

Space Notes

“Space Notes” excerpts professional articles of interest to Space professionals. The section will attempt to present a broad spectrum of newsworthy items, with references to the full article for those who wish to read further. *Suggestions and submissions for this section are solicited, and should be forwarded to the Managing Editor at richard.burks@arspace.army.mil.*

Defense Chief Maps Military’s Needs For Transformation

By Greta Wodele, National Journal’s Technology Daily, 4 February 2004

Defense Secretary Donald Rumsfeld on Wednesday mapped for lawmakers how much money the military believes it needs in fiscal 2005 to continue its efforts to transform U.S. forces in the face of 21st century threats. He said the fiscal 2005 proposal includes \$29 billion to meet transformational goals identified in a 2001 defense review. The review also highlighted the need to improve the military’s Space-based surveillance technologies, such as satellites, protect military networks from attack and disable the enemy’s information networks, among other goals. To continue communication and intelligence projects, Rumsfeld said the budget requests \$408 million for Defense’s Space-based radar system to monitor targets behind enemy lines “in any kind of weather.” The request also includes: \$775 million for a satellite system to decrease from minutes to seconds the time it takes to transmit images and information among the armed forces; \$600 million to develop wireless Internet capability to transmit information among joint war-fighters; and \$700 million to consolidate the military’s various unmanned aerial vehicles.

Lockheed Martin and Northrop Grumman Team Up for Space Satellite Radar Bid

Denver Post, 9 February 2004

Lockheed Martin has selected Northrop Grumman Corporation as a teammate in the competition to develop the Space Based Radar (SBR) system for the U.S. Air Force. The Space Based Radar mission will provide worldwide, on demand, persistent surveillance and reconnaissance for Department of Defense and national intelligence users. Scheduled for initial launch in 2012, the SBR system will grow to a constellation of spacecraft to provide rapid-revisit coverage of the entire Earth’s surface. Lockheed Martin Space Systems will lead the effort as the systems prime contractor, while Northrop Grumman will serve as Lockheed Martin’s primary teammate and subcontractor. Space Based Radar is a transformational system being developed for the U.S. Department of Defense to provide global intelligence, surveillance and reconnaissance (ISR). The SBR system will provide persistent real-time intelligence on adversary activity through the identification and tracking of moving targets, high-resolution synthetic aperture radar imaging, and collection of high-resolution terrain information.

USAF Aims To Neutralize Anti-Satellite Weapons

By Jeremy Singer, Defense News, 2 February 2004

The U.S. Air Force is studying ways to protect American military satellites from enemy anti-satellite weapons, including such potentially controversial concepts as armed spacecraft escorts. Destroying other satellites is not the effort’s primary focus, but the military will likely need a system to neutralize anti-satellite weapons sometime between 2018 and 2030, said Col. William Doyle Jr., chief of the plans division at Air Force Space Command. The plan, released in early January, is intended to outline the capabilities that will be critical to military Space operations, rather than specify particular systems, Doyle said. The plan says defensive measures will be “twice as important” as offensive measures for protecting U.S. satellites. Defensive measures can include moving a satellite to avoid collision with another object in Space, or shutting it down during a solar flare, Doyle said. The military will also hunt down and destroy ground-based satellite-jamming equipment, as it did in Iraq, he said. The Air Force will equip its satellites with onboard sensors that can locate and characterize potential threats, such as the Rapid Attack Identification, Detection and Reporting System, already under development. Separate spacecraft will likely be required to neutralize anti-satellite weapons designed to collide with or otherwise attack U.S. spacecraft, according to the master plan. The concept of escort satellites is not mentioned in the plan, but Doyle said they could be used.

Row Over GPS Jamming Still Divides U.S. And Europe

Will Knight, NewScientist.com news service, 3 February 2004

Talks to resolve a dispute between the European Union and the U.S. over how the EU’s new satellite navigation system Galileo will provide its signal have ended without agreement in Washington. Galileo is scheduled to start operating in 2007 and the EU would like the standard, publicly available signal to use a modulation known as Binary Offset Carrier (BOC) 1.5, 1.5. But U.S. officials argue that this would interfere with its use of an encrypted military signal from its satellite network, the Global Positioning System (GPS). This signal, known as the M-

