

Section  
**3**



# The Robot

## 3.1 What is a VEX Robot?

A VEX Robot is a remotely operated vehicle designed and built to play the VEX Competition game.

## 3.2 Robot Rules

### 3.2.1 General Design & Safety Rules

<R01> Dimensions of the Robot are as follows:

18”L x 18”W x 12”H

<R02> Energy used by robots must come from VEX motors and servos OR non-VEX parts requested by teams (explained below)

<R03> Protrusions from the robot deemed unsafe during inspection will not be allowed.

<R04> No “wedges” of any kind. This is not BattleBots.

<R05> If tape is used on the robot, it cannot be used to secure parts together. All parts must be secured with screws or tie straps.

<R06> Robots may not purposely detach pieces of themselves to be left on the playing field. A robot must end a match with all of the parts it began that match with.

<R07> Trading of parts between teams is permitted, but must be documented.

### 3.2.2 Cutting Parts

Because of limited resources, only a certain amount of parts may be cut:

- (2) Long angle bars (on the notches only)
- (2) Long bars (greater than 1 square)
- (2) 12” axles
- (2) Plates

Safety first! Wear safety glasses when cutting parts!

We recommend using a band saw to cut the pieces and sand it down. If you do not have a band saw, you can use a hack saw or aviation snips to cut parts and a file to file down the sharp edges.

### **3.2.3 Non-VEX Parts**

All non-VEX parts must be available to all participating teams.

If a team wants to use a non-VEX part, they must write up a proposal stating the name of the part, approximate dimensions, where to get the part, and the price of the part. When approved by a mentor, the part may be used on the robot. Every team must have a copy of the proposal.

## **3.3 Programming**

You will realize that your robot might require custom made controls. The VEX controller can be programmed to tweak how your robot performs. Teams can modify the robot controller by using either a graphical user interface programming tool or a text based programming interface tool.

### **3.3.1 EasyC by Intelitek**

The EasyC programming software comes in the VEX Programming kit available at <http://www.vexlabs.com>. EasyC is an icon based programming tool that introduces students to C programming. Version 1 has basic functions to get you started but if you find that Version 1 is not sufficient, you can upgrade to EasyC V2 for Vex. Customer support is available at the Intelitek website: <http://www.intelitek.com/>.

### **3.3.2 MPLAB by Microchip Technologies**

MPLAB is a text based programming software for people who know how to program in C. This gives the student full control over the robot by being able to edit the actual source code of the robot. This is recommended for students that know C syntax and program flow and those who have used this in the FIRST Robotics Competition. More about MPLAB can be found at: <http://www.microchip.com/mplab>

In order for the program to work on the robot, you will need a copy of the C18 compiler from Microchip Technologies. The C18 compiler will need to be purchased.

<http://www.microchip.com/C18>