



DoD INSTRUCTION 4650.06

POSITIONING, NAVIGATION, AND TIMING MANAGEMENT

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Approved by: Dana Deasy, DoD Chief Information Officer

Change 1 Approved by: John Sherman, Acting DoD Chief Information Officer

Purpose: In accordance with the authority in DoD Directives (DoDDs) 5144.02 and 4650.05, this issuance:

- Implements policy, assigns responsibilities, and provides procedures for the DoD positioning, navigation, and timing (PNT) enterprise, PNT cybersecurity, precise time and time interval (PTTI), and celestial reference frame (CRF) management, in accordance with Section 2281 of Title 10, United States Code and Space Policy Directive-7 (SPD-7).
- Establishes policy and assigns responsibilities for DoD participants in domestic civil forums, international government, and civil PNT forums.
- Establishes and provides procedures for the DoD PNT Executive Management Board (EMB) to oversee the governance process in support of the Council for the Oversight of the DoD PNT Enterprise (referred to in this issuance as the "PNT Oversight Council").
- Provides procedures for the PNT Oversight Council, in accordance with DoDD 4650.05.
- Establishes and provides procedures for the DoD PNT Working Group (WG), as well as the DoD PNT Waiver, DoD navigation warfare (NAVWAR), DoD PNT Cyber, DoD PTTI, and DoD CRF WGs.

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SECTION 1: GENERAL ISSUANCE INFORMATION

1.1. APPLICABILITY.

This issuance applies to OSD, the Military Departments, the Office of the Chairman of the Joint Chiefs of Staff (CJCS) and the Joint Staff, the Combatant Commands, the Office of Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational entities within the DoD (referred to collectively in this issuance as the “DoD Components”).

1.2. POLICY.

a. The DoD will employ the PNT Oversight Council and EMB and subordinate WGs to ensure DoD PNT enterprise capabilities and applications, including alternatives and complements to the Global Positioning System (GPS), are consistently available and interoperable across the Joint Force to the maximum extent possible.

b. To ensure preservation of DoD PNT enterprise equities, the DoD will employ the PNT Oversight Council and EMB and subordinate WGs to develop coordinated DoD positions for use by DoD participants in domestic civil forums, international government, and civil PNT forums.

c. In accordance with DoDD 4650.05, the DoD PNT enterprise:

(1) Serves three principal functions for the United States:

(a) Provides and protects the effective use of military GPS and other PNT services by U.S. and allied forces anywhere in the world.

(b) Prevents the effective use of PNT services by adversaries in areas of military operations.

(c) Preserves civil GPS PNT services to non-combatants outside areas of military operations.

(2) Provides PNT information essential to the execution and command and control of military missions and to the efficient operation of information networks necessary for continuous situational awareness by Combatant Commanders and other senior decision makers.

(3) Requires cooperation with other federal departments and agencies in the management and operation of dual-use PNT systems.

(4) Requires participation in domestic civil and international government and civil PNT forums in which coordinated U.S. Government positions must support DoD objectives.

1.3. INFORMATION COLLECTIONS.

The PNT Capabilities Information, referred to in Paragraph 2.1.v. of this issuance, does not require licensing with a report control symbol in accordance with Paragraphs 4 and 10 of Volume 1 of DoD Manual 8910.01.

1.4. SUMMARY OF CHANGE 1.

The changes to this issuance update the Under Secretary of Defense for Research and Engineering (USD(R&E)) and Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)) responsibilities and correct the designation of responsibilities for chairing the PNT Cyber WG and the NAVWAR WG.

SECTION 2: RESPONSIBILITIES

2.1. DEPARTMENT OF DEFENSE CHIEF INFORMATION OFFICER (DOD CIO).

The DoD CIO:

- a. Maintains and implements this issuance.
- b. Coordinates policy related to PNT systems and for international PNT activities with the Under Secretary of Defense for Policy (USD(P)).
- c. Coordinates policy affecting the acquisition of PNT systems, including GPS, with the USD(A&S).
- d. Coordinates policy affecting the protection of controlled technical information associated with PNT systems with the USD(R&E).
- e. Provides overall guidance on national and international matters related to PNT and achieving and maintaining a military advantage in PNT-enabled operations through NAVWAR principles.
- f. Chairs the DoD PNT EMB, oversees the secretariat that provides administrative support for the PNT Oversight Council, and directs the EMB to perform the functions described in Section 3.
- g. Establishes DoD PNT WGs to support the DoD PNT EMB, as necessary.
- h. Designates representatives to serve on the DoD PNT, PNT Waiver, NAVWAR, PTTI, PNT Cyber, and CRF WGs, as necessary. (See Section 3 for details on WG composition and functions.)
- i. Confirms the coordination of DoD PNT policy and capabilities among the DoD Components, as appropriate, and with organizations outside DoD, including the North Atlantic Treaty Organization and federal civil departments and agencies, as required.
- j. Consolidates DoD inputs into the Federal Radionavigation Plan.
- k. Approves and distributes PNT service performance standards for the GPS standard positioning service, the GPS precise positioning service, and others, as appropriate.
- l. Participates in the National Executive Committee for Space-Based PNT in accordance with SPD-7.
- m. Along with the other National Executive Committee for Space-Based PNT participants, provides support to the National Space-Based PNT Coordination Office, as appropriate.

n. Coordinates and communicates with the DoD Policy Board on Federal Aviation WG in all areas of common interest and responsibility, in accordance with DoDD 5030.19.

o. In coordination with the Under Secretary of Defense for Intelligence and Security (USD(I&S)) and other federal departments and agencies as required, ensures necessary capabilities are available to identify, locate, and mitigate any interference that adversely affects the use of PNT for military operations.

p. Provides guidance for the overall development, coordination, and approval of major DoD PTTI policies and plans, and serves as the final authority in consolidating DoD PTTI programs.

q. Requires that the procedures for DoD PTTI management in Section 4 are implemented through the DoD PTTI Manager.

r. Coordinates with the DoD PTTI Manager on PTTI policy negotiations between DoD and other federal departments and agencies and international organizations.

s. Provides guidance for the overall development, coordination, and approval of major CRF and Earth Orientation Parameters (EOP) policies and plans, and serves as the final authority in consolidating CRF programs.

t. Through the DoD CRF Manager, ensures the procedures for DoD CRF management in Section 5 are implemented.

u. Provides guidance for the overall development, coordination, and approval of DoD PNT objectives and positions regarding matters addressed in domestic and international PNT forums, and acts as the final authority in resolving objective and position issues, as required.

v. Designates an office of primary responsibility (OPR) for each specific domestic and international PNT forum that addresses matters of substantive interest to DoD and for which the DoD CIO determines that submitting a guidance package is required in accordance with Section 6. A guidance package is not normally needed, and an OPR is not normally identified, for PNT forums organized in accordance with other interagency or DoD guidance that already constrains participation.

w. Conducts an annual survey of the DoD Components to collect PNT capability inventory information to support annual NAVWAR assessments and monitor PNT modernization progress.

x. Prepares and provides to the Congressional defense committees a report on M-code modernization efforts. Each report includes, with respect to the period covered by the report, the:

(1) Projected cost and schedule, by fiscal year, for DoD to acquire M-code capable receivers.

