DEPARTMENT OF DEFENSE

AUDIT REPORT

DEFENSE DATA NETWORK

No. 90-097

July 5, 1990

Office of the
Inspector General

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

July 5, 1990

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION
ASSISTANT SECRETARY OF DEFENSE (COMMAND, CONTROL, COMMUNICATIONS AND INTELLIGENCE)
ASSISTANT SECRETARY OF THE ARMY (FINANCIAL MANAGEMENT)
DIRECTOR, DEFENSE COMMUNICATIONS AGENCY

SUBJECT: Audit Report on the Defense Data Network (Report No. 90-097)

This is our final report on the Audit of the Defense Data Network. The audit was performed from August 1988 to July 1989. Our overall audit objective was to determine whether the development and implementation of the Defense Data Network (the Network) had proceeded on schedule and in a cost-effective manner consistent with guidance established in 1983 by the then Under Secretary of Defense for Research and Engineering (USD[R&E]). Specific audit objectives were to determine if increases to original program cost estimates were reasonable and justified, if the Network was responsive to the needs of DoD users, and if applicable internal controls were adequate. Another specific audit objective was to determine if methods used to obtain contractor support were in compliance with applicable acquisition regulations and would produce cost-effective results. This audit objective was deferred to a future audit of Network contract support.

The audit was limited to the Military Network, or unclassified segment of the Defense Data Network, because the General Accounting Office completed an audit of the classified segment of the Defense Data Network in January 1989. We estimated the program costs for the Network at $1.039 billion for FY 1982 through FY 1992.

Although the Director, Defense Communications Agency, initiated procedures to increase the number of computer systems connected to the Network, 81 percent of the computers in DoD that required data communications services were not connected to the Network. Conversely, in cases where Network service was provided, previously leased data communications circuits that were replaced by the Network were not disconnected. In one Army system, disconnection of leased data communications circuits that duplicated Network service would avoid monthly recurring expenses that would total $935,287 over a 5-year period. Effectively monitoring the DoD Components' connections and the disconnections of leased data communications circuits could result in additional

savings to DoD. Unless the installation of security devices for the Network is expedited, about $4.2 million in unnecessary interest and storage expenses will be incurred over the same 5-year period. The results of the audit are summarized in the following paragraph, and the details, recommendations, management comments, and our audit responses are in Part II of this report.

The Director, Defense Communications Agency, did not follow OSD guidance, which included program direction for the Network established by the USD(R&E). Also, the Assistant Secretary of Defense (Command, Control, Communications and Intelligence) (ASD[C^3I]) did not provide effective oversight of the Network. About 81 percent of the computers in DoD requiring unclassified data communications services were not connected to the Network because DoD requirements for data communications services had increased. This increase occurred while the expected completion date (FY 1986) for the unclassified segment of the Network was delayed at least 3 years, and the projected costs for developing and operating the total Network increased from $421 million to $1.039 billion for FY 1982 through FY 1992. In addition, monetary benefits were not realized from disconnecting leased data communications circuits that duplicated the Network's service, from expeditiously connecting computers, and from installing security devices in the Network. The Network costs also were not equitably allocated among users. We made recommendations to the Under Secretary of Defense for Acquisition; ASD (C^3I); Director, Defense Communications Agency; and Commander, U.S. Army Information Systems Command to correct these conditions (page 7).

A draft of this report was provided to the addressees for comments on December 14, 1989. Comments were received from the Deputy Assistant Secretary of Defense (Command, Control, and Communications) and the Director, Defense Communications Agency, on March 13, 1990. Comments were received from the Director, U.S. Army Information Systems Command, on February 5, 1990. Appendixes B and C contain complete texts of management comments.

The Deputy Assistant Secretary of Defense (Command, Control, and Communications), responding for the Under Secretary of Defense for Acquisition, nonconcurred with Recommendation 1. to refer the Network to the appropriate Defense Acquisition Committee. The response stated that an oversight panel, the Command, Control, Communications, and Intelligence Systems Committee (the Committee), was in place, and no issues have arisen to warrant elevation of the Network for review by the Committee. We believe that the inefficiencies in planning and operating the Network, and for the reason stated in the Management Comments and Audit Response section in Part II of the report warrant its elevation to an OSD committee. Therefore, we

believe Recommendation 1. is still valid and we request that the Under Secretary of Defense for Acquisition reconsider his position and provide comments on the final report.

The Deputy Assistant Secretary partially concurred with Recommendations 2.a., 2.b., and 2.c, and nonconcurred with Recommendation 2.d. The Management Comments and Audit Response section in Part II of the report provides the specifics on the Deputy Assistant Secretary's position on these recommendations.

Concerning Recommendation 2.a., the planned action stated in the response satisfies the intent of the Recommendation. The alternative corrective actions proposed for Recommendation 2.b. are responsive, and we have revised this recommendation accordingly. On Recommendation 2.c. the Deputy Assistant Secretary partially concurred stating that certain ongoing actions may provide the desired action. We reconsidered our position and have revised Recommendation 2.c. accordingly. The Deputy Assistant Secretary disagreed with Recommendation 2.d. in the draft report to report a material internal control weakness. Although we reaffirm that a material internal control weakness existed, we believe the planned actions by the Deputy Assistant Secretary will correct this weakness. Therefore, we have deleted the recommendation from our final report. It is requested that the Deputy Assistant Secretary comment on revised Recommendations 2.b. and 2.c., to include a completion date for the ongoing actions relative to Recommendation 2.c., in response to this final report.

The Director, Defense Communications Agency, provided his comments in a joint response with the Deputy Assistant Secretary and concurred with Recommendations 3.a., 3.c., 3.e., and 3.f. Therefore, additional comments on these recommendations are not required. The Director partially concurred with Recommendation 3.g. and nonconcurred with Recommendations 3.b., 3.d., and 3.h.

As shown in the Management Comments and Audit Response section in Part II of the report on Recommendation 3.g., the Director's reply identifies specific planned corrective actions. The planned actions satisfy the intent of the recommendation. However, the Director nonconcurred with the $4.2 million of potential monetary benefits derived from implementing the corrective action. For the reasons shown in the Management Comments and Audit Response section in Part II we disagree with the Director's position. Therefore, we request that the Director reconsider his position on the potential monetary benefits of $4.2 million and provide comments in response to the final report.

The courtesies extended to the staff during the audit are greatly appreciated. A list of the audit team members is in Appendix F. Copies of the final report will be distributed to the activities listed in Appendix G. If you wish to discuss this final report, please contact Mr. John A. Gannon at (202) 693-0113 or Mr. Tilghman A. Schraden at (202) 693-0624.

Edward R. Jones
Deputy Assistant Inspector General
for Auditing

cc:
Secretary of the Army

The Director nonconcurred with Recommendations 3.b., 3.d., and 3.h. and provided information that is shown in the Management Comments and Audit Responses section in Part II of the report in support of those positions. For reasons stated in our audit responses, we believe Recommendations 3.b., 3.d., and 3.h. are still valid. Therefore, we request that the Director reconsider his position and provide comments on the final report.

The Department of the Army nonconcurred with Recommendation 4. and provided comments that partially satisfy the intent of the recommendation. Documentation that was not available prior to issuance of our draft report was also provided. Our review of the comments and documentation is provided in the Management Comments and Audit Response section of the report. While we agree with some of the specific cases cited in the Army reply and have adjusted the potential monetary benefits relative to them, there are still others on which corrective action is still appropriate. Therefore, we still believe Recommendation 4. is valid and that the Army should reconsider its position. It is requested that the Army provide comments on the corrective action remaining on Recommendation 4. and the adjusted potential monetary benefits of $935,287, in response to this final report.

This report identifies internal control deficiencies as defined by Public Law 97-255, Office of Management and Budget Circular A-123, and DoD Directive 5010.38. We recommended that the Director, Defense Communications Agency, report the noncompliance with the 1983 USD(R&E) guidance and the lack of policies, procedures, and plans for monitoring data circuits and implementing the Network Security Architecture as material internal control weaknesses. Recommendations 3.a.(1)(a)., 3.a.(2)., 3.b., 3.c., and 3.g. in this report, if implemented, will correct these weaknesses. A copy of the final report will be provided to the senior officials responsible for internal controls within the Defense Communications Agency.

DoD Directive 7650.3 requires that all recommendations be resolved within 6 months of the date of the final report. Management comments on the final report should be provided within 60 days of the date of this report. We request that the Director, Defense Communications Agency, provide a concurrence or nonconcurrence with the $4.2 million in potential monetary benefits and that the Director, U.S. Army Information Systems Command, provide a concurrence or nonconcurrence with the $935,287 in adjusted potential monetary benefits identified in Appendix D of this report. Potential monetary benefits are subject to resolution in the event of nonconcurrence or failure to comment.

DEFENSE DATA NETWORK

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Prepared by:
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DEFENSE DATA NETWORK

PART I - INTRODUCTION

Background

The Defense Data Network (the Network) is a component of the Defense Communications System, which is operated by the Defense Communications Agency (the Agency). The Network is a computer-based system that is intended to provide an interoperable, survivable, secure, and cost-effective data communications service to the DoD, enabling computer systems to exchange information worldwide.

The Network consists of four separate communications networks. The largest segment of the Network is the Military Network, which is a worldwide, unclassified system providing common-user data communications to the DoD and other selected Government and non-Government activities. The Military Network is composed of packet switching nodes, inter-switch trunk circuits, monitoring centers, and access lines. Appendix A defines these and other communications terms.

The Network was adapted from the Advanced Research Project Agency Network (ARPANET), the first packet-switching Network. ARPANET was designed under a 1969 Defense Advanced Research Projects Agency research and development program. Responsibility for the operation of ARPANET was transferred to the Agency in 1975. The users of the ARPANET were switched to the Military Network in 1983.

In April 1982, the Deputy Secretary of Defense directed the Director, Defense Communications Agency, to proceed with the development of the Network as outlined in the January 1982 ARPANET (see Appendix A) Replica Plan. The Deputy Secretary directed that all DoD data communications users were to be integrated into the Network, which is a common-user Network that provides long-haul (see Appendix A) data communications services.

The ARPANET Replica Plan was superseded by the Defense Data Network Program Plan (the Program Plan) in May 1982. The Program Plan presented a design for the Network that would satisfy worldwide survivability requirements and meet the security requirements established by the Joint Staff.

The Under Secretary of Defense for Research and Engineering memorandum, "Defense Data Network (DDN) Implementation," March 10, 1983, contains the guidance and program direction on the mandatory use of the Network by DoD Components. The guidance

sets specific objectives for the Network to ensure that it was an operationally and economically effective program. These objectives included confirming user requirements, identifying time frames for the connection of systems to the Network with a goal of maximum interoperability (see Appendix A), and developing an effective cost recovery scheme. The guidance provides for updating, refining, reviewing, and approving changes in the definition and scope of the Network. The ASD(C^3I) is to review the guidance, direction, and taskings in support of the Network on a continuing basis. The guidance endorsed the Program Plan as the initial planning document for the Network.

On February 2, 1987, the ASD(C^3I) approved the Defense Data Network Security Architecture (the Architecture), the framework for the security of the Network, which revised the security plan to protect communications that was specified in the original Program Plan. Currently, the classified Network must be isolated from unclassified circuits for security purposes.

The Office of the Joint Chiefs of Staff Memorandum of Policy 195, "Defense Data Network and Connected Systems," September 9, 1987, established that the Network was the primary means of providing long-haul data communications for all DoD data systems and confirmed that the Network was under the operational direction and management control of the Director, Defense Communications Agency.

DoD Directive 5000.1, "Major and Non-Major Acquisition Programs," September 1, 1987, establishes policies governing the acquisition of major and nonmajor programs. DoD Components are required to enhance program stability by conducting realistic long-range planning. DoD Components are also required to establish program baselines and assign program managers the authority and resources required to achieve these baselines. A program baseline is an agreement between a program manager and the Defense Acquisition Executive (or other OSD executive having oversight) that summarizes factors against which the program will be evaluated, such as functional specifications, cost, schedule objectives, and requirements. Also, acquisition programs are to be estimated, programmed, budgeted, and funded realistically. Additionally, this Directive provides for effective internal control measures to manage acquisition programs.

DoD Instruction 5000.2, "Defense Acquisition Program Procedures," September 1, 1987, establishes procedures, requirements, and responsibilities for acquiring major defense acquisition programs. The Defense Acquisition Board Executive Secretary, advised by 1 of the 10 committee chairpersons reporting to the Board, may recommend programs to the Defense Acquisition Executive for designation as a major acquisition at any point in the acquisition process.

DoD Directive 7920.1, "Life-Cycle Management of Automated Information Systems (AIS's)," June 20, 1988, provides for the life-cycle management of automated information systems, including microcomputers, that support all DoD mission areas including mission critical applications. Automated information systems include computer and telecommunications resources that collect, record, process, store, communicate, retrieve, and display information.

The Agency's Director was designated Program Manager for the Network by the Under Secretary of Defense for Research and Engineering. The Network was financed primarily through the Communications Services Industrial Fund, but additional funding was programmed by the Agency for Agency Headquarters support to the Network and by the Military Departments for preparing computer systems to connect to the Network.

Objectives and Scope

Our overall audit objective was to determine whether the development and implementation of the Network had proceeded on schedule and in a cost-effective manner consistent with guidance established in 1983 by the then Under Secretary of Defense for Research and Engineering. Specific audit objectives were to determine if increases to original program cost estimates were reasonable and justified, if the Network was responsive to the needs of DoD users, and if applicable internal controls were adequate. Another specific audit objective was to determine if methods used to obtain contractor support were in compliance with applicable acquisition regulations and would produce cost-effective results; however, we deferred this objective to a future audit of Network contract support.

The total program costs for the Network were estimated at $1.039 billion for FY 1982 through FY 1992. The audit was limited to the Military Network, or unclassified segment of the Network, because the General Accounting Office completed an audit of the classified segment of the Network in January 1989. The Network program management office did not maintain separate cost records for the Military Network, but available records indicated the Military Network accounted for more than 70 percent of the total program costs for FY 1982 through FY 1992. Activities we visited or contacted during the audit are listed in Appendix E.

We interviewed personnel from OSD, the Joint Staff, the Military Departments and their communications commands, the Defense Logistics Agency, the Defense Communications Agency, other Government agencies, and contractors providing communications services to the Government. We reviewed documents dated from October 1970 through July 1989 related to general policies and

procedures for the acquisition of DoD weapons and communications systems, and we reviewed specific program guidance and direction for the Network. We analyzed management plans and reports, program schedules, budget submissions, accounting and finance records, studies and analyses, data sheets, and contractor progress and status reports on the development and operation of the Network. We randomly selected 91 computer systems that were connected to the Network to survey DoD Components and to determine whether their computers were connected in a timely manner.

This economy and efficiency and program results audit was made from August 1988 to July 1989. The audit was made in accordance with auditing standards issued by the Comptroller General of the United States as implemented by the Inspector General, DoD, and accordingly, included such tests of internal controls as were considered necessary.

Internal Controls

The audit identified internal control deficiencies as defined by Public Law 97-255, Office of Management and Budget Circular A-123, and DoD Directive 5010.38. Guidance that ensures controls over the acquisition and operation of the Network was not followed or enforced. Also, guidance and procedures for monitoring the connection and disconnection of leased, data circuits were not established. In addition, detailed plans for implementing security for the Network were not developed. We recommended that the Director, Defense Communications Agency, report the noncompliance with the 1983 guidance of the Under Secretary of Defense for Research and Engineering and the lack of policies, procedures and plans for monitoring data circuits and for implementing the Network Security Architecture as material internal control weaknesses. Recommendations 3.a.(1)(a)., 3.a.(2)., 3.b., 3.c., and 3.g. in this report, if implemented, will correct the weaknesses. A copy of the final report will be provided to the senior officials responsible for internal controls within the Agency.

Prior Audit Coverage

The Inspector General, DoD, Report No. 86-105, "Report on the Survey of In-Process Reviews of Nonmajor Systems at DCA," dated July 8, 1986, stated that the Agency was conducting reviews of the Network's development and operation, which were found to be generally acceptable. The audit report made no recommendations.

The General Accounting Office Report No. C-IMTEC-89-1, "Telecommunications: Modifications Needed to Expedite Critical Defense System," dated January 1989, stated that no specific

threats and associated requirements for survivability had been defined and prioritized for the Network. Although overall Network design features should improve system survivability, no analyses or monitoring had been performed to evaluate the effectiveness of these features or to determine if additional measures may be needed. The report recommended that specific threats be defined and prioritized and that Network survivability be analyzed against the threats. The DoD response to the report stated that specific threats were defined and prioritized in a 1981 Joint Chiefs of Staff memorandum and were documented in the 1982 Defense Data Network Program Plan. The DoD stated that a survivability analysis would be completed by the end of 1989. As of the completion of our audit, the survivability analysis had not been completed.

PART II - FINDING AND RECOMMENDATIONS

Defense Data Network Program Management

FINDING

The Defense Communications Agency (the Agency) did not satisfy the DoD program objectives for the Defense Data Network (the Network) and did not provide required data communications services to DoD Components in a timely and cost-effective manner. This condition occurred because the Agency did not follow DoD guidance, which included program direction established in March 1983 by the then Under Secretary of Defense for Research and Engineering. The program direction required that the Director, Defense Communications Agency, update the definition and scope of the Network and that the Assistant Secretary of Defense (Command, Control, Communications and Intelligence) (ASD[C^3I]) review and approve any major changes in scope, schedules, cost, and composition of the Network. The ASD(C^3I) did not provide effective oversight and did not enforce DoD policies affecting the Network development and management.

The audit showed that about 81 percent of the DoD computers requiring unclassified data communications services were not connected to the Network because DoD requirements for data communications services increased far beyond the capabilities of the Network. This increase occurred while the expected completion date (FY 1986) for the unclassified segment of the Network slipped at least 3 years, and the projected costs for developing and operating the total Network increased from $421 million to $1.039 billion (a 146-percent increase) for FY 1982 through FY 1992. Conversely, in cases where network service was provided, previously leased data communications circuits that were replaced by the Network were not disconnected. In the Army, monetary benefits of $935,287 were not realized by disconnecting leased data communications circuits that duplicated the Network service. Additional monetary benefits were not realized from more expeditious connections of computers to the Network. The Agency had not installed security devices required for the Network, and associated delays could cost the Government more than $4.2 million in interest expenses and storage costs. Further, the Network operating costs were not equitably allocated among users.

DISCUSSION OF DETAILS

Computer Connections Versus Requirements. The Director, Defense Communications Agency, was not satisfying the 1983 program objective of maximum interoperability of DoD computer systems by connecting DoD systems requiring data communications

services to the Network. The 1982 Defense Data Network Program Plan (the Program Plan) estimated that the Network would be fully operational by 1986, providing data communications services to 488 host computers and 1,446 computer terminals in DoD. The total development and operating costs for the Network were originally estimated to be $421 million for FY 1982 through FY 1992. As of June 1989, 1,346 host computers (a 175.8-percent increase) and 1,572 computer terminals (an 8.7-percent increase) were connected to the unclassified segment of the Network. However, 5,964 additional host computers and 5,811 additional computer terminals had defense data requirements, but were not connected to the Network. Using all available financial information, we estimated the total development and operating costs of the Network would exceed $1.039 billion (a 146-percent increase) for FY 1982 through FY 1992. The Director attempted to update the original Program Plan in September 1987 for FY 1988 through FY 1992 to include projections of user requirements. The draft 1987 Program Plan projected that the number of DoD computers requiring connection to the Network would exceed the number of computers planned and funded for connection by 6,307 (8,255 required and 1,948 planned) through FY 1992. However, the Director did not submit the updated plan to the ASD(C^3I) for review and approval, primarily because of the change in program direction during the plan's development.

The new program direction emphasized expediting connections of DoD computers to the Network within Agency budget constraints. This program direction increased the number of computers connected to the Network from 390 for the 3-year period ending FY 1986 to 1,346 host computers for the period ending June 1989. The Director's commendable achievement vastly increased the Network's service to DoD Components.

Although DoD computer connections to the Network significantly increased, 5,964 computers (81.6 percent of 7,310 requirements) still required connection to the Network. The 1989 Defense Communications Systems Architecture contained a projection that DoD data communications traffic would increase 25 to 125 times by 1995. Therefore, the number of DoD computers that would require connection to the Network would be much higher than current estimates. Considering this projection, the goal of maximum interoperability did not appear achievable based on the Agency's rate of connections at the time of the audit.

Alternative Solutions. The explosive increase in the number of DoD computers requiring access to the Network and the limited ability of the Network to accommodate increasing requirements dictated the need to seek alternative solutions. However, the Director did not prepare analyses that identified the shortfalls in satisfying Components' data communications

requirements. Instead, the Director requested that the Joint Staff direct DoD Components to prioritize their requirements for computer connections. Each Component prepared a priority scheduling list of up to 400 computer connections for FY 1988 and submitted it to the Director. The Network program manager used the lists to schedule connections to the Network based on the availability of the Agency's funds for the Network in that budget year.

This method limited the number of computer connections and did not determine the shortfall in satisfying requirements for connections by evaluating the available resources against the existing and projected demand. Consequently, the Director had no long-range plan of alternatives for resolving the growing backlog of subscribers. We believe the Director should establish the total demand for the Network, determine the projected backlog of subscribers, and evaluate the alternatives for satisfying these requirements. As required by the 1983 guidance of the Under Secretary of Defense for Research and Engineering and DoD Directive 5000.1, the alternatives should be considered within new cost, schedule, and performance thresholds approved by the ASD(C^3I). These alternatives should also consider the trade-offs among budget increases, schedule extensions, technical enhancements, commercial data communication services, and changes to existing policy.

Waiver Policy. The ASD(C^3I) implemented a waiver policy in 1983 that allowed the Agency to grant temporary exemptions to DoD Components from the mandatory use of the Network. However, the waiver policy was not an effective method for accommodating the growth in requirements for use of the Network. The Agency was to ensure that DoD Components made a timely transition from dedicated or other data circuits to the Network by requiring that the DoD Components prepare a plan for transitioning to the Network and by monitoring the DoD Components' preparation of computers for connection to the Network. As of October 1988, 150 DoD Component activities were granted a waiver from using the Network.

