

# M I S S I O N HORIZON

LOOKING TO THE FUTURE



Now is the time to dream. Dream about the future. What will life be like in 50 years, 100 years, or 200 years from today? Nobody knows. But there is one thing for sure, space is where we are headed.

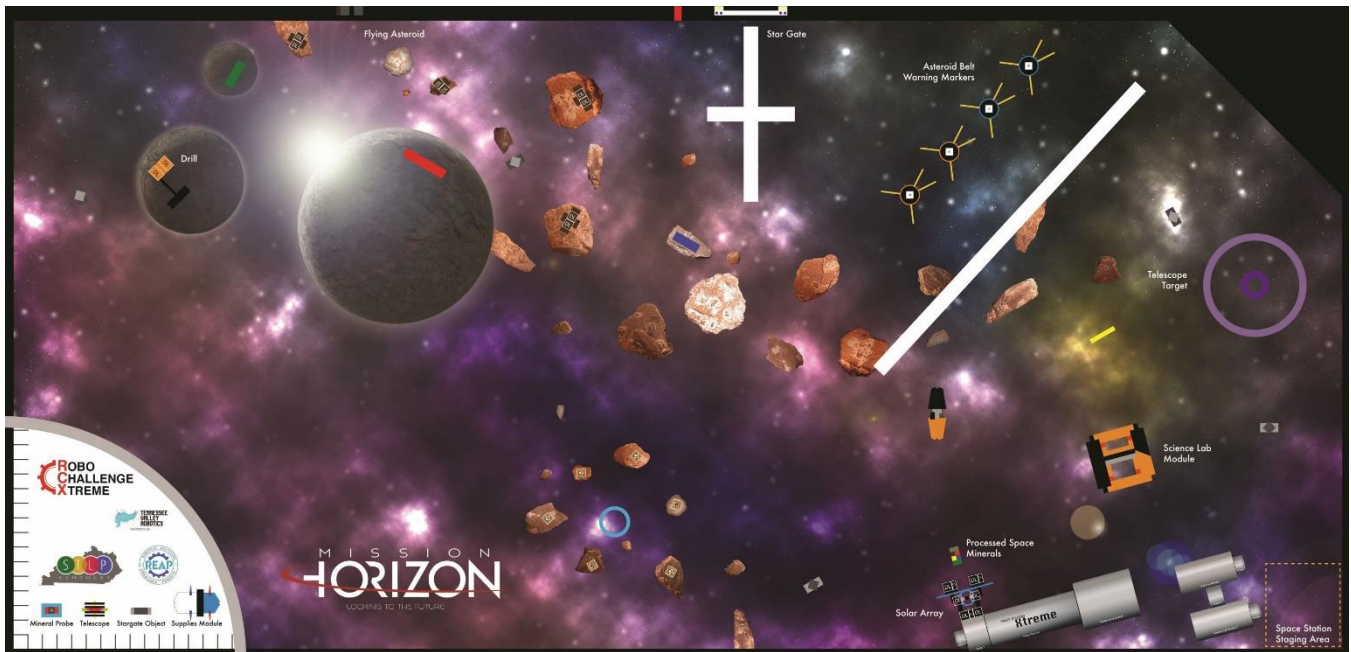
Today, world agencies like NASA, schools like Arizona State University, and private companies like SpaceX are taking steps to turn space exploration into reality. A base on the moon, a base on Mars, and even space travel for common people are all probabilities for your generation. In the 1960's TV show Star Trek, they used a fictitious device called a communicator. Today we call it the "flip phone". It is amazing how a dream has turned into reality.

So this year's challenge will take you on a ride to a distant asteroid belt to explore and locate minerals for the sustainability of life in space. Think beyond reality to what things could be like. Life will be hard in space, but the rewards will be great.

Now, let's set the stage for this year's challenge. You are stationed on a distant moon. Your tasks will include researching asteroids to find minerals. Transporting supplies and other duties to maintain Space Station Xtreme. Traveling through an asteroid belt to deliver a telescope, plus a few other things. The challenge is for you to design, construct and program a robot to accomplish these tasks. Life in space is hard, and so will the Mission Horizon Challenge. Are you up for it?

***This document is meant to be used in conjunction with other videos and documents for the Mission Horizon, Looking to the Future Challenge. Go to the RCX Program website, click on the Mission Horizon tab for a list of videos and documents. Review the videos and documents before you start. Review the videos and documents for the correct construction and placement of the Mission Objects on the mat: at the start of the Match and at the end of the Match. The videos and documents will show the correct location for how to score each Mission Object.***





## The Challenge

Remember, as your team strategizes how to approach these missions, a mission may be attempted multiple times, missions may be attempted in any order, missions may be attempted in conjunction with other mission. If there are multiple parts to the mission, like the Touch Penalty and Space Minerals, you may recover any number of mission objects back to the Safe Zone to receive a score throughout the Match. Follow the Mission instructions. Pay attention to the wording of the mission like “in”, “on”, “touch”, “not touching” and so on.

