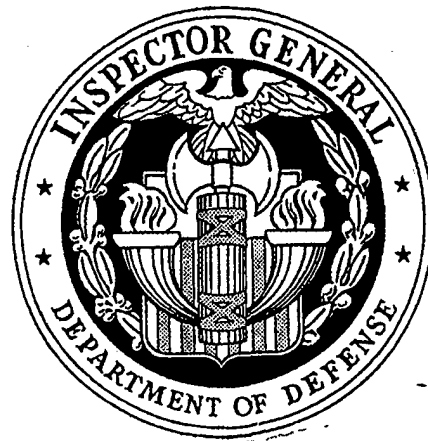


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**R**eport



GLOBAL POSITIONING SYSTEM RECEIVER COMPLIANCE  
WITH YEAR 2000 REQUIREMENTS

Report No. 99-063

December 31, 1998

Office of the Inspector General  
Department of Defense

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### **Acronyms**

|           |  |
|-----------|--|
| ADUSD     | Assistant Deputy Under Secretary of Defense  |
| ASD (C3I) | Assistant Secretary of Defense (Command, Control,<br>Communications, and Intelligence) |
| GPS       | Global Positioning System  |
| Y2K       | Year 2000  |

December 31, 1998

MEMORANDUM FOR ASSISTANT SECRETARY OF DEFENSE (COMMAND,  
CONTROL, COMMUNICATIONS, AND  
INTELLIGENCE)

SUBJECT Audit Report on Global Positioning System Receiver Compliance with Year  
2000 Requirements (Report No 99-063)

We are providing this report for review and comment. We considered management comments on a draft of this report in preparing the final report.

DoD Directive 7650.3 requires that all recommendations be resolved promptly. As a result of management comments, we deleted draft Recommendations 1 and 2. We request that the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) reconsider his position on the remaining recommendation and provide additional comments on the final report by February 1, 1999.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. Robert M. Murrell at (703) 604-9210 (DSN 664-9210) (rmurrell@dodig.osd.mil) or Mr. Young J. Jin at (703) 604-9272 (DSN 664-9272) (yjin@dodig.osd.mil). See Appendix E for the report distribution. The audit team members are listed inside the back cover.



Robert J. Lieberman  
Assistant Inspector General  
for Auditing

## Office of the Inspector General, DoD

Report No. 99-063  
(Project No. 8CC-0045)

December 31, 1998

### Global Positioning System Receiver Compliance with Year 2000 Requirements

#### Executive Summary

**Introduction.** This is one in a series of reports being issued by the Inspector General, DoD, in accordance with an informal partnership with the Chief Information Officer, DoD, to monitor DoD efforts to address the year 2000 computing challenge. For a listing of audit projects addressing the issue, see the year 2000 webpage on the IGnet at <http://www.ignet.gov>

The Global Positioning System (GPS) is a worldwide, satellite-based radio navigation system developed by DoD. The system is able to show a user's position on or above the earth with great precision, regardless of weather conditions. Dates and times are important to GPS receivers. The receivers determine a position by comparing the time generated by an internal clock to the times received from the fleet of GPS satellites. The difference between the times is used by the receiver to compute its distance from the satellite and hence compute its location.

In February 1998, the Assistant Deputy Under Secretary of Defense (Space Systems and Architectures) issued a memorandum, "Global Positioning System Year 2000 Compliance," tasking the GPS Joint Program Office (program office) to assess the Y2K compliance status of all DoD GPS receivers. The Assistant Deputy Under Secretary of Defense also directed organizations that have procured non-validated receivers from sources other than the program office to provide the program office with the Year 2000 compliance status of those receivers by April 30, 1998.

**Objectives.** The overall audit objective was to determine whether GPS components comply with Year 2000 requirements. Specifically, we determined whether the GPS receivers were Year 2000-compliant.

**Results.** The GPS program office had not completed the inventory and Year 2000 assessment of non-validated GPS receivers procured directly by DoD organizations, civilian Federal agencies, Defense contractors, and allied nations. The delay was partially caused by lack of cooperation by many of those organizations. In addition, DoD has not done enough to mitigate risk by testing commercial receivers. As a result, systematic distribution of information on Y2K compliance of the equipment to users has been hampered, increasing the risk of mission disruption.

**Summary of Recommendations.** We recommend that the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) direct the GPS joint program office, in coordination with the U.S. Coast Guard, to conduct Y2K testing on all non-validated GPS receivers.

**Management Comments.** The Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) concurred with our finding. In addition, the Assistant Secretary stated that the visibility that our draft report brought to this specific GPS issue should in itself help accelerate its timely resolution. However, the Assistant Secretary did not concur with our initial recommendations because he did not believe they would be effective in achieving the objective of ensuring Y2K compliance of GPS receivers.

**Audit Response.** During the audit, both the program office and the Office of the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) took action to acquire Y2K status information on non-validated GPS receivers. Those efforts are still in progress. Based on management comments and further consideration, we deleted two draft recommendations. However, we continue to believe that the DoD needs to take an aggressive posture on testing to verify Y2K compliance on commercial receivers used in the mission-critical GPS system. The Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) comments were not responsive on that point. We request that the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) reconsider his position on the recommendation and provide additional comments in its response to the final report by February 1, 1999.

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## Background

The year 2000 (Y2K) problem is the term most often used to describe the potential failure of information technology systems to process or perform date-related functions before, on, or after the turn of the century. The Y2K problem is rooted in the way that automated information systems record and compute dates. For the past several decades, information systems have typically used two digits to represent the year, such as "98" for 1998, to conserve electronic data storage space and to reduce operating costs. With the two-digit format, however, the Year 2000 is indistinguishable from 1900. As a result of the ambiguity, computers and associated system and application programs that use dates to calculate, compare, or sort could generate incorrect results when working with years following 1999. Calculation of Year 2000 dates is further complicated because the Year 2000 is a leap year, the first century leap year since 1600. The computer systems and applications must also recognize February 29, 2000, as a valid date.

Because of the potential failure of computers to run or function throughout the Government, the President issued an Executive Order, "Year 2000 Conversion," February 4, 1998, making it policy that Federal agencies ensure that no critical Federal program experiences disruption because of the Y2K problem and that the head of each agency ensures that efforts to address the Y2K problem receive the highest priority attention in the agency.

**DoD Year 2000 Management Strategy.** In his role as the DoD Chief Information Officer, the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) issued the "DoD Y2K Management Plan" (DoD Management Plan) in April 1997. The DoD Management Plan provides the overall DoD strategy and guidance for inventorying, prioritizing, fixing, or retiring systems, and monitoring progress. The DoD Management Plan states that the DoD Chief Information Officer has overall responsibility for overseeing the DoD solution to the Y2K problem. Also the DoD Management Plan makes the DoD Components responsible for implementing the five-phase Year 2000 management process. The DoD Management Plan includes a description of the five-phase Year 2000 management process. The DoD Management Plan, For Signature Draft Version 2.0, June 1998, accelerates the target completion dates for the renovation, validation, and implementation phases. The new target completion date for implementation of mission-critical systems is December 31, 1998.

**The Secretary of Defense Memorandum, "Year 2000 Compliance," August 7, 1998.** The memorandum stated that DoD is making insufficient progress in its efforts to solve its Y2K computer problem, which the Secretary of Defense termed a critical national security issue.

**The Deputy Secretary of Defense Memorandum, "Year 2000 Verification of National Security Capabilities," August 24, 1998.** The memorandum directed that each principal staff assistant of the Office of Secretary of Defense must verify that all functions under his or her purview will continue unaffected by Y2K issues. Plans for Y2K related end-to-end testing of each process within each functional area must be provided to the Deputy Secretary of Defense by the designated principal staff assistant by November 1, 1998. The testing activities and facilities of the military Services will be used to the fullest extent possible. The principal

staff assistant for command, control, and communications functions is the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence)

**Global Positioning System.** The Global Positioning System (GPS) is a worldwide, satellite-based radio navigation system that is able to show a user's position on or above the earth with great precision, regardless of weather conditions. It was developed by DoD starting in 1978, with the goal of eventual replacement of existing navigational systems, including the land based LORAN [Long-Range Navigation] and VOR [Very High Frequency Omnidirectional Range] systems. With its real-time accuracy of positioning users to within a few feet, GPS is credited with revolutionizing areas from land surveying to search and rescue. In fact, it is often referred to as the system that has taken the "search" out of search and rescue, as demonstrated in 1995 during the rescue of Air Force Capt Scott O'Grady in Bosnia.

**Congressional Mandate on the Use of GPS.** The National Defense Authorization Act for Fiscal Year 1994, directed that after September 30, 2000, funds may not be obligated to modify or procure any DoD aircraft, ship, armored vehicle, or indirect-fire weapon system that is not equipped with a GPS receiver.

**DoD Management of the GPS Program.** The GPS program is managed by the GPS Joint Program Office (program office), Space and Missile Systems Center, Los Angeles Air Force Base, CA. The GPS program office is a multi-Service, multi-national organization, which conducts development and acquisition, and sustains all GPS segments. GPS has three segments, the space segment, the control segment, and the user segment. The space segment consists of 24 satellites, each in its own orbit 11,000 nautical miles above the Earth. The control segment consists of five ground stations located around the world that monitor the satellites to ensure they are working properly. The user segment consists of receivers, which anyone can hold in their hand, or mount in a car, tank, or aircraft.

