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versight Audit Report

Intelligence Support Directorate

**COMMERCIAL SATELLITE IMAGERY**

**This special version of the report has been revised to omit proprietary data.**

**Report Number PO 96-017**

**September 23, 1996**

Office of the Inspector General  
Department of Defense

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### **Acronyms**

CIO	Central Imagery Office
DIA	Defense Intelligence Agency
DMA	Defense Mapping Agency
EOSAT	Earth Observation Satellite
EDC	Earth Resources Observation Systems Data Center
NIMA	National Imagery and Mapping Agency
SPOT	Systeme Pour l'Observation de la Terre



INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE  
400 ARMY NAVY DRIVE  
ARLINGTON, VIRGINIA 22202-2884

September 23, 1996

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

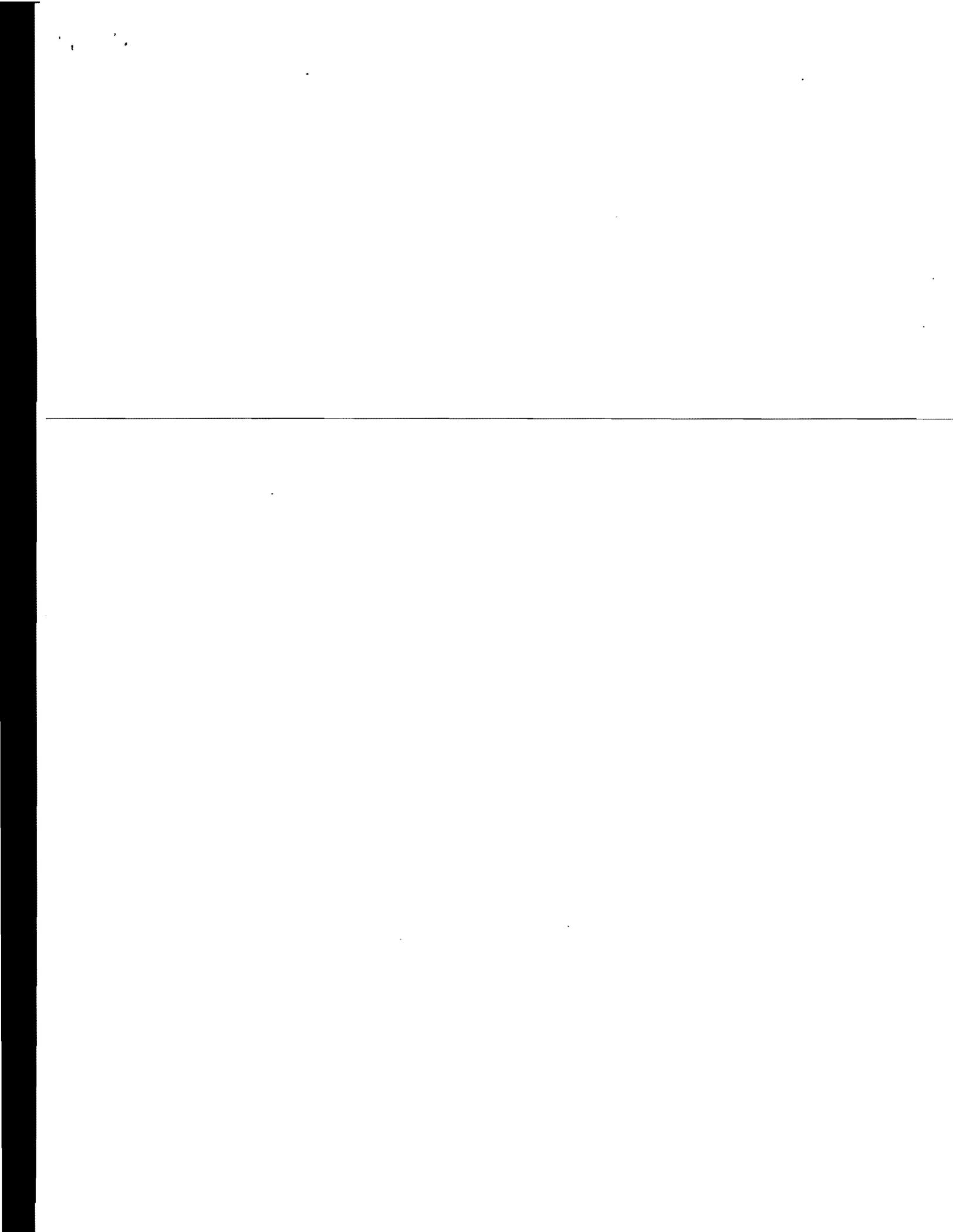
SUBJECT: Audit Report on Commercial Satellite Imagery (Report No. PO-96-017)

We are providing this audit report for information and use. Management comments on a draft of this report were considered in preparing the final report.

Comments on the draft of this report conformed to the requirements of DoD Directive 7650.3 and left no unresolved issues. Therefore, no additional comments are required.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. Charles M. Santoni, Audit Program Director, at (703) 604-8880 (DSN 664-8880) or Mr. Lloyd G. O'Daniel, Audit Project Manager, at (703) 604-8891 (DSN 664-8891). See Appendix C for the report distribution. The audit team members are listed inside the back cover.

Russell A. Rau  
Assistant Inspector General  
Policy and Oversight



## Office of the Inspector General, DoD

Report No. PO-96-017  
(Project No. 4RC-0055.01)

September 23, 1996

### Commercial Satellite Imagery

#### Executive Summary

**Introduction.** Imagery has become a vital source of information for policymakers and warfighters. Satellite systems provide images of the earth that assist DoD and other Federal agencies in mission planning. The Earth Observation Satellite Company currently operates the Land Remote Sensing Satellite system, which produces unclassified imagery for the U.S. Federal Government. In addition, foreign governments and private domestic and foreign companies sell their satellite imagery on the open market. DoD and other Federal agencies purchase commercial imagery because it is unclassified, contains unique imagery data, and provides broad area coverage.

**Audit Objectives.** The overall audit objective was to evaluate DoD compliance with governing policies, regulations, directives, and instructions as they relate to interoperability and requirements for secondary imagery dissemination systems. The audit was reannounced to include all imagery dissemination systems. This report addresses the effectiveness of commercial imagery management within DoD. It also addresses the adequacy of the commercial imagery management control program.

**Audit Results.** DoD does not acquire and archive commercial imagery in the most cost-effective manner. As a result, some DoD commercial imagery purchasers may be paying more than necessary for imagery because they cannot take advantage of volume discounts and low licensing fees. In addition, DoD imagery users are not aware of the commercial imagery that is available within DoD, therefore creating the opportunity for DoD to duplicate purchases of imagery data products. Potential monetary benefits to be realized by implementing the recommendation were undeterminable. See Part I for a discussion of the audit results.

