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Report to The President and the Secretary of Defense on the Department of Defense

BY THE

Blue Ribbon Defense Panel

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APPENDIX H

Staff Report on

Telecommunications

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PREFACE

During the Blue Ribbon Defense Panel's study of the Department of Defense, it was fortunate to receive in March 1970 an independent analysis on Telecommunications prepared by Mr. Thomas W. Scandlyn.

Mr. Scandlyn's staff report to the Panel is considered to be of sufficient interest to top-management personnel of the Department of Defense to be included as an Appendix to the Panel's Report. However, your attention is invited to Page 20 of the Panel's Report which states that Staff Reports are being printed as information, without necessarily implying endorsement by the Panel on each of their findings and recommendations.

The Panel is grateful to Mr. Scandlyn for this study and to the American Telephone and Telegraph Company for donating his services to the Panel.

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PART I

SCOPE OF THE STUDY

The purpose of this study is to evaluate the structure by which and the environment in which command, control and telecommunications (CCT) is managed within the Department of Defense (DoD). This involved extensive discussions with the principal managers of CCT activities in the Office of the Secretary of Defense (OSD), the Office of the Joint Chiefs of Staff (JCS), the Defense Communications Agency (DCA) and the Military Departments (MILDEPs) as well as with managers of various CCT operational and support activities both in the United States and overseas. In addition, systems and subsystems, hardware and software, planning, programming and budgeting, operations and maintenance, research and development, training and many other aspects of CCT matters were sampled to gain further insight on possible changes which might improve the CCT management structure and environment.

THIS IS BASED ON THE ASSUMPTION THAT BETTER DECISIONS AND BETTER MANAGEMENT SHOULD FLOW FROM AN IMPROVED STRUCTURE AND ENVIRONMENT, ACCRUING SIGNIFICANT BENEFITS.

PART II

COMMAND, CONTROL AND TELECOMMUNICATIONS IN THE DoD

The command, control and telecommunications functions are largely being accomplished, although at a greater cost than necessary. Many fine systems and operations were observed. These reflect the efforts of able technicians, engineers, researchers, managers, contractors and executives in the CCT field in the DoD. However, duplication and inadequate interoperability exist; MILDEP parochialism and divided, weak OSD corporate management plague the optimum procurement and utilization of CCT resources. This study and its recommendations, then, deal primarily with improvements and refinements, many of which have been or are being considered in-house.

The command and control of weapons and weapon systems (including personnel) and the support of them (logistics) is the military necessity and justification for command, control and telecommunications (CCT) in the DoD. The effective and efficient administration of worldwide forces numbering in the millions is an easily demonstrated, further justification for large scale telecommunications. Therefore, CCT is near universal to DoD activities.

Current annual expenditures are in the two to four billion dollar range. More than 100,000 people on DoD payrolls

spend full time in CCT activities in locations around the world. These locations are often remote of necessity and costly to support.

The span of technology is near all encompassing. The DoD has a recognized need to load antennas at the lowest possible frequency (SANGUINE) and, by contrast, to use the highest frequency which is just now beginning to be understood (LASER). The reliability and redundancy needed in some DoD telecommunications are both bona fide and unique. Virtually every telecommunications technology known is applied somewhere within the DoD. The state of the art is continuously pressed to find new or better solutions to satisfy legitimate military requirements.

Every presently conceivable type signal passes over the telecommunications systems of the DoD carrying nearly every type of information. The signals of radars and other sensing devices, for example, are transmitted over short and very long distances for analysis and as decision aids. Sensor and device control, voice and record, secure and clear, analog and digital, graphic and photographic signals pass over vast networks composed of every type transmission system.

Buried, aerial and underseas cables along with field wire are significant system elements. LF, HF, VHF and UHF radio systems are used extensively. Tropospheric scatter,

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terrestrial point-to-point and celestial (satellite) microwave radio systems are used in many forms and configurations. The signals carried by these systems are switched and processed by a wide variety of switchers, signal processors, computers and/or other devices to deliver the information carried by them to the users in useful form for decision making or for the support and administration of DoD activities.

There are two main streams of military authority and activity. The first is the direction of military operations. The second is the support of military operations. This dual organization structure has a significant impact on telecommunications and the management of telecommunications in the DoD as may be seen from the discussions which follow.

The direction of military operations function involves the deployment and use of military assets and personnel in a deterrent role or in actual combat. Authority and command of this activity passes from the President to the Secretary of Defense to the Joint Chiefs of Staff to the Commanders-in-Chief (CINCs) of the eight Unified and Specified Commands to the Component Commands of the individual military departments and from there down through the chain of command of each military service component, ultimately to the combat units: ship, plane, company, missile, etc. Thus, command-control telecommunications is that telecommunications

capability along with associated devices which enables commanders at the various levels along the military operations chain of command to have timely, appropriate and sufficient information on which to base the command of operations. Much of this capability has been traditionally called "strategic" communications but this nomenclature has largely lost its meaning in the wake of technological and organizational evolution since World War II. THE TELECOMMUNICATIONS ASSOCIATED DIRECTLY WITH BASIC COMBAT UNITS IS DEFINED AS TACTICAL. THIS NARROW DEFINITION WILL BE USED THROUGHOUT THIS PAPER AND INCLUDES TELECOMMUNICATIONS IN THESE CATEGORIES ONLY: MAN-PACK, VEHICULAR, ABOARD NAVAL VESSELS, AIRBORNE, COMBAT FIELD UNITS NECESSARY TO THE FLUID MOVEMENT OF GROUND FORCES IN COMBAT, COMBAT AIRFIELD NAVAIDS, AIR TRANSPORTABLE FIELD UNITS WHILE IN COMBAT DEPLOYMENT AND, FINALLY, ALL LIKE ASSETS HELD FOR CONTINGENCIES AND IN COMBAT READINESS.

