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Inspector General's Survey

of the

Office of Computer Services

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DD/S 70. 2107

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April 1970

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I.   SUMMARY

1.   The Office of Computer Services, DD/S&T, is responsible for satisfying those automatic data processing (ADP) requirements that are handled centrally. It has an authorized strength of ⬚ staff employees, spends about ⬚ a year, and has about one-third of the Agency's ADP resources.

2.   OCS consists of a Director's office, three staffs and four divisions. The staffs develop new computer techniques, conduct ADP training and handle general administration. Three divisions--Management Support, Intelligence Support, and Scientific Applications--assist in the design of ADP systems and develop computer programs. The fourth, the Operations Division, runs the computers and handles production requirements. The managers of the Office, staffs and divisions are energetic and talented; their work force is highly skilled.

3.   Although computer specialists are in great demand, the turnover rate in OCS is not unusually high. For example, in a recent six-month period, only four left to accept employment elsewhere. Most of the Office professionals plan or want to make a career in the Agency and believe that their talents and skills were being used effectively. As in other organizations, however, the young professionals want to be given challenging assignments and promotion opportunities as they mature. They also express the need for better communications up and down and question some OCS management practices.

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4. The development of ADP experts within the Agency through training, advancement and rotation is presently the responsibility of several different components using computers. An ADP career service has been suggested as a means of providing efficient centralized personnel management and making maximum use of such talents. While much can be said in favor of such a service, we do not believe that this is the time for this move, largely because we found it difficult to separate technical ADP responsibilities from substantive responsibilities of the systems analysts and some programmers. We recommend that the Information Processing Board (IPB) do what it can to facilitate the career development of ADP people.

5. Rotation of OCS computer specialists into substantive components and the assignment of substantive experts to OCS can do much to close the communications gap and assure more efficient use of ADP in the future. Some of this has been done and with good results. Improvements in the quality and range of OCS services to customers can also be brought about by a number of managerial steps. Specifically, there is a need for better written standards and procedures; for improvement in staff work; for better ADP documentation; and for a tightening up of supervisory practices and housekeeping routines. While OCS has done well in keeping up with demands for its services in a period of rapid ADP growth, it is now time to improve the organization and management of its basic resources.

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6. The Scientific Applications Division of OCS is engaged in an impressive array of programs and projects in support of a diverse list of customers (OSI, OSA, OEL, FMSAC, OC, OSP, OER, OMS, TSD, etc.). Its work is satisfactory, but the division needs better records on the availability of software systems. The division's bull pen-type work area makes concentration for its highly qualified mathematicians and scientist practically impossible; a condition they feel lowers their efficiency to perhaps 35 percent.

7. The Management Support Division maintains about 50 systems which produce some 1,000 different kinds of reports for all components of the Support Services and other Agency elements. Most of the programs for the systems were designed to run on earlier generation computers than those OCS now has. This means that these more advanced computers perform like an older, less advanced, less efficient computer while running these programs (referred to as emulation). In addition, some of the systems are poorly documented and have been revised and patched in a piecemeal fashion, thus increasing inefficiency and inflexibility.

8. The Management Support Division has a large investment in the Support Information Processing System (SIPS) which now has ☐ OCS and ☐ DDS people working on it as a SIPS Task Force. The effort to design and develop SIPS began in 1964 with fewer people involved but with the basic aims the same. These were to report support data

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more completely and faster, to reduce redundant reporting, and to lower data manipulating time. What began as an effort to design and develop overly sophisticated systems has now been cut back to 40 sub-systems within ten major systems which are in three areas-- human, financial, and material resources. The effort has also been modified to allow an incremental approach in the design and development of the ten systems rather than introduce them all at once. After the earlier years of frustrations and little real success, the Task Force now appears to be progressing. However, we found a need for the establishment of more firm system parameters; a need to determine programming methods (batch or on-line); and a need to standardize data elements and codes. We also found a need for the DDS components to devise and firm up their input procedures, to make plans for the utilization of the outputs, and to arrange training for the staffs involved in the new procedures.

9. In the past, the SIPS Program has lost momentum because of insufficient technical expertise and indecisive communications with management. It appears that these problems have been overcome and that the Task Force now has specific plans as to where it is heading and when it will get there. However, much is still to be done and continued support is essential. To stop the SIPS effort now would mean the loss of a large investment. Further delays in developing the systems would be very costly.

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10. Some of the staff who have been detailed to SIPS from support offices need counseling. Their morale is low because they feel that they are out of the mainstream of consideration for promotions and reassignment opportunities. A recommendation on this point is included in the report.

11. The Intelligence Support Division works for the DDI, the DD/S&T, the DDP, NIPE, and OC. Its main projects involve the storage and manipulation of large masses of information. The majority of the division's work is regarded as satisfactory by the users. One software program developed by the division is not getting the use OCS feels it should, however. This is CAPRI (Centralized Automatic Processing and Retrieval of Intelligence). It is based on the premise that many requirements in organizing, processing, and displaying information are enough alike, even though the substantive content is dissimilar, to allow the multiple use of one ADP program for a wide number of users. The program is ready but has few users. OCS believes that the program meets many of the DDI's basic information storage and retrieval requirements. A number of DDI members, however, feel that CAPRI has limited practical use. In this and in other fields closely related to the work of Central Reference Service of DDI, there has been a lack of clarity regarding OCS responsibilities. We have recommended that the Deputy Director for Intelligence and the Deputy Director for Science and Technology

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focus their attention in clarifying the roles and responsibilities of OCS and CRS.

12. We found that the Intelligence Support Division was once poorly managed, underemployed, and had inadequate standards, procedures and documentation. A change in management corrected the first problem; the new management is correcting the second; the third remains a problem.

13. The Operations Division runs the computer center. It is competently managed, and a small technical staff provides great help in day-to-day problem solving. Most of its employees are computer operators, key punch operators, and clerks. The division performs a great deal of work reliably and promptly.

14. In studying the operations of the computer center, the inspectors were impressed by the complexity of decision-making in the field of equipment selection. Clearly, the rate of technological advance tends to outstrip our ability to make efficient use of the computers we have (i.e., need for emulation). It also seems to force the pace of decision-making about the future structure of our work in this area. High-capacity, high-speed computers are available, and it would be tempting from the point-of-view of cost to move in the direction of integrated operations and time-sharing operations. At the same time much of the Agency's work requires flexibility and a high degree of security. There are those who

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believe that fourth-generation small computers assigned to support

our work in certain specialized, compartmented fields and "controlled"

by the using component are the answer to the need for flexibility and

security. But it is not at all clear when such computers will be

available and what they will cost.

15. We suggest that the Agency pause and take stock. There is

a need to catch up with the equipment on hand and a need to select

our future course with great care.

16. The need for central Agency review and coordination of ADP

was met in part by the Executive Director-Comptroller's memorandum of

13 October 1969, which created an Information Processing Board (IPB)

chaired by an appointee of the Executive Director-Comptroller. This

was a strong step forward in meeting this need but does not eliminate

all problems. The Board does not have full-time members. All,

including the Chairman have other jobs. The Board has no real

authority. Its functions are largely advisory in nature and essen-

tially are as follows:

    a. To assist in the formulation of policy-planning

guidance.

    b. To suggest how to eliminate duplication or achieve

compatibility.

    c. To assist in determining the best use of Agency

ADP facilities.

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d. To advise the Executive Director-Comptroller.

17. The IPB, then, has no real authority. We believe this authority for the coordination of Agency ADP might better be placed in the hands of a full-time Board Chairman who reports directly and only to the Executive Director-Comptroller and has the support of a strong professional staff.

18. The Community On-Line Intelligence System (COINS) experiment affects the work of OCS in several ways. The basic system appears to be faulty. It ties up one OCS computer for three hours a day. Problems with software, different filing and coding systems, and a common computer language problem have not been solved. It is possible that the system does not meet a valid intelligence need. Finally, it poses problems in one area in which the Agency is already overloaded with problems, that of ADP security.

19. Certain security problems are inherent in ADP. A great deal of intelligence and support information is in one central place. The information is in packages easily removed or copied. Electromagnetic radiation must be eliminated by careful shielding. Spillage of compartmented information present in time-sharing multi-classification level systems is possible. The many remote terminals in time-sharing systems increase the possibility of unauthorized access to compartmented information. The flood of computer-produced intelligence information can create classification and dissemination control problems.

20. There is a need to form a task force of security and ADP specialists large enough and competent enough to deal with these problems and those additional ones that are caused by COINS. The security effort addressed to these problems at present is quite inadequate.

21. We found that OCS is customer-oriented and responsive to customer requirements within the limits of OCS capabilities. A number of problems raised by the users, however, must be given continued attention. These start with a communications gap wherein the customers cannot understand the jargon used by the computer specialists, and the computer people do not fully understand the substantive information needs of the users. Some customers are influenced, perhaps unduly, by their past experiences with ADP and computers and tend to be skeptical about cost and time estimates. They also tend to be critical of ADP outputs where the inputs were made by some other person or component; on the other hand, they are satisfied with outputs in which they made the inputs. Some voiced concern about the lack of reliability of the OCS interactive time-sharing system and the amount of "down-time." Some believe OCS and ORD should have better planning and closer working relationships. A number of customers pointed out the lack of any clear-cut OCS priority system for allocation of analyst and programmer time in relation to the substantive importance of the application. Most

thought that their own ADP systems or programs needed upgrading and improving in some way. In the main they tended also to be as critical of those ADP-related processes for which they were responsible as they were of services performed by OCS. They blamed themselves and also believed that their own management had not always given ADP the proper degree and level of interest and support to ensure good system design and reliable input procedures. On the positive side, customers in the Support Directorate reported reasonably good OCS service for on-going programs, and we found this to be the overall Agency attitude in this area of Office operations.

22. OCS and the Office of Training have made a commendable effort in providing the right kind of training for ADP specialists and users. Only two areas seem to have been slighted--increased emphasis on the disciplines associated with systems analysis, and the training of high-level Agency managers who, in the long run, make many of the key ADP decisions for the Agency.

23. Finally, it is our belief that OCS must establish a system for costing ADP services and must be given assistance in solving the problem of working space.

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II. INTRODUCTION

1. This report of survey presents our findings concerning management within OCS; Office relationships with higher management; relationships with customers and other Agency computer organizations; and OCS problem areas. A number of recommendations are made concerning these areas and relationships.

2. In planning this survey, we were fully conscious of the fact that our inspectors would not be able to analyze and solve technical problems in the ADP field. As the survey progressed and as such problems were identified, the inspectors sought to determine whether or not management was devoting sufficient attention to their resolution. It is our belief that by conducting a comprehensive review of OCS on this basis we have been able to suggest profitable lines of action to management, without becoming involved in technical debate.

3. The inspectors conducted interviews with members of all of the components of OCS, the various Directorate Information Processing Coordinators, the customers using the services of OCS, other Agency computer operating elements, the O/PPB, and the NIPE Staff. All concerned were most cooperative.

