IPSC IT FEST 2026

Arena Specification

Half-Life

Version 2 · 5 November 2026 · changes highlighted

The Doon School

DEHRADUN

This document is part of the Half-Life document pack. It sets out the arena that a school builds its practice replica against, and the objects that the robot sorts. Terms used here are defined in the Rulebook, Terminology.

Version 2, 5 November 2026. Text highlighted in yellow is new or changed since the version of 9 October 2026. Every change is listed in the table "Changes in this version" at the end of this document.

1. Plan drawing

1.1 Figure 1 is the plan view of the arena, seen from above, drawn to scale. All positions in this document are in millimetres, measured from the bottom-left inner corner of the arena as drawn, with x to the right and y upward. Where the figure and a table in this document differ, the table governs.

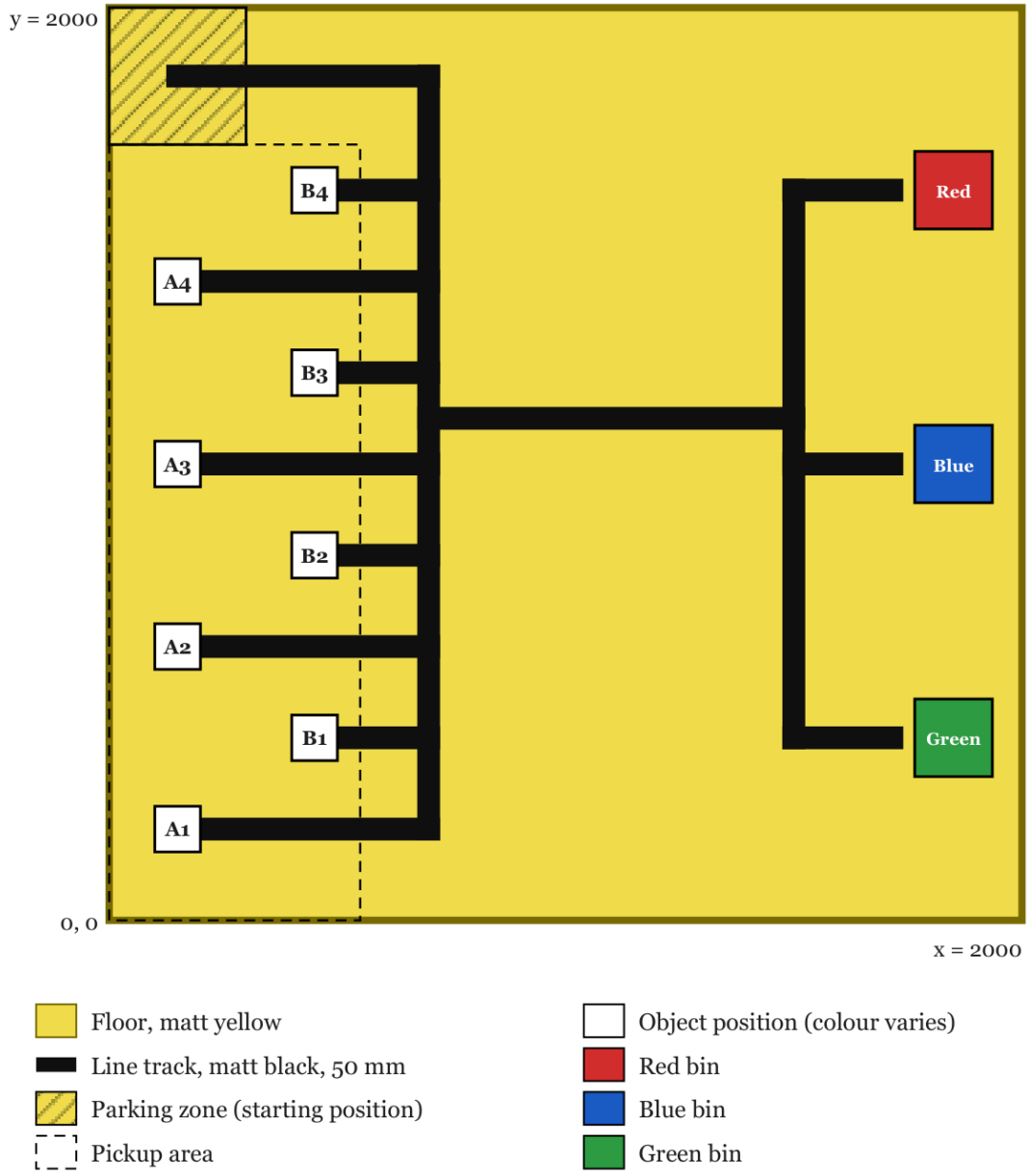


Figure 1. Plan view of the arena in its real colours, drawn to scale. A1 to A4 and B1 to B4 are the 8 object positions; the colour of the object at each position varies between rounds. The key is part of the figure.

