Spring
2013

Autonomous Sentry Missile Launcher – Competition Details

TARGETS, AWARDS, POINTS, EVENT DETAILS, PLAYING FIELD

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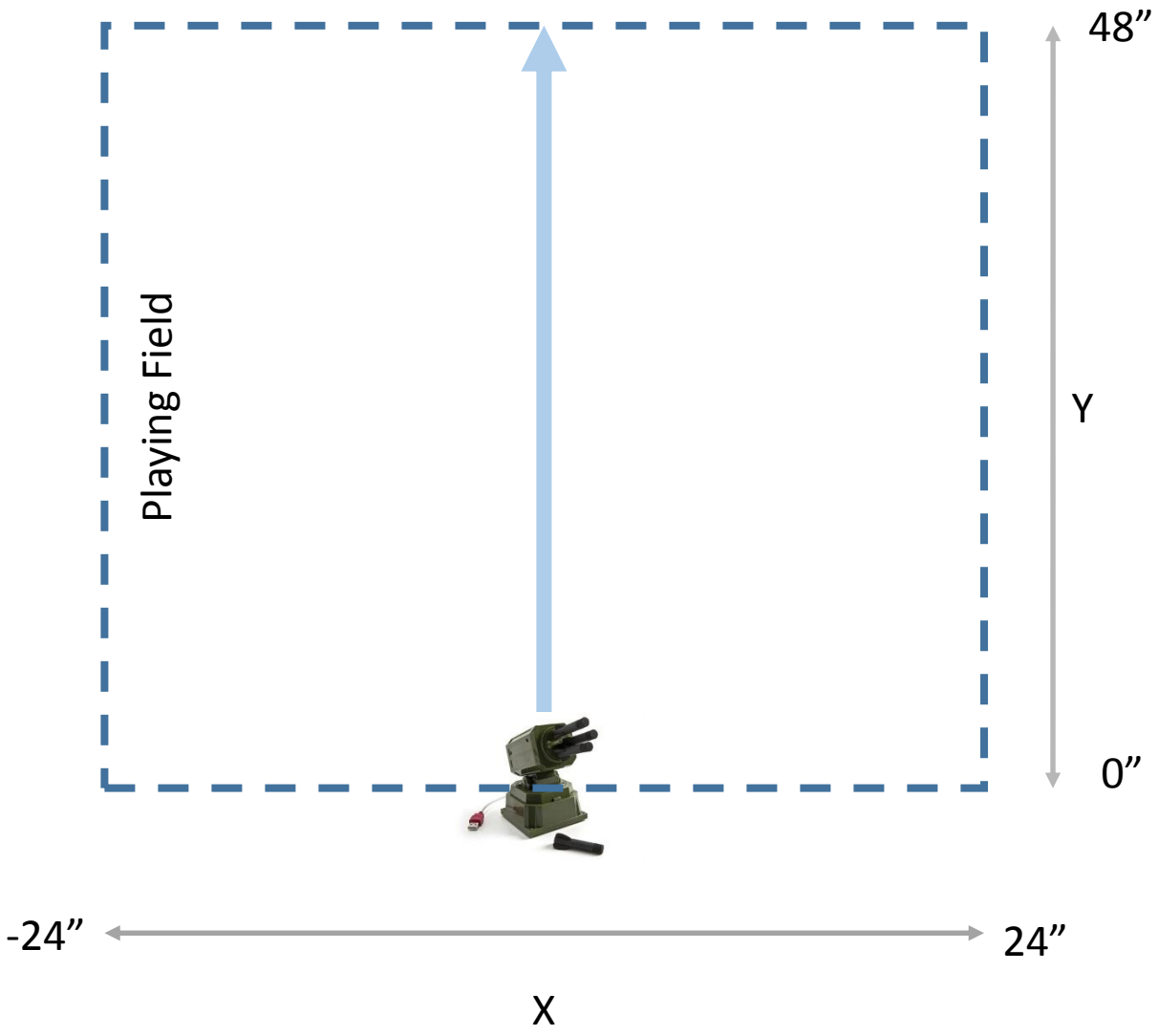
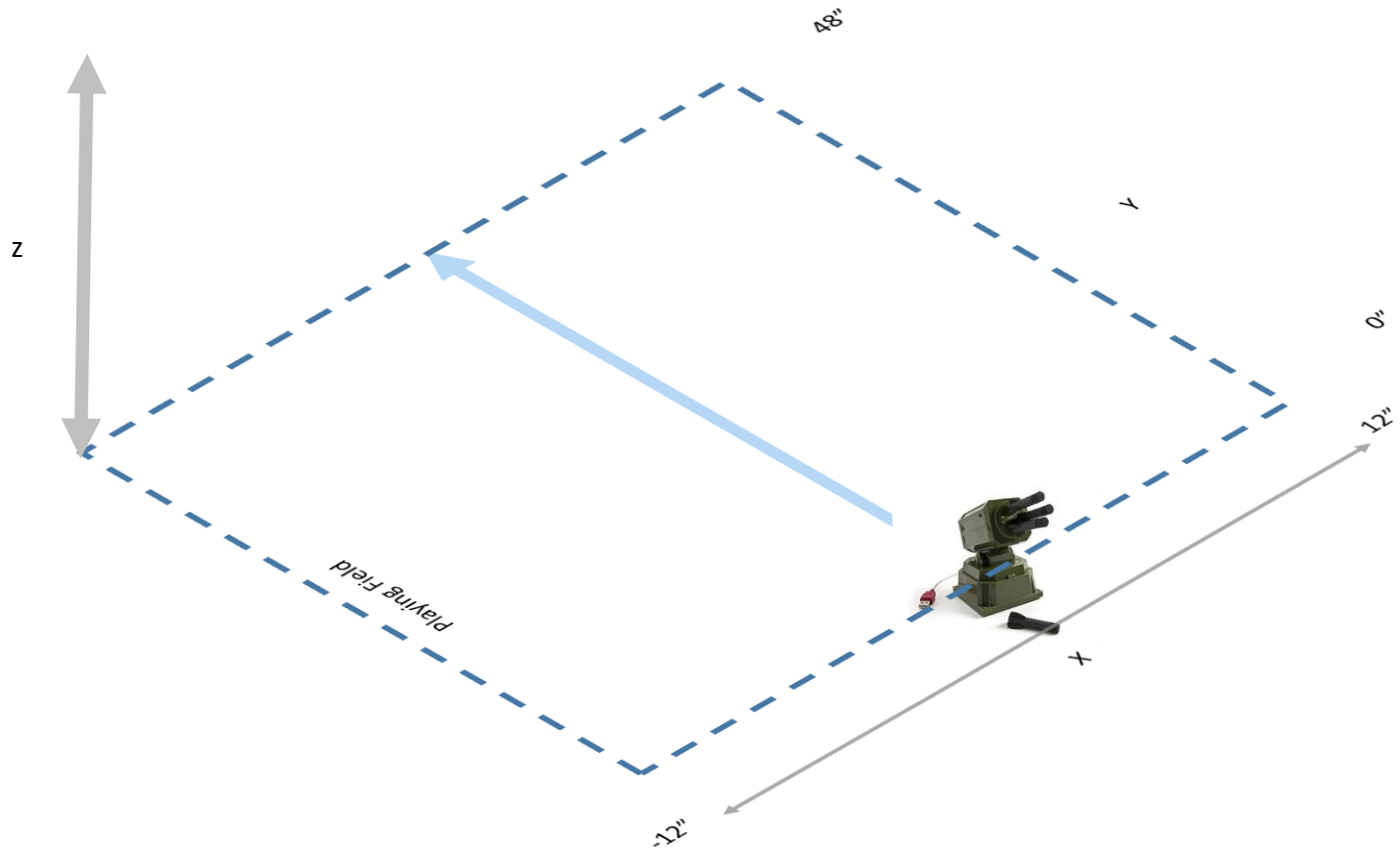
Playing Field