The functions necessary for the support of military operations are carried out by DoD components and/or one or more of the Military Departments (MILDEPs). Most DoD assets are procured by, held by and managed by the MILDEPs; most DoD appropriations are earmarked to a particular MILDEP. The MILDEPs recruit, train, develop and support both military and civilian employees of their departments. They also furnish

trained military personnel for other duties in DoD agencies and components such as DCA, DIA, OSD staff, etc.

The point-to-point and long-haul requirements just described are satisfied, for the most part, by the Defense Communications Systems (DCS), a worldwide telecommunications capability planned, engineered and managed by the Defense Communications Agency (DCA) but operated by the MILDEPs. The bulk of the DCS consists of common-user switched systems:

1. The Automatic Digital Network (AUTODIN) is a worldwide system primarily for handling record and data traffic and is used in common by the MILDEPs and others in the DoD structure. It employs high quality, current technology in store and forward switching, message processing, terminal and peripheral hardware. Its assets are largely leased from common carriers in the CONUS and Hawaii and largely owned, operated and maintained by the MILDEPs elsewhere. The system is planned, engineered and managed by DCA.
2. The Automatic Voice Network (AUTOVON) is a worldwide dial network primarily for voice traffic but capable of data and record transmission. It is a common user service in that it is used

by all elements of the DoD structure. Its four wire trunks and electronic switching reflect high quality current technology. Its assets are largely leased in the CONUS and Hawaii and largely owned, operated and maintained by the MILDEPs elsewhere. It is planned, engineered and managed by DCA.

3. The Automatic Secure Voice Communication network (AUTOSEVOCOM) is a worldwide dial secure voice network. It is used in common by the MILDEPs and other elements of the DoD. It is planned, engineered and managed by DCA. The MILDEPs operate and maintain Government owned elements.

The resources of the DCS are used also to meet some, but not all, long-haul CCT needs for dedicated-use systems. Dedicated systems or networks are noncommon-user assets and are those procured and used for a particular need, generally for a particular MILDEP or command such as the JCS or one of the CINCs. There is a large number of these, some of which are very large. The trunking for some of them is managed by DCA. Other elements use large-scale, fixed-plant routes which are not a part of the DCS and, therefore, are in no way under the management control of DCA.

While the DCS is the backbone of the DoD system, it is but a part of the total complex. Telecommunications for military garrisons, weapons systems, dedicated systems and tactical needs comprise an even larger segment of the CCT complex.

CCT technology is changing more rapidly than in almost any other discipline and there is no indication that the rate of change will slow in the foreseeable future. CCT is critical to the military mission itself. Effective and efficient administration of the entire spectrum of DoD activities rests heavily on adequate, readily accessible telecommunications. These combine to support very large, technologically sophisticated telecommunications activities which permeate the entire DoD.

IN THE DEPARTMENT OF DEFENSE, THEN, COMMAND, CONTROL AND TELECOMMUNICATIONS CAN ONLY BE OPTIMIZED AS TO MISSION AND COST BY PROFESSIONAL, IN-HOUSE MANAGEMENT AT ALL LEVELS ABOVE THE COMBAT UNITS, ALIGNED IN AN OPTIMUM STRUCTURE.

PART III

STRUCTURE FOR OPERATION AND MANAGEMENT OF CCT

A. Brief Background

The structures by which CCT is operated and managed have evolved over the years in response to great growth in requirements and to sweeping changes in CCT technology itself as well as to dynamic changes in methodology and technology in other fields of DoD involvement. Nuclear devices and missile weapons systems are examples of changes in technology in other DoD fields which reflect greatly changed demands on CCT technology and management.

The environment in which CCT is operated and managed has evolved over the years also. The environment is strongly influenced by policies external to telecommunications in DoD per se. Policies and regulations relating to Civil Service and Military personnel are examples of such external influences.

Through World War II and for a number of years beyond, each MILDEP largely provided whatever CCT needed to command and control its own mission and for the support and administration of its ancillary activities. Long-haul ("strategic") systems were seldom engineered or used in common.

During World War II both the Army and the Navy developed separate, worldwide communications systems to carry out the global activities of their respective missions. The establishment of a separate Air Force under the Unification Act of 1947 added yet another worldwide military communications system, for the Air Force developed a communications capability to meet the command-control and support requirements of its strategic retaliatory forces dispersed around the globe. By current standards these were relatively unsophisticated systems; they were essentially point-to-point oriented with little or no switching or interoperability with other systems. The management control over these systems was also relatively unsophisticated; coordination of communications matters between the MILDEPs was the responsibility of the Joint Communication-Electronics Committee of the JCS. OSD policy and program/budget guidance for all Services was handled in the Office of the Assistant Secretary of Defense (Supply and Logistics).

As the requirements and expenditures for separate long-haul CCT rose through the fifties, economic and other pressures mounted to engineer and manage these increasingly expensive systems for the use in common of the MILDEPs and other DoD elements. In response to these

pressures, and after several alternatives were evaluated, the Defense Communications Agency (DCA) was established in 1960 to exercise operational control and supervision of the DCS. Through Charter changes by 1967, DCA was "expected" (1) to exercise management control and operational direction over DCS and (2) to exercise management control over R&D, planning, engineering, and programming of the MILDEPs, Unified/Specified Commands and DoD Agencies supporting DCS.

The MILDEPs retain direct ownership of or provide the funds for the leasing of all CCT elements. They do most of the R&D and all of the field work including real estate acquisition, field engineering, installation, operation and maintenance of all CCT elements. They, of course, recruit, train, deploy and support the people necessary to perform these functions.

B. Structure and Environment Now

1. The Management of Operations and Maintenance

Each of the MILDEPs has a large communication command to operate and maintain its telecommunications including the dedicated CCT systems it has retained and the elements of the DCS assigned to it. These commands are the following:

ARMY-------Strategic Communications Command (STRATCOM)

NAVY-------Naval Communications Command (NAVCOMM)

AIR FORCE--Air Force Communications Service (AFCS)

In the Air Force in addition to AFCS, the Strategic Air Command (SAC) and the Air Defense Command (ADC) have sizable telecommunications organizations of their own. The Ground Electronics Engineering Installation Agency (GEEIA) is a separate worldwide Air Force command for field engineering and installation. The Air Force proposes to fold GEEIA into AFCS. Field engineering and installation in the Army is a function of STRATCOM while in the Navy these functions are performed by the Navy Electronics Command.

