

where KIDS think science is **COOL** and  
DREAM of becoming science and  
technology HeROES



**MOTOROLA**

Midwest



**FIRST**

*regional*

The Competition - 1998



**Chicago, Illinois**

> March 12 - 14, 1998



# WELCOME

## MidWest

### Regional Competition 1998

#### Dear Competitors and Guests:

**W**elcome to the seventh annual FIRST Robotics Competition.

We began in 1992 with 28 teams. Last year, we had 155 teams from 30 states competing. This year, 200 teams are competing. Our goal is to have 2000 teams participating by the turn of the century. We want all students from across the country to discover the excitement and rewards of science, math, and technology.

As the competition grows, so does the support and commitment necessary to ensure that each student has a positive and lasting experience. A great deal of effort goes into making it happen. FIRST, with the leadership of Corporate America in our alliance with Industry, Education and Government, can effectively reverse the negative trends of math and science interest that we see today.

Our country's participating colleges and universities help provide hands-on experience of the world of science and technology. Teachers, professors, professional volunteers, and the countless individuals from civic groups, as well as our sponsors and suppliers, are also indispensable to this effort. Of course, none of this would be possible without the extraordinary enthusiasm generated by the thousands of students who participate in The Competition each year. All deserve tremendous thanks and recognition.

Our vision at FIRST - "We see a world where science and technology are celebrated, where kids think science is cool, and dream of becoming science and technology heroes."

It's working. Thanks to all of you, and your continued support and commitment, our great vision is becoming a reality.

**Dean Kamen**  
**Founder, FIRST**



# AWARDS

## MidWest Regional Competition 1998

### Regional Competition Judges Awards

#### **Chrysler**

##### *Team Spirit Award*

Awarded to the team that exhibits extraordinary enthusiasm and spirit through an exceptional partnership which thrives on teamwork.

#### **Honeywell**

##### *Leadership in Control Award*

Awarded to the team displaying the most innovative control system or application of control components to provide unique machine functions.

#### **Johnson & Johnson**

##### *Best Sportsmanship Award*

Awarded to the team displaying the best sportsmanship and continuous gracious professionalism in the heat of competition.

#### **Motorola**

##### *Quality Award*

Awarded to the team displaying the most robust design, that is, the project that best exhibits the relationship between quality of design, quality of construction and quality of performance.

#### **Xerox**

##### *Creativity Award*

Awarded to the team displaying the most creative design, use of a component or the most creative or unique strategy of play.

- *Best Play of the Day*
- *Number One Seed*
- *Outstanding Defense*
- *Most Photogenic*
- *Best Offensive Round*
- *Featherweight in the Finals*
- *Rookie All-Star*

### National Championship Awards

#### **Autodesk Award for Excellence**

##### *in Engineering, Creativity and Communication*

Awarded to the team who clearly and creatively presents design solutions through computer modeling and animation using the software provided by Autodesk.

#### **Chairman's Award**

Presented to the team which is judged to have created the best partnership effort between team partners and whose partnership best exemplifies the true meaning of FIRST. Judging criteria includes community involvement, outreach, FIRST impact on students, school curriculum, etc. The judging panel reviews materials, which may consist of videos, photos, or written chronicles submitted prior to the National Championship. The traveling trophy is a high-tech, custom crafted Dean Kamen clock, which the New York Times called "Art that Ticks".

#### **Founder's Award**

Presented by Dean Kamen to the organization or individual that best promotes the ideals and goals of FIRST.

#### **Woodie Flowers Award**

##### *presented by Small Parts, Inc.*

Awarded to an individual participating in The Competition who best demonstrates excellence in teaching science, math and creative design.

#### **WPI Design Innovation Scholarship**

All teams participating in The Competition will qualify for the Worcester Polytechnic Institute Design Innovation Scholarship. The winning team will be selected through a vote conducted by all the teams. Votes are submitted to FIRST at the National Championship at Disney World on April 2-4, 1998. The scholarship award will be presented to the team who receives the most points.

#### **Daniel Webster College Scholarship**

All teams participating in The Competition will qualify for the Daniel Webster College Scholarship. The winning team will be elected through a vote conducted by all the teams. Votes are submitted to FIRST at the National Championship at Disney World on April 2-4, 1998. The award will be presented to the team who receives the most points.

#### **Autodesk Design Your Future Award**

In an effort to inspire more women to experience the creativity, productivity and sense of satisfaction that comes from participating in FIRST - The Competition, Autodesk, Inc. introduces this award to be shared by a young woman student and her school. Open to all teams participating in FIRST, this award will be presented to a young woman student nominated by her team. The award will be presented at the National Championship at Disney World.



