www.tekacko.cz
facebook.com/tekacko

TKAC TECHNOLOGICKÝ KLUB ALBRECHTICE

Královéhradecký kraj

NAD ORLICÍ o.p.s.

TÉKÁČKO

organizes a competition

ROBOTRACK

ORIENTAČNÍ BĚH ROBOTŮ

2026

1. Introduction

The competition entitled ROBOTRACK – ROBOT ORIENTEERING is organized by the Technology club of Albrechtice nad Orlicí (TÉKÁČKO).
The competition is intended for elementary and high school students who are interested in new technologies and robotics and are members of interest groups, for example.

The competition will take place **on March 25, 2026,** starting at 9:30 a.m. at the SK Týniště nad Orlicí Sports Hall, Družstevní 936. A detailed schedule will be sent to registered teams by March 3, 2026, at the latest.

Contact details for the organizer:

Organizational matters	m.vilimkova@tekacko.cz
Technical matters	j.jasansky@tekacko.cz

2. competition teams

2.1. Competition teams for the CONTROLLED ROBOT ORIENTEERING discipline

Competing students will form teams of one to three members. The team captain will be an adult, e.g., a teacher, hobby club instructor, etc. However, the captain may only act as a mentor during the competition (i.e., they may not interfere with the work of the competing team).

Teams will be divided into two categories:
Younger students' category – children attending grades 1 to 5 of elementary school
Older pupils' category – children attending grades 6 to 9 of elementary school or the corresponding grades of multi-year grammar schools.
Each competition team may present itself under its own name and create its own profile for this occasion (team name, team logo, clothing, etc.), but this is not a requirement and does not affect the evaluation.

Teams can register for the competition using the registration form attached to these rules.

The entry fee of CZK 150 per competing student will be collected in cash upon arrival at the competition. The entry fee will be used to provide refreshments for the competitors.

2.2. Competition teams for the AUTONOMOUS ROBOT ORIENTEERING discipline

Competing students will form teams of one to three members. The team captain will be an adult, e.g., a teacher, hobby club instructor, etc. However, the captain may only act as a mentor during the competition (i.e., they may not interfere with the work of the competing team).

Teams will be divided into two categories:
Younger students' category – children attending grades 1 to 9 of elementary school or the corresponding grades of multi-year grammar schools.
Older pupils' category – students attending secondary school
Each competition team may present itself under its own name and create its own profile for this occasion (team name, team logo, clothing, etc.), but this is not a requirement and does not affect the evaluation.

Teams can register for the competition using the registration form attached to these rules.

The entry fee of CZK 150 per competing student will be collected in cash upon arrival at the competition. The entry fee will be used to provide refreshments for the competitors.

3. Tasks for competition robots:

3.1. FIRST DISCIPLINE – ORIENTEERING RUN BY CONTROLLED ROBOTS

The competition area is a field with posts containing chip card readers. Hereinafter referred to as controls. The maximum guaranteed range of the reader in relation to the chip card is 5 cm, but the actual range may be greater.

There are 5 x 5 control points on the field at a distance of **1 m** and a start control point.

Diagram of the field with control points:

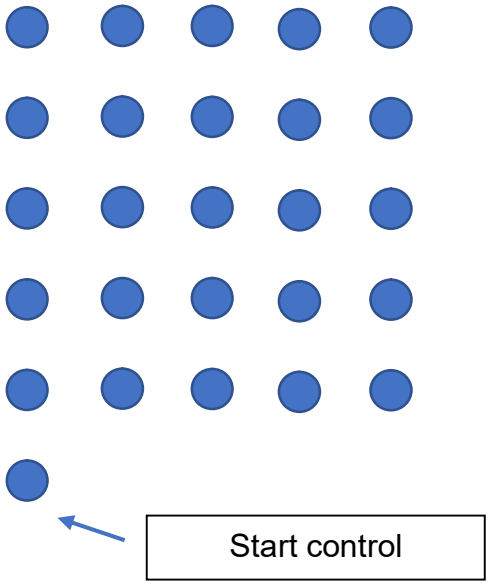
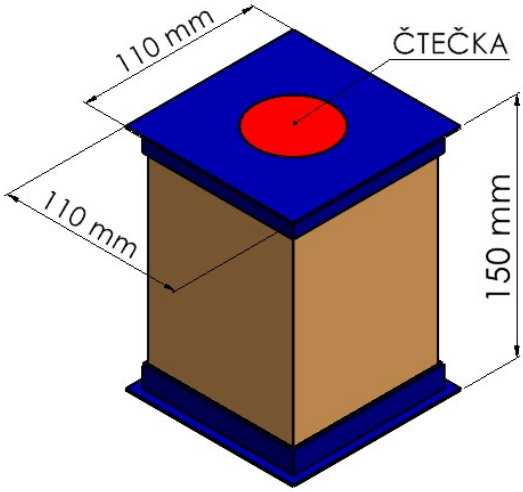


