

## Lunar Landing Gear **Be New Soon!**

### Lunar landers and others are on their way.

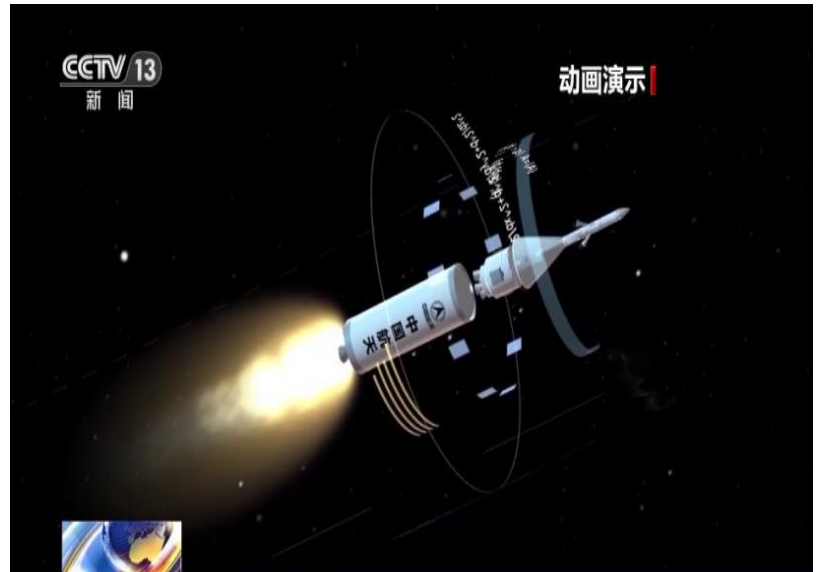
China plans to achieve a manned landing on the Moon by 2030, and to accomplish this task. China is developing the Long March 10 launch vehicle. The new-generation manned launch vehicle, named Long March 10, has been designed in two configurations, the first with boost, which is mainly responsible for sending the lunar lander and the lunar landing craft into the Earth-Moon transfer orbit. Because of the long delivery distance, the rocket thrust is higher in this configuration. The height is about 92 meters, the take-off mass is about 2,187 tons, and the take-off thrust is about 2,678 tons.

At present the development work is in the process of orderly and rapid progress, the

typical characteristics of the launch vehicle is also the use of non-toxic and non-polluting liquid oxygen kerosene propellant, the core stage diameter of 5 meters, bundled with a 5-meter diameter booster. Of course, in order to meet the needs of manned landing on the moon, its biggest requirement is that the carrying capacity should be large, so its future lunar orbit carrying capacity is 27 tons, which is more than three times higher than that of the Long March 5, and the carrying capacity of the near-Earth orbit is about 70 tons, which is about three times higher than that of the Long March 5, which is roughly of the same order of magnitude.

## A new generation of manned spacecraft:

**Modular is more  
adaptable**



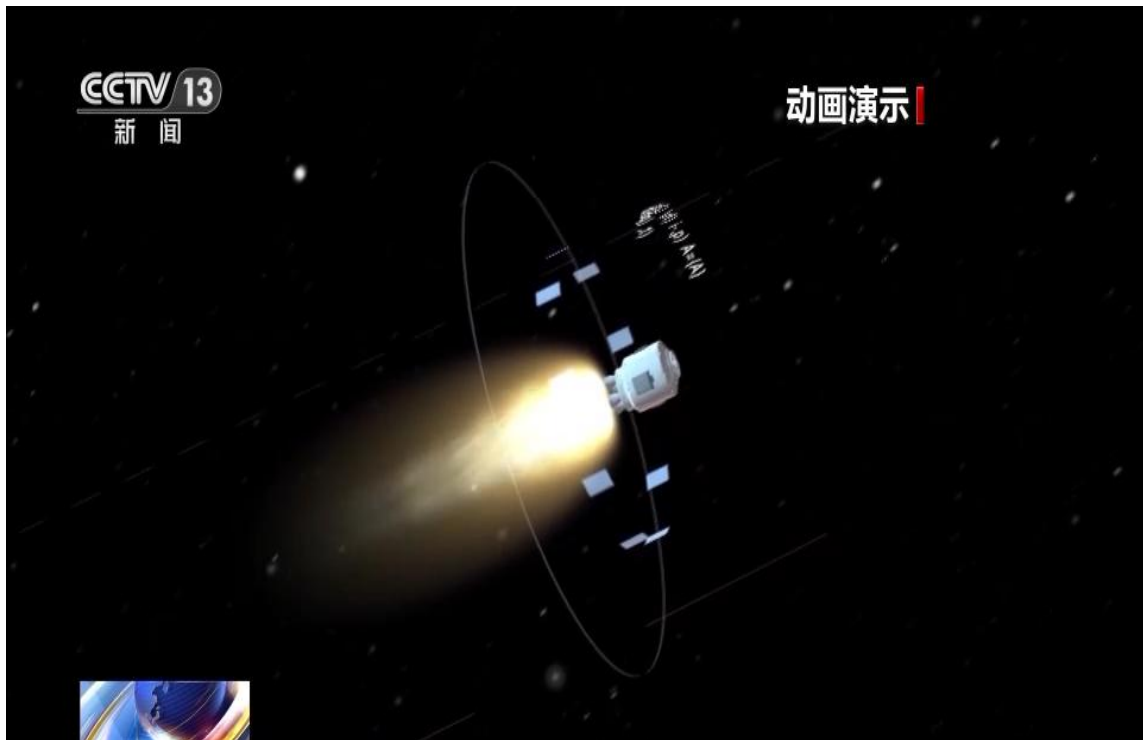
In addition, in order to optimize the operating cost of the space station operation phase, LM-10 has also designed another unboosted configuration, which can carry out the space station astronaut and cargo transportation tasks, and the first sub-stage of the unboosted configuration rocket will be designed according to the reusable design.