Each of these worldwide CCT commands has an organization structure headed by flag officers and running down through enlisted personnel (technicians). To help these organizations remain sensitive and fully responsive to mission requirements, the jobs at certain levels of the command structure are double-hatted; i.e., these officers serve their own chain of command for the operation and maintenance of communications

as well as serve as the communications staff officer for the military operations chain of command. For example, under one of his hats a General officer in Heidelberg, Germany, is Commander of STRATCOM operations in Europe as a part of worldwide STRATCOM operations under a commander at Ft. Huachuca, Arizona. Under his other hat, he is the Communications and Electronics (C-E) staff officer for the Commander-in-Chief, US Army--Europe.

These MILDEP commands for CCT (STRATCOM, GEEIA, etc.) are large scale, complex undertakings. The largest has over fourty thousand people, most of whom are technically oriented. They, along with the C-E staffs of the MILDEPs, do all necessary programming, budgeting, field engineering, installation engineering, transportation, construction, installation, acceptance/performance testing, operation, maintenance, modification, modernization, removal, relocation, reconditioning and reinstallation of all CCT assets whether DCS or MILDEP elements. They maintain contingency CCT assets along with personnel in combat readiness. They train, deploy and support the necessary personnel to satisfy all of the above functions.

In recent years there has been significant movement within DoD toward the reduction of duplication of efforts and facilities. Much, but not all, long-haul CCT assets are now engineered and managed, but not funded, by DCA. Generally, but not always, STRATCOM, NAVCOMM or AFCS operates, maintains and manages most CCT assets at a particular base, post, camp or station. There remains, then, duplication of work centers including support and some duplication of line and staff functions; for example, within the Air Force, SAC and ADC, rather than AFCS, manage, operate and maintain CCT in support of their respective missions, often in locations where AFCS is already performing other CCT missions.

The DCA, a separate agency reporting to the Secretary of Defense through the JCS, exercises management control and operational direction over all CCT elements included in the DCS. The DCS, and hence the management purview of DCA, stops at the mainframe of bases, posts, camps and stations, a point considerably short of the total system. This means that no one exercises R&D, planning, engineering and management on an overall user-to-user basis for complex systems like AUTODIN, AUTOVON, AUTOSEVOCOM, etc. DCA has little fiscal control of the DCS; for example, it is still possible for money specifically programmed for the DCS to be unilaterally reprogrammed

by a MILDEP to other purposes without either the approval or concurrence of the Director, DCA.

The Director of DCA allocates, reallocates and restores DCS service but does not determine restoral priorities, that rightly being a function of the JCS. Nor does the Director have any command function over the DCS; the MILDEPs have operating commands who provide for installation, operation, maintenance and support of their assigned portion of the DCS. Under his operational-direction hat, the Director of DCA takes direct action via his Defense Operations Control Center (DOCC) in Washington and its area and regional centers to satisfy requirements, route and reroute circuits, authorize alternate routes, etc. Under his management control hat, he performs a sort of system overview and attempts to improve and augment the system by exercising control over the planning, programming, system engineering and operating practices for DCS. In this latter role, DCA is the coordinator of activities of many components and agencies from submission and validation of a requirement for service through to acquisition, installation and operation.

Additionally, the roles and responsibilities of the Director, DCA, have been constructively

expanded beyond the original boundaries. The Director now has these additional duties:

1. Manager of the National Communications System (NCS) for which the Secretary acts as the Executive Agent.
2. System/project manager for the Defense Satellite Communications System.
3. Technical support for the National Military Command System (NMCS).
4. Centralized leasing of DoD circuitry from communications common carriers, but not the programming and budgeting for such leases.
5. Implementation of the automatic switched networks including the Defense Special Security Communications System (DSSCS).
6. Chairman of the Military Communications-Electronics Board.

2. CCT Management by OSD

Overall policy guidance and management of CCT matters is now widely diffused throughout several elements of the OSD staff largely as a result of the functional design of the organization.

1. The Secretary of Defense is the Executive Agent for the National Communications System and the Executive Agent for the Government in all communications security matters.

2. The Assistant Secretary of Defense (Administration) is the principal advisor to the Secretary of Defense for NCS matters and is his coordinator for all command, control and communications.

3. The Assistant Secretary of Defense (Installations and Logistics) is the principal staff assistant to the Secretary of Defense for transportation, telecommunications, petroleum and logistical services. He develops both policy and technical guidance to insure the development of compatible DoD telecommunications systems and plays a predominant role in the management of DoD telecommunications resources.

4. The Assistant Secretary of Defense (Comptroller) is the principal advisor to the Secretary of Defense in programming, budgeting and fiscal matters. His relationship with the

defense agencies and MILDEPs extends across the entire financial management field. The DCA and the MILDEP communicators work closely with the ASD(C), for it is he who establishes and directs, in coordination with other OSD staff elements, the functioning of the DoD Planning, Programming and Budgeting System (PPBS) which is the mechanism by which Defense Agencies and components obtain, first, resource approval for updating their portion of the Five Year Defense Plan and, finally, dollar approval through the annual budget hearing procedures.

5. The Assistant Secretary of Defense (Systems Analysis) performs analytical functions spanning the entire operation of DoD. In the telecommunications area he performs studies and analyses of quantitative telecommunications requirements in light of strategic missions, force planning, etc., and conducts cost effectiveness studies and reviews communications requirements as a part of his broad responsibilities.

6. The Director of Defense Research and Engineering (DDR&E) has the basic

responsibility in the telecommunications area for the research, development, test and evaluation of new communications techniques and equipment. In addition, by Secretary of Defense order, he is assigned the responsibility for planning, directing and supervising the execution of technical support for the National Military Command Center and, in that capacity, exercises supervision over DCA which provides the engineering and actual technical support for the NMCS.

