

# 2011 Handbook

## *Beckman-Coulter Team TRŪBLŪ*



**FIRST** Team 2496

A guiding document for the Robotics Team at Beckman High School, Irvine,  
California, 92602

**Beckman High Robotics Booster Club  
18 December 2010**

# Table of Contents

<b>INTRODUCTION.....</b>	<b>3</b>
<b>FIRST AND FRC .....</b>	<b>3</b>
<b>THE STORY OF TEAM TRŪBLŪ.....</b>	<b>4</b>
<b>STATEMENT OF FOCUS.....</b>	<b>4</b>
<b>GOALS .....</b>	<b>4</b>
<b>TEAM ROLES AND RESPONSIBILITIES.....</b>	<b>4</b>
<b>TEAM TRŪBLŪ ROLES AND RESPONSIBILITIES.....</b>	<b>6</b>
<b>AUTODESK TEAM .....</b>	<b>7</b>
<b>PIT CREW .....</b>	<b>7</b>
<b>MENTORS ROLES AND RESPONSIBILITIES .....</b>	<b>7</b>
<b>BECKMAN ROBOTICS BOOSTER CLUB ROLES AND RESPONSIBILITIES.....</b>	<b>7</b>
<b>2011 ROBOTICS TEAM SCHEDULE .....</b>	<b>9</b>
<b>BEHAVIOR AND ATTITUDE.....</b>	<b>11</b>
<b>ATTENDANCE.....</b>	<b>12</b>
<b>SHOP SAFETY RULES .....</b>	<b>12</b>
<b>TRAINING SIGN-OFF SHEET .....</b>	<b>13</b>
<b>COMPETITIONS .....</b>	<b>14</b>
<b>TRAVEL .....</b>	<b>14</b>
<b>FUNDRAISING .....</b>	<b>14</b>

## Introduction

### FIRST and FRC

FIRST is a non-profit organization that provides an opportunity for high schools students to compete in the areas of science and engineering. The following is extracted from the website: [www.usfirst.org](http://www.usfirst.org).

#### What is FRC?

*FIRST* Robotics Competition (FRC) is a unique varsity sport of the mind designed to help high-school-aged young people discover how interesting and rewarding the life of engineers and researchers can be.

The *FIRST* Robotics Competition challenges teams of young people and their mentors to solve a common problem in a six-week timeframe using a standard "kit of parts" and a common set of rules. Teams build robots from the parts and enter them in competitions designed by Dean Kamen, Dr. Woodie Flowers, and a committee of engineers and other professionals.

*FIRST* redefines winning for these students because they are rewarded for excellence in design, demonstrated team spirit, gracious professionalism and maturity, and the ability to overcome obstacles. Scoring the most points is a secondary goal. Winning means building partnerships that last.

What is unique about the FRC program?

It is a sport where the participants play with the pros and learn from them  
Designing and building a robot is a fascinating real-world professional experience  
Competing on stage brings participants as much excitement and adrenaline rush as conventional varsity tournaments.

The game rules are a surprise every year.

## The Story of Team TRÜBLÜ

A group of parents came together in the Spring of 2007 and developed the idea of a possible robotics club/team at Beckman High. The parents met with the school principal and with her blessing began drumming up interest and support from Beckman students. The first informational meeting was held in the Beckman High library in May of 2007. Fourteen students showed up to watch videos from former FIRST Robotic Competitions and most of those students are continued with the team until graduation three years later. Mentors were also brought in around this time and began meeting. Funding was sought, and Beckman-Coulter stepped forward and graciously supported the team. BLEET became an official club at Beckman High in Fall of 2007 and *Beckman-Coulter Team TRÜBLÜ* was born. The student-led management club began meeting regularly and often to build the organization. Among the first tasks accomplished, the leaders named the team. The team name TRÜBLÜ was chosen to signify the Beckman High Patriot spirit and to closely align the robotics club with the TRÜBLÜ thirteen points of emphasis which blanket the walls of the school. *Determination, punctuality, tolerance, honor, leadership, commitment, involvement, strength, individuality, integrity, optimism, focus and loyalty.* Each of these traits is something the Beckman-Coulter Team TRÜBLÜ members would like to bring with them when they enter a competition. The robot's name was also chosen at this time: ARNOLD 01 in honor of Arnold O. Beckman. Beckman High was named for renowned scientist and inventor Arnold O. Beckman. His many inventions include the defibrillator and the incubator, which both have saved many lives of the young and old. The BLEET club was phased out eventually and the team now maintains its own management. The team has now grown to over 40 active members with more enthusiasm than ever.

## Statement of Focus

Our team focus is to develop technical and organizational knowledge regarding the process of building a fully functioning robot, to establish a positive, contributing presence within the local community, and to encourage student members to develop themselves in accordance with the thirteen TRÜBLÜ points of emphasis.

