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Armed Services Committee, U.S. Senate

Unmanned Aerial Vehicle Programs

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RELEASED BY THE SENATE
ARMED SERVICES COMMITTEE

STATEMENT OF

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BEFORE THE

SUBCOMMITTEE ON AIRLAND FORCES

OF THE

SENATE ARMED SERVICES COMMITTEE

ON

UNMANNED AERIAL VEHICLE PROGRAMS

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Mr. Chairman and Members of the Subcommittee, thank you for inviting me here today. With your permission, I will provide my written statement for the record and briefly summarize my comments. If I may, I would like to use these two models as displays for my discussion.

I was invited to provide you with a description and status of the High Altitude Endurance (HAE) Unmanned Air Vehicle (UAV) Program. The HAE UAV system is an advanced airborne reconnaissance system comprised of two complementary air platforms, the Tier II Plus Global Hawk and the Tier III Minus DarkStar, and a common mission ground control station. This system is currently under development by the Defense Advanced Research Projects Agency (DARPA) in a Joint Program Office with the Departments of the Air Force, Navy and Army, for the Defense Airborne Reconnaissance Office (DARO). The HAE UAV system addresses several service mission needs validated by the Joint Requirements Oversight Council of the Joint Chiefs of Staff for long-range surveillance and broad area coverage imaging capability supporting the theater commander. Each mission-optimized vehicle is specified to have a Unit Flyaway Price (UFP) of no more than $10 million (FY$94). The Global Hawk vehicle is optimized for supporting low-to-moderate threat, long endurance surveillance missions in which range, endurance and persistent coverage are paramount. The DarkStar vehicle features an incorporation of low observables, or stealth, and is optimized for a moderate endurance, high altitude reconnaissance mission in which ensured, survivable coverage is more important than range and endurance. This dual approach provides a flexible and cost-effective mix of platforms. The current Chairman's Program Assessment, in fact, strongly recommends pursuing both the Global Hawk and DarkStar systems to achieve this mix.

The Global Hawk, being developed by an industry team led by Teledyne Ryan Aeronautical and Raytheon/E-Systems, is considered the "workhorse" of the HAE UAV mix. It is a conventionally designed, wing/body/tail, jet-powered aircraft optimized for payload, range and endurance. It is a 24,000 pound vehicle capable of operating at 65,000 foot altitude with up to 42 hours of endurance. In terms of physical size, it has an overall wing span of 116 feet and a length of 44 feet. Its overall size is comparable to a U-2. The DarkStar, being developed by an industry team led by Lockheed Martin Skunk Works and Boeing Military Aircraft, is more of a special purpose aircraft targeted for use in high-threat environments prior to the suppression of hostile air defenses. It is a more unconventional design and, as mentioned, is optimized for the incorporation of low observability or stealth for survivability. It has a gross weight of 8,600 pounds, or, about a third that of the Global Hawk and can operate at just over a 45,000 foot altitude for more than 8 hours. Physically, it is a little over half the span and a third the length of the Global Hawk aircraft. The Common Ground Segment, being developed by Raytheon/E-Systems, combines mission planning, command and control, communications and imagery quality control for both systems into a transportable system housed in two ruggedized shelters.

In terms of payload, both systems are being developed to support the collection of high quality radar and optical imagery at high collection rates. The Global Hawk system offers a 2,000 pound payload capacity and carries both Synthetic Aperture Radar (SAR) and Electro-Optic/Infrared Red (EO/IR) Sensors. With the SAR payload, the Global Hawk will be able to survey up to 40,000 square nautical miles per day per aircraft at better than 3-foot resolution or

form 1,900 1-foot spot images, each 2 kilometer by 2 kilometer, at 1-foot resolution. Hughes Aircraft is developing both of the Global Hawk sensor payloads. The DarkStar offers a 1,000 pound payload and carries either a Low Probability of Intercept (LPI) SAR or EO sensor, one at a time, and offers similar collection rates and imagery resolution, though its capacity per mission is less due to its reduced endurance. Northrop Grumman Electric Sensors and Systems is developing the DarkStar SAR and Recon Optical is developing the EO sensor. The common ground station will disseminate the imagery product from the two air vehicles to existing exploitation systems.

The HAE UAV system is taking advantage of a number of unique acquisition practices in order to achieve an affordable system solution.

First of all, cost is the single requirement for both of these aircraft. The contractors are being driven to a $10 million UFP requirement; all other system attributes, including performance, are traded off against this requirement. We refer to this as "cost as an independent variable" and the intent is to arrive at a system solution which is not the best we can imagine but rather good enough to do the job.

Secondly, the HAE program is one of the Department's Advanced Concept Technology Demonstration (ACTD) programs, and, as such, takes advantage of early user involvement in the program to insure that user needs and desires are being addressed, as a way of streamlining the downstream transition of the program into operational use. Our prime customer and user, the United States Atlantic Command (USACOM), is currently working closely with us and the service components to tailor requirements and develop a concept of operations, building upon related work done for the Predator UAV, for ultimately employing these systems in a variety of military roles. In later phases of the program, these users will be directly involved in operational demonstration and evaluation of HAE UAV capabilities, will assess the overall utility to the warfighter, and will provide critical input to production transition decisions to be made near the turn of the century.

