

PM **PNT**

**AGILE &
ADAPTIVE
STRATEGY**

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"Key to developing the technologies necessary to meet our modernization goals is encouraging a culture of innovation within the Army, and forging new partnerships with traditional and non-traditional industries, academia, and other partners."

ARMY MODERNIZATION STRATEGY, 2019

"Today's modern Army has to transition from a finite mindset to an infinite mindset on modernization. Ours is a mission of continual evaluation of where we're at, where we need to be in 2028 or 2035 and how to best use our resources now, to ensure our future Soldiers are ready to dominate any multi-domain battlefield."

GENERAL JOHN M. MURRAY

"Cultivating a lethal, agile force requires more than just new technologies and posture changes; it depends on the ability of our warfighters and the Department workforce to integrate new capabilities, adapt warfighting approaches, and change business practices to achieve mission success."

THE NATIONAL DEFENSE STRATEGY



FROM THE PROJECT MANAGER

Today, nearly every Army ground combat system relies on Positioning, Navigation, and Timing (PNT) (mostly provided by Global Positioning System (GPS)); it is central to American military operations. Our adversaries have recognized this critical Achilles' heel to mounted and dismounted operations, and are blocking our access to GPS. Incidents of malicious disruption to both the access and integrity of our GPS data are increasing worldwide — development and proliferation of cheap and ubiquitous threat technologies will continue well into the future. Project Manager Positioning, Navigation, and Timing (PM PNT) was chartered to outpace this enduring risk to operations.

Working with our stakeholders across the Armed Forces, PM PNT is constantly assessing new and disruptive PNT technologies. Leveraging industry Independent Research and Development (IR&D), Academia, and the DoD Science and Technology (S&T) community, we seek out best-of-breed technologies to optimize our capabilities.

To counter the Threat, there is no single Assured PNT silver bullet. A continuously enhanced and layered solution set is needed: multiple PNT technologies integrated to communicate with each other and with the user. These layered solutions must include various sources of PNT data to address multiple attack vectors, allowing us to protect our Radio Frequency (RF) usage and extend our capabilities beyond it. To counter electronic attack, our systems must be flexible in utilizing other parts of the RF spectrum as well as non-RF PNT technologies. Our ultimate objective is Assured PNT that can operate independently of RF for durations long enough to ensure mission accomplishment.



MR. MIKE TRZECIAK

Project Manager

Positioning, Navigation, and Timing

<https://pm-pnt.army.mil/>

Using agile and adaptive acquisition processes and a Modular Open Systems Approach (MOSA), we will optimize our solutions by layering and continuously upgrading "plug-and-play" solutions as new technologies emerge. Our Open Innovation Lab (OIL) is a collaborative space that breaks down common acquisition and security barriers to allow us to build relationships with non-traditional partners while strengthening our relationships with established, trusted partners. This grants us access to innovative resources beyond our own organization and keeps us in sync with emerging cutting-edge technological advancements. We will rely on industry and academia to show us their best compatible technologies, conduct evidence-based assessments, and rapidly transition those solutions to the field.

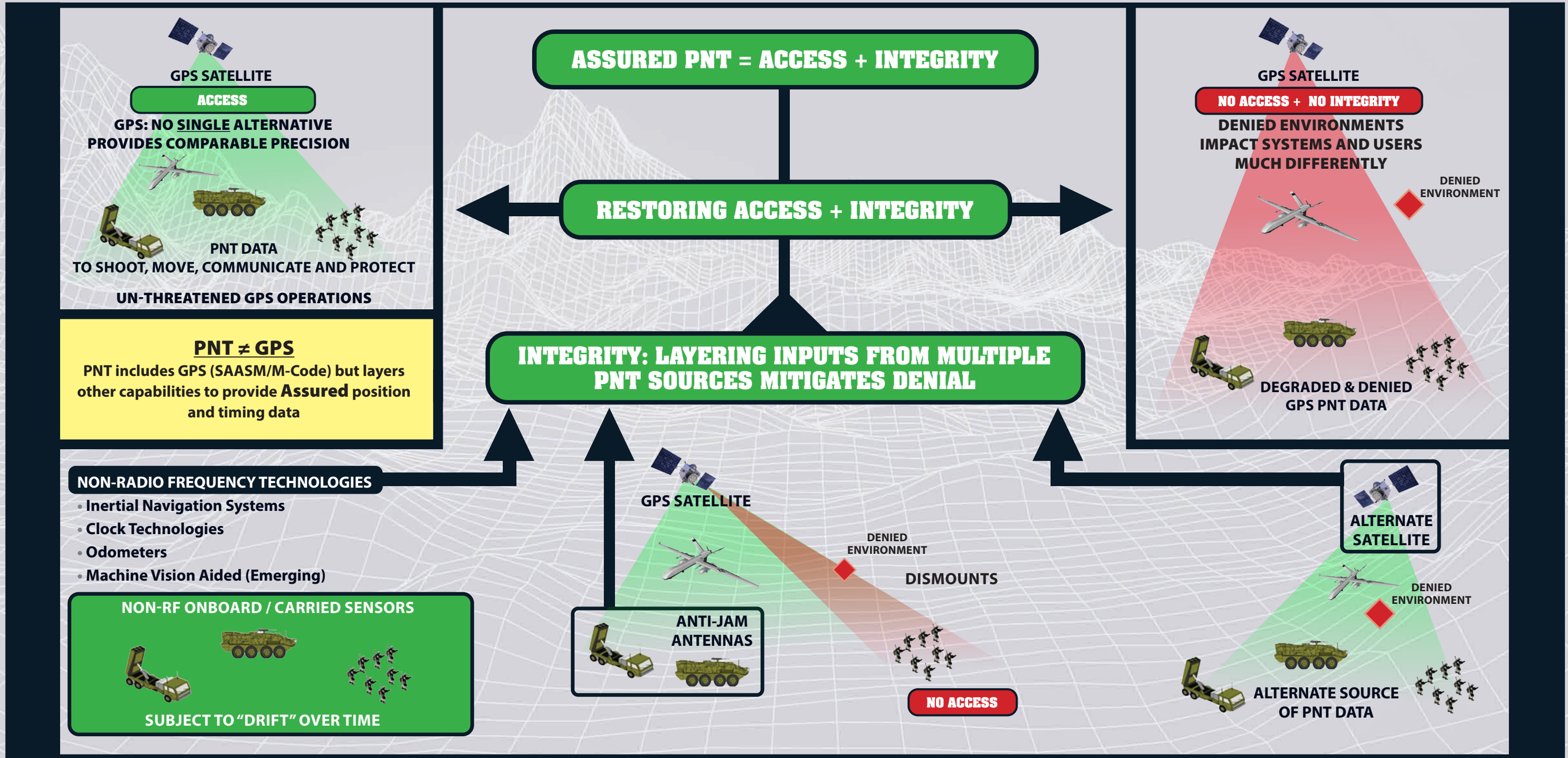
We will not be wedded to a single configuration or solution. PM PNT is fully committed to supporting Mounted and Dismounted forces engaged in Multi-Domain Operations by providing affordable, precise, and resilient Assured PNT products that are on time and on target.