## Goals

### Robotics Team Goals:

1. To promote the ideals of FIRST within the spirit of gracious professionalism.
2. To enter a working robot into the First Robotics Competition.
3. To learn how to work together as a team and to keep to the schedule.
4. To promote team spirit among all club members.
5. To gain a sense of ownership and responsibility for completion of a project.

### Beckman Robotics Booster Club Goal:

Enhance the opportunities for students at Beckman High School to discover the relevancy of science and math by providing an opportunity with hands-on learning through Robotics.

## Team Roles and Responsibilities

### Team Management Captain Duties

1. Run meetings
2. Call meetings

3. Supervise club activities
4. Manage phone tree
5. Maintain overall schedule

### **Secretary- Human Resources Officer**

1. Take minutes at meetings
2. Take attendance
3. Update the phone list and distribute
4. Obtain permission slips
5. Handle team paperwork
6. Ensure that each team member receives handbook and signs contract

### **Treasurer – Finance Officer**

1. Prepare budget
2. Modify budget
3. Present budget at general meetings
4. Meet with Booster Parent Treasurer

### **Fundraising**

1. Organize the Hexbug™ fundraiser
2. Promote Hexbug™ fundraiser (ask for help from publicity)
3. Collect money and turn in to treasurer

### **Webmaster**

1. Find web provider
2. Design website so that it will be able to grow with the club/team
3. Train web team members
4. Design website to be eye-catching and functional
5. Maintain website with updates

### **Community Relations/ Publicity Coordinator**

1. Write and submit articles for school and local newspaper.
2. Create posters
3. Generate publicity ideas (Meet Arnold 01)
4. Set up open house times for robotics workshop and advertise
5. Take photos and video clips and collect photos and video clips from others
6. Create DVD with photos and video clips from past year

### **Team Spirit Captain**

1. Promote spirit
2. Plan fun activities movies, bowling, laser tag, etc.
3. Birthday

### **Travel Captain**

1. Work with Booster parent in charge of travel to make arrangements for the team.
2. Create maps and flyers describing location of event
3. TBD for future long distance travel

## Team TRŪBLŪ Roles and Responsibilities

Team members carry heavier responsibilities during the six-week crunch period. All team members must be aware of their roles and be available to work. The schedule for this year will probably be altered as we move forward, however, generally understand there will be a heavy time commitment daily during the time that your sub-team is scheduled. There will be a mandatory break during the week of finals but Friday after finals will be a full day commitment. We need to make up the time that finals takes from us. Bring your homework to workshop meetings so that you can work on it when you have a chance. Take advantage of break and lunch during those six weeks to get your homework done and any available time that you might have in class, also. We are looking into the option of quiet homework workshops for team members so that they may have a quiet area to finish homework during lunchtime.

### Team Captain

1. Manages team and schedule

### Strategy Captain

1. Learn the strategy of the current game
2. Teach winning strategy to TRŪBLŪ team members

### Software Lead

1. Manage software team
2. Manage overall software design
3. Meet with Electronics Lead and Mechanical lead for overall design coordination
4. Learn as much as possible about the programming language C.
5. Learn EasyC development software

### Electronics Lead

1. Learn as much as possible about the electronic requirements of the robot.
2. Manage electronics design team
3. Manage overall electronics design
4. Meet with Software Lead and Mechanical Lead for design coordination

### Mechanical Lead

1. Learn as much as possible of the robot mechanics
2. Manage the mechanical team
3. Manage the overall mechanical design
4. Meet with Electronics Lead and Software Lead and Team Captain regularly for design coordination

### Tool Captain

1. Provide training, in conjunction with safety captain, to team members on proper use of tools
2. Maintain list of tools
3. Keep order in tool storage area
4. Ensure that members are following safety procedures
5. Design a method in which team members may make a special request for tools needed.
6. Provide treasurer with budget for tools needed for the year.
7. Design and plan buildout of workshop

### Battery Captain

1. Provide training in conjunction with safety captain to team members on proper use of batteries

2. Make posters detailing proper safety procedures
3. Ensure that members are following safety procedures
4. Provide treasurer with budget for batteries needed for the year
5. Maintain battery voltages at competition and in the workshop
6. Maintain records of batteries

### **Safety Captain**

7. Provide training in conjunction with tool captain to team members on proper use of tools
8. Make posters detailing proper safety procedures
9. Ensure that members are following safety procedures
10. Provide treasurer with budget for safety items needed for the year

### **Project Engineer**

1. Maintain notebook of schedules
2. Track progress of teams
3. Report progress to Team Captain

### **Technical Writer**

1. Document the robot mechanics, electronics,
2. Collect the software code printout and include with documentation

### **Field Team**

1. Design and Build field for practice

### **Autodesk Team**

1. Download software and begin training
2. Work with design team

### **Pit Crew**

This team will be decided once the robot begins to take shape.