Thirdly, DARPA is executing the current phase of the program using Section 845 Agreements Authority. This allows tremendous flexibility in how we develop and acquire these systems and provides the mechanism for insuring that we can achieve our $10 million UFP goal.

Finally, we are executing the current phase of the program within an Integrated Product Development (IPD) environment. This has created a unique atmosphere between the government and industry that promotes teamwork and trust and provides complete visibility into program progress.

Both the Global Hawk and DarkStar developments are in Phase II of a four-phase program. Phase I was the concept definition phase and resulted in the selection of our current contractor teams. Phase II, the current phase, is focused on developing, fabricating and flight testing both systems. The flight testing will include both airworthiness and payload performance testing, as well as some limited field demonstrations. During Phase II, two Global Hawk and four DarkStar vehicles and one common ground station will be built and tested. This phase is currently expected to run through September 1998. Phase III focuses on operational

demonstration and user evaluation of the two systems through field demonstrations and military exercises. During this phase, additional air vehicles and common ground stations will be fabricated in numbers to be determined. Phase III will run through September 2000. The completion of Phase III will be followed by a decision whether to enter into full production in Phase IV.

As I'm sure all of you are aware, the HAE UAV Program has experienced its share of ups and downs during the past year. The DarkStar program, following a successful first flight last March, crashed on take-off during its attempted second flight in April. During the past 10 months, we have been working closely with the contractor team to determine the cause of the crash, identify changes required to rectify the problems and implement the fixes in Air Vehicle #2. Changes in the DarkStar flight control system and to the vehicle landing gear are currently being incorporated and tested in preparation for resuming flight testing late this summer. Initial flight tests, as originally planned, will be conducted without payloads to assess the airworthiness of the system. Payloads will be integrated and tested in later flights. We are currently also in negotiation with the DarkStar contractor team for the fabrication of Air Vehicles #3 & #4. That agreement should be awarded within a month.

The Global Hawk program entered development almost a year after the DarkStar program, but, with the events of the past year, the two programs are nearly coincident on their road to flight test. Global Hawk development has encounted its own technical difficulties that have contributed overall to about a six month slip in first flight schedule since last year when I briefed the committee. As in so many other developmental programs, the design, coding and testing of software has been the biggest driver to schedule growth. However, at this point, design of the Global Hawk is complete. Air Vehicle #1 has completed fabrication and is currently in ground testing. Formal roll-out of the Global Hawk occurred on February 20 of this year. First flight of the Global Hawk is currently projected for the first quarter of next fiscal year. As with DarkStar, early flights will be airworthiness tests with payloads integrated afterward and performance testing continuing through the end of Phase II in September 1998. We are also currently in negotiation with the Global Hawk contractor team for the fabrication of the remaining ACTD air vehicles. That agreement should be awarded this summer.

Following completion of the current phase of the HAE UAV program, DARPA is scheduled to transfer management responsibility to the Air Force. About 18 months ago, the Air Force established a Systems Program Office (SPO) at the Aeronautical Systems Command at Wright Patterson Air Force Base for this purpose. That office is currently substantially involved with ongoing HAE UAV system developments. Planning for this transition, as well as possible transition to production at the end of the ACTD, has already begun. The Acting Deputy Under Secretary of Defense for Advanced Technology, Mr. Tom Perdue, has initiated a process for working out the transition of ACTD programs into production and is leading the discussions currently ongoing regarding the HAE UAV transition. In addition, the Air Force has established a General Officer-level steering committee specifically chartered to address the areas necessary to field and sustain an HAE UAV force.

The HAE UAV system differs in many ways from the tactical UAV systems. These differences involve both technical and operational considerations. The HAE UAVs are theater-

level assets and are to be controlled predominately by the Joint Task Force Commander. The tactical UAVs will come under the control of lower echelons. Control of the HAE UAVs is, for most of the mission, expected to be via SATCOM, while the tactical UAVs will be line-of-sight only. The HAE UAVs provide broad area surveillance over the battlefield while the tactical UAVs provide much more focused coverage. The HAE UAVs will provide high resolution imagery while the tactical UAVs provide predominately video. The HAE UAVs will provide extremely high bandwidth data while the tactical systems will provide data at much lower bandwidths. The HAE UAV systems are designed to be relocatable but basically operating from fixed bases while the tactical systems are designed to be fully deployable. Both systems offer unique capabilities that can be fully employed in a complementary and interoperable way.

In conclusion, the HAE UAV system, despite developmental problems that we have encountered during the past year, is well underway to providing the warfighter and the nation with a new, powerful and much needed capability. Continuing progress over the next few years will demonstrate and define the capabilities of the system and ultimately prove the military worth of its implementation in a variety of roles and missions.

Thank you very much, Mr. Chairman and Subcommittee Members.