

## Team 67- “Heroes Of Tomorrow” – The HOT Team



### Why The HOT Team Is A Chairman’s Award Winner



There are many reasons why the Heroes Of Tomorrow (the HOT Team) is a natural for the Chairman’s Award. Let the team share some of them with you.

#### **1. The Year Round Partnership**

The HOT Team program is not just a six-week program. It lasts all year. In the following list you can see that the Team has been quite busy since the National Competition last year:

**May:** Celebration Dinner; Lessons Learned Meeting; Start Recruitment for Next Year; Hamvention

**June:** Adopt-A-Road Cleanup; Graduation Parties

**July:** Milford 4<sup>th</sup> of July Parade; Adopt-A-Road Cleanup

**August:** FIRST Forum; Mentor Planning Meeting; Huron River Cleanup

**September:** FIRST LEGO League (FLL) for Michigan; Recruit Team; FIRST Meeting with parents and students; Start Oakland County Competitive Robotics Association (OCCRA); GM Proving Ground Open House; Adopt-A-Road Cleanup

**October:** FLL for Michigan; FIRST; OCCRA

**November:** Regional Tournament for FLL; FIRST Preparation (shop safety, approached to design, etc.); OCCRA; Milford Christmas Parade

**December:** FLL State of Michigan Tournament; FIRST Preparation

**January:** Sent e-Mail Offering Assistance to all Michigan Rookie Teams requesting Mentoring; FIRST Kickoff; FIRST Build; Mentor Holly Team; Build parts for Team 515; Start Weekly HOT Team Build Updates on Cable TV

**February:** FIRST Build; Weekly HOT Team Build Updates on Cable TV; Pep Rally at Lakeland and Milford High School; Demonstrate robot to Howell High School; Parent Night

**March:** Pep Rally at Detroit Science Center; Compete at Great Lakes Regional

**April:** Compete at Western Michigan Regional; Compete at Nationals

The partnership that exists between the HOT Team, General Motors, and the Huron Valley Schools is unique. In their own words, listen to the school district leadership: Dr. Robert O’Brien, Superintendent of the Huron Valley Schools, “The work of the HOT Team really is appreciated. We appreciate the partnership with GM and want to make sure that the team stays around the Huron Valley School system for many years.”

David Maile, Principal of Lakeland High School, “I have also been fascinated by the ability of the organization to build cooperation into the competition. It promotes a ‘systems thinking’ approach and the spirit at the events is high energy and intense.” It is very hard for school administration to understand how students from two rival schools can work so well together.

The HOT Team is unique in that two high schools in the Huron Valley School District have come together under one umbrella to form the team. These inter-district high schools have put aside their traditional rivalry to form a trusting, successful partnership dedicated to the improvement of science and technology opportunities within the district.

Another indication of the partnership is that this year the schools have actively participated by inviting the team to build their OCCRA robot at Milford High School and use the high school’s computers and network to produce this year’s animation submission. Lakeland High School was used to produce the team’s weekly ‘HOT Team Update’ video for broadcast on the local cable network. Lakeland also was the sight of the fifth annual regional FIRST LEGO League tournament, HOT SHOTS Havoc.

#### **2. The HOT Team and its Impact on the Students and the Schools.**

In 1996, the GM Milford Proving Ground approached the Huron Valley Schools to ask them if they wanted to participate in the FIRST program. They accepted, not knowing what to expect. At that time the school was on a path to close their mechanical and technical shops. The HOT Team started demonstrating the value of technology to the district. One of the HOT Team mentors took a seat on the school strategic planning committee. As a result of that committee the district decided to scrap the plan and



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instead proposed a mileage increase to promote technology in the schools. In 2001 the mileage passed with funds earmarked for technical education.

As the district started to plan their curriculum and facility needs, they created a Manufacturing Lab Committee. The HOT Team was a natural source for input. Two team members from the GM Proving Ground were selected for the committee. These employees are now working to improve the technology curriculum. The HOT Team was part of the planning process that is now seeing the addition of two Manufacturing Technology Education Labs to the Huron Valley Schools budgeted at \$4.5 Million!

The HOT Team holds fast to the belief that the main reason for FIRST is to INSPIRE students to investigate science and technology. With that principal, the HOT Team defined its goal: “The Mission of the General Motors Proving Ground and Huron Valley Schools FIRST Robotics Team is to provide a venue where high school students will be inspired to explore the fields of science and technology in a real world environment, with the goal of transforming these students into the Heroes of Tomorrow, while being the Heroes of Today.”

Each year as the HOT Team designs and builds their robot they are not just focused on winning, but to incorporate as many different engineering problems and solutions that the game presents. This results in students taking a strong look at many engineering and technology fields. In our seven years 156 students have been members of the HOT Team. Many of these students have now gone on to receive their degrees. Three former HOT Team members have been hired by GM as full time employees. Some of the students have been inspired to change their plans and are now following engineering or technical learning paths. And it doesn't stop there. Many students continue to call or e-mail their mentors even after their experience with the HOT Team is complete. Some students have even invited the mentors to attend their graduation parties.