# INNOVATORS

## MidWest Regional Competition 1998

### **FIRST President**

*Andrew M. Allen*

Andrew Allen is President of FIRST. A former NASA Astronaut and Space Shuttle Commander, he is a veteran of three space flights and has logged over 900 hours in space. Prior to joining FIRST, he was Director of Space Station Requirements at NASA Headquarters. Selected by NASA in June 1987, Allen became an astronaut in August 1988. Allen was a member of the Navy ROTC unit and received his commission in the United States Marine Corps at Villanova University in 1977. Following graduation from flight school, he flew F-4 Phantoms from 1980-1983. He was selected by Headquarters Marine Corps for fleet introduction of the F/A-18 Hornet, and also graduated from the Marine Weapons & Tactics Instructor Course, and the Naval Fighter Weapons School (Top Gun). A 1987 graduate of the United States Navy Test Pilot School at Patuxent River, Maryland, he was a test pilot under instruction when advised of his selection to the astronaut program. Mr. Allen is a recipient of the Defense Superior Service Medal, Distinguished Flying Cross, the Defense Meritorious Service Medal, the Single Mission Air Medal, the NASA Exceptional Service Medal, NASA Outstanding Leadership Medal, and the NASA Space Flight Medal. He received an honorary doctorate of Public Service from Bucks County Community College in 1993, and an honorary doctorate of Engineering Science from Villanova University in 1996.

### **FIRST Founder**

*Dean Kamen*

Dean Kamen is President and owner of DEKA Research & Development, a New Hampshire based company specializing in advanced technologies in medical equipment. He is chairman and owner of Teletrol Systems, Inc., a manufacturer of electronic environmental control systems for commercial and industrial buildings. A physicist, engineer, and inventor, he holds more than forty patents. In 1976, while an undergraduate at Worcester Polytechnic Institute, he founded Auto Syringe, Inc., to produce the world's first wearable infusion pumps. In 1988, Dean was named Entrepreneur of the Year by the New Hampshire Hugh Technology Council. In 1994, he was named Design News Magazine's Engineer of the Year and was honored as a 1994 Kilby Award Laureate. In 1994, he earned the Hoover Medal for "Innovative and imaginative leadership in awakening America to the excitement of technology and its surpassing importance in bettering the lot of mankind," as stated by the American Society of Mechanical Engineers. Dean has received honorary doctorates from Worcester Polytechnic Institute. Dean is a Fellow with the American Institute for Medical and Biological Engineering (AIMBE), and a member of the Engineering Society for Advanced Mobility, Land, Sea, Air, and Space (SAE), the American Society of Engineers (ASME), and the Society of Plastics Engineers (SPE). In 1997, he was elected to membership to the National Academy of Engineering.

### **FIRST Advisor**

*Woodie Flowers, Ph.D.*

Woodie Flowers is the Pappalardo Professor of Mechanical Engineering at MIT, and a researcher in the Center for Innovation in Product Development. He received a BS from Louisiana Polytechnic University and S.M., M.E., and Ph.D. degrees from MIT. His current research includes work on the creative design process and product development systems. He helped create MIT's renowned course "Introduction to Design." Dr. Flowers also received national recognition in his role as host for the PBS television series "Scientific American Frontiers from 1990 to 1993", and received a New England EMMY Award for a special PBS program on design. He is a member of the National Academy of Engineering, a Fellow of the American Association for the Advancement of Science, and recipient of an Honorary Doctor of Humane Letters from Daniel Webster College. He is a MacVicar Faculty Fellow for extraordinary contributions to undergraduate education from MIT. He was the Inaugural Recipient of the Woodie Flowers Award by FIRST. Currently, Dr. Flowers is on the Board of Directors of The General Scanning Corporation, NYPRO Inc., and The Lemelson-MIT Prize Board Executive Committee. He is National Advisor for FIRST, a Trustee for Boston's Museum of Fine Arts, and a member of the Historical Commission in Weston, Massachusetts.