After the waiver policy was implemented in November 1987, the ASD(C^3I) recognized that the rate at which the Agency was connecting DoD Components' computers to the Network was less than the rate of new requirements for Network use. In addition to noting technical problems in connecting DoD subscribers' computers in 1988, the ASD(C^3I) noted that the planned funding for the Network was not adequate to support current and projected requirements for connecting DoD Components' computers. In attempting to alleviate the shortfall of connections, the ASD(C^3I) encouraged DoD Components to augment the funding of the Network for their specific connection requirements. The ASD(C^3I) also planned

several revisions to the waiver policy to accommodate the increase in requirements, but did not issue new policy.

Waiving Components from mandatory use of the Network is a temporary solution that does not resolve the increasing demand for data communications services in the DoD. We believe the ASD(C^3I) should reevaluate the need for the waiver policy in lieu of other more effective solutions including recommending changes to the DoD policy that the Network be the single provider of long-haul data communications services in DoD.

Commercial Alternatives. In June 1988, the Director, Defense Communications Agency, performed a feasibility study of supplementing the Network with a leased commercial service. From the study, he determined that alternatives proposed by vendors for a leased service equivalent to the CONUS segment of the Military Network were not cost-effective. The Director also determined that commercial alternatives could not improve the rate of connecting DoD subscribers to the Network. On June 2, 1988, the Director concluded that the commercial alternatives should be reconsidered in the future when system integration planning for the mid-1990's will be performed.

The commercial vendors included in the feasibility study were required to consider military features, such as DoD standard software protocols, precedence levels, and inter-switch trunk encryption (see Appendix A) in preparing analyses for the leased alternatives. These military features were required to satisfy program objectives of interoperability, survivability, and security and accounted for about 35 percent of the total costs of the Network. We found that these military features were not being implemented for the Network and may not be necessary. For example, the Architecture requires that the backbone (see Appendix A) of the Network be 100-percent encrypted (encoded) to ensure that transmitted data are adequately protected. Data were transmitted over the Network when less than 5 percent of the CONUS portion of the Military Network segment was encrypted. This record of transmissions contradicts the need for 100-percent encryption of the CONUS portion of the Military Network as a security requirement. Because the rate of connecting DoD computers to the Network did not keep pace with the increase in requirements, and because the need for some military features was questionable, the criteria for evaluating commercial alternatives to the CONUS portion of the Military Network should be changed.

After the evaluation of a leased equivalent to the CONUS segment of the Military Network, Congress mandated the use of the Federal Telecommunications Services (FTS) 2000 system for all Government telecommunications services. The FTS-2000 includes data communications services that can be used by DoD Components when

the system becomes operational in FY 1990. At the time our audit concluded, OSD was still evaluating the appropriateness of the FTS-2000 relative to national security responsibilities of DoD. However, the ongoing evaluation of the FTS-2000 did not address all services potentially available to the Military Network. The FTS-2000 provides a solution to the increasing demand for data communications services in DoD that has not been resolved by either the ASD(C^3I) or the Director. Accordingly, a cost and technical analysis of commercial alternatives, which includes the FTS-2000 system, should be performed to evaluate the feasibility of replacing or supplementing the Network with commercial, leased data communications services.

Providing commercial service as an alternative to the Military Network may require a change in DoD policy initiated by the ASD(C^3I), if analyses determine that commercial alternatives could satisfy the increasing demand for data communications services and could be cost-effective.

Network Program Management. The 1983 memorandum by the Under Secretary of Defense for Research and Engineering specifically assigned program management responsibility to the Director, Defense Communications Agency. The Director assigned the Deputy Director, Defense Communications System Data Systems, as the Network program manager. Subsequently, a program management office was established with 115 personnel. The effectiveness of Network program management was seriously impaired, because the Network program manager was not given the authority needed to effectively carry out assigned tasks. The Network program manager did not have and still does not have authority commensurate with the intent of policies established in DoD Directive 5000.1, DoD Instruction 5000.2 for major programs, and DoD Directive 7920.1 even after Network projected costs passed the dollar thresholds normally associated with major defense acquisition programs or major automated information system acquisitions. This condition contributed to the unforeseen cost growth and the lack of compliance with the DoD policy that mandated all DoD computers be connected to the Network.

Program Baseline. The Director, Defense Communications Agency, and the ASD(C^3I), did not comply with the 1983 guidance from the Under Secretary of Defense for Research and Engineering regarding Network management. The Director did not update the Program Plan to incorporate new cost, schedule, and performance objectives for the Network which would establish a new program baseline. In addition, the ASD(C^3I) did not formally review and approve the changes made to the Network that affected the program baseline established in the Program Plan.

The Agency's Director changed the composition of the Network presented in the Program Plan by planning and developing new devices, upgrading equipment, and reallocating responsibility to pay leasing and procurement costs from the Agency to the DoD Components. These changes significantly changed the program baseline and associated objectives. But no new, approved program objectives were established as criteria to evaluate the overall success of the Network as required by DoD Directive 5000.1.

Without adequate criteria, effective management oversight was essentially lost over the Network. Independent management decisions at the Agency could not be measured against performance criteria, and the Network program manager could not be held accountable for the operation of the Network.

Dedicated Data Circuits. Monetary benefits were not realized from disconnecting dedicated, leased data circuits (see Appendix A) that duplicated Network service. Connection to the Network was to provide maximum interoperability for computers and other devices in DoD that have data communications requirements. As DoD computers become operational on the Network and can transmit and receive data effectively, the dedicated data circuits leased by the Components should be disconnected. However, our survey of Network subscribers showed that DoD Components were not disconnecting the dedicated, leased data circuits that duplicated Network service.

From our survey, we selected an information system (Army Sustaining Base Network) in the U.S. Army Information Systems Command for further evaluation. The system had 46 computers that required connection to the Network and had a waiver from the Agency that allowed for the system of computers to transition to the Network by 1993. The activity managing the system had no criteria either for determining whether the dedicated, leased data circuits were required during the transition period or for disconnecting the circuits.

Although the Army information system was not fully transitioned, as of March 31, 1989, the system could effectively transmit and receive data among 15 of its computers using the Network. At that time, the activity paid $170,750 a year for 19 dedicated, leased data circuits for 10 of the 15 computers that duplicated the Network service. These dedicated circuits were effectively replaced by the Network and should have been disconnected, saving $170,750 annually in leased circuit costs, or about $935,287, adjusted for inflation, for the 5-year period ending FY 1994.

In a comprehensive cost comparison, the Program Plan showed that the acquisition and operation of the Network would be more cost-effective over a 10-year period than using dedicated, leased data circuits. The ASD(C^3I) issued guidance in November 1987 that

precluded use of data communications services other than the Network, unless the DoD Component had been granted a valid waiver. This action, however, was limited to Components leasing new dedicated data circuits and did not provide the direction and guidance for the Director and DoD Components to disconnect existing dedicated, leased data circuits when host computer systems or other devices became operational on the Network.

DoD Components had 4,046 dedicated, leased data circuits with annual total costs of about $48 million. Some of these circuits were potentially replaceable by the Network, which could result in monetary benefits additional to the $935,287 identified above. However, the ASD(C^3I), the Agency, and the DoD Components had not evaluated the composition of the 4,046 dedicated data circuits to determine which circuits were replaceable by the Network. Therefore, the Director should establish procedures to identify, track, and report to the DoD Components and OSD which dedicated data circuits should have been or will be replaced by the Network.

Additional guidance from the ASD(C^3I) and implementing instructions from the Agency's Director are necessary to avoid duplication and to reduce costs for data communications services. In our opinion, the potential monetary benefits could offset the costs incurred by DoD Components for purchasing the software, hardware, and data circuits necessary to connect with the Network and could expedite the transition of subscribers to the Network.

Leased Defense Data Network Circuits. In addition to failing to disconnect dedicated circuits, access lines for connection of DoD computers to the Network were leased for excessive periods before the computers were operational on the Network. The Network program manager could have reduced costs for the leasing of data circuits by more effectively monitoring the connection of DoD Component computers to the Network. We surveyed DoD Components in our random selection of 91 operational systems with computers connected to the Network and found 45 (49 percent) of the host computers were delayed more than 6 months before becoming operational on the Network. These delays resulted in the Agency paying for leased data circuits while host computers were awaiting connection to the Network.

An information system manager in the U.S. Army Information Systems Command identified 73 leased data circuits that were used to connect Command computers on the Network. We calculated the recurring costs for leasing these data circuits from the month the first payment was made to the month the computer became operational on the Network, or to December 1988, the cutoff period for our analysis. Thirty-three data circuits had no recurring costs recorded or had no excessive costs incurred.

However, for the remaining 40 data circuits, the Agency paid $185,530 for 17 leased circuits that were later canceled, and the computers were never connected to the Network. An additional $123,817 was paid for another 15 leased circuits, and the computers were not operating over the Network as of April 1989. The Agency paid for one of these circuits monthly since July 1, 1987, although no data were transmitted over this circuit. A summary of our analysis of the unnecessary payments made for these data circuits follows.

Summary of Excess Recurring Costs of Data Circuits

Status of Connections	Leased Access Lines	Excess Costs
Operational Computers	8	$ 56,213*
Nonoperational Computers	15	123,817
Canceled Requirements	17	185,530
Total	40	$365,560

* Excess costs less 60 days of leasing expenses to allow lead time for computers to become operational.

The Network program management office scheduled computer connections to the Network that included a sequence of events for preparing the computers for the connection. During the scheduling process, the Network program management office did not monitor the status of the preparation, funding, or integration of computers at the Component level.

Leasing access lines for excessive periods occurred because DoD Components did not have sufficient funds budgeted or available to procure the hardware and software needed to connect the computers to the Network as scheduled. Proper monitoring and coordinating between the Network program management office and the DoD Components would have reduced the costs for leasing access lines required for connecting computers to the Network.

Program Planning. The Director, Defense Communications Agency, did not perform adequate long-range planning for the Network. The Program Plan and the February 1987 Architecture were essentially the only detailed, planning documents reviewed and approved by OSD. Although the Program Plan included a comprehensive cost comparison of alternative program plans, design approaches to the survivability and security of the Network, and schedules for implementing system hardware and software, the Program Plan was intended to be an initial planning document only. The Program Plan was not supplemented with more

definitive analyses, such as a complete life-cycle cost estimate, a survivability analysis, and a test and evaluation master plan.

Life-Cycle Cost Estimate. The Network program manager had not completed a life-cycle cost estimate of the complete Network. Consequently, the total cost for developing and operating the Network was understated. DoD guidance requires life-cycle cost estimates to provide full visibility of program costs and to serve as a management tool in assessing variances in actual acquisition and operating costs when comparing predictions of these costs for program decisions. In March 1982, the Network program management office completed a comprehensive cost comparison of alternative program plans for the Network. However, that comparison was not a life-cycle cost estimate of the complete Network, because costs such as site preparation and development of separate subnetworks were excluded.

A life-cycle cost estimate initiated in 1987 for the Defense Communications System included the Network. The Network portion of the cost estimate was completed in May 1989, but was limited to the Communications Services Industrial Fund. Costs for the Agency's Headquarters and for the DoD Components to purchase hardware, software, and other operation and maintenance expenses for computer connection to the Network were excluded. The exclusion of these costs significantly affects the overall perspective of the success of Network operations from a cost-effectiveness standpoint. The Network program management office needs to complete a life-cycle cost estimate that will include all costs associated with the development and operation and maintenance of computers by DoD Components for the Network.

Survivability. The Agency had not prepared sufficient plans and analyses to evaluate the Network's survivability against threats to data communications. The Program Plan, which included a survivability analysis and threat assessment, was outdated. Since 1982 when the Network was initiated, changes were made in the Network's configuration and operational capacity affecting its survivability. Some of the changes are described below in the OSD review of the Test and Evaluation Master Plan. However, the Program Plan was not updated, and a sufficiently detailed threat assessment and survivability analysis were not made. These deficiencies were corroborated in the January 1989 General Accounting Office Report, "Telecommunications: Modifications Needed to Expedite Critical Defense System."

Test and Evaluation Master Plan. The Network program management office began preparing drafts of test and evaluation master plans in 1983 that included sections on survivability, vulnerability, and threats to the Network. The Director, Operational Test and Evaluation, DoD, who prescribes the outline and content of these plans, did not approve the draft test and

evaluation master plans for the Network because the plans were deficient in setting criteria used for testing.

The Network program management office submitted its first draft test and evaluation master plan to OSD for review and approval in September 1986. In its review of the draft in April 1987, the Director, Operational Test and Evaluation stated:

> The DDN [the Network] is recognized as an operational Network, but there are major upgrades and enhancements planned which could potentially impact the operational capacity, availability, vulnerability, reliability, cost and maintenance of the system. Therefore, it is necessary that the developmental and operational goals, thresholds, and test-verifiable criteria be provided in the TEMP [test and evaluation master plan] for the overall DDN, different networks [including the Military Network], and components. Without these items being clearly defined and provided in quantitative numbers, it is difficult, if not impossible, to test and evaluate the progress of the DDN enhancements and upgrades.

The OSD also stated:

> The survivability features of the DDN are not clear, and the testing and evaluation of these features needs to be included in the TEMP. For example, what are the acceptable degradation thresholds (e.g., number of networks, adaptive routing, restorability features/times) for the different mission areas? The survivability features required in a system should be based on the threat. Therefore, request that the threat and threat/vulnerability assessment of the DDN be provided to DUSD(T&E) [Deputy Under Secretary of Defense (Test and Evaluation)] and Director, OT&E [Operational Test and Evaluation] prior to the resubmission of the TEMP.

We found no evidence that a threat assessment or a survivability and vulnerability analysis were prepared since this 1987 review by the OSD.

The Network program management office had prepared two additional draft test and evaluation master plans since 1986, one in December 1987 and one in November 1988. The draft plans were

submitted, but not approved by the Director, Operational Test and Evaluation, who officially designated the Network as a program for his oversight in September 1988.

OSD critical comments on the draft test and evaluation master plan prepared in December 1987 reiterated that more clearly defined quantitative goals and thresholds were required for confirmation of the Network's operational effectiveness. We determined that these goals and thresholds had not been quantified in the draft plan prepared in November 1988. For example, a requirement for the minimum amount of data to be transmitted through the Network by a cross-section of DoD Component users was not specified as a criterion in the draft plan. Therefore, the Network could not be tested against this criterion to determine its survivability. In conclusion, 7 years have passed, and more than half a billion dollars has been spent since the Network was initiated in 1982, but a test and evaluation master plan has yet to be approved for the system.

Security. Although the 1987 Architecture required that detailed plans be prepared for installing security devices in the Network, the Agency had not prepared the plans. Consequently, the security program objective was not accomplished, because security devices required for the operation of the Military Network segment of the Network were not installed. The Program Plan projected that the Network would have adequate security protection when the Network was operational in 1986. The Architecture required that the classified segment of the Network and the DoD Components' host computers use security devices (KG-84A's) for the encryption of data transmissions. From September 1983 to February 1985, the program management office placed purchase orders with the National Security Agency for 3,828 KG-84A's to satisfy this requirement.

In the 1987 Architecture, the program management office proposed that the unclassified Military Network segment be completely encrypted with KG-84A's by 1988. The Agency fell short of this target date. The Agency completed encryption of less than 5 percent of the CONUS segment of the Military Network through June 1989.

The National Security Agency, the DoD procuring activity for communications security devices, changed its guidance in 1988 for encrypting CONUS communications, affecting the requirements for KG-84A's for the Network. Basically, the National Security Agency decided that data transmitted over certain CONUS communications lines did not need encryption. However, since the change in guidance, the Defense Communications Agency had not evaluated the impact on the need for and distribution of KG-84A's in the Network. Since 1986, the Agency maintained an average inventory of about 2,100 KG-84A's at Kelly Air Force Base,

Texas. These stored KG-84A's could have been used to satisfy security requirements for other systems of the DoD Components. In addition, the effective interest and storage expense to the Government for unnecessarily holding these KG-84A's was about $2.9 million for January 1986 through June 1989. If the installation of the KG-84A's is not expedited for the Network, the Government will incur about $4.2 million in unnecessary interest expenses and storage costs over a 5-year period for maintaining an inventory of 2,100 KG-84A's.

Although requirements for encrypting CONUS communications may have decreased, on February 3, 1989, the program management office estimated that overall requirements for the KG-84A's for the Network had increased by 2,430. But, the additional KG-84A's were not purchased. The current contracts issued by the National Security Agency for the KG-84A's are expiring and, therefore, no new KG-84A's will be procured. Consequently, the Network may need new security devices (KG-84C's) to satisfy the requirement. However, the Network program management office had not planned, programmed, or budgeted sufficient funds to acquire additional KG-84A's or the KG-84C's.

Usage Sensitive Billing. The program management office had not effectively implemented an equitable cost recovery scheme for the Network, as specified in the 1983 Under Secretary of Defense for Research and Engineering guidance. Through FY 1989, the primary DoD subscribers to the Network, the Military Departments, paid one-third each of the total Communications Services Industrial Fund annual costs for the Network, although each Military Department had differing rates of Network usage.

At the time our audit concluded, to rectify the inequities, the Agency was preparing to implement a usage sensitive billing system in FY 1990 that will base Network charges on the amount of data transmitted and on a monthly connection fee for specified subscribers. However, because the Agency could not provide adequate data traffic statistics for budgeting estimated expenses, the Army and the Air Force deferred fully implementing their billing system to FY 1992. DoD Components were concerned that the usage sensitive billing system would not provide the type of information necessary to bill subordinate organizations. As a result, the Agency continued to investigate alternatives that would provide the billing capabilities required by the DoD Components. The development costs for these alternatives had not been definitized. Initial estimates of development costs indicated that as much as $2.2 million would be needed, and that the alternatives may take up to 2 years to implement after they are determined and accepted.

The billing system the Agency plans to implement in FY 1990 will provide data traffic and detailed Network charges only to the customers with computers directly connected to the Network. Customers with computers that are gateways (see Appendix A) will receive a billing statement of consolidated charges for all devices connected through the gateway to the Network. The Army and the Air Force plan to acquire additional gateways and implement them worldwide. Without detailed billing statements from the Agency for all Network users, DoD Components will have to develop supplementary accounting systems to determine and distribute Network charges to users connected to gateways.

The planned billing system proposed for FY 1990 also did not equitably allocate costs. DoD Components will be charged a tariff that was designed to fully recover costs for operating the Network. However, the basis for the tariff sets rates disproportionately between fees for traffic (the quantities of data transmitted) and connection fees. Traffic rates represent only about 35 percent of the total recovery costs of the Network, which compares to a 75-percent ratio used by some commercial services. This Network cost recovery method penalizes DoD subscribers that are required to be connected to the Network, but that have low traffic.

An equitable cost recovery scheme was a program objective that was to be expedited when the Network began in 1983. In July 1986, Joint Chiefs of Staff Memorandum MJCS-137-86 further specified four legitimate objectives for an adequate usage sensitive billing system. Implementing this system was complicated by the increase in requirements for data communications service and by the Components' technical innovations to accommodate the increase in requirements and take advantage of the proposed cost recovery scheme. Regardless of these complications, the functional features, associated costs, and performance of the usage sensitive billing system remained unresolved 6 years after the objective for an equitable cost recovery scheme was established. This delay was another indicator of inadequate planning and coordination by management in achieving program objectives for the Network.

Management Oversight. The ASD(C^3I) did not provide adequate oversight of the development and management of the Network as specified in the 1983 Under Secretary of Defense for Research and Engineering guidance and direction. A representative of the ASD(C^3I) attended regularly scheduled executive sessions at which managers reported the progress of the development and operations of the Network. Through these sessions and correspondence, the ASD(C^3I) was made aware of changes in Network requirements, DoD subscribers, program costs, and schedules. However, the ASD(C^3I) did not enforce compliance with DoD policy regarding Network

management. Although informal guidance and a waiver policy were issued, the only official documents or plans that were reviewed and approved by the ASD(C^3I) were the 1982 Program Plan and the 1987 Architecture.

The ASD(C^3I) took an inactive role in monitoring the Network and acquiesced to actions taken by the Network program management office. Milestones or deadlines for updating the Program Plan, the Architecture's required detailed security plans, a threat assessment, and a survivability analysis were not established. In contrast, other oversight managers in OSD, including the Director, Operational Test and Evaluation; and the Director, Defense Research and Engineering, ensured that adequate documents for testing the Network were prepared. First, on September 15, 1988, the Network was officially designated as a system for oversight by the Director, Operational Test and Evaluation. Second, the Director, Defense Research and Engineering, required the Network program management office to submit an adequate test and evaluation master plan by October 1, 1989, or the Director, Operational Test and Evaluation, would recommend a budget adjustment for the Network to the Comptroller of the Department of Defense.

Because of the inactive role of the ASD(C^3I), causes for the increase in estimated life-cycle costs to more than $1 billion and the need for major upgrades and new integration efforts for the Network have not been isolated and evaluated. To provide added assurance that the Network would receive adequate management oversight, the Network should be reviewed for designation as a major defense acquisition program in accordance with DoD Directive 5000.1 or for designation as a major automated information system in accordance with DoD Directive 7920.1. During the audit, we discussed this matter with officials of the Agency, the ASD(C^3I), and the Defense Acquisition Board. Those officials resisted reviewing the Network for designation as a major automated information system. The principal objections were that the Network was an operating system, and the funds used to acquire the Network were mainly from the Operation and Maintenance appropriations and not from Procurement appropriations.

Although we recognize the relative merit of these arguments, the vast increase in requirements and in costs indicate, in our opinion, the need for more intensive DoD management of the Network. If the Network is made a matter of interest to the Defense Acquisition Board, the Agency's Director could receive the authority necessary to resolve the wide disparity between demand and capabilities of the Network and the attendant funding problems that have plagued the installation of this vital communications network.

Internal Management Controls. The Director, Defense Communications Agency, needed to improve management procedures for planning and operating the Network to comply with DoD Directive 5010.38, "Internal Management Control Program." A material weakness in internal management controls occurs when a DoD Component is not complying with existing controls, or when the Component lacks applicable controls to safeguard or to protect against the waste, loss, fraudulent use, or mismanagement of resources or assets. The policies and procedures in the 1983 Under Secretary of Defense for Research and Engineering guidance, in DoD Directive 5000.1, and in DoD Instruction 5000.2 provided a framework of controls to ensure effective management of the acquisition and operation of the Network.

The increase in the estimated life-cycle cost of the Network from $421 million to $1.039 billion represented a significant increase. These costs should have been analyzed, reviewed, and approved to ensure that changes in the Network's composition were cost-effective and that program objectives were satisfied in a timely manner and in accordance with DoD policies. The Director's lack of updating formal planning documents to identify new thresholds that would accommodate the changes in the scope, requirements, cost, schedule, and composition of the Network resulted in noncompliance with established guidance and constituted a material weakness in internal management controls.

