
Skunk Works Digest Wednesday, 7 February 1996 Volume 05 : Number 615

From: Kathryn & Andreas Gehrs-Pahl <schnars@ais.org
Date: Tue, 6 Feb 1996 03:40:26 -0500 (EST)
Subject: News about Groom Lake

To get away from the word jousting and name calling, here is something really interesting to the Skunk Works List.

The latest Aviation Week & Space Technology (AW&ST), from February 5, 1996, has two very skunky articles on pages 26-28. I am a little bit behind with my AW&ST summaries, but I think, this one can't wait:

The headlines are: "GROOM LAKE TESTS TARGET STEALTH", pages 26-27, and "PILOTS TO LEAVE COCKPIT IN FUTURE AIR FORCE", pages 26-28.

The first article confirms rumors about two or more new stealth aircraft being tested at Groom Lake. One is an Unmanned Aerial Vehicle (UAV) the other is an aircraft, which can fly manned or unmanned. At least the UAV has apparently already flown, while the other will incorporate "Smart Skin" properties. These include the ability to attenuate radar reflections better than current Radar Absorbing Materials (RAM), as well as the ability to change its color, to blend in with the background. It also incorporates infrared signature limiting technology. The aim is for an "invisible air vehicle" (in the radar, infrared and visual spectrum), which can operate unimpeded day or night. AW&ST also mentions drag reduction by electrostatic fields, again.

Both vehicles have hard points for weapons, but because the current US combat rules do not allow UAVs to drop bombs or fire missiles, at least the second aircraft could fly manned attack missions, besides unmanned reconnaissance or targeting missions.

To make an aircraft truly invisible, the USAF would need to perfect the ability to repeat and reverse radar signals, and further improve infrared signature reductions.

[Besides those two fixed-wing USAF stealth aircraft, it is also rumored that a British stealth aircraft and at least one stealth helicopter is currently tested at Groom Lake.]

The second article (and parts of the first) deal with the "New World Vistas" report, which highlights the technological advances, expected to be used by the USAF in the next 30 years (1995 to 2025).

The possible high-tech weapons listed in a year-long study released by the service are so advanced that special training would be essential to make sure humans are not overwhelmed by science. "The keyboard and the mouse are simply not adequate for the 21st Century," said Gene McCall of Los Alamos National Laboratory (LANL), chief of the Air Force Scientific Advisory Board. Some of the technologies, sketched out in the 15-volume report:

* Use of unmanned aircraft to do more than the spy missions they perform now; Uninhabited Combat Aerial Vehicles (UCAV) and Uninhabited Reconnaissance Aerial Vehicles (URAV), able to out-maneuver missiles at 15-20 g, flying at speeds of Mach 12-15 and operating at altitudes of 85,000-125,000 ft.

  Guided from control centers inside the United States or from aircraft like E-3 AWACS or E-8 J-STARS (and their follow-ons), robot planes could roam the world with laser or other high-energy/microwave weapons to destroy ground and air targets. Although it goes against the grain of traditional Air Force people, the idea of pilotless combat aircraft has inherent advantages over manned warplanes. Unmanned craft could be more survivable, for starters. Shape and function need not be constrained by a cockpit, a human body or an ejection seat.

  Gene McCall, who directed the "Vistas" project, told a Pentagon news conference an unmanned strike plane could be designed to accelerate and maneuver at 20 times the force of gravity, or double what a pilot can withstand. With such speed of maneuver the unmanned plane could simply outfly a hostile missile, McCall said. An unmanned bomber or fighter also could be stealthier. The plane could be perfectly flat on the bottom, reducing vulnerability to radar detection. The landing gear could be on top rather than on the bottom, and a simple rollover maneuver -- impossible with a human in the cockpit -- would put it in landing position.

  Small versions of the unmanned combat plane could be carried aboard and launched from large conventional aircraft -- giving them truly global reach. For all its promise, remotely piloted combat planes aren't likely to enter the Air Force for another 20 years or so, McCall said. Even then, pilots will not become extinct. "I don't think we're ever going to replace completely the manned aircraft," he said.

