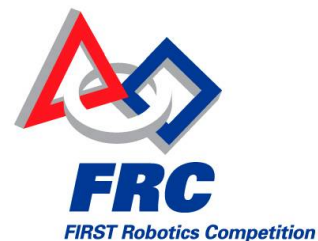


**Section**  
**6**



# THE ARENA

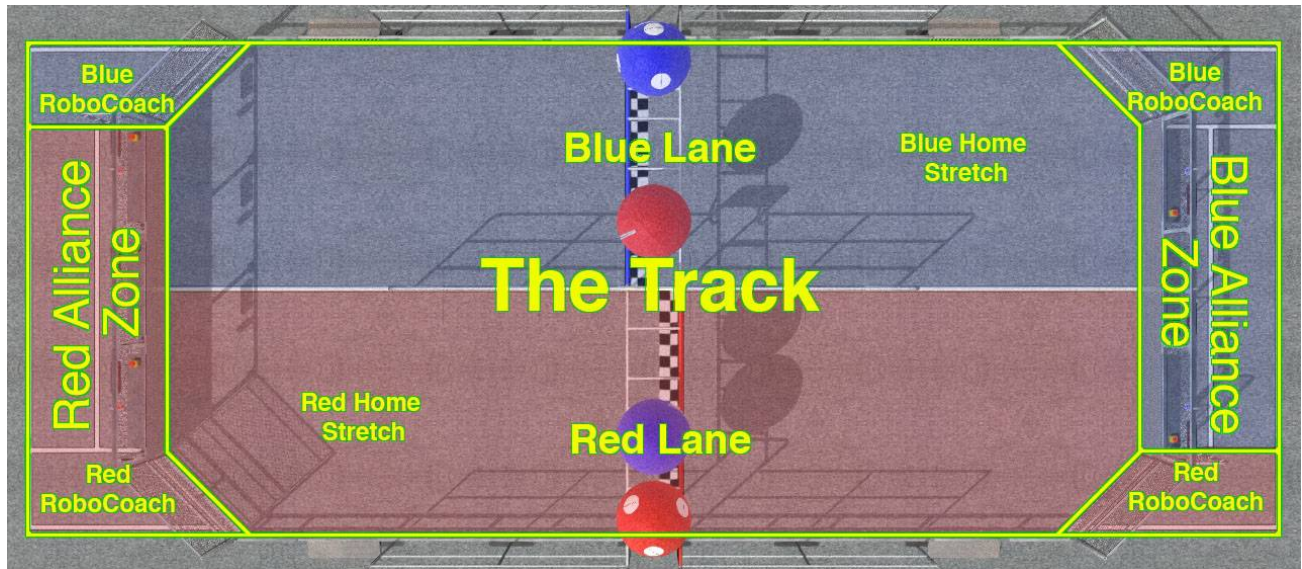
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## 6 THE ARENA

### 6.1 OVERVIEW

The following sections of the manual describe the arena, game, robots and tournament structure used in the 2008 *FIRST* Robotics Competition. Please be sure to read and thoroughly understand Sections 6, 7, 8, and 9 to fully understand the game and ensure the best opportunity for success during the competition season.



*Note: The illustrations in this section of the manual are for a general visual understanding of the FIRST Overdrive arena only. Please refer to the official drawings for exact dimensions and construction details.*

The *FIRST* Overdrive game field, known as the “TRACK,” is a 27 by 54-foot rectangular area in which the ROBOTS compete. The TRACK is split lengthwise into the Red Lane and the Blue Lane, to correspond with the team ALLIANCES that play the game. Positions from which signals may be passed to the ROBOT from a team ROBOCOACH are located at the outer corners of the TRACK. The ones on the Red Lane are designated as Red ROBOCOACH STATIONS, and the ones on the Blue Lane are designated as Blue ROBOCOACH STATIONS. The Alliance Zones are located outside the ends of the TRACK. These rectangular zones consist of three team stations. The three teams that make up each ALLIANCE play the game from these zones.

The specifications for the *FIRST* Overdrive arenas used in competition are listed below in Section 6.1.1. The arenas are designed to withstand rigorous play and frequent shipping. Precise specifications and construction details of the TRACK can be found on the *FIRST* web site off of the manual landing page, [www.usfirst.org/frc/2008/manual](http://www.usfirst.org/frc/2008/manual). Note that the web site also contains drawings for suggested low-cost versions of the important elements of the TRACK that teams can build for their own use during the construction and testing of the ROBOT.