Other material internal control weaknesses occurred because the Director did not implement procedures for monitoring the disconnection of dedicated data circuits, the timely connection of the DoD Components' computer systems to the Network, and the timely installation of security devices for the Network. Each of these weaknesses has resulted in significant losses of resources and could cause future losses of resources. Accordingly, all the material weaknesses should be reported in the annual assurance statement as required by DoD Directive 5010.38 and should be tracked until the problems are resolved.

Summary. The Director, Defense Communications Agency, did not achieve the program objectives of data networking requirements, interoperability, survivability, and security of the Network by 1986 as intended. Requirements and costs of the Network continued to grow but the Agency was not exercising management oversight and revising its plans to identify current requirements, meet them, and obtain necessary funds. Also, the ASD(C^3I) had no criteria to determine whether the Network was successfully managed or whether the Network would achieve its ultimate objectives. The new program objectives would be more achievable if the Director improved the management procedures for planning and operating the Network, and if the ASD(C^3I) improved and enforced existing policies. Designating the Network as a

major defense acquisition or as an automated information system would provide the additional oversight to ensure that the program complies with existing DoD guidance and policies.

RECOMMENDATIONS FOR CORRECTIVE ACTION

1. We recommend that the Under Secretary of Defense for Acquisition refer the Defense Data Network to the appropriate Defense Acquisition Committee to determine if the Network should be designated as a major defense acquisition program or as a major automated information system under the guidance of the Defense Acquisition Board.

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

a. Require the Director, Defense Communications Agency, to update the definition and scope of the Defense Data Network as dictated by changes in user requirements, technological developments, and economic factors in accordance with the guidance, program direction, and policies established in March 1983 by the Under Secretary of Defense for Research and Engineering. In accordance with that guidance, review and approve the major changes in the scope, schedules, cost, and composition of the Defense Data Network submitted by the Director in an updated program management plan.

b. Issue specific guidance prohibiting the use of dedicated data circuits by DoD data communications subscribers who have completed their transition to the Defense Data Network. The guidance should require that firm dates be established for completing the transition from dedicated, leased circuits to the Defense Data Network for each type of system, computer, and device.

c. Update the cost and technical analyses of alternative commercial solutions, to include the Federal Telecommunications Service 2000 packet-switched data service, to the DoD data communications services provided by the unclassified Military Network segment of the Defense Data Network. The analyses should include an evaluation of the special military features that compares costs of these features to the risks associated with interoperability, survivability, and security of the Military Network.

3. We recommend that the Director, Defense Communications Agency:

a. Comply with the 1983 guidance for the Defense Data Network from the Under Secretary of Defense for Research and Engineering:

(1) By updating a program management plan that:

(a) Includes long-range projections of DoD Components' systems, computers, and other devices requiring connections to the Defense Data Network. The updated plan should establish appropriate cost, schedule, and performance objectives associated with these projections.

(b) Provides solutions to eliminate the backlog of DoD Components awaiting connections to the Defense Data Network. Alternative solutions should include evaluations of trade-offs among budget increases, schedule extensions, proposed technical enhancements, and recommended changes to current OSD policies that affect the operation of the Defense Data Network.

(2) By implementing a cost recovery scheme that equitably allocates costs for Defense Data Network utilization and provides sufficient services and information to DoD subscribers of the Defense Data Network.

b. Establish procedures for identifying, tracking, and reporting dedicated, leased circuits that should be replaced by the Defense Data Network consistent with guidance approved by the Assistant Secretary of Defense (Command, Control, Communications and Intelligence).

c. Implement procedures to collect and analyze the data necessary to effectively monitor the connection of DoD Components' computer systems to the Defense Data Network.

d. Complete a life-cycle cost estimate for the Defense Data Network that includes all costs programmed by the DoD Components in addition to the Communications Services Industrial Fund costs.

e. Complete the preparation of an adequate Test and Evaluation Master Plan for the Defense Data Network for the review and approval of the DoD Director, Operational Test and Evaluation.

f. Complete the preparation of a system-specific threat assessment for the Defense Data Network and a survivability analysis of the CONUS portion of the Military Network segment.

g. Require detailed plans addressing the development, acquisition, deployment, cost, and schedule for implementing the approved Defense Data Network Security Architecture in compliance with the Assistant Secretary of Defense (Command, Control, Communications and Intelligence) Memorandum, dated February 2, 1987.

h. Report the noncompliance with the 1983 Under Secretary of Defense for Research and Engineering guidance and the lack of procedures for monitoring data circuits and detailed plans for implementing security devices as material internal control weaknesses in accordance with DoD Directive 5010.38, "Internal Management Control Program," and track the status of corrective actions until the problems identified are resolved.

4. We recommend that the Commander, U.S. Army Information Systems Command, disconnect the dedicated, leased data circuits that have been replaced by the Defense Data Network and discontinue payments for leasing those dedicated circuits.

MANAGEMENT COMMENTS AND AUDIT RESPONSE

Management Comments on Finding. The Deputy Assistant Secretary of Defense (Command, Control, and Communications) and the Director, Defense Communications Agency, partially concurred with the Finding. The Deputy Assistant Secretary and the Director, stated that the Finding was misleading by indicating that the Network had a change in scope and had uncontrolled program cost growth. They concluded that the Network satisfied program objectives and stayed within the original program guidance and direction. In addition, in achieving its objectives, the Network supported more than eight times the number of users estimated at a lower cost per user than anticipated.

Audit Response. We disagree with the Deputy Assistant Secretary and the Director that the Finding was misleading. DoD Components' requirements for connection to the Network were increasing as were the estimated program costs. To satisfy these increasing requirements, the program costs would have to increase further, the connections would have to be delayed and stretched over a longer time period, or trade-offs would have to be made on other requirements of the Network. As a result, new cost, schedule, and performance objectives with associated thresholds should be established to account for these changes in requirements. The conclusion that the Network supports significantly more users than estimated at a lower cost per user than anticipated is oversimplified and inappropriate. Each customer added to the Network will share in the fixed costs; thus, the cost per customer will be reduced proportionately. This is a standard business principle, which requires more thorough analysis to determine the impact of added customers to the cost of the Network. Also, the comparison of known quantities (number of actual connections) and an unknown quantity (a budget estimate) for measuring performance is invalid. A better standard of measurement, such as the cost per user of the unclassified segment of the Network for any specified period of

time, was not estimated by the Network program management office. Therefore, an appropriate standard for evaluating management performance was not available. However, an independent study done by the Army (see Army's comments, Appendix C) showed that the cost of the Network is significantly higher than the Army's configurations for data communications. Consequently, the relationship drawn by the Deputy Assistant Secretary and the Director of total customers to total Network costs is inappropriate for assessing the performance of the Network managers.

We also disagree with the position that program objectives were satisfied within the original program guidance and direction. The ultimate objective of the Network is to provide interoperable, survivable, secure, and cost-effective data communications services to DoD customers worldwide using a single, computer-based system. We believe the inadequate planning and analyses of requirements and survivability factors, delays in installing security devices, and inefficiencies in connecting subscribers that are cited in Part II of our report support our conclusion that these multiple objectives were not being satisfied. Also, the 1983 USD(R&E) guidance specifies that the Director, Defense Communications Agency, is to "Establish appropriate management thresholds which will ensure early identification of major changes or problems in the program costs or schedules."

We reviewed the Defense Communications System Five Year Plan (the Five Year Plan) and determined it did not specify the thresholds for cost, schedule, and performance and did not contain sufficient detail for the Deputy Assistant Secretary to monitor the management and evolution of the Network. The Five Year Plan for FY 1990 and FY 1991 referred to the outdated 1982 Program Plan for cost figures and other detailed analyses of the Network. The Five Year Plan may be the appropriate planning document for the planning and programming of the Network within the Defense Communications Systems, but we believe the proper plan for program costs, schedule, and performance objectives and the thresholds mentioned in the 1983 USD(R&E) guidance is a program management plan that is periodically updated by the Defense Communications Agency and reviewed by the Office of the Assistant Secretary of Defense (Command, Control, Communications and Intelligence).

Management Comments on Recommendation 1. The Deputy Assistant Secretary, responding for the Under Secretary of Defense for Acquisition, nonconcurred with Recommendation 1. to refer the Network to the appropriate Defense Acquisition Committee to determine whether the Network should be designated as a major defense acquisition program or as a major automated

information system. The Deputy Assistant Secretary believed the Network did not meet the criteria for a major acquisition program or a major automated information system. Also, high-level oversight was unnecessary for the Network because an oversight panel, the Command, Control, Communications, and Intelligence (C^3I) Systems Committee, was in place, and no issues have arisen to warrant elevation of the program for review by the Committee.

Audit Response. The comments from the Deputy Assistant Secretary on Recommendation 1. address the thresholds in DoD Directive 5000.1, but do not address the thresholds in DoD Directive 7920.1. The Network may not meet the strict interpretation of the dollar criteria in DoD Directive 5000.1; however, we believe the inefficiencies in managing a Network that is mandated by the Deputy Secretary of Defense warrants special consideration in OSD. This special consideration satisfies another criterion in DoD Directive 5000.1 for designating the Network as a major defense acquisition program. Also, the total Network costs of $189 million (excluding annual Operation and Maintenance costs and the Military Departments' costs to integrate the Network) exceed the $100 million criterion for designation as a major automated information system prescribed in DoD 7920.1. In addition, although the C^3I Systems Committee was in place, the Committee has not been used in recent years to review the operation of the Network. We believe the report has highlighted several inefficiencies in planning and operating the Network that warrant elevation to an OSD Committee to independently evaluate the efficiency and effectiveness of managing the Network. The Network has also reached a point in its operation (about 7 years after its implementation in 1983) where a high-level review would be appropriate to evaluate the Network objectives and operational effectiveness against changing technology and DoD fiscal constraints. A high-level review of the Network would have been done 5 years after implementation under the major defense acquisition program and major automated information systems criteria. Based on the issues discussed in this audit response, we believe Recommendation 1. is still valid. Accordingly, we request that the Under Secretary of Defense for Acquisition reconsider his position on Recommendation 1. and provide comments in response to the final report.

Management Comments on Recommendation 2.a. The Deputy Assistant Secretary partially concurred with Recommendation 2.a. He is coordinating with the Agency on a revised program management plan that will be issued in June 1990. However, the Deputy Assistant Secretary believes the formal guidance for governing the evolution of the Network is the Defense Communications System Five Year Plan.

Audit Response. Concerning Recommendation 2.a., the planned action to issue a revised program management plan that will be reviewed and approved by the Deputy Assistant Secretary satisfies the intent of the recommendation. We still believe this is the proper plan for monitoring changes in program objectives of the Network for the reasons stated in our response to the Deputy Assistant Secretary's comments on the Finding.

Management Comments on Recommendation 2.b. The Deputy Assistant Secretary concurred with the intent of Recommendation 2.b. to issue specific guidance prohibiting the use of dedicated data circuits by data communications subscribers who have transitioned to the Network. However, the Deputy Assistant Secretary proposed that the revised program management plan being prepared for the Network by the Agency include a reference to a new, draft directive that will be issued in April 1990. The draft directive is being prepared by the Deputy Assistant Secretary and will provide the specific guidance recommended.

Audit Response. The alternative action proposed by the Deputy Assistant Secretary is responsive to Recommendation 2.b. We have revised this recommendation in the final report to reflect the planned actions, and we request that the Deputy Assistant Secretary comment on the revised recommendation in his response to the final report.

Management Comments on Recommendation 2.c. The Deputy Assistant Secretary partially concurred with Recommendation 2.c. that analyses of commercial alternatives to the Network should be updated. The Agency is evaluating alternatives in an ongoing study, the Integrated Data Communications System, Western Hemisphere (IDCS WESTHEM). The Deputy Assistant Secretary disagreed that a specific study for the Network should be conducted independently of the Agency, should include an evaluation of military features, and should include an evaluation of the applicability of the FTS-2000 data communications services.

Audit Response. For Recommendation 2.c., we reconsidered our position in recommending a study independently of the Agency, and we have revised this recommendation accordingly. The evaluation of commercial alternatives to the Network being considered within the context of the IDCS WESTHEM study conducted by the Agency is responsive to Recommendation 2.c. However, the target date for completing this effort was not provided in management's comments on the draft report. Also, we believe potential changes in the Network Security Architecture could affect the goal of fully integrating the unclassified Military Network with the classified Network, thereby affecting the need for military features and the applicability of the FTS-2000

communications services. The classified Network currently must be isolated from unclassified circuits for security purposes. This condition conflicts with one of the original goals of the Network, which was to have a fully integrated data communications system in DoD. The Network will operate as two separate, but connected systems coordinated under one program management office. Under this operating method, the need for military features in the CONUS portion of the unclassified Network and the applicability of commercial alternatives may be different from the current planned operating method. For these reasons, the study of commercial alternatives to the unclassified Network should include an evaluation of military features and the applicability of the FTS-2000 data communications services. Therefore, we request that the Deputy Assistant Secretary reevaluate his position and provide comments on the revised Recommendation 2.c. in his response to the final report. We also request that a completion date for the IDCS WESTHEM study be included in the response.

Management Comments on Recommendation 2.d. The Deputy Assistant Secretary nonconcurred with Recommendation 2.d. in the draft report that the lack of enforcement of the 1983 Under Secretary of Defense for Research and Engineering (USD[R&E]) guidance and the absence of guidance on the replacement of dedicated, leased data circuits should be reported as a material internal control weakness to the Secretary of Defense. The Deputy Assistant Secretary stated that his office coordinates on the Defense Communications System Five Year Plan, and through this means and other actions, his office is in compliance with the 1983 USD(R&E) guidance. Also, additional guidance, specifically for the Network, beyond that currently planned for the disconnection of dedicated circuits is not necessary; therefore, no material internal control weakness exists.

Audit Response. Although we reaffirm that a material internal control weakness applicable to the 1983 USD(R&E) guidance existed for the reasons cited in our draft report, we believe the planned actions by the Deputy Assistant Secretary will correct this weakness. Therefore, we have deleted Recommendation 2.d. from the final report.

Management Comments on Recommendations 3.a., 3.c., 3.e. and 3.f. The Director, Defense Communications Agency, concurred with Recommendations 3.a., 3.c., 3.e. and 3.f. In response to Recommendation 3.a., the Director stated that an updated program management plan would be issued in June 1990 and that an equitable cost recovery scheme, implemented beginning FY 1990, would be monitored and refined as required to meet the intent of the 1983 USD(R&E) guidance. For Recommendation 3.c., the Network program management office would implement procedures by April 15,

1990, to collect and analyze the data necessary to effectively monitor the connection of DoD Components' computer systems to the Network. A Test and Evaluation Master Plan for the Network is expected to be completed by April 1990 in response to Recommendation 3.e. A threat assessment was prepared by the National Security Agency for the Network in October 1989 that will be coordinated with the Defense Intelligence Agency, and a survivability analysis is expected to be completed by April 1990 to satisfy the intent of Recommendation 3.f.

Audit Response. The comments and planned actions of the Director, Defense Communications Agency, are responsive to Recommendations 3.a., 3.c., 3.e., 3.f.

Management Comments to Recommendation 3.g. The Director partially concurred with Recommendation 3.g. The Architecture for the Network is being revised to include consideration of evolving security device technology; and critical features of the current Architecture, such as the installation of KG-84A's in the Network, are being expedited. The Director nonconcurred with the $4.2 million of potential monetary benefits derived from expediting the installation of KG-84A's into the Network. The Director stated that the delays associated with the installation of the security devices were the result of prudent business practices of evaluating cost-effective alternatives for the security of the Network.

Audit Response. The comments and planned actions of the Director are responsive to Recommendation 3.g. We disagree, however, that the delays and the costs associated with the installation of KG-84A's were the result of prudent business practices, but rather were the result of inadequate planning and monitoring of the installation of these security devices. We agree that the quantity of KG-84A's initially purchased should have been based on valid requirements, and we noted in the report that these requirements actually increased. We also agree that alternatives to purchasing additional security devices should be evaluated to avoid any unnecessary costs. However, the KG-84A's in the inventory should have been installed at the sites of the inter-switch trunks and the host computers as the Network and subscribers became operational. The KG-84A's were not being distributed to Network sites, and sites did not have the funds budgeted to accommodate the installations and upgrades. We determined that the Network program management office did not monitor the distribution and installation of KG-84A's for each site. Consequently, the Network program management office could not ensure that the KG-84A's were shipped to the appropriate sites and could not determine when and where the KG-84's were installed or make any adjustments in placing the specific KG-84A's. During our audit, the Network program management

office began coordinating the data necessary to monitor and ensure the installation of the KG-84A's. We maintain that had detailed plans been prepared and updated to track when and where the security devices were installed, the KG-84A's stored at Kelly Air Force Base for inordinate periods of time could have been expedited to Network sites or used to satisfy other DoD Components' requirements, regardless of changes in security policy. Therefore, we request that the Director reconsider his position on the potential monetary benefits of $4.2 million cited in the report and provide comments in his response to the final report.

Management Comments to Recommendations 3.b., 3.d. and 3.h. The Director nonconcurred with Recommendation 3.b. because OSD was updating policy and procedures for all long-haul circuit revalidations, which would include circuits related to the Network; and these updated procedures for identifying, tracking, and reporting dedicated circuits are Military Department Telecommunications Certification Office (TCO) responsibilities. The Director nonconcurred with Recommendation 3.d. because the life-cycle cost estimate for the Network, completed in May 1989, sufficiently addressed the costs of the Network, although the host computer equipment and software required by the Military Departments for connection to the Network were excluded from this estimate. In addition, the Director nonconcurred with Recommendation 3.h. because the material internal control weaknesses cited were not within the scope and control of the Agency and did not meet the criteria defined in DoD policy.

Audit Response. The actions planned by the Deputy Assistant Secretary to have long-haul circuits revalidated and to issue new policy in May 1990 that will update procedures for identifying, tracking, and reporting dedicated, leased data circuits and that will clarify TCO responsibilities are partially responsive to Recommendation 3.b. Although TCO's have the responsibility to coordinate, certify and monitor the Military Departments' requests for activating and terminating data circuits, we established that the Military Departments' organizations were not efficiently and effectively accomplishing these tasks. Because the Network program management office had no procedures to monitor the transition of the DoD Components from dedicated data circuits to the Network, the office was unaware of the effect the TCO's inactivity had on the implementation of the Network. The program manager has an ongoing responsibility to determine whether the Network is satisfying program objectives and whether the Network is cost-effective. Therefore, the program manager should have procedures to monitor the transition of the Components' computer systems to the Network and to report to the Military Departments and higher authorities any discrepancies, deficiencies, or inefficiencies that could be corrected. We

believe Recommendation 3.b. is still valid. Therefore, we request that the Director reconsider his position and provide comments on the final report.

Concerning Recommendation 3.d., we disagree that the life-cycle cost estimate for the Network completed in May 1989 sufficiently addressed the costs of the Network. One purpose of a life-cycle cost estimate is to provide full visibility of costs associated with a system so that the program manager can effectively monitor the development and operation of the system. This concept was reinforced in the program management plan completed by the Network program management office in 1982, which included the Components' costs to integrate their computer systems with the Network. These costs were excluded from the May 1989 life-cycle cost estimate, which is inconsistent with the 1982 procedure. These costs are important for several reasons, one of which is that the Components were not budgeting adequate funds for integrating their computer systems. A lack of adequate funds should concern the program manager, because without the budgeted funds, delays are caused in meeting target dates for the computer systems to be operational on the Network. We gave examples of the delays in connecting computers and in installing KG-84A's in Part II of of our report. The cause and impact of the delays in these examples support our position that the Components' costs to integrate their computer systems into the Network should be included in a life-cycle cost estimate. In addition, our analysis of the May 1989 life-cycle cost estimate showed that several costs were excluded from the breakdown of the work structure in the estimate, because the costs were unknown or were not accumulated, such as the costs for operating the Network program management office. We believe Recommendation 3.d. is still valid. Therefore, we request that the Director reconsider his position and provide comments on the final report.

We disagree that the material internal control weakness cited in Recommendation 3.h. was not within the scope and control of the Agency and did not meet the criteria defined in DoD policy. DoD Directive 5010.38 states that a DoD-level material weakness (a weakness serious enough to notify the Secretary of Defense) is a problem that amounts to $2 million or more. Also, a material weakness may be due to noncompliance with existing controls that deal with all program and administrative functions. The Agency was not in compliance with several policies governing the implementation of the Network as discussed in Part II of this report. In addition, the problems identified exceeded the $2 million criterion for reporting material weaknesses. We believe Recommendation 3.h. is still valid. Therefore, we request that the Director reconsider his position and provide comments on the final report.

Management Comments on Recommendation 4. The Army nonconcurred with Recommendation 4. to disconnect the dedicated leased data circuits that have been replaced by the Network, because the Network could not fully support requirements for transmitting data in the Army Sustaining Base Network (Army Standard Information System). The Army stated that some Army dedicated circuits are retained to satisfy requirements for the Standard Information System, and these circuits have an approved waiver. However, the Army examines and eliminates dedicated, leased lines that become excess as a result of the Network implementation and as a result of a separate study called Project Maximize, which was expected to be completed in February 1990. Through Project Maximize, the Army planned to disconnect 30 dedicated, leased circuits in 1990. The Army did not comment on the potential monetary benefits from disconnecting the 24 dedicated, leased circuits specified in the draft report.

Audit Response. Although the Army nonconcurred with Recommendation 4., the Army's actions involving Project Maximize will eliminate 30 dedicated circuits for the Army Standard Information System. Of the 30 dedicated, leased circuits, we determined that 6 were included in the 24 circuits we identified in our draft report as circuits that should be disconnected by the Army. These six circuits represented $350,210 in recurring savings over a 5-year period. The action taken to disconnect the six dedicated circuits partially satisfies the intent of the recommendation. We considered the Army's requirements for dedicated circuits to supplement the Network when we calculated that the 24 dedicated circuits could be disconnected. However, the Army's report on the reliability of the Network was not available prior to the issue of our draft report. We have since reviewed the Army's report on reliability and found that 5 of the 24 dedicated circuits identified in our draft report did not meet the reliability requirement. Accordingly, we have excluded them as circuits that should be disconnected. We still believe Recommendation 4. is valid for 19 of the dedicated, leased data circuits in our report. Accordingly, we request that the Army reconsider its position on disconnecting the remaining 13 circuits identified in our report. We also request that the Army comment on the adjusted potential monetary benefits of $935,287 over a 5-year period for disconnecting 19 dedicated circuits.

