

# 0 INTRODUCTION

## 0.1 WHAT IS THE FIRST ROBOTICS COMPETITION?

The FIRST Robotics Competition is an exciting program that assimilates teams, sponsors, colleges, and technical professionals with high school students to develop their solution to a prescribed engineering challenge in a competitive game environment. The program has resulted in life-changing, career-molding experiences for its participants. It is also a lot of fun.

In 2005, our reach will expand to over 25,000 students representing approximately 1,000 teams. These teams will come from almost every state in the U.S., as well as from Brazil, Canada, Great Britain, Mexico, Ecuador, and Israel. FIRST has truly become an international program and is continuously growing. These teams will participate in 30 Regional Competitions, one Pilot Regional in Israel, and the Championship Event at The Georgia Dome in Atlanta, Georgia. The competitions combine the practical application of science and technology with the fun, intense energy, and excitement of a championship-sporting event.

This year's challenge will be presented at the 2005 FIRST Robotics Competition Kickoff on Saturday, January 8, 2005. At the Kickoff, all teams:

- Will be shown this year's game and field for the first time
- Will learn about the 2005 game rules and regulations
- Will receive a kit of parts. The Kit of Parts will include motors, sensors, chassis, transmissions, vision camera, bearings, and other materials that teams can use in the design and construction of their robots. They will also receive a multi-channel radio control system and a 12V battery power supply. The kit is meant to provide a level starting point for all teams. The rules also indicate additional items teams can purchase.

*When you bring dedicated, enthusiastic students, teachers, engineers, and other professionals together, they will produce a wide range of amazing machines that are competition ready in six weeks of construction time.*

## 0.2 GRACIOUS PROFESSIONALISM, A FIRST CREDO

Dr. Woodie Flowers, FIRST National Advisor, asks and provides his view regarding the question, "Why do FIRST folks talk so much about that phrase?"

Quoting Dr. Flowers, "Obviously it would not make sense to endorse "asinine professionalism" or "gracious incompetence." It is, however, completely consistent with the FIRST spirit to encourage doing high quality, well-informed work in a manner that leaves everyone feeling valued. Gracious professionalism seems to be a good descriptor for part of the ethos of FIRST. It is part of what makes FIRST different and wonderful.

"Gracious professionalism has purposefully been left somewhat undefined because it can and should mean different things to each of us. We can, however, outline some of its possible meanings. Gracious attitudes and behaviors are win-win. Gracious folks respect others and let that respect show in their actions. Professionals possess special knowledge and are trusted by society to use that knowledge responsibly. Thus, gracious professionals make a valued contribution in a manner pleasing to others and to themselves.

"In FIRST, one of the most straightforward interpretations of gracious professionalism is that we learn and compete like crazy, but treat one another with respect and kindness in the process. We try to avoid leaving anyone feeling like they are losers. No chest thumping barbarian tough talk, but no sticky sweet platitudes either. Knowledge, pride, and empathy comfortably blended.

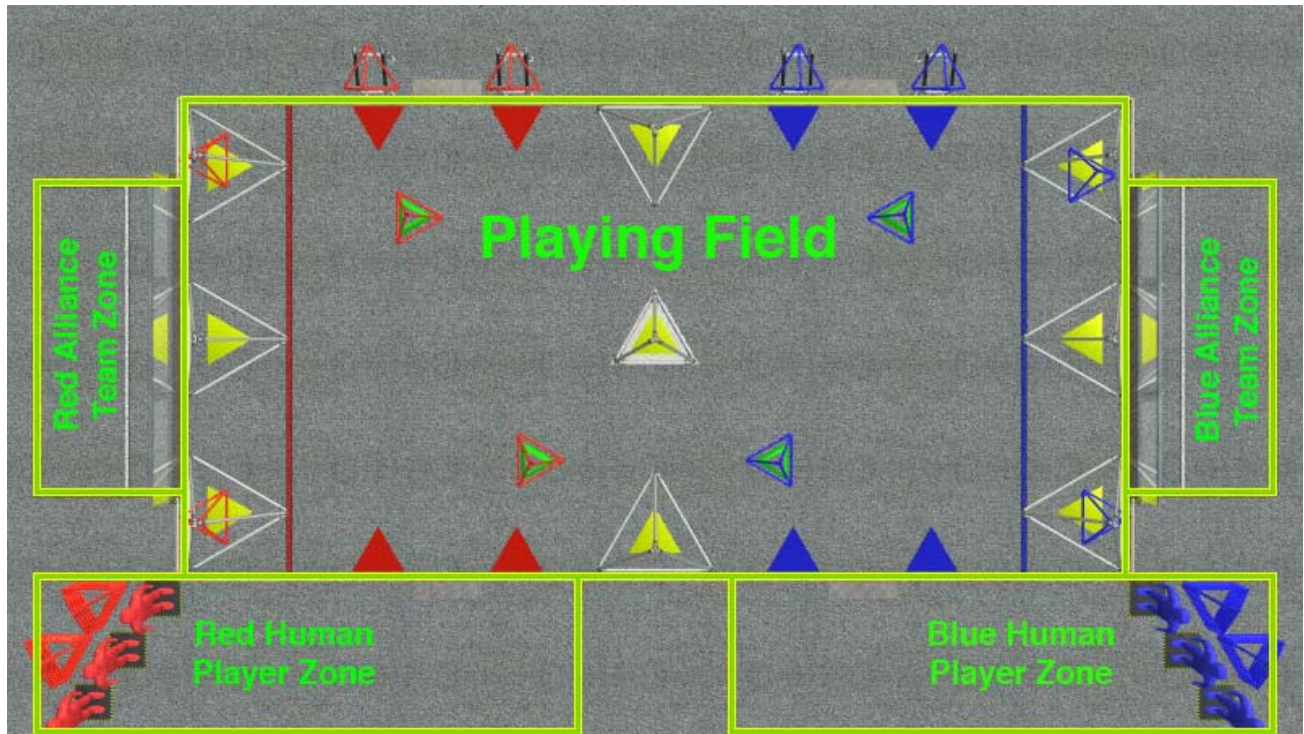
“Understanding that gracious professionalism works is not rocket science. It is, however, missing in too many activities. At FIRST, it is alive and well. Please help us take care of it.

