

China Reveals Its Long-Range Space Plans

by Marsha Freeman

Up until one year ago, the world generally learned about China's activities in space only after the fact. China's space program was as secret as that of the former Soviet Union.

In November 1999, China carried out an uncrewed test of a new space vehicle, named Shenzhou, which is designed to carry astronauts into Earth orbit. For the first time, Chinese space officials spoke publicly about the mission while it was under way, and the amount of information that was released to the media was almost as surprising as the mission itself.

On Nov. 22 this year, the Information Office of the State Council of China released an eight-page White Paper, summarizing the past accomplishments and future plans for the Chinese civilian space program. Titled simply, "China's Space Activities," the White Paper lays out a 20-year perspective in this crucial area of economic and research and development activity, the foundation of which is based on the principle that the exploration and utilization of space is an "integral part of the state's comprehensive development strategy."

In contrast to the United States and most other nations, where space programs are treated as just another "line item" in an annual budget, pitted in a competition with other domestic spending programs, China's space program is seen as making a critical contribution to the long-term economic growth of the nation. "As a developing nation," the White Paper states, "China's fundamental tasks are developing its economy and continuously pushing forward its modernization drive."

The "aims and principles" of China's space activities are clearly stated: "to explore outer space, and learn more about the cosmos and the Earth; to utilize outer space for peaceful purposes, promote mankind's civilization and social progress, and benefit the whole of mankind; and to meet the growing demands of economic construction, national security, science and technology development and social progress, protect China's national interests, and build up comprehensive national strength."

What the White Paper presents is a perspective for developing an in-depth, broad-based, and extensive space infrastructure, which will lay the foundation for the use of space for economic advancement, future manned flights in Earth orbit, and, eventually, flights to the Moon. Unlike the Soviet space program, which was organized around high-risk "space spectacles" timed for maximum political impact, China's space program is proceeding at the pace that technological

progress allows. While that has made it very frustrating for Western space analysts, who constantly focus on predicting when China will orbit its first astronaut, the answer to when that will occur seems most likely to be, "when we are ready."

Focus on the Asia-Pacific Region

While upholding the "principle of independence," the White Paper states that China is "actively promoting international exchanges and cooperation." China will "tackle key problems and make breakthroughs in space technology," the paper states, but these efforts "shall be combined organically with technology import [based] on principles of mutual benefit and reciprocity."

China's early space program benefitted from cooperation with the Soviet Union, which exchanges continue to the present day. The Russian space program has trained Chinese astronauts, or "taikonauts," for future missions. And in the past, China has expressed interest in cooperation with the United States, and the U.S.-led International Space Station, which is now under construction.

But, the White Paper stresses that China considers cooperation with other developing nations, such as its joint Earth remote sensing satellite program with Brazil, to be of primary importance. The paper states: "The cooperation between China and Brazil in the space sector has set a good example for the developing countries in 'South-South Cooperation' in the high-tech field."

China also attaches great importance to space cooperation in the Asia-Pacific region. In 1992, China, Thailand, Pakistan, and other nations sponsored the "Asia-Pacific Multilateral Space Technology Cooperation Symposium." This led, in 1998, to a Memorandum of Understanding between the governments of China, Iran, the Republic of Korea, Mongolia, Pakistan, and Thailand for cooperation in a "small multi-mission satellite," and related activities.

The White Paper reports that since 1988, China has provided scholarships every year to developing countries for long-term space technology training courses in China, and has hosted regional conferences concerning economic development through the use of space technologies.

China is an active partner with other developing nations in Asia in providing telephone, television, and Internet services to cities and remote regions of the country, through the use of telecommunications satellites. Educational programming and telemedicine are two important applications of space technology being jointly developed and deployed.

Short- and Long-Term Plans

The White Paper states that China is drafting a space development strategy oriented to the 21st Century, and outlines current development targets.

Within the next decade, China plans to build up an Earth observation system for "long-term stable operation," providing continuous data. Such a system will include meteorologi-



The Chinese spacecraft Shenzhou, after its return from an unmanned test in November 1999.

cal, land remote sensing, ocean sensing, and disaster monitoring satellites, for stereoscopic observation and dynamic monitoring of the land, atmosphere, and water environment of the country and peripheral regions, and the whole globe.

China plans to establish an independent satellite navigation and positioning system, which requires a suite of coordinated satellites, similar to the American Global Positioning System.

Long-term development targets—for the next 20 years or more—include the industrial development and marketing of space technology and applications. This requires “spinning off” the technology developed for space into other industrial sectors, and the economy as a whole, “to meet a wide range of demands of economic construction, state security, and science and technology development and social progress.”

The approach that will be taken is to accelerate the applications of space technology by encouraging enterprises engaged in such work to help “renovate institutions and technology,” especially in applying telecommunications services to industry. In addition, China will build upon and improve its stable of rocket vehicles, to continue to offer launch services on the international market.

Another target for the long term, is to establish a “multi-function and multi-orbit space infrastructure, composed of various satellite systems,” with the necessary ground control facilities. This would reflect the fact that satellites for Earth observation are generally in Sun-synchronous orbit, orbiting

north to south, from pole to pole, rather than around the Equator. Some mobile phone and other communications systems, as well as reconnaissance satellites, may be in low-altitude equatorial Earth orbits. Weather satellites are customarily in higher geosynchronous orbits. China is planning an in-depth near-Earth space infrastructure that includes all of these applications.

The Chinese space program will also aim to “obtain a more important place in the world in the field of space science, with more achievements, and [to] carry out explorations and studies of outer space” over the next two decades. So far, China has not focussed its space resources in space science.

Specifically, the White Paper states that one goal is “to develop space science and explore outer space by developing a [next-generation] scientific research and technological experiment satellite group,” which will strengthen “studies of space microgravity, space materials science, space life science, the space environment, and space astronomy,” and carry out “pre-study for outer space exploration, centering on the exploration of the Moon.”

And finally, the program aims “to realize manned spaceflight and establish . . . R&D testing systems for manned space projects,” and to “establish China’s own manned spaceflight system, and carry out manned spaceflight scientific research and technology experiments.”

Does this mean that it will be the second decade of the 21st Century before there is a Chinese taikonaut in space? Not necessarily.

Periodically, there are conflicting statements by Chinese officials about their plans for the first manned space mission. The principles, however, do not vary. First, there will be more unmanned tests, of perhaps a few generations, of Shenzhou vehicles. Modifications have already been made for the second vehicle, which is expected to also be tested unpiloted. Chinese officials indicate that they do not have any artificial deadline to meet, but rather, plan an extensive test program.

Second, the schedule will not be driven by “space spectacles.” For decades, Kremlinologists in the West could fairly accurately predict when a dramatic new development would take place in the Soviet space program. They would search for an upcoming anniversary of the Revolution, or an important political event.

China has outlined a 20-year perspective for developing every facet of space technology, in a measured and comprehensive plan. The White Paper states that one important prerequisite for meeting these targets is the “speeding up of the development of talented people in the space industry.” In this regard, “special policies will be adopted to promote space education and train qualified personnel to foster a contingent of young and highly qualified space scientists and engineers.”

The entire nation will be involved, as “efforts will be made to publicize space knowledge,” which will “motivate all sectors of society to support the development of the space industry.”