The playing field will be 2’ by 4’ wide as shown below. The playing field (looking down in the z-dimension).

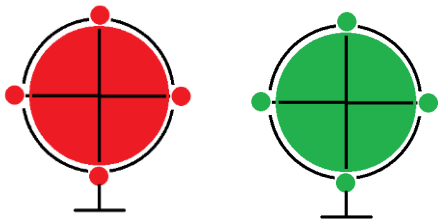




The above is an isometric perspective of the playing field. The target launcher exists at location 0, 0, 0. All targets are measured from this location. The z-dimension is pointing perpendicular to the table. The y-dimension points forward from the target launcher. The x-dimension extends left and right.

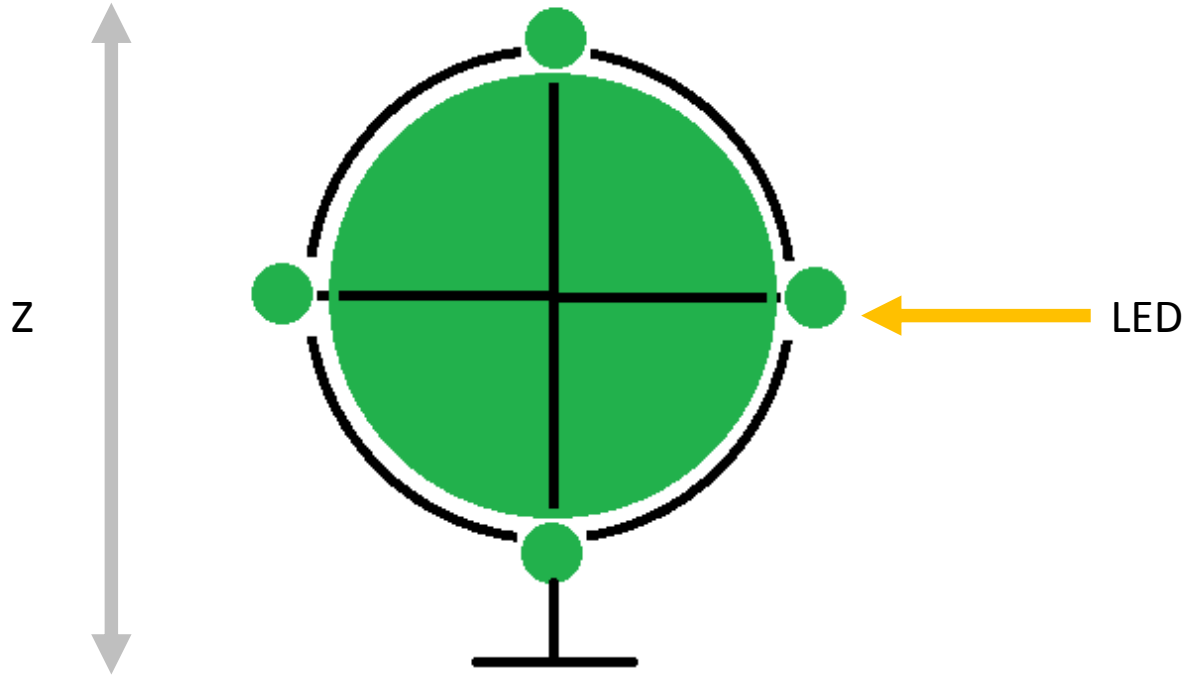
Targets

The targets are circular roughly 2.5 inches. The targets are made by a 3D-printer. The targets are lined by four light emitting diodes (LED).



