Audit Report

OFFICE OF THE INSPECTOR GENERAL

DEMAND ASSIGNED MULTIPLE ACCESS TERMINALS

Report No. 98-009 October 14, 1997

Department of Defense

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Acronyms and Abbreviations

DAMA	Demand Assigned Multiple Access
JWCA	Joint Warfighting Capabilities Assessment
kHz	Kilohertz
MILSATCOM	Military Satellite Communications
UHF	Ultra-High Frequency
UFO	Ultra-High Frequency Follow-On

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

October 14, 1997

MEMORANDUM FOR VICE CHAIRMAN, JOINT CHIEFS OF STAFF

SUBJECT: Audit Report on Demand Assigned Multiple Access Terminals (Report No. 98-009)

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

Comments on this report conformed to the requirements of DoD Directive 7650.3 and left no unresolved issues. Therefore, no additional comments are required. As a result of management comments we revised portions of the report narrative for accuracy and simplicity.

We appreciate the courtesies extended to the audit staff. Questions on the audit should be directed to Mr. Robert M. Murrell, Audit Program Director, at (703) 604-9428 (DSN 664-9428) or Ms. Nancee K. Needham, Audit Project Manager, at (703) 604-9404 (DSN 664-9404). See Appendix C 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. 98-009 **October 14, 1997**
(Project No. 6RD-0056.01)

Demand Assigned Multiple Access Terminals

Executive Summary

Introduction. This report is the second in a series resulting from our Audit of Communications Capability Within the DoD to Support Two Major Regional Conflicts Nearly Simultaneously. This report discusses management of the fielding and funding of Demand Assigned Multiple Access (DAMA) terminals. The total cost of the combined effort to field and fund DAMA terminals is $717.7 million. The first report, Report No. 97-187, "Communications Capability Within DoD to Support Two Major Regional Conflicts Nearly Simultaneously," July 14, 1997, discusses military satellite communications and the requirements determination process for deliberate planning related to the national military strategy.

Audit Objectives. The overall audit objective was to evaluate DoD communications capabilities to support two major regional conflicts. Specifically, we evaluated the Services' compliance with the Joint Staff mandate for use of DAMA terminals. We discuss the adequacy of the management controls of the related organizations in Inspector General, DoD, Report No. 97-187.

Audit Results. The fielding of DAMA terminals has been delayed beyond the Joint Staff mandate of September 30, 1996. As a result, the limited ultra-high frequency spectrum provided by military satellite communications is not efficiently utilized and the additional satellite bandwidth that could be provided by DAMA is not available for use in support of the two major regional conflict scenario. Additionally, delayed fielding of DAMA will result in limited interoperability of joint forces.

Summary of Recommendations. We recommend establishing oversight of the DAMA program by the Joint Requirements Oversight Council, expediting the fielding of the terminals, and assuring that the total required number of terminals are fully funded, and remain, fully funded.

Management Comments. The Vice Chairman of the Joint Chiefs of Staff concurred with the report recommendation, subject to the incorporation of specific comments into the report. The Vice Chairman of the Joint Chiefs of Staff agreed that the Joint Requirements Oversight Council should provide oversight of the Demand Assigned Multiple Access program and agreed that the Services should fully fund and substantially field the terminals by FY 2000. The Vice Chairman of the Joint Chiefs of Staff stated that the creation of

Joint Program offices is not a Joint Staff responsibility but is an Under Secretary of Defense for Acquisition and Technology responsibility, and stated further that the primary cause for DAMA terminals not being fielded is that the program was not centrally funded.

The Assistant Secretary of Defense, Command, Control, Communications, and Intellegence concurred with the draft report. See Part I for a discussion of management comments and Part III for complete management comments.

Audit Response. The Vice Chairman of the Joint Chiefs of Staff comments were considered responsive. In response to management comments, we revised portions of the report narrative for technical accuracy.

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Part I - Audit Results

Audit Background

This report is the second in a series resulting from our Audit of Communications Capability Within the DoD to Support Two Major Regional Conflicts Nearly Simultaneously. This report discusses the managing, fielding, and funding of demand assigned multiple access (DAMA) terminals. The first report, Report No. 97-187, "Communications Capability Within DoD to Support Two Major Regional Conflicts Nearly Simultaneously," July 14, 1997, discusses military satellite communications and the requirements determination process for deliberate planning related to the national military strategy.