(2) Programs conducting M-code modernization efforts and the number of M-code capable receiver cards procured by DoD.

- (3) Number of receiver cards not yet procured.
- (4) Percentage of the M-code modernization efforts completed by each program.

2.2. USD(A&S).

The USD(A&S):

- a. Co-Chairs, with the Vice CJCS, the PNT Oversight Council.
- b. Coordinates with the DoD CIO on matters of PNT acquisitions to confirm that approved PNT policies are implemented in acquisition activities subject to USD(A&S) portfolio management.
- c. Coordinates with the DoD CIO on the designation of joint program offices and associated organizations for developing, and acquiring PNT systems.
- d. Coordinates with the DoD CIO on PNT-related international cooperation strategies as they pertain to this issuance.
- e. Coordinates with the USD(R&E) to support the protection of controlled technical information associated with the life cycle acquisition of PNT systems.
- f. Establishes policies and provides procedures for the approval of developmental testing of DoD PNT systems, including GPS.
- g. Designates representatives to the DoD PNT EMB and PNT, PNT Waiver, NAVWAR, PTTI, CRF, and PNT Cyber WGs, as necessary. (See Section 3 for details on WG composition, functions, and procedures.)

2.3. USD(R&E).

The USD(R&E):

- a. Develops and maintains the DoD PNT Science and Technology Roadmap to support future operational concepts requiring PNT technologies.
- b. Coordinates with the DoD CIO regarding DoD research programs concerning PNT to ensure the protection of critical technology from adversary exploitation.
- c. Coordinates with the DoD PTTI Manager regarding DoD research programs concerning PTTI.
- d. Coordinates with the DoD CRF/EOP Manager regarding DoD research programs concerning CRF and EOP.

e. Coordinates with the USD(A&S) to support the protection of controlled technical information associated with the life-cycle acquisition of PNT systems.

f. Designates representatives to the DoD PNT EMB and PNT, PNT Waiver, NAVWAR, PTTI, CRF, and PNT Cyber WGs, as necessary.

2.4. UNDER SECRETARY OF DEFENSE (COMPTROLLER)/CHIEF FINANCIAL OFFICER, DEPARTMENT OF DEFENSE (USD(C)/CFO)).

The USD(C)/CFO designates representatives to the DoD PNT EMB and PNT, NAVWAR, PTTI, and CRF WGs, as necessary. The USD(C)/CFO designates representatives to the DoD PNT EMB and PNT, NAVWAR, PTTI, and CRF WGs, as necessary.

2.5. UNDER SECRETARY OF DEFENSE FOR INTELLIGENCE AND SECURITY (USD(I&S)).

The USD(I&S):

a. Provides intelligence support on PNT-related matters and designates representatives to the DoD PNT EMB and PNT, NAVWAR, PTTI, PNT Cyber, and CRF WGs, as necessary. (See Section 3 for details on WG composition and functions.)

b. Coordinates with the DoD CIO on items identified in Paragraph 2.1.o.

2.6. DIRECTOR, NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY (NGA).

Under the authority, direction, and control of the USD(I&S), and in addition to the responsibilities in Paragraph 2.13., the Director, NGA:

a. Maintains the standard for the terrestrial reference frame (TRF), Earth gravity model, and world magnetic model.

b. Coordinates with the Superintendent, United States Naval Observatory (USNO) to maintain overall consistency between the CRF and the TRF, and the mathematical transformation between these two reference frames as determined by USNO and disseminated through the USNO EOP data series.

c. Coordinates with the intelligence community to ensure consistency and avoid errors in the transformation between the CRF and the TRF.

2.7. DIRECTOR, DEFENSE INTELLIGENCE AGENCY (DIA).

Under the authority, direction, and control of the USD(I&S), and in addition to the responsibilities in Paragraph 2.13., the Director, DIA, leads efforts in producing all-source intelligence analysis on PNT-related matters.

2.8. DIRECTOR, NATIONAL SECURITY AGENCY/CHIEF, CENTRAL SECURITY SERVICE (NSA/CSS).

Under the authority, direction, and control of the USD(I&S), who exercises the authority, direction, and control of the Secretary of Defense over the NSA/CSS, and in addition to the responsibilities in Paragraph 2.13., the Director, NSA/CSS, provides, validates, and verifies sufficiency of security solutions during the development, integration, and operation of all segments of the GPS, in coordination with the Secretary of the Air Force.

2.9. USD(P).

The USD(P):

- a. In coordination with the DoD CIO, develops, coordinates, and monitors implementation of DoD policy, strategy, and planning related to space-based PNT systems.
- b. Provides oversight and guidance to the DoD CIO on international matters as they pertain to this issuance, including oversight and guidance relating to exports and technology transfers of PNT systems and associated technologies.
- c. Provides advice to DoD CIO on use of PNT technology by manufacturers and suppliers for the Defense Industrial Base in developing, manufacturing, and delivering systems for the DoD.
- d. Coordinates with the DoD CIO on items identified in Paragraph 2.1.b.
- e. Designates representatives to the DoD PNT EMB and PNT, NAVWAR, PTTI, and CRF WGs, as necessary.

2.10. GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE (GC DOD).

The GC DoD provides legal advice on PNT-related matters and designates representatives to the DoD PNT EMB and PNT, NAVWAR, PTTI, and CRF WGs, as necessary.

2.11. DIRECTOR OF COST ASSESSMENT AND PROGRAM EVALUATION (DCAPE).

The DCAPE:

- a. Reviews PNT programs and plans, including supporting cost and force effectiveness analyses prepared by the Military Departments.
- b. Designates representatives to the DoD PNT EMB and PNT, NAVWAR, PTTI, PNT Cyber, and CRF WGs, as necessary.

2.12. DIRECTOR, OPERATIONAL TEST AND EVALUATION (DOT&E).

The DOT&E:

- a. Establishes policies and provides procedures for the conduct of PNT-related operational test and evaluation.
- b. Designates representatives to the DoD PNT EMB and PNT, NAVWAR, PTTI, PNT Cyber, and CRF WGs, as necessary.