4. During the course of the survey, Agency ADP activities, including those of OCS, were also being reviewed by other Agency
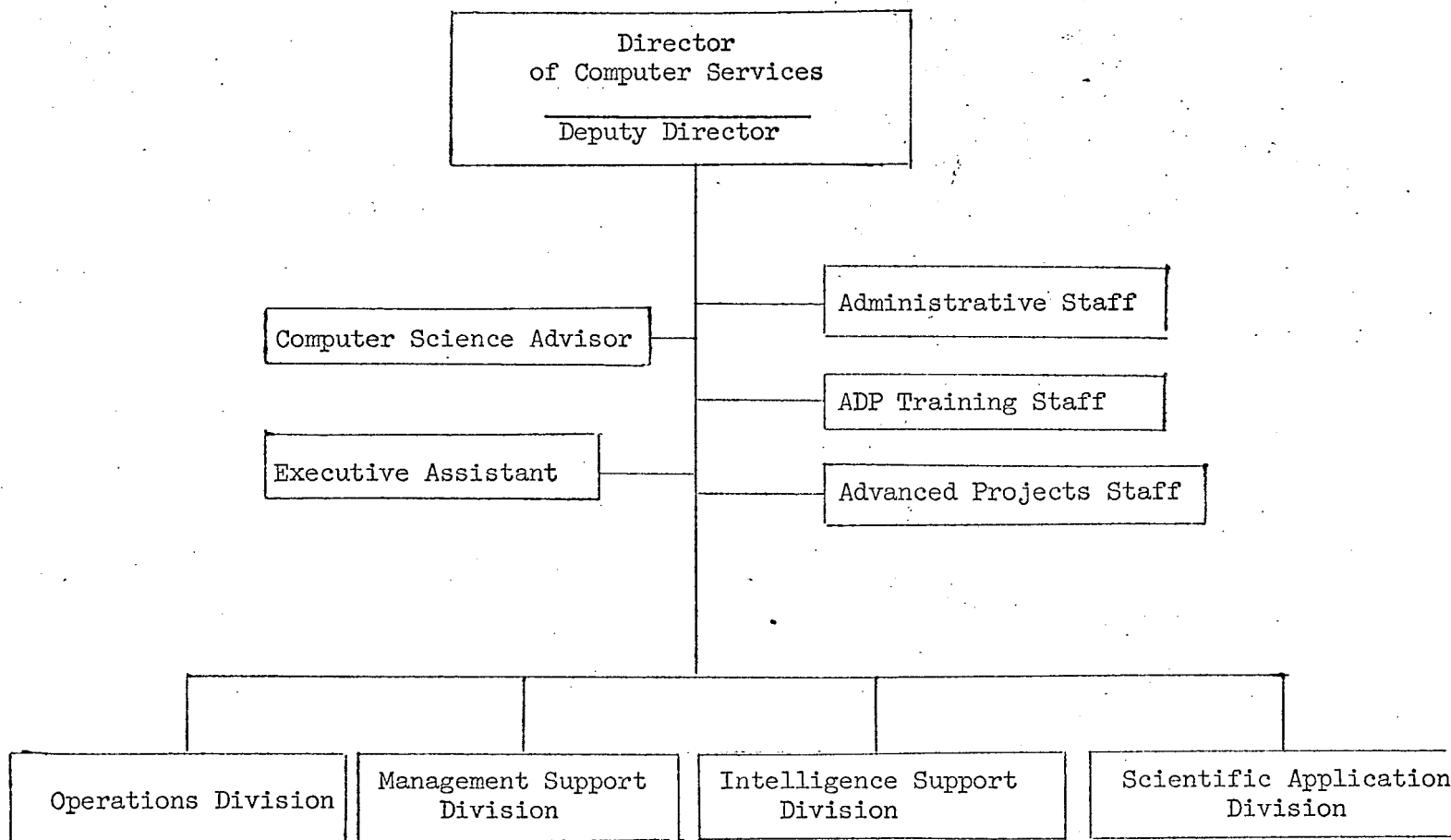
elements such as the DDI ASPIN* Staff, the recently created Information Processing Board, O/PPB, and the IG Audit Staff. We have had profitable talks with each of these groups.

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*Automated Systems for the Production of Intelligence

OFFICE OF COMPUTER SERVICES

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┌─────────────────────────────────┐
│           Director              │
│      of Computer Services       │
│  ─────────────────────────────  │
│       Deputy Director           │
└─────────────────────────────────┘
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┌──────────────────────────┐   ┌──────────────────────────┐
│ Computer Science Advisor │   │   Administrative Staff   │
└──────────────────────────┘   └──────────────────────────┘

                                      ┌──────────────────────────┐
                                      │   ADP Training Staff   │
                                      └──────────────────────────┘

┌──────────────────────────┐   ┌──────────────────────────┐
│   Executive Assistant   │   │ Advanced Projects Staff │
└──────────────────────────┘   └──────────────────────────┘

| Operations Division | Management Support Division | Intelligence Support Division | Scientific Application Division |

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III. MISSION AND ORGANIZATION

1. <u>Mission</u> - The Office of Computer Services is responsible for satisfying those automatic data processing requirements that are handled centrally [   ]. OCS has about one-third of the Agency's ADP resources.

2. <u>Organization</u> - OCS is an office in the Directorate for Science and Technology. The Office has an authorized strength of [   ] staff employees, has 10 computer company or contract employees at headquarters and seven contracts with commercial firms in furtherance of its mission (not including rental contracts for machinery and software). The budget for FY-1970 is [   ] The central position of OCS within the Agency's overall ADP structure was reaffirmed in a memorandum issued by the Executive Director-Comptroller on 13 October 1969. This memorandum establishes an Agency Information Processing Board consisting of representatives of each of the directorates and chaired by an individual appointed by the Executive Director-Comptroller. The Director of the Office of Computer Services, as the DD/S&T Information Processing Coordinator, serves on this Board.

3. Although established as an Office in August 1963, its organization is still evolving to adjust to the very fluid nature of the requirements levied upon it. The current organization of OCS is reflected in the chart on the page facing this one. A brief description

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of the functions of the Office of the Director, the staffs, and the

divisions of OCS follows. More detailed comments concerning perform-

ance and problem areas are dealt with in later chapters of this

report.

4. Office of the Director - This office includes the Director,

a deputy, an executive officer, two scientific advisors, a special

assistant and two secretarial employees. At the present time the

Director is on a year's training assignment, and his deputy is now

the Acting Director.

5. The office establishes policy for and administers the

operations and activities of the entire OCS complex. In general,

its functions are to plan and program long-range personnel, financial,

space, and equipment resources for OCS; to review proposals or requests

for OCS computer support; to participate in the ADP programs of other

government departments; to chair meetings of ADP technicians and

users to discuss and resolve common problems; to represent the DD/S&T

on the Information Processing Board; and, to coordinate ADP activities

and interface with other Agency elements.

6. Staffs - There are three special staffs within OCS, the

Advanced Projects Staff, the ADP Training Staff, and the Administrative

Staff.

a. Advanced Projects Staff - This staff consists of

specialists and mathematicians. It develops

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new computer techniques by working on matters of
general interest rather than on the specific needs of
customers. Examples of some of this staff's services
are: (a) the development of computer time-sharing
systems; (b) development of man/machine languages;
and (c) the review and evaluation of new, unusual,
or prospective computer systems.

b. <u>ADP Training Staff</u> - This staff of [   ] 25X
[   ] is responsible for designing and con-
ducting a computer science training program as an Agency
service of common concern.

c. <u>Administrative Staff</u> - This staff, consisting of
[   ] is the admin-
istrative arm of the Director and provides assistance to
all OCS elements in matters of security, logistics,
finance, training, personnel, and administration.

7. <u>Divisions</u> - Four divisions carry out the mission of OCS. There
are three "applications" divisions: the Management Support Division,
the Intelligence Support Division, and the Scientific Applications
Division. These divisions work with the customer to determine his
ADP needs and, either single-handedly or in partnership with the
customers, design and implement systems, develop programs, and
test the programs. Once a system is in operation, the responsible

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applications division will monitor the quality of the output and remain in communication with the customer so that any necessary system change can be made to improve the product.

8. The fourth division is the Operations Division, which handles the production aspects of a job, i.e., scheduling, maintaining and operating the computer center equipment. The technical staff of this Division has the responsibility for implementing and modifying the software which activates and controls the computer hardware.

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IV.   GENERAL MANAGEMENT AND PERSONNEL

1.   The Director of OCS, the Deputy Director and division and staff chiefs are an energetic and talented group of men who have played an important role in expanding the Agency's ADP capabilities during the past several years. They talked candidly and objectively to the inspectors about the many problems faced by the Agency and by their Office in upgrading and refining ADP systems and applications.

2.   The ADP specialists and technicians that make up the greater part of the OCS work force appear to be highly skilled. This is the result of Office management's recruiting and training program. At the time of our survey, about 55 individuals were being recruited, 40 percent of whom were professionals. Of those professionals already on board, [ ] have bachelor degrees. The OCS training program has added significantly to the expertise of these people and has made possible the utilization of non-professionals.

3.   OCS management recognizes that personnel turnover is detrimental to maintaining high standards of ADP service to the Agency. In our view, the turnover rate is not unusually high considering the rather unsettled nature of this evolving and expanding field. During the period 1 July 1969 to 31 December 1969, 25 people left OCS, but only four left to seek employment elsewhere. The following table shows the numbers that left, their grades, and their reasons for

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leaving:

GRADES	NUMBER LEAVING	REASON FOR LEAVING	NUMBER
GS-13	2	Reassignment	8
GS-12	3	Retirement	1
GS-11	1	Relocation	3
GS-10	2	Military	2
GS-09	2	Maternity	4
GS-08	3	Other Govt. Employment	1
GS-07	3	Private Industry	3
GS-06	3	LWOP	1
GS-05	2	Personal	2
GS-04	4		

4. Even though the OCS turnover rate is not excessive, our interviews with employees at all grades and levels turned up a number of conditions which, if corrected, might lead to a diminishing rate and an improvement in the quality of work. Corrective action by OCS management is possible in our judgment.

5. Most OCS employees are highly interested in ADP work as a profession. They evidenced no interest in being considered for other types of assignments, and the majority intended or desired to make a career in the Agency. However, a number of the younger employees stated frankly that this depended entirely upon whether or not they received challenging assignments and steady promotions.

6. Most OCS employees felt that their talents and skills were being utilized effectively. Most thought that Agency training was of a very high quality and improved their on-the-job performance. On the other hand, a number of employees, especially in the Intelligence

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Support Division, complained of occasional idleness or "dead time" because of unforeseen equipment or program problems or inept planning or scheduling of work assignments. Many felt remote from the OCS front office. They thought that there should be better channels and mechanisms for communicating plans, instructions, and information downward and ideas and information upward. A number thought there was a "communications gap" between OCS and top- and middle-level management in the Agency; that OCS dealt mostly with "coordinators" or low-level representatives of management, and that many of these people seemed irresolute or uncertain as to what management really wanted from ADP. Several said that OCS should be less concerned about its "image" and "pleasing the customer" and more concerned about good systems design. Some felt that the Office should do more searching analysis and inquiry into the cost of satisfying requests in relation to the realistic needs for information. A number of OCS people commented that the overall ADP management in the Agency was fragmented, unstructured, and lacking in authoritative standards for resolving issues and making decisions.