Military Satellite Communications. Worldwide ultra-high frequency (UHF) user communications requirements are rapidly increasing, new communications networks are emerging, and UHF radios are inexpensive and capable of meeting Service requirements. The UHF satellite systems have a global field of view; however, the UHF frequency spectrum has finite limits. Therefore, countries worldwide have agreed on the distribution of frequencies used by UHF satellites. The worldwide agreement predefines and limits the available channels to support UHF military satellite communications (MILSATCOM).

All UHF MILSATCOM frequencies authorized for DoD are in use, and current Service satellite requirements exceed the existing UHF capacity. MILSATCOM channels cannot be increased because of the UHF requirements of other countries. DoD currently controls all the UHF satellite frequencies it is likely to have, and future reductions of available channels are possible. Adding new satellites to the UHF constellation will not increase the capacity available to the Services because of the limits of UHF frequencies and restrictions on use by other countries. The UHF frequency limitations intensify existing satellite communications shortfalls.

UHF Satellite Constellation. The existing UHF satellite constellation consists of a mix of old UHF and newer ultra-high frequency follow-on (UFO) satellites. The DoD is fielding the UFO satellite constellation. The objective of the constellation is to provide two satellites per footprint (see the glossary in Appendix B) with a mix of 5 and 25 kilohertz (kHz) channels. The UFO satellites 2 through 7 are now in orbit, and satellites 8 through 10 are scheduled for launch as shown in Table 1 on the following page. Those satellites are expected to be fully operational 60 days after launch. Satellites 8 through 10 will replace existing satellites, but will not increase existing capacity.

Table 1. Launch Dates for UFO Satellites

Satellite	Location	Date
UFO-8	Pacific Ocean	February 1998
UFO-9	Atlantic Ocean	September 1998
UFO-10	Indian Ocean	January 1999

As the UFO constellation matures, the mix of 5 kHz and 25 kHz channels is changing. From July 1996 to the placement of UFO-10 into operation, the number of 25 kHz user accesses will decrease 32 percent from 249 accesses to 188 accesses. The number of 5 kHz user accesses will increase 121 percent from 83 accesses to 184 accesses.

Interim DAMA earth control stations are now in place and operational to control eight 5 kHz and eight 25 kHz channels per satellite. The Joint UHF MILSATCOM Network Integrated (JMINI) Control System 25/5 kHz controller, capable of automatically managing 78 channels each, will become operational in FY 2000 and will be located in the geographical area where two satellite footprints overlap. JMINI control stations will control a portion of the two satellites. DAMA Network Integrated Control System will be collocated with existing Navy Computer and Telecommunications Area Master Stations and will control the full UFO satellite capacity of 78 channels.

Audit Objectives

The overall audit objective was to evaluate DoD communications capabilities to support two major regional conflicts. Specifically, we evaluated the Services' compliance with the Joint Staff mandate to field DAMA terminals. We discuss the adequacy of the Joint Chiefs of Staff management control program in Inspector General, DoD Report No. 97-187, "Communications Capabilities Within DoD to Support Two Major Regional Conflicts Nearly Simultaneously," July 14, 1997. See Appendix A for a discussion of the audit process. We discuss the adequacy of the management controls of the related organizations in Inspector General, DoD, Report No. 97-187.

Fielding of DAMA Terminals

The fielding of DAMA terminals has been delayed beyond the Joint Staff mandate of September 30, 1996. Fielding of the terminals has been delayed because the Services have not been able to fully field and fund DAMA terminals, and because there has been a lack of centralized management of the program within the DoD. As a result, the limited UHF spectrum provided by MILSATCOM is not efficiently utilized and the additional satellite accesses that could be provided by DAMA to alleviate the UHF capacity shortfall are not available for use in support of the two major regional conflict scenario. In addition, delayed fielding of DAMA terminals will result in limited interoperability of joint forces.