**Military Use of GPS.** First showcased during Operation Desert Storm, GPS became the source for precise and accurate targeting information for the Tomahawk cruise missile, Joint Direct Attack Munitions, Army Tactical Missile System, and Joint Standoff Weapon. The military's growing dependence on GPS-guided smart bombs has heightened DoD concerns about the vulnerability of the navigation system to the Y2K problem. DoD plans for all military aircraft to use GPS for navigation by Year 2000. By the year 2000, DoD estimates that approximately 17,000 U.S. military aircraft are expected to be equipped with GPS receivers, and about 100,000 portable receivers will be in use by U.S. ground forces and military vehicles. DoD organizations, civilian Federal agencies, Defense contractors, and allied nations have bought about 128,000 GPS receivers, with a total estimated value of \$291 million, through the GPS program office as of August 1998. DoD organizations, civilian Federal agencies, Defense contractors, and allied nations plan to buy more than 47,000 additional GPS receivers with a total estimated cost of \$167 million between 1999 and 2004.

**Civilian Use of GPS.** The DoD has operated the GPS from its inception. It was obvious, however, that GPS would also have civilian uses as a precision navigation system. After Soviet forces shot down Korean Airline Flight 007 in 1983, President Reagan directed that the GPS, operated by the DoD, be made available for international use. Reaching far beyond military applications, the GPS satellites

today provide navigational information to commercial aircraft, ships at sea, hikers, rental car customers, and anyone else equipped with a GPS receiver. Civilian navigation services are operated by the Department of Transportation through the U.S. Coast Guard. For military security reasons, navigational accuracy is intentionally reduced for civilian use. However, in March 1996, President Clinton announced that the Government would remove military restrictions from GPS technology within the next decade. This announcement was intended to terminate the current practice of degrading civil GPS signals, thus providing better signals for commercial and civilian users of GPS.

**GPS Receivers.** DoD organizations, civilian Federal agencies, Defense contractors, and allied nations procure GPS receivers either through the GPS program office or directly from industry. A significant fraction of these organizations' total GPS receivers has been procured directly from industry.

**GPS Receiver Time Sensitivity.** Dates and times are important to GPS receivers. The receivers determine a position by comparing the time generated by an internal clock to the times received from the fleet of GPS satellites. The difference between the times is used by the receiver to compute its distance from the satellite and hence compute its latitude and longitude. If the time and date generated by receivers are wrong, the position estimates will be widely inaccurate.

**GPS End of Week Rollover Issue.** The "End of Week" rollover issue is a problem that occurs every 20 years and may impact GPS receivers. GPS system time, which counts weeks from week number zero to week number 1023, started on midnight January 5/6, 1980. On midnight August 21/22, 1999, the GPS week will roll over from week 1023 back to week 0. This could be interpreted as an invalid date by the receivers. On August 22, 1999, many GPS receivers will erroneously conclude that it is January 6, 1980, August 23 will become January 7, and so on. Accuracy of navigation may be severely affected. As of April 15, 1998, DoD determined that all GPS satellites, support systems, and all program office procured receivers are End of Week-rollover compliant.

**GPS Y2K Issue.** The GPS Y2K problem is threefold and reflects the three components of the navigation system: the space segment, the ground control segment, and the user segment. The GPS program office analyzed GPS satellite and satellite support systems, evaluated ground control systems, tested GPS receivers procured from the program office, and identified cost and schedules for corrective actions.

- The GPS space segment is ready for the year 2000, and all GPS satellites are Y2K-compliant. Some satellite support systems are not Y2K-compliant, but are scheduled for repair or replacement by December 1998.
- GPS ground control systems, which mostly consist of legacy systems, are not Y2K-compliant. However, a system-wide assessment of the problem has been completed and all corrective actions are scheduled to be implemented by December 31, 1998.

- The program office determined that all receivers procured through the program office are Y2K-compliant. However, not all receivers were procured through the program office and all models require assessment.

## Objectives

The overall audit objective was to determine whether the GPS components comply with Y2K requirements. Specifically, we determined whether GPS receivers were Y2K-compliant. We did not review the management control program related to the overall audit objective because DoD recognized the Y2K issue as a material management control weakness area in the FY 1997 Annual Statement of Assurance. See Appendix A for a discussion of the audit scope, methodology, and prior audit coverage.

# **Y2K Assessment of Global Positioning System Receivers**

The GPS program office had not completed the inventory and the Y2K assessment of GPS receivers procured directly (without validation by the program office) by DoD organizations, civilian Federal agencies, Defense contractors, and allied nations. This occurred because a significant number of the organizations did not respond to a GPS program office request to provide Y2K compliance status of the non-validated receivers. As of September 25, 1998, only 81 of 253 organizations had responded to information requests. In addition, DoD has not done enough to mitigate risk by testing commercial GPS receivers. As a result, systematic distribution of information on Y2K compliance of the equipment to users has been hampered, increasing the risk of mission disruption.

## **Guidance for Y2K Assessment of DoD GPS Receivers**

The Assistant Deputy Under Secretary of Defense (ADUSD) (Space Systems and Architectures) memorandum, "Global Positioning System Year 2000 Compliance," February 1998, tasked the GPS program office, to assess the Y2K compliance status of all GPS receivers used by DoD. The ADUSD also directed the DoD organizations, civilian Federal agencies, Defense contractors, and allied nations that procure receivers not validated by the program office to provide the program office with Y2K status of those receivers by April 30, 1998. Specifically, ADUSD directed those organizations to provide the GPS program office with the following information:

- identification of GPS receiver type(s),
- Y2K compliance status of GPS receivers,
- if not currently compliant, the plan and schedule to reach compliance, and
- the amount of funds expended or budgeted to assess compliance and implement required fixes

## **Y2K Assessment of GPS Receivers**

DoD organizations, civilian Federal agencies, Defense contractors, and allied nations can buy 15 different types of validated, Y2K-compliant GPS receivers through the GPS program office. However, they can directly purchase receivers not validated by the program office by meeting Congressional exemption criteria or by obtaining waivers from the Assistant Secretary of Defense (Command, Control,

Communications, and Intelligence) (ASD (C3I)) A significant number of GPS receivers have been procured directly from industry using the waivers and the exemptions

**Congressional Direction on Development of GPS Receivers.** Pursuant to the FY 1986 Appropriations Conference, Congress directed DoD not to develop GPS receivers outside the sponsorship, direction, and coordination of the GPS program office. However, Congress authorized exemption for independent development of GPS receivers to organizations with special use requirements for GPS, such as range, advance technology, mapping, special forces, and classified applications.

**Waiver to Procure Non-program office Validated Receivers.** ASD (C3I) memorandum, "Navstar GPS User Equipment," August 19, 1987, required that programs that do not meet the special use exemption authorized by congressional guidance would not be initiated until detailed justification is provided and approval had been received from ASD (C3I). In addition, the ASD (C3I) memorandum, "Development, Procurement and Employment of DoD GPS User Equipment," April 30, 1992, required that, except for Congressional exemptions, DoD develop and procure all DoD common user equipment through the GPS program office. Waiver requests for special applications were to be submitted to ASD (C3I). ASD (C3I) would consider waiver requests for use of commercial Standard Positioning Services user equipment in specific application categories not involving combat operations, which did not require direct military Precise Positioning Services accuracy. There have been 39 GPS receiver waivers granted to Army, Navy, Air Force, National Guard Bureau, Defense Evaluation Support Activity, and Defense Mapping Agency, between August 1990 and November 1997. The audit identified at least 11,991 non-validated receivers that these organizations were authorized to procure (see Appendix B).

**Y2K Assessment and Testing.** As of September 25, 1998, the GPS program office had not completed the inventory and the Y2K assessment of those non-validated GPS receivers procured directly with the waivers or exemptions as directed by ADUSD (Space Systems and Architectures). Although there are over 70 GPS receiver manufacturers with several hundred GPS receiver models, the GPS program office Y2K testing database only contained Y2K testing results of 49 GPS receiver models procured outside of the program office. The testing was performed by four DoD testing centers including the 746th Test Squadron, Holomon Air Force Base; Naval Research and Development Center, San Diego; Naval Research Laboratory, Washington D.C., and Electronic Proving Ground, Fort Huachuca. However, those receiver models tested are standalone models and were not tested for Y2K interface with other system components. In addition, the U.S. Coast Guard, Department of Transportation, developed a list of GPS receiver manufacturers and their addresses. However, the Coast Guard had not performed Y2K testing of GPS receiver models. Instead, they were asking GPS users to contact the manufacturers directly to inquire about status of Y2K compliance (see Appendix D).

## Status of Organizations Response to GPS Program Office

A significant number of organizations did not acknowledge the ADUSD direction and did not respond to the GPS program office request to provide Y2K compliance status of the non-validated receivers. Nor did the GPS program office make sufficient efforts to obtain the required responses. As of August 21, 1998, only 72 of 253 organizations had responded to the GPS program office as shown in table 1.