In addition to the features of the new generation of manned rockets for the Moon just described, this type of rocket has another outstanding feature, which is that it will further optimize the operating costs during the operation phase of the space station. Therefore, the first sub-stage of this type of rocket is currently designed according to reusability, and there is a relatively innovative reusability program. I believe that in a few years, these two types of rockets will meet you one after another.

## lunar lander:

**Lightweight design  
to control weight**





The reporter learned that the “Long March 10” satellite launch vehicle will go through several unmanned flights for verification before the first manned mission, and is expected to have the conditions for the first flight in 2027.

In addition to the new-generation manned launch vehicle, a new-generation manned spacecraft is also under development, which adopts a modularized design and adapts to the needs of near-Earth and deep-space missions. Zhang Hailian, deputy chief designer of China's manned spaceflight project, also introduced the relevant information at the 9th China International Commercial Spaceflight Summit Forum.

According to Zhang, the new generation of manned spacecraft is mainly used to send astronauts to circumlunar orbit and return to Earth, and consists of an escape tower, a return module and a service module.

Zhang Hailian, Deputy Chief Designer of China Manned Space Engineering Project: The escape tower is mainly used to take the return module away from the malfunctioning rocket once it fails during the ascent of the rocket to ensure the safety of the astronauts. The return capsule is the cockpit and control center of the astronauts, and the service module mainly provides propulsion and energy for the spacecraft. The orbiting mass of the spacecraft is about 26 tons, and it can take three astronauts.

In addition, on the basis of the new generation of manned spacecraft, China is also coordinating the development of near-Earth spacecraft.

In fact, is mainly to reduce the volume of the engine and propellant storage tanks. How to land on the moon after reaching lunar orbit?

Zhang Hailian, deputy chief designer of China's manned spaceflight program, yesterday introduced the design idea of the lunar lander. It is mainly responsible for landing the astronauts on the lunar surface from the circumlunar orbit and returning to the circumlunar orbit. The crew is 4 to 7 people, which also reserves space for subsequent space tourism. Return capsule, escape tower and moon landing spacecraft is basically the same, the service module in accordance with the requirements of the near-Earth mission to develop.

The lunar lander, which weighs about 26 tons, consists of a lunar module and a propulsion module, and can send two astronauts to the lunar surface. It adopts a lightweight design to improve structural efficiency and has power redundancy.

Moon Landing Module (MLM) is the space capsule, and the Propulsion Module (PM) is mainly responsible for completing the near-lunar braking of the lander near the moon, as well as the main deceleration of the lunar descent, which is extremely sensitive to the weight.

And therefore it needs to adopt a lightweight design, such as the integration of the design and so on, including the use of advanced materials and structural technology to improve the efficiency of the structure, and to strictly control the weight.

The lunar module is equipped with four 7,500N engines, which have certain power redundancy functions to ensure the safety of the astronauts, and at the same time, the lunar lander also has the ability to control the flight autonomously.