DEFINITIONS

Access Line	Leased data transmission circuit connecting a DoD Component's host computer or computer terminal to the Defense Data Network.
ARPANET	Advanced Research Projects Agency Network; Experimental Network developed under the sponsorship of the Defense Advanced Research Projects Agency in 1969 to test the advanced technology concepts of long-distance packet-switching and resource sharing.
Backbone	Network core transmission device comprised of packet-switches and inter-switch trunks.
Common-User Network	Communications Network shared among DoD computer devices.
Communications Services Industrial Fund	A revolving working capital account that funds the operating costs and bills at established rates to participating departments and agencies.
Dedicated Data Circuit	Leased transmission line that permanently connects two or more user locations.
Encrytion	Encoding data for security purposes.
Gateway	A computer that enables data to be transmitted from the Defense Data Network to another data Network.
Interoperability	The condition achieved among communication-electronics systems when information or services can be exchanged directly and satisfactorily between and among them and their users.
Inter-Switch Trunk	Leased data transmission circuit connecting two packet-switching nodes.
KG-84A	Cryptographic device to provide encryption for data transmitted between computer devices.
Long-Haul	Communications extending beyond post, camp, or station boundary.

DEFINITIONS (Continued)

Military Network	The unclassified segment of the Defense Data Network, which provides worldwide common-user data communications to the DoD and other selected Government and non-Government activities.
Monitoring Center	Computer operation that continuously observes the Network elements and performance to identify and isolate trouble spots, to deploy new software, and to schedule maintenance.
Packet-Switching	Data communications technique whereby messages are broken down into small segments or "packets" that are routed independently to their destination and then reassembled.
Subscriber Network	Equipment and circuits enabling subscriber systems' access to the backbone.
Waiver	Written statement signifying data communications needs are not currently supported by the DoD common-user Defense Data Network, and approval has been given by OSD to use a data service other than the Defense Data Network.

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301-3040

COMMAND, CONTROL,
COMMUNICATIONS
AND
INTELLIGENCE

13 MAR 1990

MEMORANDUM FOR DIRECTOR, READINESS AND OPERATIONAL SUPPORT DIRECTORATE, INSPECTOR GENERAL

SUBJECT: Draft Audit Report: Defense Data Network (Project No. 8IC-0067)

This memorandum is a joint response to your request for comments on the Draft Audit Report on Requirements Validation for Telecommunications Services (Project No. 8IC-0067) forwarded by your December 14, 1989, memorandum. The audit objectives were to determine if increases to original program cost estimates were reasonable and justified; and if applicable internal controls were adequate. The results of the audit indicated that the Director, Defense Communications Agency was not satisfying overall Network objectives; Assistant Secretary of Defense (Command, Control, Communications and Intelligence) did not provide effective oversight; that monetary benefits were not realized from disconnecting leased data communications circuits that duplicated the Network's service; and that the Network costs were not equitably allocated among users.

The draft report indicates a change in scope and uncontrolled program cost growth -- this is misleading. The Defense Data Network currently supports more than eight times the number of users estimated, at a lower network cost per user than anticipated; yet the program stayed within the constraints of the original program guidance, and direction established by the Under Secretary of Defense (Research and Engineering) memorandum of March 10, 1983. This is a tribute to the effectiveness of both the original guidance and the management of the Defense Data Network.

Although we concur with some of the findings and recommendations, we are concerned about the accuracy of many of the specific statements within the report. Our detailed comments to specific items are attached. The points of contact are Ms. Oma Elliott, OASD(C3I), 697-7626 and Mr. Phil Lavietes, DCA, 692-7319.

Albert R. Lubarsky
Deputy Assistant Secretary of Defense
(Command, Control and Communications)

J. T. Myers, LTG USA
Director
Defense Communications Agency

Attachments

Draft Audit Report on the (Project No. 8IC-0067)

Defense Data Network

ASD(C3I)/DCA Comments

FINDINGS

Final Report Page No.

(Although the findings in the draft report were not numbered, we have numbered them for easy reference.)

FINDING NO. 1: DCA did not satisfy the DoD program objectives for the Network. These objectives included confirming user requirements, identifying timeframes for connection of systems to the Network with a goal of maximum interoperability and developing an effective cost recovery scheme. 7

ASD(C3I)/DCA POSITION: Partially concur. The process for confirming individual requirements occurs within each Service or agency and then is registered in the User Requirements Data Base (URDB). A requirements prioritization working group chaired by the Joint Staff then meets quarterly to categorize and prioritize the URDB and confirm accuracy and make changes as required. Therefore, we do not agree that the objective of confirming user requirements has not been satisfied.

We do not concur that the program objective of identifying time frames for connection of systems to the Network was not satisfied. The URDB specifies a required operational date and along with the prioritization process divides requirements into FY funding availability from which installers develop work plans. TSRs are then issued to move requirements from the planning to the implementation phase.

While there are some DDN users who do not have the complete set of protocols required for full interoperability with other DDN users, the establishment of DoD protocols does provide for the "maximum potential for interoperability" as stated in the 1983 DoD guidance. Concur that until all users have implemented the necessary protocols, the interoperability of some users will remain limited. The implementation decisions for protocol conversion have been based both on economic and operational considerations.

We agree that at the time of the completion of this audit an effective cost recovery scheme had not yet been implemented. At that time DCA was collecting data and making refinements in order to develop an equitable cost recovery system. Beginning in October 1989, bills were generated from the system. The Navy is currently using these bills which comprise a monthly recurring connection charge representing the fixed costs and a variable traffic charge. At this time, the Army and Air Force have elected to use an alternate fixed monthly charge which is based on the sum of connection rates and an average of historical traffic volume. All services receive a detailed supplemental report which breaks out connection charges and traffic status for every connection to the network. After the first two years of usage sensitive billing, Army and Air Force will convert to the same traffic sensitive bills as the Navy.

There has always been a mechanism to give components sufficient information to bill subordinate organizations. The billing identity is the program designator code. The exception is when the user has devices, hosts or gateways that have subordinate users behind them. When this is done, these users are considered external to the Network and if there needs to be a system to provide equitable distribution between these users, then the manager of the gateway would have to establish it.

To establish a network that sees beyond gateways, while theoretically possible, was not envisioned in the network design, would be inordinately expensive, and could cause problems in the event that the gateway interconnects to another network. The report mentions that DoD components will have to develop supplementary accounting systems to determine and distribute Network charges to users connected to gateways. We do not believe this is a deficiency. It is the most equitable and practical method to satisfy the needs of these users.

The effectiveness of the billing strategy is under close review and evaluation and will be modified as experience dictates to insure cost-effectiveness.

FINDING NO. 2: DCA did not provide required data communications services to DoD Components in a timely and cost-effective manner. 7

ASD(C3I)/DCA POSITION: Partially concur. The contention that service lead times were extended in order to install the DDN backbone is correct. However, this was due to the necessary development of the backbone system with attendant procurement and development lead times. The fact that these lead times were extended by the growth in user requirements is also a factor that was not considered at the inception of the program. However, these factors have been significantly mitigated by DCA actions in recent years. Current computer connections have been more expeditious as noted in your report. As of February 90, 87.5% percent of all funded user requirements have been met and the remaining funded requirements are in some stage of implementation.

FINDING NO. 3: Program direction required that DCA update the definition and scope of the Network. The Director did not update the Program Plan to incorporate new cost, schedule, and performance objectives for the Network which would establish a new program baseline. 7

ASD(C3I)/DCA POSITION: Partially concur. DCA did update the definition and scope of the Network as defined by the DoD 1983 guidance as directed. The guidance states:

> "Evolution of the DDN as a Defense Communications System (DCS) element will be governed by the DCS Five Year Plan (FYP) process. Any major changes in the scope, schedules, cost, or composition of the network must be reviewed and approved by DUSD(C3I)."

Each year DCA presented the current program status in the DCS FYP. The DCS FYP goes to the Joint Staff for review. Upon completion of the review the Joint Staff forwards the DCS FYP to OASD(C3I) with a summary of changes from the previous version, comments and a

recommendation for approval. After OASD(C3I) review, a letter is issued approving the document and providing additional guidance as required.

In addition, numerous briefings and discussions of program changes were conducted in order to ensure that OSD was actively involved in those changes. Such was the case in instances cited in the report such as the reallocation of responsibility to fund costs. These decisions were made in concert with the customers and OASD(C3I) concurrence. The Joint Staff ran a joint action on reallocation of responsibility that resulted in the issuance of MOP 195. Changes in budget responsibility were implemented through the out year transfer of funds.

The Director did take action to update the program plan, which was under revision during the audit. It is currently being staffed and is expected to be issued by June 1990. As the audit states, the program plan needs to be updated to incorporate new cost, schedule, and performance objectives. This has been done continuously through the program planning process with the program plan being only a part of this process.

It also should be noted that during this period changes to the program baseline were merely evolutionary such as the addition of memory, ports, etc. that served to extend the life of the installed capital investment. These changes were all thoroughly discussed and approved through OASD(C3I).

The audit report evaluates the adequacy of program planning (such as establishing a baseline) based on the current status of a single document, the program plan. While the program plan is a highly useful document and it is desirable to have it up to date, practical considerations often render any detailed and comprehensive document out of date by the time it is issued. The 1983 OSD guidance recognized the value of insuring regular program review by linking the review and approval process to an existing annual process, accomplished through the DCS FYP annual update and the annual PPBS process.

FINDING NO. 4: Program direction required that OASD(C3I) review and approve any major changes in scope, schedules, cost, and composition of the Defense Data Network and did not provide effective oversight or enforce DoD policies affecting the Network development and management. The guidance provides for updating, refining, reviewing, and approving changes in the definition and scope of the Network. The ASD(C3I) is to review the guidance, direction, and tasking in support of the Network on a continuing basis. ASD(C3I) did not formally review and approve the changes made to the Network that affected the program baseline established in the program plan. ASD(C3I) did not enforce compliance with DoD policy regarding Network management. Although informal guidance and a waiver policy were issued, the only official documents or plans that were reviewed and approved by the ASD(C3I) were the 1982 Program Plan and the 1987 Architecture. Because of the ASD(C3I)'s inactive role, causes for the increase in estimated life-cycle costs to more than $1 billion and the need for major upgrades and new integration efforts for the Network have not been isolated and evaluated. 7

ASD(C3I)/DCA POSITION: Nonconcur. While the baseline in the DDN Program Plan did change, do not concur that effective oversight was not provided or that DoD policies were not enforced or that formal review was not conducted.

In addition to the review and approval of the 1982 Program Plan and 1987 Architecture, the DCS FYP that includes DDN planning is reviewed and validated annually by the Joint Staff, and ASD(C3I), and the CSIF which funds DDN is reviewed during the budget process by both by OASD(C3I) and the OSD comptroller on a regular bases.

Less formally, work plans, usage sensitive billing proposals, transition planning and cost analyses (e.g. cost versus lease alternatives, cost benefit analysis on implementing DISNET, life-cycle cost analysis) are reviewed on a regular basis.

The increases in estimated life-cycle costs and the need for major upgrades, and new integration efforts for the Network have been identified in the documents, plans and reviews addressed above. OASD(C3I) has remained active in oversight of DDN since it's inception. The increases in estimated life-cycle costs have not resulted from the level of oversight given the program, but rather are due to an increase in valid requirements.

Also see ASD(C3I)/DCA POSITION on FINDING NO. 3.

FINDING NO. 5: About 81 percent of the DoD computers requiring unclassified data communications services were not connected to the Network because DoD requirements for data communications services increased. 7

ASD(C3I)/DCA POSITION: Partially concur. With the increase in user requirements, the program schedule has been extended over a longer period. This was based on users prioritizing their requirements and determining what year they could afford the connection into DDN. The figure of 81% used in the draft report is highly misleading.

The 81% includes users future requirements. This may include requirements for data transmission for systems that may not yet be operational but will require connection at a later date. DoD Components provide input on future requirements for planning purposes. Before these requirements can be implemented, the DoD Component must issue an implementation TSR authorizing DCA to spend money and provide updated circuit requirement and funding data.

As of the end of FY 1989, 3,011 users were connected to DDN, representing 76% of the FY 1989 and prior year funded requirements. Since then, significant progress has continued with the result being as of 15 February 1990, 87.5% of funded user requirements are connected to DDN. This represents a far more realistic measure of progress and positive program status than do the figures quoted in the draft report. The remaining funded requirements are within the capacity of the Network and are in some stage of the connection process.

FINDING NO. 6: Projected costs for developing and operating the total Network increased. 7

ASD(C3I)/DCA POSITION: Partially concur. Projected costs did increase due to an increase in network requirements, however, the cost per user has decreased. As noted in the draft audit report, the number of users increased 175% while the network costs increased by only 146%.

FINDING NO. 7: Monetary benefits of $1.2 million were not realized by disconnecting leased data communication circuits that duplicated the Network service. Additional monetary benefits were not realized from more expeditious connections of computers to the Network. 7

ASD(C3I)/DCA POSITION: Partially concur. While we discourage any unnecessary duplication of service, the Department of the Army has determined that the requirements for some duplicate circuits are valid. Refer to the Army response to the draft report. While every attempt is made to have the circuit, the equipment and DDN availability closely coordinated, the process is not foolproof. The draft DoD directive on management of base and long haul telecommunications services defines the Service responsibility to "Establish a review and revalidation program for all base and long haul telecommunications services that effectively implements the policy articulated in this directive and ensures that only required telecommunications services are kept and are cost effectively acquired." This directive will be in formal coordination by April 1990.

FINDING NO. 8: Security devices could cost the Government more that $4.2 million in interest expenses and storage costs. The architecture required that the classified segment of the network and the DoD Components' host computers use security devices (KG-84A's) for the encryption of data transmissions. From September 1983 to February 1985, the program management office placed purchase orders with the NSA for 3,828 KG-84S's to satisfy this requirement. 7

ASD(C3I)/DCA POSITION: Partially concur. The situation is more complex than explained in the audit report. As initial installation of KG-84's proceeded and installation costs escalated, it seemed prudent to consider other viable alternatives for encryption at DDN hosts. The Program Manager suspended installation of KG-84's in early FY 88 and immediately initiated a review to determine if a more cost-effective alternative was available.

Early in FY89 installation of KG-84's on inter switch trunks (ISTs) was resumed because no viable alternatives were acceptable. Only host installations continued to be suspended. The host review will be completed in July 1990. The costs cited in the audit report associated with interest expenses and storage costs were not unnecessary but were costs of prudent business decisions that were made to avoid much larger and potentially wasteful expenditures of funds.

The KG-84's were retained in case an acceptable alternative could not be identified. The premature disposal of the equipment could have resulted in additional expenditures for new KG-84's as well as initial procurement lead time necessary to effect the purchase. In addition, potential delays in installation caused by additional lead time to procure the KG-84's could result in further delays in encryption of the hosts and result in larger expenditures for secure data transmission.

To date, no acceptable alternative has been identified and the program office is preparing a KG-84 installation schedule for the hosts if required upon conclusion of the review.

However, because of the significant implications of the review findings and resulting decisions, ASD(C3I) will make the ultimate decision on how to proceed with the security architecture.

FINDING NO. 9: Further, the Network operating costs were not equitably allocated among users. 7

ASD(C3I)/DCA POSITION: Concur. To address this deficiency usage sensitive billing was introduced in October 1989 and will continue to be refined until this deficiency no longer exists.

FINDING NO. 10: We found that the effectiveness of Network program management was seriously impaired because the Network program manager was never given the authority needed to effectively carry out assigned tasks. This condition contributed to the unforeseen cost growth, the lack of compliance with established DoD policy, and the inability to connect DoD computers to the Network in a timely manner. 11

ASD(C3I)/DCA POSITION: Nonconcur. The program manager has the necessary authority to manage the program within the confines of the program structure as it is set up. The authority to carry out the tasks assigned to the program office was established in the DDN Management Engineering Plan, October 1987, which was signed by the Director, DCSO and senior managers from the Joint Staff and the military departments and agencies.

Changes in system costs are due to a major change in user requirements brought on by major changes in the use of computers and data communications over the past decade and are not due to the program managers' lack of authority. At the time of the inception of the program, the major changes in the availability of computers could not have been anticipated. However, it was soon recognized that the $421 million figure in the 1982 plan was wrong. A 1982 memo from USD(R&E) recognized this in projecting a cost for DDN (FY82 through FY 88) of $522.9 million (inflated). The cost per user, however, has decreased when compared to the original projections.

FINDING NO. 11: Without adequate criteria, effective management oversight was essentially lost over the Network. Independent management decisions at the Defense Communications Agency could not be measured. 12

ASD(C3I)/DCA POSITION: Nonconcur. The original DDN Program Plan contained detailed performance criteria which formed the baseline for Network evolution to accommodate user demand. Those criteria were used as a basis for reviews which triggered changes in program management and implementation that lead to improved connectivity, protocol enhancements, and improved overall internet performance. Additionally, performance thresholds were developed, coordinated with the Service O&M Commanders, and published to further ensure management oversight. Finally, the new DDN Program Plan, currently in coordination, provides updated criteria. Accordingly, do not agree that effective management oversight was lost over the Network. See ASD(C3I)/DCA POSITION on FINDINGS NO. 3 and 4.

FINDING NO. 12: Considering the projection that 81 percent of 7,310 requirements still required connection to the Network the goal of maximum interoperability did not appear achievable based on the Agency's rate of connections at the time of the audit. 8

ASD(C3I)/DCA POSITION: Nonconcur. The issues that have limited full interoperability have been both technical and cost related and not a function of the number of requirements. We are now in a position to accommodate all known requirements, and believe the goal of maximum interoperability is fully achievable. See ASD(C3I)/DCA POSITION on FINDING NO. 5.

FINDING NO 13: The Director did not prepare analyses that identified the shortfalls in satisfying Components' data communications requirements. Instead (he) prioritized requirements for computer connections. (He) had no long range plan of alternatives for resolving the growing backlog of subscribers. (He) should establish the total demand for the network, determine the projected backlog of subscribers, and evaluate the alternatives for satisfying these requirements. These alternatives should also take into consideration the trade-offs among budget increases, schedule extensions, technical enhancements, commercial data communication services, and changes to existing policy. 8

ASD(C3I)/DCA POSITION: Nonconcur. In addition to evaluating the potential for supplementing the Network with leased services in a study, he initiated a life cycle cost analysis of the Network backbone, and related Network services which was completed in May of 1989. Although the auditors faulted the analysis for not addressing the Service and agency host and terminal life cycle costs it is our position that those costs associated with DDN at the host and terminal level must be identified within Service and agency capital asset accounts and are not appropriate for consideration in Network cost analyses. The prioritization process was never intended to replace planning or investigation of viable alternatives but to serve as an implementation planning and scheduling aid. The DDN Program Plan will address potential requirements as well as validated and funded requirements to enhance its planning value.

FINDING NO. 14: Waiving Components from mandatory use of the Network is a temporary solution that does not resolve the increasing demand for data communications services in the DoD ... including recommending changes to the DoD policy that the Network be the single provider of long-haul data communications services in DoD. 10

ASD(C3I)/DCA POSITION: Partially concur. The waiver policy is recognized as a temporary measure that does not resolve increasing demand for data communications services in the DoD and is intended to optimize the amount of communications which can be obtained to satisfy all recipients. It is a necessary measure to meet current users needs.

Of the 150 plus waivers outstanding at the beginning of the DoDIG Audit, more than 40% were approved because DDN could not accommodate synchronous terminals, DISNET requirements (when the network was not sufficiently developed to support these users), T-1 requirements, and heavy data traffic requirements. These waivers provided users with temporary communications services until DDN could accommodate their requirement.

These waivers are necessary and are managed in accordance with established DoD policy with ASD(C3I) oversight. The waiver policy is an effective method of providing this flexibility to meet current user requirements and, in the waiver policy revision soon to be released, all waived systems must provide for connection to, and interoperability with, DDN.

The requirements for interoperability and command and control military unique features is increasing, not decreasing and Network growth and development provides an increasing capability to meet those requirements. We do not agree that there is any reason to change the DoD policy making the Network the single provider of long-haul data communications services in DoD.

FINDING NO. 15: Military unique features were not being implemented, and may not be necessary. The criteria for evaluating commercial alternatives to the CONUS portion of the MILNET have changed. 10

ASD(C3I)/DCA POSITION: Partially concur. While the military features were not being immediately implemented, to characterize these features as unnecessary is incorrect. Standard DoD protocols, precedence levels, and inter-switch trunk encryption are required to satisfy program objectives and remain valid requirements.

The fact that current transmissions are not encrypted does not invalidate the requirement. Rather, it indicates that the resources (both in dollars and in engineering and installation manpower) to install the encryption are not currently available and that management has decided to accept the risk of not encrypting on a temporary basis. The acceptance of additional risk for a short period does not invalidate a requirement but merely means that additional risk has been accepted.

A preemption and precedence capability was introduced into the Network with the release of PSN 7 software. Users can take advantage of this capability with minor modification to their host software. This capability is critical to support organizational message traffic.

The need for interoperability and the military unique features remains and was highlighted as a result of the Defense Message System MROC 2-88 implemented in February 1989.

FINDING NO. 16: In June 1988 a feasibility study determined leased service alternatives equivalent to the CONUS segment of the MILNET were not cost-effective but commercial alternatives should be reconsidered in the future when system integration planning for the mid-1990's will be performed. 10

(a) The FTS-2000 includes data communications services that can be used by DoD Components when the system becomes operational in FY 1990.

(b) Evaluation of the FTS-2000 did not include services potentially available to the MILNET.

ASD(C3I)/DCA POSITION: Partially concur. Do not concur that FTS-2000 data communications services can replace DDN because DoD requirements mandate that DDN be a separate Network. The Brooks Act and Section 627 of Public Law 100-440 do not apply to DoD acquisitions when, among other things, they involve command and control, cryptographic or intelligence activities. The Defense long haul, common user telecommunications systems are all heavily involved in the command and control of military forces and have been acquired with features that support military activities through varying crisis scenarios. The Defense Communications System's common user networks which are specifically exempted are: The Defense Switched Network (DSN)--Automatic Voice Network (AUTOVON) and the Defense Commercial Telecommunications Network (DCTN), the Automated Digital Network (AUTODIN), and the Defense Data Network (DDN).

Agree that commercial alternatives should be reconsidered as indicated by the IDCS WESTHEM effort currently under way at DCA but consideration must include the requirement for military unique features.

