

# More Room For Shenzhou

**Apart from an increase in the crew size and flight time, the most significant advancement of the Shenzhou 6 mission was the use of the Orbital Module. At last, China's astronauts could enjoy the additional living space this cylindrical unit provides.**

The Orbital Module for Shenzhou 6 is still circling the Earth, presumably carrying out an extended mission. It could remain in orbit for six months or more. So, with the crew of Shenzhou 6 safely back on Earth, attention must shift to this ongoing part of the flight.

What exactly is on board the Orbital Module of Shenzhou 6? It's a question that's largely unsettled. China has changed the payloads of its Orbital Modules quite radically over the course of the Shenzhou program. The top (or front, depending on your orientation) of the orbital module has carried everything from complex antenna farms to high-resolution cameras.

But photography, computer graphics and even scale models of the Shenzhou spacecraft reveal a relatively vacant section. Like a soda can, Shenzhou's orbital module seems to end in a flat circle. Why has this space (no pun intended) been left blank?

Admittedly, there is a small protrusion which sticks out like a bent thorn. This could be a small antenna or a probe to investigate the particles and fields environment at the front of the spacecraft. It could even be a retaining tab that helps the Shenzhou spacecraft to remain steady under the shroud of the Long March 2F launch vehicle. But this is not a substantial payload. Nevertheless, the Orbital Module has probably been used better on this flight than ever before.

Chinese authorities stated that, this time, most of the activity would take place inside the Orbital Module instead of outside, and much of it would not be experimental. The Orbital Module has mostly served as a living area for the crew of Shenzhou 6, offering sleeping bags, food preparation facilities and a toilet. The crew themselves were also an experiment package, as they performed vibration tests on the spacecraft, evaluated the performance of new equipment, and used themselves as subjects for biomedical tests.

There was one other change to the Orbital Module of Shenzhou 6. Some graphics depict a large flat panel attached to the side of the module. This is different from the rectangular bulge that apparently houses propellant tanks for the module's thrusters, which has been carried on previous missions. What is this? It could be a sample tray for exposing specimens to space. But without the chance to recover these specimens, such an experiment would be dubious.

It's possible that this large flat panel is a radar experiment, possibly a synthetic aperture radar panel. This could have been set to fold out with a sequence of panels after the orbital module began to fly independently. Or it could have been simply used as a small test experiment. On previous missions, China has reportedly flown electronic intelligence-gathering equipment, as well as surveillance cameras. A radar payload would be the next logical step in a program that has regularly contributed to military reconnaissance.

Radar experiments are notoriously power-hungry, as they must actively beam out a signal over a long distance. The solar panels of the Orbital Module are large enough to support a small experiment payload and its telemetry, but it's doubtful that they could supply enough electricity for a decent SAR package. This could be a major factor that rules against the radar hypothesis.

If the new package isn't a sample tray or a radar array, what is it? China hasn't given an explanation for this, or the thorn on top of the Orbital Module. Although media coverage of Shenzhou 6 has been better than for

its predecessors, China still has a long way to go before we truly understand the workings of this interesting spacecraft.

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