



# BLITZ BITS

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## SPECIAL POINTS OF INTEREST:

- **FIRST Tech Challenge Kickoff on September 19th**
- **Highlights from 2007 Challenge**

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## FIRST Tech Challenge

Team Blitz is putting together two teams to compete in the 2007 FIRST Tech Challenge (previously referred to as the FIRST VEX Challenge.) If you are interested in participating, please contact the team lead.

The FIRST Tech Challenge grew out of the existing FIRST Robotics Competition. FIRST creates the game/challenge and teams can use the Vex Robotics Design System kit to participate.



Teams can be made up of 10 students or fewer, and is recommended for high-school-age students. There is an upper age limit that states



**Working with VEX at the Museum's Robotics Expo last fall 2006.**

the students participating on the teams must be no older than high school aged.

The Vex Robotics Design System, challenges students' creative problem-solving skills by enabling them to build robots that do amazing things. The Vex System allows students to design and construct robotic devices which can be autonomously programmed or radio con-

trolled to perform various tasks that expand the boundaries of experimental intelligence.

This year's FTC Kickoff was held online on September 19th, and the 2007 tournaments will run from November until February. The season will conclude with the FIRST Championships at the Georgia Dome, featuring the FIRST Tech Challenge World Championship Event.

This years challenge requires picking up PVC rings and placing them in a variety of goals. Capturing a goal wins extra points for a team.

Please monitor the FIRST website for more information about the FIRST Tech Challenge at [www.usfirst.org](http://www.usfirst.org)



## Basic Robot Construction Bryan Adrian

The VEX Challenge depends solely on the technical ability of the team members. Team members must know the proper way to construct a working robot using subsystems.

There are many different subsystems that must work together for the robot to run and operate smoothly. First of these subsystems belongs to the "brain" or, better known as, the command module. The "brain" contains all the code needed to run the robot through the interface of motors and sensors. On the command block there are ports where motors and sensors can be plugged into the master code. Different

sensors may include touch, rotation, ultra-sonic, and rarely, sound sensors. Rotation sensors measure the number of rotations a wheel or axis has gone around 360 degrees. Touch sensors sometimes initiate a new sequence of a program when the button is depressed or released. Motors are the cool little boxes that make a robot move forward, turn, and then move backward. Sensors and the command module are kind of like the eyes, ears, and brain of a human, only they for a robot.

How are you going to drive the robot without a frame to attach the brain and sensors to? Without a rigid frame a robot is not a

robot. For example, say someone is trying to build a house. Where would you start when building a house? I would start on the foundation seeing as though that is the part of the house that supports the walls and roof. Robots are kind the same way in that they need a strong "foundation" in order to build other attachments on top of the chassis. Motors, gears, and wheels have to fit in or on the chassis. What kind of frame you make will determine what kind of drive train you put on that frame. Also, depending on how heavy the robot is you might have to have a higher gear ratio to compensate for the weight. Attachments and what not also have to be rigid. Your robot will fall apart quickly if you do not make everything rigid.



Students learn programming skills to control the robots.

Team Blitz placed second and won the Rookie All Star team award at the 2007 Colorado Regional Competition!

Team Blitz at the Georgia Dome for the 2007 World Competition.



## Programming Bits Nathan Grubb

For the inexperienced, programming can seem like a mystery, a black box, understood only by a select few. But it is not. The code written and stored within a memory chip is the glue of the robot, pulling all the components together. No amount of mechanical engineering can replace this precious resource.

Although you may think that such an important component is complicated, it can be broken down into several, smaller elements, easily mastered with practice. There are two main branches of programming, the logic

and the code. Logic is the process that the computer uses to decide what and how to accomplish a task. For example, when writing a program to navigate through a maze, the program must decide when to turn, when it reaches a wall, which is indicated by the position of a bumper switch on the front of the robot.