**Summary of Recommendations.** We recommend that the Assistant Secretary of Defense (Command, Control, Communications and Intelligence) establish policies and procedures for procuring and archiving commercial imagery. We also recommend designation of the Defense Mapping Agency as the DoD procurement agency and the Defense Intelligence Agency as the agency responsible for the central archive for all commercial imagery.

**Management Comments.** The Assistant Secretary of Defense (Command, Control, Communications and Intelligence) concurred with the finding. Management stated that the National Imagery and Mapping Agency is scheduled to begin operations on October 1, 1996. The DoD Directive establishing the agency and the Memorandum of Agreement between DoD and the Director of Central Intelligence designate "NIMA as the sole DoD source and as the primary Intelligence Community source for the acquisition and archiving of commercial satellite imagery." These documents are scheduled for issuance in the first quarter of FY 1997. The Concept of Operations for the use of commercial imagery is scheduled for completion on December 1, 1996.

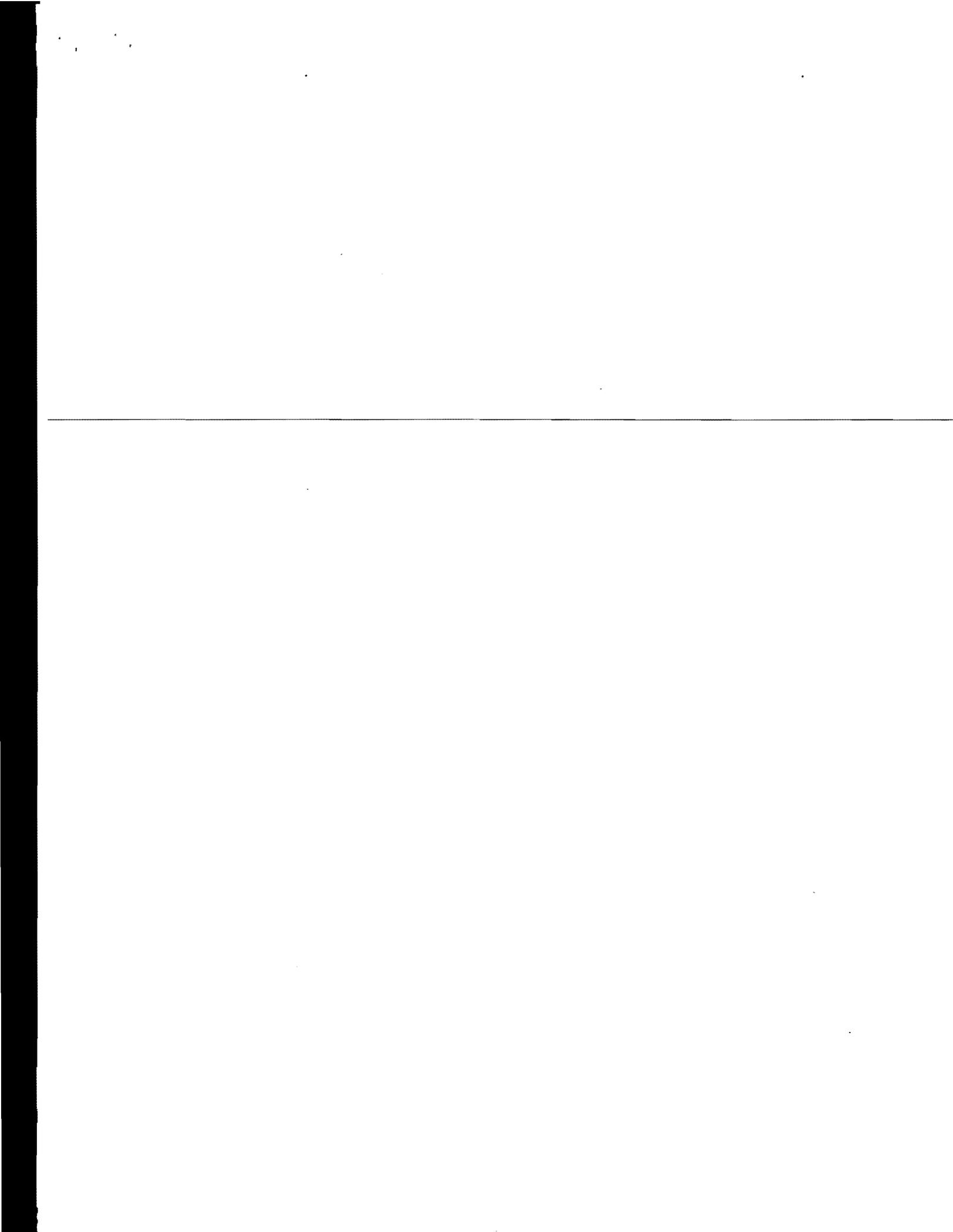
The Initial Operational Capability for the Commercial Satellite Imagery Library at the Defense Intelligence Agency is also scheduled for the first quarter of FY 1997. New acquisitions are being placed in the library and a data call is out to all DoD organizations to locate imagery not already held by the Defense Intelligence Agency. See Part I for a complete discussion of management comments and Part III for the complete text of those comments.

**Audit Response.** Management comments were fully responsive. No additional comments are required.

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## **Part I - Audit Results**

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## Audit Background

The National Aeronautics and Space Administration developed the Land Remote Sensing Satellite (Landsat), a U.S. Government commercial imagery<sup>1</sup> satellite system<sup>2</sup>. The first Landsat satellite became operational in 1972. Landsat satellites were the first to make world imagery data available to a wide variety of users. In 1984, the Department of Commerce awarded General Electric Company and Hughes Aircraft Company a contract to commercialize the Landsat program. As a result, the companies formed a joint venture, the Earth Observation Satellite (EOSAT) Company, to manage the program and market Landsat imagery with no Government funding. EOSAT Company is the exclusive distributor of Indian imagery outside India. EOSAT Company also distributes imagery from Japan's Japanese Earth Resources Satellites, European Space Agency's European Remote Sensing Satellites, and Russian satellites.

In 1987, the French launched the Systeme Pour l'Observation de la Terre (SPOT) satellite. Since then, other foreign governments and companies have developed and launched commercial imagery satellites. In addition, several U.S. companies expect to launch imagery satellites soon. Those companies include Space Imaging, GDE, Orbital Sciences Corporation, and Earthwatch.