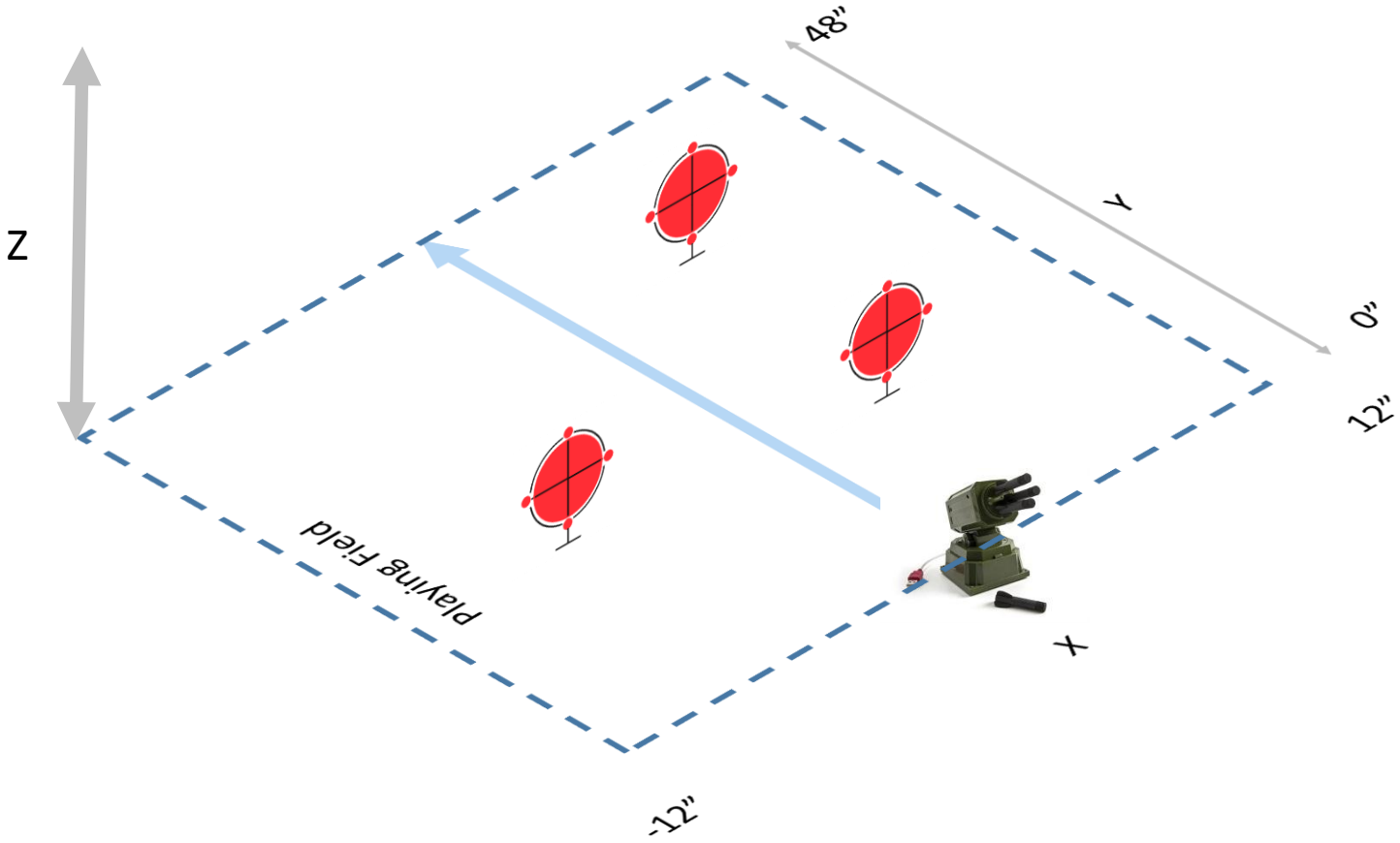
Foe Friend

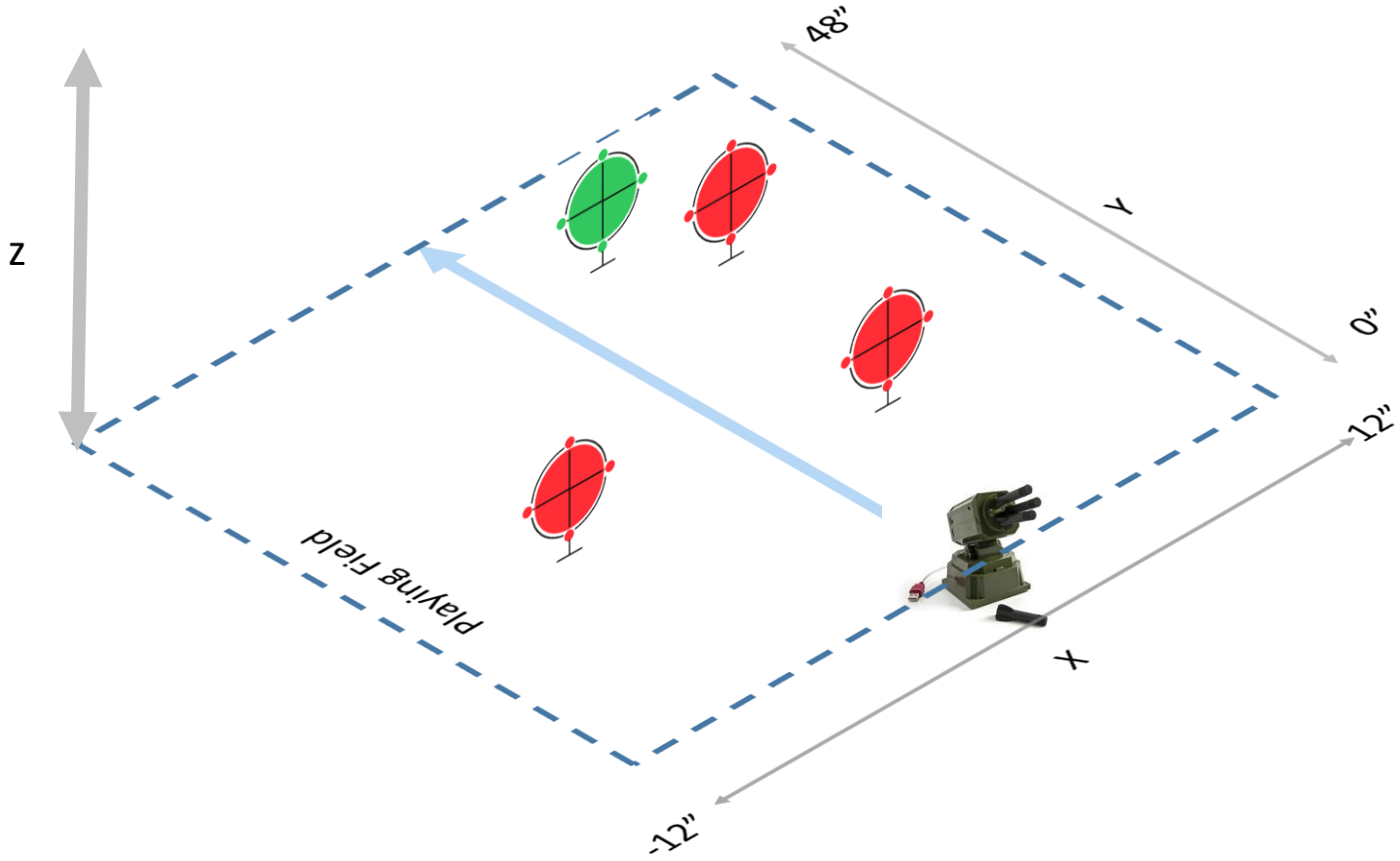
Friend targets are colored **green** and foe targets **red.** The target *z* dimension is measured from the table to the center of the target.