Diagram of the chip reader location at the control point:



At the start of the race, the members of the competing team place their robot in the starting zone and wait for the light signal from the starting control. The robot leaves the starting zone and approaches the starting control so that the chip card placed on the robot is within approximately 5 cm of the reader, at which point the reader registers the robot's passage. When the robot passes through the reader at the start control, the time measurement begins and a randomly selected control in the control field lights up. The robot's task is to reach it (by the shortest route and as quickly as possible) and record its passage through the control with the chip card on the reader, which then lights up the next control. The robot thus completes its race with six randomly selected checkpoints in the field, with the time measurement ending when the time is recorded by the reader at the last, i.e., sixth checkpoint.

Random selection of checkpoint combinations means that individual competing robots will encounter different sequences of checkpoints, but the optimal route length is the same for all competing teams.

The robot will have a maximum time limit for completing the course. A penalty time will be added for each checkpoint not passed.

If a competing robot touches a checkpoint and, for example, moves it, knocks it down, etc., a time penalty will be added.

Each robot will have two attempts. The better time will count towards the evaluation.

3.2. SECOND DISCIPLINE – ORIENTEERING RUN FOR AUTONOMOUS ROBOTS

The competition area is a field with obstacles containing a chip card reader. Hereinafter referred to as checkpoints. The maximum guaranteed range of the reader in relation to the chip card is 5 cm, but the actual range may be greater. The race field contains 6 checkpoints and a start and finish checkpoint. The checkpoints are 1.5 to 2 m apart. Upon registration, competitors will receive a map with the locations of the individual checkpoints using orientation angles.

Diagram of the race area with the location of the controls:

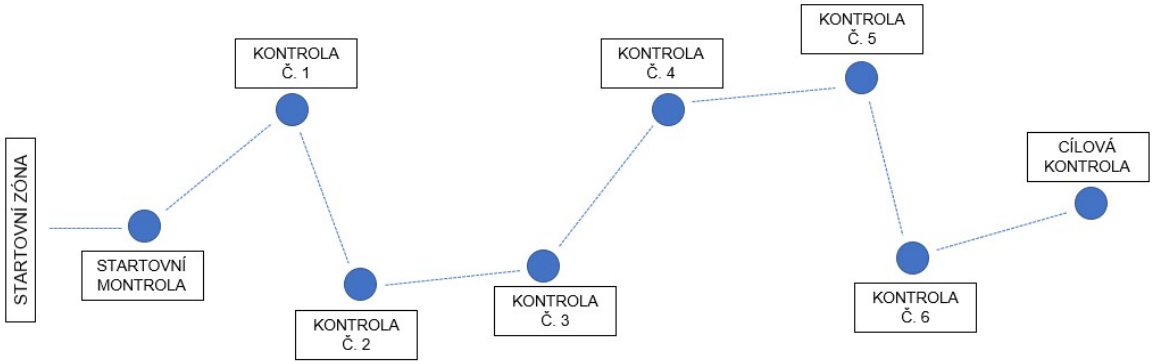
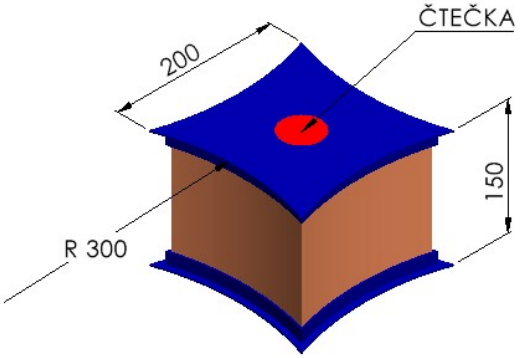