**Increased Use of Commercial Imagery.** The Defense Mapping Agency (DMA) currently has two contracts with SPOT Image Corporation. One contract is for purchasing imagery at fixed prices. The other contract is for using Eagle Vision, a deployable ground station, to acquire imagery directly from SPOT satellites. DMA is currently negotiating a new contract with EOSAT Company to purchase Landsat imagery. The DMA purchased \$32.5 million of SPOT and Landsat imagery from FYs 1988 through 1995 for DoD. Some DoD agencies buy commercial satellite imagery directly from commercial vendors. The total dollar value of commercial imagery that DoD purchased directly from commercial vendors is unknown. In 1992, the Office of Technology Assessment estimated that the annual sales for commercial imagery and value-added services will grow 15 to 20 percent annually. That estimate includes Landsat and SPOT imagery sales. As commercial vendors launch additional satellite systems and imagery users find more uses for commercial imagery, Government expenditures for imagery could increase significantly.

**Applications of Commercial Imagery.** DoD has used commercial imagery primarily for mapping, charting, and geodesy. However, the intelligence

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<sup>1</sup>Imagery is the representation of objects reproduced by electronic, optical, or radar means on film, electronic display devices, or other media.

<sup>2</sup>Commercial imagery satellite systems include systems managed by non-DoD Government agencies and foreign and domestic companies that provide their imagery for a fee.

community and tactical forces are increasingly using imagery for other purposes. During Operation Desert Storm, the United States and its allies used Landsat and SPOT imagery to make maps, determine transportation routes, assess enemy fortifications, and evaluate the environmental consequences of the war. Commercial imagery uses in DoD could include monitoring international military activities, complying with arms control treaties, preparing for crisis support, detecting land mass and foliage changes, and supporting training exercises. In addition, commercial imagery is increasingly used in terrain visualization systems for mission planning and execution.

**Advantages of Using Commercial Imagery.** Commercial imagery provides unclassified imagery products to DoD. The products available include spectral imagery data and day/night all-weather coverage.

**Unclassified Imagery.** Public Law 98-365, "Land Remote-Sensing Commercialization Act of 1984," reaffirms the U.S. policy of making all Landsat land remote-sensing data available to all potential users without discrimination. In addition, Public Law 102-555, "Land Remote Sensing Policy Act of 1992," specifies that Landsat is to remain an unclassified program that operates on the principle of open skies and nondiscriminatory access. Foreign commercial imagery companies including those from France, Canada, Russia, India, China, and Japan sell their imagery on the open market. During the audit, we identified certain DoD organizations that purchased commercial imagery so that they could freely share the imagery with their allies and coalition forces.

**Spectral Imagery Data.** Collection systems produce spectral imagery data by recording the reflected and emitted energy produced by the interaction of an energy source, such as the sun, with objects and materials on the earth's surface, and the collection system's sensors. The data are collected in different bands of light in the ultraviolet, visible, and infrared forms. Particular combinations of the light bands best fulfill certain mission requirements such as camouflage detection, trafficability analysis, runway characterization, and drop zone/landing zone analysis. The major advantage of spectral imagery data is the ability to provide a visual presentation of reflected energy, such as heat, which is not visible to the human eye. Spectral imagery technology continues to evolve and advance. Landsat and SPOT satellites provide spectral imagery.

**Day/Night All-Weather Coverage.** Radar imagery systems emit pulses of microwave radiation from a radar transmitter toward the earth's surface and then collect or measure the reflected radiation to produce an image. Those systems can provide unclassified imagery any time and in all weather conditions. Canada's Radarsat is one of a few satellites that provides radar imagery.

The Canadian radar satellite was launched in November 1995. The satellite produced its first imagery in November 1995 and is expected to reach full operational capability in June 1996. Lockheed Martin is the exclusive U.S. Government distributor for Radarsat.

## Audit Results

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**Other Considerations When Using Commercial Imagery.** Imagery users must consider several factors when using commercial imagery, including timeliness and vendor imagery file formats.

**Timeliness.** DoD users expressed concern that commercial imagery vendors cannot be depended on to provide imagery in a timely manner. Vendors generally send their imagery to customers via mail or courier, rather than digitally. However, vendors are willing to rush an order for a considerably higher price. For instance, SPOT Image Corporation charges \$1,500 per image, in addition to the normal charge, for guaranteed delivery within 2 days. EOSAT charges an additional 200 percent for delivery within 7 days.

**File Formats.** Commercial imagery vendors provide imagery in their own imagery file formats rather than in formats that DoD uses for other types of imagery. As more vendors provide imagery in proprietary formats, users may have to use several different software packages to handle the various file formats. Use of accepted DoD file formats would permit seamless digital dissemination of imagery within the DoD imagery architecture.

## Audit Objectives

The original audit objective was to evaluate DoD compliance with governing policies, regulations, directives, and instructions as they relate to the interoperability and requirements for secondary imagery dissemination systems<sup>3</sup>. On November 9, 1994, the audit was reannounced to include all imagery dissemination systems. This report addresses the effectiveness of commercial imagery management within DoD. It also addresses the adequacy of Central Imagery Office (CIO) implementation of a management control program as it relates to the use of commercial imagery. See Appendix A for a discussion of the audit scope and methodology, a discussion of the adequacy of the commercial imagery management control program, and a summary of prior coverage related to the audit objectives.

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<sup>3</sup>These systems are used to transmit previously exploited imagery, as opposed to current systems that transmit exploited and unexploited imagery.

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## Commercial Satellite Imagery

DoD does not acquire and archive commercial imagery in the most cost-effective manner. DoD management of commercial imagery is fragmented and comprehensive guidance for acquiring and archiving commercial imagery has not been developed. As a result, some DoD commercial imagery purchasers may be paying more than necessary for imagery because they cannot take advantage of volume discounts and low licensing fees. In addition, DoD imagery users are not aware of the commercial imagery that is available within DoD, therefore creating the opportunity for DoD to duplicate purchases of imagery data products.

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## Commercial Imagery Management

DoD Management of Commercial Imagery. Commercial imagery management within DoD is fragmented. The DMA, the CIO, the Defense Special Projects Office, and the Defense Intelligence Agency (DIA) provide commercial imagery support and guidance to DoD users. However, no single organization is responsible for overall management of commercial imagery.

Defense Mapping Agency. The DMA is under the direction, authority, and control of the Assistant Secretary of Defense (Command, Control, Communications and Intelligence). DoD Directive 5105.40, "Defense Mapping Agency," December 6, 1990, designated DMA as the primary action office for DoD purchases of Landsat and SPOT imagery.

The DMA receives imagery requests by telephone, facsimile, and written correspondence. The DMA checks the data base it maintains of all DoD imagery DMA has purchased from commercial vendors for the requested imagery. The data base contains 1,764 Landsat and 8,367 SPOT images as of March 15, 1996. If the requested imagery had been purchased, DMA sends the imagery to the requestor at no charge or directs the requestor to the organization holding the desired imagery. If the requested imagery is not available, DMA forwards the request to the commercial imagery vendor. The commercial vendor sends the requested imagery to DMA for dissemination to the requesting agency.