code, is planned for deployment in 2012. During a military conflict, the U.S. would try to jam all public satellite signals so that its enemy could not use satellite positioning. But jamming Galileo's signal would also disrupt the M-code, the U.S. says. An alternative modulation, called BOC 1.1, has been suggested for Galileo by the U.S. But this would provide a slightly less accurate signal, prompting some observers to suggest that the U.S. is trying to degrade Galileo for commercial reasons. Another meeting between the EU and U.S. will be held later in February when officials will try to resolve the outstanding issues. Whichever modulation is finally chosen Galileo should provide a more precise service than GPS as it exists now. Europe has argued it needs a satellite positioning system that is independent from GPS, to ensure a sound footing for development of commercial capabilities. Nonetheless, EU and U.S. officials have agreed to make the Galileo and GPS interoperable and Galileo will also provide an encrypted signal for use by European military forces.

Canadian Forces To Tap Into U.S. Satellite System

By David Pugliese, Victoria, British Columbia, Defense News.com, 10 February 2004

The Canadian Forces will receive access to the U.S. Department of Defense's Advanced Extremely High Frequency (EHF) satellite system by the end of the decade, giving it a dedicated satellite communications capability for the first time. Canada will receive access to the satellite constellation for a 12-year-period starting at the end of 2009, said David Meeds, manager of the Canadian Forces Protected Military Satellite Communications Project. The Advanced EHF satellite program is managed by the U.S. Air Force and provides the next-generation follow-on capability to the Milstar system. The Advanced EHF program will consist of three to four cross-linked satellites with increased communications capacity and coverage. The first satellite is scheduled for launch at the end of 2006 or in early 2007.

DoD Expects To Field Nine GMD Interceptors In 2004

Marc Selinger, Aerospace Daily, 4 February 2004

Defense Department officials, providing more specifics about their missile defense deployment plans, revealed late Feb. 2 that nine interceptor missiles for the Missile Defense Agency's Ground-based Midcourse Defense (GMD) system will be deployed by the end of 2004. DoD had previously estimated that it would field "up to 10" interceptors in 2004. Officials said the department will deploy the interceptors as they become available. The department continues to say it plans to field a total of "up to 20" interceptors by the end of 2005: 16 at Fort Greely, Alaska, and four at Vandenberg Air Force Base, Calif. In addition, DoD announced recently that it intends to deploy up to 20 more interceptors in 2006-2007, some of which could be located at an unspecified third site (DAILY, Feb. 2). The extra interceptors would bring the total to as many as 40. To defend against long-range ballistic missiles, DoD expects to begin putting GMD on alert with several interceptors in the fall of 2004.

Pentagon OKs Army Plan To 'Bridge' Expected MEADS Delay

Emily Hsu, Inside Missile Defense, 4 February 2004

The Pentagon has approved the Army's plan to address a "likely delay" to the start of the Medium-Extended Air Defense System development program, according to a Jan. 29 memo. Signed by the Pentagon's acting acquisition chief Michael Wynne, the memo directs the Army to begin plans to expand the MEADS risk-reduction effort to "bridge" a delay likely to occur before system development and demonstration begins. The SDD phase was slated to begin this spring following the signing of a memorandum of understanding by the United States and its European partners (Germany and Italy). This may change, however, as the nations continue to negotiate an agreement on how to accommodate the recent U.S. decision to merge MEADS with the Patriot Advanced Capability-3 program while meeting the needs of the Germans and Italians. The Army and Office of the Secretary of Defense, meanwhile, have been hashing out a formal agreement on how the service will move forward with the recently restructured programs, according to defense and industry sources.

Lockheed Martin Delivers Integrated Air and Space Command and Control Capability for Air Force, USSTRATCOM

PRNewswire-FirstCall, Colorado Springs, CO, Yahoo! Financial News, 30 January 2004

Lockheed Martin has delivered a prototype integrated air and Space command and control (C2) capability to the U.S. Air Force and U.S. Strategic Command (USSTRATCOM), taking the first significant step toward automated access and availability of Space information in Air Operations Centers (AOC) around the globe. Delivered to the C2 Transformation Center, Langley Air Force Base, the prototype capability integrates Global Positioning System (GPS) navigation accuracy and satellite overflight information directly into the air battle planning process. Through the integrated capability, Space battle management systems will also have access to the Air Tasking Order (ATO), while the AOC will have similar access to the Space Tasking Order (STO). This

move will enable more cohesive planning between air and Space command centers, and provides an initial but powerful machine-to-machine data exchange capability that will serve as the foundation for future integration efforts.