7. From time to time consideration has been given to creating a separate career service for ADP personnel. It is argued that such a service would make maximum use of the talents of such personnel and would offer to all ADP specialists a chance to compete for advancement and for assignments that would broaden their professional experience.

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There is, indeed, much to be said for centralized career management of computer operators and even programmers. In the case of systems analysts, and in some cases of programmers, it is difficult to separate the technical side of their work from the substantive side. Thus the needs of the ADP components and the needs of the substantive offices must be carefully weighed before a solidly based decision can be reached in this matter. For this reason we do not feel that this is the time to make a decision with regard to establishing one ADP career service for the Agency. Such a decision should be deferred until the overall roles and responsibilities for ADP had been settled and experience has indicated how best to handle the experts in this field.

8. Pending a decision on career service, the IP Board could perform a useful function in coordinating the rotation of persons between directorates where this would be advantageous to the Agency or to the individual.

9. The assignment of OCS personnel to other components as a permanent transfer or for indoctrination and/or substantive on-the-job training has occurred in isolated cases in the past. We noted great customer satisfaction where this had been done and a greater appreciation of substantive problems on the part of the computer specialist. Some customers felt there was reluctance on the part of OCS to make such commitments of its personnel, especially where it

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has meant an outright transfer. We can understand this position but believe that such assignments, as well as assignments of substantive specialists to OCS, can do much to close the communications gap between computer specialists and substantive specialists and to assure efficient use of ADP in the future.

10. In reviewing OCS management and personnel, we found a need for greater interest in the organization and issuance of authoritative written standards and procedures; for improvement in staff work; for greater observance of approved standards in the documentation of ADP systems and programs; and for a tightening up of supervisory practices and housekeeping routines. While we reiterate our belief that OCS management has had to run hard just to keep up with demands for its services, we feel that emphasis should now be given to improving the organization and management of basic ADP resources. There is a need for a refinement of their technical and management processes and procedures if they are to improve the quality and range of services provided to customers.

11. We found especially that most OCS written standards and procedures had been devised and issued by the various divisions and that they vary widely in content and quality. Those procedures issued at the OCS Office level are badly organized, uncodified, out of date, and are not available for reference by all employees. We recognize that the differences in the types of ADP applications handled by the

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divisions require some variation in documentation standards at the

division level, but we believe it would be considerably more efficient

to devise a set of general standards and procedures at the Office

level than to have each division write its own set. Documentation

standards which may need to be devised at the division level should

be reviewed at the OCS Office level to ensure that they are in

general conformance with the general standards and procedures estab-

lished for the Office as a whole. OCS recognizes the need to improve

its procedures and has already initiated action toward that end, but

considerably more work remains to be done.

Recommendation No. 1

That OCS devise, publish and arrange for Office-
wide dissemination of OCS standards and procedures.

12. We believe that many of the management and personnel

problems cited in this section can be corrected by OCS while others

require action by the IP Board and the directorates concerned. Because

their correction appears to be primarily a matter of improvement and

refinement of management processes, the question arose as to why this

has not been done to date. Having completed our survey, we believe a

few words can be spoken in extenuation.

13. First we found that OCS management has been faced with a

rapidly changing ADP technology. Within a decade computers have

evolved from tube-types to discrete transistors and now to integrated

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circuits; and a fourth generation is in the offing. In this computer technology "explosion," OCS has managed to improve, upgrade, modify, and replace equipment apace. Their present computer equipment is maintained and operated effectively from the standpoint of servicing on-going programs. We view this as a significant accomplishment on the part of OCS management.

14. Next we found that the ADP services provided by OCS have grown at a very rapid pace over a wide range of applications such as scientific computations, information storage and retrieval, intelligence collection and processing, and administrative activities. This growth in services, the computer technology explosion, and most importantly the lack of clear-cut roles and responsibilities of various Agency components for the development and utilization of computer resources have made OCS management a trying and difficult job. To date, the OCS managers have demonstrated a high degree of pragmatism and perceptive common sense in providing essential services, balancing conflicting requirements, building up manpower, machine, and software resources, and managing on a day-to-day basis.

15. We feel that the Acting Director, OCS, his staff, and division chiefs are trying to correct deficiencies cited in this report. However, we believe more must be done to refine management practices and clarify roles and responsibilities in the future, and we have made several recommendations on this.

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V. SCIENTIFIC APPLICATIONS DIVISION

1. This division has [   ] secretary-stenographers. The officers are specialists in mathematics, physics, electrical engineering, aerospace engineering, engineering science, computer science, and chemical engineering. This diversity in personnel experience is required because the division assists other Agency components in defining and solving engineering and scientific problems. The division supports elements of the DD/S&T, DDI, DDS, DDP, and NIPE/DCI.

2. This division is divided into four units, the Trajectory and Orbital Determination Branch, Mathematics Branch, Signal Analysis Branch, and the Scientific Systems Staff.

3. The Trajectory and Orbital Determination Branch--This branch has [   ] It works in two principal areas, air defense systems analysis and trajectory and orbital analysis. Examples of the former are: a computer system for simulating the mission of a high altitude reconnaissance vehicle over denied areas and evaluating the effectiveness of air and radar facilities; and a computer system for simulating an ABM defensive system and evaluating its effectiveness against ICBMs launched from fixed sites and mobile platforms. The principal customers for such service are OSI, OSA, OEL, FMSAC, OC, and OSP. These organizations

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will require continuing and increasing support to make analyses of changing air defense systems and to improve computer techniques so that more effective analysis can be performed. Additional work will be required if it is decided to operate certain programs that have been developed by contractors.

4. In the trajectory and orbital analysis area, computer programs have been developed to determine the trajectory of missiles, to predict the orbits of satellites, and to evaluate the accuracy of rader tracking systems. The main customer is FMSAC. OCS has endeavored to modify programs developed by contractors and to understand FMSAC-developed programs in an attempt to reduce the amount of outside contract work.

5. This branch also serves OSR on an ad hoc basis on requirements requiring quick responses.

6. Mathematics Branch--This branch has [   ] all   25X
mathematicians, and the part-time use of [   ]. It   25X1
works in four main areas:

    a. Modeling. In this area the branch has developed and maintains three major projects:

        (1) Project [   ] This project tries to

25X1

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OBGI. The system's file contains coastlines, cities, railroads, etc., on a world-wide basis and is well arranged so that the user can **request** any one of 16 projections. The purpose of the system is to produce the map projections quickly. Such projections would take months to do manually. Once the programs are completed by the branch, they are turned over to OBGI for running. Both OBGI and SAD are constantly in touch with the cartographic community, and the system and the data bank involved have been given to other agencies.

3. Medical Services. There are two projects in this area, one for the Psychological Staff and the other for the Clinical Staff. The first is in a developmental stage but should be operational in several months. Overnight it will score tests given to applicants and employees and point out psychological problem areas so that people tested could be recalled for personal interviews by the psychologist the day following testing. The second project, which is dormant for the moment, involves a series of programs which could analyze information on physical examination results, pointing out things that are unusual. The data going into the system would include medical history forms, laboratory reports, and doctors'

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diagnoses.

4. Support to the CS. The branch supports a variety of applications for the CS. TSD is one of the main customers. One program, which has been going on for seven years and will probably continue for another two, involves testing the life of batteries. Another program involves [   ] The branch   25X1

also has a program for [   ]   25X1

[   ]. The program provides weekly traffic summaries.

7. In addition to the above four areas, the branch also services ad hoc requirements.

8. Signal Analysis Branch - This branch has [   ] and   25X

[   ], uses contractors on a part-time basis and is divided into three substantive areas.

9. The signal analysis group handles programs for OEL, FMSAC, OC, and ORD dealing in the analysis of telemetry, ELINT, COMINT, RADINT, and "special things." The work involves analogue pre-processing, analogue to digital conversion, display of data, and analyses of data. The objective of the work is to extract intelligence from signals.

10. The communications application group assists the Office of Communications in developing programs which help predict the perform-

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ance of various existing and proposed communications and intercept systems.

2 X1

12. The Scientific Systems Staff - This staff is supervised by the Deputy Chief of SAD and has five professionals. It supports customers on software matters with OSP contractors and gives special software support to OSP's [   ] projects. It has   X1 assigned three officers to OSP for this purpose. Increasing importance is being placed on assignments of this kind which also involves getting into substantive areas as well as working on software matters.

13. Comments - A problem, common to several units in OCS but of particular concern to SAD, is the one of inadequate office space. SAD has very highly qualified scientists who are difficult to recruit. After obtaining their services, we put them to work in a bull-pen of an office where concentration is practically impossible. SAD employees estimate that such working conditions cut the efficiency of their performance down to perhaps 35 percent. This sounds exaggerated, but they mean it quite seriously. We realize that the management of OCS has made a great effort to obtain more adequate space and is still trying, but without much success. A recommendation concerning the subject is made in our "General Discussion" section.

14. When SAD receives a request for service, it checks its own

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software to see if any system exists which would be useable. If not, it checks with manufacturers, as do the customers at times. Reliance is placed upon manufacturers to identify suitable software of their own or of other government agencies. There is no systematic requirement for centrally recording and identifying Agency in-house software items, and we believe that one should be established. In addition, there should be a similar system within the government, taking, of course, security considerations into account.

Recommendation No. 2

That OCS initiate action with the IP Board to consider:

a. The need to establish a central point of record for Agency software systems; and

b. The need to establish a similar government-wide central point of record for software systems.

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VI. MANAGEMENT SUPPORT DIVISION

1. The Management Support Division (MSD) uses computer systems to help management account for people, money, and things. It maintains about 50 systems involving over 300 separate applications, which produce some 1,000 different kinds of reports for all components of the Support Directorate and other Agency elements. The division is also working on a very large-scale developmental project, the Support Information Processing System (SIPS). This project involves the study, redesign, evaluation, and programming of most of the present Support Directorate ADP activities and is meant to extend information processing into areas not previously serviced.

2. The division, consisting of the Office of the Chief, MSD and its four branches (Budget and Fiscal Branch, Material Branch, Manpower and Personnel Branch, Development Branch), has a total of ☐ employees,   25X1

consisting of ☐ computer systems analysts, ☐ computer specialists,   25X1

☐ computer programmers, and ☐ stenographer-typists. An additional ☐ DDS officers have been assigned to form part of a SIPS Task Force under the direction of the Chief, MSD. Of the total ☐ employees   25X1

assigned to MSD, approximately 75 percent are committed to SIPS activities, and the remaining 25 percent are engaged in servicing and maintaining the on-going ADP systems. The Chief, MSD, is also the Director of the SIPS Task Force. He is responsible to the Director, OCS, in

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his capacity of Chief, MSD, and to the Assistant DDS in connection with the SIPS developmental activities. He keeps both these officials informed of his activities by frequent briefings and reports as required.