7. Lastly, the Assistant Secretary of Defense for International Security Affairs interfaces with DCA and the MILDEPs when negotiations are required to obtain overseas base rights for telecommunications facilities and activities.

At best, such a system of fragmented responsibilities generates difficulty in coordinating all of the individual considerations which may arise in an issue, even on such an issue as a discrete weapons system. The problem is greatly magnified when dealing

with a commodity or service such as CCT which, by the nature of its universality throughout DoD, requires "corporate" management to optimize costs and mission effectiveness. Under the existing functional staff structure there is no office short of that of the Secretary of Defense himself which has the complete overview and the authority to make the corporate-type decisions so necessary for effective telecommunications management. A corporate approach was taken for three years (1964-1966). During that time telecommunications resources were managed through a collective technique (oddly enough called a functional review) known as the Consolidated Command, Control and Communications Program (CC^3P) Review. The origin of the CC^3P is as follows:

Basically, DoD resource management is exercised through the mechanism of the PPBS referred to above. This system, inaugurated by Mr. McNamara, eliminated the previous management by budget ceiling only and substituted a system whereby resources were to be requested, justified and approved through a rigorous cycle of planning, programming and budgeting, the whole system designed ultimately to match military resource needs to national and strategic objectives.

Under the concept, all projects and programs of DoD were grouped into one of several major program groupings, each of which was then subdivided into hundreds of individual projects or objectives called Program Elements (PE). The summation of all approved Program Elements and major programs was contained in an overall document known as the DoD Five Year Defense Program (FYDP). Once approved and included in the FYDP, resources allocated to a particular PE; e.g., a discrete communications project or system, could only be modified or added to by submission of a request for change, called a Program Change Request (PCR). PCR's were submitted to OASD(C); the request was then routed to that ASD having primary cognizance for the particular type of activity represented in the request, while other ASDs would have collateral action responsibilities to furnish their comments and/or recommendations for action to the Primary Action Office. Yet, even the designers of this system must have recognized from the beginning that certain kinds of DoD activities might be so universal by nature as to be unresponsive to this fragmented management technique. The original instructions for the PPBS system included provision that annual comprehensive reviews be conducted, one

category being ".....functional area reviews of inter-related program elements or aggregations such as intelligence, communications, etc."

Hence, during the years 1964-1966 a series of annual reviews, known as the Consolidated Command, Control and Communications Program Reviews, took place which in effect represented a truly unified or "corporate" approach to telecommunications resource management by the OSD staff. Under a Primary Action Officer, responsible directly to the Secretary of Defense, an AdHoc review group, with membership from DDR&E, ASD staffs, JCS, DCA, NSA and the Bureau of the Budget, analyzed each Program Element containing any command, control or communications resources. Requests for resource changes to Program Elements (i.e., specific command and control or communications activities, projects or systems) were reviewed not only from the point of view of impact upon the specific project or system but also from the point of view of necessity for those resources (and the project or system itself) in relation to other existing or proposed command, control and communications resources and assets. To a considerable degree, "zero-base" review was accomplished, resulting not only in a comprehensive DoD corporate knowledge of existing

command, control and communications capabilities, worldwide, but also in a truly corporate visibility of costs therefor in terms of men, money and materials allocated to the CCT community. (The only portion of the DoD telecommunications spectrum not reviewed by the CC^3P group was that of tactical equipment normally authorized and issued on the basis of approved tables of equipment for the combatant organizations of the three services.)

Due to several factors, the annual CC^3P reviews were discontinued after the 1966 review and the programming portion of resource management reverted to the mechanism of the PPBS only. The PPBS has recently been revised; for CY-1971 resource needs, the defense agencies and military departments will submit requests not in the form of individual Program Change Requests but as consolidated submissions to be known as Program Objective Memoranda (POM). A further departure is that these POMs must be kept within monetary constraints to be announced by the Secretary of Defense in an annual Fiscal Guidance Statement. Provision is still made for the conduct of comprehensive reviews, such as the CC^3P, within the framework of the PPBS, if so desired.

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3. Management of Research and Development (R&D)

The basic responsibility for R&D efforts lies with the Director of Defense Research and Engineering. The Director of DCA exercises management direction over those R&D activities of the MILDEPs which directly relate to the DCS. The MILDEPs directly manage all other R&D efforts under the guidance of DDR&E. The R&D is either actually carried out in the DoD laboratories mentioned below or under contracts generally administered by them.

Telecommunications R&D in the Army is primarily conducted at the several laboratories at Fort Monmouth, New Jersey which are under the command of the Army Electronics Command, a major command of the Army Materiel Command. An electronics R&D capability also exists at the Army's Electronics Proving Ground, Fort Huachuca, Arizona; this activity comes under the command of the Army Materiel Command also.

In the Navy, telecommunications R&D is carried out by one of two organizations: the Naval Research Laboratories, under the Chief of Naval Research or the Naval Electronics Laboratory Center, under the Chief of Naval Materiel.

Telecommunications R&D in the Air Force is carried out primarily by the Rome Air Development Center, an activity of the Air Force Logistics Command.

4. Role of the JCS

Within the JCS, as within DoD, the responsibility for the overview of CCT matters is fragmented throughout several functional offices. These are: (1) the Communications-Electronics Staff (J-6); (2) Joint Command and Control Requirements Group (JCCRG); (3) the Military Communications-Electronics Board (MCEB) and (4) the National Military Command Center (NMCC). And, of course, the Director of DCA reports through the JCS to the Secretary of Defense.

The JCS plays an important interface role between the OSD and the Unified/Specified Commands and is involved in all aspects of CCT from validation of requirements from the operating forces to relating telecommunications needs to total national and strategic objectives in plans such as the Joint Strategic Objectives Plan (JSOP).

PART IV

AREAS OF CONCERN

A. Corporate Management

The most obvious weakness of the organization structure is the absence of corporate management of command, control and telecommunications (CCT) to assure maximum capability at minimum cost from an overall Department of Defense mission point of view rather than from individual MILDEP points of view. This weakness has been observed over a period of time by, among others, the following: certain Members of Congress, the Deputy Secretary of Defense, and the GAO.