2.13. DOD COMPONENT HEADS.

The DoD Component heads, in accordance with the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 5123.01H and in compliance with DoD Instruction (DoDI) 4650.08, identify and document PNT-related operational capabilities, as appropriate.

2.14. DOD COMPONENT HEADS WITH ACQUISITION AUTHORITY.

In addition to the responsibilities in Paragraph 2.13., the DoD Component heads with acquisition authority:

- a. Conduct research, development, test, and evaluation on PNT equipment and modify and procure such equipment to provide inter- and intra-Service and allied coalition commonality, while leveraging commercial technologies to the maximum extent possible.
- b. Acquire:
 - (1) PNT equipment that provides protection against adversary disruption.
 - (2) Capabilities to identify, locate, and mitigate interference that affects the use of GPS for military operations.
 - (3) Capabilities to deny PNT to adversaries without unduly disrupting civil or commercial use outside of an area of operations.
- c. Provide responses to surveys conducted by the DoD CIO to collect PNT capability inventory information, in accordance with Paragraph 2.1.w.
- d. Each designate, in writing, one principal Component representative to the DoD PNT EMB and other representatives to the PNT, NAVWAR, PTTI, PNT Cyber, and CRF WGs, as necessary. (See Section 3 for details on WG composition and functions.) Provide the principal Component representative's name, staff agency, and office code to the DoD CIO.
- e. Appoint and oversee the activities of a DoD Component PTTI coordinator who coordinates the respective Component's PTTI operational and research programs with the DoD PTTI Manager and serves as a PTTI WG member. Provide the name and contact information of the Component PTTI coordinator to the DoD PTTI Manager.

f. Appoint and oversee the activities of a DoD Component CRF/EOP coordinator who coordinates the respective Component's CRF/EOP operational and research programs with the DoD CRF/EOP Manager and serves as a CRF/EOP WG member. Notify the DoD CRF/EOP Manager of the Component's appointed CRF/EOP coordinator and associated contact information.

g. When assigned as the OPR for a specific domestic or international PNT forum, each designate a principal representative responsible for preparing and submitting a guidance package to the DoD CIO in advance of the forum and for the post-event report following the forum. (See Section 6 for details on, and deadlines for, delegation preparation and reporting procedures for PNT forums.)

h. Ensure PNT project budget information is presented in separate program elements and budget line items, as appropriate, to support PNT Oversight Council Annual Report development.

2.15. SECRETARIES OF THE MILITARY DEPARTMENTS.

In addition to the responsibilities in Paragraphs 2.13. and 2.14., and in coordination with the USD(A&S), USD(R&E), and the DoD CIO, the Secretaries of the Military Departments assign representatives to support joint program offices for developing acquiring, and managing technical risk to PNT systems.

2.16. SECRETARY OF THE NAVY.

In addition to the responsibilities in Paragraphs 2.13., 2.14., and 2.15., the Secretary of the Navy, through the Oceanographer of the Navy:

- a. Serves as the DoD PTTI Manager and the CRF/EOP Manager.
- b. Develops and maintains the standards for PTTI services, EOPs, and the CRF for the other DoD Components.
- c. Maintains the standard for the CRF and the temporal reference frame for the other DoD Components.

2.17. SECRETARY OF THE AIR FORCE.

In addition to the responsibilities in Paragraphs 2.13., 2.14., and 2.15., the Secretary of the Air Force:

- a. Develops, procures, and modernizes the major components of the GPS in a timely and synchronized manner.
- b. Operates and maintains the GPS constellation and ground control segment.

- c. Performs GPS systems engineering and integration with other stand-alone and augmentation systems, as required, to oversee GPS compatibility and interoperability.
- d. Develops updates to the GPS standard positioning service performance standard and precise positioning service performance standard, and forwards them to the DoD CIO for approval and publication.
- e. Develops Air Force and Space Force space policy, issue integration, and strategy for the Department of the Air Force and coordinates activities across the Space Force space enterprise.
- f. Supports the DoD CIO's radio spectrum responsibilities assigned in DoDD 5144.02 by ensuring GPS radio-frequency compatibility and interoperability with other radionavigation satellite systems. Defends the GPS spectrum at the International Telecommunication Union and other forums, as necessary.

2.18. CJCS.

In addition to the responsibilities in Paragraph 2.13., the CJCS:

- a. Recommends DoD positions on PNT matters affecting the North Atlantic Treaty Organization and individual nations in coordination with the USD(P) and DoD CIO.
- b. Coordinates the development of CJCSI 6130.01 with the DoD CIO, USD(P), and USD(A&S).
- c. Participates in the National Executive Committee for Space-Based PNT in accordance with SPD-7.
- d. Supports the National Space-Based PNT Coordination Office in conjunction with the other members of the National Executive Committee for Space-Based PNT, as appropriate.

2.19. COMMANDER, UNITED STATES SPACE COMMAND (USSPACECOM).

In addition to the responsibilities in Paragraph 2.13., the Commander, USSPACECOM:

- a. Advocates for joint resilient PNT requirements and capabilities supporting NAVWAR operations for the DoD.
- b. Provides contingency joint resilient PNT and NAVWAR planning and operations support to the Combatant Commanders.
- c. Develops recommendations for the CJCS regarding joint concepts, strategy, doctrine, tactics, techniques, and procedures for resilient PNT capabilities.
- d. Participates in the development and maintenance of DoD PNT service performance standards for the GPS standard positioning service, the GPS precise positioning service, and others, as appropriate.

- e. Notifies DoD GPS PNT users of leap second insertion.

2.20. COMMANDER, UNITED STATES STRATEGIC COMMAND (USSTRATCOM).

In addition to the responsibilities in Paragraph 2.13., the Commander, USSTRATCOM, provides support regarding employment and advocacy of PNT capabilities affecting strategic mission areas for which USSTRATCOM is responsible and regarding use of electromagnetic spectrum in support of NAVWAR.

2.21. COMMANDER, UNITED STATES CYBER COMMAND (USCYBERCOM).

In addition to the responsibilities in Paragraph 2.13., the Commander, USCYBERCOM designates representatives to the DoD PNT EMB and PNT, NAVWAR, PTTI, PNT Cyber, and CRF WGs, as necessary.

2.22. COMMANDER, UNITED STATES NORTHERN COMMAND (USNORTHCOM).

In addition to the responsibilities in Paragraph 2.13., the Commander, USNORTHCOM designates representatives to the DoD PNT EMB and PNT, NAVWAR, PTTI, and CRF WGs, as necessary.

SECTION 3: PNT OVERSIGHT COUNCIL, EMB, AND WGS

3.1. DOD PNT OVERSIGHT COUNCIL.

The composition and function of the DoD PNT Oversight Council are detailed in DoDD 4650.05.

a. Schedule and Battle Rhythm.

