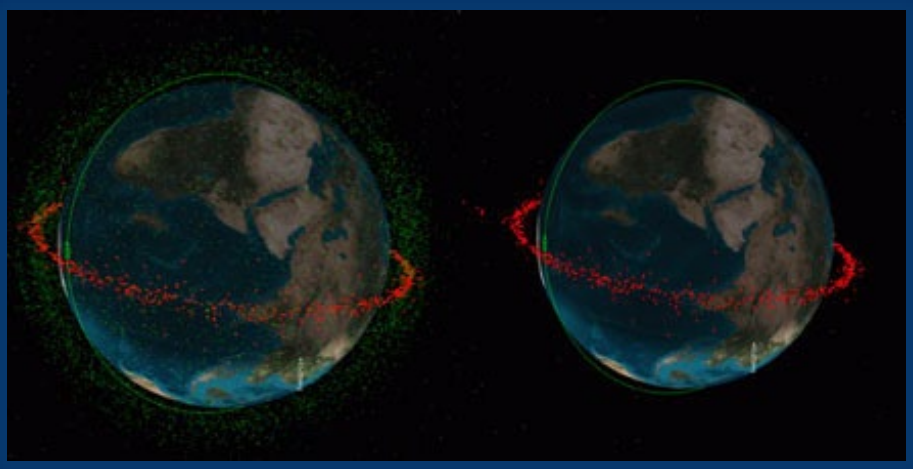
# China's Antisatellite Missile Test: Why?

We may not yet know enough to understand China's intentions.

**By Mark Williams Pontin**

March 8, 2007

**On January 11, 2007, an aging Chinese Feng Yun 1C polar weather satellite orbiting 865** kilometers above Earth was struck by a kinetic kill vehicle carried on a ballistic missile launched from China's Xichang Space Center. It was a successful antisatellite (ASAT) weapons test that showed that the Chinese could, in the future, knock down U.S. satellites. On February 23, U.S. vice president Dick Cheney responded during a speech in Sydney, Australia, first by noting China's "important role" in the recent treaty with North Korea, then by stressing that "last month's antisatellite test, and China's fast-paced military buildup, are less constructive and are not consistent with China's stated goal of a 'peaceful rise.'"



The aftermath: In both images above, the red band represents debris from the recent Chinese destruction of a satellite. In the top image, the green band represents the orbital path of the International Space Station; in the bottom image, it represents the many low-Earth orbit satellites currently in use.

In fact, what the People's Republic intended with its ASAT demonstration isn't obvious, given contradictory signals that have emerged from China. But one thing is for sure: the Chinese ASAT test is the largest debris-generating event in Earth orbit ever recorded. NORAD has catalogued 917 pieces of debris. Yet that figure represents only what's trackable; NASA's Orbital Debris Program Office estimates that more than 35,000 pieces of debris larger than one centimeter were also created.

Furthermore, analysis by the Center for Space Standards and Innovation (CSSI), in Colorado, just after the Chinese test was first reported showed debris spread from below 200 kilometers up to almost 4,000 kilometers, posing a threat to many operational satellites due to the debris cloud's polar orbit. According to Thomas Kelso at the CSSI, computer modeling predicted that during the week following February 28 there would be 1,033 occasions when a Feng Yun 1C fragment would come within five kilometers of a satellite payload in low-Earth orbit (LEO). "Over any seven-day period, we're now routinely seeing 1,000 to 1,100 conjunctions within five kilometers between the Feng Yun satellite's fragments and payloads in Earth orbit," Kelso says.

Graphics supplied by the CSSI illustrate the possible hazards to other satellites in LEO, including the International Space Station (ISS). The first graphic shows how the ISS passes through the ring of debris at the southern part of its orbit. The second figure shows the larger population of LEO satellites that could also be affected (view graphics). "At CSSI, we have orbital data for 2,792 payloads in Earth orbit," Kelso reports. "Out of that total, 1,866 of these payloads pass through the zone now affected by the debris from the Chinese ASAT test–in other words, that's two-thirds of all payloads in Earth orbit."

So what were the Chinese thinking when they created this disastrous ring of rubble around Earth? Here matters get sketchier. More than a week after the test, a Chinese foreign-ministry spokesman could only tell foreign reporters at a Chinese New Year reception in Beijing that the ministry "had not been informed" about any such military action. Only on January 25–two weeks later–did the ministry issue a formal statement that "there's no need to feel threatened by this" and that "China has not participated, nor will it participate, in arms race of the outer space in any form." And it's true, on the one hand, that China has for the past five years called with persistent regularity for a new treaty to ban weapons in space. Most notably, a draft outline that China and Russia jointly presented to the U.N. Conference on Disarmament in 2002 suggested elements of an international legal agreement to ban weapons in space and called specifically for the prohibition of either threats or the use of force against space objects–something that would definitely bar antisatellite weapons.

Nevertheless, on the other hand, Chinese possession of an ASAT capability is in line with the stated objectives of the People's Liberation Army (PLA). Back in the 1970s, this topic was already being debated within China's military circles. By 1994, in an article in *Modern Defense Technology* titled "Miniaturization and Intellectualization of Kinetic Kill Vehicle," a number of Chinese military analysts were insisting that ASAT technology was critical to China's national security. Then, as China's defense establishment began adopting concepts like asymmetric war and the revolution in military affairs that have become fashionable in Western military circles, sentiments like those expressed by Wang Cheng, in a July 5, 2000, article from *Liawang* (*Outlook*) called "The US Military's 'Soft Ribs,' A Strategic Weakness," gained currency: "For countries that can never win a war with the U.S. by using the method of tanks and planes, attacking the U.S. space system may be an irresistible and most tempting choice." Most recently, in September 2006 the Pentagon revealed that China had repeatedly fired a powerful laser at an American surveillance satellite in tests aimed at blinding it.