2. Fixed dimensions

Element	Dimension (mm)	Tolerance (mm)
Arena, between the inner faces of the boundary wall (x × y)	2000 × 2000	±10
Boundary wall height above the floor	100	±5
Boundary wall thickness	12	±2
Pickup area (x from 0 to 550, y from 0 to 1700)	550 × 1700	±10
Parking zone (x from 0 to 300, y from 1700 to 2000)	300 × 300	±5
Line width (every line of the line track)	50	±2
Object size, every object is a cuboid (width × depth × height)	100 × 100 × 150	±5
Distance between object centres in the same row	400	±5
Distance between the two object rows (centre to centre)	300	±5
Bin, outer size (width × depth)	170 × 170	±5
Bin opening, inner size (width × depth)	150 × 150	±5
Bin rim height above the floor	200	±5
Bin inner depth (rim to inner floor)	200	±5
Distance between bin centres	600	±5

3. Positions

3.1 Object positions. Each object stands upright, with its 150 mm side vertical, centred on the position below. Each position is the end of that object's branch line.

Position	x	y	Position	x	y
A1	150	200	B1	450	400
A2	150	600	B2	450	800
A3	150	1000	B3	450	1200
A4	150	1400	B4	450	1600

3.2 Bin positions. Each bin is an open-top box fixed to the arena floor with screws or brackets so that it cannot slide or tip, centred on the position below.

Bin	x	y
Red	1850	1600

Blue	1850	1000
Green	1850	400

3.3 Line track. Each line is 50 mm wide and centred on the coordinates below. Lines meet at right angles.

Line	From (x, y)	To (x, y)
Parking line	150, 1850	700, 1850
Left trunk	700, 200	700, 1850
Branches of A1 to A4	150, y of the object	700, y of the object
Branches of B1 to B4	450, y of the object	700, y of the object
Centre line	700, 1100	1500, 1100
Right trunk	1500, 400	1500, 1600
Bin branches (red, blue, green)	1500, y of the bin	1715, y of the bin

Each bin branch ends 50 mm short of its bin. The branches of A1 to A4 and B1 to B4 and the parking line join the left trunk from the left. The centre line leaves the left trunk to the right.

4. Surface and boundaries

4.1 The arena floor is 12 mm plywood or MDF, painted matt yellow. The boundary wall is 12 mm plywood or MDF, painted matt yellow on its inner face. No glossy or reflective finish is permitted, since glare interferes with sensors. Floor joints must be flush, with no step of more than 1 mm.

4.2 The line track is matt black paint or matt black electrical tape.

4.3 There are no internal walls. The robot navigates by following the line track.

4.4 Each contact between the robot and the boundary wall is counted under Judging Rubric §2.3.4. A robot that climbs over or otherwise fully crosses the boundary wall and leaves the arena has its run ended at that point (Rulebook §4.5(e)), and is scored on what it had completed up to that point (Rulebook §4.8).

4.5 Contact between the robot and a bin or an object is not a wall contact and is not penalised. If a bin comes loose during a run, the run continues and the bin is fixed again before the next run.

5. Objects, bins and colour standard

Element	Colour	Print reference	Physical material	Mass
Floor	Yellow	Yellow acrylic paint (lemon yellow), matt	Plywood or MDF	Not applicable
Line track	Black	Matt black paint or matt black electrical tape	Not applicable	Not applicable

Red (hazardous) object	Red	Red acrylic craft paint (fire-engine red)	Solid cuboid, 100 × 100 × 150 mm, of epoxy resin or wood. No LED or other light source	150 to 250 g
Blue object	Blue	Blue acrylic craft paint (royal blue)	Hollow cuboid, 100 × 100 × 150 mm, closed on all six faces, made of cardboard or thermocol	20 to 100 g
Green object	Green	Green acrylic craft paint (grass green)	Hollow cuboid, 100 × 100 × 150 mm, closed on all six faces, made of cardboard or thermocol. No balloon is used	20 to 100 g
Red bin	Red	Red acrylic craft paint (fire-engine red)	Open-top box per §2 and §3.2	Not applicable
Blue bin	Blue	Blue acrylic craft paint (royal blue)	Open-top box per §2 and §3.2	Not applicable
Green bin	Green	Green acrylic craft paint (grass green)	Open-top box per §2 and §3.2	Not applicable

5.1 Every object and every bin has a matt finish. No glossy, reflective or transparent surface is permitted. Blue and green objects are identical except for their colour.