CCT resources are expensive; the capability is critical to the mission and necessary for efficient administration. Long-haul and many other CCT elements are favorably cost responsive to increasing scale. Appropriately combining requirements of the MILDEPs can enable reliability with minimum idle redundancy.

The entire spectrum of CCT whether tactical or "strategic," DCS or non-DCS and for whatever purpose including telecommunications for intelligence and data processing, would benefit both as to cost and mission effectiveness from strong, professional staff management

at the OSD level. THE COMMAND AND CONTROL ASPECT OF CCT AS USED CONSISTENTLY THROUGHOUT THIS PAPER MEANS THE TELECOMMUNICATIONS FOR COMMAND AND CONTROL, INCLUDING DIRECTLY COUPLED DISPLAYS, CONSOLES, PROCESSORS, AND OTHER TERMINALS WHOSE PRIMARY FUNCTION IS TELECOMMUNICATIONS, AND SPECIAL SUBSYSTEMS SUCH AS MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK (MEECN).

The OSD is the only level of the management structure with overall Department of Defense perspective which can be given sufficient authority to assure appropriate standardization, compatibility and interoperability among DCA and MILDEP elements of CCT while protecting the integrity of the mission requirements of the individual combat, contingency and support commands. It is the only level in a position to objectively balance mission capability and cost. This level can be restructured and staffed with personnel with appropriate expertise to provide effective staff management of (1) all CCT resources and (2) all operations and engineering matters relating to CCT from a total Department of Defense point of view.

B. Management Skill

A less obvious but more significant concern relates to the weakness of the CCT management body in terms of deep understanding and broad experience with the complex, rapidly changing technology of CCT. This weakness is more significant than the structural one discussed above in two ways: (1) its impact on both initial and ongoing costs and (2) the years it would take to correct it or change it very much, even with a well-thought-out, training and development plan in effect on a broad scale. THIS WEAKNESS IS THE MAJOR SOURCE OF EXCESSIVELY EXPENSIVE SYSTEMS AND THE REASON FOR MOST OVERRUNS.

Let it be clear that there are capable, highly skilled technicians, engineers, researchers, managers and executives in the CCT field in the Department of Defense. If this were not so, CCT in DoD would be poor indeed; but this is not the case. Yet the weakness exists. Significant improvements can be made.

Professionalism, expertise and sophistication in depth on a broad base in an organization does not just happen. Management development itself must be professionally planned and supervised from recruitment to retirement: a fact well-known and understood in the

MILDEPs in the matter of officer managers for their primary missions of defense and war. It appears to be less well understood for the highly specialized and technical function of CCT. The highest rank assigned in this field is one Lieutenant General and neither he nor his predecessors were so assigned because of his expertise in the management and technology of CCT per se. Since the demise of the Army Signal Corps as an operating organization, officers, in general, are seldom rewarded and promoted on the basis of their performance in the management of the multibillion dollar, technical business of CCT.

Professionally planned and supervised development of civilian-employee engineers, researchers and managers is almost totally lacking in the CCT field in DCA, the MILDEPs and OSD on an effective, broad basis. Witness the paucity of high-level, in-house, civilian experts and managers who have risen through the ranks as a result of their developing expertise. Yet CCT in the Department of Defense could provide an attractive career environment for civilian engineers/managers because in that environment the span of technology is near all encompassing and the state of the art is continuously pressed.

CCT systems are technologically and physically complex. They must be conceived, researched, developed, procured, operated and managed as overall, user-to-user systems if high performance and reasonable cost objectives are to be attained. They can not be researched, developed, procured, operated and maintained as "black boxes" wired together without suffering severe cost and effectiveness penalties.

The CCT mission requirements must be thought out and translated into specific technical parameters and, finally, working systems by researchers, engineers and managers with a deep understanding of the technology and with broad experience with CCT operations in the Defense mission environments.

> THIS CAPABILITY MUST RESIDE IN-HOUSE ON A BROAD BASE THROUGHOUT VARIOUS LEVELS OF THE ORGANIZATION; IT CANNOT BE EFFECTIVELY CONTRACTED OUT: ONLY THE USER CAN DEFINE HIS WANTS FOR THE PRICE HE IS WILLING TO PAY.

C. Purview of CCT Participants

Despite the progress toward corporate effectiveness in CCT matters which has resulted, in a significant degree, from establishing DCA and the brief but effective use of techniques like the CC^3P Reviews, there is still

reason for concern about inadequate interoperability of systems, and duplication of systems, operations, supervision/management and staffs which flow from the weaknesses already discussed.

As long as MILDEPs are retained, each participant in CCT activities (A, N, AF, DCA, and OSD) has certain minimum, legitimate, discrete and unique functions which they, themselves, are in the best position to carry out. (As can be seen these functions relate more to combat compatibility than to MILDEP labels: Army has ships, Navy has planes, etc.)

PARTICIPANT	MINIMUM ROLE
DCA	Management control and operational direction of the Defense Communication System (DCS)
Army (Marines)	Man-pack, vehicular, combat transportable field units
Air Force (Army, Navy)	Air-to-air, air-to-ground/carrier, combat airfield NAVAIDS and air support transportable field units
Navy (Army)	Ship-to-ship, ship-to-shore
OSD	Engineering, operation and resource management from an overall DoD staff management point of view. Charter the extent and places of participation of each of the other participants

The MILDEPs and DCA carry out many CCT functions ranging far beyond these minimum roles. The current extent and places of participation are, in part, due to precedent and historical accidents of time, place and circumstances in the absence of effective corporate management.

There are still some locations (bases, etc.) where more than one MILDEP operates and maintains CCT. Some fairly large point-to-point networks for so-called "strategic" systems remain apart from DCS.