3. <u>Budget and Fiscal Branch and Its Current Systems</u> - This branch maintains four current ADP systems for the Deputy Director for Support and provides services in support of O/PPB. The four systems are identified as Accounts, Vouchered Funds Payroll, Unvouchered Funds Payroll, and W-2 Tax Reports. In addition to these ADP systems, there is an electronic accounting machine (EAM) operation performed by Office of Finance to process agent payrolls. Most of the programs for the current systems are run under 301/501 emulation* on RCA Spectra 70/45 and 70/35 equipment.

4. <u>Material Branch and Its Current Systems</u> - This branch maintains five current ADP systems for the Deputy Director for Support, which are Stock Accounting, Defense Logistics Supply Center (cataloguing), Contract Information File (CONIF), Forms, Agency and non-Agency, and Electronic Printing of Intelligence Composition (Printing Services Division electronic type setting). In addition to the above ADP systems, an EAM operation produces a report on the status of Agency vehicles for the Director of Logistics.

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*Emulation means to program the most advanced computers (e.g., the third generation) so that they perform like an earlier, less advanced computer (e.g., the first and second generations).

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5. There are two ADP systems maintained for the **Deputy Director of Science and Technology**. These are ACORE (contract information) and RASP (measurements of performance on surveillance vehicles). Current materiel resource systems are processed on RCA Spectra 70 and IBM 360 equipment.

6. <u>Manpower and Personnel Branch and Its Current Systems</u> - This branch maintains some 42 current ADP systems for the Support Directorate. These systems produce more than 800 reports pertaining to tables of organization, qualifications and skills, retirement status, statistical projections and actuarial studies, personnel histories and training records, skills inventories, security name-check information, credit union, hospitalization, insurance reporting, etc. The programs for the current systems are processed on IBM 360 and RCA Spectra 70 equipment.

7. <u>Development Branch</u> - Presently this branch is concerned primarily with the SIPS developmental activities. The branch is involved in other activities. For example, recently the branch has been given the task of improving and debugging the Printing Services Division's Electronic Printing of Intelligence Composition System (EPIC). EPIC is a computerized system for processing National Intelligence Survey texts. It produces formatted input data to photo-composing equipment which, in turn, produces a finished printed output. EPIC has been in operation since 1965, and has the potential of effecting savings in

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both time and costs. EPIC should provide fully made-up pages of text and eliminate several reviews and corrections of text which are required when utilizing traditional printing methods. These benefits appear not to have been fully realized, however, because of problems involving programming bugs and input which have not yet been ironed out. It is expected that the assignment of an additional OCS specialist to this program should help clear up EPIC problems.

8. Comments - Most of the 50 ADP systems currently maintained by MSD were designed and programmed before the advent of third-generation computers. The systems do not take full advantage of the possibilities offered by today's equipment and computer technology. Most of these systems are inadequately documented and have been revised and "patched" in piecemeal fashion. They are also inflexible and difficult to modify to meet changing legal and administrative requirements, and they do not provide Agency management with the type of relevant and timely information that would be possible if the systems were updated. Approximately half of the present ADP applications were programmed for second-generation computer equipment, and running these programs in emulation on third-generation equipment results in inefficient use of present computer capabilities.

9. MSD fully recognizes the difficulties caused by past practices of inadequate documentation of ADP programs and has recently given major emphasis and attention to devising definitive

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written standards and procedures covering documentation practices.
The enforcement of the documentation standards recently published
by MSD should help to alleviate many of the problems currently
being experienced in connection with changing and upgrading programs,
and should serve to improve the future efficiency and productivity
of the division.

10. Comments made by MSD customers concerning MSD services are
discussed later in the section Customer Attitudes and Problems.

11. Support Information Processing System (SIPS) - The SIPS
program entails updating all of the existing support systems and
making use of advanced computer technology to increase the range and
improve the quality of support information services. Benefits ex-
pected from SIPS include: more complete, responsive, and timely
data for general management purposes for use of the Support Director-
ate and other Agency components in carrying out their personnel,
security, budgetary, custodial, accounting, and general adminis-
trative functions; reduction in redundant data and the manual
processes associated with the recordkeeping, filing, and manipulation
of support data; and reduction in machine time presently required to
run these first- and second-generation programs in emulation on third-
generation equipment.

12. The need to update and improve the support systems was
recognized by both DDS and OCS several years ago, and led to the

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establishment of the SIPS program. The SIPS analysis and design
work began in 1964 under the direction of the DDS Information Pro-
cessing Coordinator. The SIPS Group has been composed at various
times of from [   ] officers detailed from the Offices of Per-
sonnel, Logistics, Finance, and other components of DDS, with
limited advisory support from OCS. The group continued developmental
work on this activity until 7 November 1968. At that time the DDS
and DD/S&T reached an agreement, approved by the Executive Director-
Comptroller, to establish a SIPS Task Force. The Force was formed
under the Chief, MSD/OCS and was composed of the DDS SIPS Group
and all of the personnel of MSD/OCS not otherwise committed to on-
going ADP programs. A reassessment of the SIPS plan was made at
that time, with the result that the number of sub-systems previously
planned for under the three major groupings was reduced, certain
design features were changed, design phases and priorities were
established, and plans were altered to provide for the phased imple-
mentation of each of the systems or sub-systems rather than the simul-
taneous implementation of the whole SIPS program.

13. The present SIPS plan envisages the design and implementation
of ten major ADP systems, with approximately 40 sub-systems, which will
be put together to form an integrated information system for use in
managing and accounting for the Agency's human, financial, and materiel
resources. The ten major systems are:

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Human Resources Systems

(1) Manpower Control

(2) Staffing Complement

(3) Skills Inventory

(4) Automated Name Checking (NANCA)

(5) Special Clearances (SPECLE)

(6) Pre-Employment Processes

Financial Resources Systems

(7) Agency Payroll

(8) General Accounting

(9) Budget Processes

Materiel Resources System

(10) Materiel Resources

14. According to the SIPS plan, the developmental tasks which must be completed prior to implementation of each major system has been divided into four phases, as follows:

Phase I   Requirements Collection

Phase II   Requirements Analysis

Phase III   Systems Design

Phase IV   Programming, Testing, Implementation

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Each of the four main tasks is further subdivided into specific subphases to establish benchmarks for measuring progress.

15. Phase I, Requirements Collection, has been completed for all of the ten major systems, and Phase II, Requirements Analysis, is considered to have been substantially completed on all major systems except the Materiel Resources System. The present effort is concentrated primarily upon Phase III, Systems Design, which involves firming up the design parameters of each system, preparing function flow charts for each process, devising information input and output specifications, establishing performance requirements, and organizing file structures. The target dates established for completion of Phase III, design stage, and Phase IV, Implementation, are set forth below:

TARGET DATES

System Task	4Qtr 1969	1Qtr 1970	2Qtr 1970	3Qtr 1970	4Qtr 1970	1Qtr 1971	2Qtr 1971	3Qtr 1971	4Qtr 1971	1Qtr 1972
Manpower Control System										
Phase III	. . . .									
Phase IV	. . . .									
SARCA										
Phase IV	. . . .									
SPECLE										
Phase III	. . . .									
Phase IV	. . . .									

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TARGET DATES

System Task	4Qtr 1969	1Qtr 1970	2Qtr 1970	3Qtr 1970	4Qtr 1970	1Qtr 1971	2Qtr 1971	3Qtr 1971	4Qtr 1971	1Qtr 1972
Staffing Complement										
Phase III	....									
Phase IV			....							
Skills Inventory										
Phase III				......						
Phase IV					....					
Pre-Employment Processes										
Phase III	....									
Phase IV	(No firm target date for implementation)									
General Accounting										
Phase III	....									
Phase IV			....							
Agency Payroll										
Phase III	....									
Phase IV		....								
Budget Processes										
Phase IV	....									
Materiel Resources										
Phase II	....									
Phase III		....								
Phase IV				....						

16. There are several very persuasive reasons, from the stand-
point of utilization of Agency resources, why the SIPS effort should

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be accorded a high priority and why everything practical should be done to maintain a steady rate of progress toward system completion. The overall cost of the SIPS effort is high and will continue to mount the longer it takes to implement the system. The cost of running the present on-going second generation systems in emulation on third generation equipment is also high and cannot be reduced until the systems are redesigned and programmed. The lack of flexibility and poor documentation of the present on-going systems also represent a hazard, because changing regulatory or legal requirements could result in a breakdown of parts of the present systems or make them prohibitively expensive to operate. A large number of people in the DDS and throughout the Agency must spend a considerable amount of time in manipulating the administrative data required by present procedures and practices. Many of these processes will be significantly improved and presumably the number of people doing them reduced as new procedures are introduced. Steady progress is also essential for maintaining the morale of the SIPS Task Force employees. All of these points argue for an early firming up of the systems design phase and an aggressive push forward for the activation of the various sub-systems.

17. The formation of the SIPS Task Force, the provision for access to the Assistant Director for Support for management decisions, and the placement of all of the people working on the SIPS effort in

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one physical location have had a beneficial effect. The DDS functional specialists and the OCS systems experts can now work together as a team and can direct all their efforts toward the solution of the many complex problems involved. The quality of staff and developmental work and access to high-level management have improved and expedited decision-making. The cutback in the number of sub-systems and the modification of some overly-sophisticated plans for on-line inter-active services and for the total integration of all data associated with this project have resulted in more realistic work plans and firmer user requirements.

18. There are still many problems that lie ahead before the SIPS Program is completed. The rate at which these problems are solved will depend to a large extent upon the degree of priority which can be assigned to this project by DDS and OCS. The first step is to establish firm design parameters of the major ADP systems. This requires positive decisions on the part of both users and designers. In addition, early and positive decisions must be made as to which of the various sub-systems will operate in a batch mode, and which will require on-line interactive services. The procedures, file structures, equipment, and software required for on-line services are quite different from that required for batch operations. Extensive testing and revision of customer input procedures and processing cycles will be necessary in those cases where on-line systems or

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sub-systems are required. Another prerequisite to programming this activity is the need for the standardization of data elements and codes. This job is essential if the system is to be integrated to the extent that single data inputs are to be transmitted between and utilized by the various systems and sub-systems. When the above design features are firmed up, the priority given the level and quality of programmer support will determine the pace at which progress is made. During this same period, however, the DDS components must devise and firm up input procedures, make plans for the utilization of the outputs, and arrange for the required training of their staffs if the new procedures are to be implemented effectively. OCS must also be prepared to handle the problem of scheduling computer time and assigning personnel needed to run the old and new applications in parallel while testing and debugging the system.

19. The Task Force leader and the various group leaders now working on the SIPS activity appear confident that they are on the right track, and that they can successfully implement this system in an incremental fashion as presently planned. If the system development becomes bottlenecked, however, further cutbacks on integration of data or on deferment of on-line facilities may be necessary in order to achieve faster progress.