FINDING NO. 17: As DoD Components become operational on the Network the dedicated data circuits leased by the Components should be disconnected. DoD Components were not disconnecting the dedicated, leased data circuits that duplicated Network service. ASD(C3I) did not provide guidance of the Director and DoD Components to disconnect existing dedicated, leased data circuits when host computer systems or other devices became operational on the network. 12

(a) The activity managing the system had no criteria either for determining whether the dedicated, leased data circuits were required during the transition period or for disconnecting the circuits.

(b) As of March 31, 1989 Army dedicated circuits were effectively replaced by the Network and should have been disconnected.

(c) ASD(C3I), the Agency, and the DoD Components had not evaluated the composition of the 4,046 dedicated data circuits to determine which circuits were replaceable for the Network

(d) Additional guidance from the ADC(C3I) and implementing instructions from the Agency's director are necessary to avoid duplication and to reduce costs for data communications services.

ASD(C3I)/DCA POSITION: Partially concur. A circuit that can transmit data may not be able to meet all system requirements. Therefore, an existing circuit should not be arbitrarily disconnected until system requirements can be met. DCA does report back to the user on the status of his DDN circuit. Whether this partially transitioned system can effectively meet the users requirement is a judgement call of the user and his supporting service communications personnel, not DCA.

If the Army user determines that the current capability available through DDN is acceptable, they have the means to issue a disconnect Telecommunications Service Request (TSR) to eliminate the duplicate service.

Although ASD(C3I) did not issue a specific policy requiring DDN users to disconnect the existing service, all circuits require validation and periodic review of validation to insure efficient management of telecommunications assets. The decision and responsibility to disconnect service is a function of the user and his Telecommunications Certification Officer (TCO).

- The report seems to imply that the greatest visibility into duplicative service exists at the DCA level. This is not true. The managers who have the greatest visibility into duplicative circuits are the TCO's and the responsibility for identifying and disconnecting duplicative circuits is a joint responsibility of the TCO and the user, not DCA.

DCA does have responsibility for promptly informing users of DDN installation status including delays. To our knowledge this has been done adequately. To ensure this, DCA will coordinate with users at the next TCO conference in August 1990 to see if there are some areas that may require improvement. Also, ASD(C3I) is in the process of developing a directive that will address DoD-wide long-haul circuit management and revalidation. The directive will include some specific guidance on the management of data circuits as they relate to DDN issues. The draft directive is currently out for initial review and comment and will enter formal staffing in April 1990.

FINDING NO. 18: Delays resulted in the Agency paying for leased data circuits while host computers were awaiting connection to the Network. The agency paid $185,530 for 17 leased circuits that were later canceled. The Network program management office did not monitor the status of the preparation, funding, or integration of computers at the Component level. These delays resulted in the agency paying for leased data circuits while host computers were awaiting connection to the network. The Agency paid $185,530 for 17 leased circuits that were later canceled. 13

ASD(C3I)/DCA POSITION: Partially concur. The claim that the network program manager could have reduced costs for leasing data circuits by more effectively monitoring the connection of DoD components to the Network is not accurate. The finding does not consider the responsibilities of the user and TCO versus the responsibilities of the DDN Program Manager as explained in response to FINDING NO. 17.

DDN users are provided the status of their connections through the DDN subscriber integration status tracking process. This process identifies the status of requirements to DoD Components so they can be ready for leased services when the services are available and avoid unnecessary expense resulting from schedule changes and delays whenever possible. The information is updated monthly into the URDB and is available on-line to all DoD components.

As delayed connections are identified, the Components are requested to cancel the service or expedite completion to prevent the waste of funds. The Components decide whether to cancel circuits, not the DCA DDN Program Manager.

Some funds were spent unnecessarily as a result of coordination problems. This was a significant problem at one time. However, intensive management and coordination has greatly reduced the impact of delays. The current tracking system was established to minimize the delay between circuit activation and actual connection but some loss due to installation delays

or equipment delivery slips is inevitable. Interactive coordination through the status tracking process has minimized the delay experienced. MOP 195 gives more control over circuits to the user and will help to minimize these delays.

FINDING NO. 19: The Director, DCA, did not perform adequate long-range planning for the Network. The Program plan was not supplemented with more definitive analyses, such as a complete life-cycle cost estimate, a survivability analysis, and a test and evaluation master plan. 14

ASD(C3I)/DCA POSITION: Nonconcur. See ASD(C3I)/DCA POSITION on FINDING NO. 13. Also, a test and evaluation master plan has been prepared. Although not formally submitted at the time of the audit, it has already been reviewed by OSD with comment. A final draft which addresses all OSD concerns was promulgated for service coordination and final submission for OSD approval is expected by April 1990.

FINDING NO. 20: The Network program managers had not completed a life-cycle cost estimate of the complete Network. The Network PMO needs to complete a life-cycle cost estimate that will include all costs associated with the development and operation and maintenance of computers for the Network by DoD Components. 15

ASD(C3I)/DCA POSITION: Nonconcur. See ASD(C3I)/DCA POSITION on FINDING NO. 13.

FINDING NO. 21: The DCA had not prepared sufficient plans and analyses to evaluate the Network's survivability against threats to data communications. These deficiencies were corroborated in the January 1989 GAO report. We found no evidence that a threat assessment or a survivability and vulnerability analysis were prepared since this 1987 review by the OSD. 15

ASD(C3I)/DCA POSITION: Concur. NSA, in response to OASD(C3I) tasking, submitted "Information Systems Security Assessment of DDN" on 13 October 1989. The vulnerability assessments began in January 1990 and the following schedule applies:

Europe: Jan 1990
Europe to CONUS: Jan 1990
CONUS: April 1990
Korea: April 1990
Pacific Theatre: December 1991
Pacific to CONUS and Europe: December 1991

Findings from the vulnerability assessments will be reviewed by OASD(C3I) to execute appropriate follow up action.

FINDING NO 22: The Network program management office began preparing drafts of TEMPs in 1983, 1st draft September 1986. Seven years have passed, more than half a billion dollars 15, 16

has been spent since the Network was initiated in 1982, but a test and evaluation master plan has yet to be approved for the system.

ASD(C3I)/DCA POSITION: Concur. A test and evaluation master plan has been completed. The TEMP was delivered to OSD on January 31, 1990. Currently, it is being staffed with the Services with review and signature by all expected by March 31, 1990. Comments received to date are favorable and OSD(DDT&E) has indicated that their concerns have been adequately addressed.

FINDING NO. 23: The Security program objective was not accomplished, because security devices required for the operation of the Military Network segment of the Network were not installed by personnel from the program management office. NSA changed guidance in 1988 for encrypting CONUS communications which affected the requirements for KG-84a's for the Network. Basically the National Security Agency decided that data transmitted over certain CONUS communications lines did not need encryption. Consequently, the Network may need new security devices (KG-84C's) to satisfy the requirements. 17

ASD(C3I)/DCA POSITION: Partially concur. The Security program objective has not yet been met however this is not because the personnel from the program management office are remiss. Installation was delayed while acceptable alternatives were being investigated. Since there appeared to be no viable alternatives for the ISTs, the installation on the ISTs was resumed. Alternatives for encryption of the hosts are being addressed in a study started in early FY88 and will be concluded by July 1990. Immediate action will then be taken to protect the hosts. The DDN Security Architecture and NSA assessments have all indicated a requirement to encrypt the MILNET portion of DDN. There has been some NSA guidance that certain types of unclassified data can be encrypted with DES encryption devices but this does not apply to the MILNET and the requirement for KG-84s remains. The Program management office has been trying to find other alternatives but to date has not been successful in identifying an acceptable alternative. Should the Network require more encryption devices than it can identify and have to supplement with the KG-84C, the C model is backward compatible with the A model.

FINDING NO. 24: Usage Sensitive Billing as specified in the 1982 USD(R&E) guidance, had not been effectively implemented by the program management office. 18

(a) This Network cost recovery method penalizes DoD subscribers that are required to be connected to the Network, but that have low usage rates.

(b) This delay was another indicator of inadequate planning and coordination by management in achieving program objectives for the Network.

ASD(C3I)/DCA POSITION: Partially concur. The report challenges the equity of the billing ratio of traffic (incorrectly termed usage) charges as a whole. It claims a 75% ratio for commercial services and attributes a 35% ratio to DDN. In fact, not all commercial services use a traffic charge. The DDN ratio accomplishes two things by design:

- First by making the larger part the monthly recurring charge, users costs are more predictable than with a variable charge.

- Second, it is equitable because the cost of the circuit is the larger component of cost and reflects the users planning and decisions regarding the capacity he needs.

The user that orders a high speed connection pays for that connection regardless of whether the volume justifies it. A low volume user that orders a low speed connection gets the best price because that user best estimated his needs.

While it has taken some time to develop, coordinate, and gain consensus on a billing methodology, DCA and the community as a whole have been actively working towards developing an acceptable, fair and equitable billing methodology. If inequities are determined to exist in the current billing methodology, changes will be made to correct the situation. Therefore do not concur that this deficiency is a factor of inadequate planning and management, but rather a result of the time necessary to implement a very difficult procedure.

FINDING NO. 25: ASD(C3I) needed to improve the oversight and management procedures for planning and operating the Network to comply with DoD Directive 5010.38. Deleted

ASD(C3I)/DCA POSITION: Nonconcur. Material internal control weaknesses do not exist. DCA and OASD(C3I) are in compliance with DoD Directive 5010.38. DoD Directive 5010.38 provides that a material weakness is:

- noncompliance with controls

- or lack of adequate controls

To be considered material, it must satisfy two conditions:

- does not provide reasonable assurance that the objectives of internal control are being me; and

- warrants reporting to the next higher level of management either as a point of information or for assistance to effect corrective action.

Whether a situation is material is a judgement of management. In the opinion of DCA and ASD(C3I) the situations described in the audit report do not constitute material weaknesses. The three separate potential material weaknesses identified in your report are separate issues and are addressed individually:

Program Oversight and Non Compliance with Guidance. DCA did comply with the USD(R&E) guidance by providing reviews through the DCS FYP process and ASD(C3I) and the Joint Staff did review and approve the program through the annual process as required by the USD(R&E) guidance. The DCS FYP constitutes a formal planning document. Therefore, the test for noncompliance or lack of controls clearly does not apply. While the program plan is an additional control, the lack of an official, updated program plan does not constitute a material weakness since other control mechanisms were in use.

Draft Audit Report on the (Project No. 8IC-0067)

Defense Data Network

ASD(C3I)/DCA Comments

RECOMMENDATIONS

RECOMMENDATION 1: We recommend that the USD(A) refer the Defense Data Network to the appropriate Defense Acquisition Committee to determine if the Network should be designated as a major defense acquisition program or as a major automated information system under the guidance of the Defense Acquisition Board. 22

[Action has been delegated to ASD(C3I) for response.]

ASD(C3I) POSITION: Nonconcur. The life cycle cost of the Network does not approach the thresholds designated in DoD Directive 5000.1. The Directive defines a major acquisition as exceeding 200 million dollars in RDT&E costs or the procurement cost exceeds 1 billion dollars in constant FY 1980 dollars, or approximately 1.5 billion in FY 1990 dollars. The DDN program has never approached these thresholds. For FY 1982 to 1992 the RDT&E Network costs are 67.6 million dollars, procurement appropriation costs are 109.3 million dollars, and equipment purchase through the Communications Services Industrial Fund are 12.5 million dollars. The total Network costs are only 189.4 million dollars, significantly under the established thresholds.

The purpose for the designation as a DAB or MAISRC program is to provide high level oversight to major acquisition programs. The DDN program has an established oversight panel which is under the C3I Systems Committee of the Defense Acquisition Board. Although the DDN does not meet the criteria for a major acquisition program or a major automated information system, should the need arise for program oversight through the acquisition oversight process, the structure is in place to meet that need. To date there have been no issues to warrant elevation of program review.

DCA POSITION: Concur with ASD(C3I) position.

RECOMMENDATION 2. We recommend that the ASD(C3I): 22

RECOMMENDATION 2a: Require the Director, DCA, to update the definition and scope of the Defense Data Network as dictated by changes in user requirements, technological developments, and economic factors in accordance with the guidance, program direction, and policies established in March 1983 by the USD(R&E). In accordance with that guidance, review and approve the major changes in the scope, schedules, costs, and composition of the DDN submitted by the Director in an updated program management plan. 22

ASD(C3I) POSITION: Partially concur. We will continue to require compliance with guidance, program direction, and policies established in March 1983. However, the formal process designated in the March 1983 guidance, direction, and policy is the DCS FYP rather than the

program management plan. The March 1983 guidance and direction clearly states that evolution of the DDN as a DCS element will be governed by the DCS FYP process. Each year the scope was projected based upon changing user requirements in the DCS FYP and then reviewed and approved by the Joint Staff and OASD(C3I) in accordance with the March 1983 guidance. The definition of DDN as stated in the 1983 guidance and direction still accurately describes the current Network as a data communication service which will utilize packet technology as its primary switching technique to fulfill the data communications needs of the DoD and as the data communications service of the DCS. It goes on to describe the DDN program plan as a comprehensive description of the initial planning for the network.

The definition and scope of the Network have not changed nor has uncontrolled cost growth occurred. The cost of the Network per user has declined and the individual requirements, although originally underestimated, have been met with the management structure, resources, and technology designated in the March 1983 program guidance for much fewer users.

DCA POSITION: Concur with the ASD(C3I) position. We will continue to comply with the March 1983 guidance, program direction, and policy. The program management plan has also been revised.

ONGOING ACTIONS:

1. Program review and approval will continue through the DCS FYP process as defined by USD(R&E) in March 1983.

2. The program plan is in final coordination and will be issued by June 1990.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 3 and 4.]

RECOMMENDATION 2.b: Review and approve specific guidance issued in an updated program management plan prohibiting the use of dedicated data circuits by DoD data communications subscribers when those subscribers complete their transition to the Defense Data Network. The guidance should require firm dates be established for completing the transition from dedicated, leased circuits to the Defense Data Network for each type of system, computer, and device. ---22---

ASD(C3I) POSITION: Partially concur. The management of data circuits (as well as voice) is being addressed in a draft directive being developed by this office. Do not concur that the DDN program management plan is the proper document for the guidance you describe.

DCA POSITION: Concur with ASD(C3I) position. We agree that further guidance is needed and that the actions of the ASD(C3I) are appropriate.

ONGOING ACTIONS:

1. We will recommend that the Network program plan include reference to the appropriate guidance and policy for circuit management.

2. Our draft directive will reference DDN specifically and provide adequate guidance with reference to applicable policies and procedures. The directive is targeted for coordination in April 1990.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 17 and 25.]

RECOMMENDATION 2c: Initiate an update of the cost and technical analysis of alternative commercial solutions, to include the FTS-2000 packet-switched data services, to the DoD data communications services provided by the unclassified Military Network segment of the Defense Data Network. The analysis should be independent of the DCA and should include an evaluation of the special military features by comparing costs of these features to the risks associated with interoperability, survivability, and security of Military Network. 22

ASD(C3I) POSITION: Partially concur. Nonconcur that an additional study regarding commercial alternatives is warranted because the Director, DCA tasked, and completed in June 1988, an extensive analysis and assessment of potential alternative commercial solutions which included participation by numerous commercial organizations. None of the fully documented proposed solutions were found to be cost-effective.

The requirement for military features has been clearly established through the Joint Staff process although DDN has not fully implemented all of the features yet. The DoDIG draft report does not provide sufficient rationale to indicate that validated requirements are no longer needed.

Do not concur that FTS-2000 data communications services can replace DDN because DoD requirements mandate that DDN be a separate Network. The Brooks Act and Section 627 of Public Law 100-440 do not apply to DoD acquisitions when, among other things, they involve command and control, cryptographic or intelligence activities. The Defense long haul, common user telecommunications systems are all heavily involved in the command and control of military forces and have been acquired with features that support military activities through varying crisis scenarios. The Defense Communications System's common user networks which are specifically exempted are: The Defense Switched Network (DSN)--Automatic Voice Network (AUTOVON) and the Defense Commercial Telecommunications Network (DCTN), the Automated Digital Network (AUTODIN), and the Defense Data Network (DDN).

Agree that commercial alternatives should be reconsidered as indicated by the IDCS WESTHEM effort currently under way at DCA but consideration must include the requirement for military unique features.

DCA POSITION: Concur with ASD(C3I) position.

ONGOING ACTIONS:

DCA has initiated a major effort under IDCS WESTHEM to solicit commercial alternatives that can meet the DCS command and control and military unique requirements and result in reduced costs to the DoD.

RECOMMENDATION 2.d: Report the lack of enforcement of the 1983 USD(R&E) guidance and the absence of guidance on the replacement of dedicated, leased data circuits with the Defense Data Network as a material internal control weakness in accordance with DoD Directive 5010.38, "Internal Management Control Program," and track the status of corrective actions taken until the problems identified are resolved. Deleted

ASD(C3I) POSITION: Nonconcur. No material internal control weakness as defined in DoD Directive 5010.38 exists. We have complied with the 1983 USD(R&E) guidance through the DCS FYP process as well as a variety of other actions as described elsewhere. Because we are currently in the process of providing increased guidance and direction on the management of long-haul circuits, it should not be necessary to provide circuit management guidance for DDN separate from the DoD wide effort.

DCA POSITION: Concur with ASD(C3I) position.

ONGOING ACTIONS:

1. DCA has suggested to the OSD internal control program office that they raise the disconnection of circuits that are not required as an internal control issue for the Services and agencies.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 17 and 25.]

RECOMMENDATION 3: We recommend that the Director, DCA, take action in an expeditious manner to: 22

RECOMMENDATION 3.a: Comply with the 1983 guidance for the DDN from the USD(R&E): 22, 23

(1) By updating a program management plan that:

(a) Includes long-range projections of DoD Components' systems, computers, and other devices requiring connections to the DDN. The updated plan should establish appropriate cost, schedule, and performance objectives associated with these projections.

(b) Provides solutions to eliminate the backlog of DoD Components awaiting connections to the DDN. Alternative solutions should include evaluations of trade-offs among budget increases, schedule extensions, proposed technical enhancements, and recommended changes to current OSD policies that affect the operation of the DDN.

(2) By implementing a cost recovery scheme that equitably allocates costs for DDN utilization and provides sufficient services and information to DoD subscribes of the DDN.

DCA POSITION: Concur. An updated program plan is beneficial and the items you identify in 3.a(1)(a) and (b) will be addressed in the updated plan. We were developing such a plan during

the time of the audit. We were also developing an equitable cost recovery scheme in close coordination with the Services and ASD(C3I) during the time of the audit.

ONGOING ACTIONS:

1. The revised program plan has been completed and is currently out for final review. We expect to issue the plan in June 1990.

2. The new cost recovery scheme was implemented at the beginning of FY90 and is being closely monitored to identify problem areas and course corrections as required to meet the intent of the 1983 guidance.

ASD(C3I) POSITION: Concur with DCA and support ongoing actions.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 1, 3, 9, 24 and 25.]

RECOMMENDATION 3.b: Establish procedures for identifying, tracking, and reporting dedicated, leased circuits that should be replaced by the DDN consistent with guidance approved by the ASD(C3I). 23

DCA POSITION: Nonconcur. OSD is already updating policy and procedures for all long-haul circuit revalidation and the implementation of these updated procedures for identifying, tracking, and reporting dedicated leased circuits is a TCO responsibility. We will request a discussion be included in the next TCO conference which is scheduled for August 1990, to insure a thorough understanding of the updated policy and procedures, and assist as appropriate for optimum execution of the 100% circuit revalidation.

ASD(C3I) POSITION: Agree with the DCA position. Improved management of all leased circuits is a high priority in this office and we are taking action to correct current deficiencies. These issues are not solely DDN program issues and are not limited to data circuits. The single consolidated and verified circuit data base tasked by this office will assist TCO's in identifying both dedicated data circuits that should be on DDN and duplicate circuits that may need to be re-validated or cancelled.

ONGOING ACTIONS:

1. ASD(C3I) memorandum of 30 January 1990 addresses "The lack of a review and revalidation process..." and requires a "...100 percent physical inventory of all their telecommunications assets..."

2. ASD(C3I) has drafted a new policy on Management of Base and Long Haul Telecommunications Services. This policy will include specific DDN concerns specifically. The draft is currently being circulated for comment, target for final coordination is April 1990, promulgation May 1990.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 7 and 17.]

RECOMMENDATION 3.c: Implement procedures to collect and analyze the data necessary to effectively monitor the connection of DoD Components' computer systems to the DDN.

DCA POSITION: Concur. We have already implemented improved procedures. We have given much attention to the coordination of circuit availability, equipment availability, lead times and delivery schedules. Increased monitoring and coordination and reporting among DoD components, to include DECCO, has vastly improved the process.

ONGOING ACTIONS:

1. Review and refine the coordination and implementation process continuously.

2. The Network management office is developing a procedure for improving the timing of the TSR release. These procedures are expected to be implemented 15 April 1990.

ASD(C3I) POSITION: Concur with the DCA position. At one time the scheduling and coordination problems were beyond acceptable thresholds. The aggressive actions on the part of DCA, DECCO, and the Services and agencies have greatly improved the implementation process.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 17 and 25.]

RECOMMENDATION 3.d: Complete a life-cycle cost estimate for the DDN that includes all costs programmed by the DoD Components in addition to CSIF costs. 23

DCA POSITION: Nonconcur. A complete Life Cycle Cost Estimate was done for the Network in May 1989. The host and terminal equipment belongs with the Service and agency capital asset accounts and are not part of the cost of the Network and not part of the DDN baseline equipment.

ASD(C3I) POSITION: Concur with DCA position.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 13, 19 and 20.]

RECOMMENDATION 3.e: Complete the preparation of an adequate Test and Evaluation Master Plan for the DDN for the review and approval of the DoD Director, (OT&E). 23

DCA POSITION: Concur. The Test and Evaluation Master Plan for the Network has been submitted to the Service Secretaries for formal coordination.

ONGOING ACTIONS:

Formal coordination is expected to be completed by April 1990 and will then be submitted to DDR&E(T&E) for final approval.

ASD(C3I) POSITION: Concur. The Test and Evaluation Master Plan has received favorable informal acceptance and addresses all of the concerns previously identified by DD(T&E). This document is expected to become a model for information systems test plans.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 22.]

RECOMMENDATION 3.f: Complete the preparation of a system-specific threat assessment for the DDN and a survivability analysis of the CONUS portion of the MILNET segment. 23

DCA POSITION: Concur. A classified threat assessment on the DDN, focusing on the MILNET, was prepared by NSA and submitted to ASD(C3I) on 13 October 1989. Preparations have been completed and survivability analysis was initiated in January 1990 and the CONUS portion of the analysis is scheduled for April 1990. See complete schedule under FINDING NO. 21.