The DCS stops at the mainframe of bases, posts, camps and stations--even in the United States. The traditional argument is that the base commander must have his own base communications if he is to be held responsible for his mission; yet, many of the larger complexes house elements of several commands, often of more than one MILDEP. It seems more important that each of these commanders residing at a base be more concerned with the quality, adequacy and cost of his CCT than on who solders the wires and polishes the switchboard plugs. Additionally, base telecommunications complexes can significantly affect expensive long-haul systems if not engineered, operated, maintained, and traffic-balanced as a part of a total system from user to user.

The organizations and authorities for and the financial aspects of CCT should be structured to discourage, not encourage, CCT for its own sake. These aspects should be structured to assure mission sensitivity and responsiveness on the one hand and cost effectiveness on the other.

D. Fiscal Matters

Appropriate visibility of all aspects of CCT is, and for some time has been, a matter of concern. Since the demise of the short-lived CC^3P Reviews, corporate fiscal management of CCT has been weak due to the fragmented responsibilities for CCT at the OSD level. Recognizing this, the Deputy Secretary of Defense recently directed the ASD(C) to furnish increased visibility of DCS costs and tasked the Director, DCA, to play a stronger role in the resource management for the DCS. In addition, for FY-71 only, the Deputy Secretary requested the Director, DCA, to compile total CCT costs except for those associated with CCT organic to combat units. However, there remains a need at the OSD level for zero-base analyses of all significant CCT resources along with objective appraisals of their effectiveness against which current and proposed additions and changes can be assessed. Continuing analysis and management of O&M and procurement expenditures for DCS, tactical and non-DCS-non-tactical elements of CCT is lacking on a corporate basis.

The other fiscal concern relates to DCA. The physical assets of the DCS are owned and operated by the MILDEPs for DCA; yet DCA has very little control over the fiscal aspects of these DCS elements. Monies and resources specifically programmed for the DCS can be unilaterally reallocated to other uses by the MILDEPs.

Even more important DCA does not seem to have sufficient fiscal control of the DCS to effectively balance cost and service quality on systems such as AUTOVON, for example. The DCA uses an industrial fund, largely, to pay for leased facilities as opposed to broader uses which might be made of it. For example, in connection with their Federal Telecommunications System (FTS), the General Services Administration (GSA) uses their industrial fund to pay for leased services and other costs but also in two additional ways which are valuable to the effective management of such telecommunications:

1. As a fiscal mechanism enabling the managing agent, GSA, to balance the grade of service with cost since the costs of all elements of significance to the overall system flow through this fund. (This includes local telecommunications, or, as a minimum, those parts of them related to FTS grade of service.)
2. As a means of charging the organizational unit for the services used.

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PART V

RECOMMENDATIONS

The command, control and telecommunications requirements for the military missions and the support of them are largely being met. Much has already been done to seek the benefits of consolidation, current technology and pressure on the state of the art. More can be accomplished. These recommendations, then, are evolutionary, not revolutionary. Radical change would be disruptive and expensive and is unwarranted at this time.

These recommendations seek improvements and refinements in the structure and environment for the management of CCT from which solid, significant, long-term benefits should flow.

If these recommendations merit implementation, it would be beneficial to make the OSD structural change first. Then, with appropriate support from the ASDs, MILDEPs, DCA, JCS, certain field Commands, and other DoD elements, task the new organization to devise detailed plans for and to manage the implementation of the others.

RECOMMENDATIONS

A. Corporate Management

Establish a new OSD structure: Assistant to the Secretary of Defense (Command, Control and Telecommunications) /ATSD(CCT)/. The ATSD(CCT) will serve as the OSD staff manager for the entire spectrum of CCT whether tactical or "strategic," DCS or non-DCS and for whatever purpose including telecommunications for intelligence and data processing. CCT equipment normally delivered with discrete weapons systems, such as that found on aircraft, ships and terrestrial vehicles, will continue to be managed by the respective weapons systems project managers. However, even in these cases, the ATSD(CCT) will have cognizance of the inter-service compatibility and application, technical parameters, and fiscal implications of the CCT portions of these weapons systems as a part of his responsibilities for overall DoD management of CCT resources.

The CCT functions to be consolidated under the new OSD office are essentially the NCS and coordinator for all command, control and communications functions of the ASD(A), the telecommunications requirements analysis functions of the ASD(SA) and the telecommunications functions of the ASD(I&L). The functions of

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DDR&E and the ASD(C) are not being consolidated but the ATSD(CCT) will, of course, be the primary action office in developing and reviewing CCT research and development and fiscal programs.

The ATSD(CCT), himself, must be appointed at a sufficiently high level to enhance his capability to carry out the difficult tasks expected of him as delineated in this paper; certainly no lower than Executive Level V, and preferably IV.

The recommended OSD organization structure and charter, which are wholly consistent with this study and these recommendations, are in Appendix I of this paper. As an order-of-magnitude estimate, initially the head count in the ATSD(CCT) office need not greatly exceed the numbers now devoted to CCT in various OSD elements and Defense Agencies.

B. Management Skills

1. Ask the MILDEPs to reappraise their career planning, development and use of officers as engineer/managers in the highly technical field of CCT.
2. Task the ATSD(CCT) to assure that each major element of the CCT community in DoD generates professionally planned and managed education, training and career development programs for its civilian-employee engineers, researchers and managers.

C. Purview of CCT Participants

1. Redefine the DCS so as to include base, post, camp and station telecommunications in the United States and garrison (permanent) type installations overseas. Extend the purview of DCA by double-hatting the functions of Post Signal/Base Communications Officer into the DCA organization.

2. Direct that all existing and future long-haul transmission systems, regardless of their current or intended use, be included in the DCS under DCA except those vehicular and air transportable types when held as contingencies or while in temporary deployment for active combat support. If these are to be replaced with more permanent type installations, it should be done under DCA management. The DCS transmission facilities will, then, be engineered and managed for use in common for all elements of DoD. These facilities will carry both dedicated and common user services depending strictly upon which approach most nearly satisfies the true mission requirement in the light of the technology and economics at the time.