## 6.1.1 Dimensions and Tolerances

The exact dimensions and construction details of the TRACK are contained on the official arena drawings. The relevant drawings include:

<b>2008 FRC DRAWINGS</b>			
<b>TITLE LINE 1</b>	<b>TITLE LINE 2</b>	<b>DWG NO.</b>	<b>SHEET/S</b>
2008 Field	Bridge (Overpass) Assembly	G08-0003	1 Sheet
2008 Field	Bridge, Divider and Fence	G08-0004	19 Sheets
2008 Field	Rail Extension	G08-0005	2 Sheets
2008 Field	Rail Corner Connector	G08-0006	1 Sheet
2008 Field	FG Panel Posts	G08-0007	1 Sheet
2008 Field	FG Panels	G08-0008	1 Sheet
End Panel	Fabrication	F05-0001	1 Sheet
End Panel	Assembly and Weld Details	F05-0002	2 Sheets
Drivers Station Support	Fabrication	F05-0003	1 Sheet
Drivers Station Support	Assembly	F05-0004	1 Sheet
Corner Support	Fabrication	F05-0005	1 Sheet
Corner Support	Assembly	F05-0006	1 Sheet
Field, Rail	Fabrication & Assembly	F05-0007	1 Sheet
Field, Rail / Gate	Fabrication & Assembly	F05-0008	1 Sheet
Field, Top Rail	Fabrication & Assembly	F05-0011	1 Sheet
2008 Field	Border/Driver Station Plastic	F05-0012	2 Sheets
Field Outrigger	Fabrication & Assembly	F05-0013	1 Sheet
Hinge Insert	Fabrication	F05-0015	1 Sheet
Field Entry Ramp	Fabrication & Assembly	F05-0016	1 Sheet
Field Gate Hanger	Fabrication	F05-0021	1 Sheet
Field Trip Guard	Fabrication	F07-0023	1 Sheet

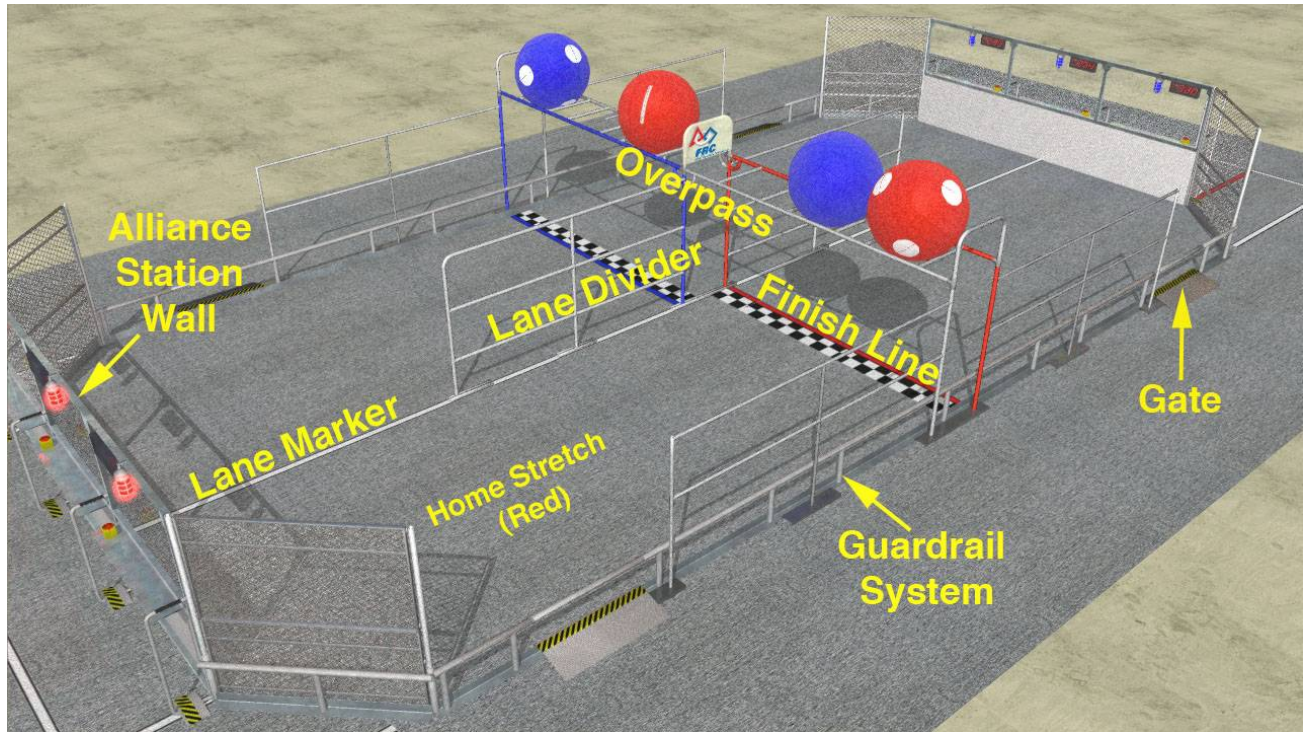
The competition arenas are modular constructions that are assembled, used, disassembled, and shipped many times during the competition season. They may undergo a significant amount of wear and tear. Every effort is made to ensure that the arenas are as identical from event to event as possible. However, as the arenas are assembled in different venues by different event staff, small some variations do occur. Fit and tolerance on large assemblies are ensured only to within 1/4 inch. Successful teams will design robots that are insensitive to these small variations.