WHAT IS ASSURED PNT?



CHALLENGE

Commercial and Military GPS systems can be disrupted by frequency interference such as weather, terrain, urban areas, and adversary intervention, which could affect Army forces' ability to shoot, move, and communicate. Our challenge is to provide Access and Integrity through non-RF technologies, anti-jam antennas, and alternate sources.



ADAPTIVE ACQUISITION



MISSION

Provide Warfighter-valued Assured PNT solutions today that enable Multi-Domain Operations in rapidly evolving challenged environments.

VISION

Ensure overmatch capability through innovative acquisition and rapid integration of cutting-edge modular and open-system Assured PNT technologies.



CHALLENGES OF TRADITIONAL ACQUISITION

SLOW

The traditional acquisition model does not move at the speed of business; it can take more than 10 years from concept to deployment. Technology becomes outdated or obsolete quickly in the field. The benefit of getting something to the field 'now' without investing in future modularity only helps in the short run but doesn't benefit in the long term.

RIGID

Traditional budget and acquisition processes estimate the lifecycle cost of a system up front, which was intended to foster careful consideration of important decisions and stabilize planning. However, committing to a set plan creates barriers to seeking out better alternatives. Managers become beholden to an obsolete plan rather than explorers of better options.

LIMITING

Traditional acquisition is not conducive to new vendors, especially small businesses and startups who cannot afford to wait for funding. The Government often gets locked in to buying full systems (all or nothing) from established vendors with a lot of overhead. Promising new capabilities die off waiting for funding that won't be available for years, or because they can't be leveraged to replace proprietary components.

HOW THE ARMY IS OVERCOMING

ARMY ADAPTATION

Ushering in a new era of acquisition based on lessons learned from the traditional acquisition process.

Leveraging new adaptive acquisition frameworks to provide greater flexibility in development, procurement, and fielding of cutting-edge technology to the Soldier.



ARMY MODERNIZATION

Rapidly fielding new technologies across modernization priorities and modernizing existing equipment. Focusing on innovation, creativity, and entrepreneurship through partnerships with diverse and small businesses.

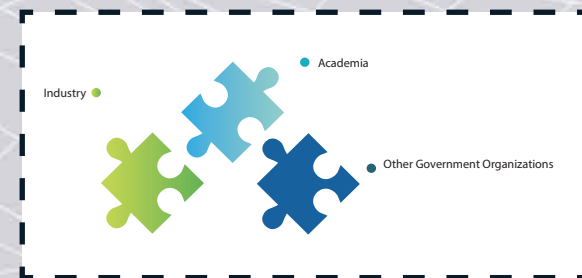
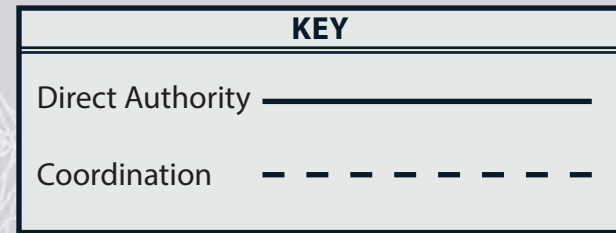
Completely outfitting the Army with doctrine, organizations, equipment, and training environments to dominate adversaries in sustained Large Scale Combat Operations.

HOW PM PNT IS OVERCOMING

- Using new adaptive acquisition constructs to eliminate lengthy development cycles—prototyping, pilot programs, alternative contracting methods
- Making our focus Soldier-centric—partnering with stakeholders for awareness and understanding of Soldier needs against emerging threats
- Standing up new Product Office (Product Manager PNT Modernization) and OIL to support our ability to take advantage of emerging technologies
- Investing in future acquisition by implementing a MOSA that leverages modular design and open standards as a strategic capability
- Developing and maintaining the Army's PNT Reference Architecture and supporting the compliance assessments and strategies of other acquisition offices
- Improving availability and integrity of PNT data by protecting RF PNT sources, optimizing layered technologies, and exploring alternatives beyond GPS and RF
- Continuously evaluating technological advances from industry, non-traditional/small innovative companies, academia, and Government S&T to find, mature, and field the latest capability available
- Creating a more adaptive and effective workforce through Agile training and using a Learning Plan style of project management
- Forging relationships with academic institutions and other Government innovation hubs

