

# With Maj. Gen. Craig R. Cooning

Interview by James W. Canan

*Where do we stand in space acquisition? How are the major programs coming along?*

We continue to make progress, although there are some issues. Let me begin with SBIRS [Space Based Infrared System] High. We believe we're beginning to get some traction in that program. The first SBIRS High HEO [highly elliptical orbit] sensor was delivered last August. We were on schedule to deliver the second, but we're keeping it on hold for awhile because it looks like the schedule for the host spacecraft—the first GEO SBIRS High satellite—is slipping.

*What is the status of that satellite?*

The first GEO bird is in electronic test and integration right now, and so from that perspective, it looks fairly good, although we did have another cost breach notification this past year. The money that it will take to fix that is in the 2006 budget request.

*Is the program in jeopardy? How would you assess it?*

I would put it this way: The people who are looking at the program are all from Missouri, the "show me" state. The program got a tremendous boost in the delivery of its first HEO sensor, but it's still facing challenges. I'm cautiously optimistic about the SBIRS HEO sensor. On the GEO spacecraft, I think something will probably pop up that we don't know about now—an unknown unknown—and our ability to deal with that will determine how tough things will be.

*How did the program get into trouble?*

Problems arose because we didn't do enough component-level testing before we made a larger investment in building its hardware. We couldn't just say we're going to go back and start all over again.

So we're facing challenges when we go to the integration and testing of the

GEO bird, such as making its sensors work together and making sure they don't have jitter, for example. The program people believe they understand the parameters of what needs to be done, but it's going to be a challenging thing to do.

*What's the basic problem with SBIRS?*

An independent review of the SBIRS program concluded that it has congenital defects. If we were going to start the program today we probably wouldn't start it the same way that it was started in the 1995 time frame.

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*Peter Teets [former under secretary of the Air Force and former director of the National Reconnaissance Office] kept emphasizing that problems are bound to occur in programs if they aren't structured properly from the start. Would you say that SBIRS is a case in point?*

Yes. It's absolutely essential to get it right—to do everything right—in the very beginning of a program. We have to make sure we're doing adequate up-front testing of parts and components so that we don't discover problems after everything is integrated. This is why we have gone back to applying milspecs and milstandards [military specifications and standards] to programs on a selective basis.

*Why were milspecs deemphasized in the first place?*

When they were applied across the board in the past, there was a lot of blood

on the floor. They were blamed for being too restrictive, for driving up costs, and there was a backlash against them in the early 1990s. So we got away from them. But then we started having failures, not just in space programs but in airplane programs as well, because we were deviating too much from a lot of the sound acquisition principles that had been codified in the milspecs and milstandards.

*So you're reaffirming those principles in your contracting?*

That's what we're doing, and what we want to do in future programs.

*Can you give an example?*

Yes, the milstandard defining what must be done in design reviews. It's Mil-Standard 1521B, "Technical Reviews and Audits for Systems, Equipment, and Computer Software." When we write it into a contract, everybody knows—not only the prime contractor but also the subcontractors and the second-tier suppliers—what the government requires, and what its expectations are for a successful design review. We're not leaving any of it up to guesswork.

The milspec becomes a common language that engineers and program managers understand in order to get everything right. Everybody is on the same sheet.

*Do you think there might be another backlash against milspecs some day?*

We're going to try to avoid that. We have to make sure that the pendulum doesn't swing too far either way.

*So what's in store for the SBIRS program?*

It will continue to challenge us. We've been directed to put our shoulders to the program and keep pressing on, to grind away step by step and work with the contractors to make this program happen. That's what we're doing: Adding

testing and oversight to the program in the FY06 president's budget was the right thing to do.

*It's SBIRS or nothing, isn't it? Is there anything else in store that the Air Force could substitute for the SBIRS constellation as a replacement for the DSP [Defense Support Program] early warning constellation?*

No, there isn't. We have one more DSP satellite—DSP 23—to launch. But whatever we do will take time and money, so there is a compelling need to keep the DSP constellation healthy, and the timetable for replacing the DSP satellites does not allow for a lot of options. Either we accept the risk—an operational risk and a risk to our nation—of not fielding SBIRS, or we put our shoulders to SBIRS and just press forward. And that's hard.