**Table 1. Organizations responding on Y2K Status of Receivers As of August 21, 1998**

| Component                                 | Organizations with Waivers Granted | Organizations Responding | Organizations Not Responding |
|---|------------------------------------|--------------------------|------------------------------|
| Army                                      | 71                                 | 25                       | 46                           |
| Navy                                      | 53                                 | 11                       | 42                           |
| Air Force                                 | 95                                 | 26                       | 69                           |
| Marine Corps                              | 5                                  | 2                        | 3                            |
| Defense Advanced Research Projects Agency | 1                                  | 1                        | 0                            |
| Defense Information Systems Agency        | 1                                  | 1                        | 0                            |
| Defense Intelligence Agency               | 1                                  | 0                        | 1                            |
| Defense Special Weapons Agency            | 1                                  | 1                        | 0                            |
| National Imagery and Mapping Agency       | 1                                  | 1                        | 0                            |
| National Security Agency                  | 2                                  | 0                        | 2                            |
| U.S. Special Operations Command           | 1                                  | 1                        | 0                            |
| Contractors                               | 13                                 | 2                        | 11                           |
| Federal Agencies                          | 7                                  | 1                        | 6                            |
| Allied Nations                            | 1                                  | 0                        | 1                            |
| <b>TOTAL</b>                              | <b>253</b>                         | <b>72</b>                | <b>181<sup>1</sup></b>       |

<sup>1</sup> Appendix C lists delinquent organizations that did not respond to GPS program office

During our audit, the GPS program office proactively issued a follow-up memorandum on August 11, 1998, to urge immediate response by those organizations that had not replied to the initial ADUSD memorandum. The memorandum stated that the GPS program office would consider those organizations as potentially non Y2K-compliant for GPS Y2K readiness if it does not receive responses by September 25, 1998. However, this letter was still insufficient to solicit responses from those delinquent organizations (see table 2) and we advised the Office of the ASD (C3I) on August 28, 1998, that higher-level management intervention was needed.

**Table 2. Additional Organizations responding on Y2K Status of Receivers  
As of September 25, 1998**

| Component                                       | Non responding Organizations<br>As of August 21<br>1998 | Additional Organizations<br>Responding as of<br>September 25, 1998 | Remaining Organizations<br>Still Not<br>Responding |
|---|---|--|--|
| Army  | 46  | 0  | 46   |
| Navy  | 42  | 0  | 42   |
| Air Force                                       | 69  | 8  | 61   |
| Marine Corps                                    | 3   | 0  | 3  |
| Defense Advanced<br>Research Projects<br>Agency | 0   | 0  | 0  |
| Defense Information<br>Systems Agency           | 0   | 0  | 0  |
| Defense Intelligence<br>Agency                  | 1   | 0  | 1  |
| Defense Special<br>Weapons Agency               | 0   | 0  | 0  |
| National Imagery<br>and Mapping<br>Agency       | 0   | 0  | 0  |
| National Security<br>Agency                     | 2   | 0  | 2  |
| U.S. Special<br>Operations<br>Command           | 0   | 0  | 0  |
| Contractors                                     | 11  | 1  | 10   |
| Federal Agencies                                | 6   | 0  | 6  |
| Allied Nations                                  | 1   | 0  | 1  |
| <b>TOTAL</b>                                    | <b>181</b>  | <b>9</b>   | <b>172</b>   |

## **Action Taken by Management**

Although the Assistant Inspector General for Auditing briefed the audit results to the Deputy Chief Information Officer and the Deputy Assistant Secretary of Defense (Chief Information Officer Policy and Implementation) on August 28, 1998, and the draft of this report was issued on September 30, 1998, the Office of the ASD (C3I) tasked the Defense Components on November 9, 1998, to gather the required information from delinquent organizations. As of December 17, 1998, Defense Components still had not provided the information to the Office of the ASD (C3I) because they were still in the process of gathering and compiling the information.

## **Summary**

A significant number of GPS receivers used by DoD organizations, civilian Federal agencies, Defense contractors, and allied nations for military aircraft, ground forces, military vehicles, Navy ships, and other military navigation purposes remain untested and unassessed for Y2K compliance. Those organizations run the risk of equipment failure and mission disruption unless there is greater cooperation with the program office.

## **Management Comments on the Finding**

The Deputy Assistant Secretary of Defense (Command, Control, Communications, Intelligence, Surveillance, Reconnaissance, and Space Systems) concurred with our finding that the GPS joint program office had not completed the inventory and Y2K assessment of all GPS receivers procured directly. In addition, the Deputy Assistant Secretary stated that the visibility that our draft report brought to this specific GPS issue should in itself help accelerate its timely resolution; and, as a result of our audit, the DoD Y2K office had tasked the Services through their Y2K organizations to collect and report the information identified in our draft report. The Deputy Assistant Secretary further stated that since they were still in the process of gathering and compiling that information, it would be provided to us in a follow-on letter.

## **Recommendations, Management Comments, and Audit Response**

**Deleted Recommendations.** As result of management comments and further consideration, we deleted Draft Recommendations 1. and 2. Draft Recommendation 3 has become the final report Recommendation.

**We recommend that the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) direct the GPS joint program office, in coordination with the U.S. Coast Guard, to conduct Y2K testing on all GPS receivers not yet validated by the GPS joint program office.**

**Management Comments.** The Deputy Assistant Secretary of Defense (Command, Control, Communications, Intelligence, Surveillance, Reconnaissance, and Space Systems) did not concur with the recommendation because he did not believe the recommendation provided an effective solution to achieving the objective of ensuring Y2K compliance of GPS receivers. The Deputy Assistant Secretary stated that the recommendation greatly expands the U.S. Government's GPS Y2K responsibilities to include commercial products, raises questions about potential liabilities, and requires expenditure of DoD resources that currently are not available in the GPS program office.

**Audit Response.** The Deputy Assistant Secretary of Defense (Command, Control, Communications, Intelligence, Surveillance, Reconnaissance, and Space Systems) comments are not responsive. The management position is unclear. While the comments indicate nonconcurrency, they also state that the feasibility and implication of the recommendation are still under review. The comments infer a shared concern about the reliability of unverified Y2K compliance data, but offer no alternative to our recommendation.

Since GPS is a mission-critical system, we believe DoD should take an aggressive posture on receiver testing in accordance with the general intent of the Deputy Secretary of Defense Memorandum, "Year 2000 Verification of National Security Capabilities," August 24, 1998. If suppliers are unable or unwilling to provide fully credible status information, we see no choice but DoD testing.

Concerns about testing capacity and resources should be minimal. As described in page 6 of this report, some GPS receiver Y2K testing has already been performed by four DoD testing centers. DoD GPS users should use these testing centers to the fullest extent. In addition, we identified an additional GPS receiver Y2K testing capability located at Naval Air Station, Patuxent River, Maryland. We request that the Assistant Secretary of Defense (Command, Control, Communications, and Intelligence) reconsider his position on the recommendation and provide additional comments in response to the final report.

## Appendix A. Audit Process

This is one in a series of reports being issued by the Inspector General, DoD, in accordance with an informal partnership with the Chief Information Officer, DoD, to monitor DoD efforts to address the Y2K computing challenge. For a listing of audit projects addressing the issue, see the Y2K web page on the IGnet at <http://www.ignet.gov>

### Scope

We reviewed and evaluated the progress of the GPS program office in the Y2K assessment of non-program office validated GPS receivers procured directly by DoD organizations, civilian Federal agencies, Defense contractors, and allied nations. We met with GPS program office personnel to obtain Y2K compliance status of the receivers not validated by the GPS program office. Through those meetings and information provided by program office personnel, we developed the list of 253 organizations that were requested to respond to the data call for the status of GPS receiver Y2K compliance, identified 181 delinquent organizations that had not responded, assessed Y2K compliance receiver status from organizations that responded to the data call, and developed a list of the GPS receiver manufacturers.

**DoD-Wide Corporate Level Government Performance and Results Act Goals.** In response to the Government Performance Results Act, the Department of Defense has established 6 DoD-wide corporate-level performance objectives and 14 goals for meeting the objectives. This report pertains to achievement of the following objective and goal.

- **Objective:** Prepare now for an uncertain future. **Goal:** Pursue a focused modernization effort that maintains U S qualitative superiority in key war fighting capabilities (DoD-3)

**DoD Functional Area Reform Goals.** Most major DoD functional areas have also established performance improvement reform objectives and goals. This report pertains to achievement of the following functional area objectives and goals

- **Information Technology Management Functional Area.**  
**Objective:** Become a mission partner **Goal:** Serve mission information users as customers. (ITM-1.2)
- **Information Technology Management Functional Area.**  
**Objective:** Provide services that satisfy customer information needs  
**Goal:** Modernize and integrate DoD information infrastructure (ITM-2.2)
- **Information Technology Management Functional Area.**  
**Objective:** Provide services that satisfy customer information needs  
**Goal:** Upgrade technology base (ITM-2.3)

**General Accounting Office High-Risk Area.** In its identification of risk areas, the General Accounting Office has specifically designated risk in resolution of the Y2K problem as high. This report provides coverage of that problem and of the overall Information Management and Technology high-risk area.

## Methodology

**Audit Type, Dates, and Standards.** We performed this program audit from July 1998 to September 1998, in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We did not use computer-processed data for this audit.

**Contacts During the Audit.** We visited or contacted individuals and organizations within DoD. Further details are available upon request.