The PNT Oversight Council will meet at least quarterly to align with the annual Planning, Programming, Budgeting, and Execution cycle.

(1) Calendar Year First Quarter.

Primary standing agenda items will be to finalize the previous year's annual report and the President's budget submission and give a status update of action items from the previous meeting.

(2) Calendar Year Second Quarter.

Primary standing agenda items will be to develop issue paper topics for the next budget cycle and give a status update of action items from the previous meeting.

(3) Calendar Year Third Quarter.

Primary standing agenda items will be to finalize and prioritize critical issues affecting budget decisions and give a status update of action items from the previous meeting.

(4) Calendar Year Fourth Quarter.

Primary standing agenda items will be to review and approve next years' work plan (developed and submitted by the DoD PNT EMB as described in Paragraph 3.2.d.), document the Planning, Programming, Budgeting, and Execution budget decisions, and give a status update of action items from the previous meeting.

b. Meeting Execution.

(1) The PNT Oversight Council Secretariat will develop and distribute agendas at least 4 weeks before the scheduled meeting.

(2) All presentations must be available to the PNT Oversight Council Secretariat for review 3 weeks before the scheduled meeting to facilitate read-ahead preparation.

(3) The PNT Oversight Council Secretariat will package and distribute read-ahead material to the PNT Oversight Council membership at least 1 week before the scheduled meeting, including the status of any action items from previous meeting(s).

(4) In accordance with DoDD 4650.05, any PNT Oversight Council decisions will be by consensus of the voting members. If the PNT Oversight Council cannot reach a consensus, the co-Chairs will make the final determination. Dissenting positions will be included in the meeting minutes.

c. Meeting Documentation.

(1) The PNT Oversight Council Secretariat will draft and distribute meeting minutes within 5 working days of the meeting. Minutes will include details on action items assigned during the meeting, with the organization tasked and a suspense date for completion.

(2) Membership will have three working days to respond with comments or approval of the minutes.

(3) The PNT Oversight Council Secretariat will distribute final minutes to membership following adjudication of comments received. Action items documented in the final minutes will constitute formal tasking to the member organization assigned the action.

d. Annual Report.

The PNT Oversight Council Secretariat will prepare an annual report to Congress for the co-Chairs to approve. To support report preparation, the DoD Component heads will separate their PNT projects into budget line items, as directed in Paragraph 2.13.h.

3.2. DOD PNT EMB.

The PNT EMB oversees the governance process in support of the PNT Oversight Council, develops topics and recommendations for the PNT Oversight Council, and functions as the primary advisory body to the DoD CIO on all DoD PNT policy matters.

a. Composition.

The DoD PNT EMB will be composed of:

- (1) The DoD CIO, who will chair the EMB.
- (2) One principal representative, designated in writing, who is a full-time or permanent part-time government employee or Service member, to represent each of these officials:
 - (a) Secretaries of the Military Departments.
 - (b) CJCS.
 - (c) USD(A&S).
 - (d) USD(R&E).
 - (e) USD(P).

- (f) USD(C)/CFO.
 - (g) USD(I&S).
 - (h) Chief of Naval Operations.
 - (i) Chief of Staff, U.S. Army.
 - (j) Commandant of the Marine Corps.
 - (k) Chief of Staff, U.S. Air Force.
 - (l) Chief of Space Operations.
 - (m) Commander, USSPACECOM.
 - (n) Commander, USSTRATCOM.
 - (o) Commander, USNORTHCOM.
 - (p) Commander, USCYBERCOM.
 - (q) GC DoD.
 - (r) Director, DIA.
 - (s) Director, NGA.
 - (t) Director, NSA/CSS.
 - (u) DCAPE.
 - (v) DOT&E.
 - (w) Chief, National Guard Bureau.
- (3) Other members whom the Chair may invite to participate in the Committee, as necessary.

b. Function.

The DoD PNT EMB will:

- (1) Oversee the governance process in support of the PNT Oversight Council.
- (2) Develop topics and recommendations for PNT Oversight Council action through regular meetings and a systematic coordination process.

(3) Function as the primary advisory body to the DoD CIO on all DoD PNT policy matters.

(4) Advise the DoD CIO regarding the overall management, supervision, and decision-making processes for DoD PNT matters, including biennial review of the Federal Radionavigation Plan and other plans requiring DoD review (e.g., architecture products relevant to DoD PNT systems).

(5) Establish additional WGs to support the EMB, as required.

c. Schedule and Battle Rhythm.

The DoD PNT EMB will meet at least quarterly, optimally no less than 2 weeks before quarterly PNT Oversight Council meetings.

d. Focus Areas and Work Plan Development.

(1) The DoD PNT EMB, with the assistance of its subordinate WGs and the PNT Oversight Council Secretariat, will prepare a yearly work plan for PNT Oversight Council approval. The work plan will cover anticipated activities throughout the year affecting these focus areas of the DoD PNT Enterprise:

- (a) Sustaining current PNT capabilities.
- (b) Modernization of current PNT capabilities.
- (c) PNT requirements.
- (d) PNT threats and vulnerabilities.
- (e) PNT technology trade space.

(2) Focus areas may be expanded or contracted as necessary through PNT Oversight Council direction. The work plan will be submitted for PNT Oversight Council review and approval at least 30 days before the first quarterly Council meeting.

(3) The DoD PNT EMB will act as the clearinghouse for all policy and M-code waiver requests. The DoD PNT Waiver Working Group (WWG) will forward results of their activities to the EMB for approval.

(4) The DoD PNT EMB will act as the forum for developing a consensus on the DoD position. The DoD representatives to the National Space-Based PNT Executive Committee and Executive Steering Group proceedings will bring the position forward.

(5) The DoD PNT EMB will also act as the primary DoD forum to develop consensus on DoD positions presented at the GPS International WG, Civil GPS Service Interface Committee, and other similar international and interagency venues.

e. Meeting Execution.

(1) Agendas will be developed and distributed at least 4 weeks before the scheduled meeting.

(2) All presentations must be available to the PNT Oversight Council Secretariat for review three weeks before the scheduled meeting to facilitate read-ahead preparation.

(3) The PNT Oversight Council Secretariat will package and distribute read-ahead material to the EMB membership at least 1 week before the scheduled meeting, including the status of any action items from previous meetings.

f. Meeting Documentation.

(1) The PNT Oversight Council Secretariat will draft and distribute meeting minutes within 5 working days of the meeting and send it to the attendees for review. Minutes will include details on any action items assigned during the meeting, with the organization tasked and a suspense date for completion.

(2) Attendees will have 3 working days to respond with comments or approval.