## 6.2 THE TRACK

*Note: The official FIRST Overdrive Track description, layout, dimensions and parts list are contained in the "2008 FRC Drawings". Diagrams and dimensions below are for illustrative purposes only.*

## 6.2.1 Boundaries and Markings

The TRACK is an octagonal carpeted 27 feet by 54 feet area, bounded by two Alliance Station Walls and a Guardrail System.



The Alliance Station Wall is 6-1/2 feet high, 18 feet wide, and centered on the ends of the TRACK. The wall is composed of a 3-foot high base of diamond plate aluminum topped with a 3-1/2-foot high transparent acrylic panel. The corner between the Alliance Station Wall and the Guardrail System, called the ROBOCOACH STATION, is protected by a six foot tall, six foot wide section of chain link fence. The protective fence is oriented at a 45-degree angle between the Alliance Station Wall and the Guardrail System. This angled corner helps prevent TRACKBALLS from getting trapped in the corners of the TRACK.

The Guardrail System is a horizontal pipe 20 inches above the floor, supported by vertical struts mounted on a 3" aluminum angle. A shield is attached on the inside of the Guardrail system, extending from the floor to the top of the guardrail, and running the length of the guardrail. The Guardrail System defines the borders of the TRACK, except where it is bounded by the Alliance Station Wall and the ROBOCOACH STATIONS.

Four gates in the Guardrail System allow easy access to the TRACK for placement and removal of ROBOTS. The gates are four feet wide and are located in each quadrant of the TRACK. The gates are closed and shielded during game play. Along the edge of the TRACK between the gates, a set of additional rails extends upwards from the floor to approximately six feet high. These additional rails are to help prevent TRACKBALLS from exiting the TRACK during game play.