20. <u>Discussions with SIPS Employees</u> - We received a variety of reactions and opinions in talking with the OCS and DDS employees

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working on the SIPS Program. The group leaders and branch chiefs seemed encouraged by the progress being made since the formation of the Task Force. They were cautiously optimistic about future progress and felt that present target dates for implementation of the major systems could be met, provided continued access to high levels of DDS management could be maintained to ensure timely decisions in respect to users' final systems design requirements.

21. Although most of the SIPS employees were very critical of the way in which the program had been managed in the past, they seemed to feel that the present "mix" of skills and talents has improved the quality of analysis and planning. Some, however, think that the present "mix" of personnel skills is not in proper balance. Those individuals feel that there are still too few ADP-oriented systems analysts and too many functional specialists and junior programmers assigned to the SIPS Task Force.

22. A number of the DDS detailees to SIPS display a keen interest in the potentialities of ADP, like the type of work they are doing, and feel that the skills and experience they are acquiring as members of the SIPS Task Group will enhance their value to their parent Career Service and increase their opportunities for career advancement. There is a low morale among other DDS detailees, however. These individuals feel estranged from their parent Career Services and think they are not in the mainstream of consideration for promotions

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and reassignment opportunities. They have all been assured that
they are considered along with all others of their service for
promotion and reassignment, and it has been pointed out to them
that a number of SIPS detailees have been promoted. Some of them,
however, remain unconvinced and feel "trapped" in a situation they
cannot get out of until the SIPS task objectives are completed, and
some are still doubtful that the tasks will be completed as scheduled.
A number of them, detailed to what they thought would be a one- to
two-year assignment, have been working on the SIPS Program for four
or five years and are depressed and discouraged by the prospect
that they may have to spend two or three more years on work for
which they do not feel particularly well suited or qualified. There
is no easy solution to this difficult problem. The feeling that they
are "trapped" tends to lower the efficiency and productivity of these
employees. On the other hand, any large-scale rotation of the SIPS
Group would have a serious adverse effect on the Program by requir-
ing the training of replacements.

Recommendation No. 3

That the Director of the SIPS Task Force and the
heads of the DDS Career Services concerned arrange for
counseling with each DDS detailee with a view to assuring
the best possible long-range utilization of the indiv-
idual, both from his standpoint and that of the Agency.

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VII. INTELLIGENCE SUPPORT DIVISION

1. The Intelligence Support Division (ISD) has ☐ employees   25X1
and is comprised of the Office of the Chief and four branches:
the Data Applications Branch, Special Projects Branch, Intelligence
Management Branch, and the Programming Services Branch. The primary
function of ISD is to provide assistance to certain Agency components,
mainly intelligence producers, in the development of ADP systems
required in the support of their missions. This involves the study,
analysis, and development of systems and the programming of computer
applications designed to increase the productivity or improve the
efficiency of the using component.

2. Functionally, the four branches of ISD are all engaged in
the above-mentioned activities and are collectively involved in the
development or maintenance of ADP systems principally for DDI, DD/S&T,
DDP and NIPE. The following are examples of current activities of
the four branches.

3. Special Projects Branch - This branch provides services and
assistance to OSR/DDI in connection with Strategic Cost Analysis Model
(SCAM) which is designed for costing various force postures associated
with strategic weapons; develops statistical data on the Vietnam war
for the SAVA Staff; provides ADP support for OER in connection with
the economic analyses of world trade data (TRADER); and assists the

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Office of Security in the development of an ADP system to aid in detecting unauthorized transmissions.

4. <u>Intelligence Management Branch</u> - This branch works closely with the NIPE Staff in the development and maintenance of the Target-Oriented Display (TOD) system, now called Community Intelligence Resources Information Systems (CIRIS). TOD is designed to record and analyze the total resources of the U.S. intelligence community. The branch is also involved in the development of a closely related system for the maintenance of an Overseas Intelligence Facilities Inventory for NIPE. The branch is assisting FMSAC in reviewing and improving machine files as to content and use on the FMSAC/AID Project. Assistance is also provided to various Agency components in reviewing contractor work statements and contractor performance in connection with contracts involving computer use.

5. <u>Programming Services Branch</u> - This branch assists the Office of Communications in developing and maintaining ADP systems that provide data required for secure agent transmissions; provides services to OSI in connection with data manipulations or simulations relating to biological and chemical warfare; and performs services for other Agency components in connection with the development of on-line ADP applications for intelligence production analysts.

6. <u>Data Applications Branch</u> - This branch is involved in the maintenance and utilization of a large-scale, general-purpose file

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management system, CAPRI (Centralized Automatic Processing and
Retrieval of Intelligence) and in a project for CRS/DDI called
QUIKTRAK. CAPRI, which had its origin in the CHIVE effort, was
developed by OCS on the premise that many of the requirements em-
ployed in organizing, processing, and displaying intelligence infor-
mation are sufficiently alike, even though the substantive content
of the files differ, to permit efficient multiple use of the same
ADP program to serve the common needs of a wide variety of users.
Several years of developmental work have gone into the CAPRI effort,
and the system is now ready for use. However, it has not been widely
accepted, and its actual use at this time is limited to only a few
applications.

7. OCS officials described CAPRI as a deep-index file manage-
ment system of considerable power and utility, and seem to feel that
it can be profitably applied to serve many of DDI's basic information
storage and retrieval requirements. Some officials in DDI, however,
were quite skeptical concerning the value and utility of CAPRI and
felt that its use was very limited for satisfying the practical re-
quirements for information handling in the DDI. Additional exper-
ience in application will be necessary to tell whether CAPRI is worth
the time and money that has been put into its development.

8. Arrangements have recently been made to support CRS/DDI in
the development of QUIKTRAK, a complex on-line ADP system used for

analysis of data required by OSR concerning foreign military forces and installations. The initial design of this system was handled by an outside contractor ⬚ under an ORD contract. Present plans are to phase out the ⬚ contract and utilize OCS, CRS, and OSR capabilities to provide the systems analysis and programming support required.

9. <u>Comments</u> - At the beginning of our inspection when we first surveyed ISD and talked to all its employees, the division had been recently reorganized, apparently to improve supervision and management and to adopt a posture which would be more responsive to customer requirements. The new chief of the division was trying to institute improvements in supervisory practices, devise better techniques for conducting systems studies, and establish and enforce more explicit standards for programming conventions and documentation.

10. In the past, some ADP programs were never completely documented by ISD and therefore required the intervention of a programmer between the customer and the Operations Division each time the customer asked for machine services. At the time of our survey, priority attention was being given by the new management to completing the documentation on these programs and to the preparation of run manuals which would then be turned over to the Operations Division, thus enabling the Operations Division to respond directly to customer requests for routine computer

services without the intervention of a programmer. This would also enable ISD to get on with new work.

11. In our initial talks with the employees in ISD, we found that underemployment was the primary problem in the division. Although most employees felt that OCS was concerned about them and had a generous promotion policy, ISD morale was low, and many of the people expressed frustration, because their talents and energies were not being properly utilized. There were various views expressed as to the causes and effects of the underemployment problem. A few employees appeared to have adopted a slow work pace that stretched out the work available and seemed to have adapted quite comfortably to that pace. However, most of the employees were clearly unhappy about the situation and blamed "management" in one way or another for not keeping them busy and fully occupied. This criticism took several forms. The sharpest criticism was leveled at the previous division and branch chiefs for bad management and supervisory practices. Employees complained about unclear delegations of authority and responsibility, lack of long-range planning, and purposeful direction and guidance, inadequate standards and procedures, poor documentation practices, inept organization and scheduling of work assignments, and failure to gain or maintain customer confidence in ISD's capability and willingness to help them in solving their ADP problems. Some of the employees leveled criticism at the office of

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the Director, OCS, for failure to clarify the roles and relation-
ships of OCS with CRS/DDI concerning the utilization of the CAPRI
system in developing storage and retrieval systems for the Intel-
ligence Directorate, and for failure to clarify the ground rules
for participation by ISD in the development of the QUIKTRAK system.
Several employees complained that OCS internal communications were
weak and that they generally heard about OCS plans and activities
via the grapevine rather than being apprised through official
channels.

12. Some of the people in ISD also criticized other Agency
components for placing too much dependence upon outside contractors
for the development of computer systems and software packages in-
stead of using OCS. They also criticized users for failing to des-
cribe their ADP requirements or problems with sufficient clarity
to enable OCS analysts and programmers to do their jobs without
extensive backtracking and delays.

13. The lack of clarity in respect to the roles and respon-
sibilities of OCS and CRS/DDI appeared to be the source of many of
ISD's problems. CRS/DDI has its own computer center, which is used
primarily to operate a large ADP program (AEGIS) for the storage and
retrieval of intelligence information. At the time of our initial
survey, CRS controlled the computer equipment supporting Project
QUIKTRAK, operated a Rapid Search machine, and provided some other

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limited ADP services to DDI customers. Presumably OCS' role is to
provide "all other" computer services requested by the Intelligence
Directorate. We found that there was considerable uncertainty
respecting the type of ADP systems and software the Intelligence
Directorate really needs, confusion as to the respective respon-
sibilities of CRS and OCS in satisfying those needs, and disagree-
ments about the methods which should be employed by OCS in providing
ADP support to the Intelligence Directorate. Definitive analysis
and clarification of the roles are needed to improve the relation-
ships between these offices and to permit more effective utilization
of personnel in support of the Intelligence Directorate's ADP require-
ments.

14. Most of the employees felt that the new division chief was
aware of the problems about which they complained and that he and
the branch chiefs were trying to initiate changes and develop work
projects designed to bring about improvements in the situation. We
later talked to the division chief as well as the Acting Director,
OCS, to be sure they were apprised of the underemployment situation
and related problems in ISD. The Acting Director, OCS, assured us
he had been made aware of the problems by the Chief, ISD, and that
he had initiated, or was in the process of initiating, actions
intended to correct the situation. At this point we arranged to
conduct a later review of the ISD to determine the effects of the

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corrective actions being taken.

15. Later in our survey we again reviewed the situation in ISD and found that:

a. A reduction from ⬚ employees in the division's on-board personnel strength had been made.

b. Arrangements had been made with CRS/DDI to use five of the ⬚ ISD employees in providing support for the development of the QUIKTRAK system. The ⬚ contract is being phased out.

c. An ISD employee had been detailed to OER/DDI to assist that office in upgrading its ADP applications so as to provide better support for OER analysts.

d. The CAPRI system was beginning to be used in connection with eight ADP customer applications. (Projects ⬚ for OER; DRUGS for Office of Medical Services; ITEMREG for ISC; DISPG for Special Projects Staff; PROGLIST for Office of ELINT; and NATSEC for the National Security Council.) OCS officials appeared confident that further practical uses would be found for this system.

e. Several additional work programs, including a major DDP retrieval project, had been assigned to ISD by the Office of the Director, OCS.

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f. Supervisory practices in the division had been tightened and improved, and all employees appeared to be fully occupied.

16. Finally, we found that the Acting Director, OCS, was engaged in discussions with the Information Processing Coordinator/DDI to clarify responsibilities and obtain agreement as to how OCS will support the Intelligence Directorate's ADP needs.