Mandate to Field DAMA

In 1984, the Joint Staff directed transition to narrowband secure voice capability for UHF SATCOM users to increase warfighter access to UHF. The Joint Staff required the use of DAMA technology by 1994, in Memorandum Joint Chiefs of Staff 63-89, dated April 17, 1989. Because of technical and programmatic developments, updated guidance was provided in the Joint Staff Memorandum, MCM-89-94, "UHF Satellite Communications Demand Assigned Multiple Access Requirement," July 28, 1994. That memorandum mandated that the Services use DAMA terminals for all UHF MILSATCOM and specified that all users have DAMA terminals fielded by September 30, 1996. Chairman, Joint Chiefs of Staff Instruction 6251.01, "Ultra-High Frequency Satellite Communications Demand Assigned Multiple Access Requirements," July 31, 1996, outlines the minimum requirements for all users of UHF military satellite communications. The UHF DAMA terminals were to be interoperable in accordance with Military Standards 188-181, 188-182, and 188-183 no later than September 30, 1996.

The Joint Staff required all UHF users who were unable to comply with the mandate to submit waivers. Users can request a temporary waiver because of terminal fielding delays or network constraints. The temporary waiver is attached to the satellite access request and must be submitted with every satellite access request. A technical waiver may be requested by users who have networks or circuits that are incompatible with DAMA. The technical waivers are entered into the Integrated Communications Data Base and must be revalidated every 2 years.

Technical Solutions to Increase Satellite Capacity

DoD has determined that two technical solutions, discussed below, exist for the UHF capacity shortfall. The users of UHF use the two techniques together to increase the utilization of the existing bandwidth, thereby improving the efficiency of the traffic flow.

o Narrowband secure voice is hardware that digitally compresses a voice signal prior to transmission. This process allows voice traffic to be placed on a narrow bandwidth, 5 kHz channel.

o The DAMA technique is a multiple-access control technique that enables numerous earth terminals to share the capacity of a single satellite communications channel. A device, called a controller, divides the channel into time segments and assigns those segments to users based on mission need.

Currently, access to satellite channels is provided manually through administrative procedures. Each user's network or circuit is assigned a single channel for a long-term or permanent period of time. During that time, the user has dedicated control of that entire channel and no other user has access. As a consequence of the dedicated access control, if the user does not use the satellite channel during the allotted time, MILSATCOM cannot make effective use of the UHF capacity.

The DAMA technology allocates channel time segments upon user request or on the basis of need or network ranking and allows multiple users to share the same channel. As soon as a user completes a transmission, the channel time segments can immediately be reallocated to new users. Additionally, compression utilizes a more narrow bandwidth, thus freeing satellite bandwidth to new users. By implementing DAMA, entire channels would no longer be dedicated to particular users for long periods of time and other users could make efficient use of channel capacity.

Management and Funding

No centralized program management office was established to provide oversight or centralized funding for the acquisition and fielding of DAMA terminals, even though the Joint Staff mandated in 1989 that the Services use DAMA. The Services achieved limited coordination through the Joint DAMA Implementation Working Group, which was established by the Joint Staff in 1994 to educate the user community. The working group's draft charter states that the mission of the

working group is to define and revise the course of action required to fully implement UHF DAMA to best meet user needs. The draft charter has not yet been formalized.

Without a centralized program management office, the Services funding for DAMA terminals has been erratic and incomplete. Combined joint service funded and unfunded requirements for DAMA total more than $700 million. The Army has a requirement for 3,479 terminals, but has established funding for only 2,348 terminals. The Navy established funding for DAMA in its 1998 Program Objective Memorandum. However, the Navy withdrew that funding for other MILSATCOM shortfalls, then reinstated funds in FY 1998 to ensure that deploying battle groups are compliant with joint task force DAMA interoperability. However, the Navy recently withdrew DAMA funding to satisfy other shortfalls, thus the battle groups will not be DAMA compliant. The Air Force also established funding in its 1998 Program Objective Memorandum, but has since reduced the amount of that funding. As of March 1997, the Services have not funded 1,496 terminals of the stated requirement of 6,646 terminals. Service funding and requirements are shown in Table 2.