3. Consummate the merger of GEEIA into AFCS.

4. Merge SAC CCT activities into AFCS; SAC "J-6" should be double-hatted into the AFCS organization.

5. Restudy ADC's CCT activities to determine which elements may be effectively merged into other MILDEP CCT operating activities.

6. Double-hat the J-6/CE of the Unified Commands into the DCA to assure that DCA remains fully sensitive and responsive to field operations and mission requirements from the CINC's point of view.

7. In each case where double-hatting is used to link the CCT participants (DCA, STRATCOM, NAVCOMM and AFCS) to field commands (1) require efficiency reports on the commander from each organization and (2) provide staff support in common for the two functions or, as a minimum, collocate the staff elements.

8. Task the ATSD(CCT) to inventory all situations (bases, test and maintenance sites, et cetera) where there appears to be inefficient duplication of CCT operation and maintenance activities. These should be individually evaluated on an objective, corporate basis. A plan should be developed for correcting each case on an orderly basis as facilities, systems and people can be rearranged.

9. Task ATSD(CCT) to study the role beyond the minimum described in Part IV which each participant in CCT activities should play in order to minimize cost and maximize mission and support capability for the years ahead.

D. Fiscal Matters

1. Task the ATSD(CCT) to develop, in conjunction with the ASD(C), a means of providing continuing fiscal visibility for all O&M and procurement expenditures for DCS, tactical and non-DCS-non-tactical elements of CCT on an overall DoD basis by having DCA and each MILDEP furnish information on its elements in a way which will accommodate analysis and consolidation by the ATSD(CCT).
2. Task the ATSD(CCT) to perform a zero-base inventory and analysis of the major elements of CCT resources, avoiding undue details which are not needed at the OSD level.
3. Revive and adapt the CC^3P Review type technique to aid the ASTD(CCT) in carrying out his corporate responsibilities of resource management and operations and engineering.
4. Find a way to give DCA sufficient fiscal control of DCS elements to effectively balance service quality for any approved expenditure level.
5. Provide for the specific concurrence of the ATSD(CCT) prior to any reallocation by the MILDEPs (and/or DCA, if later given more monetary authority) of monies and resources previously programmed specifically for CCT.
6. To the extent that it is feasible to do so, find ways to reflect the expenditures for CCT into the budgets

of the user organizational elements as an effective moderating influence on requirements.

EVEN IF ONLY TEN PER CENT IMPROVEMENT FLOWS FROM THE IMPLEMENTATION OF THESE RECOMMENDATIONS, THAT EQUATES TO $200,000,000 TO $400,000,000 SAVINGS ANNUALLY, BASED ON CURRENT LEVELS OF ACTIVITY.

RECOMMENDED CHARTER

SUBJECT: Assistant to the Secretary of Defense (Command, Control and Telecommunications)

I. GENERAL

Pursuant to the authority vested in the Secretary of Defense and the provisions of the National Security Act of 1947, as amended, including the DoD Reorganization Act of 1958, the position of Assistant to the Secretary of Defense (Command, Control and Telecommunications) /ATSD(CCT)/ is hereby established with responsibilities, functions, and authorities as prescribed herein.

II. RESPONSIBILITIES

The Assistant to the Secretary of Defense (Command, Control and Telecommunications) is the principal staff assistant to the Secretary of Defense on command, control and telecommunications matters. He is also the principal assistant to the Secretary of Defense for the National Communications System.

III. SCOPE

The scope of command, control and telecommunications for which the ATSD(CCT) has responsibility is delineated below:

A. Categories

1. The Defense Communications System as defined in DoD Directive 5105.19 including transportable contingency assets for extension or restoral of the DCS.

2. Camp, post, base, and station telecommunications.

3. Fixed and/or transportable non-DCS telecommunications facilities which are not included in telecommunications equipment/systems considered to be organic to military forces/units.

4. Telecommunications equipment/systems considered to be organic to military forces/units.

5. DoD elements of the National Communications System (to the extent this category is not included in the DCS).

6. Those special telecommunications of a sensitive nature, e.g., those related to the support of intelligence functions.

7. Telecommunications security (COMSEC) equipment insofar as reviewing such matters for consistency with other telecommunications matters.

8. Telecommunications for command and control including directly coupled displays, consoles, processors, and other terminals whose primary function is telecommunications, and special subsystems such as Minimum Essential Emergency Communications Network (MEECN).

9. Telecommunications in support of Automatic Data Processing (ADP).

10. Areas indicated below are specifically excluded except to the extent necessary to establish interface and radio frequency compatibility with other systems:

    a. Electronics including sensors such as radars, SIGINT (COMINT and ELINT), and electronic warfare systems.

    b. Telecommunications integral to weapons systems designed for and usually delivered with and as a part of the airplane, missile complex, ship, tank, etc., whose costs are normally included in the cost of the weapons system.

B. The responsibilities for management and operational direction of command, control and telecommunications resources will remain with the Services and Defense Agencies.

IV. FUNCTIONS

Under the direction, authority and control of the Secretary of Defense, the Assistant to the Secretary of Defense (Command, Control and Telecommunications) shall perform the following functions:

A. General

1. Serve as principal staff assistant to the Secretary of Defense for command, control and telecommunications matters.

2. Act as staff manager at the OSD level of all telecommunications, including (a) telecommunications for, but not the function of, command and control and (b) telecommunications in support of Automatic Data Processing (ADP).

3. Act as the DoD coordinator for those special telecommunications of a sensitive nature, e.g., those related to the support of intelligence functions.

4. Monitor non-telecommunications actions with respect to their impact upon telecommunications plans and programs.

5. Serve as the DoD central point of contact on telecommunications matters to organizations external to DoD.

6. Perform such other functions as the Secretary of Defense may assign.

B. National Communications System (NCS)

1. Serve as the principal assistant to the Secretary of Defense in his role as Executive Agent, NCS.

2. Coordinate as necessary with all agencies participating in the NCS.

3. Review progress in fulfilling NCS responsibilities and recommend to the Executive Agent for the NCS, as appropriate, measures for improving the NCS and for securing efficiency, effectiveness, and economy.