Recommendation No. 4

That the Deputy Director for Science and Technology ensure that a definitive understanding is reached with the Deputy Director for Intelligence to clarify the roles and responsibilities of OCS and CRS.

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VIII. OPERATIONS DIVISION

1. The Operations Division, with ▢ staff employees, runs the OCS computer center. They are assisted by ▢. The division employees are mostly computer and card punch operators.

2. Services provided by this division are: scheduling and coordinating production requests; job control and card punching; preparing input data for processing, using keypunch machines, card sorters, collators, interpreters, and printers; operating and scheduling the many computers and peripheral equipment; maintaining a tape and disc library; reviewing and maintaining step-by-step production procedures; and implementing and modifying the systems software which activates and controls the hardware.

3. The division chief and his deputy supervise the activities of the Technical Staff, the Production Control Branch, and the Computer Processing Branch. Division supervision and control is exercised through regular daily contacts between the chief and his subordinates but also by means of weekly staff meetings, one with all branch and staff chiefs present and another meeting with the chiefs individually. The branches, in turn, hold weekly meetings to pass the word. Personal direction is supplemented by directives outlined in Chapters 50-55 of the OCS Operating Procedures, as well as by Division Procedural Notices for the customers' guidance.

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4. **The Technical Staff** - This staff has [   ] mainly

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systems programmers. It is responsible for implementing and
modifying the software which activates and controls the computer
hardware to ensure the productivity of the hardware and improve
its capabilities. The staff members do not create applications
systems or programs. They do, however, assist customers in straight-
ening out faults in application systems which make these systems
incompatible with the computer and/or its software. Occasionally
they tailor their software to meet specific needs of the user and
the computer system configuration.

5. Because of the staff's software responsibilities, the chief
keeps abreast of the latest developments in software systems and,
with the staff members, deals with the manufacturers and their
representatives on software and hardware problems. The chief is a
member of the OCS Technical Review Committee. He also attends
meetings held by OCS with user technicians. We have noted, however,
that very little cross-fertilization takes place between the computer
technicians of the various directorates. For example, if a Clan-
destine Service (CS) technician has a software-hardware problem,

5X1   he takes it up with the [   ] representative with the CS, who in turn

5X1   takes the problem to the senior [   ] representative in the Agency.
Similarly, an OCS man may turn to one of the OCS-assigned [   ] rep-
resentatives, who again turns to the senior [   ] representative.

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The ☐ representative, in effect, winds up as a coordinator for
an Agency problem, which we believe is improper.

Recommendation No. 5

That the Intelligence Processing Board establish
a system that will improve technical coordination
among the directorates' computer technicians and with
contractor representatives.

6. The chief of the Technical Staff considers his employees to
be well qualified for their jobs. He believes morale is good, and
we found it to be so. The high morale seems to be based on the
availability of promotion headroom and the variety of challenging
problems that keep interest high.

7. The Production Control Branch - This branch has two sections,

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It is a mixture of professionals (mostly program-
mers) and key-punch operators.

8. The programmers of the ☐ are res-
ponsible for the job control and documentation of on-going programs.
They adjust many of the programs to meet the current needs of cus-
tomers. This function was once performed by the applications divisions,
and in many computer organizations, probably would be a staff function
and not one assigned to the Operations Division. However, the function
was removed from the applications divisions and assigned to the old
operational-type EAM unit, which processed data mostly of a financial
nature, and was placed in the Operations Division. Between 60 and

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70 projects are assigned to the section.

9. Although the [ ] has standard criteria requiring documentation of the programs it manages, the standards are not uniformly enforced. This is understandable to a degree considering the varied nature of the many programs. Nevertheless, sound ADP practices would require stricter compliance.

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10. The [ ] handles 100 or more jobs. Most of these have been going on for some time, such as payroll, personnel locator, and similar programs. The section members prepare the input data for computer processing by using key punch machines, card sorters, collators, interpreters, and printers.

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11. The Computer Processing Branch - This branch runs the OCS computers. Its [ ] are divided among three 8-hour shifts, which operate the computer center 24 hours a day, 7 days a week. The branch chief has overall responsibility for branch activities, but each shift has a supervisor who works a particular shift time on a permanent basis. In addition, each shift has a senior operator/supervisor who rotates with his shift but is subordinate to the permanent shift supervisor. Tape librarians and clerks are also members of each shift. The clerks receive jobs and deal with the customers.

12. We believe the routine by which jobs are accepted needs description and comment. The clerks receive the job request forms

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(Form 2737), which identify the job to be done, the customer, and
other details. They then put together the project program. This
involves getting all necessary tapes from the tape library and
assembling other components of the job to be done. The assembled
job is then either delivered to the computer room or placed in a
rack for pickup by the operators when they are free. When the job
has been run, it is picked up by the customer, who turns over a
file copy of Form 2737 as a receipt for the work done and for what-
ever material is returned to him. All branch members fill out a
daily record of work done, and the machines, in turn, have counting
devices that record the work done. The branch members do not
question anyone's right to submit a job request. They assume that
the request has proper authorization. They strive to please the
customers. If there are, in fact, any uses of the computer center
for private or other unauthorized purposes, it would require an
extremely detailed check of the employees' work records and computer-
use records to discover them. Normal and quite close checks have
revealed none. The branch chief is aware that this could be a
problem and gives it continuing attention.

13. Comments - We believe that the Operations Division is well
run. Morale appears high, and there are small personnel losses to
industry. The division offers its employees opportunities to improve
their qualifications and move up to better jobs both within the

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division and other areas of OCS.

14. We found space problems within the division. For example, the Technical Staff occupies one room with a large amount of customer traffic in and out. The room is therefore noisy, congested, and poorly suited for concentration and uninterrupted work. In addition, the _____ of the Production Control Branch occupies a dreary, noisy, though secure area. We will discuss the OCS space problem further in a separate section.

15. Current Operations Division Equipment - The computers currently being used by the Operations Division are:

3	IBM 360/65	1	RCA 70/35
2	IBM 360/20	1	RCA 70/45
1	IBM 360/67	1	CDC 3092 (915)
1	ANDI	1	CALCOMP

16. The IBM 360/67 time-sharing computer has 50 remote computer terminals now operational, with 20 pending.

17. Future Equipment Needs - In considering whether or not the Operations Division now has the right computers to do its job, or in attempting to forecast what they should have in the future, we are faced with problems which are beyond our technical competence to solve. Further, we have not found an individual who has expressed great confidence in his ability to make these determinations. We have the impression that the Agency acquired its earlier computers

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through a number of isolated decisions arrived at by means of
computer-company salesmanship, enthusiasm in an expanding technical
environment, the personal persuasion of a few of our own computer
and customer specialists, and an honest and growing Agency need to
employ ADP. However, the acquisition of its latest computers was
the result of a more coordinated and comprehensive appraisal of
needs, and these computers are getting the on-going jobs done.
There has been progress. Nevertheless, even with our technical
limitations, we feel that no one really knows if what we have is
what we need, if what we have is cost-effective relative to other
ways of doing the job, or what our future computer mix or non-mix
should be. We recognize the steps taken by the Executive Director-
Comptroller to strengthen Agency-wide ADP coordination as most help-
ful; but we feel that much more should be done within OCS, the user
organizations, and the IP Board in planning future OCS computer
requirements. The ASPIN effort may more clearly define the users'
needs. We believe OCS, with ORD's cooperation, should give more
attention than they now do to what their future needs will be, as
well as to how their present computers could be employed most effect-
ively.

18. During the course of this survey, we have been apprised of
the rapid advances that are taking place in computer technology. While
the capabilities (and problems) of third generation computers are only

now being realized, the computer R&D people are planning the fourth generation. As they become a reality, the physical size of computers should be reduced, speed of operations should increase, storage should be increased, and, hopefully, costs in terms of relative efficiency may come down. Computer developments have moved rapidly from tubes to transistors to integrated circuits. On the one hand, we are impressed with the potential of time-sharing with its utilization of a high-powered central computer, and, on the other hand, there is the possibility that the 1970s may see the development of small, relatively cheap computers that could be dedicated to the exclusive use of an individual or office and still be cost-effective. We have the impression that time-sharing with an IBM 360/67 makes a great deal of sense considering its tremendous capabilities. Nevertheless, the problems involved in integrating many diverse intelligence programs suggest that there may be other more cost-effective ways to handle this diversity in the future. Computer literature is of little help. Some experts support time-sharing, using larger and larger capacity and higher and higher speed central processors. Others believe the "fourth generation" computers can make dedicated systems for small groups or organizations practical. While we have no firm view one way or another, we do have some suggestions.

19. The need for compartmentation in computer usage is accepted today, and we believe that compartmentation will continue to be a

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basic requirement and so an AIP security problem for the Agency.
We also believe that the number of unique computer programs that
will evolve in the future will increase. We cannot judge whether
or not integrated systems can handle many and diverse programs
securely in the future. In addition, we cannot determine whether
or not fourth generation computers will be cost-effective if employed
as dedicated systems. We are reasonably certain that such determin-
ations will be difficult to make regardless of who tries. Their
difficulties are exemplified by one expert's remark that even with
the remarkable computer advances in recent years, about half of the
third-generation IBM 360's now installed in the U.S. are still
operating in the "emulation" mode--i.e., are using programs designed
for second-generation computers rather than the more efficient pro-
grams developed for the 360's.

20. With these problems in mind we suggest that OCS and the
Agency Intelligence Processing Board consider the following:

a. Has OCS reached a point in computer and
software purchases and usage at which it should pause
and spend considerable effort in analyzing the potential
of what it has and how it is using it? In other words,
should OCS cut back on the acceptance of new computer
requirements and go all out to clean up existing
systems and programs or discard some it already has?

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b. To what degree is the Agency willing to lower its compartmentation security standards to accommodate the use of Agency and Community ADP time-sharing systems?

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IX. GENERAL DISCUSSION

A. Roles and Responsibilities

1. **Background** - By 1966, Agency information processing activities involving the use of ADP had expanded to the point that it was necessary to adjust responsibilities in this area. The expansion, plus BoB pushing, led to the July 1966 publication of a Headquarters Notice concerning Agency ADP policy. The Notice provided that ADP policy direction and staff responsibility should rest with the Executive Director-Comptroller assisted by the Information Processing Staff in O/PPB. It directed that the Computer Support Center, DD/S&T, provide computer services support to all Agency components and satisfy both their requirements for programming assistance and for operation of computer equipment. The responsibility for problem analysis was left in the various directorates or components. However, if they lacked analytic capability, the Computer Support Center would furnish such support. NPIC and RID were authorized to continue the independent operation of their computer installations. Finally, the Notice directed each Deputy Director to appoint an Information Processing Coordinator (IPC) to establish priorities, develop programs, and undertake problem analysis to meet the information processing requirements of his directorate.

2. One effect of the Notice was the establishment of OCS as a

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common concern service unit for ADP matters. The directorates retained line responsibility for determining the basic requirements for substantive information, decisions as to the feasibility of utilizing an ADP system to satisfy information requirements, the analysis and design of ADP systems, programming, control over inputs, utilization of outputs, and the continuous review and evaluation of results in relation to costs incurred and benefits obtained.