Table 2. DAMA Procurement Costs
(Funding in millions)

	Service Quantity	Funded	Additional Requirements	Not Funded
Army	2,348	$ 68.6	1,131	$ 30.5
Navy				
Manpack terminals	278			
Ship-shore modems	586	82.0	0	0
Air Force				
Airborne terminals	577	199.6	154	93.2
Ground terminals	2,288	92.6	211	7.6
Marine Corps	569	62.9	0	0
Total	**6,646**	**$505.7**	**1,496**	**$131.3**

For FYs 1999 through 2010, DAMA program costs total $717.7 million to include procurement; research, development, test, and evaluation; and unfunded requirements costs as shown in Table 3 on the following page.

Table 3. DAMA Program Costs (millions)

Procurement costs for FYs 1996 through 2003	$505.7
Research, development, test, and evaluation costs	
Army	12.7
Air Force	67.0
Unfunded requirements for FYs 1998 through 2008	131.3
Total	**$717.7**

We believe that the DAMA program could best be managed by the Joint Warfighting Capabilities Assessment (JWCA) process. The JWCA process is well established. Creating another centralized management structure this late in the program could be costly and could slow the fielding of the DAMA terminals. Chairman, Joint Chiefs of Staff, Instruction 3137.01, "The Joint Warfighting Capabilities Assessment Process," February 22, 1996, provides joint policy and guidance for the role of the JWCA. The JWCA teams, sponsored by a director of a Joint Staff directorate, can identify opportunities for improving warfighting effectiveness. The JWCA findings and recommendations are presented to the Joint Requirements Oversight Council for consideration. The Chairman, Joint Chiefs of Staff, can draw from the JWCA process and the advice of the Joint Requirements Oversight Council to fulfill his responsibility to provide advice to the Secretary of Defense regarding program recommendations and budget proposals.

Fielding of DAMA Terminals

The Services have not fielded any Military standard compliant DAMA terminals as of March 1997 and did not comply with the Chairman's Memorandum MCM-89-94 that required fielding by September 30, 1996.

Army, Air Force, and Marine Corps Terminals. The Army has a stated requirement for 3,479 DAMA terminals and has 2,348 terminals on contract. The Air Force has a stated requirement for 3,230 DAMA terminals and has 2,865 funded. However, as of March 1997, neither Military Department has fielded any DAMA terminals. The Marine Corps has a stated requirement for 569 DAMA terminals and has procured the terminals, but fielding will not begin until FY 1998.

Navy Terminals. The Navy currently has 25 kHz radios. However, those radios are not in compliance with the new DAMA military standards which require equipment with a 5 kHz capability. Further, the Navy has a stated requirement for 864 DAMA terminals, which are funded, but as of March 1997, no terminals had been fielded. The Navy stated that the *USS George Washington* battle group, deploying in October 1997, should be the first deployable battle group to be equipped with DAMA terminals. Each battle group that deploys after the *USS George Washington* should also be equipped with DAMA terminals. However, recent changes in the Navy funding and fielding plan canceled the fielding of DAMA terminals for two command and control ships in the *USS Nimitz* battle group.

Terminal Fielding Opportunities. The DAMA terminals can be effectively fielded to increase the number of UHF channels available to warfighters. For example, in Korea, equipment using 5 kHz channels is available to support U.S. Forces, Korea requirements, yet the Services supporting U.S. Forces, Korea have not fielded DAMA terminals. As a result, scarce UHF MILSATCOM channels are not used efficiently and dedicated bandwidth capacity remains unused. Delayed fielding by the Services will negatively affect the warfighter's UHF communications capabilities. In addition, initial users of DAMA will realize an increased satellite access capability over those without DAMA terminals. However, as terminals are fielded and the Joint MILSATCOM Network Integrated Controller becomes available in FY 2000, more channels will be managed using DAMA technology and eventually only users with DAMA terminals will have access to UHF MILSATCOM.

Conclusion

Shortfalls exist in providing DoD UHF MILSATCOM mission support because of limited frequency spectrum capability and rapidly increasing communications requirements. The UHF spectrum is saturated, and adding satellites will not increase the UHF capacity. The Joint Staff has determined that the most viable technical solution to this shortfall is the use of DAMA. However, the Services have not ensured effective management of their responsibilities to fund and field the DAMA program and have not complied with the Joint Staff mandate.