*Let's turn to the space radar program. What's going on there?*

We've spent the past year working space radar very hard. Congress told us in the last legislative cycle that we need to fundamentally change our approach to space radar, and how we plan to move forward. One of the biggest watershed events was formally linking the intelligence community and the Dept. of Defense. [CIA Director] Porter Goss and Secretary of Defense [Donald] Rumsfeld signed a joint memorandum that committed each to our space radar as the system of the future that both communities will embrace. Having

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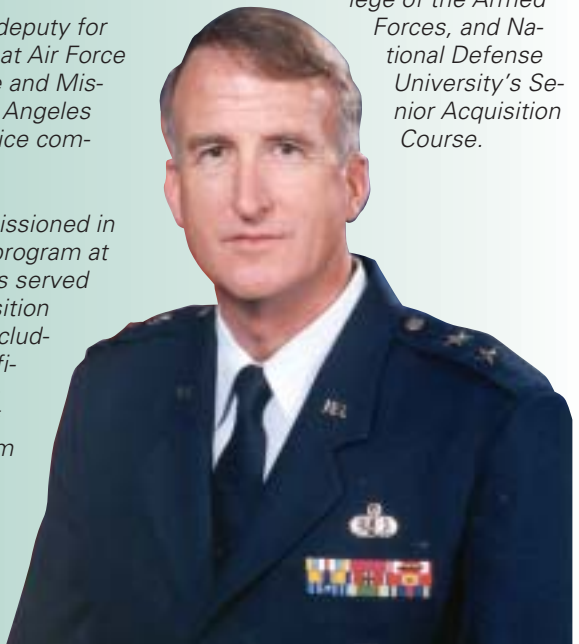
*Previously, he served as deputy for transitions and programs at Air Force Space Command's Space and Missile Systems Center, Los Angeles AFB, Calif., and then as vice commander of that center.*

*Gen. Cooning was commissioned in 1973 through the ROTC program at Auburn University. He has served in a broad range of acquisition and logistics positions, including program executive officer for all Air Force space programs, and director of two major weapon system programs.*

*Gen. Cooning was awarded both the space and master acquisition badges, the Distin-*

*guished Service Medal, Defense Superior Service Medal, Legion of Merit, Meritorious Service Medal with five oak leaf clusters, and Air Force Commendation Medal.*

*He received a bachelor of aviation management degree from the Auburn University School of Engineering and a master of business administration degree from the University of Alabama. He is a graduate of the Squadron Officer School at Maxwell AFB, Air Command and Staff College, Armed Forces Staff College, Industrial College of the Armed Forces, and National Defense University's Senior Acquisition Course.*



both of them lined up behind the program is very important to us.

*What's the status of the program?*

We're planning on doing a space-based demo of the space radar satellite in the 2008-2009 time frame to prove that the technology is mature and producible. We recognize that Congress would like us to do some of our space acquisition programs differently. We want to give the program some velocity to show Congress that we can build something and get it up there in a reasonable time, that we don't just get bogged down slogging our way through the typical acquisition process. Certain congressional staffers have told me

that it seems we just keep coming back for additional dollars, and that we need more schedule. So we've put some dynamics into the space radar program, and we believe that Congress will be more receptive to it.

*When do you plan to launch the first full-up space radar satellite?*

We want to have initial launch capability for the space radar baseline system by 2015 and launch it then. The timing of the demo should allow us to do that. We expect that our preparations for the space-based demo will help us to greatly reduce or eliminate risk for the space radar baseline system.

### *What is the scale of the demo system?*

For the demo, we expect that the antenna on the satellite will be somewhere around a quarter-scale version of the one on the notional system that we expect to launch in 2015. The ESA [electronically scanned array] on the notional system will be big enough to do the SAR [synthetic aperture radar] mission that the intelligence community would need, and also to be the GMTI [ground moving target indicator] for the military community.

### *Is the space radar launch timetable tied into the development of new launchers?*

Indeed. Demonstrating responsive launch capability is part of the space radar demo. Will that capability come from the [Space X] Falcon rocket project or from Orbital Sciences' Minotaur launch vehicle, or something else? We intend to find out. We want to take advantage of all such developments in the launch arena.

### *Could you talk a little more about the Falcon program?*

In terms of developing boosters for operationally responsive launch, the ac-

tivity if we don't have that big an investment in the satellite—if we can get it into space on a launch vehicle in the \$5-million-\$7-million price range, like Falcon promises to be. Then we can begin to fundamentally redesign our satellites.

### *Which would drive down costs significantly?*

Absolutely. Redundancy makes a satellite larger, which requires more throw weight, more power, and bigger solar arrays. So if we fundamentally change that equation, we drive costs down and start employing space differently, because we won't be launching this precious commodity that we can't afford to lose. The opportunity is immense. There's just so much promise there.

### *Back to space radar for a bit. Is it a high Air Force priority, given other demands on resources? Could airborne intelligence, surveillance, and reconnaissance [ISR] assets do the whole job of spotting and tracking targets? Is space radar absolutely essential?*

Space radar is a high priority, and I think ultimately it will be absolutely essential. Airborne assets may not be able to see certain things on the ground because their field of vision is a lot smaller.

