



# 2021 Kerbal Rocketry Challenge Rules

## OVERVIEW

Congratulations! You and your team have been invited to the second annual Kerbal Rocketry Challenge. This year, you will be tasked with building a self-sustaining base on the Moon (Mun, in Kerbal-language).

## OBJECTIVE

Teams must construct a self-sustaining Mun base that can safely house astronauts, or in this case “kerbals”. To ensure longevity of the base and the kerbals, the base must also include a functional In-situ Resource Utilization (ISRU) module(s). This challenge will require you to construct rockets that can land these modules safely and accurately—you’ll want to land in a consistent location to ensure the materials you’re launching are close to each other on the Mun in your quest to create a realistic base. You will have 500,000 in funds to accomplish this mission. For this mission, your team will need to download the official [2021 Kerbal Rocketry Challenge Save File](#). Instructions for loading this save file are found at the end of the rules.

## PRIZES

The first place team will receive \$3,000 and second place team will receive \$1,500.

## SCORE

Each team’s submission will be scored based on how many of the objectives you achieve below, with each objective worth one point.

- Housing and containing 3 kerbals in habitation module(s) on the Mun.
- Housing and containing 5 kerbals in habitation module(s) on the Mun.
- Housing and containing 8 kerbals in habitation module(s) on the Mun.
- Filling up the liquid fuel and oxidizer of a **completely empty** Rockomax X200-16 in under 8 hours of MET (we encourage you to use the time warp feature to speed up the process).

Teams that achieve all objectives will be judged on the following criteria in order of importance:

1. How much time it takes to fill up the liquid fuel tank.
2. The distance between the modules of the Mun base in meters, with closer being better.
3. The number of additional habitation modules present as part of the base, with more modules being better. These modules do not have to hold kerbalnauts.

A habitation module is defined as a part with a set crew capacity and slots to accommodate kerbalnauts but cannot control a craft. Three habitation modules are usable in the challenge: the PPD-10 Hitchhiker Storage Container, the Mk1 Crew Cabin, and the Mk2 Crew Cabin.

Timing for filling the Rockomax X200-16 begins once you take your screenshot of your empty tanks and begin filling the empty tank via the in-game ISRU system. You cannot fill it with fuel from another tank, but you may have a full ore tank with ore mined from the Mun.

The last two screenshots will be used to judge your achievement of the ISRU requirement of the objectives. After you have collected ore from the Mun in your ore storage tank, you may decide to begin your ISRU conversion. When you reach this point, we ask you to pin the menu for your empty fuel tank and the menu for your ISRU modules TURNED OFF. After you take your screenshot, the clock on your ISRU production begins.

## SUBMISSIONS

Teams must upload their save file and screenshots to the American Rocketry Challenge online portal. Only one submission is permitted per team. The deadline for uploading your submissions is 11:59 PM EST on August 8. Winners will be announced at our live awards ceremony on August 16.

As proof, your team will need to provide:

- A .ZIP folder containing your submission's save file
- Multiple screenshots, with the user interface visible, displaying:
  - Take screenshots of all rockets that will be used throughout your mission on the launch pad
  - Take a screenshot of your habitation modules on the Mun
  - Take a screenshot of your game showing empty fuel tank and every ISRU module turned OFF. If there is fuel in your tank, you must use the FTE-1 Drain Valve to drain the tank of its contents. We must also see your Mission Elapsed Time (MET) in the upper left corner
  - Take a screenshot of your full fuel tank on the Mun. We must also see your MET in the upper left corner once your tank has filled.