Central Imagery Office. In 1992, DoD Directive 5105.56, "Central Imagery Office," established CIO. The directive states that CIO is "to ensure that United States Government intelligence, mapping, charting and geodesy, and other needs for imagery are met effectively and efficiently in a manner conducive to national security, consistent with the authorities and duties of the

## Commercial Satellite Imagery

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Secretary of Defense and the Director of Central Intelligence." The CIO has several current initiatives to address commercial imagery. These initiatives include:

- o providing guidance to commercial vendors on standards and formats to help ensure that commercial imagery will be compatible with existing U.S. Government systems;

- o conducting a study to determine the utility of commercial and civil satellites for fulfilling national requirements;

- o developing a DoD multispectral training program through the Community Imagery Training Council; and

- o chairing the Remote Earth Sensing Working Group, which is a community forum that addresses all aspects of remote sensing.

The CIO expects that responsibility for these initiatives will be transferred to the National Imagery and Mapping Agency (NIMA), once the new agency is established. The NIMA will consolidate the CIO, the DMA, and the National Photographic Interpretation Center, as well as other initiatives and programs related to imagery. The organization is scheduled to start operations in October 1996.

**Defense Special Projects Office.** The Defense Special Projects Office, under the direction of the Assistant Secretary of Defense (Command, Control, Communications and Intelligence), published the "Multispectral Users Guide" in response to a June 1994 operational requirements document. The guide describes spectral imagery characteristics, applications, collection systems, and processing and ordering procedures. The Defense Mapping School has incorporated the guide into its training curriculum. The latest version was published in August 1995.

**Defense Intelligence Agency.** In 1985, DIA initiated the Tactical and Military Multispectral Requirements Evaluation Group (the Group). The Group provided a forum for information exchange and a focal point for multispectral applications for DoD. In addition, the Group was involved in several military exercises that demonstrated the use of multispectral data. In the late 1980s, the Group fielded the Multispectral Imagery Testbed. The Group conducted user surveys of the Unified and Specified Commands during 1990 and 1991. The DIA dissolved the Group in 1994.

## DoD Guidance on Commercial Imagery

DoD has not established comprehensive policies and procedures for acquiring and archiving commercial imagery. Because of the increasing availability and use of commercial imagery, detailed guidance must be provided to all commercial imagery users. Until DoD designates a focal point for commercial

imagery management, DoD cannot successfully implement policies and guidance. Several DoD Components have developed procedures for acquiring and using commercial imagery that have been tailored to their missions and functions.

**DMA Guidance.** The DMA Handbook 8290.2, "Handbook for Ordering Commercial Land Remote Sensing Satellite Data by the Department of Defense," August 18, 1989, defines:

the procedures by which all agencies or subdivisions of the U.S. Department of Defense (DoD) will make inquiries and place orders to the DMA to obtain commercial land remote sensing satellite data such as Landsat, SPOT and other future unclassified data acquisition systems in both photographic and digital form.

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The handbook had not received widespread distribution outside the traditional cartographic<sup>4</sup> community. The evolving commercial imagery users, including the intelligence and tactical communities, did not have guidance on how to order spectral imagery. For example, an Army Intelligence unit in Japan did not receive the correct imagery for training requirements because it did not use proper procedures for ordering commercial imagery. Guidance and training on obtaining commercial imagery could prevent similar problems.

**U.S. Army Guidance.** On November 26, 1990, the U.S. Army issued the "Multispectral Imagery Letter of Instruction Outline." The outline provides technical and procedural guidance to Army Major Commands and tactical units for procuring and processing commercial satellite multispectral imagery.

**CIO Guidance.** The CIO established the International and Commercial Arrangement Branch in May 1995 to "Develop and implement policy regarding the use of commercial imagery in coordination with the DoD, Intelligence and Civil communities, within the guidelines of the United States Imagery System." The policy includes a commercial imagery concept of operations.

## Commercial Imagery Purchases

Some DoD organizations are independently buying commercial imagery without the benefit of a central manager. As a result, DoD does not know the magnitude of commercial imagery purchases. DoD needs a coordinated management effort to avoid potential waste of DoD resources.

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<sup>4</sup>Cartography is the art or practice of graphically drawing lines on maps or charts of natural or man-made features of a place or region to show their relative positions or elevations.

## Commercial Satellite Imagery

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**Purchases Through the Defense Mapping Agency.** DoD Directive 5105.40, "Defense Mapping Agency," designates DMA as the primary ordering agent for SPOT and Landsat imagery. Table 1 shows SPOT and Landsat image purchases through DMA for FYs 1993 through 1995<sup>5</sup>.

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**Purchases Directly From Others.** Several DoD organizations are circumventing DMA when purchasing commercial imagery by buying imagery directly from EOSAT and Earth Resources Observation Systems Data Center (EDC).

**Earth Observation Satellite Company.** Approximately 40 percent of EOSAT sales to the U.S. Government were to DoD for Landsat imagery. Table 2 shows EOSAT sales to the U.S. Government, to DoD through DMA, direct to DoD activities, and the total to DoD for FYs 1993 through 1995<sup>5</sup>. Direct DoD sales are purchases made through a broker, other than DMA, where the purchaser was identified as a DoD organization.

There are no restrictions on sharing Landsat imagery within the U.S. Government. Currently 18 ground stations collect Landsat data around the world. EOSAT owns the U.S. ground station in Norman, Oklahoma. The other ground stations are owned and operated by the country in which they reside. The U.S. Government price for Landsat imagery collected at the Norman, Oklahoma, ground station is \$<sup>5</sup> per image. Prices for imagery

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<sup>5</sup>Proprietary data omitted.

from the other ground stations are set by the countries in which the ground stations reside. As of March 19, 1996, prices ranged from \$<sup>6</sup> to \$<sup>6</sup> per image for imagery from foreign ground stations.

**Earth Resources Observation Systems Data Center.** The EDC is part of the United States Geological Survey within the Department of Interior. The EDC is the designated U.S. Government imagery archive for remote sensing data. Over 20 DoD organizations have purchased directly from EDC, rather than going through DMA. The EDC provides brokerage services for the U.S. Government to buy Landsat and SPOT data. For Landsat imagery stored at EOSAT, EDC charges \$<sup>6</sup> per image plus a high density tape access fee for the tape that the desired image is stored on. The high density tape access fee is equal to \$<sup>6</sup> times the number of images on the tape. Depending on the number images on a tape, the price may be cheaper than buying imagery directly from EOSAT. Prices on imagery from the foreign Landsat ground stations are set by the countries in which the ground stations reside. DoD customers can purchase SPOT imagery from EDC for DoD-wide use for \$<sup>6</sup> per image. Table 3 shows total and DoD Landsat and SPOT brokerage sales for FYs 1993 through 1995<sup>6</sup>. Landsat sales may include sales that are included in the sales reported by EOSAT.

