To all teams building game practice field elements: 01/07/05

Here is some clarification concerning the field elements. The link names given can be found on the 2005 First Robotics Competition Documents web page on the FIRST web site.

There are five different field elements, with full field quantities given:

Goal (8- incl. 4 with magnets)
Center Goal (1)
Loading Platform (4)
Tetra (40 Red, 40 Blue- incl. 2 Red and 2 Blue ea. hanging and vision tetras)
Targets

The location of these elements is shown in the link "2005 FIRST Robotics Competition Game Field Layout".

It is recommended each team build the following practice field elements:

Goal (with hanging magnet)
Center Goal
Loading Platform
Tetra
Hanging Tetra- could substitute for the plain Tetra
Vision Tetra
At least 1 target of each color for vision testing

Materials- The materials required to build each element are listed in the link titled "2005 FIRST Robotics Competition Game Team Elements Materials List". The methods to build team practice versions are described below:

Goal- There are eight tetrahedron goals on the full field. Four of the goals are modified with a hanging magnet at its peak. There are two methods to simulate the actual game goal. One uses the low density polyethylene (LDPE) 'cloverleaf' connectors provided by FIRST in your robot kits, the other uses metal 'cloverleaf' connectors and pipe nuts available from Innovation First, Inc.(IFI). The IFI hardware will create a goal visually identical to the actual game goals.

> **Goal using LDPE cloverleaf**- this goal is made with PVC tubing, PVC end caps with a hole and "Tee" nut and the LDPE cloverleaf. The end caps create a 'bump' at the end of each piece of tubing that is not on the actual game goals. The construction of this type goal is detailed on the link: "2005 FIRST Robotics Competition Game Team Field Elements Tetra-Goal Assembly". Additional LDPE cloverleaf connectors are available from Innovation First, Inc.
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> **Goal using IFI hardware**- this goal is also made with PVC tubing, but instead of using end caps, you will need to drill a ¼ in. hole as detailed in the drawings in the link: "2005 FIRST Robotics Competition Game Team Field Elements Tetra-

Goal Assembly Innovation First Version". The only difference between this team goal and the actual game goal is the game goals will be made from aluminum instead of PVC.

Instructions for attaching the hanging magnet are detailed on the link: "2005 FIRST Robotics Competition Game Team Field Elements Tetra-Goal Assembly" link.

Center Goal – There are two options for building the team version of the center goal, using wood or PVC pipe. The PVC version most closely represents the actual game center goal.

Center Goal using wood- The wood team version of the center goal is the lower cost option. However, while the height and size are very close to the actual game version, there are significant differences in the shape of the members. The instructions for building the wood center goal are detailed in the drawing links: "2005 FIRST Robotics Competition Game Team Field Elements Center Goal Assembly" and "2005 FIRST Robotics Competition Game Team Field Elements Center Goal Fabrication ".

Center Goal using PVC- The PVC center goal uses a kit of hardware from Innovation First, Inc.. Hardware from IFI will be sent to the field element builder address provided to FIRST for delivery on January 4th. Instructions for building the PVC center goal are in the link: "2005 FIRST Robotics Competition Game Team Field Elements Center Goal Fabrication Innovation First Version". The PVC center goal is nearly identical to the actual game center goal.

Loading Platform- The team version of the loading platform is made from wood as detailed on the drawing link: "2005 FIRST Robotics Competition Game Team Field Elements Tetra Loader". The plywood is on the sides only, the front and back are open with the exception of the 2 x 3 supports.

Tetra- The team version of the game tetra is nearly identical to the actual game tetra. The only difference is custom PVC end caps are molded for the actual game versions, as opposed to off-the-shelf end caps from Home Depot for the team version. There are three versions of the tetra in the game:

Tetra- made from PVC pipe, end caps and molded 'cloverleaf' connectors. Additional connectors can be ordered from Innovation First or fabricated from ¼ in polycarbonate (Lexan). The drawing link for the connector is "2005 FIRST Robotics Competition Game Team Field Elements Tetra Connector".

Hanging Tetra- One tetra should have fender washers added as detailed in the link: "2005 FIRST Robotics Competition Game Team Field Elements Tetra-Goal Assembly" so it can hang from the magnet inside a goal. The actual game version of the hanging tetra will use a 2 ½ in. washer available from Innovation First, Inc. instead of the 2 in. washers listed on the advance buy material list.

Vision Tetra- The vision tetra has an eight-inch green band around its middle that the robot vision system will use as a target. The band is constructed from three pieces of ¼ in. plywood or luan, painted green, and attached with cable ties to the tetra. The link for the drawing for the vision tetra and its target is "2005 FIRST Robotics Competition Game Team Field Elements Vision Tetra".

Targets- There are several targets on the field to aid with the vision system, located either under the goals or in front of loading stations. They are triangles with 36-inch sides and can be made with ¼ inch plywood or luan, primed and painted the colors listed in the "2005 FIRST Robotics Competition Game Team Field Elements Target Paint Colors" link. The paint is available from Home Depot.

Good luck building!
FIRST Engineering