Coming after the laser incidents, "space hawks" have seen in the ASAT test further evidence of hostile Chinese designs on space, to which the United States must respond by developing its own space military capabilities. Thus, for instance, last week, U.S. Air Force Maj. Gen. William Shelton, head of Space Command and the Strategic Command's Joint Functional Component Command for Space, told the defense industry newsletter *Inside the Pentagon* that technologies like the

Chinese ASAT capability "aren't dual-use, these are things directly threatening [our] space capability. If they've got the capability to do me harm, as a warfighter, that's what I've got to respect–because intent can change overnight. As the capability evolves on the part of the people [who] would want to do us harm in space, you've got to stay ahead." In the hawkish view of space affairs, the persistent Chinese talk of a space arms-control treaty should be considered merely an effort to hobble the United States while China either catches up technologically and economically or at least mitigates its strategic disadvantage by secretly developing the very weapons systems that would be prohibited by a treaty. Those pushing for a treaty, the hawks claim, want what amounts to an unenforceable and unverifiable ban on space weapons.

"Space doves," conversely, have been angered by the appalling amount of orbital wreckage the Chinese test has created, but they interpret it as a reaction to U.S. failure to respond to China's calls for a space-weapons ban and to an increasingly provocative U.S. policy, manifested in the revised National Space Policy that the Bush administration released last year (See "A Dangerous Step toward Space Warfare"). The doves also point to the U.S. military's predilection for proposing expensive, futuristic weapons systems like "Rods from God" (projectile rods launched from satellites that could strike their ground targets anywhere on the planet at a minimum velocity of nine kilometers per second), a Space Plane that could carry smaller craft that then drop smart bombs and other high-velocity penetrators from space, and a suborbital transport that could deliver U.S. Marine squads anywhere on Earth within a couple of hours. This sort of thing is confrontational, the doves argue, and now the Chinese have used their ASAT test to send a message back to the United States that if it wants to weaponize space it will not be alone.

Experts on China agree that Beijing has sent a message, but they stress that current space affairs are best understood in a longer-term geopolitical context.

Robert Ross, an MIT Security Studies program fellow who's collaborating with Beijing University's Institute of Strategic Studies on a project examining the influence of China's rise on contemporary international politics, says the ASAT test is part of the country's larger military modernization, which is seen by the Chinese as "simply prudent behavior to improve security against the other great power in the system." Beijing doesn't expect to catch up with the United States, Ross says, or even achieve war-winning capability off of the Asian mainland. "Rather," he says, "China aims to erode U.S. war-fighting superiority however it can, thus reducing U.S. confidence that it can wage war against China at no cost and engage China over peripheral less-than-vital issues. The U.S. has enjoyed a monopoly of space-based C4ISR [command, control, communications, computers, intelligence, surveillance, and reconnaissance] for the past 20 years. It's to be expected that China would work to end this monopoly. It may be an unpleasant awakening for the U.S., but it doesn't necessarily portend expansive Chinese military ambitions."

Still, Jonathan Pollack, of the Naval War College, in Newport, RI, notes the policy dilemma for China in all this: "You can make, as the Chinese have, boundless numbers of statements about disapproving of American activities in space and American plans for space warfare. But unless you demonstrate a capability, it's not going to be so compelling. So do you demonstrate that capability or do you simply warn of unspecified consequences to what the U.S. might be doing? That's a political call. However, for the U.S. constituencies wanting to pursue militarization of space, China's ASAT test has without a doubt helped their case." Moreover, while the Chinese may have decided to demonstrate forcibly to the United States that it's much easier and cheaper to knock down weapons placed in orbit than to put them up there, other technical means existed of demonstrating that fact without creating such an unprecedentedly large debris cloud around Earth.

Thus, China has to some extent shot itself in the foot in this respect also. Ross believes it quite likely that the PLA didn't even talk to knowledgeable physicists about the possibilities: "Rather, it had responsibility for the test, focused narrowly on its concerns, and it was either unconcerned or unaware of the issue."

Gregory Kulacki, at the Union of Concerned Scientists, agrees: "The people we know in China who are experts on debris in space had no clue it was coming; they weren't consulted and they're all very upset about it. One possibility is that whoever briefed the political leadership may not have known about the debris problem or may have withheld the information." Nevertheless, Kulacki is impatient with speculation. "The problem with all this supposition is that it's just that and does more harm than good when some assumption gets locked in as the conventional wisdom. We don't really know who made this decision, who was responsible for the technology development, why they decided to go ahead, or what supervision the Chinese political establishment had. There are arguments about the Chinese forcing us back to the negotiating table on a treaty to ban assets in space and so forth. Yet we really don't have the information to make judgments about what their intentions are. We should learn more about Chinese institutions and Chinese individuals, rather than guessing from afar."

Are the Chinese–and especially the PLA–willing to engage? Kulacki, who works in China four to five months of every year, answers emphatically: "I've asked people in the PLA, at the Chinese war colleges, if they want to talk, and they definitely say they do." Regarding a space-weapons ban, Kulacki is pragmatic about the military realities. "Difficult questions exist that many people in the arms-control community haven't thought through. Suppose there's a conflict, and the other side has access to satellite imaging that puts your forces in the field at risk. Do you blind or jam or confuse the signals? Is that a violation of a ban on attacking a satellite? The danger is that these things call for quick decisions, and there's the risk of large-scale, quick escalation into accidental wars that neither side intended to get into." The remedy, Kulacki insists, is, again, more engagement. "You would think, or hope, that both the U.S. and China realize that they can't get into a war. They need to make sure that they don't get into one by accident."

**by** Mark Williams Pontin