5.2 A school that built balloon objects for its practice replica replaces them with green objects to this specification. A red object built to the version of 9 October 2026 (epoxy block with an LED) still meets §5 once its LED is removed or permanently switched off.

Lighting is normal indoor lighting.

6. What varies between rounds

Element	Varies how	Range
Colour of the object at each of the 8 positions	Randomised each round. The Event Head draws one colour layout by lot before each round. Every team in that round runs on the same layout. The layout is not shown to teams before their run.	Any mix of red, blue and green summing to 8 objects, including all 8 of one colour or none of a colour
Which object of a given colour stands at a position	May change between runs	Any object that meets §5

7. What never varies

7.1 Everything in §2 to §5 is fixed for the whole event, including every position in §3. Only the colours in §6 vary. Emptying a bin under §9.2 does not change any position.

8. Line track use

8.1 Once the robot has lifted an object, it may follow that object's branch line to the left trunk, then the centre line to the right trunk, then the bin branch to the bin. Each bin branch leads to

the same bin for the whole event.

8.2 The robot is intended to reach its target bin by following the line track (for example with an IR sensor array) rather than by mapping or vision-based navigation, since the whole track is fixed for the event.

8.3 Each A branch passes between B positions. The distance from the centre of an A branch to the nearest face of a B object is 150 mm. For example, the A2 branch (y = 600) passes B1, whose top face is at y = 450, and B2, whose bottom face is at y = 750. A robot 250 mm wide that is centred on the line clears each B object by 25 mm.

9. Placement in a bin

9.1 An object is placed only when it lies fully within the bin with no part protruding above the rim. Objects are carried and placed, not pushed, across the arena (Rulebook §4.4).

9.2 A bin holds one object at a time. As soon as the judge panel records an object as placed, the bin marshal lifts it out of the bin by hand and puts it outside the arena. The object stays placed and keeps its points (Judging Rubric §2.3.1). The bin is then ready for the next object.

9.3 The bin marshal stands outside the boundary wall behind the bins (x greater than 2000) and reaches in over the wall. The marshal never touches the robot. If any part of the robot is within 100 mm of the bin, the marshal waits until it moves away. A marshal's accidental contact with the robot is not human intervention and is not penalised.

9.4 If the robot puts a second object in a bin before the marshal has emptied it, each object is judged separately against §9.1. An object resting on another object normally protrudes above the rim and is then not placed.

Changes in this version

Version 2 of 5 November 2026 replaces the version of 9 October 2026. Every change is listed below and highlighted in the text.

Clause	Was (9 October 2026)	Now (5 November 2026)
§2, object row	Object, bounding size	Object size, every object is a cuboid
§3.2	Each bin is an open-top box standing on the floor	Each bin is fixed to the floor with screws or brackets so that it cannot slide or tip
§4.5 (new)	Not covered	Touching a bin or an object is not a wall contact and is not penalised; a loose bin is fixed before the next run
§5, red object	Epoxy-resin block with a red LED lit steadily by an internal battery	Solid cuboid of epoxy resin or wood, painted red. No LED or other light source (the LED had no role in the rules or scoring)
§5, blue object	Hollow shape of cardboard or thermocol that fits within 100 × 100 × 150 mm and is at least 140 mm tall	Hollow cuboid, 100 × 100 × 150 mm, closed on all six faces, cardboard or thermocol
§5, green object	Foam-filled balloon on a 100 × 100 mm card base	Hollow cuboid, identical to the blue object except for colour. No balloon

§5.1 (new)	Matt finish required only for the floor and wall (§4.1)	Every object and every bin is matt; no glossy, reflective or transparent surface
§5.2 (new)	Not covered	Schools replace practice balloons with green cuboids, and remove or switch off the LED in practice red objects
§6	Randomised each round; any mix summing to 8	One layout per round, drawn by lot by the Event Head, the same for every team, not shown before the run; includes all 8 of one colour or none of a colour
§6, new row	Not covered	Which physical object of a colour stands at a position may change between runs
§7.1	Only the colours in §6 vary	Adds: emptying a bin does not change any position
§8.3 (new)	Not covered	Clearance between an A branch and the B objects: 150 mm from line centre, 25 mm for a 250 mm robot
§9.2 (new)	Not covered. A bin could hold only one object, so no run could place all 8	The bin marshal empties each bin as soon as a placement is recorded; the object keeps its points
§9.3 (new)	Not covered	Where the marshal stands; never touches the robot; waits if the robot is within 100 mm; accidental contact not penalised
§9.4 (new)	Not covered	A second object put in a full bin is judged on its own under §9.1