



DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, DC 20350-2000

IN REPLY REFER TO

OPNAVINST 9420.1B
N6
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OPNAV INSTRUCTION 9420.1B

From: Chief of Naval Operations

Subj: POSITIONING, NAVIGATION AND TIMING (PNT) POLICY;
ADMINISTRATION AND PLANNING

Ref: (a) DOD Directive 4650.5, Positioning and Navigation and Timing, of 2 Jun 2003 (NOTAL)
(b) CJCSI 6130.01C CJCS Master Positioning, Navigation and Timing Plan (CJCS MPNTP), of 31 Mar 2003 (NOTAL)
(c) Federal Radionavigation Plan (FRP), 2005 (DoD 4650.5/DOT-VNTSC-RITA-05-12) (NOTAL)
(d) Federal Radionavigation Systems (FRS), 2001 (DOT-VNTSC-RSPA-01-3.1/DoD 4650.5) (NOTAL)
(e) USN/USMC PNT Policy Ltr of 27 Jun 00 (NOTAL)
(f) US Code Title 10C Part IV Chapter 639 Section 7396 (NOTAL)
(g) SECNAVINST 5000.36A
(h) CNO ltr Ser N00/8U5000076 of 17 Mar 98 (NOTAL)
(i) Joint Requirements Oversight Council Memorandum (JROCM) 016-04, of 27 Jan 2004 (NOTAL)
(j) Deputy Secretary of Defense Classified Memorandum on Navigation Warfare Implementation Guidance of 17 Nov 2004 (NOTAL)
(k) CNO Executive Board Decision Memorandum of 27 Nov 2000 (NOTAL)

1. Purpose

a. To provide Navy policy, administration and planning requirements for implementing reference (a).

b. To describe the roles of the Navy in periodic revisions of references (b), (c) and (d).

c. To assign responsibilities and leads to Navy Positioning, Navigation and Timing (PNT) and Navigation Warfare (Navwar) issues.

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d. To assign, when tasked by the Office of the Secretary of Defense (OSD), responsibility to serve as the United States (U.S.) Representative to the North Atlantic Treaty Organization (NATO) Sub-Committee 8 on Navigation (SC/8).

2. Cancellation. OPNAVINST 9420.1A and USN/USMC PNT Policy ltr of 27 Jun 00 (reference (e)).

3. Background. The Department of Defense (DoD) is responsible for developing, testing, evaluating, implementing, operating, and maintaining aids to navigation and user equipment required for national defense and ensuring that military platforms and personnel operating in consonance with civil platforms and systems have the necessary positioning, navigation, and timing capabilities.

a. The DoD PNT Executive Committee (EXCOM) is the DoD focal point and forum for all DoD PNT matters. It provides overall management supervision and decision processes for DoD PNT matters. The DoD PNT EXCOM coordinates and provides recommended DoD positions to the Deputy Secretary of Defense in his capacity as a co-chair of the National PNT EXCOM.

b. The Joint Chiefs of Staff (JCS) provide guidance to the armed forces regarding preparation of their respective detailed navigational plans. The JCS are aware of operational navigation requirements and capabilities of the Unified and Specified Combatant Commands and the Services, and are responsible for the development, approval, and dissemination of reference (b).

c. The Oceanographer/Navigator of the Navy (CNO (N84)) serves as the CNO's senior navigation policy and standards advisor, and is the focal point for navigation policy, technical performance and certification standards for electronic charting systems, GI&S data standards, navigation training and requirements for emerging technology.

d. The Superintendent, U.S. Naval Observatory (USNO), is responsible for establishing and maintaining the astronomical reference frame(s) for celestial navigation, and orientation of space systems, to include catalogs and almanacs as directed by reference (f). USNO is also responsible for deriving and maintaining the standard Precise Time and Time Interval (PTTI), and maintains the designated timing standard for the U.S. Navy and the Department of Defense (DoD). USNO is the Functional Area Manager (FAM) for all Navy systems, applications, and

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services involving PTTI and the astronomical reference frame(s) in accordance with reference (g).

4. Scope

a. The provisions of this instruction apply to the Chief of Naval Operations, Fleet Commanders and commanders of systems commands.

b. For this instruction, PNT includes position determination, point to point tracking, asset attitude or orientation determination, arrival prediction and associated timing references. It also encompasses techniques, systems, equipment, and operator skills associated therewith. PNT requires determination of position, heading, roll, pitch, velocity, altitude or depth, and time with respect to the operation of ships, submarines, aircraft, space vehicles and forces ashore. PNT parameters can be absolute or relative and include determination of rates of change.

5. Policy

a. The Navy shall rely on those PNT systems provided by or approved by DoD agencies.

b. Every platform/user with a validated PNT requirement shall have both an approved primary and at least one alternate means of position and precise time determination. The alternate means must be independent of the primary. Position determination, navigation, and time/time interval are critical to every aspect of Naval Warfare, though the required performance may vary by user and by mission. The technical complexity of the solution may vary with the platform/user, but proficiency in both primary and alternate means must be maintained. In addition, position determination by dead reckoning and celestial should not be precluded.

c. PNT systems shall be built to jointly adopted standards and be interoperable within naval forces, with other services and with allied forces. The complexity of modern warfare requires all units to exchange PNT dependent data in a precise, timely, and efficient manner. Resource and requirements sponsors shall ensure inclusion of interoperability parameters in appropriate documents.

