

Weighing Up Shenzhou 6

September 27 2005

As we enter the final weeks before the launch of China's second manned space mission, it's time to weigh up the relevance of the latest tidbits released through the Chinese media.

Generally, everything that we have seen points to a fairly consistent pace of preparing for the flight of Shenzhou 6, which has managed to stick to its schedule. This suggests that the Shenzhou program is in fairly good technical, financial and political health.

Speculation of a September launch turned out to be spurious, but it showed how much confidence some officials had in the upcoming mission. It's highly possible that this could have been accomplished if authorities had requested it.

On the technical side, we have been told that the two-man crew of Shenzhou 6 will have hot food, sleeping bags, toilet facilities and the chance to get more sleep than the short naps that Yang Liwei took on his Shenzhou 5 mission. Allowing the crew to use the cylindrical orbital module will do more than just give them more room: It will give the crew members privacy and possibly silence during rest periods or bathroom breaks.

A translation of a Chinese-language report from the Zhongguo Tongxun She news agency states that the weight of Shenzhou 6 "will increase by 200 kg for carrying two astronauts." This is an interesting technical statement, but the figure is not necessarily as precise as it may seem.

Does this figure include the weight of the second astronaut and his spacesuit? Is the bulk of this extra mass taken up with logistics such as food, water and oxygen? Does any of this mass include additional infrastructure for the spacecraft, such as scientific payloads? Or are such mission-specific items counted separately? With no answers to such questions, we don't really know how Shenzhou 6 has changed.

Curiously, we have received little information on the experiment program planned for the flight, apart from the pig spermatozoa experiment that's gained popularity in the media for its slight quirkiness. What else is really planned?

The extensive silence is consistent with China's vagueness on any aspect of the Shenzhou program. But it also lends support to the strong possibility that much of the astronaut's activities will be military-related. Shenzhou has carried surveillance payloads in the past, and the presence of a crew on a long-duration flight presents an excellent opportunity for advancing this type of mission.

Crews on Soviet and Russian space stations have routinely used high-resolution film cameras to monitor the Earth beneath them, and China could be planning to do the same. A large camera could be installed inside the Orbital Module, permitting the crew to operate it and interchange film cartridges. There could also be another electronic camera on the exterior of the Orbital Module, which will remain in orbit for months after the crew return to Earth.

China has operated high-resolution CCD cameras that beam their data to Earth, but it's possible that China's electronic cameras still don't approach the resolution of a large film camera. Thus, Shenzhou 6 could return the best ground imagery that China has ever obtained from space.

China's enthusiasm for conventional film photography from space is

demonstrated by the frequency of its recoverable satellite launches, which reportedly have photography as their major objective.

Over the course of five days, it's probable that most parts of the Earth that China wishes to observe will be exposed to good sunlight, with appropriate contrast and weather conditions, at some point in Shenzhou's orbital track.

The photography list is probably mostly pre-planned, but mission control could still propose "targets of opportunity" that may arise on the mission, such as natural disaster recovery operations in the USA.

Such photography doesn't even need to be high-resolution to be useful. Photographing agricultural regions leads to harvest estimates for grain, which can influence China's negotiating stance in trade deals.

Whatever is released to the public, this is going to be an interesting mission. We're waiting for the countdown to begin.

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