### **3. What the Participants Experienced in the FIRST Program**

The students and mentors of the HOT Team experience many challenges during the design and build times of the robot season. Each year the team tries to build a robot to perform all the tasks that FIRST wants in the game. This year it was not just push containers around or go to the top of the ramp, but stack and protect the containers as well. It soon became evident that stacking was going to be easier than keeping them in a stack. The team designed a telescoping holding arm that will hold the containers together but release them when necessary. This was a clear demonstration to the students that an engineer's job was an evolution of thinking and problem solving, a journey of continuous improvement to find and build better solutions.

While this was one example here are several more: adding rubber material to the elevator arms to keep the containers from sliding during robot movement; testing different materials to get best traction for wheels; testing motors to determine which motors work best with which function; and modification of design on the wheel turrets; computer problems in the animation group.

The experience that the FIRST program enables, and the HOT Team has taken advantage of, are the processes needed to solve problems. The experience for the participants leads them to understand that technical careers can be an interesting mental exercise, which can be hands-on, with immediate feedback on the success of your solutions.

### **4. HOT Team Impact on the School, Local Community, and the State of Michigan**

One of the indicators of the importance that the school board places on the HOT Team is that four years ago they approved a motion that gives all HOT Team members a varsity school letter, equating this program with varsity sports. To the best of our knowledge, the HOT Team program was the first in the country to get this recognition from their school. It is quite a sight watching the students walking around town with varsity jackets that say “FIRST Robotics” on the back.

The HOT Team is well known around the Huron Valley area. The team takes part in many community events, such as the Milford 4<sup>th</sup> of July and Christmas Parades, Commerce Road Adopt-a-Road Cleanup (more than 10,000 cars a day pass the HOT Team/GM/Huron Valley Schools road signs), and the Huron River Cleanup. In 1999, just before the Millennium change, the Village of Milford came to the HOT Team and asked them to engineer a Times Square like ball-drop for downtown on New Years Eve. The team created a 32-foot countdown tower with a reflective cone. Several thousand people crowded in Main Street to celebrate. The event, with our tower, was broadcast for a few minutes on national TV.

Late in 1997 the team introduced this program to our local state representative and senator. The program so interested them that in 1999 the team was invited to the state capitol in Lansing where the House and Senate cited them in a special ceremony. Since that time, State Representative Nancy Cassis (now State Senator) has spread the FIRST message to others, has served as FLL State Judge for two years, and was a VIP speaker at the Michigan FIRST Kickoff.

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### **5. Spreading the Message of FIRST through the FLL**

In 1998 the HOT Team was so pleased and excited about their FIRST experiences that they wanted to involve the elementary and middle schools in the district. They created a program called HOT SHOTS (Students Honoring Outstanding Technology and Science) and created a game with remote control cars. It was a hit. One student from that program is a member of the HOT Team this year.

When FIRST heard of the success of the program they asked the HOT Team to pilot the FIRST LEGO League. The HOT Team worked with the school district to form 54 teams from middle and elementary schools in the District. Of the 1,500 students involved nationwide that year, more than 500 were from the Huron Valley School District. The HOT Team created a master plan book detailing what needed to be done to stage a FLL event. This book has become the standard for subsequent events throughout the country. Since that time the HOT Team has sponsored the FLL State Tournament for Michigan. The team developed a model for advancement to the tournament using a merit system instead of the random lottery system suggested by FIRST. Every year there have been more FLL teams in Michigan than any other state. The HOT Team has developed a pilot program to identify school districts in the state that currently do not field LEGO Teams, target these areas for future regional competitions, and use the connections through the State Legislature to encourage and mentor these districts for FLL participation in 2003. The HOT Team is now working to have more than 400 FLL teams in Michigan this year.

It is the belief of the HOT Team that FLL is the ‘sand lot’ of the high school program. This year five of the students on the team were on a FLL team. One former FLL team member has been waiting since the fifth grade to be on the HOT Team. Widespread FLL participation will form the bubble-up pressure in these districts for additional FIRST Teams at the high school level.

The HOT Team also uses the FLL to spread the message of FIRST in another way—the judges. In the five years that the HOT Team has been a part of FLL they have targeted many influential people to be judges. By participating as a judge, they are placed right in the middle of the action where the kids can tell them what FIRST programs mean to them. Through this method we can bring decision makers from less affluent districts into the FIRST family. Here are some of the judges:

Paula Blanchard – former First Lady of Michigan  
George L. Davis, II – Assistant to Detroit Mayor Archer for Public Policy Analyst, Public Safety  
Leo E. Hanifin – Dean of the College of Engineering and Science, UofD, Mercy  
Kenneth Hill – Founder and director of DAPCEP (Detroit Area PreCollege Engineering Program)  
Jeffery W. Jones – Assistant to Detroit Mayor Archer for Public Services  
Isaiah McKinon – former Chief of Police for Detroit  
Nettie Seabrooks – Chief Operating Officer and Chief of Staff for Mayor Archer  
Joseph Petrosky – Director of Focus Hope  
Kenneth Cameron – GM, former Space Shuttle Pilot  
Nancy Cassis – Michigan State Senator, District 15  
Larry Hutchinson – Director of Exhibits, Detroit Science Center  
Joanne Jacobson – Assistant Superintendent of Schools, Fraser School District  
Jennifer Joubert – Chief of Staff, Detroit Public Schools  
Judith McNeely – Director, Office of School Partnership, Detroit Public Schools  
Karen Reed – Program Director, Detroit Science Center  
Douglas Schafer – Chief of Police, Novi