The second step to programming is taking your logic writing the code, the language that the computer can understand. For our case, we will use the language C, although there are many lan-

guages. For our maze program, turn when the bumper switch is pressed, is written like:

```
if(Bumper1 == 1)
{motor1.setMotor(0);
motor2.setMotor(255);
}
```

Now, I know what you're thinking, "What does that mean!?" If you want to learn, just come over during the meetings, we'll be happy to get you started. With the right materials and a little effort you could write code like an expert, and if you need any help along the way,

## Highlights from 2007 FRC Michaela Rillings

Team Blitz had an incredible rookie year! The highlights of the Colorado Regional event include:

1. Winning the Rookie All-Star Award, and therefore qualifying for Worlds,
2. Retaining 1<sup>st</sup> place for a while during the nine matches,
3. Watching our team captain (my brother Jared) be one of the eight team captains who got to choose their alliance,
4. Scoring the highest number of points in the competition during a semi-final match.

It was a thrill to get as far as the final round in the championship, placing second overall. As a rookie team, we were glad to have a working robot that competed so well never mind qualifying to attend the World Championships.

Although we didn't do as well at the World Championships in Atlanta, due to mechanical difficulties, it was still a once-in-a-lifetime experience to compete there and to see all of the great teams and the innovative designs used to build the robots. It was also fun to compete with teams

from other countries, such as Israel and participate in a couple of high scoring matches. Team Blitz learned a lot by going to World's and we hope to be competing there again!

After we returned from the Worlds in Atlanta we were invited by Representative Rob Witwir to the Colorado State Legislator. Mr. Witwir introduced us to the House Floor and we were privileged to speak with many of our State Representatives.

## Vex Challenge Tyler Grubb

There are many ways to challenge a robot and its creator. This last year the Vex Challenge was lifting softballs into foot high bins for points. Your robot also had the option to hang on a 3" bar for course points. The bar was located on a platform that is spinning. There also was an atlas ball that doubles your

points.

Our Mentor team, Faith Christen, held a Vex Challenge last year. The goal was to be first in getting three balls from your opponent's goal to your goal. The competition include a phase when your robot had to go through a maze, initially in auto-

nomous mode and, if not out yet, then remote control. Now in our second year, we are building a maze game before the Vex Challenge. This is similar to our mentors maze, but we have moving walls and the field is collapsible.

# A Seniors Perspective on Animation Zach Repasky

As far as my experience in FIRST I would have to say it was amazing!

I don't know if I will ever get to experience anything quite like that again in my life. I am so proud to have been a part of Team Blitz. I had so much fun, and I met a lot of amazing and talented people that will do great things some day, I am sure. Our enthusiasm for our robot and the animation as well as each other was a priceless experience in itself. We had fun together as well as worked hard together. Here is part of my experience of working hard

for the team. After 2 straight nights of around 3 or 4 hours of sleep to get an animation in on time and still have no idea how it is was going to get done. After you complete it the next day, you feel like the happiest person alive. Everyone is so proud and excited for what you have done and accomplished. Once again, you stay even a little later that night to help a friend and teammate try and figure out an autonomous program.

So, anyway I don't know if some of that made sense, but I had a great time, and there is

so much more that I didn't even tell here. Like going to the capital and being a "spokesperson" for the team. Thank You So Much for everything Donna. I hope to help out when I can this year as a mentor and please keep on letting me know of all upcoming events! Thanks and I hope to hear from you soon.

*Zach was a member of the team for the 2007 competition. Now he is in his first year of college. Good luck Zach!*



**Zach Repasky**

## CAD Corner Jared Rillings

There are numerous benefits to using CAD to design your VEX or FIRST robot. Among these benefits include being able to completely design the plans and construction blueprints of your robot on a computer. Also when building your robot you're able to design it without having to use traditional pencil and paper thereby eliminating defects and errors that may occur when using that method. When using CAD you're able to design more

complicated and better detailed drawings then if drawing on paper. It is possible to design these more detailed drawings because you're able to zoom in on the drawings, and put in more accurate dimensions than possible without a computer. A final item to mention is that there are numerous types of CAD programs but most are very similar and easy to use once you have a background in a specific program.