## SCREENSHOT INSTRUCTIONS

1. Take a screenshot of your rocket(s) on the launchpad before launching.
2. Once you land on the Mun, take a screenshot of the habitation module(s) on the Mun.
3. Once you have landed all necessary ISRU technology on the Mun, you will need to empty your Rockomax X200-16 tank using the FTE-1 Drain Valve if it isn't already empty
4. Left-click the Rockomax X200-16 tank and use the "pin" icon to pin the tank to your screen.
5. Left-click each of the ISRU module(s) and use the "pin" icon to show each of the ISRU modules turned OFF.
6. Click the alarm clock in the upper left corner to display MET. If you see UT, click the clock again to switch to MET.
7. Take a screenshot of your empty Rockomax X200-16 and ISRU modules with all pinned menus showing and with MET in the upper left corner of your screenshot.
8. Turn on ISRU module(s) immediately and begin producing fuel and oxidizer. This is when the time begins on your ISRU production.
9. Once you have completely filled the Rockomax X200-16 fuel tank with liquid fuel and oxidizer, left-click on your tank and pin the menu to the screen.
10. Take a screenshot showing the menu for the completely full tank and with MET showing in the upper-left corner of your screen.

MET can be seen in  
the upper left

ISRU converter and Rockomax  
X200-16 menus pinned and visible



## REQUIREMENTS

Your team's submission will also need to comply with the following rules:

- All submissions must be played on the game's "Career" mode using the official save file found on page three.
- All modules of your Mun base must be within 150m of each other.
- All kerbals must be inside habitation modules to count towards scoring.
- The Rockomax X200-16 fuel tank must be **completely empty** before you begin your ISRU liquid fuel and oxidizer production
- A team's final submission must use the provided save file.
- No additional technologies, buildings, or contracts may be used in your submission.
- Teams may not use any of the banned parts listed in the "Banned Parts" section.
- No add-ons, modifications, or other downloadable content other than the American Rocketry Challenge Flag Pack may be used.
- No cheats, console commands, exploits, or techniques such as part clipping may be used in a submission.

## JUDGING

A group of American Rocketry Challenge judges will review each submission to ensure it abides by the requirements, and no mods, add-ons, or exploits were used in the design of the rocket.

## OFFICIAL SAVE FILE

[Click here to download the "2021 Kerbal Rocketry Challenge Save File."](#)

To load the save file, first extract the files from the .ZIP folder. Then, go to the "saves" folder in your game's root directory and drag the extracted "KRC" folder into your "saves" folder.

[Click here for instructions on finding your game's root directory.](#)

Teams are free to experiment and practice using other save files, but your submission must use the provided save file.

## CLARIFICATIONS

- The 500,000 Funds can be used in any way the team sees fit to complete the mission.
- Recovering parts and modules to recover funds is allowed.
- No other method of generating additional funds besides recovering parts is allowed.
- If you own official DLC for Kerbal Space Program, it must be disabled while you are competing and cannot be used in your official submission.
- Your ISRU production time begins as soon as you take your screenshot of your empty fuel tank and turn on your ISRU converters.
- You are allowed to fill up ore tanks with ore mined from the Mun before starting your ISRU conversion. The time spent mining ore will not count toward ISRU production time.

## TIPS AND TRICKS

Kerbal Space Program has tutorials on how to operate various aspects of the game. Under “Start Game”, you should see a “Training” option. This series of missions will help you become acquainted to the game if you are new, or if you need a refresher.

All trainings leading up to and including “To the Mun, Part 1 & Part 2,” are useful for learning how the game works. Completing these missions will allow newer players to become acquainted with game mechanics and aspects of the Kerbal Rocketry Challenge mission. However, these trainings are not required.

Additionally, the Kerbal Space Program wiki is a comprehensive resource that contains data about any aspect of the game including launching, parts, planets, and much more! If you find yourself confused, using the wiki can help you get an in-depth explanation.

You may use FTE-1 Drain Valve to drain the fuel from a Rockomax X200-16 to empty the tank before you record your ISRU production. This part will allow you to empty the tank completely before submitting a screenshot of your tank.

It is **strongly encouraged** that you fill up tanks with ore mined from the Mun before beginning your ISRU conversion into liquid fuel and oxidizer. This will allow your ISRU converter to be more efficient.

## BANNED OR LIMITED PARTS

Your team may not use the parts listed below in your submission for the competition:

- EAS-1 External Command Seat
- LV-N "Nerv" Atomic Rocket Motor
- MK-3 Passenger Module