# THE GAME

## MidWest

Regional Competition

1998

# Ladder Logic

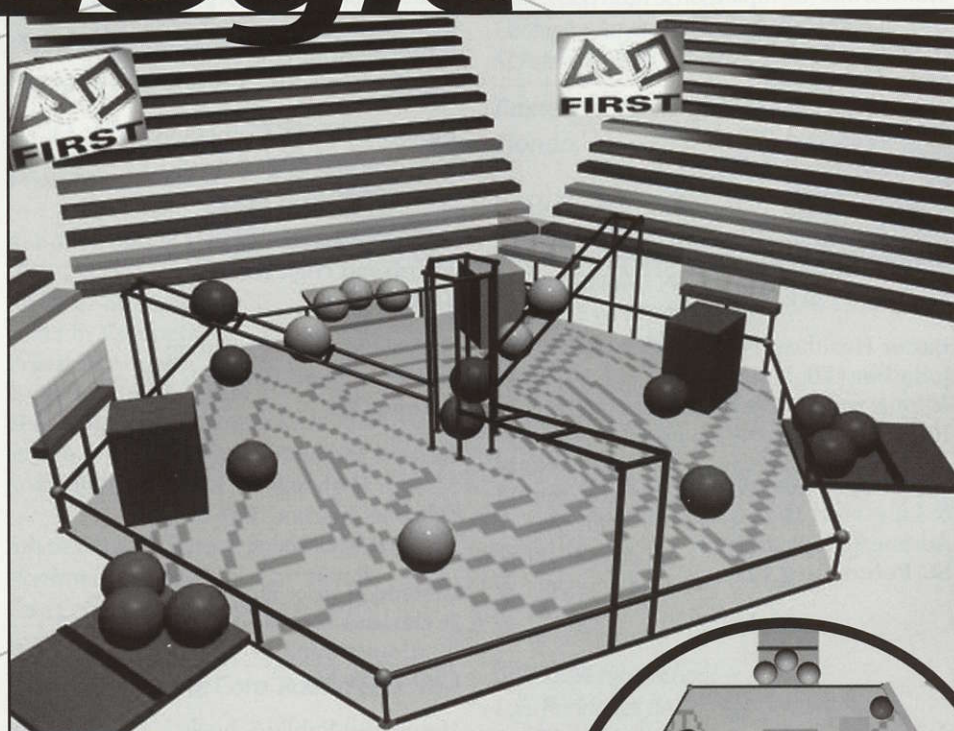
## The Playing Field

The playing field is a carpeted, hexagon-shaped area with a central and three side goals. Around the perimeter of the field are three stations for human players, who drive the remote-controlled robots on the field to score points. To score points, each team has nine colored balls for their robots to transport and place on the goals. The balls are evenly distributed around the playing field.

## The Robots

The robots are designed and built by the school/company teams during a six week period. The "robo-gladiators" are constructed from a wide range of materials including aluminum, fiberglass, plywood and PVC pipe. Each robot can weigh up to 130 pounds and must start each match no larger than 30" x 36" x 48".

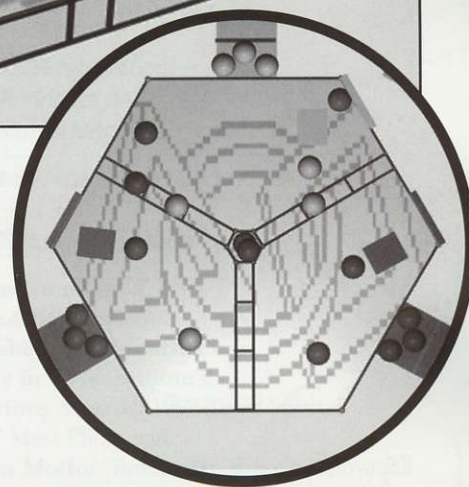
The robots use a 12 Vdc sealed lead acid battery for an on-board power supply. This battery powers cordless drill motors, automobile seat adjuster motors, window lift motors and power sliding van door motors, a diaphragm air pump, air cylinders, speed controllers and a programmable control system. The drivers use joysticks and switches to remotely control the robots via a telemetry radio system.



## Scoring

In two minute matches, the three robots and human players score points by placing the balls onto the side goals or into the central goal. The balls are color-coded to identify team ownership. A human player, located outside the perimeter of the field, is allowed to hand balls to the robot or throw balls directly at the goals.

At the end of each match, the scores are counted. The balls placed on the side goals are worth 1, 2 or 3 points and the balls placed in the central goal double the score. The winner of each match is the team with the highest score.





# TEAMS

## MidWest

### Regional Competition

#### Teams 1998

## Team List

Transformer Company,  
Broadhead High School  
& Monroe Senior High School  
**Monroe,WI**

Arial Systems, Corp.  
& Roosevelt High School  
**Chicago,IL**

Banner Engineering Corp.  
& Benilde-St. Margaret's School  
**St. Louis Park,MN**

Baxter Healthcare Corporation  
Johnsburg High School  
& Lake County Technical Campus  
**Round Lake,IL**

Baxter Healthcare Corporation  
& Lakewood High School Center for  
Advanced Technologies  
**St. Petersburg,FL**

Baxter Healthcare Corporation,  
Luis Munoz Marin High School &  
InterAmerican University  
**San German,PR**