(3) The PNT Oversight Council Secretariat will distribute final minutes to membership no later than 10 working days after meeting. Action items documented in the final minutes will constitute formal tasking to the member organization assigned the action. Member organizations may assign actions to the appropriate subordinate WG of the EMB.

3.3. DOD PNT WG.

a. Composition.

The DoD PNT WG will be:

(1) Chaired by a staff representative designated by the DoD CIO, who is a full-time or permanent part-time government employee or Service member.

(2) Composed of representatives for each of the officials listed in Paragraph 3.2.a.(2). Each DoD PNT EMB principal must designate a DoD PNT WG representative in writing.

(3) DoD PNT WG leads may assign additional WG members, who are full-time or permanent part-time government employees or Service members, as required, to help formulate organizational positions for their respective DoD PNT EMB principals. This will ensure that DoD PNT WG representatives have ready access to EMB principals who represent their organizations on PNT matters.

b. Function.

To accomplish its objectives in support of the DoD PNT EMB, the DoD PNT WG will:

- (1) Develop recommendations for EMB action through regular meetings and a systematic coordination process.
- (2) Support consistent engagement by EMB principals in discussions regarding all PNT matters affecting DoD and the United States.
- (3) Promote regular information sharing with EMB principals so that they will be fully informed when actions are raised for decision.
- (4) Develop a collaborative environment among DoD PNT WG colleagues and facilitate the DoD CIO to:
 - (a) Efficiently manage EMB actions.
 - (b) Prepare the Deputy Secretary of Defense to co-chair the National Space-Based PNT Executive Committee.
 - (c) Execute responsibilities related to the GPS assigned in SPD-7.
- (5) Establish ad hoc WGs to address specific issues for DoD PNT WG and EMB consideration. Potential focus areas include PNT security and cybersecurity, PNT international cooperation, and PNT science and technology.

c. Schedule and Battle Rhythm.

The DoD PNT WG will meet at least monthly, as required, to support the EMB and PNT Oversight Council.

d. Meeting Execution.

- (1) Agendas will be developed and distributed at least 1 week before the scheduled meeting.
- (2) All presentations must be available to the PNT Oversight Council Secretariat for review 3 working days before the scheduled meeting to facilitate read-ahead preparation.
- (3) The PNT Oversight Council Secretariat will package and distribute read-ahead material to the WG membership at least 1 working day before the scheduled meeting.

e. Meeting Documentation.

- (1) The Chair's staff will draft the meeting minutes within 5 working days and send it to the attendees for review. Minutes will include details on any action items assigned during the meeting, with the organization tasked and a suspense date for completion.
- (2) Attendees will have 3 working days to respond with comments or approval.

(3) The Chair's staff will distribute final minutes to membership no later than 10 working days after meeting. Action items documented in the final minutes will constitute formal tasking to the member organization assigned the action.

3.4. DOD PNT WWG.

a. Composition.

The DoD PNT WWG will be:

- (1) Chaired by a staff representative designated by the DoD CIO.
- (2) Composed of one representative from each of these offices:
 - (a) Joint Staff.
 - (b) Office of the USD(A&S).
 - (c) Defense Security Cooperation Agency.
 - (d) Defense Technology Security Administration.
 - (e) Each Military Service's International Affairs organization.
 - (f) Each Military Service's Acquisition organization.
- (3) Composed of other members whom the Chair may invite to participate as necessary.
- (4) The Chair and all members must be full-time or permanent part-time government employees, or Service members.

b. Function.

To support the objectives of the DoD PNT EMB, the DoD PNT WWG will review waiver submissions and anticipate waiver policy adjustments.

c. Schedule and Battle Rhythm.

The PNT WWG will meet at least every 2 months, or as directed by the Chair.

d. Meeting Execution.

- (1) Agendas will be developed and distributed at least 1 week before the scheduled meeting.
- (2) The Military Services are responsible for preparing briefings for new submissions and providing the briefs to the DoD CIO. CJCSI 6130.01F identifies the information required in

the briefings. All presentations must be available to the DoD CIO for review ten working days before the scheduled meeting to facilitate read-ahead preparation.

(3) The Chair's staff will package and distribute read-ahead material to the WG membership at least 5 working days before a scheduled meeting.

e. Meeting Documentation.

The Chair's staff will provide meeting minutes within 5 working days of the meeting.

3.5. DOD NAVWAR WG.

a. Composition.

The DoD NAVWAR WG will be:

(1) Tri-chaired by designated staff representatives from the Offices of the DoD CIO and CJCS and USSPACECOM.

(2) Composed of one representative from each of these offices to deal with NAVWAR matters affecting planning and operations:

- (a) Office of the USD(A&S).
- (b) Office of the USD(R&E).
- (c) Office of the USD(P).
- (d) Office of the USD(I&S).
- (e) Joint Staff.
- (f) United States Army.
- (g) United States Marine Corps.
- (h) United States Navy.
- (i) United States Air Force.
- (j) United States Space Force.
- (k) USSPACECOM.
- (l) USSTRATCOM.
- (m) USNORTHCOM.

- (n) NSA/CSS.
- (o) DIA.
- (p) National Reconnaissance Office.
- (q) NGA.
- (r) National Guard Bureau.

(3) Composed of other members whom the Chair may invite to participate in the DoD NAVWAR WG, as necessary.

(4) The Chair and all members must be full-time or permanent part-time government employees or Service members.

b. Function.

To support the objectives of the DoD PNT EMB, the DoD NAVWAR WG advises and assists in the development and integration of NAVWAR-related policy and capabilities. The DoD NAVWAR WG will:

(1) Review and comment on NAVWAR-related policy, doctrine, directives, and instructions.

(2) Within existing corporate processes, such as the Joint Capabilities Integration and Development System, review and advise on annual USSPACECOM assessments of existing and potential NAVWAR capabilities and capability shortfalls, in accordance with DoDI 4650.08.

(3) Within existing corporate processes, review and advise on NAVWAR employment options. This includes advising on and helping write overarching NAVWAR concepts of operation, where requested.

(4) Review and recommend content to NAVWAR intelligence products, such as DIA's Biennial NAVWAR Assessment and Intelligence Preparations of the Battlespace.

(5) Review and comment on the biennial assessment of NAVWAR operational capabilities produced by the USSPACECOM Joint NAVWAR Center.

(6) Provide a joint forum to facilitate the compatibility of technologies and applications related to NAVWAR.

(7) Advocate for Modular Open-System approaches for integrated PNT Military Services in accordance with direction in DoDI 4650.08.

(8) Advocate for the collaborative capabilities for PNT modeling and simulation by the Military Services and for biennial production of DOD PNT Science and Technology Roadmap, to document evolving PNT information capabilities.

c. Schedule and Battle Rhythm.