3. Another effect of the Notice was the appointment of the IPCs for each directorate. The coordinators met frequently but informally and formed a loose-knit central coordination body usually with participation of the IP Staff members of O/PPB. The IPCs in fact represented their own directorates' interests rather than providing an Agency-level staffing facility for the objective analysis of ADP problems. Such parochial attitudes were natural and not contrary to any regulatory provisions.

4. As Agency ADP activities developed further, proposals have been made at various times to place all such activities in one central organization. As recently as September 1969, the DCI stated that at least for the time being no reorganizational step to provide for centralization would be taken. He did request, however, that the Executive Director-Comptroller take steps to strengthen the coordination and management of Agency ADP activities.

5. The 13 October 1969 Memorandum - As a first step, the Exec-

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utive Director-Comptroller issued a memorandum on 13 October 1969,
which set forth certain criteria which should be followed in making
decisions to use ADP. It placed responsibility for making these
decisions on component- and directorate-level management and set
forth benchmarks for such decisions. It also stated the respon-
sibilities of the IPCs within their directorates and appointed them
to a newly established Agency Information Processing Board chaired
by an appointee of the Executive Director-Comptroller. The Board
was made responsible for:

    a. Assisting in the formulation of policy and
planning guidance concerning CIA's information processing
activities, both internally and as they relate to other
agencies and to the intelligence community.

    b. Reviewing proposed ADP applications which have
significant resource implications at the time the first
benchmark is reached to determine whether and to what
degree it may duplicate or relate to other existing or
planned ADP activities in other directorates; to deter-
mine the need for compatibility with other activities in
the Agency; and to suggest means by which compatibility
may be achieved where there is a need.

    c. Assisting as appropriate in determining what
facilities or systems are to be used to solve particular
problems.

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d. Advising the Executive Director-Comptroller on
ADP matters generally and offering specific recommendations
as appropriate.

6. The Board was authorized to draw on the IP Staff of O/PPB
and components as necessary to accomplish its mission. The Executive
Director-Comptroller also called upon the DDS to establish a Technical
Facilities Committee to work with the Board on requirements for support
services and facilities. This has been done.

7. We believe that the 13 October 1969 memorandum is an important
step forward toward meeting the Agency's obligation to establish
effective management of its ADP activities. Much more remains to be
done. The IP Board has been delegated no real authority. Its members,
except for the Chairman, are still under the control of their own
directorates and have full-time jobs. The Chairman is also Deputy
Director, O/PPB.

8. As it now stands, therefore, the IP Board which has been
assigned a most important mission is, in fact, only a committee made
up of individuals who cannot act independently in the interest of the
Agency as a whole. We have observed that some organizations, includ-
ing the military services, assign the coordination and control respon-
sibilities for ADP systems development to a strong professional ADP
staff that reports directly to top management. Whether such a staff
should be large or small depends upon the degree of centralization

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or dispersion of ADP responsibilities. It is essential, however, that it have the requisite skills and sufficient strength and independence to provide a professional review of major system design proposals within the framework of a common discipline, and to perform the planning and control functions necessary to ensure the compatibility of systems from the standpoint of top management objectives. It is our belief, that if the IP Board is to carry out its mission the Board must also have some measure of independence and authority. One way to accomplish this would be to arrange its membership so that the members are devoting full time to the work of the Board and are responsible only to its chairman who in turn would be responsible only to the Executive Director-Comptroller. We realize, however, that the talent and technical competence of the Board's members are scarce commodities and if the members were to be taken out of their directorates, the latter would suffer. Because of that, and because of the current style of Agency ADP organization, we believe that the independence needed could be accomplished by making its chairman directly responsible to the Executive Director and by assigning to him a strong staff. The members of the Board would continue to operate in a coordinating and advisory role. We believe that a board structured in this fashion and given authority in the fields mentioned below could well serve the top management of the Agency. The IP Board would, of course, still be free to call upon

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O/PPB and other individuals and components in the Agency as
necessary.

9. Although many people within the Agency and outside disagree
on many aspects concerning the management of computer and ADP systems,
there appears to be general agreement that there are at least six
major administrative processes in the development and operation of
ADP systems which must be subjected to specific management control.
These processes are (1) Determination of basic information require-
ments; (2) Conduct of a feasibility study; (3) Review and approval
of system design; (4) Programming; (5) Operations of computers; and,
(6) Review and evaluation of results. The inter-dependence of these
processes is such that the proper and timely execution of each pro-
cess is crucial to the successful management of any ADP system. It
is recognized that the actions required to perform the six major
processes described briefly above may involve scores of sub-processes
within each major process, some of which are highly technical. The
importance of disciplined interaction and coordination of effort
between the ADP specialists and functional specialists on each of
these processes is also recognized. However, since each of these
major processes requires differing types and levels of knowledge and
skill, we believe it essential from the standpoint of effective
internal management control that general standards be established.
We believe that it is in these areas that the Chairman of the IP

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Board should be delegated authority to establish ADP standards to
assist the directorates in meeting the responsibilities outlined in
the 13 October 1969 Executive Director-Comptroller memorandum.

Recommendation No. 6

That the Executive Director-Comptroller consider
assigning the Chairman of the IP Board strong staff
assistance, and delegating to him the authority to
devise and issue Agency ADP standards and procedures.

10. Following are some further comments concerning the six
management processes mentioned above:

11. Requirements - In the past, OCS, like its cousins in
private industry, used a strong sales approach to promote its ser-
vices and drum up business. The customers, in turn, did not always
determine their real information needs as explicitly and precisely
as they might have. Often the customers' requirements were expressed
in vague terms or in the form of overly sophisticated aspirations,
and OCS accepted ADP requests that were considerably less than perfect.
In addition, there was too little office concern with proper manage-
ment approval of requirements in the user component.

12. We found that conditions are improving both in OCS and in
the customer components. OCS, although still very customer-oriented,
no longer seeks out business aggressively. The customers are also
becoming more knowledgeable of the limitations as well as the capa-
bilities of ADP and consequently are more selective in their require-
ments. However, there is still room for improvement in requirements

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criteria. One of the problems facing the Agency at this time is that of appraising and controlling the requirements for ADP time-sharing and interactive services. Undoubtedly some Agency elements have a legitimate need for a reliable interactive time-sharing service. We are concerned, however, over the growing number of requests for the installation of remote-terminal equipment, the growth of information files which will be required to support such services, and the ready acceptance of such requests. Fifty remote terminals have already been installed. OCS has twenty requests for additional installations, and several hundred requests are anticipated over the next few years. The uncontrolled proliferation of remote terminals has far-reaching implications. It represents an open-end demand on Agency resources in terms of the costs of hardware and software required to support the system as well as the manpower required to establish appropriate file structures and to make other changes in ADP systems design and programs so that they may operate effectively in the interactive time-sharing mode. There is a need for closer review of the justification for remote terminals.

13. <u>Feasibility Study</u> - This type of study includes estimating and projecting costs for the development of the system as well as the cost of care and feeding the system once it is in operation. Benefits which are expected from the system should be identified in such terms as storage and retrieval services, reports, indexes, runs, and display

information. Within the Agency, comprehensive feasibility studies
have not always been conducted prior to designing and programming
ADP systems. We observed that in many cases the target dates and
cost estimates projected for the design and programming of ADP
systems were understated, and that ADP systems are seldom implemented
within the cost ceiling or time-span originally planned.

14. **Design** - The design of an ADP system is complex, time-con-
suming, and expensive. The design effort involves explicit identifi-
cation of each item of information and the detailed charting of each
step and process. It includes establishing input and control points,
devising procedures, formatting reports and displays, and a variety of
other detailed work. It requires the continuous interaction and
expertise of a computer-oriented system analyst and the functional
specialist. ADP systems have at times been designed by functional
specialists without adequate or timely participation by ADP special-
ists; or by ADP specialists without adequate participation by function-
al specialists. We found that, in other cases, both the functional
offices and OCS failed to assign the specialists on a timely basis
and failed to require periodic status reports on the progress of the
work.

15. **Programming** - Although programming is an intricate technical
process the details of which are perhaps best left to the computer
programmers, we believe that its supervision is an important OCS

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management responsibility. It is therefore important that OCS require that a programmer adhere to the standards and conventions prescribed for his craft, document every step of the process so that it can be understood by other programmers, and refrain from making any changes that would affect the system design without full consultation and approval of the system designer and user. It is also necessary that the interaction between the functional and ADP specialists be continued until the system is programmed, tested, and is operating effectively. We observed that in some instances this had not been done.

16. <u>Machine Operations</u> - We found that the operation of computers and processing equipment was better managed than any of the other major processes mentioned to this point. The Operations Division has established workable standard operating and control procedures, time standards, scheduling, file retention, and housekeeping routines.

17. <u>Review and Evaluation of ADP Results</u> - Continuous critical examination of the output from ADP systems to ascertain the value and usefulness of the product is essential to identify benefits and to cancel, update, or improve the procedures, programs, or other ADP processes. We found that many users were critical of some aspect of their ADP product. Some were working aggressively within their own offices and with OCS to effect needed improvements. Others have identified their problems to OCS formally or informally, but OCS has

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not always been able to act promptly in effecting needed programming
changes or systems improvements, because of other conflicting require-
ments for their services. A more positive method of formal iden-
tification of deficiencies in on-going ADP systems and some priority
system for assigning OCS systems analysts and programming talent to
effect improvements seems to be needed. Also, standards and procedures
are needed for regular evaluation of ADP results to determine their
real usefulness so that management can decide whether or not to
continue such ADP programs.

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B. Priorities

1. Increasing and conflicting demands are being placed upon OCS for systems design and programming assistance to update old systems and programs, to design new systems, and to provide more interactive time-sharing services, systems software, and hardware support. Under the prevailing practices, the customer who wants to use ADP must get approval to go ahead from his own directorate. Beyond the directorate level no firm management mechanism appears to exist for determining the relative urgency or benefit to the Agency of employing one system as opposed to another, of designating priorities for the development of those systems considered of greatest value to the Agency, or for striking a reasonable balance between updating old programs and devising and testing new programs. OCS operates on an ad hoc priorities basis with respect to systems design and programming assistance. The Office switches personnel from one system to another, depending in large part on the degree of pressure which can be exerted by the customer. Considering the constraints and conflicting pressures under which they work, they do as good a job in this respect as could be expected. Clearly, however, some definitive system of priorities should be established.

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Recommendation No. 7

That the IP Board address itself to Agency ADP
priority problems.

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C. COINS Experiment

1. The Office of Computer Services participates in an inter-agency experiment that affects some aspects of its common concern services for the Agency. The experiment is the Community On-Line Intelligence System effort (COINS) established by a directive of President Johnson to the DCI. The CIA (OCS), DIA, NSA, NPIC, State, and the National Indications Center (NIC) are participating in the experiment. The Director, NSA, is the Executive Agent for COINS. Our treatment of COINS in this report is limited to a description of attitudes towards the experiment that we found prevalent among computer people and a discussion of some of its security implications. We regard this latter subject as one of utmost importance.