The lack of centralized management of the DAMA program and the reluctance of the Services to fully fund it has delayed the fielding of the much needed terminals. The DAMA terminals are needed to expand the availability of current and future MILSATCOM capacity. The DAMA technology will provide more efficient use of available channels and increase accesses available to users. We believe that a fully successful implementation of this technical solution to the UHF shortfall requires the expedited fielding of DAMA terminals and the Network Integrated

Control System by FY 2000. In addition, the Services should make funding immediately available for all validated requirements to ensure compliance with the Joint Staff mandate. If implementation is not substantially completed by FY 2000, the resulting inefficient use of DoD UHF channels will continue to contribute to mission impairment and will result in limited interoperability of joint forces in communications support to the two major regional conflict strategy.

Recommendations, Management Comments, and Audit Response

We recommend that the Vice Chairman, Joint Chiefs of Staff, direct the Joint Requirements Oversight Council, through the Joint Warfighting Capabilities Assessment process, to provide oversight of the Demand Assigned Multiple Access Program until Service fielding is complete, and require the Services to fully fund their requirements and substantially field the terminals by FY 2000.

Management Comments. The Vice Chairman of the Joint Chiefs of Staff, concurred with the finding and recommendation. The Joint Staff provided a number of changes to the report narrative, most of which we agreed to add to the report. See Part III for the full text of management comments.

Other Management Comments

Office of the Assistant Secretary of Defense, Command, Control, Communications, and Intelligence Comments. Although not required to comment, the Director, C4I Integration Support Activity provided comments on the report. The Director concurred with the draft report.

Part II - Additional Information

Appendix A. Audit Process

Scope

We evaluated DOD communications requirements, capabilities, and resources to support two major regional conflicts. Specifically, we reviewed the extent to which the Services have complied with the Joint Staff mandate to field DMA terminals by September 30, 1996. Also, we reviewed the DMA terminal acquisition plans of the Army, Navy, Air Force, and Marine Corps. Those acquisition plans have a total cost of $717.7 million.

Methodology

In evaluating the Services' compliance with the Joint Staff mandate, we:

- o conducted interviews with users and management for all organizations visited and contacted;
- o reviewed documentation, dated from February 1989 through March 1997, relating to communications requirements and existing capabilities;
- o reviewed documentation relative to the existing capabilities to support and implement two major regional conflicts;
- o reviewed the acquisition strategy for DMA terminals;
- o analyzed the funding and fielding plans for the terminals;
- o assessed the adequacy of the oversight provided for the DMA program; and
- o assessed the effectiveness of the implementation of the DMA program.

Use of Computer-Processed Data. The audit relied on computer-processed data for information; however, we did not rely on the computer-processed data to develop our conclusions. Nothing came to our attention as a result of specified procedures that caused us to doubt the reliability of the computer-processed data.

Audit Type, Dates, and Standards. We performed this economy and efficiency audit from May 1996 through May 1997. The audit was performed in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD.

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

Prior Coverage. No prior coverage has been conducted on DAMA in the last 5 years.

Appendix B. Glossary

Access. The point of entry into a circuit or other communications facility.

DoD Satellite Communications. DoD satellite communications systems encompass the operation, control, and employment for military systems operating in several frequency bands, leased capacity on commercial systems, and satellite service provided by allied nation systems.

Bandwidth. The range of electrical frequencies a communications device can handle. The wider the bandwidth, the greater its capacity.

Channel. A voice-grade transmission facility with defined frequency response, gain, and bandwidth. It is a path of communication between two or more points, also called a circuit, facility, line link, or path.

Electromagnetic Spectrum. The electromagnetic spectrum includes the range of frequencies of electromagnetic radiation from the lowest to highest. Most telecommunications of concern to the military planner operate using the radio frequency band of the spectrum.

Footprint. A footprint is the area of the earth's surface where the signal from a specific satellite can be received.

