

Problem Statement : Galactic Trooper Finale

TASK:

- Teams has to build a manually controlled bot which can do simple task of gripping blocks and putting them in target zones so that it can complete the route by overcoming the discontinuities.
- The bot can be wired or wireless. In case the participants use wireless mechanism, they must use dual frequency remote.

ARENA:

- The outer dimensions of arena are 2670 mm X 2250 mm (lxb)

It consists of the following:

- Five thermocol blocks with each of dimensions 150 mm X 150 mm X 100 mm (lxbxh)
- Two rectangular hurdles of dimensions 100mm x50mm (lxb) in the path between start zone & checkpoint 1 as shown in fig.1
- "Deposit Zone 1" (Trench) of dimensions 400mmx170mmx100mm (lxbxh) which is shown in fig. 1
- "Deposit Zone 2" of dimensions 350mmx200mm (lxb) shown blue in color
- L shaped ramp assembly with inclination 20 degrees and declination 30 degrees
- "Gate zone" of dimensions 500mmx100mm
- "Sand box" of dimension 500mm x 250 mm x 10mm



Fig. 1



Fig. 2



Fig. 3

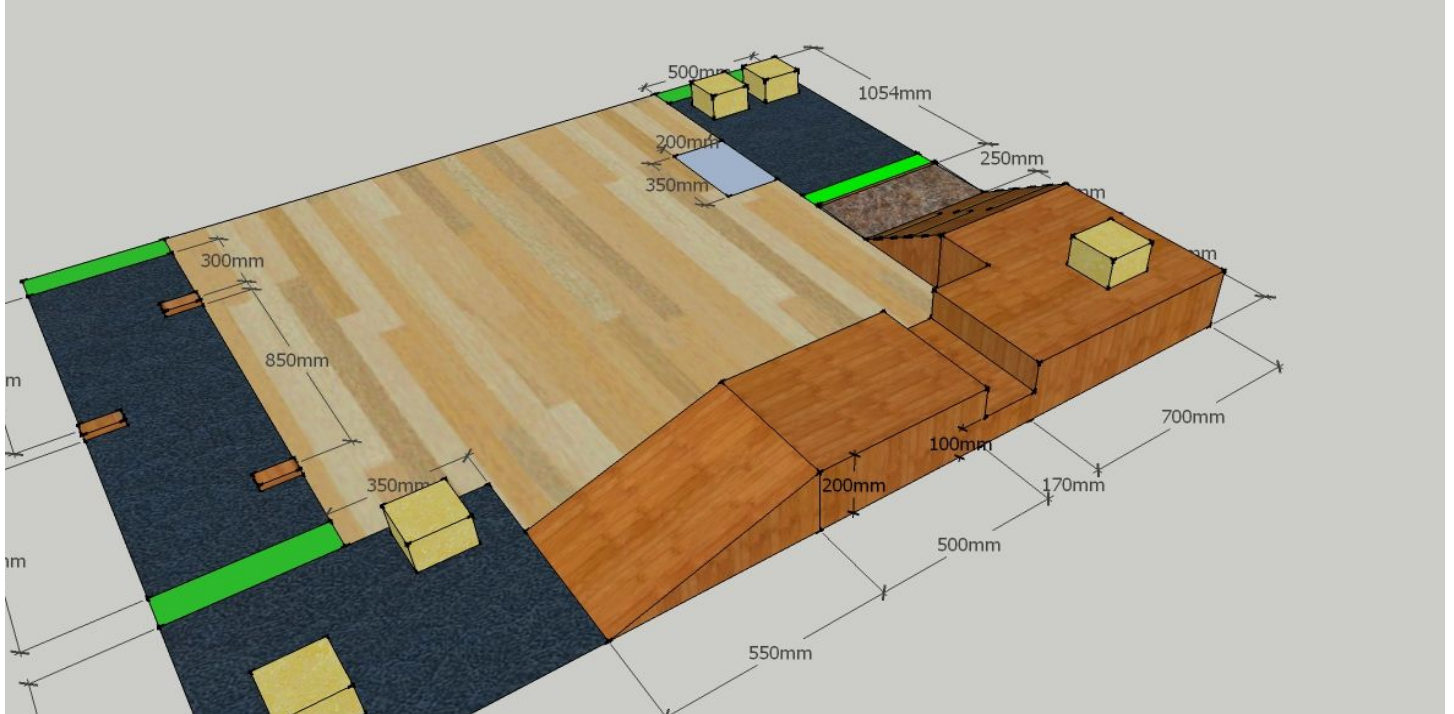


Fig. 4

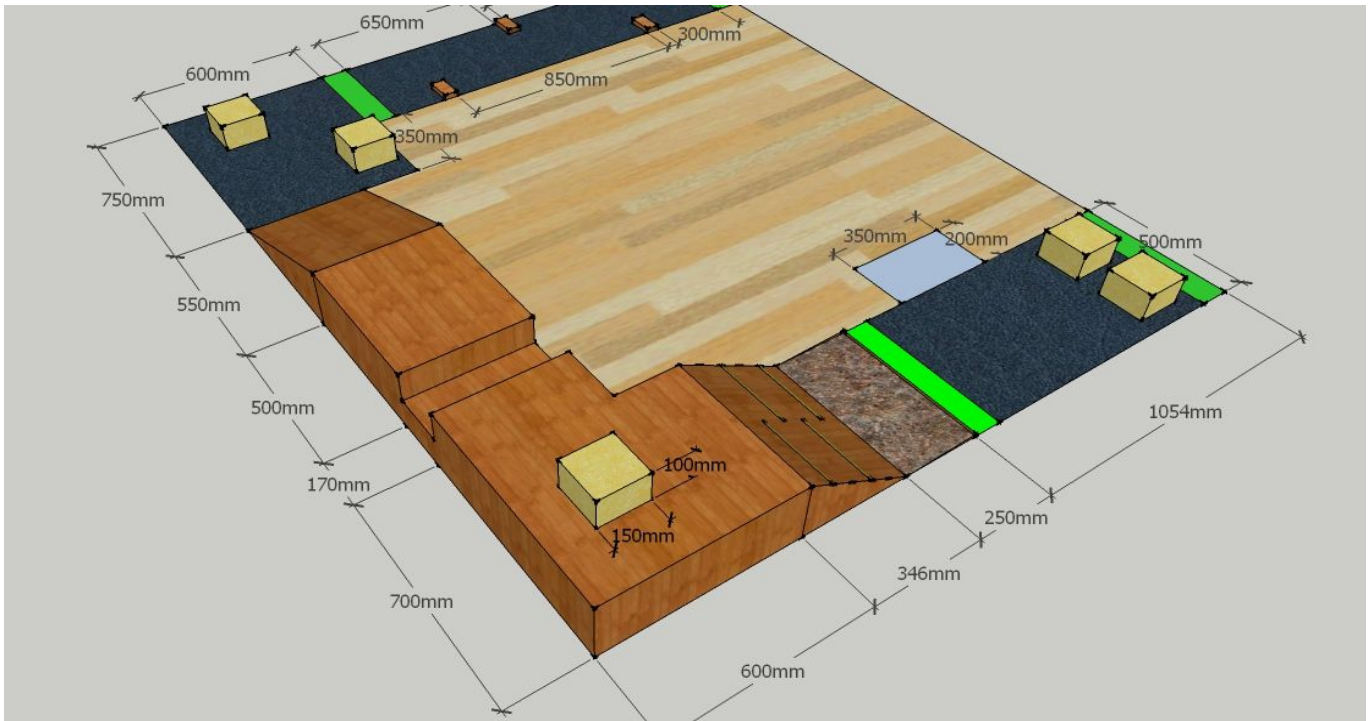


Fig. 5



Fig. 6



Fig. 7

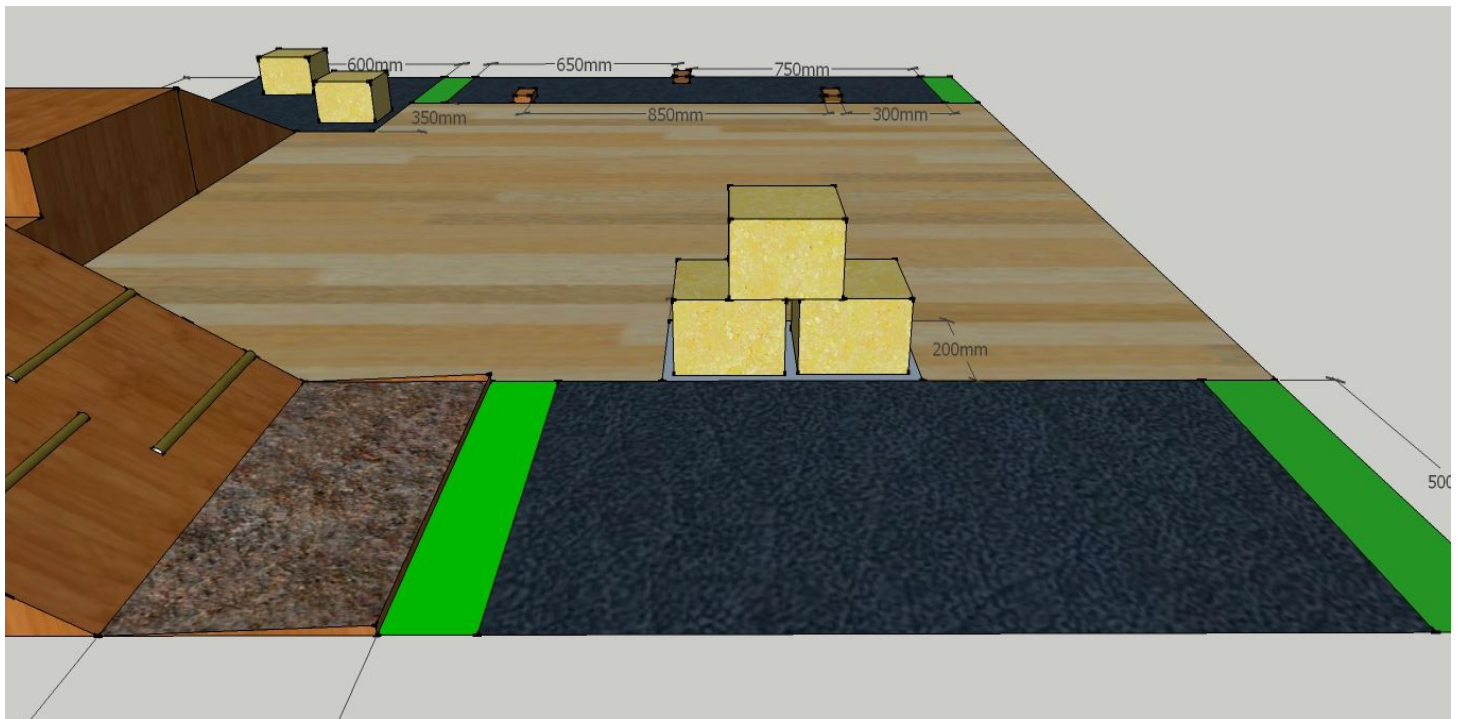


Fig. 8 (Pyramid Structure)

BOT SPECIFICATIONS:

- The dimensions of the bot should be less than or equal to 300 mm X 200 mm X 300 mm at the start of the game failing which the team will be disqualified from the competition. However the bot can extend its dimension once the run starts. An error of (+5% /5%) is permitted.
- The bot must be controlled manually.
- Teams can use both wired as well as wireless control mechanisms. In case of wired bots, the length of wire should be minimum 2 meters so that the wire remains slack at any instant of time. If the participants use wireless mechanism then it is mandatory to use a dual frequency remote.
- The dimensions of the remote are not included in the size constraint of the bot.
- Bot must have an on-board power supply in any case.
- Participants are not supposed to use any readymade lego components or readymade gripping mechanism. However the participants are allowed to use readymade gear assemblies. Violating this clause will lead to immediate disqualification of the team.
- Irrespective of the mechanism used, only one person will be allowed to control the bot.
- Failing to meet the above specifications will lead to immediate disqualification.