“In the long run, gracious professionalism is part of pursuing a meaningful life. If one becomes a professional, and uses knowledge in a gracious manner, everyone wins. One can add to society and enjoy the satisfaction of knowing that you have acted with integrity and sensitivity. That’s good stuff!”

### 0.3 THE 2005 GAME – “TRIPLE PLAY”

“TRIPLE PLAY” will present the teams with several new challenges:

- A 3 versus 3 competition
- A fresh, new shape for both the game object and the [scoring] goals, namely the TETRAHEDRON, which is basically a 3-dimensional triangle
- A vision system (camera and associated electronics)
- A larger playing field (3’ wider and 6’ longer than the 24’ wide x 48’ long 2004 field)



An aerial view of the 2005 playing field would show the observer:

- Nine goals configured in a 3 x 3 matrix
  - 3 goals at each end of the field along the driver station wall (in marked zones called the end zones)
  - 3 goals at midfield
- Game TETRAHEDRONS (a/k/a “tetras”) hanging in the four corner goals
- Two “vision” tetras for each alliance randomly located in the space between the end zone and the midfield goals
- Alliance robots in front of their driver stations
- One tetra may be held by one robot on each alliance at the start of the game
- 3 RED human players and 3 BLUE human players [each with extra tetras] standing on pads arranged on diagonal lines off 2 corners of the field
- Four tetra loading platforms along one side of the field

Robots will attempt to place red and blue game tetras (colored to match the two alliance colors) **in** or **on** one or more of the nine goals to both score points and claim “ownership” of goals with their colored tetras.

Ownership is claimed:

- By the physically higher tetra color on a goal **or**, if no tetras are on top
- By the physically higher tetra color in the base of the goal **or**, if no stacks are in the base
- By the alliance with more tetras in the base.

Tetras **in** goals score 1 point and tetras **on** goals score 3 points. A row or diagonal of the same color scores 10 points. Getting all of an alliance's robots back in their end zone at the conclusion of the match scores 10 points

Each 2-1/4 minute match will feature two (2) three-team alliances playing from opposite ends of the field. The robots from each alliance will be placed on starting positions in front of the driver stations (one at the tip of the center goal in an alliance's end zone and one to each side of the center goal and touching the driver station wall).

The robots will have a 15-second autonomous period (no driver control) at the start of a match to knock down and score hanging tetras and/or to use their starting tetras and/or gather tetras from the loading platforms and/or to locate "vision" tetras (specially marked for identification by the vision system) to score points and claim goals. Vision tetras scored on any of the 3-midfield goals will yield 1 or 2 bonus tetras added to the corner goals in their end zone.

After the Autonomous Period, the robots will be under driver control for the remaining 2 minutes of the match. Drivers from each alliance will be able to acquire additional tetra game pieces from four (4) locations, two (2) of which are attended by their human player (tetras will be placed on their robots) and two (2) of which are unattended (robots pick up tetras from loading platforms), and continue to score and claim goals. Before the end of the match, alliance robots will speed back to their end zones to top off their scores.

This year's game will certainly challenge teams with the vision system, the "new" tetra shape, working as a three-team alliance, and strategizing on claiming goals.