

Global Positioning System (GPS) Enterprise



In December 2024, DOT&E approved the IOT&E test plan for the Next Generation Operational Control System (OCX) Blocks 1 and 2. IOT&E for OCX Blocks 1 and 2 has begun, with the cooperative vulnerability and penetration assessment (CVPA) performed in September 2025. Also in September 2025, the Military GPS User Equipment (MGUE) Increment 1 program completed integrated developmental test (DT)/operational test (OT) as installed on the MQ-1C Gray Eagle unmanned aerial system. DOT&E will publish classified test reports on OCX Blocks 1 and 2 and MGUE Increment 1 in FY26.

Though the GPS Enterprise was removed from oversight in July 2025, some of the specific program elements that enable the GPS Enterprise will remain on DOT&E oversight. DOT&E removed GPS III and MGUE Increment 2 from oversight, as the former has stabilized and the latter is covered by other programs on oversight.

SYSTEM DESCRIPTION

The GPS Enterprise is a satellite-based global radio navigation system of systems, operated by

the Space Force, that provides accurate and secure positioning, navigation, and timing (PNT) information to users worldwide. It consists of three operational segments: space, control, and military user equipment. The space

segment includes 31 operational satellites in the GPS constellation that transmit both civilian and encrypted military signals to users. The control segment (primary and alternate sites) operates the GPS constellation; supports launches,

anomaly resolution, and disposal operations; and tasks navigation warfare effects in support of combatant commands. The military user equipment segment includes the MGUE, which is intended to modernize military GPS receivers, including the ability to receive and use the more secure Military Code (M-code) signal.

MISSION

Military and civilian users across the globe use GPS to access PNT information that allows them to conduct a wide variety of missions. GPS military receivers allow military commanders to navigate and maneuver within strategic, operational, and tactical theaters.

MGUE Increment 1 receivers will enable military users to access the M-code signal, which is now available across the globe for developmental and user equipment testing. MGUE Increment 2 receivers will include the ability to use Regional Military Protection (RMP), which will concentrate higher M-code signal power broadcast by GPS III Follow-On Production (GPS III F) satellites in a targeted region to ensure the warfighter has continued access to PNT data in contested environments.

OCX will provide full M-code and modernized civil signal operations, including a more accurate Kalman filter algorithm to calculate satellite orbits, increased PNT monitoring capabilities, more robust and sophisticated cyber defense capabilities, and additional support to civil signals.

PROGRAM

The GPS Enterprise consists of multiple programs pursuing separate acquisition paths to advance the space, control, and military user equipment segments. In August 2021, DOT&E approved the Enterprise TEMP Revision C that encompasses the three segments of GPS. In FY26, the Space Force plans to draft the Enterprise TEMP Revision D, to address updates to OCX.

- **GPS III Satellite** – An Acquisition Category (ACAT) IC program that achieved Milestone C (MS C) in January 2011. The last of the ten GPS III satellites, Space Vehicle 10, was made available for launch in December 2022. Since 2018, the Space Force has successfully launched eight GPS III satellites and plans to launch the remaining two satellites in FY26. The two most recent satellite launches in FY25 demonstrated the Space Force’s ability to complete high-priority launches on a rapid timescale to achieve a broader goal of tactically responsive space operations. In July 2025, DOT&E removed GPS III from oversight because program development has stabilized and there are no significant planned upgrades or OT activities.
 - **GPS III F Satellite** – An ACAT IB program. These satellites will provide enhanced RMP signals and support for search and rescue services. The Air Force made the GPS III F MS C decision in July 2020, following completion of the program’s Critical Design Review. The Space Force plans
- to conduct cyber operational testing of Block III F satellites in FY26. The Space Force plans to launch the first GPS III F satellite in FY27 and operationally accept it in FY28.
- **Operational Control System (OCS) Architecture Evolution Plan (AEP)** – The Air Force fielded OCS AEP in 2007. It features two ACAT III upgrades: Contingency Operations (COps) and M-code Early Use. These upgrades allow the system to command and control GPS III satellites and provide core M-code capability from the existing GPS constellation while maintaining previous civilian and military services. OCS AEP had been considered part of the GPS Enterprise, which DOT&E removed from oversight in July 2025 because it was not specific to programs of record. OCS AEP development has stabilized and no longer requires DOT&E oversight.
 - **OCX** – An ACAT ID program awarded in February 2010 with an initial expected completion date of early 2016. OCX achieved MS B in June 2017 and was relieved of MS C requirements. The Space Force accepted the system from the development contractor in July 2025. OCX will replace OCS AEP following a successful constellation transfer that the Space Force currently plans to execute in FY26, followed by operational acceptance. DOT&E approved the IOT&E test plan for OCX Blocks 1 and 2 in December 2024, and the CVPA cyber test plan in September 2025. Continued delays to OCX put U.S. warfighters and allies

at risk, because full M-code has not been deployed to the field for use in operations.