ONGOING ACTIONS:

Conduct the survivability analysis as scheduled.

ASD(C3I) POSITION: Concur. We tasked DCA to evaluate the NSA threat assessment and they have provided an initial briefing on the impact. Tasking from this office will address some of the issues raised in the threat assessment. The methodology and schedule for the DDN survivability analysis have been coordinated with this office and have our approval.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 21.]

RECOMMENDATION 3.g: Require detailed plans addressing the development, acquisition, deployment, cost, and schedule for implementing the approved DDN security architecture in compliance with the ASD(C3I) memorandum, dated February 2, 1987. 23

DCA POSITION: Partially concur. ASD(C3I) has requested a revised Network security architecture. An initial draft was presented to ASD(C3I) but was put on hold by that office pending the completion of actions external to the Network management office. We were advised to expedite ongoing implementation of the current architecture with focus on the most critical features (for example: the installation of KG-84's on the ISTs) and are proceeding as advised. We are continuing with our study on host encryption alternatives.

ASD(C3I) POSITION: Concur with DCA position. The network security issues are complex in a changing environment and in consideration of an evolving security device technology. The Network management office and the effort to revise the security architecture are dependent upon external actions. NSA must lead a review to assess security threats and perform security risk analysis. DIA must advise and support NSA on the development of the assessment and by validating the assessment expeditiously. Recent developments inside and outside the DDN program are changing the assumptions upon which the architectures of DDN and other DoD data networks are based. Until these external actions are completed it makes sense for Network managers to pursue the most critical aspects of the approved architecture that are

not likely to change. New guidance and tasking will be issued shortly which will lead to a broad integrated communications security architecture.

ONGOING ACTIONS:

ASD(C3I) is preparing an extensive tasking to all Service and agency components outlining responsibilities and defining milestones for resolving current security issues. This tasking will be issued by April 1990 and all actions completed by April 1991.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 23.]

RECOMMENDATION 3.h: Report the noncompliance with the 1983 USD(R&E) guidance and the lack of procedures for monitoring data circuits and detailed plans for implementing security devices as material internal control weaknesses in accordance with DoD Directive 5010.38, "Internal Management Control Program," and track the status of corrective actions until the problems identified are resolved. 24

DCA POSITION: Nonconcur. The problem identified is not within the scope or control of the organization audited and does not meet the criteria for material internal control weakness as defined in the cited DoD directive.

ASD(C3I) POSITION: Concur with the DCA position.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 25.]

RECOMMENDATION 4: We recommend that the Commander, U.S. Army Information Systems Command, disconnect the dedicated, leased data circuits that have been replaced by the DDN and discontinue payments for leasing those dedicated circuits. 24

DCA POSITION: Defer to Army response provided separately.

ASD(C3I) POSITION: Defer to Army response provided separately.

[Also see ASD(C3I)/DCA POSITION on FINDING NO. 7.]

Disconnecting Dedicated Circuits When DDN Circuits Become Operational. It is the responsibility of the user and TCO to determine that an existing circuit is no longer necessary and issue a disconnect TSR. One of the basic tests for material weakness is whether the weakness belongs to the organization under evaluation. If a control is external to the organization, it does not effect the reasonable assurance of the organization. Deciding to disconnect circuits is not a DDN program or DCA responsibility.

Detailed Plans for Implementing Security Devices. The installation of security devices on hosts was delayed due to uncertainty over acceptable alternatives to meet host and IST encryption requirements. After determination that there were not viable alternatives for the ISTs, the installation of KG-84s on the ISTs was resumed. Acceptable cost-effective alternatives for encryption of the hosts are being addressed in a study started in early FY88. The study was extended to include evaluation of evolving public encryption capabilities but will be concluded by July 1990 and appropriate action will be taken to protect the hosts.

Summary of Potential Monetary Benefits Identified in the Draft Report.

Finding	IG's Estimated FYDP Benefits	DCA's Position	DCA's Estimated FYDP Benefits	Rationale
Storing KG-84's	$1,358,730	Nonconcur	$ - 0 -	Not an unnecessary cost but a cost of a prudent business decision. Analysis of alternatives will be completed this FY. KG-84's will either be installed or disposed of expeditiously based upon results.
Interest Public Debt	$4,025,820	Nonconcur	$ - 0 -	Decision to purchase KG-84s based on valid requirement. Decision to suspend installation based on potential for more cost effective options. Therefore, costs are cost of prudent business decisions, not unnecessary costs

SAIS-PS (SAIG-PA/20 Dec 89) 1st End Mr. Heininge/53031
SUBJECT: Draft Audit Report on the Defense Data Network
(Project No. 8IC-0067)

HQDA (SAIS-PS), WASHINGTON, DC 20310-0107 February 5, 1990

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

The purpose of this endorsement is to provide input to your draft audit report, dated 14 December 1989.

Concur with recommendations 1, 2, and 3 made on page 38 as written. 22, 23 & 24

Nonconcur with recommendation number 4 on page 38. The DDN is not yet sufficiently reliable or robust enough to support distributed processing in the technical environment and the volume of current Army data systems. As an example, Army Standard Information Systems (ASIMS) requirements are not fully supported by the DDN. 24

Consequently, in order for Army to provide adequate telecommunications support, circuit availability, reliability, and increased interoperability to users, some dedicated leased data circuits are retained. Circuits that are retained, have an approved DCA waiver.

Army continues to examine and eliminate leased lines that become excess to our needs as a result of DDN improvement and implementation.

JEROME B. HILMES
Lieutenant General, GS
Director

Encl
nc

CF:
SAIG-PA (26-2b)

DEPARTMENT OF THE ARMY
USAISC — SUSTAINING BASE NETWORK ACTIVITY
FORT BELVOIR, VA 22060-5897

REPLY TO
ATTENTION OF

07 FEB 1990

ASQNL-ND-NB

MEMORANDUM FOR Commander, USAISEC, ATTN: ASQB-CG, Fort Huachuca, AZ 85613-5300

SUBJECT: ASIMS Defense Data Network (DDN) Connectivity

1. BACKGROUND. During the period 01-31 May 1989 this Headquarters directed the ASIMS contractor, Electronic Data Systems Federal Corporation (EDSFC), to conduct a 30 day test of the DDN among the ASIMS Regional Data Centers (RDCs) to provide SBNA with a report of down time and the number of bytes being transported over the Defense Data Network. The EDSFC report showed over 600 hours of DDN down time for the 5 RDCs, while DCA's Bolt, Beranek and Neuman (BBN) recorded only 6 hours of down time. As a result of this discrepancy (600 +hours versus 6 hours) SBNA met with BBN, DCA, 7Th Signal Command, and EDSFC. The government decided to repeat the test with emphasis on diagnosing and correcting each problem by calling in each outage to the BBN Network Operations Center (NOC) and requesting a trouble ticket be assigned to each outage. This second test which included 5 RDCs and 14.5 data processing centers (Fort Devens participated for only 15 days), was conducted from 15 November 1989 through 14 December 1989 and revealed down time of 973.57 hours for the 30 day test period. The total number of minutes monitored was 842,000 (30 days x 24 hours per day x 60 minutes per hour x 19.5 sites = 842,000), and the amount of total down time of 58,414.2 minutes. The results reflect down time of 6.9 percent. The period monitored included four weekends (192 hours), Thanksgiving (24 hours, and 3rd shift for 19 days x 8 = 152 hours) for a total of 368 hours. These hours should not have been considered because the DPCs were not in operation. Enclosure 1 is a copy of the test results. Comparing this to the reliability of the dedicated circuits, the latest monthly report received by this office showed ASIMS dedicated circuits running over 99 percent reliable.

2. Using the EDSFC statistics, if we eliminated weekends, Thanksgiving, and 3rd shift, the base would be 430,560 minutes (23 days x 16 hours per day x 60 minutes per hour x 195 sites =430,560) against the reported 33,096 minutes of downtime reflecting down time to be 7.7 percent.

3. DDN - ASIMS uses NCR COMTEN front end processors with COMTEN Communications Network Systems (CNS) software for the trunk lines and COMTEN PCNS for the DDN lines. Data is transmitted over the DDN circuit only when all dedicated circuits are busy. SBNA has

tasked the contractor to investigate the cost of redirecting this algorithm so data will be transmitted on the DDN circuits first. SBNA can then conduct another test to evaluate DDN reliability when forced to full capacity.

4. SBNA has provided DDN access to the 5 RDCs and 15 DPCs and have received funding to connect the remaining DPCs to the DDN. The current plan is to complete installation by the end of March 1990. Because the BLACKER encryption device is not yet available and DDN Milnet cannot process classified data at this time, a dedicated circuit must remain to support remote initial loads (RIL) and classified telecommunications. SBNA has directed the contractor to provide a list of peak bandwidth requirements for classified and unclassified processing. SBNA plans to disconnect excess dedicated circuits based on bandwidth requirements. SBNA could disconnect approximately 71 dedicated circuits between the RDCs and the DPCs based on capacity of DDN circuits in place or to be installed. With the removal of the 71 dedicated circuits, the bandwidth of the DDN circuits will not be large enough to process all ASIMS data. RDC-Washington will require 6 56 KB circuits; RDC-Atlanta, 8; RDC-Monterey, 8; RDC-Killeen, 8; and RDC-Louisville, 10.

5. CAPACITY. DDN is experiencing PSN saturation problems, i.e., on 19 January 1989, the PSN that RDC-Washington is connected to was saturated, resulting in time outs. These time outs did not impact ASIMS users because of the availability of dedicated circuits. This headquarters has a waiver from DDN that expires on 31 January 1993. This waiver was granted from the Defense Communications Agency because they were concerned with supporting a large volume data processing network such as ASIMS. Enclosure 2 is a copy of a report that lists the amount of data that ASIMS processed for March and September 1989. The March 1989 figures show that the packet cost based on 128 bytes per packet would be approximately $1,208,360.01 per month. SBNA currently pays approximately $2.1 million per year for dedicated circuits. In addition to packet charges, with DDN, a customer is charged a monthly connection fee and in some circumstances, a long haul circuit charge.

6. There are several alternatives available to the Army as it concerns ASIMS and DDN based on the assumptions of a 45 percent overhead for DDN circuits versus a 10% overhead for leased circuits. A 56 KB circuit on DDN would permit throughput of 30.8 KB compared to 50 KB on a leased circuit. This throughput

information was obtained from a DDN class conducted by Sprint International, Federal Systems, who is also a contractor to DCA.

a. Based on individual site's bandwidth requirements, SBNA retains only the number of leased circuits needed to supplement the DDN circuits in place or scheduled. Each DPC requires a minimum of one dedicated circuit in support of classified transmission and RIL, requiring the DDN to handle the majority of ASIMS data. However, ASIMS would have to increase the DDN bandwidth for the RDC's as indicated in paragraph 4.

b. Operate as currently configured, i.e., leased and DDN circuits. Project MAXIMIZE will be completed in the February 1990 timeframe. At that time, all but 25 9.6 KB circuits would have been upgraded to 19.2 KBS. Project MAXIMIZE will permit us to disconnect 30 additional dedicated circuits in 1990 further reducing the cost of dedicated circuits.

7. In conclusion, SBNA will continue using the leased circuits as currently implemented until that time when the DDN can support ASIMS. SBNA is committed to provide users with the best possible reliability (99% for leased circuits versus 93% for DDN) at the lowest cost. When DDN can support the data traffic that ASIMS represents at an acceptable reliability level and if DCA agrees to charge the same for a packet of 1024-bytes as they are currently charging for a 128-byte packet, SBNA can transition to DDN within budget, and still meet users expectations.

2 Encls

GERALD R. MOWERY
Director

CF:
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- Each time an access link fails because of a PSN failure, scheduled or unscheduled, it is considered an outage.

3. During the reporting period of November 15, 1989 through December 15, 1989, EDS reported each outage and attempted to have each one assigned a problem ticket number. However, EDS experienced difficulty on several occasions with the NOC refusing to assign problem ticket numbers to outages for the following reasons:

- The NOC refused to accept outage call on access circuits that are located on PSNs in remote locations (i.e., Fort Gordon's PSN). Apparently, a trouble reporting procedures exists within BBN that only Host Site administrators at the remote location can call in problems. Therefore, several of the outages reported are not assigned NOC ticket numbers for the above reason. EDS and the Army, however, have convinced BBN that the RDCs should be able to call in problem tickets. In fact, outage calls from the RDCs for remote locations are now being allowed in most instances.

- If a PSN outage occurred because of a BBN scheduled outage, a problem ticket number was refused.

- If a PSN outage occurred because of a power failure, sometimes a ticket was refused, sometimes not.

4. To summarize the results of the monitoring, a total of 973.57 hours of outages were observed during this period.

5. Questions regarding Enclosure (1) may be addressed to Connie Bennett at (703) 644-8217. Contractual questions should be directed to the undersigned at (703) 644-8109.

ELECTRONIC DATA SYSTEMS CORPORATION

A.R. Catlin
Contract Manager

ARC:CB:aa

DDNOUTAG

cc: SBNA, Mr. G. Mowery
7th Signal, Attn: ASN-OP-O, (Mr. J. Cottone)
COR

Mrs. Rose Alberter, Contracting Officer
Contract Management Office
U.S. Army Information Systems Selection
and Acquisition Agency
Attn: ISSA-AAD
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2461 Eisenhower Avenue
Alexandria, Virginia 22331-0700

SUBJECT: ASIMS Project, Contract DAHC26-81-C-0013, DDN Outage Report for Period November15, 1989 - December 15, 1989

REFERENCES: (a) Meeting Between EDS and Army Representatives from SBNA, BBN, and 7th Signal on November 2, 1989
(b) EDS Letter 890701__, dated July 1, 1989; Subject: DDN Reliability Test

ENCLOSURE: (1) Summary of DDN Monitoring Results

Dear Mrs. Alberter:

1. During reference (a), EDS and the Army discussed the results of reference (b). In reference (b), EDS reported over 600 hours of DDN down-time for the 5 RDCs, while DCA and Bolt Beranek and Neuman (BBN) recorded only 6 hours of down-time. EDS and the Army representatives jointly decided that the reason for the discrepancies in reporting existed because EDS outages were not receiving BBN trouble ticket numbers. Therefore, EDS and Army representatives decided to repeat the test, with emphasis on diagnosing and fixing each problem by calling in each outage to the BBN NOC and having a trouble ticket assigned.

2. The following report documents the results of DDN Monitoring for the period of November 15, 1989 through December 15, 1989. The criteria used in this report for recording a DDN outage to ASIMS is as follows:

- Each time an access link to the DDN fails and is down for more than 1 minute, it is considered an outage. Access link failures that recover in less than one minute and did not continually reoccur (i.e., link bouncing up and down) are not reported.

- Each time an access link bounces (i.e., up and down) more than 3 times in a 5 minute period, it is considered an outage and will be reported to the BBN NOC.

A S I M S

D D N O U T A G E R E P O R T

11/15/89 TO 12/15/89

RDC	DPI	DATE DOWN	DATE UP	LOST MINUTES	START TIME	END TIME	VICTOR IR#	NOC TICKET #	OUTAGE REASON
W		11/15	11/15	28	09:16	09:44	W0911171200S6	NONE	TRUNK TO EUROPE DOWN,NOC SAID EUROPE HAD TO CALL IT IN
L		11/15	11/15	193	14:06	17:19	A0911153143415	10644	PSN DOWN, DUE TO POWER FAILURE, NOC REFUSED TO OPEN TICKET, BUT AFTER SEVERAL ESCALATIONS, OPENED A TICKET.
	FT KNOX	11/15	11/15	193	14:06	17:19	A0911153140637	10644	PSN DOWN, DUE TO POWER FAILURE, NOC REFUSED TO OPEN TICKET, BUT AFTER SEVERAL CALLS, OPENED A TICKET.
	HUACHUCA	11/20	11/20	100	15:20	17:00	H0911155184626	NONE	HUACHUCA ACCESS LINK DOWN, CALLED INTO NOC BUT NOC REFUSED TO ASSIGN TICKET NO.
	SHERIDAN	11/16	11/16	87	10:03	11:30	A0911161035841	NONE	PSN DOWN, NOC REFUSED TO ASSIGN TICKET SAID SCHEDULED OUTAGE
	FITZSIMNS	11/20	12/07	24600	08:00	10:00	K0911291658S5	10788	ACCESS LINK DOWN, COMBINATION ONPOST CIRCUIT AND OFE MODEM PROBLEM.
R		11/20	11/21	1077	08:03	02:00	R0911200603S0	10782	LINK DOWN, GTE REPAIRED DIGITAL LINE PROBLEM
W		11/20	11/20	148	19:17	21:45	W0911202131S0	10815	PSN DOWN, NOC REPORTED A SOFTWARE PROBLEM, NOC REFUSED TO ASSIGN A TICKET AT FIRST BUT DID SO AFTER INSISTANCE.
	BRAGG	11/20	11/20	46	12:13	12:59	A0911201301S3	NONE	FT. BRAGG ACCESS CIRCUIT DOWN,CALLED MILNET BUT DID NOT INSIST ON TROUBLE TICKET
L		11/20	11/20	60	15:15	16:15	A0911201548S7	10797	PSN DOWN, NOC RESOLVED PROBLEM
W		11/21	11/21	36	10:32	11:08	W0911211405A5	NONE	ASE PSN DOWN, NOC OPERATOR TED VAIVE ,HE SAID TROUBLE DESK WAS DOWN AND TO CALL BACK LATER
W		11/21	11/21	20	01:31	01:51	W0911210526O3	NONE	PSN DOWN DUE TO POWER OUTAGE AT PSN LOCATION, DID NOT INSIST ON TROUBLE TICKET
	CAMPBELL	11/21	11/21	31	10:42	11:13	A0911211042A2	10835	LINK DOWN, BUT MILNET COULD NOT INVESTIGATE OR OPEN TICKET DUE TO NOC MOVING, LATER GAVE TICKET NUMBER
	DIX	11/22	11/22	116	07:31	09:27	A0911221005S5	10850	PSN DOWN, RECEIVING MULTIPLE ALARMS, NOC RELOADED PSN
	BRAGG	11/22	11/22	60	10:30	11:30	A0911221041S2	NONE	FT. BRAGG ACCESS CIRCUIT DOWN,DID NOT ASK FOR TICKET #.
	GORDON	11/27	11/27	195	11:45	15:00	A0911271219Z7	11007	ACCCESS LINK DROPPING INTERMITTENTLY, MILNET CORRECTED THE PROBLEM
A		11/28	11/28	4	06:33	06:37	A0911280633S1	NONE	ACCCESS LINK DROPPED FOR 4 MINUTES, PROBLEM CORRECTED BY RESTORING CARRIER TO CIRCUIT
L		11/28	11/28	238	01:02	05:00	A0911280102S5	11021	ACCCESS LINK DROPPED MILNET CALLED OUT TO GTE
	CAMPBELL	11/30	11/30	235	12:25	16:00	A0911301632J0	11105	ACCESS LINK DOWN , CALLED MILNET, THEY FOUND THE CAMPBELL MODEM IN LOOPBACK, PROBLEM CLEARED BY MILNET
	GORDON	11/30	11/30	1320	01:00	16:20	A0912012258J6	NONE	ACCESS LINK DOWN , CALLED MILNET, NOC REFUSED TO OPEN A TICKET.
R		12/01	12/04	108	06:56	08:54	H0912040935S0	11136	ACCESS LINK DOWN, MILNET COULD NOT EXPLAIN THE REASON FOR THE OUTAGE
	CLAYTON	12/04	12/04	39	08:13	08:52	K0912041917I7	NONE	PSN DOWN, MILNET (JOHNNY) REFUSED TO ASSIGN TICKET, SAID SCHEDULED RELOAD OF PSN
	DIX	12/04	12/06	3326	08:52	16:18	R0912041345A8	11221	LINK TO PSN IS DOWN, RECEIVING TIMEOUT MESSAGES, PSN NOT RESPONDING, MILNET COULD FIND NO PROBLEM
	CLAYTON	12/04	12/05	90	13:00	15:30	K0912051616A7	NONE	ACCESS LINK UP BUT PSN, REJECTING OUTGOING CALLS,DID NOT REPORT TO NOC
	SILL	12/04	12/05	122	09:50	11:52	K0912051604O8	NONE	ACCESS LINK DOWN, BUT PROBLEM CLEARED BEFORE IT WAS CALLED IN TO MILNET
	GORDON	12/05	12/05	11	13:49	14:00	A0912051349I8	11266	GORDON ACCESS LINK DOWN MILNET, COULD NOT FIND A PROBLEM, CLEARED WHILE TESTING
	EUROPE	12/06	12/06	67	07:31	08:38	W0912060737Z9		PSN IN EUROPE DOWN, MILNET LOCAL NOT CALLED BECAUSE THEY ALWAYS SAY TO CALL EUROPE.
	GORDON	12/06	12/06	37	16:13	16:50	A0912061701J9	NONE	ELISABETH AT MILNET, REFUSED TO ACCEPT THE CALL, SAID THE USER AT GORDON WOULD HAVE TO REPORT THE OUTAGE.
	GORDON	12/06	12/07	550	22:15	07:25	A0912062235Z1	11321	LEROY FROM MILNET, HAD RDC PERSON, PUT THE RDCA BSU IN LOOPBACK, WHICH KNOCKED DOWN ALL ATLANTA CONNECTIONS. PROBLEM WAS DIAGNOSED BY M
	CLAYTON	12/07	12/07	72	07:45	08:57	K0912070857I4	NONE	CLAYTON ACCESS LINK DOWN, PROBLEM CLEARED BEFORE IT COULD BE CALLED INTO MILNET
	SAM HOUST	12/07	12/11	5928	07:45	09:03	K0912070852I2	NONE	SAM HOUSTON ACCESS LINK DOWN, PROBLEM REFERRED OUT TO SID MARTINEZ OR POST. MILNET SAID BRIDGING PROBLEM ON CIRCUIT.
	DEVENS	12/07	12/07	106	14:25	16:11	W0912071658I0	11363	DEVENS PSN DOWN, MILNET CLEARED PROBLEM.
	DIX	12/08	12/11	4355	09:15	09:50	A0912080947I0	11391	DIX ACCESS LINK DOWN, MILNET COULD NOT DIAGNOSE PROBLEM, PROBLEM CLEARED WHILE TESTING.
W		12/08	12/11	4684	16:06	22:10	W0912082150S0	11407	LINK BOUNCING, ASKED NOC TO INVESTIGATE, THEY DETERMINED THE PROBLEM TO BE AT&T'S.