POWER SUPPLY:

- The participants should use an on board electric or non-electric power supply i.e. the power source should be on the bot itself. The power source must be non-polluting and must satisfy the safety constraints determined by the organisers. In case of non-electric power supply, the participants must get it approved from the organisers beforehand via email. Organisers are not responsible for the inconvenience if the approval is not sought.
- In case of an electric power supply, the voltage between any two points should be less than or equal to 24V DC at all times during the run.
- AC power supply will not be provided and cannot be used in the competition.

GAMEPLAY:

- The bot must start from the START line.
- The bot has to arrive at the checkpoint 1 by avoiding the hurdles in between
- The bot has to pick up the block 1 and block 2 one at a time and put them in the deposit zone 1 to complete the path for crossing
- The bot has to arrive at the checkpoint 2 after crossing the deposit zone 1
- After that it has to pick up block 3 from and arrive at checkpoint 3 along with the block while crossing over the sand box.
- The block 3 has to be placed in the deposit zone 2
- The bot has to pick the two blocks from the gate zone place it in the deposit zone 2 in the form of pyramid (2 blocks on ground and one over them)
- Then it has to cross the gate to arrive at the final FINISH line

GAME RULES:

- The bot would be checked for safety before starting and will be disqualified if found unsafe for other participants.
- Only one team member is allowed to handle the bot. No other team member is allowed to enter the arena.
- The bot will be liable for disqualification if it causes any kind of damage to the arena or its components.
- The bot is not allowed to slide the blocks against the ground except for fine adjustment in the "Structure Zone", "Deposit Zone" and while filling up void.
- Any damage done to the blocks will lead to immediate disqualification.
- Maximum of 6 minutes will be given for each team.
- The arena has three checkpoints, In case the bot gets stuck at any place, then the block it is carrying (if any) will be repositioned at its initial position and the bot will be kept in the checkpoints corresponding to that zone.
- The blocks which are correctly deposited in deposit zones/pushed from ramp won't be disturbed.
- The timer won't be stopped during this process.
- Points will not be awarded if the blocks in deposit zone are arranged in pyramidal structure.

JUDGING:

- 20 points will be awarded for successfully crossing hurdles between check point 1 & start point.
- 20 points each will be awarded for placing one block in the deposit zone 1, Thus a total of 40 points will be awarded for placing both the blocks to complete the path
- The participants may voluntarily skip the above step and arrive at checkpoint 2 but in this case they will not be given the benefit of time thus scoring C=0 for such cases
- 20 points will be awarded for crossing the wedge and reach checkpoint 2; points will be awarded only once for crossing the wedge. Points will not be awarded if the bot crosses the wedge multiple times
- 30 points will be awarded to arrive at checkpoint 3 if and only if the bot is carrying block 3 at that particular instant
- 20 points will be awarded if the bot successfully crosses the sandbox while carrying the block
- 20 points each will be awarded to keep one block in the structure zone, Thus a total of 60 points will be given for keeping both the blocks in structure zone. These points will only be awarded if the blocks are arranged in pyramidal structure (2 blocks at bottom and one on their top)
- In case bot falls/ crosses the referred path then 10 points will be deducted and bot will be placed at the previous checkpoint corresponding to that zone as shown in Fig. 1.

SCORING:

- A = Total points scored
- B = Penalty
- C = (360 -Time left after crossing the finish line in seconds)
- Total points scored = A + B - C
- The team with maximum points will be the winner

TEAM SPECIFICATIONS:

- A team may consist of a maximum of 4 members.
- Students from different educational institutes can form a team.

ELIGIBILITY:

- All students with a valid identity card of their respective educational institutes are eligible to participate.

CERTIFICATE POLICY:

- Top three teams from wildcard qualifiers will qualify for the Grand Finale.
- Top three teams in the grand finale will be awarded Certificate of Excellence.
- Certificate of participation will be given to the teams scoring more than the critical marks which will be decided later.