Air Force, NRO Paths Diverge on New Communications Satellites

Jeremy Singer, Washington, Space News, 19 January 2004

Divergent requirements have led the U.S. Air Force and National Reconnaissance Office (NRO) to pursue separate but compatible next-generation communications satellites rather than a common platform as originally planned, according to Pentagon and industry officials. In addition, the new Air Force system, dubbed T-Sat, is expected to complement rather than replace the X-band Wideband Gapfiller communications satellites that the service plans to deploy starting in 2006. The T-Sat satellites are expected to begin launching in 2012, and the NRO satellites are expected to launch on a similar schedule. Both the T-Sat and NRO Optical Relay Communications Architecture satellites will be equipped with laser as well as radio frequency payloads and are expected to provide at least 10 times greater capacity over today's systems, which rely exclusively on radio frequency.

Surviving Space: Risks to Humans on the Moon and Mars

By Robert Roy Britt, Senior Science Writer, Space News, 20 January 2004

There is no "biggest danger" in setting up a permanent lunar presence or sending people to Mars, says John Charles, an enthusiastic proponent of both ideas and a NASA analyst of the costs and risks of human Space flight: "There are several." Launch, landing and re-entry are perhaps the riskiest moments of any Space venture, history shows. But on long missions, what would otherwise be minor threats could become at best serious limitations or at worst deadly disasters. Basking in the glow of President Bush's call for sending humans back to the Moon as early as 2015 and then eventually to the red planet, Charles, who works at the Johnson Space Center in Houston, offered up his danger list yesterday:

- Lack of a medical facility could turn a mundane injury into a life-threatening situation;
- "Psychosocial" pressure will be high in a small group isolated for months or years;
- Zero or reduced gravity causes bone and muscle loss;
- Dangerous radiation particles are abundant beyond Earth orbit.

Russia To Construct Its Own Global Navigation System

Pravda.ru, 28 January 2004

After completing its own global navigation system, Russia will become the second country, along with the USA, to have its own satellite navigation system. According to the Russian Aviation and Space Agency, this year Russia is going to launch three satellites of Uragan (Hurricane) class and to finish developing its own Glonass global navigation system. Successful launching the satellites scheduled for the end of the year will allow Russia to have the group of 16-18 satellites onto the orbit by the end of 2005. Glonass system is designed for continuously transmitting the coordinates of objects located in air, at sea, on the ground or in Space to within one meter. According to experts, launching the global navigation system is a critical component for effective military defense for Russia and protecting its national interests. Two Uragan satellites and one Uragan-M new generation device designed for 7 years of use will be transported to the geo-stationary orbit by Proton carrier rocket.

Koptev: Satellite Deal Will Be Signed Soon With India

By Simon Saradzhyan, Staff Writer, Moscow Times, 30 January 2004

Moscow and New Delhi will sign an agreement this year for India to help Russia develop its Glonass satellite navigation system, which needs more satellites to have a global reach, Russian Aviation and Space Agency chief Yury Koptev said. The Russian Space agency and the Indian Space Research Organization signed a memorandum of understanding in November for India to assist in designing and producing the satellites.

Air-Breathing Space Vehicles May Follow In USAF Wave Rider's Wake

By Jeremy Singer, Washington, Defense News, 26 January 2004

Pratt and Whitney and Boeing Co. plan to start flight-testing a scramjet rocket engine aboard an experimental missile around 2007. The tests, which are being funded by the U.S. Air Force, could set a speed record and also pave the way for air-breathing Space launch vehicles around 2020, service and industry officials said. In addition to helping improve satellite launchers, the technology, known as a supersonic combustion ramjet, could benefit a variety of other applications, including long-range strike vehicles. The laboratory awarded a \$7.7 million dollar, one-year contract Dec. 12 for the two companies to work on their design for the expendable Endothermically Fueled Scramjet Engine Flight Demonstrator vehicle, which is also known as the Wave Rider because it resembles a surfboard. The Wave Rider contracts are part of an effort called the National Aerospace Initiative, which is intended to coordinate the military's work on both air and Space propulsion systems,