- **OCX 3F** – A tailored ACAT II program that builds on the software delivered by OCX. Contingent on successful OCX deployment, the subsequent OCX 3F upgrade will allow OCX to support launch as well as command and control GPS IIIIF satellites. The Space Force anticipates delivery from the vendor in FY27 and plans to operationally accept OCX 3F in FY28. Since OCX 3F builds on the software delivered by OCX, schedule slips to OCX correspondingly affect operational acceptance of OCX 3F and reduce any remaining margin in the OCX 3F delivery schedule.
- **MGUE Increment 1** – An ACAT IC program that achieved MS B in January 2017 and was relieved of MS C requirements. The program was designed to deliver personnel- and vehicle-based M-code receivers to the warfighter, including improved GPS signal availability in degraded threat environments. The MGUE Increment 1 program delivered an interim functional aviation/maritime receiver card in September 2022. The program continues to resolve deficiencies related to integration with the lead maritime platform, the Arleigh Burke-class destroyer, and plans to operationally test MGUE aboard the ship in FY27. In September 2025, the U.S. Army Special Operations Command conducted an integrated DT/OT of the aviation/maritime receiver card embedded within the

MQ-1C Gray Eagle unmanned aerial system. Gray Eagle does not pass data to GPS-guided weapons, so future testing of MGUE Increment 1 will be required as configured on a weapons platform like the B-2 aircraft. The Space Force expects to transfer the program to the Air Force in FY26.

- **MGUE Increment 2** – The program is structured as two Middle Tier of Acquisition rapid prototyping efforts. The first is the Miniaturized Serial Interface (MSI) receiver with next-generation Application-Specific Integrated Circuits (ASICs) that will deliver improved jam resistance, address MGUE Increment 1 ASIC hardware obsolescence, support the enhanced RMP offered by GPS IIIIF satellites, and support low-power applications (e.g., guided munitions). The second is the handheld receiver, which will incorporate the MSI receiver, with the prototype unit planned for FY28 availability. DOT&E removed MGUE Increment 2 from oversight in July 2025, because the MSI receiver is already covered by existing testing programs and the handheld does not require oversight.

» MAJOR CONTRACTORS

Space Segment

- Lockheed Martin Space – Denver, Colorado (GPS III / IIIIF satellites)

Control Segment

- Lockheed Martin Space – Denver, Colorado (OCS AEP)

- Raytheon, a subsidiary of RTX – Aurora, Colorado (OCX)
- Raytheon, a subsidiary of RTX – Aurora, Colorado (OCX 3F)

Military User Equipment Segment (MGUE Increments 1 and 2)

- L3Harris Technologies, Inc. – Anaheim, California
- Raytheon, a subsidiary of RTX – El Segundo, California
- BAE Systems – Cedar Rapids, Iowa
- Technology Advancement Group – Ashburn, Virginia

TEST ADEQUACY

In March 2025, DOT&E funded an assessment of OCS AEP through the Cyber Assessment Program to assess the current cyber defense posture of the GPS control segment. Testing included vulnerability identification, penetration testing, and an assessment of the defensive monitoring of OCS AEP. These results will be included in the overarching cybersecurity reporting.

In September 2025, in accordance with the DOT&E-approved cyber test plan, the Space Force began to conduct the CVPA of OCX Blocks 1 and 2, which DOT&E observed. The CVPA will complete in FY26 and will be followed by an adversarial assessment (AA). DOT&E will evaluate the cyber survivability of OCX Blocks 1 and 2 in a classified IOT&E report using data from the CVPA and AA, as well as data from the OCS AEP cyber assessment for comparison purposes.

The Space Force delayed OCX testing of command and control of

the four-satellite mini-constellation until FY26, due to program schedule delays. The Space Force still plans to complete this limited test ahead of the full IOT&E, beginning later in FY26.

In September 2025, the U.S. Army Special Operations Command conducted an integrated DT/OT of MGUE Increment 1 as configured on Gray Eagle, in accordance with a DOT&E-approved test plan. DOT&E observed the event to assess MGUE Increment 1's operational effectiveness and suitability in this specific configuration. Additional testing is still required on a maritime platform, as well on an aviation platform that incorporates a GPS-guided weapon, such as the B-2. In FY26, DOT&E will report on MGUE Increment 1 operational testing on Gray Eagle following completion of data analysis.

PERFORMANCE

» EFFECTIVENESS AND SUITABILITY

There are insufficient data at this time to assess OCX's operational effectiveness and suitability. DOT&E will provide these assessments in a classified IOT&E report, following completion of testing, expected in FY26.

DOT&E continues to analyze data from the MGUE Increment 1 integrated DT/OT and will assess MGUE Increment 1's progress towards operational effectiveness and suitability in a classified report in FY26.

DOT&E has no updates to previous operational effectiveness and suitability findings for other GPS

programs, as they did not undergo OT in FY25.

» SURVIVABILITY

There are insufficient data at this time to assess OCX's cyber survivability. DOT&E will provide this assessment in the classified IOT&E report, following completion of all testing. The cyber survivability assessment will utilize data from the CVPA and AA, as well as data from the OCS AEP cyber assessment for comparison purposes.

DOT&E has no updates to previous survivability findings for other GPS programs, as they did not undergo OT in FY25.

RECOMMENDATION

The Space Force and Air Force should:

1. Fund and plan MGUE Increment 1 OT that integrates the maritime/aviation receiver card with a platform that employs a GPS-guided weapon system, like the B-2.