



U.S. Navy Tactical Control System (TCS) Controlling Multi-Service UAVs



U.S. Navy Tactical Control System: Meeting the commander's requirement for dominant information superiority

The Tactical Control System (TCS) is designed to provide command and control of Unmanned Aerial Vehicles (UAV) for all branches of the U.S. and NATO armed services. The system can be configured in racks for ship-based operations, land-based shelters, or installation on a High Mobility, Multi-Purpose, Wheeled Vehicle (HMMWV). In addition, near-term enhancements focused on open systems architecture will facilitate the integration of TCS functionality into existing hardware and C4I architectures and networks.

There are five levels of TCS functionality. Levels I and II enable receipt of imagery. In addition to receipt of imagery, Levels III and IV provide command and control of the air vehicle and payload. Level V provides complete air vehicle C2, payload control, imagery receipt, and the ability to takeoff and land. In all cases, TCS processes and disseminates payload

imagery to end users. These capabilities allow the battlefield commander to receive and, in some cases, direct the collection of imagery from a tactical UAV asset in the area of operations.

The launch and recovery operations of a TCS-controlled Predator in a 2000 Joint Forces Command demonstration substantiated command and control of the U.S. Army Shadow 600 Tactical UAV (TUAV) and successfully supported command and control of Fire Scout Vertical Takeoff and Landing UAV (VTUAV) in 2003. Since then, TCS has controlled the Fire Scout from the USS Denver and from onboard the P-3C Antisurface Warfare Improvement Program aircraft. Full Level V command and control of the Fire Scout from the P-3C in December 2003 was a first in the UAV industry. Additional Fire Scout demonstrations are planned.

TCS will meet the battlefield commander's need for focused intelligence gathering and enhanced engagement capabilities in a variety of dynamic theater environments and systems. They include increased interoperability, the addition of new simplified UAV systems and payloads, and the incorporation of precision weapons. The support contract for Fire Scout includes provisions to allow for simultaneous operation of multiple UAVs, compliance with STANAG 4586, integration of multiple plug-and-play payloads, weaponization of Fire Scouts, and operational evaluations. Further developments include a Raytheon-funded initiative for transitioning the TCS core system from a Unix-based operating system to Linux.

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TCS offers increased interoperability; the addition of new, simplified UAV systems and payloads; and the incorporation of precision weapons.

The TCS program is developing a core capability to operate a wide variety of UAVs across Department of Defense (DoD) and NATO service lines. To date, the program has demonstrated the ability to operate with a variety of tactical UAV systems (as shown in the figures to the left).

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