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d. Navstar GPS is the primary positioning and navigation system for U.S. Naval operations, per reference (b), and is the primary means of distributing USNO Precise Time (UTC(USNO)). GPS shall provide onboard systems with positioning, navigation and distributed precise time/time interval data with common geographic and time references for fleet and joint service operations. However, naval aircraft will continue to use the Tactical Air Navigation (TACAN) system as the primary navigation system for enroute and terminal flight in controlled airspace until replaced by GPS. Other external systems may be used if GPS does not provide an acceptable level of performance.

e. GPS Precise Positioning Service (PPS) systems, which shall always be keyed when operated, shall be used for all combat, combat support, and combat service support operations and training. Keyed operation provides:

(1) Access to the PPS;

(2) Anti-spoofing;

(3) Improved resistance to intentional and unintentional interference.

Unkeyed operation degrades performance to, at best, the Standard Positioning Service and provides no protection against spoofing, limited protection against interference, and will likely provide unacceptable performance.

f. All U.S. Navy tactical aircraft, combatant ships and submarines must have a dead reckoning navigation capability. The interval between required position updates is based on a number of factors, including platform missions, and confidence in and availability of an external reference system for update.

g. Policy relating to the development, procurement, and use of electronic charts on Navy vessels is set forth in the U.S. Navy Electronic Chart Display and Information System Policy per reference (h).

h. Use of the System to Estimate Latitude and Longitude Astronomically (STELLA) software remains authorized. No other automated/computerized celestial navigation programs are authorized for USN navigation due to unknown accuracy of the methods used and the star-position databases unless specifically reviewed and approved by USNO. The U.S. Naval Observatory will

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publish the annual Nautical Almanac which if preferred, may be used.

i. Navigation and timing interfaces and protocols shall be standardized between systems to the maximum extent feasible and shall use UTC (USNO) as the timing standard. There is an existing and increasing need for systems aboard naval platforms to have accurate PNT data to accomplish their mission. Standardization of interfaces and protocols minimize the incompatibilities PNT data users will have to accommodate.

j. There is a need for continuous all-weather capability during all phases of marine navigation, especially in the harbor and harbor approach phase. Efforts will continue to define and validate requirements and to take advantage of modern technology. U.S. Navy vessels shall be equipped to make full use of progress in this area. However, traditional piloting methods such as visual and radar shall continue to be used to ensure safety of passage.

6. Responsibilities

a. The Director, Warfare Integration Division (CNO (N6F)) shall:

(1) Serve as the primary focal point for Navy PNT matters not specifically assigned to the Navigator of the Navy (CNO (N84)), or the U.S. Naval Observatory.

(2) Serve as the primary Navy member of the DoD PNT Executive Committee and provide a qualified individual to serve as the Navy's member to the DoD PNT EXCOM Working Group established by reference (a).

(3) Approve and forward Navy submissions for reference (b) to the Chairman, JCS.

(4) Approve and forward Navy FRP and FRS submissions to OSD (references (c) and (d)).

(5) Act as the Navy lead in preparing and maintaining for submission to the Net-Centric Functional Control Board (NC FCB) the Navy's GPS User Equipment Roadmap per references (i) and (j).

(6) Assign a qualified individual from the Space and Communications Pathways Branch (CNO (N6F1)) as the U.S. Representative to the North Atlantic Treaty Organization (NATO) Sub-Committee 8 on Navigation (SC/8) to meet OSD tasking.

(7) Conduct a biennial review of reference (c). Changes and revisions shall be consistent with and flow from the CJCS Master Positioning, Navigation and Timing Plan (MPNTP).

b. The Deputy Chief of Naval Operations (Information, Plans, and Strategy) (N3/N5) shall:

(1) Act as the Navy lead in addressing PNT prevention capabilities and requirements (Navwar Denial) as directed by reference (j).

(2) Provide a qualified individual to serve as the Navy's member to the DoD PNT EXCOM Navwar Working Group per reference (a).

c. The Director of Naval Intelligence (CNO (N2)) shall:

(1) Act as the Navy lead in providing, to the Defense Intelligence Agency, Navy requirements for continuing analysis of the evolving Navwar threat.

(2) Support National Security Agency (NSA) efforts to baseline current Navwar ES capabilities for all platforms with potential capabilities to support Navwar signals intelligence (SIGINT) requirements, and ensure Navwar ES requirements are reflected in appropriate capabilities documentation as directed by reference (j).

d. The Oceanographer/Navigator of the Navy (CNO (N84)) shall:

(1) Be responsible for the development of technical standards for navigational systems used by all Navy units in accordance with reference (k), to include the review of Initial Capability Documents (ICD), Capabilities Definition Documents (CDD) and Capability Production Documents (CPD), under which navigation equipment or systems will be procured.

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(2) Conduct independent analysis and assessment of existing navigation systems and emerging technologies to support programming guidance.

(3) Develop performance standards for navigational systems.

(4) Provide advice and recommendations to resource sponsors and warfare commanders regarding the technical specifications and acceptability/certification of proposed navigation systems.

(5) Provide advice on all policy decisions involving navigation and input to Navy, Defense, and Joint Planning Documents.

e. Superintendent, United States Naval Observatory (USNO) shall:

(1) Derive, maintain, and distribute the standard reference for Precise Time and Time Interval (PTTI), and the celestial reference frame for DoD components.

(2) Serve as a member of the DoD PNT EXCOM per reference (a).

(3) Serve as the DoD PTTI Manager. Provide advice and recommendations to resource sponsors and warfare commanders regarding the technical specifications, acceptability and certification of proposed timing systems. Provide advice on all policy decisions involving timing and input to Navy, Defense, and Joint Planning Documents.

(4) Establish, provide, and maintain high-precision astronomical reference frame(s) for celestial navigation and orientation of space systems.

(5) Provide Earth orientation parameters and predictions for use by DoD and National systems for precise positioning of navigation and ISR assets.

(6) Provide operational astrometry products and services for the Navy and DoD, to include star catalogs, almanacs, and software applications for celestial navigation,

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platform attitude or orientation, and to support future system development (such as Automated Celestial Navigation).



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