In addition to providing brokerage services, EDC sells copies of imagery from its archive. EDC charges \$<sup>6</sup> for each Landsat image. In FY 1995, EDC sold \$<sup>6</sup> of imagery from its archive to DoD.

A SPOT Image Corporation official stated that DoD purchases all its SPOT imagery through contracts with DMA and EDC. DoD organizations that purchase SPOT imagery from EDC may not obtain the discounts prescribed in the DMA contract with SPOT Image Corporation. The DMA contract with SPOT Image Corporation contains a licensing agreement for DoD-wide use. SPOT Image Corporation provides DMA with volume discounts and minimal licensing fees. Two types of volume discounts are available. The first is a 5-percent discount on imagery after total purchases have reached \$1 million. The second is a discount on single purchases of 76 images or more.

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<sup>6</sup>Proprietary data omitted.

## Commercial Satellite Imagery

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Representatives from DMA stated that DoD users who purchase SPOT imagery, without going through DMA, may be charged a higher price for the image plus as much as 100 percent of the image purchase price for a licensing agreement.

**Increasing Commercial Imagery Sources.** Several foreign governments and foreign and domestic companies are selling, or will be selling, commercial imagery on the open market. For example, DoD, through DMA, has started purchasing imagery from Radarsat. DoD currently has no procedures in place for purchasing Radarsat imagery. Further, various sources exist for the same imagery. For example, users can purchase Landsat imagery through EOSAT, DMA, EDC, the U.S. Department of Agriculture, or private distributors. In addition, vendors are developing systems that allow users to pull imagery directly from commercial imagery satellites. For example, the Air Force's Eagle Vision allows U.S. Forces in Europe to receive SPOT imagery directly from the satellite.

With an increasing number of commercial imagery sources, DoD needs to designate a focal point to manage commercial imagery. That focal point should establish guidance on purchasing commercial imagery. Without guidance, DoD imagery users are unable to determine what commercial imagery is available within DoD. As a result, DoD users may purchase duplicate imagery products or pay more than necessary due to not receiving discounted prices.

## Commercial Imagery Archives

The U.S. Government maintains several archives and working libraries for commercial imagery. As previously indicated, the designated U.S. Government archive is at EDC. DoD organizations that also maintain commercial imagery archives include DIA, the Air Force's 480th Intelligence Group, and the Army topographic units. DoD does not maintain a centralized archive or listing of all commercial imagery bought by DoD Components.

**Earth Resources Observation Systems Data Center.** Since 1972, EDC has maintained a large archive of commercial imagery and continues to be the primary U.S. remote-sensing data archive. Public Law 102-555, "Land Remote Sensing Policy Act of 1992," October 28, 1992, Title V, Section 502, Subsection (b), directed the Secretary of Interior to establish the National Satellite Sensing Data Archive. The Secretary of Interior directed EDC to carry out the responsibilities of maintaining this archive.

EDC archives satellite imagery from Landsat, SPOT, the National Oceanic and Atmospheric Administration, and other sources. Its current commercial satellite and aerial imagery holdings exceed 11 million images, including around 4 million satellite images. EDC has more than one million digital and almost 3 million photographic Landsat images. EDC has negotiated the rights to the first 12 years of declassified National imagery. Information on archive holdings is available through the Internet on the Global Land Information System. This system allows the user to view information to ensure the usefulness of the

imagery before ordering. Landsat imagery purchasers may realize significant savings by purchasing imagery from the EDC archive. For example, EDC charges \$<sup>7</sup> per image for Landsat imagery in its archive versus the EOSAT minimum price of \$<sup>7</sup> per image.

**DIA.** The DIA Imagery Division stores airborne, satellite, and mapping, charting, and geodesy hardcopy imagery. The satellite imagery includes commercial, civil, and foreign satellite imagery. In March 1995, the CIO United States Imagery System Directive 2-0, "United States Imagery System Imagery Processing, Exploitation, and Delivery Policy," designated DIA as the location for the central DoD archive for commercial, civil, and foreign satellite imagery. The imagery will be archived on a modified Imagery Product Library<sup>8</sup>. The archive is scheduled for completion in November 1996.

Commencing in FY 1996, DIA will archive all imagery that DMA purchases. The DIA plans to keep imagery in the archive a maximum of 5 years and to use EDC for permanent storage. As new imagery of an area is purchased, old images of that area will be sent to EDC. DoD users will have to pay EDC \$<sup>7</sup> to receive a copy of an image that DIA has sent to EDC for storage.

**Air Force 480th Intelligence Group.** The 480th Intelligence Group (the 480th) provides an archive capability primarily for Air Force combat units. The 480th publishes a hard-copy catalog of archived images that is available to customers upon request. As of September 12, 1995, the 480th had 1,827 SPOT images in its archive. No Landsat images are in its archive. In addition, the 480th is considering putting an imagery catalog on Intelink.

**U.S. Army Topographic Units.** The U.S. Army Topographic Engineering Center at Fort Belvoir, Virginia, supplies imagery to the six Army topographic units, which includes the 29th Topographic Group at Fort Shafter, Hawaii. The 29th Topographic Group has an extensive in-house archive, reproduction, and dissemination capability for commercial imagery.

**Need for Comprehensive Commercial Imagery Archive.** Although DIA has been designated the central DoD archive for commercial imagery, its archive will not contain all commercial imagery purchased by DoD. The archive will not contain purchases made before FY 1996 or imagery purchased by organizations who choose to not use DMA as a purchasing agent. DoD needs to develop guidance and policies for archiving that will allow it to identify and utilize the commercial imagery it has previously purchased.

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<sup>7</sup>Proprietary data omitted.

<sup>8</sup>CIO designated the Image Product Library as the standard digital imagery storage device in the United States Imagery System.

## Conclusion

Imagery has become a vital source of information for policymakers and warfighters. Organizational responsibility for commercial imagery within DoD is fragmented. DoD has not established specific guidance for acquiring, using, and archiving commercial imagery. The lack of coordination and specific guidance may result in inefficient use of and uneconomical expenditures for commercial imagery. As a result, DoD may not take advantage of the full potential of using commercial imagery. The proposed establishment of NIMA will consolidate responsibility and authority for commercial imagery within a single agency. However, the establishment of NIMA is uncertain at this time. Therefore, policies and procedures need to be established for commercial imagery that assign responsibilities for its procurement and archiving.

## Recommendation for Corrective Action

We recommend that the Assistant Secretary of Defense (Command, Control, Communications and Intelligence):

1. Establish policies and procedures for procuring and archiving commercial imagery that include a requirement for archives to be checked prior to fulfilling new requisitions.
2. Designate the Defense Mapping Agency as the DoD procurement agent for all commercial imagery.
3. Designate the Defense Intelligence Agency as the agency responsible for centrally archiving all commercial imagery.

