levers attached to the wheels.

There is a black and red wire leading to the motor at the front of the car. These are the power leads to the motor. The receiver board directs power to the motor to either make it turn clockwise or counterclockwise. You will find similar wires running to the motor that runs the rear wheels. Another thing you will notice on most all rc cars is a small disc (probably brownish in color) soldered to the motor terminals. This is a ceramic capacitor. The capacitor is used to capture stray electrons that are generated when the motor is running and to reduce interference with the RC signal.

Source: [http://tech.texasdi.org/8010rccartinker](http://tech.texasdi.org/8010rccartinker)