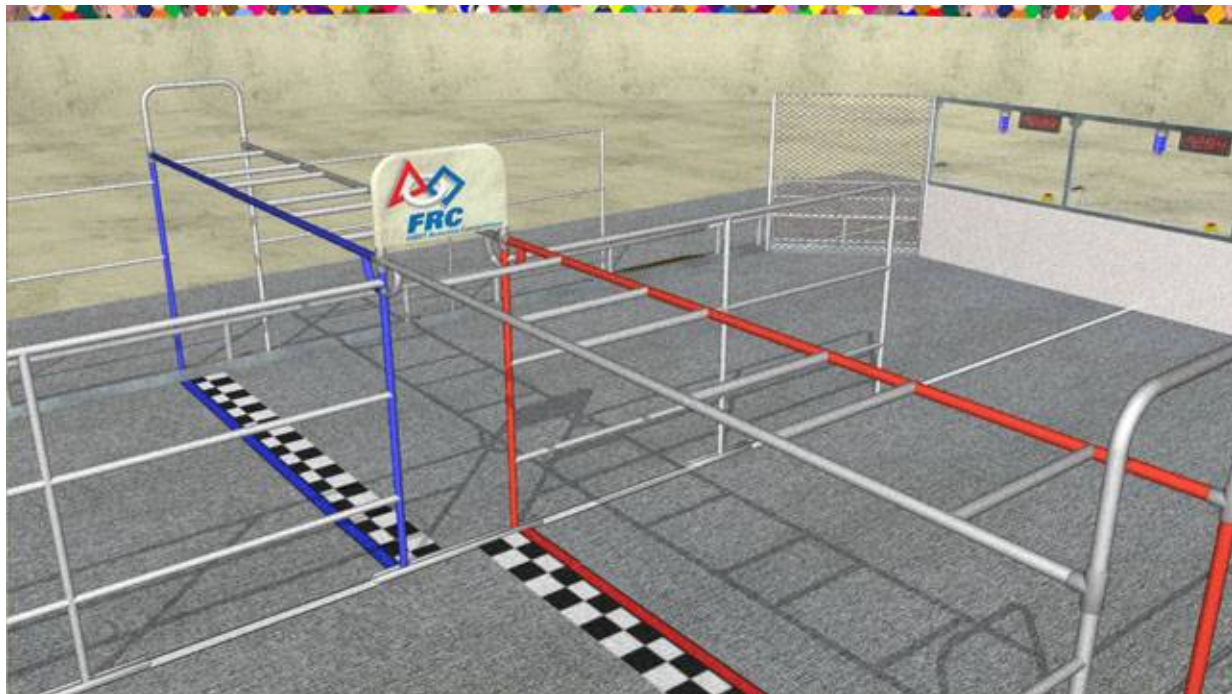
A two-inch wide stripe of white gaffers tape extends down the center-line of the TRACK and under the LANE DIVIDER. This stripe is known as the "LANE MARKER." The LANE MARKER divides the TRACK into two halves: the "Red Lane" and the "Blue Lane."

A red or blue “FINISH LINE” is marked on each side on the carpet under the OVERPASS. The FINISH LINE is indicated by a six-inch wide tripe of black-and-white checkered tape, followed by a two-inch wide stripe of colored gaffers tape. The pipes of the OVERPASS structure coplanar with the vertical projection of the gaffers tape are colored to provide further indication of the plane of the FINISH LINE. For the red FINISH LINE, the gaffers tape and pipes are red, and for the blue FINISH LINE the gaffers tape and pipes are blue.

As the ROBOTS move in a counter-clockwise direction around the TRACK, the quadrant of the TRACK immediately preceding the FINISH LINE for each ALLIANCE is known as the “HOME STRETCH.” The HOME STRETCH for the red ALLIANCE is the one immediately in front of the red ALLIANCE ZONE, and the HOME STRETCH for the blue ALLIANCE is the one immediately in front of the blue ALLIANCE ZONE. The HOME STRETCH is bounded by the FINISH LINE for the ALLIANCE, the LANE DIVIDER/LANE MARKER, the Alliance Station Wall and the Guardrail System.

All taped lines, rails, fences, and borders used to define the different regions of the TRACK are intended to represent the boundaries of three-dimensional spaces. When determining if an object is within an area indicated by the lines, or to determine if an object has CROSSED a line, the lines/borders are projected vertically upwards.

## 6.2.2 The OVERPASS



The OVERPASS structure extends across the minor axis of the TRACK. The OVERPASS is constructed of 1-1/2 inch O.D. steel pipe and connecting hardware. The OVERPASS is supported by three vertical supports – one at each end, and one in the center (the center support is also part of the LANE DIVIDER). The vertical supports rise above the horizontal portion of the OVERPASS, to a total height of eight feet and four inches. This is to help prevent TRACKBALLS from rolling off the OVERPASS and exiting the arena, or rolling across the center of the LANE DIVIDER. The