## Management Comments

The Assistant Secretary of Defense (Command, Control, Communications and Intelligence) concurred with the finding. Management stated that NIMA is scheduled to begin operations on October 1, 1996. The DoD Directive establishing NIMA and the Memorandum of Agreement between DoD and the Director of Central Intelligence designate "NIMA as the sole DoD source and as the primary Intelligence Community source for the acquisition and archiving of commercial satellite imagery." These documents are scheduled for issuance in the first quarter of FY 1997. The Concept of Operations for the use of commercial imagery is scheduled for completion on December 1, 1996.

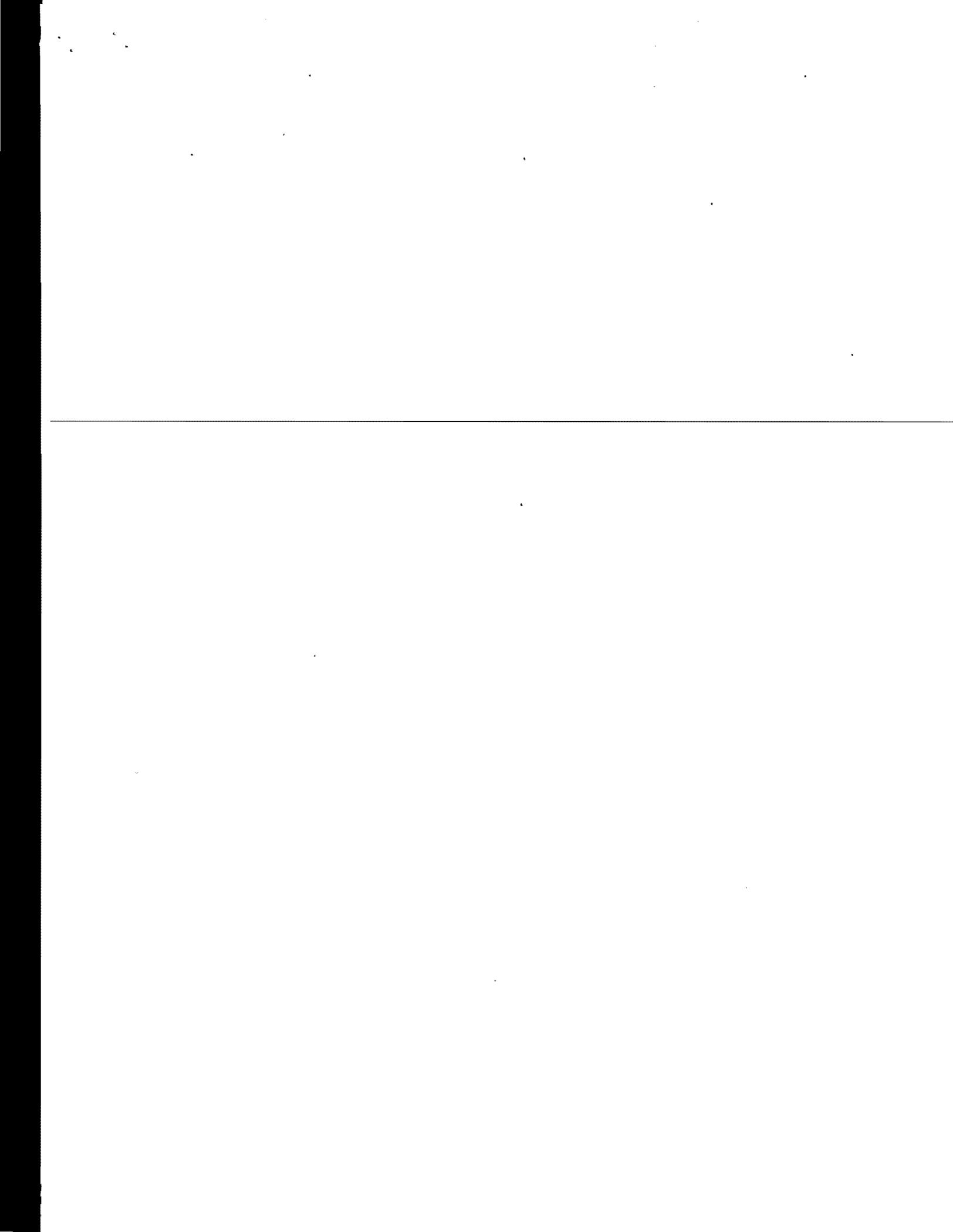
The Initial Operational Capability for the Commercial Satellite Imagery Library at DIA is also scheduled for the first quarter of FY 1997. New acquisitions are

being placed in the library and a data call is out to all DoD organizations to locate imagery not already held by DIA. The Assistant Secretary of Defense (Command, Control, Communications and Intelligence) stated that the current plan is to have a Memorandum of Agreement between NIMA and DIA that will allow DIA to maintain the library.

## Audit Response

Management comments were fully responsive. No additional comments are required.

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## **Part II - Additional Information**

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## Appendix A. Scope and Methodology

### Scope

**Commercial Imagery.** We reviewed the DoD management of and procedures for purchasing, using, and archiving commercial imagery. We interviewed DoD personnel who purchase, use, or archive commercial imagery. We also interviewed personnel from the National Aeronautics and Space Administration, EDC, EOSAT Company, and SPOT Image Corporation. We did not use computer-processed data or statistical sampling procedures for this audit.

**Audit Period, Standards, and Locations.** We performed this economy and efficiency audit from December 1995 through May 1996 in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD. We included tests of management controls considered necessary. Appendix B lists the organizations we visited or contacted.

### Management Control Program

DoD Directive 5010.38, "Internal Management Control Program," April 14, 1987, requires DoD organizations to implement a comprehensive system of management controls that provides reasonable assurance that programs are operating as intended and to evaluate the adequacy of the controls.

**Adequacy of Management Controls.** At the time of the audit, DoD had not provided guidance establishing responsibility for the commercial imagery functional area. Therefore, management controls over the purchase, use, and archiving of commercial imagery had not been established and could not be assessed. We identified this as a management control weakness for DoD as defined by DoD Directive 5010.38. Implementation of the recommendations in this report will designate appropriate responsibilities for managing and developing controls over commercial imagery within DoD.

### Prior Audits and Other Reviews

General Accounting Office Report No. GAO/IMTEC-91-11 "Environmental Data," November 1990, assessed how well the National Oceanic and Atmospheric Administration and the United States Geological Survey were managing environmental data collected by space and ground data collection

systems. The audit showed that the National Oceanic and Atmospheric Administration had not adequately managed and maintained its archives; performed an Agency-wide inventory of its data holdings; and promulgated Agency-wide standards for minimum acceptable storage, maintenance, quality control, and inventory practices. The report made no recommendations to the United States Geological Survey because the United States Geological Survey plans to process and convert Landsat data holdings, if approved and funded, to address all identified deficiencies.

