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## Northrop Grumman Proves Value of Vertical Unmanned Systems at Army Expeditionary Warrior Experiment

### *Fire Scout Delivers Cargo, Equipment, Assured Communications to the Warfighter*

Participants in the 2010 Army Expeditionary Warrior Experiment (AEWE), Fort Benning, Ga. had the opportunity to witness firsthand the versatility, reliability and functional maturity of the Northrop Grumman-developed Fire Scout vertical unmanned aerial system (VUAS).

Fire Scout performed in the annual Army exercises, held Jan 11 to Feb 12, as the brigade level unmanned aerial system, part of the Reconnaissance, Surveillance and Target Acquisition (RSTA) squadron. Northrop Grumman supported AEWE with two company-funded “Whitetail” versions of Fire Scout equipped with a FLIR BriteStar II laser designator payload and mission pods; an Army One System-compatible ground control station; a Tactical Control Data Link (TCDL) ground data terminal; and a crew of air vehicle operators and maintainers.

AEWE is managed by the Maneuver Battle Lab at Fort Benning, in coordination with TRADOC Army Capabilities Integration Center. It provides an opportunity for network-enabled small units to experiment in a live field environment with emerging technologies and concepts of operation. The intent of the exercises is to provide current and future Army forces with operational insights that can improve their fighting effectiveness. A wireless communications network called MAINGATE (Mobile Ad hoc Interoperability Network GATEway) served as the communications backbone for AEWE 2010.

### **Support to the Brigade Combat Team**

During the AEWE, Fire Scout flew a variety of missions that demonstrated its capabilities and unique value to the brigade combat team. Typically, it flew RSTA missions to areas of interest to the brigade commander. Periodically, however, Fire Scout was reassigned to support battalion, company or even platoon level missions. Movement from area to area was facilitated by Internet-like chat among commanders via the MAINGATE network.

During each mission, Fire Scout used its EO/IR payload to produce full motion video of its targets. This video was made available to ground commanders in two ways: (1) it was sent by TCDL directional antenna to the Fire Scout ground control station where it was fed into the MAINGATE network; and (2) it was broadcast via Fire Scout's TCDL omnidirectional antenna to all Army One System Remote Video Terminals participating in the exercises.

### **Fire Scout – Versatile, Flexible, Reliable**

Over the course of AEWE, Fire Scout demonstrated three critical mission capabilities required by small units operating in remote or rugged territory: (1) cargo resupply; (2) network communications relay; and (3) deployment of unmanned ground vehicles/unattended ground sensors. None of these missions can be performed efficiently by current fixed wing unmanned aerial assets. Fire Scout performed all of these missions in parallel with its primary RSTA missions.

#### Cargo Resupply

For AEWE, Fire Scout was equipped with two ruggedized containers – each rated for 65 pounds of equipment – attached to its external pylons. For the cargo resupply mission, the VUAS flew autonomously to a clearing in the forest designated Landing Zone Anzio. Before landing, Fire Scout used its EO/IR sensor to verify that the area was clear of obstacles and personnel. When its skid sensors verified contact with the ground, a command was sent autonomously to the air vehicle, releasing the ruggedized containers. Then Fire Scout took off again, reacquired its line-of-sight data link (lost temporarily when it landed in the tree-surrounded landing area) and continued its RSTA mission.

#### Network Communications Relay

For the communications relay missions, Fire Scout was equipped with a MAINGATE communications payload installed in pod attached to its external pylons. Hovering approximately 4,000 feet above the battlefield, the VUAS used this payload to relay communications among ground troops, allowing them to share high quality video, voice and data communications in real time. Fire Scout's ability to move with the ground forces and operate from a "perch and stare" position high above the battlefield allowed it to maintain optimum communications coverage for commanders and troops at all times.

Fire Scout's mature, modular design allowed Northrop Grumman's Fire Scout support team to integrate and fly the Raytheon-provided MAINGATE communications payload in record time: from start to finish, the process took less than three months; installation, check-out and first flight of the MAINGATE hardware at AEWE took just one day.

### Deployment of Unmanned Ground Systems

Northrop Grumman also demonstrated how Fire Scout could support critical missions in the future by ferrying unmanned ground vehicles or unattended ground sensors into combat zones.

As was the case with the cargo resupply mission, the VUAS flew autonomously to a designated landing zone, this time carrying a Dragon Runner unmanned ground vehicle, observed the site, verified that no obstacles or personnel were at the planned touchdown point, then transmitted the information via TCDL its ground control station. After performing an autonomous landing, Fire Scout dropped off the Dragon Runner, then took off, reacquired its line of sight data link, then continued on with its assigned RSTA mission.

### **Uniquely Qualified to Serve the Warfighter**

AEWE 2010 demonstrated that Northrop Grumman's Fire Scout vertical unmanned aerial is uniquely qualified to support commanders and ground troops operating in remote or rugged environments. It offers the following benefits:

- Versatile, modular payload capabilities
- Cargo delivery and small unit resupply
- Deployment of unmanned ground vehicles/unattended ground sensors
- Assured network communications relay
- Takeoff and landing from unimproved surfaces
- Movement at the pace of maneuvers
- Enhanced situational awareness enabled by “perch and stare” capabilities

Fire Scout is an autonomous, unmanned helicopter based on a Sikorsky Aircraft commercial airframe. Equipped with a variety of EO/IR and communications payloads, it can provide high levels of situational awareness and precision targeting support to U.S. armed forces for more than five hours at a time. Fire Scout can take off and land autonomously on any aviation-capable warship, and at prepared and unprepared landing zones in proximity to ground troops. Its ability to operate at low ground speeds allows it to move with warfighters in the field, and easily acquire and track targets in complex and urban terrain. It can also perform ‘dull, dirty, or dangerous’ missions, thereby protecting soldiers from harm's way. Northrop Grumman is developing Fire Scout vertical unmanned systems for a variety of U.S. and international military customers.

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