Hertz. Bandwidth is expressed in hertz, which are cycles per second. One hertz equals one cycle per second; 1 kilohertz equals 1,000 cycles per second; 1 megahertz equals 1 million cycles per second; and 1 gigahertz equals 1 billion cycles per second.

Integrated Satellite Communications Data Base. The Integrated Satellite Communications Data Base is a comprehensive compilation of DoD and non-DoD user requirements for communication services, including terrestrial-based, leased commercial, and military-owned satellite communications.

Military Satellite Communications (MILSATCOM). MILSATCOM refers to DoD-owned and operated or commercially leased satellite communications systems.

Ultra-High Frequency (UHF). The ultra-high frequency is part of the radio frequency spectrum, ranging between 300 megahertz and 3 gigahertz.

Ultra-High Frequency Follow-On (UFO). A new generation of single channel satellites, operating in the UHF frequency band, that will replace the aging Navy Fleet Satellite Communications System.

Appendix C. Report Distribution

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Part III - Management Comments

Joint Chiefs of Staff Comments

THE VICE CHAIRMAN OF THE JOINT CHIEFS OF STAFF
WASHINGTON, D.C. 20318-0001

CM-1845-97
5 September 1997

MEMORANDUM FOR THE DEPARTMENT OF DEFENSE INSPECTOR GENERAL

Subject: Audit Report on Demand Assigned Multiple Access Terminals (Project No. 6RD-0056.01)

1. As requested,[1] the Joint Staff has reviewed the report and concurs in the recommendation that the Joint Requirements Oversight Council provide oversight of the Demand Assigned Multiple Access (DAMA) program through the Joint Warfighting Capabilities Assessment (JWCA) process until Service terminal fielding is complete, subject to incorporation of the critical comments in the Enclosure. We further agree that the Services should be required to fully fund their requirements and substantially field the terminals by FY 2000. Also enclosed for consideration are substantive comments.

2. DAMA implementation has been a JWCA topic since the summer of 1996 and will continue to be a reported item until Service terminal fielding is complete. In the summer 1996 cycle, Navy reprogrammed $82 million to achieve 5 and 25 kHz DAMA compliance on half of its ships. Continued visibility during the summer 1997 JWCA cycle resulted in Air Force adding $20 million to accelerate DAMA fielding to aircraft and Navy adding $50 million to complete more afloat units. Implementation also has been reviewed by the Military Communications-Electronics Board on several occasions since 1993. We will continue to pursue full funding and fielding of DAMA terminals by the Services to provide the best possible capability to the warfighter.

Joseph W. Ralston
JOSEPH W. RALSTON
Vice Chairman
of the Joint Chiefs of Staff

Enclosure

Reference:
1 ODODIG memorandum, 30 June 1997, "Audit Report on Demand Assigned Multiple Access Terminals (Project No. 6RD-0056.01)"

Final Report Reference

ENCLOSURE

ADDITIONAL JOINT STAFF COMMENTS ON DAMA AUDIT REPORT

Critical comments are those that, if not incorporated, result in a nonconcurrence in the report.

1. Critical comment: Page 4, first paragraph, second sentence: Change to read: "Fielding of the terminals has been delayed because the Services have not been able to fully field and fund DAMA terminals, and because there has been a lack of centralized management of the program within the DOD." Delete the section of the sentence that reads "because the Joint Staff has not established a central program management office to provide oversight for the DAMA program within the DoD." Revised

REASON: The major problem with DAMA implementation has been lack of funding, not lack of a central management office. Additionally, the Joint Staff does not establish joint program offices, although we have maintained close oversight on DAMA implementation. The JROC makes a Joint Potential Designator recommendation to the Under Secretary of Defense for Acquisition and Technology for consideration at the Defense Acquisition Board. If the recommendation is for a joint program, the Milestone Decision Authority will designate a lead Service and direct formation of a Joint Program Office (reference: DOD Regulation 5000.2-R, 15 March 1996, and CJCSI 3170.01, 13 June 1997).

2. Critical comment: Page 5, last paragraph, first sentence: Change to read "No centralized program management office was established to provide oversight or centralized funding for the acquisition and fielding of DAMA terminals. . . ." Revised

REASON: Same as above. It is the charter of the Under Secretary of Defense for Acquisition and Technology to establish centralized program management offices.