**Management Control Program.** We did not review the management control program related to the overall audit objective because DoD recognized the Y2K issue as a material management control weakness area in the FY 1997 Annual Statement of Assurance.

## Summary of Prior Audits and Other Reviews

The General Accounting Office and the Inspector General, DoD, have conducted multiple reviews related to Y2K issues. General Accounting Office reports can be accessed over the Internet at <http://www.gao.gov>. Inspector General, DoD, reports can be accessed over the Internet at <http://www.dodig.osd.mil>. None of the previous reviews related to the Global Positioning System.

## Appendix B. Waivers for GPS Receivers

| Waiver Date                                 | Waived by | Waived to | Waived Receivers Used For                                      | Quantity                |
|---|-----------|-----------|--|-------------------------|
| 8/22/90                                     | ASD (C3I) | Army      | Small, Lightweight GPS for Desert Shield Forces                | 1000                    |
| 11/13/90                                    | ASD (C3I) | Army      | Small, Lightweight GPS for Desert Shield Forces                | 2500                    |
| 11/21/90                                    | ASD (C3I) | Navy      | Small, Lightweight GPS for Desert Shield Forces                | 200                     |
| 12/4/90                                     | ASD (C3I) | Army      | Small, Lightweight GPS for Desert Shield Forces                | 4735                    |
| 3/21/91                                     | ASD (C3I) | Navy      | Small, Lightweight for Post Desert Storm Forces                | 100                     |
| 7/31/91                                     | ASD (C3I) | Navy      | Advanced Interdiction Weapon System                            | Not Specified           |
| 8/6/91                                      | ASD (C3I) | Navy      | P-3 aircraft to support anti-drug operations                   | 100                     |
| 9/6/91                                      | ASD (C3I) | NGB       | NGB (National Guard Bureau) Counterdrug Operation              | 469                     |
| 2/10/92                                     | ASD (C3I) | Navy      | Commercial Portable GPS for Test and Evaluation                | 15                      |
| 7/27/92                                     | ASD (C3I) | Air Force | T45 Aircraft   | Not Specified           |
| 8/28/92                                     | ASD (C3I) | Navy      | Persian Gulf Operation   | Not Specified           |
| 9/9/92                                      | ASD (C3I) | DMA       | DMA (Defense Mapping Agency) Data collection evaluation effort | 1                       |
| 10/7/92                                     | ASD (C3I) | Navy      | GPS C/A-code differential systems                              | 3                       |
| 12/4/92                                     | ASD (C3I) | Air Force | C130   | 50                      |
| 12/9/92                                     | ASD (C3I) | DESA      | DESA (Defense Evaluation Support Activity)                     | 25                      |
| 3/26/93                                     | ASD (C3I) | Air Force | Aircrew survival use   | 200                     |
| 7/21/93                                     | ASD (C3I) | Navy      | Aviators survival use  | 445                     |
| 8/13/93                                     | ASD (C3I) | Navy      | Test and evaluation  | 8                       |
| 10/25/93                                    | ASD (C3I) | Army      | Small lightweight GPS receivers                                | 75                      |
| 2/24/94                                     | ASD (C3I) | Navy      | GPS integrated navigation systems                              | 3                       |
| 3/24/94                                     | ASD (C3I) | Army      | GPS for Tactical Missile Systems                               | Not Specified           |
| 5/20/94                                     | ASD (C3I) | Navy      | MX7420 receiver for survey mission                             | 1                       |
| 9/16/94                                     | ASD (C3I) | Army      | SOIC TRIMPACK Receiver   | 35                      |
| 11/4/94                                     | ASD (C3I) | Navy      | Tomahawk Receiver Unit   | 5                       |
| 12/1/94                                     | ASD (C3I) | Navy      | T44, TH57, T34 Aircraft  | Not Specified           |
| 12/7/94                                     | ASD (C3I) | Navy      | LC130  | Not Specified           |
| 12/22/94                                    | ASD (C3I) | Air Force | E4B, KC10, C9  | Not Specified           |
| 12/27/94                                    | ASD (C3I) | Air Force | T1A Aircraft   | Not Specified           |
| 2/2/95                                      | ASD (C3I) | Navy      | MX7420 receiver for survey mission                             | 1                       |
| 5/16/95                                     | ASD (C3I) | Air Force | C5, C141, KC135, C12, C18, C20, C21, VC25, T43                 | Not Specified           |
| 6/8/95                                      | ASD (C3I) | Navy      | PRC-112 Survival Radios  | 1000                    |
| 6/12/95                                     | ASD (C3I) | Army      | UH1 & Interim UH60 Aircraft                                    | Not Specified           |
| 6/14/95                                     | SAF (AQ)  | Air Force | C5, C141 & KC135 Aircraft                                      | Not Specified           |
| 6/26/95                                     | ASD (C3I) | Army      | Doppler GPS for UH60, CH47 Rotorcraft                          | Not Specified           |
| 10/18/95                                    | ASD (C3I) | Navy      | C9, C12, TC18, C20 & EC24 Aircraft                             | Not Specified           |
| 2/13/96                                     | DUSD (S)  | Air Force | UV18B, TG 7A & 11A & T41D Aircraft                             | Not Specified           |
| 3/4/96                                      | DUSD (S)  | Air Force | PRC-112 Survival Radios  | 1010                    |
| 10/6/97                                     | DUSD (S)  | Air Force | T43 Aircraft   | 10                      |
| 11/4/97                                     | SAF (AQ)  | Army      | C-17, C-137 Aircraft   | Not Specified           |
| <b>Total Number of Waived GPS Receivers</b> |           |           |  | <b>(at least) 11991</b> |

## Appendix C. Delinquent Organizations

|  |           |   |      |
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| ADVANCED SYSTEMS CONCEPTS DIRECTORATE<br>US ARMY NATICK RD&E CENTER<br>NATICK, MA 01760-5015 | ARMY      | NAVAL RESEARCH LABORATORY<br>CODE: 5711<br>WASHINGTON, DC 20375-5320  | NAVY |
| AFDTC<br>39 FTS/CAX<br>601 W CHOCTAWATCHEE AVE, STE 45<br>EGLIN AFB, FL 32542-5720           | AIR FORCE | NAVAL RESEARCH LABORATORY<br>NRL CODE 7421<br>WASHINGTON, DC 20375-5000                                       | NAVY |
| AFDTC/EMSN<br>501 DELEON ST, STE 101<br>EGLIN AFB FL 32542-5133                              | AIR FORCE | NAVAL RESEARCH LAB<br>SPACE SYSTEMS DEVELOPMENT DEPART<br>CODE 8140 (C4I BRANCH)<br>WASHINGTON, DC 20375-5300 | NAVY |
| AFFTC/PKAA<br>5 S. WOLFE AVE<br>EDWARDS AFB, CA 93524-1185                                   | AIR FORCE | NAVAL SEA SYSTEMS COMMAND<br>2531 JEFFERSON DAVIS HWY<br>ARLINGTON, VA 22242-5160                             | NAVY |
| AFRL/VSDD (RESPONDED BY 9/25/98)<br>3550 ABERDEEN AVE SE<br>KIRTLAND AFB, NM 87117-5776      | AIR FORCE | NAVAL SEA SYSTEMS COMMAND, PMS 429G2<br>2531 JEFFERSON DAVIS HWY<br>ARLINGTON, VA 22420-5160                  | NAVY |
| AIR ASW ASSAULT AND SPECIAL MISSION<br>BLDG 2272 (IPT), RM 146<br>PATUXENT RIVER, MD 20670   | NAVY      | NAVAL SURFACE WARFARE CENTER<br>DAHLGREN DIV<br>17320 DAHLGREN RD<br>CODE G33<br>DAHLGREN, VA 22448-5100      | NAVY |
| AIR DEFENSE COMMAND AND CONTROL SYSTEMS<br>4920 UNIVERSITY SQUARE<br>HUNTSVILLE, AL 35816    | ARMY      | NAVAL SURFACE WARFARE CENTER<br>DAHLGREN DIVISION<br>17320 DAHLGREN ROAD<br>DAHLGREN, VA 22448-5100           | NAVY |
| AMSEL-RD-NV-TSOD-TSB-PET<br>10221 BURBECK RD, STE 430<br>FT BELVOIR, VA 22060-5806           | ARMY      | NCCOSC, NRAD, CODE 754<br>53560 HULL STREET<br>SAN DIEGO, CA 92152  | NAVY |
| ANTARCTIC SUPPORT ASSOCIATES<br>61 INVERNESS DRIVE EAST, STE 300<br>ENGLEWOOD, CO 80112      | CONTRACT  | NCCOSC RDT&E DIVISION<br>53570 SILVER GATE AVE<br>RM 1602 W<br>SAN DIEGO, CA 92152-5500                       | NAVY |
| ARMY TACMS-BAT<br>SFAE-SML-AB<br>REDSTONE ARSENAL, AL 35898                                  | ARMY      | NAVAL RESEARCH LABORATORY<br>NRL CODE 7421<br>WASHINGTON, DC 20375-5000                                       | NAVY |
| ASC/GRB BLDG 558<br>2590 LOOP RD WEST, RM 210<br>WRIGHT PATTERSON AFB, OH 45433              | AIR FORCE | NAVAL RESEARCH LAB<br>NAVAL CENTER FOR SPACE TECH<br>4555 OVERLOOK AVE, SW<br>WASHINGTON, DC 20375-5320       | NAVY |
| ASC/GRC<br>BLDG 558, RM 016<br>2590 LOOP ROAD WEST<br>WRIGHT PATTERSON AFB, OH 45433-7142    | AIR FORCE | NAWC-WPNS<br>CODE: 4KL 300E<br>PT MUGU, CA 93042  | NAVY |
| ASC/LBA<br>BLDG 16, 2275 D STREET, STE 16<br>WRIGHT PATTERSON AFB, OH 45433-7142             | AIR FORCE |   |      |