The DoD NAVWAR WG will meet monthly. It may meet more often if required to support the EMB and PNT Oversight Council.

d. Meeting Execution.

(1) Agendas will be developed and distributed at least 1 week before the scheduled meeting.

(2) All presentations must be available to the PNT Oversight Council Secretariat for review 3 working days before the scheduled meeting to facilitate read-ahead preparation.

(3) The PNT Oversight Council Secretariat will package and distribute read-ahead material to the WG membership at least 1 working day before the scheduled meeting.

e. Meeting Documentation.

(1) The Chair's staff will draft meeting minutes within 5 working days and send it to the attendees for review. Minutes will include details on any action items assigned during the meeting, with the organization tasked and a suspense date for completion.

(2) Attendees will have 3 working days to respond with comments or approval.

(3) The Chair's staff will distribute final minutes to membership no later than 10 working days after meeting. Action items documented in the final minutes will constitute formal tasking to the member organization assigned the action.

3.6. DOD PNT CYBER WG.

a. Composition.

The DoD PNT Cyber WG will be:

(1) Tri-chaired by designated staff representatives from the DoD CIO, CJCS, and USD(A&S).

(2) Composed of at least one representative from each of these offices:

(a) Office of the DoD CIO.

(b) Office of the USD(P).

(c) Office of the USD(A&S).

(d) Joint Staff.

(e) United States Air Force.

- (f) United States Army.
- (g) United States Navy.
- (h) United States Marine Corps.
- (i) United States Space Force.
- (j) USSPACECOM.
- (k) USSTRATCOM.
- (l) USCYBERCOM.
- (m) The Office of Cost Assessment and Program Evaluation.
- (n) NGA.
- (o) NSA/CSS.
- (p) DIA.
- (q) National Guard Bureau.

(3) The Chair and all members must be full -time or permanent part-time government employees, or Service members.

b. Function.

In support of the DoD PNT EMB, the DoD PNT Cyber WG will:

(1) Within existing corporate processes, review, and provide comment on PNT-related cyber policy, doctrine, and DoD issuances.

(2) Within existing corporate processes, review and advise on existing and potential PNT cyber capabilities and capability shortfalls through:

(a) Review of Military Service and Agency quarterly reports on each system's Cyber Survivability Risk Posture.

(b) Review of Combatant Command prioritization of cyber vulnerabilities with the greatest mission risk.

(3) Review DoD research programs concerning PNT cybersecurity and participate in OSD PNT Science and Technology Roadmap development.

(4) Present disconnect between Military Service and Agency system risk mitigations and Combatant Command mission risk priorities to the EMB and PNT Oversight Council as appropriate, including:

(a) Providing a joint forum to facilitate determining compatibility and mitigation effectiveness of technologies and application related to cyber requirements.

(b) Assessing the effectiveness of current mitigation efforts to reduce mission risk and prioritize risk mitigation recommendations for the EMB.

c. Schedule and Battle Rhythm.

The DoD PNT Cyber WG will initially meet quarterly. The WG may meet more often by the agreement of and direction by the tri-Chairs, if required to support EMB or PNT Oversight Council requests. The tri-Chairs will schedule and determine the location of the meetings.

d. Meeting Execution.

(1) Agendas will be developed and distributed at least 1 week before the scheduled meeting.

(2) All presentations must be available to the PNT Oversight Council Secretariat for review 3 working days before the scheduled meeting to facilitate read-ahead preparation.

(3) The Tri-Chair's staff will package and distribute read-ahead material to the WG membership at least 1 working day before the scheduled meeting.

e. Meeting Documentation.

(1) Minutes will be drafted by the Co-Chair's staff within 5 working days and sent to meeting attendees for review. Minutes will include details on any action items assigned during the meeting, with the organization tasked and a suspense date for completion.

(2) Attendees will have 3 working days to respond with comments or approval.

(3) The Co-Chair's staff will distribute final minutes to the WG membership no later than 10 working days after the meeting.

3.7. DOD PTTI WG.

a. Composition.

(1) The Superintendent, USNO will chair the PTTI WG.

(2) The PTTI WG membership will consist of the DoD Component PTTI coordinators appointed in accordance with Paragraph 2.13.e.

(3) DoD PTTI WG leads may assign additional WG members to help formulate positions for their respective DoD PNT EMB principals, as required.

(4) The Chair and all members must be full-time or permanent part-time government employees, or Service members.

b. Function.

In support of the DoD PNT EMB, the PTTI WG will:

- (1) Review and comment on PTTI-related policy, doctrine, and DoD issuances.
- (2) Within existing corporate processes, such as the Joint Capabilities Integration and Development System described in CJCSI 5123.01H, review and advise on the assessment of existing and potential PTTI capabilities and capability shortfalls.
- (3) Function as the single body that develops PTTI recommendations for the DoD PNT EMB action through regular meetings and a systematic coordination process.
- (4) Provide a joint forum to facilitate the compatibility of technologies and applications related to PTTI.
- (5) Review and validate existing and future PTTI requirements of the DoD Components. Develop annual summaries of PTTI requirements and PTTI system implementation status to support assessment of PNT capabilities in accordance DoDI 4650.08.
- (6) Review DoD research programs concerning PTTI and participate in OSD PNT Science and Technology Roadmap development.
- (7) Review and comment on PTTI matters identified by the PTTI Manager in accordance with Section 4.

c. Schedule and Battle Rhythm.

The DoD PTTI WG will meet at least quarterly.

3.8. DOD CRF WG.

a. Composition.

- (1) The Superintendent, USNO will chair the CRF WG.
- (2) The CRF WG membership will consist of the DoD Component CRF/EOP coordinators appointed in accordance with Paragraph 2.13.f.
- (3) DoD CRF WG leads may assign additional WG members to help formulate organizational positions for their respective DoD PNT EMB principals, as required.
- (4) The Superintendent and all members must be full-time or permanent part-time government employees or Service members.

b. Function.

In support of the DoD PNT EMB, the CRF WG will:

- (1) Review and comment on CRF- and EOP-related policy, doctrine, and DoD issuances.
- (2) Within existing corporate processes, review, assess, and advise the DOD CIO on existing and potential CRF and EOP capabilities and capability shortfalls.
- (3) Function as the single body that develops CRF and EOP recommendations for the DoD PNT EMB to act upon through regular meetings and a systematic coordination process.
- (4) Provide a joint forum to facilitate compatibility of technologies and applications related to the CRF and EOP.
- (5) Review and validate existing and future CRF and EOP requirements of the DoD Components. Develop annual summaries of CRF and EOP requirements and their implementation status.
- (6) Review DoD research programs concerning the CRF and EOP and participate in OSD PNT Science and Technology Roadmap development.
- (7) Review and comment on CRF and EOP matters identified by the CRF/EOP Manager in accordance with management procedures in Section 5.

c. Schedule and Battle Rhythm.

