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New rocket marks debut mission of launch center

By ZHAO LEI in Wenchang, Hainan
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China's carrier rocket fleet has expanded further, as the newest type in the Long March family, the Long March 12, made its debut flight on Saturday night from Wenchang, Hainan province.

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The flight also marked the first mission of the Hainan International Commercial Aerospace Launch Center, the nation's first spaceport dedicated to facilitating commercial operations.

As a large crowd of spectators gathered at the coastal launch complex, four liquid oxygen-kerosene engines on the rocket's first stage roared with dazzling flames at 10:25 pm, and the rocket rose into the night sky from the No 2 launchpad at the new space complex.

After a short while, two experimental satellites separated from the rocket and entered their preset orbit, marking the success of the launch mission.

Designed by the Shanghai Aerospace System Engineering Institute, the Long March 12 is the 22nd member of the Long March family, the backbone of China's space sector, and the 17th in the operating fleet.

The institute is part of the Shanghai Academy of Spaceflight

Technology, which belongs to the State-owned industry conglomerate China Aerospace Science and Technology Corp.

The Long March 12 is the first Chinese rocket with a diameter of 3.8 meters. Most Chinese rockets have a diameter of 3.35 meters, a standard width set in the 1960s due to rail transportation factors.

At 62.6 meters tall, the two-stage model is the second-tallest among all Chinese rockets, exceeded only by the 62.8-meter Long March 5.

The vehicle is propelled by engines fueled by liquid oxygen and kerosene and has a liftoff weight of more than 430 metric tons. It is capable of transporting spacecraft with a combined weight of more than 12 tons to a low-Earth orbit, or 6 tons of satellites to a typical sun-synchronous orbit at an altitude of 700 kilometers, according to the Shanghai academy.

The new model will effectively improve China's capability to send spacecraft to a sun-synchronous orbit and deploy satellite networks in low orbits, it noted, adding that research and development started in May 2020 and finished in June this year.

Xie Li, a senior designer of the new model, said the rocket features new technologies and equipment.

"It is the first Chinese rocket equipped with an automatic ignition-malfunction detection system. ... After the engines are ignited, the system



A Long March 12 carrier rocket blasts off at 10:25 pm on Saturday from the Hainan commercial spacecraft launch site, sending two experimental satellites into their planned orbits. LUO YUNFEI / CHINA NEWS SERVICE

will detect whether the engines are functioning well, and if the result is good, the system will unleash the hold-down clamps, allowing the engines to reach full power to lift off.

"When the rocket begins to fly, the system will continue performing real-time checks on the vehicle's condition, and if any anomaly occurs, the system will take necessary measures such as to replan the trajectory to make sure the satellites can be deployed into their preset orbit," he said.

Another advantage is that the new type needs a short time for prelaunch preparations at the service tower, which means that the launch facility can serve more space missions in a given time, thus enhancing the spaceport's operational efficiency, according to the designer.

In addition, the fuel tank of the

rocket's second stage is made of a cutting-edge aluminum alloy that boasts lighter weight and better strength.

"Compared with other types of aluminum alloy used on previous Long March-series rockets, the new material is up to 15 percent lighter in structural weight and 28 percent higher in tensile strength," Xie said.

Regarding the 3.8-meter diameter, he said that a wider body enables the rocket to have four engines on its first stage, while the 3.35-meter-wide models have two. Moreover, being wider means the rocket can contain more propellants. All of these give the new model a greater carrying capacity, he added.

The Long March 12 mission marked China's 59th space launch in this year and the 545th flight of the Long March family.

Long March 8 prepares for launch at Hainan center

By ZHAO LEI and CHEN BOWEN
in Wenchang, Hainan

The Hainan International Commercial Aerospace Launch Center in Wenchang, a coastal city in Hainan province, is preparing for its second mission: a launch of the Long March 8 carrier rocket, according to the new spaceport's general manager.

Liu Hongjian said at a news conference at the center on Saturday that the Long March 8 rocket has been transported to the center, and

engineers from all relevant parties have been busy working on its pre-launch preparations.

The launch is scheduled to take place at the No 1 launch pad before the end of this year, he said.

Located in Wenchang, the Hainan International Commercial Aerospace Launch Center is a joint venture of the Hainan provincial government and three State-owned space conglomerates, including China Aerospace Science and Technology Corp.

Construction of the center, which

began in July 2022, was undertaken by China Aerospace Construction Group.

Its No 1 launch service tower was completed in late December and is specifically tasked with servicing Long March 8 carrier rockets.

The second tower was finished in early June. It is capable of servicing 19 types of liquid-propellant carrier rockets, including those in the Long March family and models developed by private companies.

On Saturday night, a Long March 12 rocket was launched from the No

2 tower, marking the model's debut flight and the new center's first space mission.

"The No 2 tower is capable of servicing rockets of different sizes, ranging from the 3.35-meter-wide types to those with a 5-meter diameter. That means it is suitable for all of China's commercial rockets," Liu said. "Each of the two launch towers can facilitate up to 16 launches each year."

The commercial spaceport has become the fifth ground-based launch complex in China and the

first dedicated to facilitating commercial space missions, which are generally paid for by a business entity rather than government-funded programs.

The Wenchang Space Launch Center, the other spaceport in Hainan, is like the three other such centers in China — Jiuquan, Taiyuan and Xichang — administered by the central government and is primarily tasked with serving State programs such as lunar explorations and manned spaceflights.

Designed and built by the China Academy of Launch Vehicle Technology, a subsidiary of China Aerospace Science and Technology Corp., the Long March 8 has two

core stages and two side boosters. It has six engines propelled by liquid oxygen, liquid hydrogen and kerosene.

The model performed its debut mission in December 2020 from the Wenchang Space Launch Center.

The Long March 8 is capable of transporting various types of spacecraft to multiple types of orbit, but its main task is to place satellites in sun-synchronous orbit to meet the surging demand for launch services from commercial satellite companies at home and abroad, according to the academy.

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