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## Appendix B. Organizations Visited or Contacted

### Office of the Secretary of Defense

Office of the Assistant Secretary of Defense (Command, Control, Communications and Intelligence), Washington, DC  
Office of the Deputy Assistant Secretary of Defense (Intelligence and Security), Washington, DC

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### Joint Staff

Office of the Director, Joint Chiefs of Staff Support, Defense Intelligence Agency (J-2), Washington, DC  
Office of the Director, Command, Control, Communications, and Computer Systems (J-6), Washington, DC

### Department of the Army

Office of the Deputy Chief of Staff for Operations and Plans, Washington, DC  
Army Space Program Office, Fairfax, VA  
Office of the Deputy Chief of Staff for Intelligence, Washington, DC  
U.S. Army Intelligence and Security Command, Fort Belvoir, VA  
66th Military Intelligence Brigade, Augsburg, Germany  
500th Military Intelligence Brigade, Camp Zama, Japan  
U.S. Army Corps of Engineers, Washington, DC  
U.S. Army Topographic Engineering Center, Fort Belvoir, VA  
U.S. Army Intelligence and Threat Analysis Center, Washington, DC  
U.S. Army Europe, Heidelberg, Germany  
U.S. Army Pacific, Fort Shafter, HI  
Eighth Army, Yongsan Garrison, Korea  
I Corps, Fort Lewis, WA

### Department of the Navy

Office of the Director of Naval Intelligence, Washington, DC  
Office of the Director, Space and Electronic Warfare, Washington, DC  
Navy Space System Division, Washington, DC  
Office of Naval Intelligence, Suitland, MD

## Department of the Navy (cont'd)

Space and Naval Warfare Systems Command, Arlington, VA  
U.S. Navy Europe, London, England  
U.S. Pacific Fleet, Pearl Harbor, HI  
7th Fleet, Yokosuka Naval Base, Japan  
Headquarters, U.S. Marine Corps, Washington, DC  
Command, Control, Communications, Computer, and Intelligence Department,  
Washington, DC  
I Marine Expeditionary Force, Camp Pendleton, CA  
Headquarters, U.S. Marine Corps System Command, Quantico, VA  
Marine Forces Europe, Boblingen, Germany  
Marine Forces Pacific, Camp Smith, HI  
III Marine Expeditionary Force, Camp Courtney, Japan

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## Department of the Air Force

Office of the Assistant Chief of Staff Intelligence, Washington, DC  
Plans Policy and Evaluation Directorate, Washington, DC  
Office of the Assistant Deputy Secretary (Acquisition), Washington, DC  
Defense Dissemination Program Office, Los Angeles Air Force Base, CA  
U.S. Air Forces-Europe, Ramstein Air Base, Germany  
Pacific Air Forces, Hickam Air Force Base, HI  
5th Air Force, Yokota Air Base, Japan  
7th Air Force, Osan Air Base, Korea  
11th Air Force, Elmendorf Air Force Base, AK  
Air Combat Command, Langley Air Force Base, VA  
9th Air Force, Shaw Air Force Base, SC  
12th Air Force, Davis Monthan, Air Force Base, AZ  
Air Intelligence Agency, Kelly Air Force Base, TX

## Unified Commands

U.S. European Command, Patch Barracks, Germany  
Special Operations Command, Europe, Boblingen, Germany  
Joint Analysis Center, Royal Air Force Molesworth, England  
U.S. Pacific Command, Camp Smith, HI  
U.S. Forces Japan, Yokota Air Base, Japan  
U.S. Forces Korea, Seoul, Korea  
Alaskan Command, Elmendorf Air Force Base, AK  
Special Operations Command Pacific, Camp H.M. Smith, HI  
Joint Intelligence Center Pacific, Pearl Harbor, HI  
U.S. Atlantic Command, Norfolk, VA  
U.S. Central Command, MacDill Air Force Base, FL  
U.S. Special Operations Command, MacDill Air Force Base, FL  
U.S. Strategic Command, Offutt Air Force Base, NE

## Appendix B. Organizations Visited or Contacted

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### Other Defense Organizations

Central Imagery Office, Vienna, VA  
Defense Information Systems Agency, Arlington, VA  
    Defense Information Systems Agency, Pacific Area, Honolulu, HI  
    Joint Interoperability Test Command, Fort Huachuca, AZ  
Defense Intelligence Agency, Bolling Air Force Base, Washington, DC  
Defense Mapping Agency, Fairfax, VA  
National Reconnaissance Office, Washington, DC

### Non-Defense Federal Organizations

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Department of Interior, Washington, DC  
    Earth Resources Observation Systems, Sioux Falls, SD  
National Aeronautics and Space Administration, Washington, DC

### Non-Government Organizations

Earth Observation Satellite Company, Lanham, MD  
Systeme Pour l'Observation de la Terre, Reston, VA

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## **Appendix C. Report Distribution**

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

Under Secretary of Defense (Comptroller)

Deputy Chief Financial Officer

Deputy Comptroller (Program/Budget)

Assistant Secretary of Defense (Command, Control, Communications and Intelligence)

Assistant to the Secretary of Defense (Intelligence Oversight)

Director, Defense Logistics Studies Information Exchange

### **Joint Staff**

Director, Joint Staff

Director, Joint Chiefs of Staff Support, Defense Intelligence Agency (J-2)

### **Department of the Army**

Auditor General, Department of the Army

### **Department of the Navy**

Assistant Secretary of the Navy (Financial Management and Comptroller)

Auditor General, Department of the Navy

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

Assistant Secretary of the Air Force (Financial Management and Comptroller)

Auditor General, Department of the Air Force

## Other Defense Organizations

Director, Central Imagery Office  
Inspector General, Central Imagery Office  
Director, Defense Contract Audit Agency  
Director, Defense Intelligence Agency  
Inspector General, Defense Intelligence Agency  
Director, Defense Mapping Agency  
Inspector General, Defense Mapping Agency  
Director, Defense Logistics Agency  
Director, National Security Agency  
Inspector General, National Security Agency  
Director, National Reconnaissance Office  
Inspector General, National Reconnaissance Office

## Non-Defense Federal Organizations

Office of Technology and Policy, Department of Commerce  
Inspector General, Department of Interior  
Office of Management and Budget  
Technical Information Center, National Security and International Affairs Division,  
General Accounting Office

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 Committee on Governmental Affairs  
Senate Select Committee on Intelligence  
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 Committee on National Security  
House Permanent Select Committee on Intelligence

## **Part III - Management Comments**

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



COMMAND CONTROL  
& COMMUNICATIONS  
& INTELLIGENCE

ASSISTANT SECRETARY OF DEFENSE

6000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-6000

September 5, 1996



MEMORANDUM FOR INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE

SUBJECT: Proposed Audit Report on Commercial Satellite Imagery  
(Report No. 4RC-0055.01)