The DoD CRF WG will meet at least quarterly.

SECTION 4: PTTI MANAGEMENT PROCEDURES

4.1. DOD PTTI MANAGER.

The DoD PTTI Manager, through the USNO:

- a. Requires interoperability in PTTI operations.
- b. Maintains the master time and frequency standard for DoD and the underlying timing reference for coordinating all U.S. Government PNT systems.
- c. Serves as the authoritative source for time and frequency. Coordinated Universal Time, as determined by the Master Clock at USNO, is the DoD time standard.
- d. Serves as Chair of the DoD PTTI WG.
- e. Coordinates DoD PTTI standards with recognized national and international standards.
- f. Advises the DoD CIO on the coordination of time scales.
- g. Develops and publishes detailed information concerning DoD PTTI reference standards.
- h. Advises the DoD CIO on PTTI policy matters involving the DoD Components and participates in PTTI policy negotiations between DoD, other Federal departments and agencies, and international organizations.
- i. Provides notification of leap second changes:
 - (1) Submits a notification message for the DoD CIO to transmit to all DoD Components no later than 2 months before the insertion of a leap second. Submit a follow-up message for the DoD CIO to send out 1 month before the insertion of a leap second.
 - (2) Coordinates with the Commander, USSPACECOM, to notify operational users no later than 1 month before the insertion of a leap second.
- j. Develops annual summaries of PTTI requirements and status, in coordination with the DoD Components. Provide a copy of the summary to the DoD CIO.
- k. Reviews and validates the DoD Components' existing and future PTTI requirements and maintains a database containing users of precise time and frequency and their requirements within DoD.
- l. Maintains a website of PTTI information including, but not limited to, such elements as Master Clock performance characteristics, dissemination systems and their characteristics, equipment required to access various dissemination systems, definitions, relevant documents, and frequently asked questions. Ensures the data are widely publicized to the DoD, USG, and public as appropriate.

m. In coordination with the USD(R&E) and appropriate DoD Component heads, coordinates DoD research programs concerning PTTI.

n. Provides time and frequency advice to government and DoD contractor personnel on a reimbursable basis for services such as:

(1) Consulting on DoD acquisition programs related to PTTI.

(2) Helping prepare the Military Critical Technologies List.

o. Coordinates all DoD time calibration and testing services offered by DoD organizations and laboratories.

(1) Maintains calibration and testing services on a reimbursable basis for time standards, transfer devices, and systems.

(2) Maintains a database of calibration and testing results to support DoD users' system engineering and procurement requirements.

p. Represents DoD in national and international forums on PTTI topics, in coordination with the DoD CIO.

q. Serves as the technical lead for the Defense Regional Clock Program.

r. Designs and develops timing suites.

s. Establishes and maintains the USNO configuration of the timing suites.

t. Establishes and operates the Master Time Operations and monitoring centers to support the Defense Regional Clock.

4.2. DOD COMPONENTS.

The DoD Components:

a. Ensure the PTTI activities of the DoD Component comply with the standard established by the Department of the Navy at the USNO, and maintain specific time scales, as required, so that the relationship of each scale to the established standard is known.

b. Prescribe technical requirements for the coordination of PTTI techniques, procedures, and periodic calibration of systems.

c. Prescribe in-house procedures for the development, coordination, and consolidation of their respective PTTI requirements.

d. Assist the DoD PTTI Manager by providing technical information on current and prospective PTTI requirements in the format prescribed by the DoD PTTI Manager.

- e. Ensure that PTTI requirements for systems and programs of the DoD Component and user agencies are coordinated with and approved by the DoD Component PTTI coordinator.
- f. Prescribe requirements for precise time that are consistent with operational and research needs for accuracy.

4.3. DIRECTOR, DEFENSE INFORMATION SYSTEMS AGENCY (DISA).

Under the authority, direction, and control of the DoD CIO, the Director, DISA serves as the programmatic lead for the CTD program and is responsible for:

- a. The survey of CTD site locations.
- b. The installation and upgrades of the timing suites as configured by the USNO.
- c. The operation and maintenance of the timing suites.

SECTION 5: CRF/EOP MANAGEMENT PROCEDURES

5.1. DOD CRF/EOP MANAGER.

The DoD CRF/EOP Manager, through the USNO:

- a. Serves as Chair of the DoD CRF WG.
- b. Requires interoperability in CRF and EOP operations.
- c. Serves as the authoritative source for standard CRF and EOP data and information, making them available to users. The Defense Celestial Database will be the authoritative source for all celestial data for DoD systems, programs, and users.
- d. Coordinates CRF and EOP standards with recognized national and international standards.
 - (1) Advises the DoD CIO on coordinating the definition of the CRF and the models of EOP prediction.
 - (2) Issues detailed information concerning DoD reference standards for CRF and EOP.
- e. Supports the Joint Capabilities Integration and Development System process for matters of intelligence, surveillance, and reconnaissance, space situational awareness, and strategic systems related to the CRF.
- f. Advises the DoD CIO on CRF and EOP policy matters involving the DoD Components and participates in CRF and EOP policy negotiations between the DoD, other U.S. Government departments and agencies, and international organizations.
- g. Develops annual summaries of CRF and EOP requirements and status, in coordination with the DoD Component CRF/EOP coordinators. Provides a copy of the summary to the DoD CIO.
- h. Reviews and validates existing and future CRF and EOP requirements of the DoD Components and maintains a database containing users of CRF and EOP within DoD and their requirements.
- i. Maintains a website that consists of CRF and EOP information, including, but not limited to, astrometric catalogs, EOP data and models, application software, definitions, relevant documents, and frequently asked questions.
- j. Develops, operates, and maintains the Defense Celestial Database and, working with DISA, must provide both public-facing and DoD-only access, as appropriate. This includes deployment onto both unclassified and classified networks.
- k. Coordinates DoD research programs concerning CRF and EOP, in coordination with the USD(R&E) and DoD Component CRF/EOP coordinators.

l. Provides CRF and EOP advice to the government and government contractors on a reimbursable basis for services such as:

- (1) Consulting on DoD acquisition programs related to PNT.
- (2) Helping prepare the Militarily Critical Technologies List.

m. Informs the DoD CIO and the DoD Component heads of the office and contact information of the principal USNO staff members involved in executing the duties of the DoD CRF/EOP Manager.

n. Represents DoD in national and international forums on CRF and EOP topics, in coordination with the DoD CIO.