Target Placement and Playing Field

Targets will be placed anywhere within the playing field. As stated earlier their locations will be measured from the reference point where the missile launcher is shown.





An example of friends and foe targets displayed in the playing field.

Points and Awards

Awards

The team with the most points will be awarded extra credit points towards their project. There are two categories of points:

1. Overall
    a. Overall points collected during semester.
2. Competition
    a. Team that earns the most points during the competition.

Both of these groups will earn extra credit: 3% increased on the overall category, 5% for the competition winner. No points are awarded for second, third, or fourth places.

Competing Clause

Your project must compete in every event. Failure to successfully engage in any event will result in a zero for that part of the project. This means, if the software fails to function, crashes, the functionality requirement of your deliverables will be deducted and severely reduce your grade.

Any systems that randomly aim, aim away, just to fire a missile without the intent to hit a target will fall under this clause. Except when there are no targets left to fire at.

Event Points

Points will be awarded in the following way with the following clauses to reduce cheating. For each event the points will be awarded to a group:

First 5 points, ***Second*** 3 points, ***Third*** 1 point, ***Fourth*** 0 points

These points will be given to the groups based on the following:

1. Fastest software to hit all targets
2. Fastest software that hits the most targets
3. Fastest group to fire all missiles (no random firing allowed, see above)

Target Points

1 point will be added for teams that hit a foe target.

2 points will be deducted for teams that hit a friend target.

1 point will be deducted for a missed target (except when no targets exist).

NOTE: If no foe targets exist and missiles are left to fire, then the software is expected to fire remaining missiles.

Group Name						
	Event ID	**Time**	**Foes Eliminated**	**Friends Eliminated**	**Missed**	**Is Random?**
	Four Foes					
	Friend Foes					
	Targets Left					
	Moving Targets					

A score sheet will look like this.

Rules

Below are rules regarding the project competition so read carefully.

Deployment

1. Your software must install on another computer.
2. Your software must run on another computer.

Camera Missile Launcher Placement

1. You may move the missile launcher anywhere behind
    a. $y < 0$
    b. $-12 < x < 12$
    c. $z = 0$ (meaning the missile launcher's base is level on the table)
2. You may move the camera anywhere behind
    a. $y < 0$
    b. $-12 < x < 12$
    c. $z = 0$ (meaning the camera's base is level on the table)

Targets and Playing Field

1. You may not touch any of the targets or change the position of the targets.
2. You must stand behind the $y < 0$ line during your group's and others' event.
3. A glance of a target does not constitute a hit the LED must turn off to count. However, in the event that the LED dims but the target system does not account for the hit, then manual scoring shall account for the hit.

Event

1. An auxiliary electronic timer will be started independently of the group software.
2. Your software must start when the judge presses the start button and a software timer must start.

3. No manual control is allowed during the event.
4. The event ends when the last missile is fired. If 2 minutes elapse with no missiles fired, then no points are awarded for that event.
5. The timer must stop when the last missile is fired. Otherwise the time taken for the event will be when the judge stops the timer. If the timer does not stop when the stop button is pressed, no points are awarded.
6. If the timer resets during the competition, then no points will be awarded. However, if it is in error of the judge, the time will be taken from the auxiliary timer.

Events

There are four major events:

1. Four Foes – four enemy targets will be placed in the arena. Your system must search and destroy all of them.
2. Friends and Foes – four total targets with a mixture of friends and foes
3. Targets Left? – 0-4 targets either friend or foes.
4. Moving Targets * -- a target may flash on or off. If hit when LED's are on, then the target was destroyed, if hit when LED's are off, then the target was missed.

* This event is TBD if it will occur.