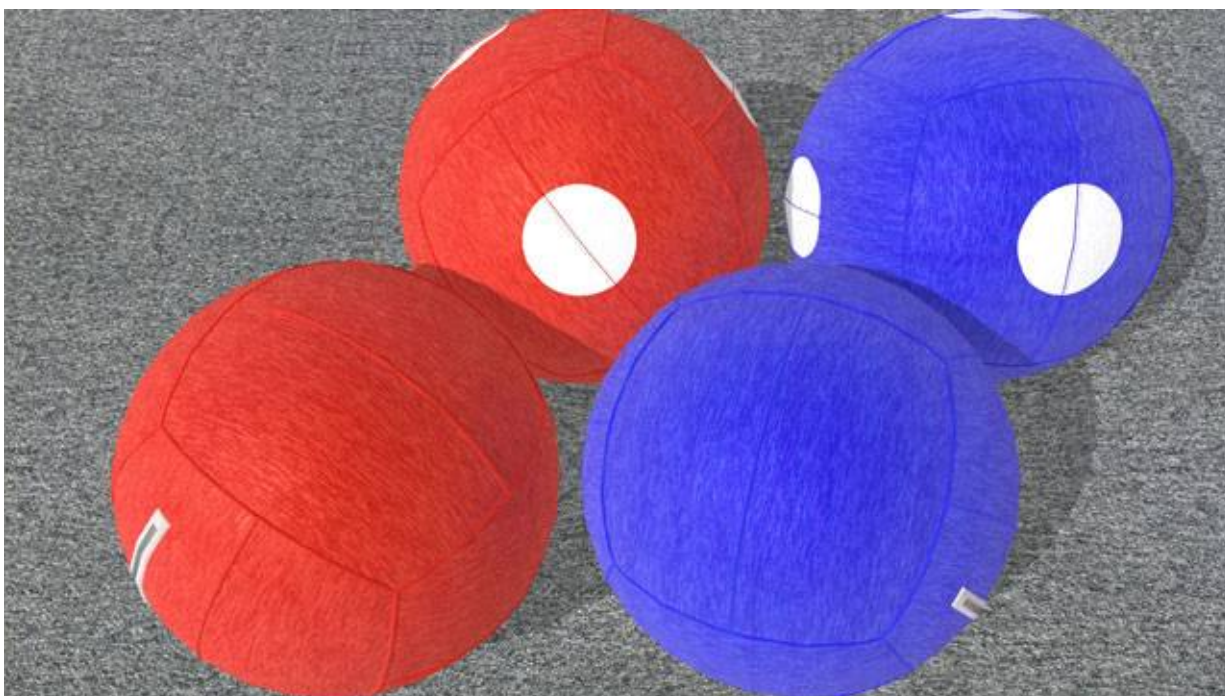
horizontal portion of the OVERPASS is 6-1/2 feet above the floor. The rails of the OVERPASS are spaced 32 inches apart (center to center). On each side of the OVERPASS, a series of spacer bars define three TARGET LOCATIONS on the OVERPASS. The TARGET LOCATIONS are sized to allow the TRACKBALLS to rest within them.

### 6.2.3 The LANE DIVIDER

The TRACK is divided by a LANE DIVIDER that extends along the major axis of the TRACK. The LANE DIVIDER is six feet tall and approximately 27 feet long. It is constructed of 1-1/2 inch O.D. steel pipe and connecting hardware, forming railing panels. The openings in the railing panels are filled with clear plastic to prevent portions of ROBOTS from inadvertently passing through the structure. The LANE DIVIDER is attached to vertical posts that are anchored to supporting plates covered by carpet. Note that these plates will create a bump in the carpet approximately 1/2 inch tall, and as a result the surface of the TRACK will not be perfectly flat. ROBOTS must be designed to accommodate these surface variations. The LANE DIVIDER is attached to the floor such that it should remain vertical and not move when struck by ROBOTS.