  The Advanced Research Projects Agency (ARPA) is working on a modification program for F-16s, to enable autonomous flight and auto-landing capability. Other options include an F-117-like delta-wing design without a cockpit, but with a blended surface fuselage, instead of flat planes. [A sketch of this design is included, which might also be a candidate for the "A-17".]

* Hypersonic fighters and UCAVs could soar into battle at 12 to 15 times the speed of sound, enabling the USAF to reach high value targets anywhere in the world in minutes. Hypersonic UAVs would cut costs dramatically and give better performance. Crucial to their development would be advanced dual-mode ramjet/scramjet engines and high-temperature, lightweight materials, allowing for long-range, long-endurance, high-altitude supercruise flight.

* Stealth will have to be pushed to a new plateau -- the multispectral approach would encompass capturing, repeating and reversing enemy radar signals, further reducing the infrared signatures and making the aircraft invisible in the visual spectrum. [Considering the difficulties encountered with relatively slow sound waves, the active cancellation of light-speed fast radar signals seems to be quite a feat to me.]

* Mega-lifter with up to 1 million pound gross takeoff weight will be able to deliver cargo within 10 meters of a preselected point at a range of 12,000

miles, after dropping them from 20,000 ft. They will be equipped with an all-weather, automatic landing aid, using Differential-Global Positioning System (D-GPS), enabling the pilot to land and taxi with an accuracy of 30 centimeters (1 foot) in zero visibility. Those airlifters could also carry UAVs or directed energy weapons like lasers, to be used as survivable offensive weapons platforms in high-thread areas.

* Hypersonic missiles. With on-board links to navigation satellites, they not only will be faster but also more accurate. McCall said a one-second electronic emission from a hostile surface-to-air, or SAM, missile radar would be enough to enable an Air Force plane 200 miles away to strike it within one minute. "We can make the operation of SAM sites the world's most dangerous occupation," McCall said.

* Precision guided micro-bombs will be able to kill tanks with mere grams of more powerful explosives. Besides being more accurate, munitions will be more powerful, per unit mass, by a factor of 10. Tiny bombs using just grams of explosive could destroy moving targets, even tanks or missile batteries. Natalie Crawford, a RAND defense specialist and chairman of the report's attack panel, said, that aircraft firepower could be increased 100 times while reducing the cost for war reserves.

* High-power microwave weapons and Electromagnetic Pulse (EMP) generators. These would be used against electronics or computers, not people. McCall said a fighter pilot threatened by a hostile warplane could send microwave signals to confuse his opponent -- perhaps by causing all of the other plane's warning lights and signals to come on. EMP generators were already tested on board of cruise missiles, which were powerful enough to destroy small electro motors and disable auto ignitions.

* Space-based surveillance and reconnaissance is expected to be worldwide, continuous and largely conducted from commercial satellites. A new, highly accurate and jam-resistant GPS system would be available, as well as distributed space-sensors and starring sensors aboard of URAVs, which could continuously monitor important targets with increased resolution.

* Brain-wave guidance of UAVs and other vehicles as well as other advanced human-machine interfaces will be perfected. "Information Munitions" will be developed, to seek out and confuse enemy computers -- the USAF's "Hacker Squadron" (the 609th Information Warfare Squadron (IWS), based at Shaw AFB, SC) is only the beginning.

* Drugs. Using what the "Vistas" report called "chemical intervention," the endurance and performance of pilots and other Air Force personnel can be enhanced. Chemical and other means can be found to reduce physical and psychological effects of jet lag, for example.

"Let me assure you that this study is not going to sit on the shelf and gather dust. We have already set aside funding for some of these promising new areas of research," Air Force Secretary Sheila Widnall said.

[Some information was compiled from additional sources like press reports.]

- -- Andreas

- ---

Andreas & Kathryn Gehrs-Pahl E-Mail: schnars@ais.org
313 West Court St. #305 or: gpahl@raptor.csc.flint.umich.edu
Flint, MI 48502-1239
Tel: (810) 238-8469 WWW URL: http://www.umcc.umich.edu/~schnars/