On the other hand, the ability to discern and discriminate among moving targets on the ground is not as good from space as it is in the airborne mode. So it's the combination of space and airborne assets that is really powerful. But we've seen in the past that space, because it gives us such a large view, provides a certain advantage. For example, aircraft with IR sensors just can't see as far as satellites with IR sensors, so we know we have to rely on space—on DSP and then SBIRS High satellites—to give us long-lead missile warning.

### *What's happening in your acquisition of the transformational satellite communications system, the TSAT?*

We're doing initial design-type work in the TSAT program. It involves not just the satellite, but also the ground network which we call TMOS, for TSAT Mission Operations System. A lot of what we're doing right now is assessing the technology and looking for the best ways of achieving the objectives of the TSAT system.

### *Are some elements of the acquisition program more important or more difficult than others?*

There's one element of TSAT that is absolutely critical: the next-generation digital signal processor. We wouldn't want to fly without it, because the whole concept behind TSAT is to have a network in the sky with Internet Protocol [IP]. Developing the technology of that next-generation signal processor, and making it work properly, is the key to the success of TSAT.

### *How will all that work?*

Terminals on the ground or in the air or anywhere will append IP addresses to communications messages and send them to a satellite, and the satellite's digital signal processor router will send them on to the intended recipients. TMOS, which is the network, will control the message priorities. It will say, for example, that a particular message is more important than others, and needs to go ahead of them and get through to the president.

### *What else is especially important in the program?*

Another crucial element of TSAT is a satellite antenna that is large enough to provide adequate communications on the move. What the Army is looking for from TSAT is a big antenna in space that will enable it to deploy small antennas on the ground. The Army wants to become faster and more mobile, to fundamentally change the way it fights. And to do that, it must equip its units with small antennas that still provide high data rates. Smaller ground antennas mean bigger space antennas.

### *Would it be fair to say that the Army won't become fully network-centric until TSAT is put into play?*

That's right. That's fair enough. The Army's Future Combat System relies heavily on the capabilities of TSAT.

### *Are there any other pressing requirements for TSAT?*

Yes. Optical crosslinks onboard the spacecraft that will give us the high data rates. I can't talk about optical [developments] in other places.

### *Is the technology far enough advanced for all this to happen?*

We know that the existing technology can give us a fundamental capability but maybe is not quite what we want for the full-up TSAT system. So we may have to

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We now have launch vehicles that cost \$100 million or twice that—or, in the case of the old Titan IV vehicles, over \$450 million. When we pay that kind of money for a launch, we want to make sure the satellite that goes up on it is going to work under every single set of circumstances, so we build into it double, triple, or quadruple redundancies. We want a satellite that's bulletproof, that's never going to fail.

But we don't need all that redun-

decide whether we really want to extend the schedule and keep pressing on toward the full-up system, or take the off-ramp.

*What do you mean by that? Going with what you have rather than waiting for what you want?*

That's about it. In the acquisition process, we've designated some off-ramps along the way to the first launch, which right now is scheduled for, and is in the president's budget for, the first quarter of FY13. For example, if we find that we can't get to the big antenna in space for the Army by then, we would tell the Army that we can take an off-ramp—go with a smaller antenna in time to support the scheduled launch, but keep working on the bigger antenna and eventually get to it.

There are other areas where we may have to take off-ramps in order to meet the acquisition schedule, which is very important to the Dept. of Defense. We've told the using services about the off-ramps,

but we haven't had to make any of those tough decisions yet.

*Now over to the GPS program. Where does it stand? What's being done to make the GPS satellites less vulnerable to jamming like that encountered in the Iraq war?*

From an evolutionary standpoint, we're working to minimize the impact of those sorts of things. The first GPS IIF satellite has been delivered to the launch base and is being readied for launch. Both the GPS IIR-M and the GPS IIF satellites have increased power, which gives them more antijam capability. In the FY06 budget, we are funding a GPS III satellite with an initial launch capability in FY13. GPS III not only has increased power for anti-jamming but also a variety of other features, such as spot beam, increased integrity, and crosslinks to other satellites.

*Space control is a very important mission now. What is the status of major acquisition pro-*

*grams aimed at improving our space situational awareness and defending and protecting U.S. space assets?*

I can discuss a few of them. We have awarded the contract for [the] SBSS [Space Based Space Surveillance] system. The prime contractor is Northrop Grumman, but Boeing is actually building SBSS. We're also in the initial stages of acquisition strategy for ODSI [Orbital Deep Space Imager] surveillance. SBSS tracks objects in space and helps maintain a catalogue of them. ODSI does reconnaissance of specific objects in deep space.

We're also in pretty good shape on the new Counter Communications System to disrupt an adversary's satellite communications. The system is operational.

*Would you say that, overall, space control acquisition programs are stable? No crisis management required at this point?*

I believe so. No big crisis management required.

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