### **Mentors Roles and Responsibilities**

Mentors come from industry and/or parents and/or teachers.

1. Provide training to members in area(s) of expertise.
2. Provide light supervision duties

### **Beckman Robotics Booster Club Roles and Responsibilities**

**All parents are encouraged to join the Beckman Robotics Booster Club and regularly attend meetings**

The Booster Club members will

1. Provide guidance to club and team members
2. Support, by picking up or delivering items for team members
3. Provide transportation to team events
4. Identify possible corporate sponsors
5. Donate supervision hours to team workshop meetings
6. Provide food for workshop meetings when needed
7. Maintain financial records for robotics team

## 2011 Robotics Team Schedule

<b>Pre Kick-off Activities</b> lunch time training sessions	<b>Jan. 3-7</b>
<b>Kick-off Weekend</b>	<b>Jan. 8-9</b>
➤ Kick-off Meeting – 2008 game & rules announced (4-10 participants)	
➤ Team meeting to review 2008 game & rules	
➤ Strategy Team meeting	
<b>Week One: Overall Design</b>	<b>Jan. 10-14</b>
➤ Sub-teams design robot	
➤ Prototype	
➤ Meeting between sub-teams for coordination of designs	
<b>Week Two: Subsystem Design</b>	<b>Jan. 15-21</b>
➤ Subteams design subsystems and components	
➤ Prototype	
➤ Complete system design, component drawings and parts list	
➤ Presentation of designs	
➤ Send designs out for fabrication	
<b>Week Three: Dead Week</b>	<b>Jan. 22-26</b>
<b>Week Four: Assemble Robot</b>	<b>Jan. 26-Feb 4</b>
<b>Week Five: Test</b>	<b>Feb. 5-12</b>
➤ Test Robot and make adjustments	
<b>Week Six: Practice and Prepare Crate</b>	<b>Feb. 12-20</b>
➤ Field Team practice	
➤ Scrimmage	
➤ Crate Robot	
<b>Week Seven: Ship Robot</b>	<b>Feb. 17-22</b>

➤ **Ship Robot : February 22, 2011**

➤ **Awards applications due**

**Weeks Eight and Nine:**

**Feb. 23-Mar. 4**

➤ **Team meeting: Review design/competition needs/competition sub-teams**

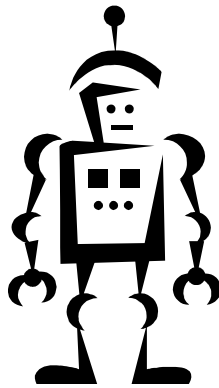
➤ **Fabricate spare parts for competition**

**Los Angeles Regional Competition**

**Mar. 24-26**

**Las Vegas Regional Competition**

**Mar 31-Apr 2**



## Behavior and Attitude

Behavior and attitude are what make our team stand out. Please review the behavior expectations and ask any of your mentors if you are unclear about any of them. Our expectations are extracted from Chief Delphi team 47's handbook:

### Events:

All eyes are on you every minute you are in public. Your behavior is a direct reflection on your character and on our team. A judge or member of another team may over hear what you say to one another and how you say it. Even the expressions on your face and body language may bring unwanted negative attention and bad impressions.

We are a very close family when we travel and conflicts may arise as a result. Students should refrain from rumors, he-said-she-said, and negative comments about one another. If a problem arises with another student you are requested to speak to a mentor immediately. Students are not allowed to have physical conflicts with each other. If a problem such as this arises, both students may be disciplined as per school rules.

### Cooperation:

Students are requested to cooperate at all times. This means that if a mentor request you to do something you will comply with the best of your ability. Ignoring the directions or requests of a mentor is not in the team's best interest. If you feel a request is out of order, you are encouraged to complete the task then speak to the mentor staff at a later more appropriate time.

### Inappropriate Behaviors:

These behaviors include but are not limited to the following:

Running in hallways, pushing or shoving, name calling(negative), making messes, fighting, swearing, stealing, and all other activities that reflect negatively on the team.

### Boyfriend/Girlfriend

In the event that a relationship develops or is ongoing, there are certain guidelines that must be adhered to at all times when engaged in team activities local and away.

Handholding, hugging, kissing and other expressions of affection are prohibited at all times. The couple must also travel in a group at all times. Couples may not wander off or sit alone. In other words, they should not appear as a couple but as part of the team. Common sense should prevail at all times.