WHO IS PM PNT

TASK ORGANIZATION

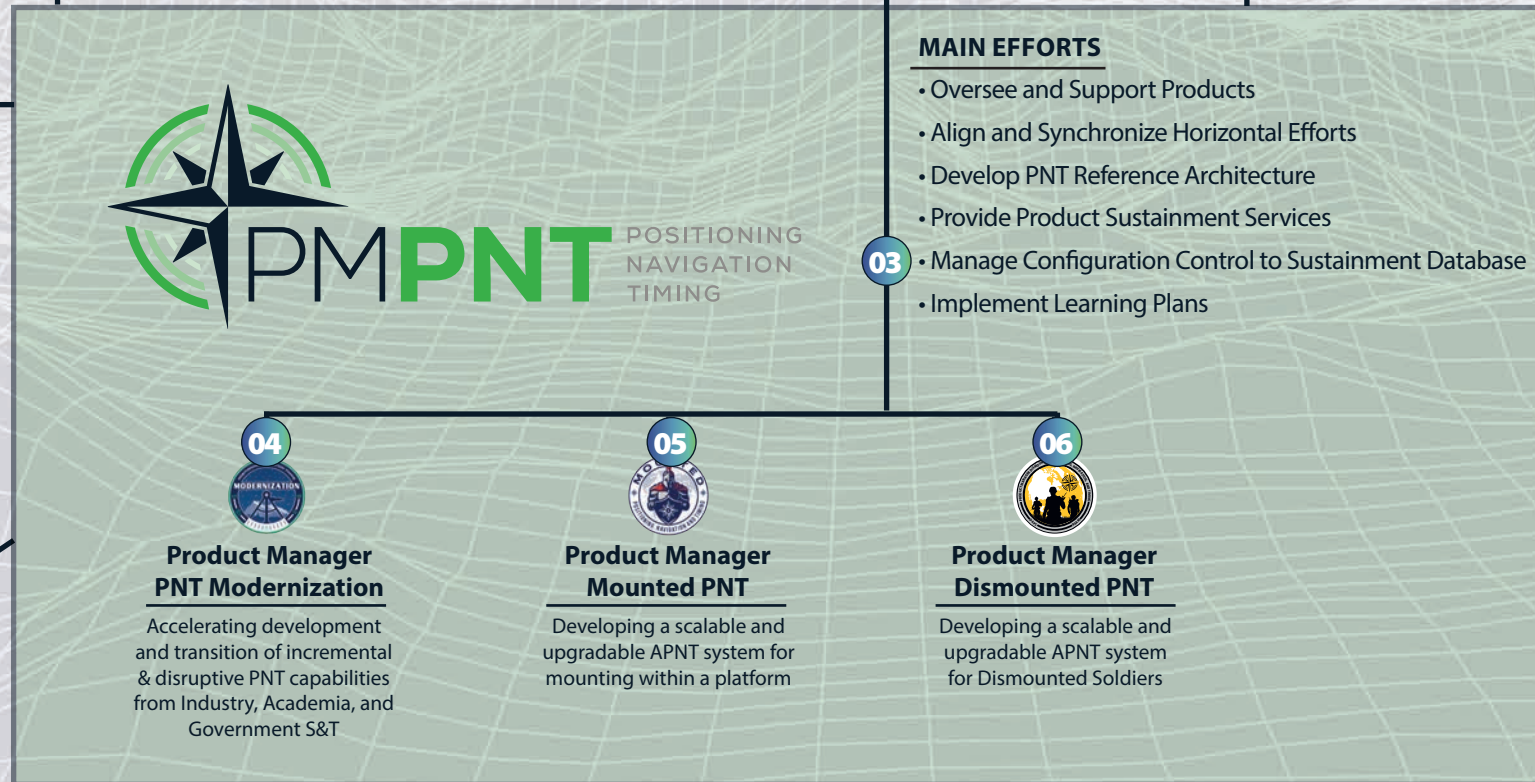


U.S. Army Futures Command (AFC)
U.S. Army Futures Command Cross Functional Team (CFT) Director



APNT/Space CFT Director

PM PNT is a member of the CFT



Product Manager PNT Modernization

Accelerating development and transition of incremental & disruptive PNT capabilities from Industry, Academia, and Government S&T



Product Manager Mounted PNT

Developing a scalable and upgradable APNT system for mounting within a platform



Product Manager Dismounted PNT

Developing a scalable and upgradable APNT system for Dismounted Soldiers

01



PEO

IEW&S

Dept. Army Sys. Coord

02

03

ORGANIZING FOR COMBAT

As part of PM PNT's Soldier-centric approach, we coordinate with a wide range of stakeholders across the Army and other branches of the military to ensure our solutions are truly meeting Soldiers' needs while working within the larger battlespace of Multi-Domain Operations. Within PM PNT, there are three product offices chartered to serve the mounted and dismounted Soldier, and to modernize and accelerate the development of technologies for those Soldiers.



Liaison Officers (LNOs) to the Acquisition Enterprise



REFER TO BACK OF BOOK FOR # DESIGNATION

PRODUCT MANAGER PNT MODERNIZATION



WHAT THE PRODUCT OFFICE DOES

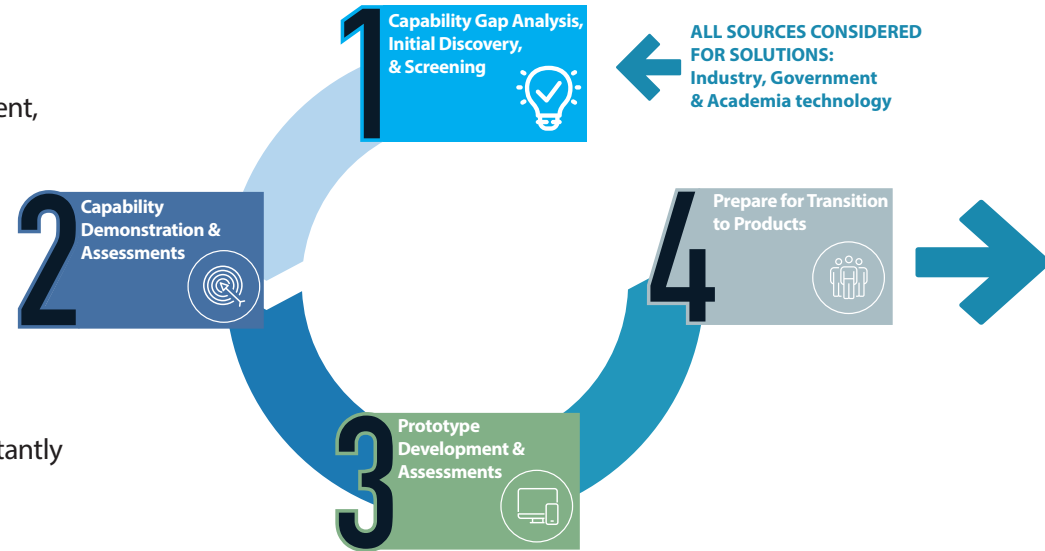
Seeks out and accelerates maturation of technologies providing a layered set of Assured PNT capabilities ready for final integration into Mounted and Dismounted maneuver systems.