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| ASC/LYB<br>2145 MONAHAN WAY<br>WRIGHT PATTERSON AFB, OH 45433-7017                                    | AIR FORCE | NIGHT VISION ELECTRONIC SYSTEMS DIR<br>ATTN: AMSEL-RD-NV-LW-MSB (WATTS)<br>FT BELVOIR, VA 22060 | ARMY      |
| ASC/RAKBS<br>2640 LOOP ROAD WEST, RM 203<br>WRIGHT-PATTERSON AFB OH 45433-5500                        | AIR FORCE | NIGHT VISION DIRECTORATE<br>AMSEL RD NV AS VEA<br>10221 BURBECK RD<br>FT BELVIOR, VA 22060-5806 | ARMY      |
| ASC/RAKBS<br>2540 LOOP ROAD WEST<br>WRIGHT PATTERSON AFB OH 45433-7106                                | AIR FORCE | NISE EAST<br>DET CODE: 614<br>VILLA RD<br>ST INIGOES, MD 20684-0010                             | NAVY      |
| ASC/WMRK<br>102 WEST D AVENUE, STE 300<br>EGLIN AFB FL 32542-6808                                     | AIR FORCE | NISE EAST<br>4600 MARRIOT DR<br>NORTH CHARLESTON, SC 29406-6504                                 | NAVY      |
| ASC/VFMS<br>2300 D ST, BLDG 32<br>WRIGHT PATTERSON AFB, OH 45433-7249                                 | AIR FORCE | OC-ALC/LADBA<br>3001 STAFF DR, STE 1AF1/106C<br>TINKER AFB, OK 73145-3020                       | AIR FORCE |
| ASC/VXCK<br>102 WEST D AVE, STE 300<br>EGLIN AFB, FL 32542-6808                                       | AIR FORCE | OC-ALC/LADCB<br>3001 STAFF DRIVE, SUITE: 2AB190B<br>TINKER AIR FORCE BASE, OK 7345-5320         | AIR FORCE |
| ASC/YC-A/FC IPT<br>2600 PARAMOUNT PLACE<br>FAIRBORN, OH 45324-6766                                    | AIR FORCE | OF-ALC/LIKM<br>6050 GUM LANE, BLDG 1215<br>HAFB, UT 84056-5825                                  | AIR FORCE |
| ASC YH-2A (RESPONDED BY 9/25/98)<br>102 WEST D AVE, STE 168<br>EGLIN AFB, FL 32542                    | AIR FORCE | OC-ALC/LKM<br>3001 STAFF DR, STE 1AG110<br>TINKER AFB, OK 73145-3018                            | AIR FORCE |
| ASC/YHW (RESPONDED BY 9/25/98)<br>EGLIN AFB, FL 32542   | AIR FORCE | OC-ALC/LKO<br>3001 STAFF DR , SUITE 1AG110<br>TINKER AFB, OK 73145-3018                         | AIR FORCE |
| ASC OL/YH-3W (RESPONDED BY 9/25/98)<br>BLDG 11<br>102 WEST D AVE, STE 168<br>EGLIN AFB, FL 32542-6807 | AIR FORCE | OL/ YU<br>102 WEST D AVE SUITE 168<br>EGLIN AFB, FL 32542                                       | AIR FORCE |
| ASC/YTA BLDG 56<br>2100 MONAHAN WAY<br>WRIGHT PATTERSON AFB OH 45433-7014                             | AIR FORCE | OC-ALC/LKO<br>3002 STAFF DR, STE 1AG110<br>TINKER AFB, OK 73145-3018                            | AIR FORCE |
| ASC OL/YUA (RESPONDED BY 9/25/98)<br>102 WEST D AVE, STE 168<br>EGLIN AFB, FL 32542-6807              | AIR FORCE | OO-ALC/PK(2)<br>6082 FIR AVE, BLDG 1232<br>HILL AFB, UT 84056                                   | AIR FORCE |
| ASC/VJD<br>BLDG 14<br>1865 FOURTH ST, STE 1<br>WRIGHT PATTERSON AFB, OH 45433-7115                    | AIR FORCE | OO-ALC/TISHC<br>6137 WARDLEIGH RD<br>HILL AFB, UT 84056-5843                                    | AIR FORCE |
| ASC/YUT (RESPONDED BY 9/25/98)  | AIR FORCE | OFFICE OF NAVAL RESEARCH<br>BLLSTON COMMONS TOWER #1, RM 804                                    | NAVY      |

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| 102 WEST D AVE, STE 168<br>EGLIN AFB, FL 32542-6807  |           | 800 NORTH QUINCY DR<br>ARLINGTON, VA 22217  |           |
| ASC/YUP (RESPONDED BY 9/25/98)<br>102 WEST D AVE, STE 300<br>EGLIN AFB, FL 32542-6807  | AIR FORCE | OTS/SAG<br>6432 POUND APPLE CT<br>COLUMBIA, MD 21045  | CONTRACT  |
| ASC/YV (RESPONDED BY 9/25/98)<br>104 WEST D AVE<br>EGLIN AFB FL 32542-6807   | AIR FORCE | PL/PKOS<br>2000 WYOMING SE BLDG 20604<br>KIRTLAND AFB, NM 87117-5606  | AIR FORCE |
| ATCAL/TERPS<br>239 COMBAT COMMUNICATIONS SQD<br>705 MEMORIAL DR<br>ST JOSEPH, MO 64503-9307                                  | AIR FORCE | PL/SXP<br>3550 ABERDEEN AVENUE SE<br>KIRTLAND AFB, NM 87117-5776  | AIR FORCE |
| ASD/YFRA<br>WRIGHT PATTERSON AFB, OH 45433   | AIR FORCE | PL/WSM<br>3550 ABERDEEN SE<br>KIRTLAND AFB, NM 87117  | AIR FORCE |
| 910 AW/DOTN<br>3976 KING GRAVES ROAD<br>YOUNGSTOWN-WARREN RGL APRT<br>ARS, OH 44473-0910                                     | AIR FORCE | PM JOINT STARS<br>SFAE-IEW-JS<br>BLDG 550<br>FORT MONMOUTH, NJ 07703  | ARMY      |
| BAD AIBLING STATION<br>CMR 407, BLDG 325<br>APO, AE 09098  | ARMY      | PMSW<br>ATTN: SFAE-IEW-SG, (ARL-344-ML-012)<br>MAIL STOP 5<br>VINT HILL FARMS STATION<br>WARRENTON, VA 22186-5118 | ARMY      |
| 56 CES/CEVN<br>13970 W LIGHTNING ST<br>LUKE AFB, AZ 85309-1149   | AIR FORCE | PROGRAM EXECUTIVE OFFICE FOR MINE WA<br>2531 JEFFERSON DAVIS HWY<br>ARLINGTON, VA 22242                           | NAVY      |
| CRUISE MISSILES & JOINT UNMANNED AERIAL VEH<br>1213 JEFFERSON DAVIS HWY<br>ARLINGTON, VA 22246                               | NAVY      | ROME LABORATORY<br>RL/IRRE<br>32 HANGAR RD<br>ROME, NY 13441-4114   | AIR FORCE |
| 95 CS/SCXF<br>35 N WOLFE AVE<br>BLDG 3940, RM 156<br>EDWARDS AFB, CA 90245-5500  | AIR FORCE | PM SOLDIER<br>10401 TOTTEN RD.<br>FT BELVOIR, VA 22060  | ARMY      |
| DEFENSE INTELLIGENCE AGENCY<br>MISSILE & SPACE INTELLIGENCE CENTER<br>REDSTONE ARSENAL, AL 35898-5500                        | DIA       | SA-ALC/LAK<br>375 AIRLIFT DR, STE 1<br>KELLY AFB, TX 78241-6334   | AIR FORCE |
| DEPARTMENT OF THE NAVY<br>PROGRAM EXECUTIVE OFFICER; THEATER AIR DEF<br>2531 JEFFERSON DAVIS HWY<br>ARLINGTON, VA 22242-5170 | NAVY      | SA-ALC/LAK<br>SFAE-C3S-GPS-RMD<br>FORT MONMOUTH, NJ 07703   | ARMY      |
| DET 4, 645TH MATERIEL SQD<br>PO BOX 33<br>ONTARIO, CA 91761-0033   | AIR FORCE | SAF/OR<br>1672 AIR FORCE PENTAGON<br>WASHINGTON, DC 20330-1672  | AIR FORCE |
| DIRECTORATE FOR APPLIED TECH<br>TEST AND SIMULATION  | ARMY      | SANDIA NATIONAL LABS<br>P O BOX 5800 (RESPONDED BY 9/25/98)   | CONTRACT  |