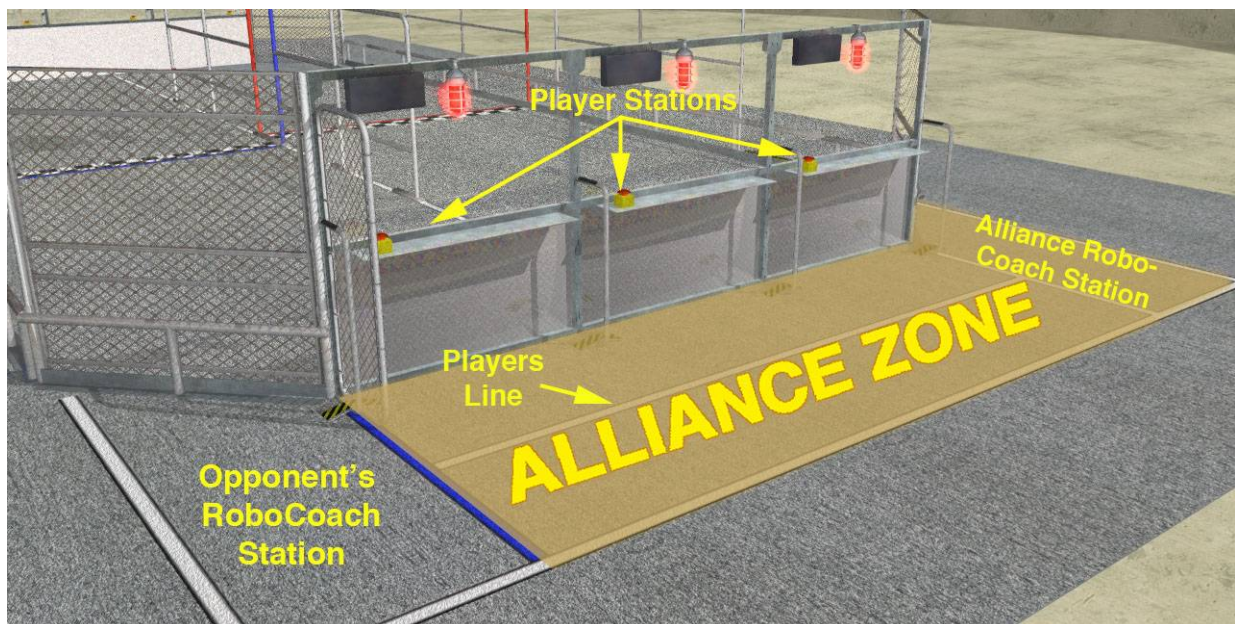
### 6.3 GAME PIECES

The game pieces, known as “TRACKBALLS,” are large balls made of an inflatable plastic bladder and an outer fabric covering. When inflated, each TRACKBALL is approximately 40 inches in diameter, and weighs approximately 7.3 pounds. Two TRACKBALLS of each alliance color, red and blue, are in the arena during the MATCH. One TRACKBALL of each color will be marked with a set of six-inch diameter white dots so that it may be uniquely identified for tracking purposes during the match.



### 6.4 ALLIANCE ZONES

The two ALLIANCE ZONES are located at either end of the TRACK, behind the Alliance Station Walls. Each ALLIANCE ZONE includes the 18' x 8' area behind the three identical player stations, and the ROBOCOACH STATION for that ALLIANCE. The DRIVERS and COACH from each team stand behind the Alliance Station Wall during the match, where they can move freely within the Alliance Zone.



#### 6.4.1 Boundaries and Markings

Each ALLIANCE ZONE shares the Alliance Station Wall with the TRACK and has its outer and back edges marked on the carpet with white gaffers tape. The ALLIANCE ZONE extends eight feet back from the Alliance Station Wall, and is the width of the Alliance Station Wall (eighteen feet). Four feet from the Alliance Station Wall, the Players Line is marked on the carpet with a two-inch wide white gaffers tape. The ALLIANCE ZONE includes the area behind the PLAYERS LINE. At the outer edges of the ALLIANCE ZONE are marked areas for the ROBOCOACH STATIONS. When standing in the ALLIANCE ZONE and facing the TRACK, the ROBOCOACH STATION for the ALLIANCE is to the right, and the opponent's ROBOCOACH STATION is to the left. The tape boundaries are considered "in" the bounded areas.

#### 6.4.2 Player Stations

Attached to the Alliance Station Wall are three aluminum shelves to support the robot control systems of the three teams on the ALLIANCE. The support shelf measures approximately 60 inches wide by 12 inches deep. There is a 4-1/2-foot long by two-inch wide strip of Velcro tape ("loop" side) along the center of the support shelf that may be used to secure the ROBOT controls and Operator Interface. Each setup location includes a competition cable that attaches to the "Competition Port" of the Operator Interface. This cable provides power for the team's Operator Interface and controls communications with the ROBOT. Emergency Stop (E-Stop) buttons for each team are located on the left end of each Player Station shelf. Arena components (including team number displays, competition arena hardware, alliance lights, control hardware cabinets and clock displays) are also located above the Player Station and below the shelf.