THE PNT MODERNIZATION PROCESS

Accelerates discovery, development, and integration of incremental & disruptive advanced PNT capabilities for Ground Forces

ASPECTS OF THE PROCESS

- Uses a learning plan as the foundation of the effort to constantly incorporate information into the process, requirements and capabilities
- Leverages Subject Matter Experts (SMEs) from government and academia to assess emerging capabilities
- Includes capability discovery & assessments, advanced capability development, prototyping, testing, and demonstration
- Assesses compliance with the Government-owned PNT Reference Architecture (RA), pntOS, and/or the Command, Control, Communication, Computers, Cyber, Intelligence, Surveillance, and Reconnaissance (C5ISR) / Electronic Warfare (EW) Modular Open Suite of Standards (CMOSS)
- Demonstrates military utility and eliminates transition of immature technologies to product developers reducing cost growth, schedule delays, and performance shortfalls
- Seeks out and accelerates maturation of technologies promoting a layered set of Assured PNT capabilities to be integrated into Mounted and Dismounted maneuver systems



WHY PNT MODERNIZATION WAS ESTABLISHED

- To create a proving ground for emerging PNT technologies – conducts market research identifying potential solutions fulfilling PNT capability gaps and address emerging threats
 - Leverages the investments of S&T and Industry
 - Uses consistent, proven processes
 - Discovers best-of-breed modular solutions via assessment and prototyping
- To identify incremental and disruptive PNT capabilities and utilize modular open system approaches while eliminating redundant, disparate development efforts for mounted and dismounted systems to drive down costs and outpace the threat
- To reduce schedule risk by providing developed materiel solutions ready for integration and fielding for MAPS and DAPS

OTHER EFFORTS

ALTNV ENTERPRISE BUILDOUT AND USER EQUIPMENT

ALTNV is a complementary APNT solution for when GPS is degraded or denied.

THE ALTNV ENTERPRISE CONSISTS OF:

- 1.) Space Segment
- 2.) Ground Control Segment
- 3.) User Equipment Segment

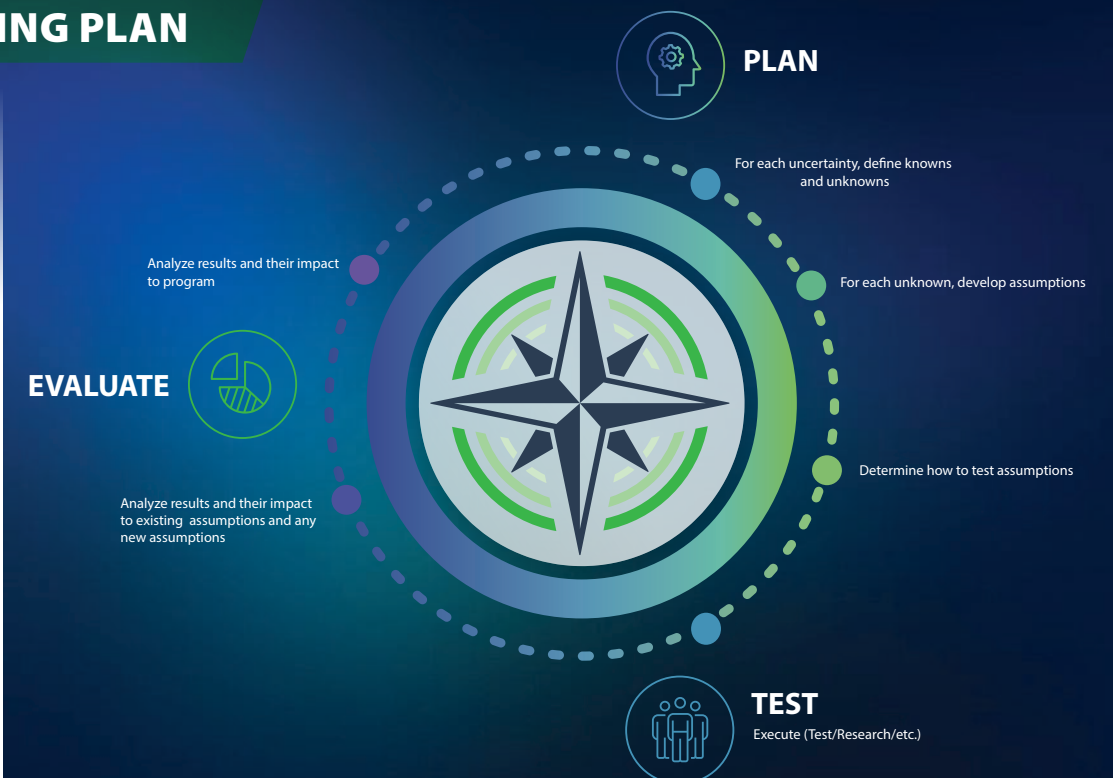
CMOSS PNT MINIMUM VIABLE PRODUCT (MVP)

A practical application of standards as a strategic capability, CMOSS is a suite of layered standards that are individually useful and can be combined to form a holistic converged architecture. CMOSS Mounted Form Factor (CMFF) (the CMOSS chassis) facilitates modular and scalable architecture enabling fusion of communication waveform, electronic warfare (EW), PNT, data storage, local computing infrastructure, and sensor capabilities (e.g., cards/modules) minimizing the need of additional cabling or mounts.