	GORDON	12/11	12/12	1423	08:17	08:00	A8912110817S1	11499 MILNET RE-ESTABLISHED PSN LINK.
W		12/12	12/12	39	19:04	19:43	W8912121922J8	CALLED NOC, NOC SAID PSN DOWN DUE TO PSN UPGRADE, REFUSED TO ASSIGN TICKET NO..
	DIX	12/13	12/15	3355	16:55	00:00	R8912131916A2	11604 ACCESS LINK DOWN, MILNET SAYS PROBLEM WITH DSU, STILL DOWN, LOOSE CABLE ON DSU
	EUROPE	12/14	12/14	60	10:55	11:55	W8912141112A0	PSN IN EUROPE DOWN, MILNET LOCAL NOT CALLED BECAUSE THEY ALWAYS SAY TO CALL EUROPE.
W		12/14	12/15	959	14:08	06:07	W8912141433I7	11597 COMBINATION PROBLEM OF PSN NOT RESPONDING TO POLL INTERMITTENTLY AND POWER FAILURE AT PSN.
	CAMPBELL	12/15	12/18	4296	12:24	12:00	R8912151302I5	11626 ACCESS LINK DOWN, FIBER OPTIC PROBLEM, ONPOST, FIBER REPAIRED.

HRS DOWN 973.57

DDN Sites

The following ASIMS sites were operational during the recent DDN test conducted from November 15, 1989 through December 15, 1989:

Site	Bandwidth	Date Oper.	% Down	Min Down
Fitzsimons	19.2 KBPS	25 MAR 88	57%	24600
Fort Dix	56 KBPS	7 AUG 89	26%	11152
Fort Sam Houston	56 KBPS	21 MAR 88	14%	5928
RDC Washington	56 KBPS	August 87	14%	5714
Fort Campbell	56 KBPS	17 NOV 89	11%	4562
Fort Gordon	19.2 KBPS	26 MAY 88	8%	3536
RDC Monterey	56 KBPS	August 87	3%	1185
RDC Louisville	56 KBPS	August 87	1%	491
Fort Knox	19.2 KBPS	1 FEB 88	1%	193
Europe	9.6KBPS	1 DEC 88	1%	127
Fort Sill	56 KBPS	27 OCT 89	1%	122
Fort Clayton	56 KBPS	28 SEPT 89	1%	111
Fort Bragg	19.2 KBPS	21 APR 89	1%	106
Fort Devens	19.2 KBPS	1 DEC 89	1%	106
Fort Huachuca	56 KBPS	31 MAR 88	1%	100
Fort Sheridan	56 KBPS	10 APR 89	1%	87
RDC Atlanta	56 KBPS	August 87	1%	4
RDC Killeen	56 KBPS	August 87	0%	0
SDC-W	56 KBPS	August 87	0%	0
Fort Ben Harrison	56 KBPS	6 MAY 88	0%	0
Pres of San Fran	56 KBPS	17 FEB 89	0%	0

Note 1: The "% Down" figures are rounded to the nearest whole number.

DDN NOTES TO FRED BOOTH (SBNA)

There are six arguments to evaluate before deleting dedicated circuits and using DDN only for ASIMS traffic:

1. Reliability of DDN - Recent test came up with a 7% outage for all sites. Seven percent is an average - some site are much worse, some sites are much better. Note that 7% outage is higher than EDS maintained SRL.

2. Packet charges for DDN usage make DDN more expensive to the Army than dedicated circuits. Packet charges are based on data plus overhead, taking into account peak and off-peak charges.

   Assumptions For Computing Packet Charges:

   A. JES raw data comes from SMF 6 records, assuming an average of 45 characters per JES record transmitted.

   B. CICS raw data transaction bytes come from SMF 110 records.

   C. Byte counts transmitted do not include ROSCOE or TSO transactions.

   D. Overhead is calculated as follows:

      CICS and CNS overhead is 20% of raw data.
      JES and CNS overhead is 16% of raw data.

      NOTE: X.25 overhead is not included in packet or charge calculations, but is included when figuring throughput for DDN capacity and access circuit bandwidth.

      X.25 is 2% of raw data plus CICS or JES plus CNS overhead.

   E. Packet charges based on:

      $1.35 per 1000 packets - peak time (0600-1800)
      $1.00 per 1000 packets - non peak (1800-0600)

      Packet size for charging is assumed to be 128 bytes.

   F. Charges were calculated only for data transferred between RDCs and DPCs. Data between RDCs was not available in this short timeframe, but can be added in at a later time. RDC to RDC traffic is typically smaller than RDC to DPC traffic.

2

FNCL 2

3. DDN Capacity: Three years ago DCA gave ASIMS a waiver to use DDN because DDN at that time did not have the capacity to carry ASIMS workload. EDS is providing workload data for DCA analysis to determine whether DDN currently has the capacity to carry ASIMS workload.

4. DDN access circuit sizes to ASIMS sites:

   Based on current ASIMS workload and assuming the following:

   A. DDN is reliable enough.
   B. DDN has the internal capacity to carry ASIMS workload.
   C. DDN internal network throughput is assumed to be the following:

      56 KB Circuit - 30.8 KB throughput
      19.2 KB Circuit - 10.6 KB throughput

      (Percentage of link throughput reported by Government contractor personnel which conduct DDN usage classes is 55% of access circuit bandwidth.)

   Assuming the above, ASIMS sites are under trunked on DDN, both DPCs and RDCs.

5. At least one circuit must remain for each site that goes classified.

6. DDN is not yet installed at all ASIMS sites. Dual homing is not yet installed at the RDCs.

DDN KILOPACKET CHARGES

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 3/89	CICS TRANSMITTED (BYTES) AS OF 3/89	75% UNCLAS JES (2nd SHIFT) AS OF 3/89	CICS AND 25% UNCLAS JES (1st SHIFT) AS OF 3/89	PRICE PER KILOPACKET (2ND SHIFT) $1.00/KILOP	PRICE PER KILOPACKET (1ST SHIFT) $1.35/KILOP	COST PER SITE (PEAK & NON-) PEAK HOURS)
RDC Washington							
Fort Devens	1,569,438,101	302,779,375	1,177,078,576	695,138,900	$9,195.93	$7,331.54	$16,527.47
Fort Monroe	907,416,664	73,853,299	680,562,498	300,707,465	$5,316.89	$3,171.52	$8,488.42
Fort Ritchie	1,270,353,764	139,487,788	952,765,323	457,076,229	$7,443.48	$4,820.73	$12,264.20
Fort Detrick	1,902,177,187	112,238,537	1,426,632,890	587,782,834	$11,145.57	$6,199:27	$17,344.84
Walter Reed AMC	1,564,784,210	191,269,824	1,173,588,157	582,465,876	$9,168.66	$6,143.19	$15,311.85
Fort Belvoir	2,635,731,468	303,640,236	1,976,798,601	962,573,103	$15,443.74	$10,152.14	$25,595.88
Fort Eustis	2,179,152,110	321,632,740	1,634,364,082	866,420,767	$12,768.47	$9,138.03	$21,906.50
Fort Lee	2,164,880,212	279,012,797	1,623,660,159	820,232,850	$12,684.84	$8,650.89	$21,335.74
West Point	2,166,994,573	150,481,332	1,625,245,930	692,229,975	$12,697.23	$7,300.86	$19,998.10
DCU-Melpar	1,320,193,175	30,792,138	990,144,882	360,840,432	$7,735.51	$3,805.74	$11,541.25
DCL-Lee	197,220,265	3,548,340	147,915,199	52,853,406	$1,155.59	$557.44	$1,713.03
RDC Washington Total:	17,878,341,730	1,908,736,405	13,408,756,297	6,378,321,838	$104,755.91	$67,271.36	$172,027.27
RDC Atlanta							
Fort McPherson	350,118,711	292,539,156	262,589,033	380,068,834	$2,051.48	$4,008.54	$6,060.02
Fort Stewart	4,635,280,134	271,062,240	3,476,460,101	1,429,882,274	$27,159.84	$15,080.79	$42,240.63
Fort Bragg	5,437,434,559	427,649,393	4,078,075,919	1,787,008,032	$31,859.97	$18,847.35	$50,707.32
Fort Benning	3,821,792,359	476,395,286	2,866,344,269	1,431,843,376	$22,393.31	$15,101.47	$37,494.79
Fort Gordon	2,092,381,564	303,274,267	1,569,286,173	826,369,658	$12,260.05	$8,715.62	$20,975.67
Fort McClellan	2,530,600,668	297,225,606	1,897,950,501	929,875,773	$14,827.74	$9,807.28	$24,635.02
Fort Rucker	3,336,471,315	313,699,823	2,502,353,486	1,147,817,652	$19,549.64	$12,105.89	$31,655.53
Fort Jackson	3,206,992,295	224,921,368	2,405,244,221	1,026,669,441	$18,790.97	$10,828.15	$29,619.12
RDC Atlanta Total:	25,411,071,604	2,606,767,139	19,058,303,703	8,959,535,040	$148,893.00	$94,495.10	$243,388.09

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 3/89	CICS TRANSMITTED (BYTES) AS OF 3/89	75% UNCLAS JES (2nd SHIFT) AS OF 3/89	CICS AND 25% UNCLAS JES (1st SHIFT) AS OF 3/89	PRICE PER KILOPACKET (2ND SHIFT) $1.00/KILOP	PRICE PER KILOPACKET (1ST SHIFT) $1.35/KILOP	COST PER SITE (PEAK & NON-) PEAK HOURS)
RDC Killeen							
NSC	404,701,745	53,855,372	303,526,309	155,030,809	$2,371.30	$1,635.09	$4,006.39
Fort Polk	3,675,010,500	281,008,469	2,756,257,875	1,199,761,094	$21,533.26	$12,653.73	$34,186.99
Fort Carson	3,765,137,193	316,499,777	2,823,852,895	1,257,784,075	$22,061.35	$13,265.69	$35,327.04
Fort Hood	0	554,691,098	0	554,691,098	$0.00	$5,850.26	$5,850.26
Fort Riley	3,204,714,182	421,169,479	2,403,535,637	1,222,348,025	$18,777.62	$12,891.95	$31,669.57
Fort Clayton	2,656,107,686	406,407,353	1,992,080,764	1,070,434,274	$15,563.13	$11,289.74	$26,852.87
Fitzsimons AMC	1,032,397,976	152,500,860	774,298,482	410,600,354	$6,049.21	$4,330.55	$10,379.76
Fort Leavenworth	1,983,549,523	193,686,452	1,487,662,142	689,573,833	$11,622.36	$7,272.85	$18,895.21
Fort Sill	5,077,094,774	395,653,223	3,807,821,081	1,664,926,916	$29,748.60	$17,559.78	$47,308.38
Fort Sam Houston	2,522,129,861	797,647,130	1,891,597,396	1,428,179,596	$14,778.10	$15,062.83	$29,840.94
RDC Killeen Total:	24,320,843,440	3,573,119,214	18,240,632,580	9,653,330,074	$142,504.94	$101,812.47	$244,317.41
RDC Monterey							
Fort Huachuca	3,394,875,389	370,723,284	2,546,156,542	1,219,442,131	$19,891.85	$12,861.30	$32,753.15
Fort Ord	30,168,259	274,379,612	22,626,194	281,921,677	$176.77	$2,973.39	$3,150.16
Presidio San Francisco	2,980,720,642	419,422,098	2,235,540,481	1,164,602,258	$17,465.16	$12,282.91	$29,748.07
Fort Lewis	6,629,613,185	288,335,806	4,972,209,889	1,945,739,102	$38,845.39	$20,521.47	$59,366.86
Fort Richardson	5,722,726,351	343,631,642	4,292,044,763	1,774,313,230	$33,531.60	$18,713.46	$52,245.06
Fort Bliss	3,342,832,250	448,067,677	2,507,124,188	1,283,775,740	$19,586.91	$13,539.82	$33,126.73
Fort Shafter	2,775,734,321	267,233,269	2,081,800,741	961,166,850	$16,264.07	$10,137.31	$26,401.37
Fort Irwin	1,824,941,180	158,177,501	1,368,705,885	614,412,796	$10,693.01	$6,480.13	$17,173.15
RDC Monterey Total:	26,701,611,577	2,569,970,890	20,026,208,683	9,245,373,784	$156,454.76	$97,509.80	$253,964.56

DDN KILOPACKET CHARGES

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 3/89	CICS TRANSMITTED (BYTES) AS OF 3/89	75% UNCLAS JES (2nd SHIFT) AS OF 3/89	CICS AND 25% UNCLAS JES (1st SHIFT) AS OF 3/89	PRICE PER KILOPACKET (2ND SHIFT) $1.00/KILOP	PRICE PER KILOPACKET (1ST SHIFT) $1.35/KILOP	COST PER SITE (PEAK & NON-PEAK HOURS)
RDC Louisville							
Fort Indiantown Gap	1,775,229,815	109,326,407	1,331,422,361	553,133,861	$10,401.74	$5,833.83	$16,235.57
Fort Campbell	4,772,788,924	459,796,225	3,579,591,693	1,652,993,456	$27,965.56	$17,433.92	$45,399.48
Fort Ben Harrison	2,709,773,462	289,263,646	2,032,330,096	966,707,011	$15,877.58	$10,195.74	$26,073.32
Fort Meade	5,206,792,408	478,877,908	3,905,094,306	1,780,576,010	$30,508.55	$18,779.51	$49,288.06
Fort Dix	3,233,774,497	309,315,844	2,425,330,872	1,117,759,468	$18,947.90	$11,788.87	$30,736.77
Fort Leonard Wood	3,072,212,730	366,790,165	2,304,159,548	1,134,843,348	$18,001.25	$11,969.05	$29,970.30
Fort Knox	0	457,229,923	0	457,229,923	$0.00	$4,822.35	$4,822.35
Fort Sheridan	3,806,528,922	443,842,298	2,854,896,692	1,395,474,529	$22,303.88	$14,717.90	$37,021.78
Fort Drum	3,417,231,188	198,803,126	2,562,923,391	1,053,110,923	$20,022.84	$11,107.03	$31,129.87
Fort McCoy	2,487,655,832	270,207,346	1,865,741,874	892,121,304	$14,576.11	$9,409.09	$23,985.20
RDC Louisville Total:	30,481,987,777	3,383,452,888	22,861,490,833	11,003,949,832	$178,605.40	$116,057.28	$294,662.68
ASIMS Monthly Total for March					$731,214.00	$477,146.01	$1,208,360.01

DDN KILOPACKET CHARGES

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 9/89	CICS TRANSMITTED (BYTES) AS OF 9/89	75% UNCLAS JES (2nd SHIFT) AS OF 9/89	CICS AND 25% UNCLAS JES (1st SHIFT) AS OF 9/89	PRICE PER KILOPACKET (2ND SHIFT) $1.00/KILOP	PRICE PER KILOPACKET (1ST SHIFT) $1.35/KILOP	COST PER SITE (PEAK & NON-) PEAK HOURS)
RDC Washington							
Fort Devens	2,038,920,986	278,160,515	1,529,190,739	787,890,761	$11,946.80	$8,309.79	$20,256.59
Fort Monroe	1,344,802,865	46,422,650	1,008,602,149	382,623,367	$7,879.70	$4,035.48	$11,915.19
Fort Ritchie	1,941,419,059	176,018,670	1,456,064,294	661,373,435	$11,375.50	$6,975.42	$18,350.93
Fort Detrick	2,989,681,607	101,806,990	2,242,261,205	849,227,391	$17,517.67	$8,956.70	$26,474.36
Walter Reed AMC	1,886,328,432	181,487,904	1,414,746,324	653,070,012	$11,052.71	$6,887.85	$17,940.55
Fort Belvoir	2,346,239,925	312,504,302	1,759,679,944	899,064,284	$13,747.50	$9,482.32	$23,229.82
Fort Eustis	3,046,819,779	389,613,236	2,285,114,834	1,151,318,181	$17,852.46	$12,142.81	$29,995.27
Fort Lee	2,665,467,668	310,153,853	1,999,100,751	976,520,770	$15,617.97	$10,299.24	$25,917.22
West Point	2,770,694,255	227,435,604	2,078,020,691	920,109,168	$16,234.54	$9,704.28	$25,938.81
DCW-Kelpar	1,036,296,220	77,866,136	777,222,165	336,940,191	$6,072.05	$3,553.67	$9,625.71
DCL-Lee	108,499,423	591,004	81,374,567	27,715,859	$635.74	$292.32	$928.05
RDC Washington Total:	22,175,170,218	2,102,060,864	16,631,377,664	7,645,853,419	$129,932.64	$80,639.86	$210,572.50
RDC Atlanta							
Fort McPherson	376,717,273	336,785,827	282,537,955	430,965,146	$2,207.33	$4,545.34	$6,752.66
Fort Stewart	5,986,510,646	295,182,970	4,489,882,985	1,791,810,631	$35,077.21	$18,898.00	$53,975.21
Fort Bragg	7,683,868,867	492,674,130	5,762,901,650	2,413,641,347	$45,022.67	$25,456.37	$70,479.04
Fort Benning	4,806,018,713	487,003,829	3,604,514,035	1,688,508,507	$28,160.27	$17,808.49	$45,968.75
Fort Gordon	2,287,218,011	341,606,449	1,715,413,509	913,410,952	$13,401.67	$9,633.63	$23,035.30
Fort McClellan	2,661,641,303	307,200,156	1,996,230,978	972,610,482	$15,595.55	$10,258.00	$25,853.56
Fort Rucker	3,715,956,702	381,583,806	2,786,967,527	1,310,572,982	$21,773.18	$13,822.45	$35,595.63
Fort Jackson	2,827,300,770	168,647,945	2,120,475,578	875,473,137	$16,566.22	$9,233.51	$25,799.72
RDC Atlanta Total:	30,345,232,286	2,810,685,112	22,758,924,214	10,396,993,183	$177,804.10	$109,655.79	$287,459.88

DDN KILOPACKET CHARGES

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 9/89	CICS TRANSMITTED (BYTES) AS OF 9/89	75% UNCLAS JES (2nd SHIFT) AS OF 9/89	CICS AND 25% UNCLAS JES (1st SHIFT) AS OF 9/89	PRICE PER KILOPACKET (2ND SHIFT) $1.00/KILOP	PRICE PER KILOPACKET (1ST SHIFT) $1.35/KILOP	COST PER SITE (PEAK & NON-) PEAK HOURS)
RDC Killeen							
NSC	456,555,294	35,867,279	342,416,471	150,006,102	$2,675.13	$1,582.10	$4,257.22
Fort Polk	5,240,297,239	427,179,685	3,930,222,929	1,737,253,995	$30,704.87	$18,322.60	$49,027.47
Fort Carson	3,894,419,315	477,949,008	2,920,814,486	1,451,553,837	$22,818.86	$15,309.36	$38,128.22
Fort Hood	0	596,976,422	0	596,976,422	$0.00	$6,296.24	$6,296.24
Fort Riley	3,942,331,033	455,737,490	2,956,748,274	1,441,320,249	$23,099.60	$15,201.42	$38,301.02
Fort Clayton	4,172,751,698	599,954,550	3,129,563,774	1,643,142,475	$24,449.72	$17,330.02	$41,779.74
Fitzsimons AMC	1,090,957,241	198,722,932	818,217,931	471,462,242	$6,392.33	$4,972.45	$11,364.78
Fort Leavenworth	2,536,847,233	201,620,453	1,902,635,425	835,832,261	$14,864.34	$8,815.42	$23,679.76
Fort Sill	5,923,528,528	508,989,737	4,442,646,396	1,989,871,869	$34,708.17	$20,986.93	$55,695.10
Fort Sam Houston	3,767,811,712	1,605,704,519	2,825,858,784	2,547,657,447	$22,077.02	$26,869.82	$48,946.85
RDC Killeen Total:	31,025,499,293	5,108,702,075	23,269,124,470	12,865,076,898	$181,790.03	$135,686.36	$317,476.39
RDC Monterey							
Fort Huachuca	3,987,298,879	407,139,600	2,990,474,159	1,403,964,320	$23,363.08	$14,807.44	$38,170.52
Fort Ord	0	303,337,103	0	303,337,103	$0.00	$3,199.26	$3,199.26
Presidio San Francisco	2,993,615,660	520,610,438	2,245,211,745	1,269,014,353	$17,540.72	$13,384.14	$30,924.85
Fort Lewis	5,914,558,271	361,519,032	4,435,918,703	1,840,158,600	$34,655.61	$19,407.92	$54,063.54
Fort Richardson	5,568,481,615	303,002,920	4,176,361,211	1,695,123,323	$32,627.82	$17,878.25	$50,506.08
Fort Bliss	2,884,776,311	520,031,641	2,163,582,233	1,241,225,719	$16,902.99	$13,091.05	$29,994.04
Fort Shafter	3,706,681,545	265,639,068	2,780,011,159	1,192,309,454	$21,718.84	$12,575.14	$34,293.98
Fort Irwin	1,540,111,201	164,391,607	1,155,083,401	549,419,408	$9,024.09	$5,794.66	$14,818.75
RDC Monterey Total:	26,595,523,481	2,845,671,409	19,946,642,611	9,494,552,280	$155,833.15	$100,137.86	$255,971.00

DDN KILOPACKET CHARGES

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 9/89	CICS TRANSMITTED (BYTES) AS OF 9/89	75% UNCLAS JES (2nd SHIFT) AS OF 9/89	CICS AND 25% UNCLAS JES (1st SHIFT) AS OF 9/89	PRICE PER KILOPACKET (2ND SHIFT) $1.00/KILOP	PRICE PER KILOPACKET (1ST SHIFT) $1.35/KILOP	COST PER SITE (PEAK & NON-) PEAK HOURS)
RDC Louisville							
Fort Indiantown Gap	1,921,040,127	169,427,640	1,440,780,095	649,687,672	$11,256.09	$6,852.17	$18,108.27
Fort Campbell	6,054,425,561	499,099,196	4,540,819,171	2,012,705,587	$35,475.15	$21,227.75	$56,702.90
Fort Ben Harrison	3,475,854,293	356,170,828	2,606,890,720	1,225,134,401	$20,366.33	$12,921.34	$33,287.67
Fort Meade	5,130,211,928	687,755,242	3,847,658,946	1,970,308,224	$30,059.84	$20,780.59	$50,840.43
Fort Dix	3,893,575,867	453,764,058	2,920,181,900	1,427,158,025	$22,813.92	$15,052.06	$37,865.98
Fort Leonard Wood	3,755,566,219	493,433,618	2,816,674,664	1,432,325,173	$22,005.27	$15,106.55	$37,111.83
Fort Knox	0	611,574,565	0	611,574,565	$0.00	$6,450.20	$6,450.20
Fort Sheridan	6,294,042,144	517,765,813	4,720,531,608	2,091,276,349	$36,879.15	$22,056.43	$58,935.58
Fort Drum	4,169,849,065	262,550,092	3,127,386,799	1,305,012,358	$24,432.71	$13,763.80	$38,196.51
Fort McCoy	3,872,493,122	285,049,786	2,904,369,842	1,253,173,066	$22,690.39	$13,217.06	$35,907.45
RDC Louisville Total:	38,567,058,327	4,336,590,838	28,925,293,745	13,978,355,419	$225,978.86	$147,427.97	$373,406.82
ASINS Monthly Total for September					$871,338.77	$573,547.83	$1,444,886.60