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| US ARMY WHITE SANDS MISSILE RANGE<br>WHITE SANDS MISSILE RANGE, NM 88002                                   |           | ALBUQUERQUE, NM 87185-1174  |           |
| DRAPER LABORATORY INC<br>555 TECHNOLOGY SQUARE<br>CAMBRIDGE, MA 02139-3563                                 | CONTRACT  | SFAE-MD-NMD-EK-K<br>USASSDC, PO BOX 1500<br>HUNTSVILLE, AL 35807-3801   | ARMY      |
| ESC/AWJ<br>3 EGLIN ST<br>HANSCOM AFB, MA 01731-211   | AIR FORCE | SM-ALC/PKLT<br>5039 DUDLEY BLVD<br>MCCLELLAN AFB, CA 95652-1027   | AIR FORCE |
| ESC/ICR<br>AIRBORNE & MOBILE INTEL SYSTEMS<br>HANSCOM AFB, MA 01731-1619                                   | AIR FORCE | 614 SOPF/CC<br>747 NEBRASKA AVE, STE A-100<br>VANDENBERG AFB, CA 93437-6282                                   | AIR FORCE |
| ESC/TG-3M<br>11 EGLIN ST<br>HANSCOM AFB, MA 01731-2120   | AIR FORCE | 21 SOPS/MA<br>ONIZUKA AIR STATION<br>1080 LOCKHEED WAY BOX 046<br>SUNNYVALE CA 94089-1235                     | AIR FORCE |
| ESC/TG3-A<br>11 EGLIN ST<br>HANSCOM AFB, MA 01731-2120   | AIR FORCE | SPACE AND JOINT SYSTEMS PROGRAM MGR<br>D-114, RUSSELL OFFICES<br>CANBERRA ACT 2600<br>AUSTRALIA               | ALLIES    |
| ESC/TNN<br>51 SCHILLING CIRCLE<br>HANSCOM AFB, MA 01731-2802   | AIR FORCE | SPACE & NAVAL WARFARE SYSTEMS COM.<br>2451 CRYSTAL DRIVE<br>ARLINGTON, VA 22245-5200                          | NAVY      |
| ESC/TNT<br>51 SCHILLING CIRCLE<br>HANSCOM AFB, MA 01731-2802   | AIR FORCE | SPACE AND NAVAL WARFARE SYSTEMS CTR<br>53560 HULL ST<br>SAND DIEGO, CA 92152-5001                             | NAVY      |
| FEDERAL CIVILIAN AGENCY PPS COORDINATOR<br>501 W FELIX ST<br>FORT WORTH, TX 76115                          | FEDERAL   | SPACE AND NAVAL WARFARE SYSTEMS COM<br>PMA-227<br>46990 HINKLE CIRCLE UNIT 8<br>PATUXENT RIVER, MD 20670-1627 | NAVY      |
| FT DETRICK<br>MCHD-PTM-T<br>FREDERICK, MD 21702-5000   | ARMY      | STANFORD TELECOM<br>PO BOX 3733<br>SUNNYVALE, CA 94088-3733   | CONTRACT  |
| 410 FLTS/DOM<br>PO BOX 901296<br>PALMDALE, CA 93590-1296   | AIR FORCE | SPAWARSYSCEN<br>49620 BELUGA ROAD<br>SAN DIEGO, CA 92152-6530   | NAVY      |
| FT WORTH DIST, CORPS OF ENGINEERS<br>PINEY WOODS PROJECT OFFICE<br>PO DRAWER W<br>JEFFERSON, TX 75657-0660 | ARMY      | STERT-TE-E-EM<br>REDSTONE TECHNICAL TEST CENTER<br>REDSTONE ARSENAL, AL 35898-8052                            | ARMY      |
| HQ AFCA/SYAZ<br>HAMMER ACE<br>607 PIERCE ST RM 409<br>SCOTT AFB, IL 62225-5421                             | AIR FORCE | STRATEGIC SYSTEMS PROGRAMS<br>1931 JEFFERSON DAVIS GWY<br>ARLINGTON, VA 22202-3518                            | NAVY      |
| HQ 1 CORPS & FT LEWIS<br>PO BOX 339500<br>FT LEWIS, WA 98433-9500  | ARMY      | SWC/DOO (ITAC)<br>SPACE WARFARE CENTER<br>M/S 8283<br>FALCON AFB, CO 80912                                    | AIR FORCE |

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| HQ SWC/DOTT<br>730 IRWIN AVE, STE 83<br>FALCON AFB, CO 80912-7383  | AIR FORCE | SWC/XRM<br>730 IRWIN AVE, STE 83<br>FALCON AFB, CO 80912-7383   | AIR FORCE |
| HQ 412TH TEST WING<br>306 E. POPSON AVE<br>EDWARDS AFB, CA 93524-6680  | AIR FORCE | TACTICAL AIRCRAFT PROGRAM<br>PMA-241<br>1421 JEFFERSON DAVIS HWY<br>ARLINGTON, VA 22243                                   | AIR FORCE |
| HG US ARMY<br>COMMUNICATIONS-ELECTRONICS COMMAND<br>FORT MONMOUTH NJ 07703-5000  | ARMY      | TANK, AUTOMOTIVE, AND ARMAMENTS COM ARMY<br>WARREN, MI 48397-5000   |           |
| HQ US ARMY CECOM<br>RESEARCH, DEVELOPMENT, AND ENGINEERING CTR<br>FORT MONMOUTH, NJ 07703-5603   | ARMY      | TEST & EXPERIMENTATION COMMAND<br>AIRBORNE & SPECIAL OPERATIONS TEST DIR<br>FORT BRAGG, NORTH CAROLINA 28307-500          | ARMY      |
| HQ USSPACECOM/J60<br>250 S PETERSON BLVD, STE 116<br>PETERSON AFB, CO 80914-3050   | AIR FORCE | THEATER AIR DEFENSE<br>2531 JEFFERSON DAVIS HWY<br>ARLINGTON, VA 22242-5170   | ARMY      |
| INSTRUMENTATION, TARGETS AND THREAT<br>SIMULATORS<br>AMCPM-ITTS-S<br>REDSTONE ARSENAL, AL 35888-7461                                     | ARMY      | 28TS/TOGA<br>203 WEST D AVE, STE 400<br>EGLIN AFB, FL 32542-6867  | AIR FORCE |
| JET PROPULSION LAB<br>MAIL-STOP: 300-243<br>4800 OAK GROVE DR<br>PASADENA, CA 91109  | CONTRACT  | 46TW/TSS<br>211 W. EGLIN BLVD, STE 128<br>EGLIN AFB, FL 32542-5429  | AIR FORCE |
| KEARFOTT GUIDANCE & NAVIGATION CORP<br>150 TOTOWA ROAD<br>WAYNE, NJ 07474-0946   | CONTRACT  | UNITED STATES NAVAL OBSERVATORY<br>TIME SERVICE DEPARTMENT<br>3450 MASSACHUSETTS AVE , NW<br>WASHINGTON, DC 20392-5420    | NAVY      |
| KWAJALEIN MISSILE RANGE<br>US ARMY KWAJALEIN ATOLL<br>CSSD-KA-RI<br>APO, AP 96555  | ARMY      | UNIVERSITY OF HAWAII AT MANOA<br>HAWAII INSTITUTE OF GEOPHYSICS<br>2525 CORREA ROAD<br>HONOLULU, HI 96822                 | CONTRACT  |
| LAWRENCE LIVERMORE NATIONAL LAB<br>PO BOX 808<br>7000 EAST AVE, MS L-495<br>LIVERMORE, CA 94551  | CONTRACT  | UNIVERSITY OF WASHINGTON<br>APPLIED PHYSICS LABORATORY<br>1013 NE 40TH ST<br>SEATTLE, WA 98105-6698                       | CONTRACT  |
| LITTON DATA SYSTEMS<br>5500 CANOGA AVE<br>WOODLAND HILLS, CA 91367   | CONTRACT  | US ARMY ARMAMENT RESEARCH<br>DEVELOPMENT & ENGINEERING CENTER<br>SMCAR-FSM-S, BLDG 94<br>PICATINNY ARSENAL, NJ 07806-5000 | ARMY      |
| MARINE CORPS COMBAT DEVELOPMENT COMMAND<br>QUANTICO, VA 22134-5001   | USMC      | US ARMY ARMAMENT RESEARCH<br>DEVELOPMENT & ENGINEERING CENTER ARD<br>BLDG 95 NORTH<br>PICATINNY ARSENAL, NJ 07806-5000    | ARMY      |
| MARINE CORPS PROGRAMS DEPT<br>NAVAL ORDINANCE CENTER<br>PACIFIC DIVISION, FALLBROOK DET<br>700 AMMUNITION RD<br>FALLBROOK, CA 92028-3187 | USMC      | US ARMY AVIATION AND TROOP COMMAND<br>FLIGHT CONCEPTS DIVISION  | ARMY      |