WHAT IS A LEARNING PLAN

A Learning Plan is a project management framework for breakthrough/innovation projects where the degree of uncertainty is high. Rather than measuring success or failure against reaching an objective, it allows a project team to change course based on what has been learned so they can reach the right objective.

PM PNT uses Learning Plans to manage exploration across the organization to ensure we are taking the best path to meet our objectives, and to ensure our objectives continue to be the correct ones. Learned information is shared among teams and used to plan the path forward by informing requirements, test methods, and problem-solving.



PRODUCT MANAGER MOUNTED PNT



WHAT THE PRODUCT OFFICE DOES

Develops, fields, and supports successive generations of Assured PNT capabilities for mounted platforms and their multiple clients, allowing operations in GPS-challenged environments.



MAPS GEN I

- Quick-Reaction Capability (QRC) delivering the “fight tonight”
- An integrated solution including an Anti-Jam Antenna, ensuring access to GPS in a denied environment
- Provides resiliency in Multi-Domain Operations (MDOs)

MAPS GEN II

- Next Generation Capability
- Provides increased GPS protection capability via sensor fusion algorithms and non-Radio Frequency sensors.
- Upgrades include:
 - M-Code
 - PNT Fusion
 - Path to ALTNV
 - Open standard interfaces (ASPN, VICTORY)

MOUNTED ASSURED POSITIONING, NAVIGATION, AND TIMING (PNT) SYSTEM (MAPS)

DESCRIPTION

The MAPS enables mounted Army forces to shoot, move, and communicate in GPS challenged environments. It Assures PNT through integrity checks of, and access to multiple integrated, modular, lean, layered PNT sources. MAPS fuses Assured PNT (APNT) sources and then distributes APNT data to on-board client systems. MAPS is a Program Executive Office Intelligence, Electronic Warfare & Sensors (PEO IEW&S) Program of Record (POR).

BENEFIT TO THE SOLDIER

MAPS enables mounted maneuver operations with audacity, combat power, tempo, and momentum in GPS challenged environments.

ADAPTIVE APPROACH

- Leverage alternative contracting methods such as Other Transaction Authority (OTA) for greater:
 - Speed: 9 months to create initial project agreement vs. 18-24 months for FAR base process
 - Flexibility: expanded scope at different Phases of OTA contract to allow for iterative development, adding features in each iteration
- Rapid prototyping for fast development and feedback cycles
- Utilize upward invitation rather than down-selection to take advantage of technology insertion
- Deliver near-term solution (GEN I) while developing next generation (POR) with improved capabilities
- MOSA investment now (through requirements) to ensure continued technological overmatch in the future

PRODUCT MANAGER DISMOUNTED PNT



WHAT THE PRODUCT OFFICE DOES

Develops, fields, and sustains Assured PNT Capabilities for Dismounted Soldiers and provides software updates for SAASM-Based GPS Receivers.

DISMOUNTED ASSURED POSITIONING, NAVIGATION, AND TIMING (PNT) SYSTEM (DAPS)

DESCRIPTION

The DAPS enables dismounted Army forces to shoot, move, and communicate in GPS challenged environments. It Assures PNT through integrity checks of and access to multiple integrated, modular, layered Size, Weight, and Power (SWaP)-constrained PNT sources. The DAPS fuses APNT sources and then either displays APNT data on an integrated display and/or distributes APNT data to various client systems through direct connect or wireless means. DAPS is a PEO IEW&S POR.

BENEFIT TO THE SOLDIER

DAPS enables dismounted maneuver operations with speed, surprise, and agility in GPS challenged environments.

ADAPTIVE APPROACH

- Leverage alternative contracting methods such as Small Business Innovation Research (SBIR) and Other Transaction Authority (OTA) for rapid prototyping and development
- Use an iterative DevOps approach to achieve APNT accuracy, access, and integrity requirements, find issues early, adapt to new requirements, and incorporate Soldier feedback
- Develop, deliver, and field capability incrementally in a series of multiple iterations and generations
- Soldier Touchpoints for stakeholder involvement and feedback
- MOSA investment now (through requirements) to ensure continued technological overmatch in the future

RESILIENCY & SOFTWARE ASSURANCE MEASURES (RSAM)

DESCRIPTION

The RSAM program provides software updates for SAASM-based GPS receivers including the dismounted / mounted Defense Advanced GPS Receiver (DAGR) and the embedded Ground-Based GPS Receiver Applications Module (GB-GRAM), and synchronizes RSAM deployment to combat forces through integrated software testing with host platforms and client systems.

BENEFIT TO THE SOLDIER

- Improved timing and position reliability in a contested environment
- Enhanced awareness of data anomalies
- Improved recovery when emerging from a contested environment



DAPS QRC

- Delivering the Fight Tonight
- Replaces DAGR on the Nett Warrior Ensemble
- Operated through Nett Warrior with some standalone capability
- M-Code
- PNT Fusion
- Path to ALTNV

DAPS POR

- Small Tactical Universal Battery (STUB) integration
- Open standard interfaces (ASPN)
- All the QRC capability, plus:
 - Improved Performance
 - Improved Reliability
 - Improved Sustainability

RSAM

- Integrity Checks
- Software Failure Prevention and Recovery Improvements
- Additional Resiliency Robustness Improvements

MODULAR OPEN SYSTEMS APPROACH (MOSA)



STANDARDS AS A STRATEGIC CAPABILITY

An investment in modularity allows us to lean forward to pace technology and our adversaries, to make cost-based decisions for best value, and to simplify and streamline acquisition in the future.