Another innovative way of spreading the message of FIRST is the team’s transportation truck, known as the HOT Wheels, a mobile FIRST billboard. This truck was placed in service as a mobile machine shop in 1998. Since that time it has hauled parts and robots for many teams to various FIRST events across the United States. This vehicle has traveled the equivalent of one and a half times around the world exclusively in the participation and promotion of FIRST. This year we have removed the “machine shop” cabinets giving the team more room to haul items for other teams. For the last three years the truck has been filled with items from other teams as they traveled to and from the National competition saving shipping costs and promoting FIRST.

### **6. The HOT Team is a Role Model.**

The HOT Team presents a positive role model to other teams. Evidence of the respect that other teams have for the HOT Team can be found in the team awards that teams give to each other. The HOT Team has won thirty awards from other teams. These awards are a point of pride on the HOT Team as they come from competitors who value our support and sportsmanship.

The HOT Team has taken an innovative approach to balancing FIRST, fundraising, and the demands of school. All three are important to the student and neither should overpower the time needed for an enjoyable high school experience. The team has

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learned as time has passed that the three must work in concert in order to have the appropriate time for each. This, too, gives the team a real world look at managing time, budget, and resources. The students and mentors are involved in decision-making relating to all aspects of the FIRST experience.

The first year all funds came from General Motors. This was because the team started in November and didn't have time to fundraise. The second year the parents and students were given a target of \$30,000 to raise. What a success. The major fundraiser was the Valentine's Day Dinner Dance and Silent Auction. Many items were donated by the businesses in the community. More than \$15,000 was raised in one night. The team also sold concessions at the Pontiac Silver Dome for many events, held bottle drives, and created a Halloween Haunted Forest for elementary age children.

The second to fifth years the students and parents did fundraising, each year bringing in more than \$20,000. Added to the list of events was a Christmas Craft store and selling concessions at University of Michigan home football games.

Last year and this year we have scaled way back in our fundraising efforts to provide time for the students to be more involved in science and technology endeavors. The HOT Team decided that it was more beneficial to take part in the Oakland County Competitive Robotics Association (OCCRA) than to fundraise. Engineering over fundraising. This meant that the team needed to learn how to get the FIRST experience while spending less money. So the team looked for ways to accomplish this.

Last year we carpoled to the competitions instead of renting busses. We asked parents to provide lunch during the build period. We started buying uniforms that could be used for several years and added co-payments when we made changes. This year we decided to only attend two regionals instead of the three. We will only send the drive team and pit crew to the regionals on Thursday. The rest of the team will arrive on Friday, thus saving one night of hotel costs for most of the team. The HOT Team believes that cost avoidance and managing our time and resources is just as important as fundraising.

### **7. The Real Meaning of FIRST**

The HOT Team has tried to be the type of team that FIRST envisioned – encouraging the study and application of science, technology, and innovation – helping others to overcome obstacles – and, shaping, impacting, and leading our communities in support of the young men and women leaders of tomorrow. This team is one that believes in helping others, especially during competitions. This year the team had another team visit during the build season, showing them our robot design and helping them with theirs. The team built parts for other teams that did not have the proper equipment.

Several years ago when FIRST was having a problem with communications during competition, the HOT Team brought equipment to help solve the problem. Then they worked with GM to obtain a screen room and give it to FIRST.

It was also the leadership of the HOT Team that was influential in GM becoming a founding sponsor of FIRST.

### **8. The Team in a Nutshell**

Well there you have it. This is not the end of our story, but in four short pages simply an introduction - the beginning of a tale that can now fill volumes. We are often asked by FIRST, “What has been your most significant challenge?” I think we can say with all honesty - condensing 7 years of inspiration, recognition, outreach, excitement, service, hard work, pride, mentoring, gracious professionalism, sacrifice and fun into 4 pages. What is our impact? It's hard to say. It's 156 students that have been on this team. It's more than 6000 elementary and middle school students that have participated in our FLL regionals and in the state tournaments. It's a billboard on wheels that has traveled the equivalent of 1 ½ times around the world. It's a village turned on to technology watching weekly updates on cable television and a community anteing up \$4.5 million to build new manufacturing technology laboratories in their schools. It's a rock solid partnership of a school district and a corporation that resides in it. But perhaps most important, it's a child with a balloon watching a robot drive down Main Street on the Fourth of July while her dog nips at its wheels, and a kid named Gina or Justin, Breanne or Andrew; that with a little inspiration can grow up to be a “Hero Of Tomorrow”.

Please visit our pit to learn so much more.