Boston Scientific Corporation  
& Edgewood High School  
**Spencer,IN**

Delphi Delco Electronics Systems  
& Kokomo High School  
**Kokomo,IN**

General Motors Powertrain  
& Pontiac Northern High School  
**Pontiac,MI**

General Motors Proving Ground,  
Milford High School, Lakeland High  
School & Harbor High School  
**Milford,MI**

General Motors Truck Group  
& Oakland Technical Center-  
Northwest Campus  
**Clarkston,MI**

Hammond Public Schools  
**Hammond,IN**

Haworth, Inc. & Holland High School  
**Holland,MI**

Honeywell's MICRO SWITCH Division,  
Freeport High School  
& Aquin High School  
**Freeport,IL**

Landis,Staefa, &  
Adelai E. Stevenson High School  
**Lincolnshire,IL**

Lawrence University, Plexus Technology ,  
Appleton North High School  
& Appleton East High School  
**Appleton,WI**

LoDan Electronics  
& St. Patrick's High School  
**Chicago,IL**

Metal Flow Corporation  
& Holland Christian High School  
**Holland,MI**

Motorola, Inc. & Dillard High School  
**Plantation,FL**

Motorola, Inc. & Libertyville High School  
**Libertyville,IL**

Motorola, Inc. ,  
Rolling Meadows High School  
& Wheeling High School  
**Schaumburg,IL**

Motorola & John Hersey High School  
**Arlington Heights,IL**

New Venture Gear, Inc.  
& Hamtramck High School  
**Troy,MI**

Penn High School & Capitol Tech  
**Mishawaka,IN**

Raytheon E-Systems,  
Boca Ciega High School  
& Dixie M. Hollins High School  
**St. Petersburg,FL**

Sage Products, Inc.,  
McHenry East High School  
& McHenry West High School  
**Crystal Lake,IL**

Structural Dynamics Research  
Corporation & Great Oaks Institute of  
Technology and Career Development,  
**Live Oaks Campus, Milford,OH**

Symbios/Colorado State Univesity  
& Poudre High School  
**Ft. Collins,CO**

Textron Automotive Company &  
Cass Technical High School  
&Oakland Technical School  
**Troy,MI**



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 a robot  
 is a lot like life.**

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 to the connections you  
 make along the way.

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Edgewood High School • Ellettsville, IN

**Boston Scientific Corporation  
 Spencer, IN**

**Bostangs**

**Team Number:** 24

**Robot Name:** The Boss

**Number of Students:** 30

**Years in Competition:** 2

**Previous Awards:** The Spirit of Competition

**Team Motto:** You can't win if you don't score  
**Team Highlight:** Due to great leadership  
 from Edgewood High School's Technology  
 dept. & Boston Scientific Corp., we've learned  
 that team work, cooperation & hard work are  
 key elements to building a super robot.

Kokomo High School • Kokomo IN

**Delphi Delco Electronics  
 Systems Team**

**Technokats  
 Robotics  
 Team**



**Number:** 45

**Robot Name:** Technokat 7

**Number of Students:** 62

**Years in Competition:** 7

**Previous Awards:** Runner-Up 1992

**Team Motto:** Discovering Science Together

**Team Highlight:** As one of the original  
 competitors in the FIRST competition, we  
 have seen our team grow into a year-round  
 robotics club and a Kokomo High  
 School tradition.

Pontiac Northern High School • Pontiac, MI

**General Motors Powertrain Team**

**Huskie Brigade '98**

**Number:** 65

**Robot Name:** Power Dawg

**Number of Students:** 23

**Years in Competition:** 2

**Previous Awards:** 1997

Mid-Atlantic Rookie All-Star,  
 Featherweight in Finals & 4th  
 Place 1997 National Championship-3rd Place

**Team Motto:** "Who let the dogs in the house?"

**Team Highlight:** "It's a dog eat dog world,  
 and we're hungry."



Milford High School • Highland MI

Lakeland High School • White Lake, MI

Harbor High School • Highland, MI

**General Motors Milford Proving  
 Ground, Milford, MI;**

**The HOT  
 Team**

**Team Number:** 67

**Robot Name:** The HOTbot

**Number of Students:** 60

**Years in Competition:** 2

**Previous Awards:** 1997 National Rookie  
 All-Star, Best Shipping Crate

**Team Motto:** Heroes of Tomorrow

**Team Highlight:** Winning one of the two  
 1997 National Rookie All Star Awards.



Oakland County Michigan School Districts

**General Motors Truck Group**

**Truck Town Terror**

**Team Number:** 68

**Robot Name:** T3

**Number of Students:** 23

**Years in Competition:** 1

**Previous Awards:** None

**Team Motto:** Bigger, Faster,  
 Stronger, Smarter