The following substantive comments are provided for consideration:

1. Page 3, first paragraph: Recommend deleting the entire paragraph.

REASON: Accuracy and simplicity. The 25 kHz/5 kHz channel mix is changing because of technical decisions leading to a spacecraft design change. The original UHF constellation, FLTSAT, had a 500 kHz wideband channel that users shared based on requirements. This wideband, power-sharing arrangement resulted in some users interfering with or simply overpowering the other users based on terminal capabilities and operator procedures. To

Enclosure

Final Report Reference

eliminate this situation, the UHF Follow-On (UFO) spacecraft was fielded without the 500 kHz wideband and with only 5 kHz and 25 kHz discrete channels. The number and mix of 5/25 kHz channels on UFO were ultimately determined by engineering efforts, not by operational emphasis.

2. If the paragraph is not deleted, recommend incorporating the following changes:

Revised

Page 3, first paragraph, first sentence: Change the word accesses to channels. After "As the UFO Constellation matures, the mix of 5 kHz and 25 kHz accesses is changing," delete "from an emphasis on 25 kHz to an emphasis on 5 kHz accesses."

REASON: In actuality, the final UFO constellation will have 136 25 kHz channels and 168 5 kHz channels, but neither channel is "emphasized."

Revised

Page 3, first paragraph, second sentence: Change "When the constellation is finalized" to "From July 1996 to the placement of UFO-10 into operation."

REASON: Accuracy. In order to show a percentage decrease, a starting point must be defined.

Page 3, first paragraph, last sentence: Delete.

REASON: Accuracy. The need for DAMA is not driven by the change in channel mix; it is driven by the growing requirement for UHF communications.

Page 3, second paragraph, second sentence: After "Joint UHF MILSATCOM Network Integrated," insert "(JMINI)."

REASON: Enables use of acronym in last sentence.

Page 3, second paragraph, last sentence: Replace "DAMA Network Integrated Control System" with "JMINI Control Stations."

REASON: Accuracy. Each NCTAMS will get a control station; the whole network is the system.

Revised

Page 7, third paragraph titled "Army, Air Force, and Marine Corps Terminals," second sentence: Change to read "2, 865 funded" vice "2, 865 on contract."

REASON: Accuracy. The terminals are in the POM but not all are on contract. The Airborne Integrated Terminal (AIT) contract has not been let so no AIT s have been purchased yet.

Final Report Reference

Page 8, first full sentence at top of page: Change "which are on contract" to "which are funded." — Revised

REASON: Accuracy. The terminals are in the POM but are not all on contract.

Page 8, first paragraph, third sentence: Change "U.S.S. Nimitz" to "USS George Washington," and change "September 1997" to "October 1997." In the next sentence, change "U.S.S. Nimitz" to "USS George Washington," and delete the last sentence. — Revised

REASON: Accuracy. Nimitz did not receive the 5 kHz upgrade because it arrived too late to be installed and complete personnel training prior to the September deployment date.

Page 8, second paragraph: Delete second and third sentences.

REASON: Clarity. Do not understand the Korea example. Some of the legacy system UHF SATCOM radios can tune to 5 kHz channels, but they are not DAMA capable. The Navy has a 25 kHz DAMA capability but cannot tune to dedicated or DAMA 5 kHz channels. Use of 5 kHz channels is a separate issue from use of DAMA. The statement that "scarce UHF MILSATCOM channels are not used efficiently" is because DAMA terminals are not fielded. The statement "dedicated bandwidth capacity remains unused" is a result of lack of 5 kHz capable radios.

Assistant Secretary of Defense for Command, Control, Communications and Intelligence Comments

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COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE

August 29, 1997

MEMORANDUM FOR INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

SUBJECT: Audit Report on Demand Assigned Multiple Access Terminals (Project No. 6RD-0056.01)

Office of the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (OASD(C3I)/ C4I Integration Support Activity (CISA) recommends concurrence with aforementioned draft report.

Dennis M. Nagy
Director
C4I Integration Support Activity

Audit Team Members

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