Provide for the receipt and processing of requests from any agency having requirements for service from the NCS to include determining feasibility, developing alternative methods of implementation, and recommending appropriate priorities.

5. Recommend NCS related tasks to be assigned to the Manager, NCS, or to other governmental agencies as appropriate.

C. Policy and Planning

1. Develop, coordinate and recommend DoD command, control and telecommunications policy.

2. Develop implementing directives to support approved command, control and telecommunications policy and to provide processes for command, control and telecommunications planning.

3. Serve as a member of the Defense System Acquisition Review Council when command, control and telecommunications matters are under consideration.

4. Coordinate efforts within the Office of the Secretary of Defense to insure that adequate controls exist for:

   a. The development and procurement of integrated secure means of telecommunications.

   b. Achievement of appropriate compatibility between command, control and telecommunications systems and their related crypto-materials.

   c. The necessary interchange of technical information between interested agencies.

5. Serve as a central point for coordination and review of telecommunications plans of the NCS, Services and DoD agencies.

D. Resource Management

1. Coordinate and provide recommendations on program/budget policies and procedures as they relate to command, control and telecommunications.

2. Review Unified/Specified Command, JCS, Military Department and DoD component validated command, control and telecommunications requirements, including associated comsec equipment, for technical compatibility and for feasibility in the context of total DoD telecommunications needs; if recommended for approval, assign follow-on tasking with guidance on alternative courses of action and priorities for fulfillment, as appropriate, and coordinate recommended actions with appropriate agencies.

3. Within the framework of the PPBS, perform continuing analysis of Military Department and DoD component telecommunications programs, budgets, financial plans and related financial activities. Maintain continuous fiscal visibility, by both program and appropriations, of all DoD command, control and telecommunications enumerated in Para. IV below and relate these to existing assets.

4. Serve as principal DoD witness to testify on telecommunications programs/budgets before committees of the Congress.

5. In coordination with ASD(A), review NSA requests for special security telecommunications systems and facilities for technical compatibility and consistency with other DoD telecommunications plans, projects and existing assets.

E. Engineering and Operations

1. Monitor all DoD telecommunications engineering to insure a total systems design and engineering approach in fulfilling DoD telecommunications needs.

2. Assign to appropriate Military Departments or DoD components the preparation of command, control and telecommunications standards under ATSD(CCT) supervision, both technical and operational. Publish resulting standards as DoD technical and/or operational standards.

3. Establish and maintain continuing indicators of the performance of current DoD operational telecommunications assets to indicate mission effectiveness and quality of service in light of assets and expenditures committed.

V. RELATIONSHIPS

A. In the performance of his functions, the Assistant to the Secretary of Defense (Command, Control and Telecommunications) shall:

1. Coordinate actions, as appropriate, with DoD components having collateral or related functions.

2. Make full use of established facilities in the Office of the Secretary of Defense and other DoD components rather than unnecessarily duplicating such facilities.

3. Maintain active liaison for the exchange of information and advice with DoD components as appropriate.

B. The heads of all Department of Defense components and their staff shall cooperate fully with the Assistant to the Secretary of Defense (Command, Control and Telecommunications) and his staff in a continuous effort to achieve efficient administration of the DoD and to carry out effectively the direction, authority, and control of the Secretary of Defense.

VI. AUTHORITIES

The Assistant to the Secretary of Defense (Command, Control and Telecommunications), in the course of exercising staff functions, is hereby specifically delegated authority to:

A. Issue instructions and one-time directive-type memoranda, in writing, appropriate to carrying out policies approved by the Secretary of Defense for his assigned fields of responsibilities in accordance with DoD Directive 5025.1. Instructions to the military departments will be issued through the Secretaries of the departments or their designees.

B. Obtain such reports and information and assistance from the military departments and other DoD agencies as may be necessary to the performance of his assigned functions.

C. Communicate directly with the Secretaries of the military departments, the Joint Chiefs of Staff, the Directors of the Defense Agencies and the Director, National Security Agency.

D. Establish arrangements for DoD participation in those non-defense governmental programs for which he has been assigned primary staff cognizance.

E. Communicate directly with all governmental agencies participating with DoD in those non-defense governmental programs for which he has been assigned primary staff cognizance.

F. Establish procedural arrangements for the discharge of overall responsibilities of the Executive Agent for the NCS.

G. Request such reports, information and assistance from governmental agencies participating in the NCS, as may be necessary.

H. Communicate directly with all governmental agencies participating in the NCS and, after appropriate clearance, with representatives of other nations on NCS matters.

VII. EFFECTIVE DATE

This directive is effective immediately. Necessary follow-on organizational and implementing actions will be taken as rapidly as possible. Whenever the Assistant to the Secretary of Defense (Command, Control and Telecommunications) assumes responsibility for a function assigned him under the terms of this directive, all DoD Components will review their existing directives, instructions, and other issuances for conformity. Two copies of all publications issued in implementation shall be forwarded to the Assistant Secretary of Defense (Administration) within 60 days for record purposes.

RECOMMENDED ORGANIZATION STRUCTURE

ASSISTANT TO THE SECRETARY OF DEFENSE
(COMMAND, CONTROL AND TELECOMMUNICATIONS)
/ATSD(CCT)/

DEPUTY ATSD RESOURCE MANAGEMENT

Fiscal management:
- Zero-base analyses of resources
- Levels of resource commitments required
- Cost effectiveness/ systems analysis
- Continuing management of overall O and M and procurement expenditures

DoD representative on budget and financial matters

DEPUTY ATSD OPERATIONS AND ENGINEERING

NCS, Executive Agent functions

Engineering and operational standards and compatibility

Formulation and review of DoD policy for telecommunications

Performance: quality; cost; mission effectiveness

Purview of the MilDeps and/or DCA for telecommunications projects and operations

DoD representative to others: Federal Departments and Agencies, industry, International bodies, foreign governments except on fiscal matters

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U. S. ARMY EUROPE

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UNITED STATES ARMY PACIFIC

Gen Ralph E. Haines, Jr., CINC
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