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| MARINE CORPS SYSTEMS COMMAND<br>2033 BARNETT AVE, STE 315<br>QUANTICO, VA 22134  | USMC    | FT EUSTIS, VA 23604   |
| MARYLAND PROCUREMENT OFFICE<br>9800 SAVAGE RD<br>FORT GEORGE MEADE, MD 20755-6000                                      | ARMY    | US ARMY AVIATION & TROOP COMMAND<br>SATFC-KO<br>FT EUSTIS, VA 23604   |
| MILITARY SEALIFT COMMAND, MIDDLE-ATLANTIC<br>1966 MORRIS ST<br>NORFOLK, VA 23511-3496                                  | NAVY    | US ARMY CHEMICAL & BIOLOGICAL DEFENSE ARMY<br>COMMAND<br>AMSCB-BDL<br>ABERDEEN PROVING GROUND, MD 21010-5423  |
| MLRS PROJECT OFFICE<br>SFAE-MSL-ML-LO-F<br>REDSTONE ARSENAL, AL 35898  | ARMY    | US ARMY CORPS OF ENGINEERS<br>BONNEVILLE LOCK AND DAM<br>WES SITE<br>CASCADE LOCKS, OR 97014  |
| NASA/JOHNSON SPACE CENTER<br>2102 NASA ROAD 1<br>HOUSTON, TX 77058-3696  | FEDERAL | US ARMY CERDEC<br>COMMUNICATIONS-ELECTRONICS COMMAND<br>RESEARCH, DEVELOPMENT & ENGINEERING<br>10221 BURBECK ROAD, STE 430<br>FORT BELVOIR, VA 22060-5806 |
| NASA/JOHNSON SPACE CENTER<br>M/CODE: EG4<br>2101 NASA RD 1<br>HOUSTON, TX 77058-3696                                   | FEDERAL | U S ARMY COMMUNICATION-ELECTRONICS<br>FORT MONMOUTH, NJ 07703   |
| NATIONAL AERONAUTICS SPACE ADMINISTRATION<br>DRYDEN FLIGHT RESEARCH CENTER<br>PO BOX 273<br>EDWARDS AFB, CA 93523-0273 | FEDERAL | US ARMY GARRISON, ABERDEEN PROVING GR<br>2201 ABERDEEN BLVD<br>ABERDEEN PROVING GROUND, MD 21005-5001   |
| NATIONAL OCEANIC AND ATMOSPHERIC ADMIN<br>4301 RICKENBACKER CAUSEWAY<br>MIAMI, FL 33149                                | FEDERAL | U S ARMY MISSILE COMMAND<br>AMSMI-RD (RFPD)<br>REDSTONE ARSENAL, AL 35898-5240  |
| NATIONAL SECURITY AGENCY<br>V342<br>FORT GEORGE MEADE, MD 20755-6000   | NSA     | US ARMY MISSILE COMMAND<br>AMSMI-RD-MG-NC<br>REDSTONE ARSENAL, AL 35898   |
| NATIONAL SECURITY AGENCY<br>ADV RECONNAISSANCE SYSTEMS OFFICE<br>FORT GEORGE MEADE, MD 20755-6000                      | NSA     | US ARMY MISSILE COMMAND<br>SOFTWARE ENGINEERING DIRECTORATE<br>BLDG 6260<br>REDSTONE ARSENAL, AL 35898-5260   |
| NAVAL AIR SYSTEMS COMMAND<br>47123 BUSE RD, UNIT #IPT<br>PATUXENT RIVER, MD 20670-1547                                 | NAVY    | US ARMY SOLDIER SYSTEMS COMMAND<br>10401 TOTTEN RD, STE 121<br>FORT BELVOIR, VA 22060-5852  |
| NAVAL AIR SYSTEMS COMMAND<br>1421 JEFFERSON DAVIS HWY<br>ARLINGTON, VA 22243   | NAVY    | US ARMY SOLDIER SYSTEMS COMMAND<br>NATICK RESEARCH, DEVELOPMENT AND ENG<br>NATICK, MA 01760-5015  |
| NAVAL AIR WARFARE CENTER<br>AIRCRAFT DIVISION<br>6000 EAST 21 <sup>ST</sup> ST<br>INDIANAPOLIS, IN 46219-2189          | NAVY    | US ARMY SPACE AND MISSILE DEFENSE COM<br>PO BOX 1500<br>HUNTSVILLE, AL 35807-3801   |
| NAVAL AIR WARFARE CENTER   | NAVY    | US ARMY SPACE AND STRATEGIC DEFENSE<br>PO BOX 1501<br>HUNTSVILLE, AL 35807-3801   |

|   |      |  |           |
|---|------|--|-----------|
| WEAPONS DIVISION<br>521 9TH ST<br>POINT MUGU, CA 93042-5001   |      | U S ARMY TANK ARMAMENT COMMAND<br>SFAE-ASM-AB-S<br>WARREN, MI 48397-5000                             | ARMY      |
| NAVAL AIR WARFARE CENTER<br>CODE 472130D<br>CHINA LAKE, CA 93555  | NAVY | 520-328-6202<br>USASMDC/SFAE-SD-STA<br>PO BOX 1500<br>HUNTSVILLE, AL 358073801                       | ARMY      |
| NAVAL AIR WARFARE CENTER<br>CODE 471120D<br>CHINA LAKE, CA 93555-6001   | NAVY | US COAST GUARD<br>COMMANDANT G-SEA<br>2100 2ND ST S W<br>WASHINGTON, DC 20593                        | FEDERAL   |
| NAVAL AIR WARFARE CENTER AIRCRAFT DIVISION<br>SPECIAL COMMUNICATIONS REQUIREMENTS BR<br>BLDG 8185 VILLA ROAD<br>ST INIGOES, MD 20684-0010       | NAVY | USS CYCLONE (PC-1)<br>FPO AE 09566-1960  | NAVY      |
| NAVAL AIR WARFARE CENTER PN DIVISION<br>CODE 472G40D<br>1 ADMINISTRATION CIRCLE<br>CHINA LAKE, CA 93555-6100                                    | NAVY | USS OAK HILL (LSD-51)<br>FPO AE 09573-1739   | NAVY      |
| NAVAL AIR SYSTEMS COMMAND HQ<br>47123 BUSE RD, UNIT IPT<br>PATUXENT RIVER, MD 20670-1547  | NAVY | WHITE SANDS MISSILE RANGE<br>ELECTRONIC PROVING GROUND<br>STEW-EPG-ET<br>FT HUACHUCA, AZ 85613-7110  | ARMY      |
| NAVAL AIR SYSTEMS COMMAND<br>1421 JEFFERSON DAVIS HWY<br>ARLINGTON, VA 22243  | NAVY | WL/AAWD-1<br>BLDG 620, STE 16<br>2241 AVIONICS CIRCLE<br>WRIGHT PATTERSON AFB, OH 45433-7318         | AIR FORCE |
| NAVAL COMMAND, CONTROL AND OCEAN SURV<br>NRAD, GPS DIVISION, CODE D31<br>53560 HULL ST<br>SAN DIEGO, CA 92152-5001                              | NAVY | WL/MNA<br>101 W ELGIN BLVD, STE 334<br>EGLIN AFB, FL 32542-6810                                      | AIR FORCE |
| NAVAL COMMAND, CONTROL AND OCEAN SURV<br>IN-SERVICE ENGINEERING, EAST COAST DIV<br>(NISE EAST) PO BOX 190022<br>NORTH CHARLESTON, SC 29419-9022 | NAVY | WL/MNAV<br>101 W EGLIN BLVD, SUITE 334<br>EGLIN AFB, FL 32542-6810                                   | AIR FORCE |
| NAVAL FACILITIES ENGINEERING SERVICE CENTER<br>1100 23RD AVE<br>PORT HUENEME, CA 93043-4370   | NAVY | WL/MNAG<br>WEAPON FLIGHT MECHANICS DIVISION<br>101 W EGLIN BLVD, STE 334<br>EGLIN AFB, FL 32542-6810 | AIR FORCE |
| NAVY ENGINEERING LOGISTICS OFFICE<br>DETEACHMENT PUGET SOUND<br>NAVAL RESEARCH LAB<br>4555 OVERLOOK AVE SW<br>WASHINGTON, DC 20375-5320         | NAVY | WL-MNGI<br>101 W EGLIN BLVD., SUITE 209<br>EGLIN AFB, FL 32542-6810                                  | AIR FORCE |
|   |      | WR-ALC/LJK<br>270 OCMULGEE COURT<br>ROBINS AFB, GA 31098-1646  | AIR FORCE |
|   |      | WR-ALC/LREA<br>7503 RD ST<br>WARNER-ROBBINS AFB GA 31098   | AIR FORCE |