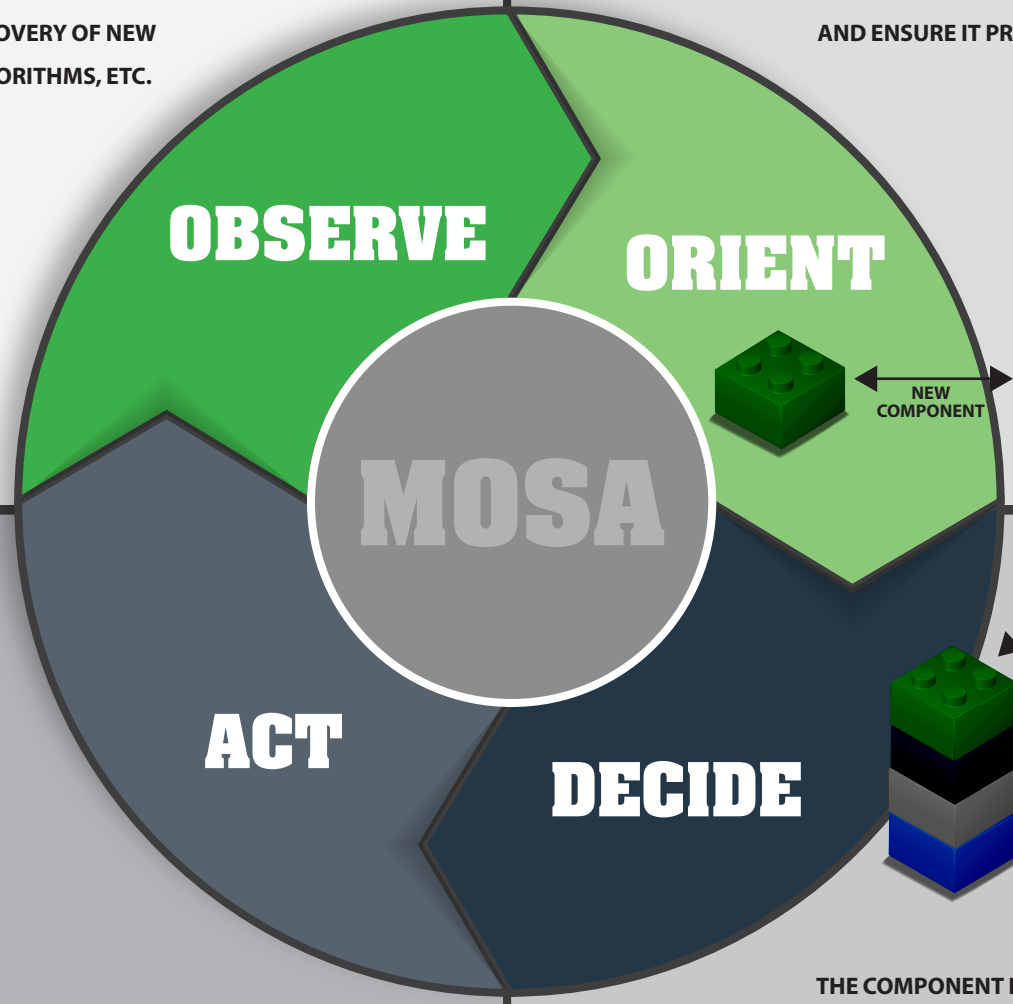


USE OF MODULAR DESIGN AND OPEN STANDARDS

- Allows for plug & play addition, removal, or replacement of components
- Reduces vendor lock and allows the Government to purchase modular components as opposed to whole systems
- Creates more opportunity for competition and innovation, including small businesses
- Allows the Government to leverage disruptive technologies

SOLDIER FEEDBACK AND TECHNICAL ADVANCES FROM RESEARCH AND INDUSTRY DRIVE PM PNT DISCOVERY OF NEW COMPONENTS, ALGORITHMS, ETC.

IT IS TESTED IN THE OIL TO VALIDATE IT AGAINST OUR CHOSEN STANDARDS AND ENSURE IT PROVIDES BEST VALUE ALGORITHMS, ETC.



THE COMPONENT IS FIELDDED, PROVIDING THE SOLDIER WITH NEW / IMPROVED CAPABILITY.

THE COMPONENT IS INTEGRATED INTO EXISTING PM PNT SYSTEMS AND TESTED IN THE SIL AND IN OPERATIONAL ENVIRONMENTS.

ARMY PNT REFERENCE ARCHITECTURE

PM PNT created and maintains the Army's PNT RA, a set of standards guiding and constraining development for all Army systems that provide, consume, or host PNT data. This RA supports the United States Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA(ALT)) objectives to reduce PNT requirement inefficiencies/redundancies, decrease Warfighter vulnerabilities, and provide an affordable migration path to the Military Code (M-Code), while aligning with the proposed DoD PNT Architecture (PNTA) Standard. PM PNT supports other PMs in assessing their systems for compliance with the RA and developing strategies for reaching and maintaining compliance.

CMOSS

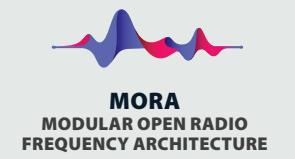
PM PNT is assisting with the development of the CSISR/EW Modular Open Suite of Standards (CMOSS) system. CMOSS is being included in and managed under the Sensor Open Systems Architecture (SOSA) initiative with Army, Air Force, and Navy participation (<http://www.opengroup.org/sosa>). The CMOSS chassis and software and the VICTORY Bus tie together processor/controller cards for radios, sensors, antennas, etc., providing centralized platform-level integration and dissemination of data (including PNT) to the various onboard clients. Under Product Manager PNT Modernization, the team is rapidly developing and testing prototypes to demonstrate proof-of-concept of PNT technologies meeting the CMOSS standards.

MAPS AND DAPS FUTURE VARIANTS

PM PNT is incorporating MOSA compliance as a requirement in its programs to ensure a path to improved acquisition—and ultimately, performance—in future variants of our products.