Diagram of the chip card reader location at the control point:



The aim of the competition is to complete the course and record passage through all checkpoints in the given order in the shortest possible time. During the race, split times at individual checkpoints will be recorded and displayed, including the current ranking.
At the start of the race, the members of the competition team will place their robot in the starting zone and wait for the light signal at the starting checkpoint. The robot will leave the starting zone and approach the starting checkpoint so that the chip card placed on the robot is within approximately 5 cm of the reader, at which point the reader will record the robot's passage. When the robot's passage is recorded by the reader at the starting checkpoint, the time measurement begins and the checkpoint lights up.
The robot searches for the nearest checkpoint No. 1, which will be at a predetermined distance (approximately 1.5 to 2 meters), and drives to it so that the distance of the chip card is a maximum of 5 cm from the reader, while the robot must not touch or knock down the checkpoint (otherwise it will receive a penalty). The robot then continues by searching

for the next checkpoint at the given distance, with only one checkpoint located at this distance (except for the one just recorded). The final time is recorded when the robot passes the last checkpoint. If the robot fails to record passing a checkpoint, it will be disqualified from the race. The competition team completes one test run (optional) and two competition runs, with the run with the shorter time counting towards the overall ranking.
The robot will have a maximum time limit for completing the track. A penalty time will be added for each checkpoint not passed.

4. Robot construction and

a) The task of the competing teams is to build a robotic vehicle (robot) using LEGO, Merkur, 3D printed parts, etc., in each case of their own design.

b) The external dimensions of the robot (width x length) are recommended to be approximately 200 x 300 mm, although no hard limits are present. It is important to remember that the robot will move between checkpoints, which are always 1 m apart at their centers.

c) Each robotic vehicle will include a place to attach a chip card for recording passage through the checkpoints. The design and location of the chip card attachment is at the discretion of each team, so that the chip card placed on the robot can be brought within a maximum distance of 5 cm from the reader at the checkpoint. The chip card holder must not shield electromagnetic radiation (the timing system is based on RFID technology).

d) Each team will receive a chip card at the beginning of the competition during the technical inspection. The dimensions of the chip card are the same as those of a standard payment card (width x length x thickness = 53 x 85 x 1 mm).

e) Any technology (e.g., ultrasonic or laser distance measurement, etc.) may be used to locate the controls in the Autonomous Robot Orienteering discipline.

f) Only finished and programmed robots can be entered into the competition. A technical inspection will take place at the beginning of the competition.

g) Each team may have one robot for each discipline.

h) The LEGO Mindstorms EV3 control cube can be used to control the robot, or a control mechanism can be assembled using programmable Arduino, ESP32, or similar boards. The actual mechanical control of the robot is arbitrary (e.g., tank control, steerable axle). The robot can be controlled in the Controlled Robot Orienteering discipline using, for example, an infrared controller, Wi-Fi, or Bluetooth connection (mobile app).

5. Final evaluation

The final evaluation in each category and discipline will be based on the best time achieved; with the team whose robot completes the course the fastest winning.

The winning teams will receive a valuable prize. A prize will also be awarded for the best design solution. All participants in the competition will receive a diploma and a small prize.

COMPETITION REGISTRATION

ROBOTRACK ORIENTAČNÍ BĚH ROBOTŮ

ORIENTEERING RUN OF CONTROLLED ROBOTS

TEAM (name):

student's name ..... school grade .....

student's name ..... school grade .....

Student's name ..... school grade .....

Captain's name .....contact number .....

Email .....

SCHOOL or AFTER-SCHOOL CLUB

School or club name

Date and signature of team captain .....

ORIENTEERING RUN OF AUTONOMOUS ROBOTS

TEAM (name):

Student's name ..... school grade .....

Student's name ..... school grade .....

Student's name ..... school grade .....

Captain's name ..... Contact number .....

Email .....

SCHOOL or INTEREST GROUP

School or club name .....

Date and signature of team captain .....

Please send your application to m.vilimkova@tekacko.cz by March 3, 2026.