5.2. DOD COMPONENTS.

The DoD Components:

a. Coordinate the Component's CRF and EOP operational and research programs in conjunction with the DoD CRF/EOP Manager and provide representatives to serve as members of the CRF WG.

b. Refer all Component CRF and EOP users to the standard established by the Superintendent, USNO.

c. Prescribe standards for the coordination and implementation of tactics, techniques, procedures, and dynamic upkeep of CRF and EOP data for DoD systems.

d. Develop Component procedures for the development, coordination, and consolidation of CRF and EOP standards.

e. Prescribe CRF and EOP standards that are consistent with operational and research needs for accuracy.

f. Provide technical information on current and prospective CRF and EOP standards to the DoD CRF/EOP Manager in the format he or she prescribes.

SECTION 6: DELEGATION PREPARATIONS AND REPORTING PROCEDURES FOR PNT FORUMS

6.1. DESIGNATED OPR AGENCY.

The DoD CIO will designate an OPR agency as specified in Paragraph 2.1.v. The designated OPR agency for each PNT forum will:

- a. Determine the name, staff agency, and office code of each member of the DoD delegation, for international government and civil forums. A listing of the DoD delegation will be included with the guidance package for DoD coordination.
- b. At least 2 weeks before each domestic or international PNT forum, prepare and submit a guidance package to the DoD CIO. Guidance packages will identify the purpose of the meeting or event, the overall objective or objectives of DoD participation, specific items of DoD interest in the meeting or event agenda as appropriate, and anticipated issues and recommended DoD positions with respect to those issues. Guidance packages will also include copies of relevant background documents.
- c. Within 2 weeks after each domestic or international PNT forum, prepare and submit to the DoD CIO a written post-event report summarizing meeting or event discussions, action items, issues, decisions, satisfaction of DoD objectives, and follow-on requirements, if any.

6.2. DISTRIBUTION.

The DoD CIO will distribute the guidance package and post-event report through the DoD PNT EMB and DoD PNT WG as appropriate.

GLOSSARY

G.1. ACRONYMS.

ACRONYM	MEANING
CJCS	Chairman of the Joint Chiefs of Staff
CJCSI	Chairman of the Joint Chiefs of Staff Instruction
CRF	celestial reference frame
DCAPE	Director of Cost Assessment and Program Evaluation
DIA	Defense Intelligence Agency
DISA	Defense Information Systems Agency
DoD CIO	Department of Defense Chief Information Officer
DoDD	DoD directive
DoDI	DoD instruction
DOT&E	Director, Operational Test and Evaluation
EMB	Executive Management Board
EOP	Earth Orientation Parameters
GC DoD	General Counsel of the Department of Defense
GPS	Global Positioning System
NAVWAR	navigation warfare
NGA	National Geospatial-Intelligence Agency
NSA/CSS	National Security Agency/Central Security Service
OPR	office of primary responsibility
PNT	positioning, navigation, and timing
PTTI	precise time and time interval
SPD-7	Space Policy Directive-7
TRF	terrestrial reference frame
USCYBERCOM	United States Cyber Command
USD(A&S)	Under Secretary of Defense for Acquisition and Sustainment
USD(C)/CFO	Under Secretary of Defense (Comptroller)/Chief Financial Officer, Department of Defense
USD(I&S)	Under Secretary of Defense for Intelligence and Security
USD(P)	Under Secretary of Defense for Policy
USD(R&E)	Under Secretary of Defense for Research and Engineering
USNO	United States Naval Observatory
USNORTHCOM	United States Northern Command

ACRONYM	MEANING
USSPACECOM	United States Space Command
USSTRATCOM	United States Strategic Command
WG	working group
WWG	Waiver Working Group

G.2. DEFINITIONS.

These terms and their definitions are for the purpose of this issuance.

TERM	DEFINITION
CRF	The fundamental set of observable physical parameters defining natural celestial objects required for position, navigation, and timing and related defense applications. This includes the fundamental reference system and relevant frame or frames (i.e., the realization of the reference system using observable celestial objects). It also includes all celestial objects referenced to the underlying reference frame used by defense systems for purposes of position, navigation, timing, guidance, orientation, space domain situational awareness, defense system calibration, and targeting applications. The minimum set of observable physical parameters consists of the positions, motions, and brightness (as a function of wavelength) of celestial objects. The DoD Components' utilization of the CRF includes, but is not limited to, the purposes of determining objects of interest's positions, orientations, motions, orbits, and intent; exquisite calibration of defense sensors; and determination of platform and instrument orientation for purposes of intelligence collection, targeting and system guidance.
EOP	The values that describe the mathematical relationship between the TRF and the CRF. This relationship is defined by the coordinates of the Earth's pole (polar motion), the rotation angle about the pole (Universal Time or UT1), precession, and nutation.
leap second	Time is occasionally adjusted by 1-second increments to ensure that the difference between a uniform time scale defined by atomic clocks does not differ from the Earth's rotational time by more than 0.9 seconds. In order to keep this cumulative difference less than 0.9 seconds, a leap second is added to the atomic time to decrease the difference between the two. This leap second can be either positive or negative depending on the Earth's rotation.

TERM	DEFINITION
Master Clock	The underlying product for all PTTI products. The single authoritative clock providing the real time representation of Coordinated Universal Time for all of DoD. An ensemble of clocks maintained at the USNO is used to ensure the accuracy and consistency of the authoritative clock.
PNT forum	A meeting or conference venue at which PNT matters are formal agenda topics.
precise time	A frequency (time interval) requirement accurate to within 1 microsecond.
PTTI	A reference value of time and time interval (frequency).

REFERENCES

- Chairman of the Joint Chiefs of Staff Instruction 5123.01H, “Charter of the Joint Requirements Oversight Council (JROC) and Implementation of the Joint Capabilities Integration and Development System (JCIDS),” August 31, 2018
- Chairman of the Joint Chiefs of Staff Instruction 6130.01, “CJCS Master Positioning, Navigation, and Timing Plan (MPNTP),” current edition
- DoD Directive 4650.05, “Positioning, Navigation, and Timing (PNT),” June 9, 2016, as amended
- DoD Directive 5030.19, “DoD Responsibilities on Federal Aviation,” September 13, 2013, as amended
- DoD Directive 5144.02, “DoD Chief Information Officer (DoD CIO),” November 21, 2014, as amended
- DoD Instruction 4650.08, “Positioning, Navigation, and Timing (PNT) and Navigation Warfare (NAVWAR),” December 27, 2018, as amended
- DoD Manual 8910.01, Volume 1, “DoD Information Collections Manual: Procedures for DoD Internal Information Collections,” June 30, 2014, as amended
- Federal Radionavigation Plan, current edition
- Space Policy Directive-7, “The United States Space-Based Positioning, Navigation, and Timing Policy,” January 15, 2021
- United States Code, Title 10, Section 2281