PNT OPERATING SYSTEM (PNTOS)

PM PNT is supporting development of a modular PNT sensor fusion solution that complements the open architectures focused on modular data exchange between sensors and systems (e.g., VICTORY). pntOS allows vendors to develop isolated PNT applications without needing knowledge of other areas. In addition, the Government-owned Scorpion Toolkit (STK), a developer's toolkit of navigation algorithms for building filters and plugins, provides a baseline implementation of pntOS that can be replaced by more advanced plugins built by the community.

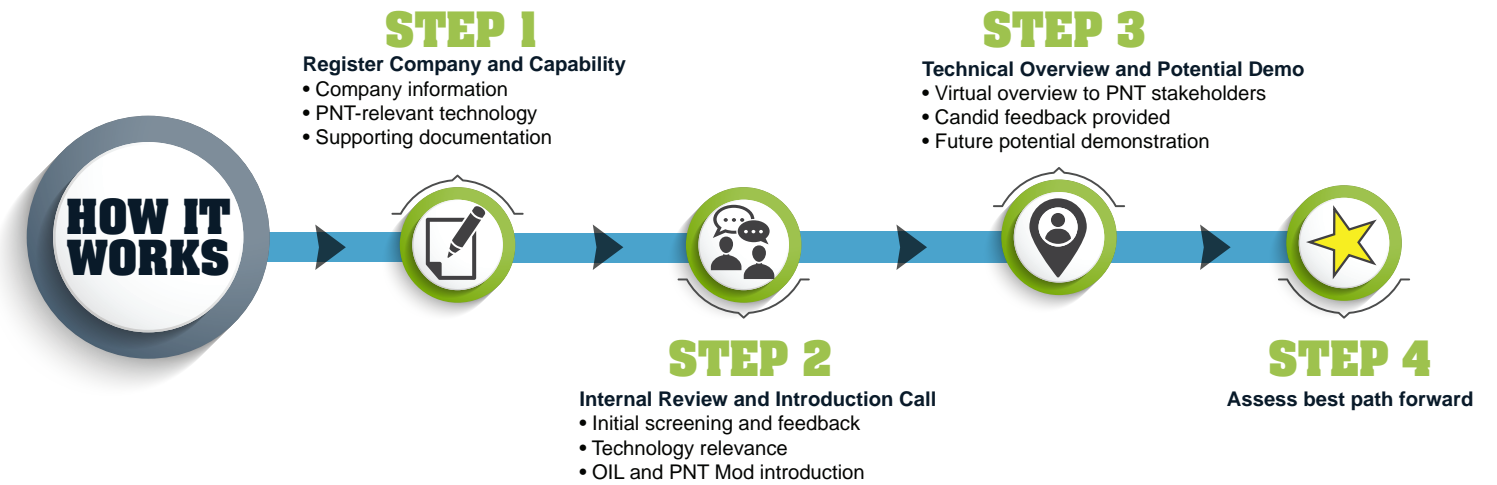


OPEN INNOVATION LAB (OIL)



BRINGING THE FUTURE TO PM PNT

The Open Innovation Lab (OIL) is a state-of-the-art collaborative space for accelerated screening and developing of emerging technologies to maintain the Army's competitive PNT advantage. <https://apntoil.army.mil>



THE OPEN INNOVATION LAB (OIL) combines the expertise of PM PNT with that of the U.S. Army Combat Capabilities Development Command (DEVCOM) C5ISR Center to screen and develop emerging technologies to maintain the Army's competitive Assured-PNT advantage. The OIL provides a gateway to the acquisition process enabling Academia, Industry, Government, and other non-traditional organizations to showcase their best technologies and capabilities, and to work together to cultivate these technologies into rapidly deployable solutions. As an entry point, the OIL is used to evaluate the current maturity and future potential of these technologies and their benefit to the Army. Operations are at the unclassified security level, opening the door to new partners and existing partners where access may have previously been a barrier to progress.

The OIL is a resource within the PNT Modernization framework, which is focused on using flexible acquisition options and agile methodologies to accelerate the path from concept to Soldier's hands. The unclassified OIL environment supports the PNT Modernization MOSA by assessing candidate technologies for compliance with identified open system standards, and by providing access to reference implementations of those standards, e.g., the Army PNT Reference Architecture, pntOS, CMOSS, VICTORY, etc. This approach will allow for continuous upgrade and improvement by swapping in the best available technologies from an array of sources while reducing risk and cost.

Technologies of sufficient maturity and potential for accelerated development may be pursued by PM PNT; technologies showing potential but needing greater effort to reach maturity and technology readiness may be picked up by one of the partnered S&T organizations including DEVCOM, Army Applications Lab (AAL), and the A-PNT / Space CFT. The process is flexible so that investment in these technologies may change as priority and perceived return on investment change. Once a technology is selected for accelerated development, Product Manager PNT Modernization leads the development until it is ready for integration and hand-off to the appropriate PNT POR, at which point the integration, production, and fielding are the responsibility of the Product Management Office directing that POR.

- Solicited (direct contact or RFI) or unsolicited companies register their relevant PNT capabilities and technologies through the OIL Website.
- Product Manager PNT Modernization performs an initial assessment. If the technology is relevant to the PNT domain, the company provides a technical overview to PNT stakeholders to include PM PNT, DEVCOM, AAL, APNT / Space CFT, Network CFT, the DEVCOM Analysis Center (DAC) and other organizations.
- If the technology sufficiently meets a near-term capability need from the S&T community or PM PNT, Product Manager PNT Modernization schedules a follow-on demonstration of the prototype.
- If after the demonstration, the prototype shows true potential to meet the near-term capability need, the vendor is then put on contract with the appropriate OIL Stakeholder to undergo testing and development on an accelerated timeline.
- Soldier touchpoints are conducted as often as possible and are necessary to evaluate emerging technologies.
- Product Manager PNT Modernization and the S&T OIL Stakeholders make a recommendation for a product decision: if a prototype reaches an acceptable maturity and continues to meet a priority capability gap, it may be transitioned to one of the Product Management offices. If the need has changed or the maturity level is not acceptable, the technology may be re-directed or rejected.
- Once a technology has been selected to transition to one of the Product teams, it goes through the normal preparation for fielding and sustainment (integration, testing, etc.).
- Tracking fielded configurations and failures drives future development of existing PORs and emerging technologies.
- The Learning Plan influences the capability gaps explored, and data from testing feeds into the organization's knowledge base.