The subject audit report has been reviewed and I concur with the findings as presented. As stated in the report, commercial imagery use within the DoD and US Government will continue to expand as additional sources and exploitation tools become available. The following additional comments are provided for your consideration:

a. The Defense Mapping Agency's (DMA) commercial licensing agreements automatically include use of the image within both DoD and the Title 50 intelligence community organizations. DMA can also acquire licenses for imagery which allow use by other US Government Agencies and Foreign Coalition Partners as needed.

b. The Central Imagery Office operates a forum called the Remote Sensing Working Group (RESWG) which meets on a monthly basis to focus on commercial imagery issues. The RESWG includes members from DoD, Intelligence and other Agencies like the Forest Service and Geological Survey. Commercial vendors are often invited to attend. This forum promotes the use of commercial imagery, exchange of information, and commercial imagery policies. Recent meetings included discussions of DMA's imagery acquisition and licensing options, the Defense Intelligence Agency's new Commercial Satellite Imagery Library (CSIL), and review of the draft "Commercial Imagery Concept of Operations" document.

c. The National Imagery and Mapping Agency (NIMA) is now likely to become a reality and will further address the findings identified in the report. NIMA is already planning to host a Commercial Imagery Conference on November 19 and 20, 1996. Day one will be for commercial vendor presentations, and day two will cover government commercial imagery activities and uses. NIMA is expected to create a "commercial advocate" unit to specifically look for ways to make use of commercial products.

Documentation being prepared for the October 1, 1996 NIMA standup will include the DoD "Charter" Directive and a Memorandum

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

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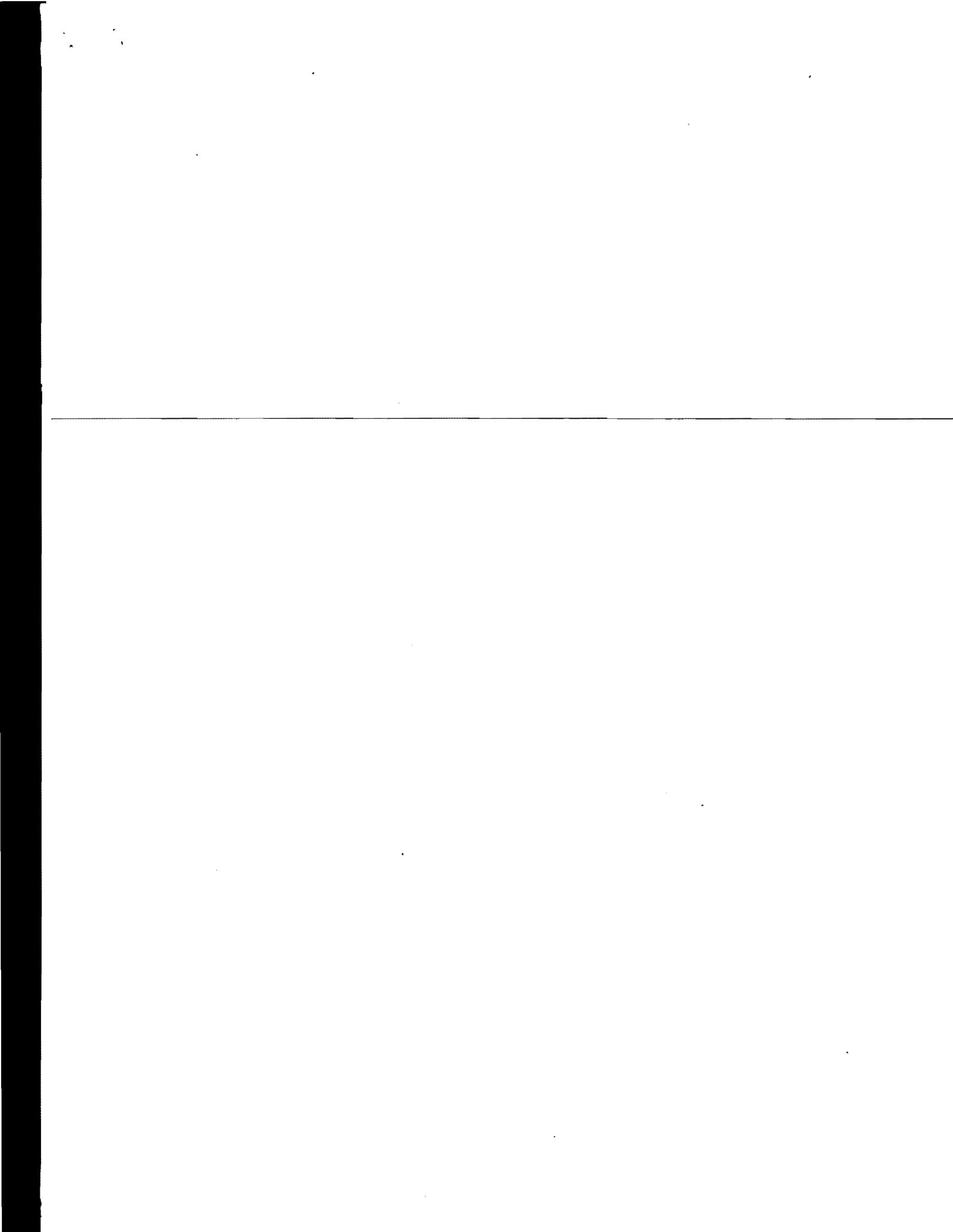
of Agreement between DoD and the DCI. Both documents will designate NIMA as the sole DoD source and as the primary Intelligence Community source for the acquisition and archiving of commercial satellite imagery. These documents should be completed and issued in the first quarter of FY97. The Concept of Operations for the Use of Commercial Imagery document currently being staffed under the direction of CIO is scheduled for completion on December 1, 1996. Additional implementing documents and instructions, including ASD(C3I) authored, will follow the formal establishment of NIMA. Documentation sufficient to address the recommendations in the report should be complete by the third quarter of FY97.

DIA has scheduled the Initial Operational Capability (IOC) for the Commercial Satellite Imagery Library for the first quarter of FY97. Additional capability will be added as resources become available and will expand electronic links and query capability with all customers. New acquisitions are currently being placed in the library and a data call is out to all agencies for locating and acquiring archived holdings not already held by DIA.

Forums like the RESWG will continue under NIMA to promote the use of commercial imagery, exchange information with other government agencies, and to stay abreast of commercial vendor developments.

Requests for any additional information may be directed to my action officer, Mr. Jack Hild on (703) 695-1830.

  
Emmett Paige, Jr.



## **Audit Team Members**

This report was prepared by the Intelligence Support Directorate, Office of the Assistant Inspector General for Policy and Oversight, DoD.

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