with an initial focus on hypersonic technology. Hypersonic vehicles fly at speeds of at least Mach 5. Scramjet engines rely on oxygen from the atmosphere, rather than onboard tanks, to mix with hydrogen fuel to produce thrust. By eliminating the need for oxygen fuel tanks on the vehicle, designers are able to reduce the vehicle's overall weight, which in turn increases its payload capacity. In the planned flight demonstration, the Wave Rider will be attached to an Army tactical rocket booster. The rocket will be carried to an altitude of about 11 kilometers by a B-52 bomber aircraft, then released. The rocket and the attached Wave Rider then will accelerate to a speed of about Mach 4.5 and fly to an altitude of about 20 kilometers. At that point, the solid rocket booster is supposed to fall away as the Wave Rider's scramjet engine kicks in, helping it accelerate to Mach 6.5. If the Wave Rider meets its goal of reaching Mach 6.5, that would place it ahead of the experimental rocket-powered F-16 as the military's fastest air-breathing vehicle. Operational vehicles flying at that speed could quickly carry sensors for reconnaissance or munitions to strike targets to areas located far from the United States. This technology also could be used for new Space launch vehicles that could operate in a way similar to aircraft.

GMD Successfully Conducts Flight Test With New Booster

Marc Selinger, Aerospace Daily, 28 January 2004

The U.S. Missile Defense Agency's Ground-based Midcourse Defense (GMD) program has successfully conducted its first system-level test using a new interceptor booster made by Orbital Sciences Corp., according to MDA. Launched on Jan. 26 at 9:23 p.m. Eastern time from the Kwajalein Atoll in the Marshall Islands, the interceptor was integrated for the first time with various GMD components, including the fire control system, which generated targeting information for the interceptor. During the test, known as Integrated Flight Test-13B (IFT-13B), the Orbital booster lifted off with a Raytheon-built mock exo-atmospheric kill vehicle (EKV). MDA spokesman Rick Lehner told *The DAILY* Jan. 27 that a computer simulation of a target launched from Vandenberg Air Force Base, Calif., showed there probably would have been an intercept in IFT-13B had a real kill vehicle and an actual target missile been used. The shoot-down would have taken place about 800 miles northeast of Kwajalein. The mock EKV "was in the proper position to make an intercept," Lehner said. For the GMD program, which is developing a shield against long-range ballistic missiles, IFT-13B was the second test with the Orbital booster. The Orbital rocket had its first successful launch during Booster Verification-6 (BV-6) in August 2003. Lehner said IFT-13B did not repeat a problem that arose in the GMD program's previous test, Booster Verification-5 (BV-5), in which a new booster made by Lockheed Martin Corp. failed to separate from a Raytheon mock EKV on Jan. 9. MDA is still trying to determine why the separation did not occur.

North Korea Offers Nigeria Missile Deal U.S. warns ally to spurn pact

By Nicholas Kralev, The Washington Times, 29 January 2004

North Korea has offered to sell Nigeria advanced missile technology, the Nigerian government said yesterday, prompting the United States to warn its African ally that it might face sanctions if it strikes a deal with Pyongyang. Nigerian officials yesterday issued vague and contradictory statements about their intentions and the missile type on offer, although they acknowledged seeking ballistic-missile technology for "peaceful" purposes. A sale would mark the first time that such technology has been introduced into sub-Saharan Africa, raising the prospect of a costly new arms race among some of the world's poorest and least-stable nations.

Study Urges Addition of Space Weapons to Missile Defense Shield

By Randy Barrett, Space News, 19 January 2004

Space-based weapons should be a central component of the national missile defense shield, according to a new report authored by a prominent missile defense pioneer. The report, "Missile Defense for the 21st Century," was written by Los Alamos National Laboratory Senior Fellow Gregory Canavan and released by the Heritage Foundation late last month. The study argues that Space-based, kinetic kill vehicles using largely 1980s era brilliant-pebbles technology could provide the cheapest and most effective defense against enemy missiles in their boost and midcourse phases of flight. The position is not a new one for Canavan or the Heritage Foundation which have long supported the concept of weaponizing Space. According to the report, the Pentagon has overlooked viable Space-based technologies that could produce interceptors for as little as \$2 million apiece within the next three years. "The main requirement is that Space-based intercept costs be competitive with those of other elements of the defense," said the report. To cover the full threat of both rogue-state launches and unauthorized firings of Russian or Chinese missiles, America would need about 2,500 kill vehicles in Space, according to the report. But the Missile Defense Agency (MDA) has shown little interest in Space-based missile defense, opting instead to put most of its \$9.1 billion budget into ground and sea-based systems.