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 3/89	CLAS JES TRANSMITTED (BYTES) AS OF 3/89	TOTAL JES (BYTES) AS OF 3/89	CICS TRANSMITTED (BYTES) AS OF 3/89	BANDWIDTH REQUIRED (KBPS) AS OF 3/89	CURRENT DDN ACCESS BANDWIDTH (KBPS)	BANDWIDTH DELTA (KBPS)
RDC Washington *							
Fort Devens *	1,352,963,880	21,749,445	1,374,713,325	252,316,146	15.6	10.6	(5.0)
Fort Monroe	782,255,745	51,509,250	833,764,995	61,544,416	9.0	10.6	1.6
Fort Ritchie *	1,095,132,555	0	1,095,132,555	116,239,823	12.7	10.6	(2.1)
Fort Detrick	1,639,807,920	0	1,639,807,920	93,532,114	18.9	10.6	(8.3)
Walter Reed AMC	1,348,951,905	5,196,240	1,354,148,145	159,391,520	15.6	10.6	(5.0)
Fort Belvoir	2,272,182,300	76,488,075	2,348,670,375	253,033,530	26.3	0	(26.3)
Fort Eustis *	1,878,579,405	170,138,070	2,048,717,475	268,027,283	21.7	10.6	(11.1)
Fort Lee	1,866,276,045	11,225,835	1,877,501,880	232,510,664	21.6	30.8	9.2
West Point	1,868,098,770	0	1,868,098,770	125,401,110	21.6	10.6	(11.0)
DCW-Kelpar *	1,138,097,565	0	1,138,097,565	25,660,115	13.1	30.8	17.7
DCL-Lee	170,017,470	0	170,017,470	2,956,950	2.0	0	(2.0)
RDC Washington Total:	15,412,363,560	336,306,915	15,748,670,475	1,590,613,671	162.4	30.8	(131.6)
RDC Atlanta *							
Fort McPherson	301,826,475	93,780,450	395,606,925	243,782,630	4.9	0	(4.9)
Fort Stewart	3,995,931,150	40,412,610	4,036,343,760	225,885,200	46.2	30.8	(15.4)
Fort Bragg *	4,687,443,585	79,479,855	4,766,923,440	356,374,494	54.2	10.6	(43.6)
Fort Benning	3,294,648,585	16,180,650	3,310,829,235	396,996,072	38.1	30.8	(7.3)
Fort Gordon *	1,803,777,210	6,846,525	1,810,623,735	252,728,556	20.8	10.6	(10.2)
Fort McClellan	2,181,552,300	17,489,880	2,199,042,180	247,688,005	25.2	30.8	5.6
Fort Rucker	2,876,268,375	18,168,885	2,894,437,260	261,416,519	33.2	30.8	(2.4)
Fort Jackson	2,764,648,530	24,858,315	2,789,506,845	187,434,473	31.9	10.6	(21.3)
RDC Atlanta Total:	21,906,096,210	297,217,170	22,203,313,380	2,172,305,949	254.5	30.8	(223.7)

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 3/89	CLAS JES TRANSMITTED (BYTES) AS OF 3/89	TOTAL JES (BYTES) AS OF 3/89	CICS TRANSMITTED (BYTES) AS OF 3/89	BANDWIDTH REQUIRED (KBPS) AS OF 3/89	CURRENT DDN ACCESS BANDWIDTH (KBPS)	BANDWIDTH DELTA (KBPS)
RDC Killeen *							
NSC	348,880,815	0	348,880,815	44,879,477	4.0	0	(4.0)
Fort Polk	3,168,112,500	13,368,915	3,181,481,415	234,173,724	36.6	30.8	(5.8)
Fort Carson	3,245,807,925	26,560,080	3,272,368,005	263,749,814	37.5	30.8	(6.7)
Fort Hood	0	0	0	462,242,582	7.1	0	(7.1)
Fort Riley	2,762,684,640	19,128,780	2,781,813,420	350,974,566	31.9	10.6	(21.3)
Fort Clayton *	2,289,748,005	23,172,885	2,312,920,890	338,672,794	26.5	30.8	4.3
Fitzsimons AMC *	889,998,255	53,822,385	943,820,640	127,084,050	10.3	10.6	0.3
Fort Leavenworth	1,709,956,485	26,901,945	1,736,858,430	161,405,377	19.8	10.6	(9.2)
Fort Sill *	4,376,805,840	28,198,665	4,405,004,505	329,711,019	50.6	30.8	(19.8)
Fort Sam Houston *	2,174,249,880	8,191,080	2,182,440,960	664,705,942	25.1	30.8	5.7
RDC Killeen Total:	20,966,244,345	199,344,735	21,165,589,080	2,977,599,345	249.3	30.8	(218.5)
RDC Monterey *							
Fort Huachuca *	2,926,616,715	302,655,330	3,229,272,045	309,707,606	33.8	30.8	(3.0)
Fort Ord	26,007,120	0	26,007,120	228,649,677	3.6	0	(3.6)
Presidio San Francisco*	2,569,586,760	0	2,569,586,760	349,518,415	29.7	30.8	1.1
Fort Lewis	5,715,183,780	188,535,915	5,903,719,695	240,279,838	66.0	30.8	(35.2)
Fort Richardson	4,933,384,785	18,320,715	4,951,705,500	286,359,702	57.0	30.8	(26.2)
Fort Bliss	2,881,751,940	127,652,895	3,009,404,835	373,389,731	33.3	30.8	(2.5)
Fort Shafter	2,392,874,415	0	2,392,874,415	222,694,391	27.6	30.8	3.2
Fort Irwin	1,573,225,155	17,413,355	1,590,638,510	131,814,584	18.2	10.6	(7.6)
RDC Monterey Total:	23,018,630,670	654,578,210	23,673,208,880	2,142,413,944	269.3	30.8	(238.5)

DDN ACCESS CIRCUIT REQUIREMENTS

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 3/89	CLAS JES TRANSMITTED (BYTES) AS OF 3/89	TOTAL JES (BYTES) AS OF 3/89	CICS TRANSMITTED (BYTES) AS OF 3/89	BANDWIDTH REQUIRED (KBPS) AS OF 3/89	CURRENT DDN ACCESS BANDWIDTH (KBPS)	BANDWIDTH DELTA (KBPS)
RDC Louisville *							
Fort Indiantown Gap	1,530,370,530	11,199,870	1,541,570,400	91,105,339	17.7	10.6	(7.1)
Fort Campbell *	4,114,473,210	25,677,450	4,140,150,660	383,163,521	47.5	30.8	(16.7)
Fort Ben Harrison *	2,336,011,605	15,575,265	2,351,586,870	241,053,038	27.0	30.8	3.8
Fort Meade	4,488,614,145	55,500,030	4,544,114,175	399,064,923	51.9	30.8	(21.1)
Fort Dix *	2,787,736,635	14,383,125	2,802,119,760	257,763,203	32.2	30.8	(1.4)
Fort Leonard Wood	2,648,459,250	27,615,285	2,676,074,535	305,658,471	30.6	30.8	0.2
Fort Knox *	0	0	0	381,024,936	5.9	10.6	4.7
Fort Sheridan *	3,281,490,450	39,566,790	3,321,057,240	369,868,582	37.9	30.8	(7.1)
Fort Drum	2,945,888,955	48,604,815	2,994,493,770	165,669,272	34.0	10.6	(23.4)
Fort McCoy	2,144,530,890	25,345,485	2,169,876,375	225,172,788	24.8	10.6	(14.2)
RDC Louisville Total:	26,277,575,670	263,468,115	26,541,043,785	2,819,544,073	309.5	30.8	(278.7)

NOTES: 56 Kilobit per second access circuits have an actual throughput of 30.8 kilobits per second.

19.2 kilobits per second access circuits have an actual throughput of 10.6 kilobits per second.

All protocol overhead is added to calculations in "Bandwidth Required" formula

* SITES ON DDN

DDN ACCESS CIRCUIT REQUIREMENTS

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 9/89	CLAS JES TRANSMITTED (BYTES) AS OF 9/89	TOTAL JES (BYTES) AS OF 9/89	CICS TRANSMITTED (BYTES) AS OF 9/89	BANDWIDTH REQUIRED (KBPS) AS OF 9/89	CURRENT DDN ACCESS BANDWIDTH (KBPS)	BANDWIDTH DELTA (KBPS)
RDC Washington *							
Fort Devens *	1,757,690,505	24,143,535	1,781,834,040	231,800,429	20.3	10.6	(9.7)
Fort Monroe	1,159,312,815	7,847,370	1,167,160,185	38,685,542	13.4	10.6	(2.8)
Fort Ritchie	1,673,637,120	0	1,673,637,120	146,682,225	19.3	10.6	(8.7)
Fort Detrick	2,577,311,730	0	2,577,311,730	84,839,158	29.8	10.6	(19.2)
Walter Reed AMC	1,626,145,200	7,069,455	1,633,214,655	151,239,920	18.8	10.6	(8.2)
Fort Belvoir	2,022,620,625	58,830,525	2,081,451,150	260,420,252	23.4	0	(23.4)
Fort Eustis *	2,626,568,775	150,065,415	2,776,634,190	324,677,697	30.3	10.6	(19.7)
Fort Lee	2,297,816,955	8,168,490	2,305,985,445	258,461,544	26.5	30.8	4.3
West Point	2,388,529,530	0	2,388,529,530	189,529,670	27.6	10.6	(17.0)
DCW-Kelpar *	893,358,810	0	893,358,810	64,888,447	10.3	30.8	20.5
DCL-Lee	93,533,985	0	93,533,985	492,503	1.1	0	(1.1)
RDC Washington Total:	19,116,526,050	256,124,790	19,372,650,840	1,751,717,387	200.5	30.8	(169.7)
RDC Atlanta *							
Fort McPherson	324,756,270	67,750,200	392,506,470	280,654,856	5.6	0	(5.6)
Fort Stewart	5,160,785,040	55,308,780	5,216,093,820	245,985,808	59.6	30.8	(28.8)
Fort Bragg *	6,624,024,885	68,138,280	6,692,163,165	410,561,775	76.5	10.6	(65.9)
Fort Benning	4,143,119,580	12,449,835	4,155,569,415	405,836,524	47.9	30.8	(17.1)
Fort Gordon *	1,971,739,665	1,605,915	1,973,345,580	284,672,041	22.8	10.6	(12.2)
Fort McClellan	2,294,518,365	25,534,035	2,320,052,400	256,000,130	26.5	30.8	4.3
Fort Rucker	3,203,410,950	10,668,780	3,214,079,730	317,986,505	37.0	30.8	(6.2)
Fort Jackson	2,437,328,250	22,129,965	2,459,458,215	140,539,954	28.2	10.6	(17.6)
RDC Atlanta Total:	26,159,683,005	263,585,790	26,423,268,795	2,342,237,593	304.0	30.8	(273.2)

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 9/89	CLAS JES TRANSMITTED (BYTES) AS OF 9/89	TOTAL JES (BYTES) AS OF 9/89	CICS TRANSMITTED (BYTES) AS OF 9/89	BANDWIDTH REQUIRED (KBPS) AS OF 9/89	CURRENT DDN ACCESS BANDWIDTH (KBPS)	BANDWIDTH DELTA (KBPS)
RDC Killeen *							
HSC	393,582,150	0	393,582,150	29,889,399	4.5	0	(4.5)
Fort Polk	4,517,497,620	17,651,205	4,535,148,825	355,983,071	52.2	30.8	(21.4)
Fort Carson	3,357,258,030	30,525,930	3,387,783,960	398,290,840	38.8	30.8	(8.0)
Fort Hood	0	0	0	497,480,352	7.7	0	(7.7)
Fort Riley	3,398,561,235	11,171,340	3,409,732,575	379,781,242	39.3	10.6	(28.7)
Fort Clayton *	3,597,199,740	16,230,015	3,613,429,755	499,962,125	41.6	30.8	(10.8)
Fitzsimons AMC *	940,480,380	49,545,540	990,025,920	165,602,443	10.9	10.6	(0.3)
Fort Leavenworth	2,186,937,270	27,844,605	2,214,781,875	168,017,044	25.3	10.6	(14.7)
Fort Sill *	5,106,490,110	55,611,945	5,162,102,055	424,158,114	59.0	30.8	(28.2)
Fort Sam Houston *	3,248,113,545	6,483,330	3,254,596,875	1,338,087,099	37.5	30.8	(6.7)
RDC Killeen Total:	26,746,120,080	215,063,910	26,961,183,990	4,257,251,729	316.7	30.8	(285.9)
RDC Monterey *							
Fort Huachuca *	3,437,326,620	192,480,345	3,629,806,965	339,283,000	39.7	30.8	(8.9)
Fort Ord	0	0	0	252,780,919	3.9	0	(3.9)
Presidio San Francisco*	2,580,703,155	67,164,255	2,647,867,410	433,842,032	29.8	30.8	1.0
Fort Lewis	5,098,757,130	147,386,340	5,246,143,470	301,265,860	58.9	30.8	(28.1)
Fort Richardson	4,800,415,185	15,481,215	4,815,896,400	251,538,776	55.5	30.8	(24.7)
Fort Bliss	2,486,876,130	104,858,865	2,591,734,995	433,359,701	28.7	30.8	2.1
Fort Shafter	3,195,415,125		3,195,415,125	221,365,890	36.9	30.8	(6.1)
Fort Irwin	1,327,682,070	45,309,600	1,372,991,670	136,993,006	15.3	10.6	(4.7)
RDC Monterey Total:	22,927,175,415	572,680,620	23,499,856,035	2,370,429,184	268.8	30.8	(238.0)

DDN ACCESS CIRCUIT REQUIREMENTS

Sites	UNCLAS JES TRANSMITTED (Bytes) AS OF 9/89	CLAS JES TRANSMITTED (BYTES) AS OF 9/89	TOTAL JES (BYTES) AS OF 9/89	CICS TRANSMITTED (BYTES) AS OF 9/89	BANDWIDTH REQUIRED (KBPS) AS OF 9/89	CURRENT DDN ACCESS BANDWIDTH (KBPS)	BANDWIDTH DELTA (KBPS)
RDC Louisville *							
Fort Indiantown Gap	1,656,069,075	20,245,545	1,676,314,620	141,189,700	19.1	10.6	(8.5)
Fort Campbell *	5,219,332,380	20,574,900	5,239,907,280	415,915,997	60.3	30.8	(29.5)
Fort Ben Harrison *	2,996,426,115	2,508,435	2,998,934,550	296,809,023	34.6	30.8	(3.8)
Fort Meade	4,422,596,490	178,233,975	4,600,830,465	573,129,368	51.1	30.8	(20.3)
Fort Dix *	3,356,530,920	22,590,720	3,379,121,640	378,136,715	38.8	30.8	(8.0)
Fort Leonard Wood	3,237,557,085	25,965,630	3,263,522,715	411,194,682	37.4	30.8	(6.6)
Fort Knox *	0	0	0	509,645,471	7.9	10.6	2.7
Fort Sheridan *	5,425,898,400	78,983,325	5,504,881,725	431,471,511	62.7	30.8	(31.9)
Fort Drum	3,594,697,470	53,205,480	3,647,902,950	218,791,743	41.5	10.6	(30.9)
Fort McCoy	3,338,356,140	25,334,595	3,363,690,735	237,541,488	38.6	10.6	(28.0)
RDC Louisville Total:	33,247,464,075	427,642,605	33,675,106,680	3,613,825,698	392.0	30.8	(361.2)

NOTES: 56 Kilobit per second access circuits have an actual throughput of 30.8 kilobits per second.

19.2 kilobits per second access circuits have an actual throughput of 10.6 kilobits per second.

All protocol overhead is added to calculations in "Bandwidth Required" formula

* SITES ON DDN

REPORT OF POTENTIAL MONETARY AND OTHER BENEFITS RESULTING FROM AUDIT

RECOMMENDATION REFERENCE	DESCRIPTION OF BENEFITS	AMOUNT AND/OR TYPE OF BENEFIT
1.	Program Results. Refers the Defense Data Network (the Network) to acquisition committees for designation as a major defense acquisition program or as a major automated information system.	Nonmonetary
2.a.	Compliance. Updates the definition and scope of the Network.	Nonmonetary
2.b.	Economy and Efficiency. Provides guidance for eliminating duplicate use of data circuits.	Nonmonetary
2.c.	Program Results. Provides for an analysis of alternative commercial solutions for increasing requirements for the Network.	Nonmonetary
3.a.(1)(a)	Compliance. Provides an updated plan that establishes appropriate cost, schedule, and performance objectives.	Nonmonetary
3.a.(1)(b)	Program Results. Provides alternatives to eliminate the backlog of DoD subscribers awaiting connection to the Network.	Nonmonetary
3.a.(2).	Compliance. Implements an equitable cost recovery scheme.	Nonmonetary
3.b.	Economy and Efficiency. Provides procedures for identifying, tracking, and reporting the disconnection of dedicated, leased circuits that should be replaced by the Network.	Nonmonetary
3.c.	Economy and Efficiency. Provides procedures to collect and analyze data to effectively monitor the connection of computer systems.	Nonmonetary
3.d.	Compliance. Provides for a complete life-cycle cost estimate for the Network.	Nonmonetary

REPORT OF POTENTIAL MONETARY AND OTHER BENEFITS RESULTING FROM AUDIT (Continued)

RECOMMENDATION REFERENCE	DESCRIPTION OF BENEFITS	AMOUNT AND/OR TYPE OF BENEFIT
3.e.	Compliance. Provides for an adequate test and evaluation master plan for the review and approval of the Director, Operational Test and Evaluation.	Nonmonetary
3.f.	Compliance. Provides for a system-specific threat assessment for the Network and a survivability analysis of the CONUS portion of the Military Network.	Nonmonetary
3.g.	Economy and Efficiency. Compliance with the Assistant Secretary of Defense (Command, Control, Communications and Intelligence) February 2, 1987, memorandum for the Network Security Architecture.	Cost avoidance of $4.2 million during FY 1990 through FY 1994
3.h.	Compliance. Compliance with DoD Directive 5010.38, "Internal Management Control Program."	Nonmonetary
4.	Economy and Efficiency. Reduces payment for circuits that have been replaced by the Network.	Cost avoidance of $935,287 during FY 1990 through FY 1994
Total Potential Monetary Benefits		$5.1 Million

ACTIVITIES VISITED OR CONTACTED

Office of the Secretary of Defense

Office of the Under Secretary of Defense for Acquisition
Office of the Comptroller of the Department of Defense, Washington, DC
Office of the Assistant Secretary of Defense (Command, Control, Communications and Intelligence), Washington, DC
Office of the Joint Chiefs of Staff (Command, Control and Communications), Washington, DC

Department of the Army

Office of the Assistant Secretary of the Army (Financial Management), Washington, DC
Headquarters, U.S. Army Information Systems Command, Fort Huachuca, AZ
U.S. Army Commercial Communications Office, Fort Huachuca, AZ
U.S. Army Communications Electronics Command, Fort Monmouth, NJ
Headquarters, Army Munitions and Chemical Command, Rock Island, IL

Department of the Navy

Office of the Chief of Naval Operations, Washington, DC
Headquarters, Naval Telecommunications Command, Washington, DC
Naval Telecommunications Automation Support Center, Cheltenham, MD
U.S. Marine Corps (Command, Control and Communications), Arlington, VA
Headquarters, Naval Data Automation Command, Washington, DC
Naval Data Automation Center, Washington, DC
Navy Regional Data Automation Center, Pensacola Naval Air Station, FL
Headquarters, Naval Supply Systems Command, Washington, DC
Ships Parts Control Center, Mechanicsburg, PA
U.S. Naval Aviation Supply Office, Philadelphia, PA

Department of the Air Force

Office of the Assistant Chief of Staff for Command, Control, Communications, and Computers, Washington, DC
Headquarters, U.S. Air Force Communications Command, Scott Air Force Base, IL
U.S. Air Force Standard Systems Center, Gunter Air Force Base, AL

ACTIVITIES VISITED OR CONTACTED (Continued)

Department of the Air Force (Continued)

U.S. Air Force Defense Data Network Program Management Office, Gunter Air Force Base, AL
2080th Communications Squadron, Los Angeles Air Force Base, CA
Headquarters, U.S. Air Force Logistics Command, Wright-Patterson AFB, OH

Defense Agencies

Defense Contract Audit Agency, Boston, MA
Headquarters, Defense Communications Agency, Washington, DC
Allocation and Engineering Directorate, Scott Air Force Base, IL
Defense Commercial Communications Office, Scott Air Force Base, IL
Headquarters, Defense Logistics Agency, Cameron Station, Alexandria, VA
Defense Contract Administration Services Management Area, Boston, MA

Non-DoD

General Services Administration, Washington, DC
U.S. Department of Treasury, Washington, DC

Non-Government

American Telephone and Telegraph Technology Systems, Federal Systems, Vienna, VA
Bolt, Beranek, and Newman, Inc., Cambridge, MA
Computer Sciences Corporation, Falls Church, VA
Telenet Communications Corporation, Vienna, VA
Tymnet, McDonnell Douglas Network Systems Company, Vienna, VA

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Non-DoD Activities

Office of Management and Budget
U.S. General Accounting Office
NSIAD Technical Information Office

Congressional Committees:

Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Subcommittee on Communications, Committee on Commerce, Science, and Transportation
Senate Committee on Governmental Affairs
Senate Ranking Minority Member, Committee on Armed Services
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
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House Committee on Armed Services
House Committee on Government Operations
House Subcommittee on Legislation and National Security, Committee on Government Operations
House Subcommittee on Telecommunications and Finance, Committee on Energy and Commerce