- 01. ASA(ALT)
- 02. PEO IEW&S
- 03. PM PNT
- 04. PM PNT MODERNIZATION
- 05. PM MOUNTED PNT
- 06. PM DISMOUNTED PNT
- 07. AFC

08. A-PNT / SPACE CFT

OTHER CFTs

- 09. AFC LRPF
- 10. AMD CFT
- 11. AFC SOLDIER LETHALITY
- 12. NETWORK CFT
- 13. AFC STE
- 14. NGCV CFT
- 15. FVL CFT

PARTNERS

- 16. ATEC
- 17. CCDC
- 18. ACM TR
- 19. ACC
- 20. HQDA G8, FDC
- 21. ACM SHA
- 22. ARL
- 23. AAL
- 24. USASMDC
- 25. DASA-CE
- 26. US SPACEFORCE (GPS)

- 27. HQDA, CIO / G8
- 28. HQDA, G2
- 29. HQDA, G8 FDC & PAE
- 30. DOD CIO / G8
- 31. HQDA, G3 / 5 / 7
- 32. HQDA, G4
- 33. ASA FM&C ASO / DASA-CE
- 34. OCLL & SAFM-BUL (CONGRESS)
- 35. OTHER ARMY SECRETARIES
- 36. DOT&E
- 37. DoD JOINT STAFF

- 38. PNT WORK GROUP
- 39. DISA
- 40. THE SERVICES
- 41. NSA
- 42. OGAs
- 43. COCOMs

LIASONS TO THE ACQUISITION ENTERPRISE

APG

- 44. PEO IEW&S
- 45. PEO C3T
- 46. JPEO CBRND

REDSTONE

- 47. PEO M&S
- 48. RCCTO
- 49. PEO AVN
- 50. JPEO A&A

BELVOIR / ORLANDO

- 51. PEO EIS
- 52. PEO SOLDIER
- 53. PEO STRI

DETROIT

- 54. PEO GCS
- 55. PEO CS&CSS

AAL	ARMY APPLICATIONS LAB
AFC	U.S. ARMY FUTURES COMMAND
ALTNV	ALTERNATE NAVIGATION
APG	ABERDEEN PROVING GROUND
APNT	ASSURED PNT
ASA(ALT)	UNITED STATES ASSISTANT SECRETARY OF THE ARMY FOR ACQUISITION, LOGISTICS, AND TECHNOLOGY
ASPN	ALL SOURCE POSITIONING AND NAVIGATION
C5ISR	COMMAND, CONTROL, COMMUNICATION, COMPUTERS, CYBER, INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE
CFT	CROSS FUNCTIONAL TEAM
CMOSS	C5ISR/EW MODULAR OPEN SUITE OF STANDARDS
COCOM	COMBATANT COMMANDER
DAC	DEVCOM ANALYSIS CENTER
DAGR	DEFENSE ADVANCED GPS RECEIVER
DAPS	DISMOUNTED ASSURED PNT SYSTEM
DEVCOM	U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND
DEVOPS	DEVELOPMENT-OPERATIONS
EW	ELECTRONIC WARFARE
FACE	FUTURE AIRBORNE CAPABILITY ENVIRONMENT
FAR	FEDERAL ACQUISITION REGULATION
GB-GRAM	GROUND-BASED GPS RECEIVER APPLICATIONS MODULE
GEN	GENERATION
GPS	GLOBAL POSITIONING SYSTEM
IR&D	INDEPENDENT RESEARCH AND DEVELOPMENT
LNO	LIAISON OFFICER
MAPS	MOUNTED ASSURED PNT SYSTEM
M-CODE	MILITARY CODE
MDO	MULTI-DOMAN OPERATIONS
MORA	MODULAR OPEN RF ARCHITECTURE
MOSA	MODULAR OPEN SYSTEMS APPROACH
MVP	MINIMUM VIABLE PRODUCT
OGA	OTHER GOVERNMENT AGENCY
OIL	OPEN INNOVATION LAB
OTA	OTHER TRANSACTION AUTHORITY
PEO IEW&S	PROGRAM EXECUTIVE OFFICE INTELLIGENCE, ELECTRONIC WARFARE, AND SENSORS
PM PNT	PROJECT MANAGER POSITIONING, NAVIGATION, AND TIMING
PNT	POSITIONING, NAVIGATION, AND TIMING
PNTOS	PNT OPERATING SYSTEM
POR	PROGRAM OF RECORD
QRC	QUICK-REACTION CAPABILITY
RA	REFERENCE ARCHITECTURE
RF	RADIO FREQUENCY
RSAM	RESILIENCY & SOFTWARE ASSURANCE MEASURES
S&T	SCIENCE AND TECHNOLOGY
SAASM	SELECTIVE AVAILABILITY ANTI-SPOOFING MODULE
SAVE	STANDARDIZED A-KIT/VEHICLE ENVELOPE
SBIR	SMALL BUSINESS INNOVATION RESEARCH
SME	SUBJECT MATTER EXPERT
SOSA	SENSOR OPEN SYSTEMS ARCHITECTURE
STK	SCORPION TOOLKIT
STUB	SMALL TACTICAL UNIVERSAL BATTERY
SWAP	SIZE, WEIGHT, AND POWER
VICTORY	VEHICULAR INTEGRATION FOR C4ISR/EW INTEROPERABILITY



 **PMPNT** POSITIONING
NAVIGATION
TIMING



U.S. ARMY