Your team will have 3 minutes to complete as many of these missions as possible. Your team’s efforts will be scored, as if a picture in time, at the end of the Match when the clock strikes 0:00. Touch Penalties and the Star Gate Object will be scored during the Match.

Make sure to review all support videos and documents for this year’s challenge. Make sure to review the General Rules. The General Rules have been updated for 2019.

Now let’s get started with a description of the missions. We will start in the Safe Zone and work our way around the board in a clockwise fashion to explain the mission.



# The Missions

**Grey Asteroids, Touch Penalties** Leave these asteroids on the on the mat for a score, or recover them to the Safe Zone for a higher score. Don't touch your robot outside of the Safe Zone for the highest points possible. Each time you touch your robot outside of the Safe Zone you lose 1 Asteroid.

0 Points, if taken by the referee for Touch Penalty  
5 Points each, on the mat anywhere, **maximum 25 Points**  
10 Points each, recovered to the Safe Zone, **maximum 50 Points**

**Mission 1: Team Space Probe** Design and construct a space probe. Must be constructed of multiple LEGOs. Must have a moveable arm. Must have a satellite dish to communicate with command. Show and demonstrate your Space Probe to the referee for a score.  
**25 Points**

**Mission 2: The Drill** Activate the Drill on a nearby moon to collect core samples.  
**25 Points**

**Mission 3: Flying Asteroid** Watch Out! Asteroids move in space. Lift the arm on this Mission Object so that the asteroid is located outside of the playing area.  
**30 Points**

**Mission 4: Star Gate** Deliver the Star Gate Object to Space Station Xtreme. But wait, you need to deliver your Star Gate Object to the Space Station Staging Area of the mat next to the North Wall. Partially or completely in the area scores.  
*Object will be removed by the referee form the opponents table as soon as possible to avoid any conflict for them.*  
**50 Points**

**Mission 5: Asteroid Belt Warning Markers** Let's see how savvy you are. This is not easy, but the rewards are great. There are 4 Warning Markers. The arm will start in position "0". Program your robot to move the markers to the position on the mat that matches the Location Code provided to you by the referee at the beginning of each Match. There are 8 different Location Codes possible. The more markers you position correctly, the higher your score. Each marker scored separately. The more markers repositioned to the correct location, the higher your score.  
**1 Marker 15 Points, 2 Markers 30 Points, 3 markers 60 Points, 4 markers 120 Points**

**Mission 6: Telescope** Deliver the Telescope to the Telescope Target area on the mat. The telescope must touch the mat. The closer the telescope is to the center, the higher the score.  
**Outer Ring 30 Points, Inner Ring 45 Points**



**Mission 7: Space Station Xtreme** The space station is the center of life for our crew. Support and maintain the space station. Each mission scored separately.

**7A: Science Lab** Reposition the Science Lab, such that it is over, or touches, the Multi-purpose Module and the Exercise Module at the same time.

**40 Points**

**7B: Maintenance Module** Place the Maintenance Module over any part of the grey area of the space station.

**35 Points**

**7C: Supplies Module** Place the Supplies Module over an Airlock. The higher the Airlock number, the greater the score.

**Airlock 1-30 Points, Airlock 2-40 Points, Airlock 3-50 Points**

**7D: Solar Array Repair** Reposition the Orange Solar Array downward.

**40 Points**

**7E: Relocate Solar Array** Relocate the Solar Array to the opposite side of the Truss. NO additional supporting LEGOs may be used to hold the Solar Array in the relocated position.

**40 Points**

**7F: Processed Space Minerals** Not easy. Relocate the Processed Space Minerals between the feet of the Truss. Partially or completely, must be touching the mat to score.

**30 Points**

**Mission 8: Mineral Probe** Place the Mineral Probe over the blue ring on the mat. Probe must cover part of the ring to score.

**25 Points**

**Mission 9: Space Minerals** To survive in space, recover the colored Space Minerals to the Safe Zone. The more minerals you recover to the Safe Zone, the higher your score.

**1 Mineral 15 Points, 2 Minerals 30 Points, 3 Minerals 45 Points, 4 Minerals 75 Points**



**Mission 10: Black Hole**

The Quad Platform is a Black Hole. Be careful!

**10A: Team Space Probe from Mission 1** Research the Black Hole. Relocate the Team Space Probe to the Quad Platform.

- Completely under the Quad Platform scores. **40 Points**
- On top of the Quad Platform scores. Must touch the Quad Platform. May not be in the control or possession of the robot. **50 Points**

**10B: Robot Probe** Research the Black Hole with your robot. Program the robot to climb onto the top of the Quad Platform. Follow Quad rules for the robot outlined in separate document.

**75 Points**

**Mission 11: Astronauts**

**11A: Drill Worker** Place an astronaut on the moon with the Drill. Partially or completely on the moon. Must be touching the mat. **20 Points**

**11B: Space Station Worker** Worker Place an astronaut on the Living Quarters Module. Partially or completely. Can touch the mat or be in a capsule. **35 Points**

**Maximum 860 Points**