## Appendix D. Manufacturers of Global Positioning System Receivers

3S Navigation  
Allen Osburne Associates  
Apelco Marine Electronics  
Arbiter Systems Incorporated  
Ashtech Incorporated  
Assurance Technology Corporation  
Austron Incorporated  
Avionics and Surveillance Group  
Azimuth Limited  
Ball Efratom Division  
Bancomm-Timing Division of Datum Incorporated  
Bendix King  
Boeing Defense and Space Group  
Canadian Marconi Company  
Centennial Technologies  
Commercial Equipment  
Corvallis Microtechnology Incorporated  
Del Norte Technology Incorporated  
Eagle Electronics  
Furuno Electric Company Limited  
Furuno USA Incorporated  
Garmin Corporation  
Geotronics of North America Incorporated  
Honeywell  
Honeywell Military Avionics Division  
Hopf Elektronik GmbH  
II Morrow Incorporated  
Interphase Technologies  
Interstate Electronics Corporation  
ITT Avionics  
Japan Radio Company Limited  
JcAir  
Leica AG  
Leica Navigation and Positional Division  
Leica Incorporated  
Litton Systems Incorporated  
Lowrance Electronics Incorporated  
Magellan Corporation  
Magellan System Corporation  
Northrop Grumman  
Marinetex  
Micrologic Incorporated  
Motorola GPS Products  
NavStar Systems Limited  
NavSymm Positioning Systems  
Northstar Technologies  
NovAtel Incorporated  
Odetics Incorporated  
Omnistar  
Philips Navigation A/S  
Premier GPS Incorporated  
Pulsesearch Navigation Systems Company  
Raytheon Defense Systems  
Raytheon E Systems  
Raytheon Marine  
Raytheon TI Systems  
Rockwell Collins Incorporated  
SCI Systems Incorporated  
Sercel Incorporated USA  
Sercel France  
SI-TEX Marine Electronics Incorporated  
Sokkia Corporation  
Sony Corporation of America  
Spectrum Geophysical Instruments  
Stanford Telecommunications  
Starlink Incorporated  
Topcon America Corporation  
Topcon Europe  
Trak Systems Division  
Trimble Navigation Limited  
True Time Incorporated  
Universal Avionics Systems Corporation

## **Appendix E. Report Distribution**

### **Office of the Secretary of Defense**

Under Secretary of Defense for Acquisition and Technology  
Director, Defense Logistics Studies Information Exchange  
Under Secretary of Defense (Comptroller)  
Deputy Chief Financial Officer  
Deputy Comptroller (Program/Budget)  
Assistant Secretary of Defense (Command, Control, Communications, and Intelligence)  
Deputy Assistant Secretary of Defense (Command, Control, Communications,  
Intelligence, Surveillance, Reconnaissance, and Space Systems)  
Deputy Chief Information Officer and Deputy Assistant Secretary of Defense (Chief  
Information Officer Policy and Implementation)  
Principal Deputy - Y2K  
Assistant Secretary of Defense (Public Affairs)

### **Joint Staff**

Director, Joint Staff

### **Department of the Army**

Assistant Secretary of the Army (Financial Management and Comptroller)  
Auditor General, Department of the Army  
Chief Information Officer, Army  
Inspector General, Department of the Army

### **Department of the Navy**

Assistant Secretary of the Navy (Financial Management and Comptroller)  
Auditor General, Department of the Navy  
Chief Information Officer, Navy  
Inspector General, Department of the Navy  
Inspector General, Marine Corps

### **Department of the Air Force**

Assistant Secretary of the Air Force (Financial Management and Comptroller)  
Auditor General, Department of the Air Force  
Chief Information Officer, Air Force  
Inspector General, Department of the Air Force  
Commander, Space and Missile Systems Center  
System Program Director, Global Positioning System Joint Program Office

## **Unified Commands**

Commander In Chief, U S Special Operations Command

## **Other Defense Organizations**

Director, Defense Advanced Research Projects Agency  
Director, Defense Information Systems Agency  
Inspector General, Defense Information Systems Agency  
Chief Information Officer, Defense Information Systems Agency  
United Kingdom Liaison Officer, Defense Information Systems Agency  
Director, Defense Intelligence Agency  
Inspector General, Defense Intelligence Agency  
Director, Defense Special Weapons Agency  
Director, National Imagery and Mapping Agency  
Inspector General, National Imagery and Mapping Agency  
Director, National Security Agency  
Inspector General, National Security Agency  
Inspector General, National Reconnaissance Office

## **Non-Defense Federal Organizations and Individuals**

Office of Management and Budget  
Office of Information and Regulatory Affairs  
General Accounting Office  
Defense Information and Financial Management Systems, Accounting and Information Management Division  
Technical Information Center, National Security and International Affairs Division  
United States Coast Guard, Department of Transportation

Chairman and ranking minority member of each of the following congressional committees and subcommittees:

Senate Committee on Appropriations  
Senate Subcommittee on Defense, Committee on Appropriations  
Senate Committee on Armed Services  
Senate Subcommittee on Acquisition and Technology, Committee on Armed Services  
Senate Committee on Government Affairs  
Senate Special Committee on the Year 2000 Technology Problem  
House Committee on Appropriations  
House Subcommittee on National Security, Committee on Appropriations  
House Committee on Government Reform and Oversight  
House Subcommittee on National Security, International Affairs, and Criminal Justice, Committee on Government Reform and Oversight  
House Subcommittee on Government Management, Information, and Technology, Committee on Government Reform and Oversight  
House Committee on National Security  
House Subcommittee on Military Procurement, Committee on National Security  
House Committee on Science  
House Subcommittee on Technology, Committee on Science

House Subcommittee on Government Management, Information, and Technology,  
Committee on Science

# Assistant Secretary of Defense (Command, Communications, and Intelligence) Comments



COMMAND, CONTROL,  
COMMUNICATIONS, AND  
INTELLIGENCE

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE  
6000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-6000

December 14, 1998



## MEMORANDUM FOR INSPECTOR GENERAL

**SUBJECT:** Audit Report on Global Positioning System (GPS) Compliance with Year 2000 Requirements (Project No. 8CC-0045)

Thank you for the opportunity to comment on your draft audit report. I concur with your finding that the GPS program office has not completed the inventory and the Year 2000 (Y2K) assessment of all GPS receivers procured directly by DoD organizations, civilian Federal agencies, Defense contractors, and allies. I do not concur with the recommendations in the report, however, because they do not provide effective solutions to achieving the objective of ensuring Y2K compliance of GPS receivers. The attachment provides general comments on the draft report and the reasons for nonconcurring with its recommendations.

Ensuring Y2K compliance of all of our systems is vital to the Department. The visibility that your report brings to this specific GPS issue should in itself help accelerate its timely resolution. As a result of your audit, our Y2K office has tasked the Services through their Y2K organizations to collect and report the information identified in your draft report. Since we are still in the process of gathering and compiling this information, it will be provided to you in a follow-on letter.

Your assistance in achieving our Y2K objectives is greatly appreciated. My point of contact is CAPT Long, my Assistant for GPS, at (703) 607-1122.

Robert M. Nurwell, RADM, USN  
Deputy Assistant Secretary of Defense  
(C3ISR and Space Systems)

Attachment:  
As stated



DASD(C3ISR & Space Systems) Comments on  
DoD Inspector General Draft Audit Report  
Global Positioning System Compliance with Year 2000 Requirements  
Project No. 8CC-0045

General Comments.

The list of organizations reported as delinquent in the audit report was composed over several years as waivers were issued, during which time many of them may have been renamed, reorganized, or eliminated. The audit report assumes that all these organizations still exist and are being unresponsive to the letters sent to them. Because of the extended period of time over which the receivers in question were purchased, however, the current existence of both the organizations themselves and the receivers they purchased is unknown.

Corrective Action:

The ASD(C3I) Y2K Office has tasked the Services through their Y2K offices to provide the required information, as the Services should be most knowledgeable regarding the status of their subordinate organizations. This information from the Services will be provided in a follow-on letter

Comments on DoD IG Recommendations:

Recommendation 1. Request the Under Secretary of Defense (Comptroller) place GPS-related procurement funds for non-responsive DoD organizations on withhold until they respond to the GPS joint program office on the Y2K compliance status of GPS receivers that have not been validated by the GPS joint program office

Nonconcur. The recommended action is considered to be ineffective in achieving Y2K compliance and likely cannot be implemented. The audit report identifies 155 delinquent DoD organizations. This recommendation would require the Comptroller to identify the funding budgeted by each of these organizations for future procurements of GPS equipment. Since most of the receivers in question have already been procured, some as long as eight years ago, withholding current funding, if any exists, is not considered an effective means of obtaining a response from all the delinquent organizations. Furthermore, except for large block procurements, funding used to procure GPS equipment at the organizational level is not identifiable by the Comptroller as GPS-related funding.

Recommendation 2. Place a moratorium on GPS-related assistance from DoD to non-responsive civilian Federal agencies, Defense contractors, and allied nations, until they respond to the GPS joint program office on the Y2K compliance status of GPS receivers that have not been validated by the GPS joint program office.

C3I Suspense No 10-074/98

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Nonconcur. Implementation of this recommendation is considered to be ineffective, and likely even counterproductive in achieving Y2K compliance. As there are only 18 organizations in this category, they will be contacted directly via telephone. The results will be reported in the follow-on letter.

Recommendation 3. Direct the GPS joint program office, in coordination with the U.S. Coast Guard, to conduct Y2K testing on all GPS receivers not validated by the GPS joint program office.

Nonconcur. This recommendation greatly expands the U.S. Government's GPS Y2K responsibilities to include commercial products, raises questions about potential liabilities, and requires expenditure of DoD resources that currently are not available in the GPS program office. The feasibility, methodology, and required resources to implement this recommendation are being investigated by the ASD(C3I) Y2K Office.

C3I Suspense No 10-074/98

## **Audit Team Members**

This report was prepared by the Contract Management Directorate, Office of the Assistant Inspector General for Auditing, DoD

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