AutoDesk Inventor is provided to FIRST teams to help build their robots by helping to test different design ideas and check for design problems in a virtual environment. To make it easier to use AutoDesk Inventor, AutoDesk has created a virtual kit of parts, that you can pull right into your AutoDesk Inventor robot design. This can save you days of work during this critical stage of the competition.

## New Members Jared Rillings

We are excited to welcome our new members Andy and Rick Peterson along with Ryan Carpenter and Lena Harris. To help you get acquainted with what lies ahead, here is a summary of the team structure from last year.

During our Rookie season Team Blitz was broken into several smaller teams of students, each responsible for a specific aspect of the robot and the competition. Being our Rookie year, it was difficult, as many Engineering fundamentals had to be in-

troduced to each student to teach them the basics of Engineering, resulting in an effective build. Once this had occurred over the course of the first week and a half, the students were broken into four primary teams. These included the chassis build team, arm mechanism team, electrical team and software team.

A student team leader was assigned for each of these teams, and the students then worked with mentors throughout the design and build. With the rela-

tively small number of students (15-20), many students served on more than one team. This encouraged the different teams to communicate with each other so that the final goal of a fully integrated robot could be met.

Other teams were also formed along the way consisting of students to create an animation, development a team web site, build a partial game rack, and design and build a shipping crate/pit structure.

**CAD stands for Computer Aided Design.**

**Fritz, the Team Blitz robot for the 2007 challenge.**





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TEAM BLITZ is a high school robotics team of students from the Conifer, Baily, and Evergreen areas. We are affiliated with FIRST (For Inspiration and Recognition of Science and Technology), a non-profit organization founded in 1989 by inventor and entrepreneur Dean Kamen "to create a world where science and technology are celebrated". Team Blitz was organized by a group of local parents and technical mentors and is under a 501c3 sponsor and is one of 1300 teams from around the world. This team of youth, ages 13-18, will compete in the FIRST Robotic Challenge.

### Our Mission

To establish a permanent robotics organization in the 285 Corridor Communities, Conifer, Aspen Park and Evergreen, whose purpose is to help our young people discover the fun and excitement of science, technology and engineering through challenges introduced to them by the FIRST robotics competition.

# Sponsorship Program

The TEAM BLITZ SPONSORSHIP program is designed to accomplish two goals:

1. Support Team Blitz in their effort to inspire local youth in the fields of technology and engineering
2. Promote local business through advertising.

It is simple, painless, and definitely a win-win for a local business and Team Blitz. We are asking from your business, one of the following:

- Make an annual cash donation.
- Make an in-kind donation to Team Blitz in the form of donated services, materials, equipment or facilities.
- Sponsor a Team Blitz outreach event.

In return, the Team Blitz will:

- Recognize your donation in this newsletter.
- Feature your business on our website. This web site will be viewed by any of 1300+ FIRST teams and their sponsors across the nation and around the world.

**Gold and Silver sponsors:** we will displayed your logo on the robot at the regional competition and world competition in Atlanta, Georgia (if we continue past the regional competition).

**Gold, Silver and Bronze sponsors:** we will add your logo to the next edition of the Team Blitz brochure and sponsorship request letter. In addition your logo will be displayed with our banner in our work booth at all competitions and outreach events.

**Event sponsors:** we will display your logo with the team banner at the event and in any publications and advertising associated with the event.

Sponsorship Levels:

- Gold Sponsor: \$2000 or more
- Silver Sponsor: \$1000-\$1999
- Bronze Sponsor: \$300-\$999
- Robot Booster Club: up to \$299



2007 FIRST VEX Challenge

## 2007 Corporate Sponsors



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Thanks also to the individual sponsors who enabled us to compete in the 2007 Worlds Competition in Atlanta!