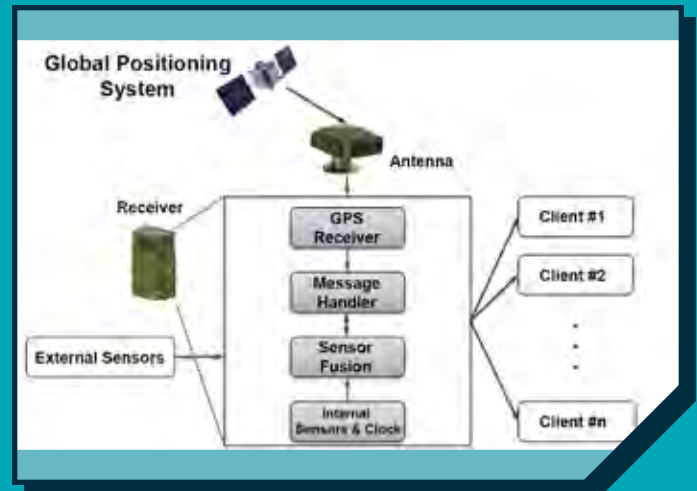


Assured-Positioning, Navigation, and Timing (A-PNT)

Assured-Positioning, Navigation, and Timing (A-PNT) products, including the Dismounted A-PNT System (DAPS) and Mounted A-PNT System (MAPS), continued with prototyping efforts and conducted early operational testing in FY21. MAPS and DAPS will enter Program of Record status as Major Capability Acquisition programs in FY22 and FY23 respectively. In early testing, A-PNT products performed better than legacy PNT systems in GPS-degraded or denied environments.



System Description

A-PNT products are intended to provide ground maneuver forces with access to trusted PNT information in GPS-degraded or denied environments, such as operations in dense vegetation, built-up urban and mountainous terrain, and in the presence of electromagnetic spectrum interference or enemy GPS jamming and spoofing. The four primary product families include:

- MAPS – Vehicle-mounted system providing PNT to multiple onboard client systems.
- DAPS – Soldier-worn system providing PNT for dismounted operations.
- Resiliency and Software Assurance Measures – Software upgrades to legacy military GPS receivers.
- PNT Modernization – Alternative solutions and complementary PNT technologies for integration into MAPS and DAPS systems.

MAPS GEN II, DAPS GEN 1.0, and GEN 1.2 are all Military Code (M-Code) GPS-enabled systems and support the Army's transition to M-Code GPS.

Program

In 2019, the Commanding General, Army Futures Command issued individual Directed Requirements for the DAPS and MAPS efforts directing the rapid prototyping, operational assessment, and limited fielding of advanced PNT technologies. The Directed Requirements outlined a "buy, try, and decide" process to inform an enduring requirement and follow-on programs of record. The PNT Program Manager is utilizing several Other Transaction Authority contracts and a phased prototyping approach to satisfy the Army Futures Command Directed Requirements.

DAPS GEN 1.0 and DAPS GEN 1.2 are following the Urgent Capability Acquisition pathway and will result in a limited equipping of two Infantry Brigade Combat Teams in FY22. In early FY22, DAPS will enter Program

of Record status at Milestone C as an Acquisition Category II, Major Capability Acquisition program. A DAPS Test and Evaluation Master Plan (TEMP) is currently in draft and expected to be approved by DOT&E ahead of the planned Milestone-C decision in FY23.

MAPS GEN II will replace the existing GPS receivers and antennas in most of the Army's ground vehicle variants. MAPS GEN II will enter Program of Record status at Milestone C as an Acquisition Category II, Major Capability Acquisition program. A MAPS MS-C TEMP is currently in Army staffing and expected to be approved by DOT&E in early FY22.

Major Contractors:

- DAPS GEN 1.0 – Integrated Solutions for Systems, Inc., Auburn, Alabama.
- DAPS GEN 1.2 – TRX Systems, Inc., Greenbelt, Maryland.
- MAPS GEN II – Collins Aerospace subsidiary of Raytheon Technologies, Cedar Rapids, Iowa.

Test Adequacy

Throughout FY21, the Army Test and Evaluation Command and PNT Program Manager conducted several test-fix-test cycles with each of the MAPS and DAPS solutions to complete prototyping efforts and prepare for entry into Program of Record status. This testing included chamber, systems integration lab, and open-air range testing.

In FY21, the Army conducted an operational assessment of the DAPS GEN 1.0 and GEN 1.2 systems in accordance with a DOT&E-approved test plan. The operational assessment was scoped to determine the performance capabilities and limitations of the GEN 1.0 and GEN 1.2 systems and support limited equipping decisions in accordance with their respective Directed Requirements. Results from the operational assessment will also inform a vendor selection to enter Program of Record status at Milestone C.

In FY21, the Army conducted a Limited User Test (LUT) of the MAPS GEN II system in accordance with a DOT&E-approved test plan. The MAPS LUT will support entry into Program of Record status

at Milestone C as an Acquisition Category II, Major Capability Acquisition program.

Cybersecurity testing of DAPS GEN 1.0 and GEN 1.2 systems, and the MAPS GEN II, is scheduled to begin in FY22.

Performance

Effectiveness

Not enough data are yet available to provide an operational effectiveness assessment of either DAPS or MAPS. Early operational testing of the DAPS GEN 1.0 and 1.2 systems and the MAPS GEN II system indicates that both systems performed better than the legacy PNT system in GPS-degraded environments.

Suitability

Not enough data are yet available to provide an operational suitability assessment of either DAPS or MAPS. Early operational testing indicates that with additional development and testing, the DAPS GEN 1.0 and GEN 1.2 systems should be able to achieve their reliability requirement. GEN 1.0 users indicated the desire for the DAPS to have a stand-alone capability and user interface separate from the Nett Warrior ensemble. GEN 1.2 users indicated the need for longer internal battery life when disconnected from the conformal battery.

Early operational testing indicates that the MAPS GEN II system should be able to achieve its reliability requirement. Integration testing revealed that adhering to the GPS interface standard does not guarantee compatibility and software updates to the client systems will be necessary. Significant integration effort remains with complex armored vehicles such as the Stryker Fire Support Vehicle, Bradley Fire Support Team Vehicle and Infantry Fighting Vehicle, Abrams Tank, and Paladin self-propelled howitzer. Extensive integration engineering and testing is planned for FY22-23.

Survivability

No data are currently available to provide a survivability assessment of either DAPS or MAPS in a cyber-contested environment.

Recommendation

1. The Army should start identifying and securing MAPS and DAPS IOT&E locations that will allow for GPS-disrupted and denied testing, as well as sufficient maneuver space for a Battalion-sized combat formation to conduct operationally realistic missions in accordance with their Mission Essential Task List.