### Note from Team Mom:

If you are not going to honor the curfews and rules at the competitions, and if you are not willing to work the entire time requested at the competitions, you will NOT be going on the trips.

Parents and students will be asked to sign a contract that you will honor the curfews and rules on the trips, and that you will WORK the entire time requested. If, after arriving, you do not honor the curfews and rules, or if you do not work the entire time requested, you may be sent home at your parents' expense, as stated in the contract.

ALL RULES OF THE TUSTIN UNIFIED SCHOOL DISTRICT STUDENT CODE OF CONDUCT MUST BE ADHERED TO AT ALL TIMES and supercedes all of the above expectations in the event there is a discrepancy.

## Attendance

Your attendance is expected at all mandatory meetings and workshops. Due to some schedules, we understand that you may miss meetings. If you need to miss meetings, please let the Club President and/or a mentor know in advance. If your non-attendance interferes with the progress of the team, you will be asked to give up your position, so that someone who is more able to handle the job duties can perform them. We must work together as a team if there are team members missing it affects the entire team. There are plenty of job assignments available that can fit any schedule. Please be honest with the yourself and the team as to how much of a time commitment you can make.

## Shop Safety Rules

1. Keep your work area clean and orderly; neatly arrange equipment and material. Do not allow parts, metal, wires, scrap or other material to accumulate on the shop floors or in work areas. Place drink cups, cans, bottles, paper , lunch scraps, etc., in the waste receptacles located throughout the facility.
2. Follow safe work practices, safe use of all tools, and maintain a healthy attitude regarding safety.
3. Always walk and work in a controlled and thoughtful manner
4. Wear ANSI-approved non-shaded safety glasses, closed-toe shoes, gloves where needed, and use hearing protection if necessary.
5. Keep full control of robot at all times with no one in the robot's path at anytime.
6. Take special care when working at higher-than-normal height.
7. Always fully open a ladder and never stand on the top step.
8. Do not play with garage doors.

Read the FIRST Robotics Competition TEAM SAFETY MANUAL 2011 for rest of the complete list of safety rules and guidelines.

### **IMPORTANT!!**

Beckman's robotics lab is a garage located on the end of a wing of the 200 building in a high traffic area. Caution must be used to keep other students away from the lab and robot. A barrier system will be used to keep passersby from walking in but team members must be diligent in maintaining that only safety trained robotics members and supervising adults may enter the area.

I have read the Attendance and Behavior and Attitudes sections in my handbook and will abide by them.

Sign here \_\_\_\_\_

## Training Sign-off Sheet

Safety:	Received Training-Date/Initials	Notes
Shop Safety Rules		
First Aid Training		
Safety Goggles/Ear protection/gloves		
Fire extinguisher/location		

Equipment	Received Training – Date/Initials	Notes
Circular Saw		
Jigsaw		
Hack Saw		
Hand Drill		
Wheel Grinder		
Files		
Wire stripping and crimping tools		
Battery chargers		
Multimeter		
Soldering Iron		

Skills	Received Training - Date/Initials	Notes
Material Identification		
Screw and Bolt Identification		
Drill and Tap for Threads		
Multimeter Usage		
Control System Identification		
Motor & Wire Identification		
Pneumatics Identification		
Sensor & Electronics Identification		
Reading Engineering Drawings		
Creating Engineering Drawings		
CAD 3D Modeling		
Animation		
Control System Programming		
Analytical Evaluation		
Graphical Design		
Strategic Game Planning		
Marketing		
Journalism and Publications		
Microsoft Project		
MathCAD		

## Competitions

We will be bringing our Beckman TRÜBLÜ spirit to competitions. You will need to submit media release and medical release forms. Beckman High Permission slips will need to be signed also. This is a Beckman High sanctioned event and we will all act accordingly as we represent our school. You are required to wear your team t-shirt at the event.

## Travel

### Car Travel

Travelling for this year's competition season will be done by automobile. Please treat the car you are travelling in with respect by following the driver's rules for food, noise, etc.

## Fundraising

Beginning in the summer the students will be running a robotics day camp for younger children. Beckman High Dance Team currently holds a profitable summer camp and we hope to model a similar program.

Our team asks for family donations of \$100 to support our program. Other teams ask for \$150 per member and as much as \$200-\$300 more if travelling to Atlanta.

This year our team is supported by Beckman-Coulter, NASA/JPL, MANIT, GCX and our families.

We are always looking for more sponsors. Advertising on the robot, workshop, and website is available. If your company has a matching program or if you know of any company or individual who would like to help the team, we have the following needs:

**Food** – We work nights and weekends and need to feed hungry students and volunteers.

**Tools, Equipment and supplies**

**Money** – for competitions and robotics kit

**Time** – Mentors: Mechanical Engineer, welding, machinist