



Robo War Problem Statement – Final Round Key Zone

Problem Statement:

Build a wired robot that can lift and hang keys on a hook at pillar.

Problem Description:

Each team has to make a robot that is capable of picking keys from a box and hanging keys on a pillar with hooks

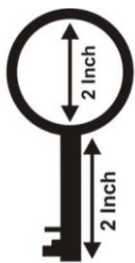
The Arena consists of a rectangular wooden board of which has 4 hook stands at each corner. The keys are placed in 3 boxes placed at the center of the Arena. There are 40 keys in total.

The Arena is divided into two color zones– Red Zone and Green Zone. Each zone has a two hook pillars of the same color. The objective of the game is to hang maximum number of keys on the matching hook stands.

1. The actual Run will be of 4 minute's duration.
2. Each team will get 1 minute of trial run.
3. Two robots will play in an arena run.
4. At the start of the event, the both robot shall be placed at the Start Line of the Arena.
5. Each key has a color code.
6. The keys have to be placed/hanged on the pillar on the same color code.
7. The robots can move anywhere in the arena.

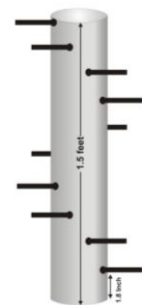
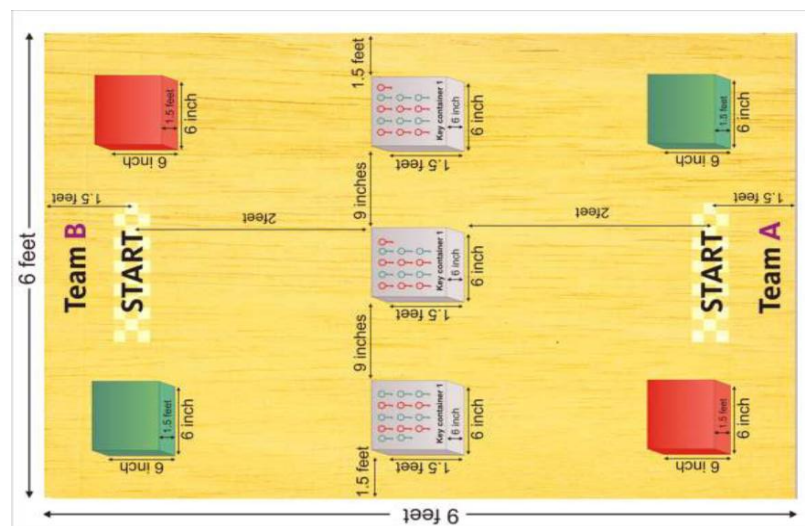
Arena

1. The dimension of the Arena is 9x6 feet. It is surrounded by a 6 inch wall on all sides.
2. The hook pillars are of 6 inch x 6 inch x 1.5 ft in size. There are 10 hooks at a distance of 1.8 inch from each other. (refer diagram)
3. The Boxes are of 1ft x 0.5 ft x 0.5ft in size. Three such boxes are placed at the center of the arena.
4. Each key in the correct hook pillar adds 10 points in teams score board.
5. There can be only one key on each hook.



Arena Key

Keys are placed in horizontal position in the arena



Hook Pillar



Scoring

1. The timer starts as soon as the judge gives his signal.
2. The score is calculated as follows:

Action	Score Generated
Pick and hang the key on right stand	+10
Pick and hang the key on wrong stand	-5

3. The total score S is calculated with the given formula:
$$S = \text{Total key placed in right hook} * 10 - \text{wrong key placed in wrong hook} * 5$$
Where,
 S is the total score
4. The teams with the highest S points move to the next level or the winner in case of final round.
5. In case of a tie, the decision of the judges will be final.

Rules for Robot Design

1. Each team will consist of a maximum of 4 members.
2. Robots damaging the Arena shall be liable for disqualification.
3. Uses of chemical/combustible/other harmful substances are prohibited.
4. Failure to observe any of the above rules may lead to immediate disqualification and the decision of the judges/organizers in this regard shall be final and binding.
5. The judges reserve the right to stop a robot from running, declare disqualification, or give instructions when necessary (e.g., if the Arena is jeopardized by the operation of the bot).
6. Only the wires, power source (if necessary) and remote control will be allowed outside the bot. All other circuitry should be placed on the bot.
7. Off the shelf LEGO kits are not allowed.

Rules for Arena Run

1. Each team will be given a first call 7 minutes prior their allocated time.
2. The second call for a team will be 3 minutes prior their allocated time.
3. If the team fails to report to the arena at the second call, it will be **disqualified**.
4. After the second call for the team, a test run time of 1 minute will be provided.
5. The Arena Run for each team will be of 4 minutes.
6. In case the robot does not change its position for 1 minute during the arena run, the team is **disqualified**.
7. **Robots falling outside the track are disqualified.**
8. Robots can move any number of boxes at a time during the arena run.
9. Robots damaging the Arena shall be liable for disqualification.
10. The judges reserve the right to stop a robot from running, declare disqualification, or give instructions when necessary (e.g., if the Arena is jeopardized by the operation of the bot)