2. The COINS idea originated with the President's Foreign Intelligence Advisory Board (PFIAB). The Board believes that money and manpower can be saved if the members of the Intelligence Community share each other's files. They envision interconnected computers at the different agencies forming a network of computer-based files. Any member of the system, then, could query any other member's files and get a quick answer. As now planned, computer-based files at CIA (OCS), NSA, DIA, and NPIC will be interconnected, and State and the NIC will have remote terminals only. NPIC is now not on-line.

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3. In our discussions with OCS officials who have an interest in COINS, we found dissatisfaction with the experiment. The dissatisfaction stems from several problem areas, which include the computers used in the system; the manner in which they are being employed; and security. There are other problem areas, which do not fall within the purview of OCS, such as parochial attitudes and the nature of the files in the system which we believe need mentioning.

4. The Computers Employed in COINS - OCS believes that DIA made a basic error when designing the communications system. Working with [   ] the DIA came up with a system design which requires that each participating agency "dedicate" a computer to COINS while on-line in the system. This means that CIA's computer employed in the system is withdrawn from Agency use during those hours when it is used in COINS. DIA, NSA, and, in the near future, NPIC must also dedicate a computer each to the system. An OCS proposal that one centrally-located time-sharing computer such as the IBM 360/67 could do the job far better and far cheaper has not been supported by anyone other than OCS.

5. OCS uses the CIA IBM 360/67 time-sharing computer in COINS. This is the computer with about 50 remote terminals (and a capacity for 80) scattered throughout OBR, OER, OSI, FMSAC, etc., that is fast becoming a valued file-retrieval and analytical tool for a growing number of Agency intelligence analysts. The computer is dedicated

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to COINS from 0700 to 0900 and from 1200 to 1300 hours each day plus 20 to 80 minutes more spent in making software changes required before and after COINS use. OCS reports that CIA time-sharing users are beginning to complain about not being able to use the computer for internal purposes during these hours. Consideration is being given to dedicating our 360/67 to COINS for eight hours a day. If this should be done the number of complaints is bound to grow.

6. Another COINS problem that has developed because of the choice of a multi-computer system over a central time-sharing system is the excessive time it takes to query files such as those in DIA. Without time-sharing, DIA's answers to queries are often delayed up to four hours. This compares to the fraction-of-a-second to a few seconds' reply time of our 360/67 while operating in COINS.

7. The multi-computer nature of the COINS system has also led to software problems. Each agency placed a computer of its own choice in the system: CIA, the IBM 360/67; DIA, a 360/30 and 360/50; NSA a UNIVAC 494; and NPIC, a UNIVAC 494. OCS officials say that it is possible by developing proper software to get them all to work together. The problem is compounded, however, by the use of a different program language in each agency. An additional complication is introduced by the absence of any community-wide standard filing system and related coding. All the computers could be programmed for one language; or all computers could have software included which would translate the

several languages that might be used to query its files; or all agencies could adopt the same filing and file coding systems. There seems to be little evidence, however, that the COINS manager will get all these problems solved to the satisfaction of all participants. The OCS proposal for one computer, one language, and one system for filing seems to have considerable merit to us.

8. Officials in OCS believe that CIA could use a computer other than our 360/67 in COINS. An IBM 360/50, for example, might be dedicated to COINS full-time at a cost of from $40,000-$50,000 a month. This would, of course, free our 360/67 for full-time internal Agency time-sharing use. OCS believes, however, that CIA COINS customers should take a hard look at their use of COINS before a decision is made to switch to a 360/50. During the three-hour periods our 360/67 is on-line in COINS it is used an estimated 10 percent of the time, according to OCS. Not only is this a great waste of the 360/67 potential, but OCS officials believe that the 10 percent use is experimental and does not represent NSA/DIA analysts' substantive use of our three files in COINS: the [ ] File, the [ ] File, and the [ ] File. The use of NSA/ DIA files by CIA analysts, on the other hand, is probably even less than NSA/DIA use of our files, according to OCS.

9. The Parochial Attitude as a COINS Problem Area - We believe that CIA analysts have little interest in the NSA/DIA COINS files,

and NSA/DIA analysts have little interest in the files the Agency now has in COINS. This may not be too surprising, considering our finding expressed earlier that CIA analysts show more faith in those Agency computer-based files to which they have an input than those to which they had no input. COINS may have serious troubles ahead if its expansion and development are based on the premise that the analysts of one agency are interested in the files of another agency while they, in fact, will not use them. Perhaps the wrong files are now in COINS, which would explain the apparent lack of analyst interest. It is possible, however, that the ingrained parochial attitudes of analysts from all the participating agencies could limit the success of any community information system. While we have no recommendation in this area, we urge that the findings of the ASPIN effort on CIA customer ADP needs be considered before additional Agency commitments are made to COINS.

10. The parochial attitudes of the analysts may be more than matched by those of their bosses when considering this as a COINS problem area. There almost certainly exists to some undeterminable degree a reluctance to share files by participating agencies. In the real competitive and security-conscious world of U.S. intelligence, there are many compelling reasons for holding one's information closely. This situation might lead to some fairly sterile COINS files.
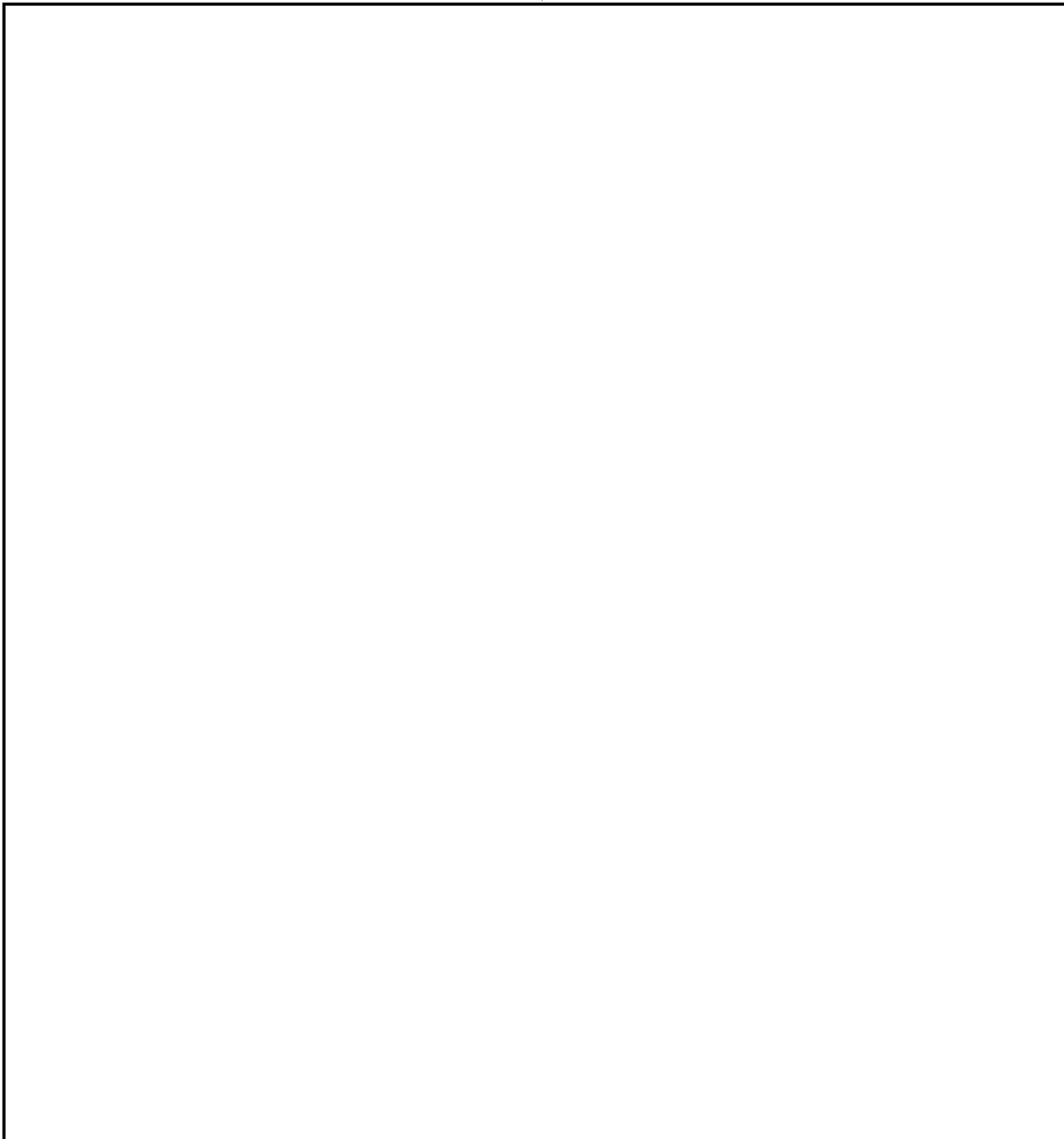
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D. Security

1. <u>Security Problems</u> - Problems of security which have been identified as inherent ones in the ADP computer environment include the following:
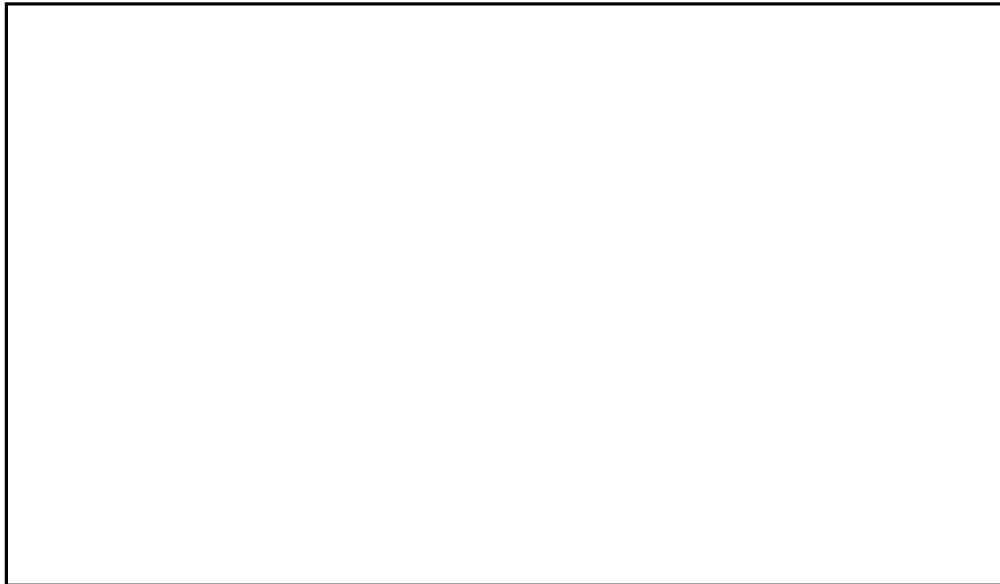
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2. The above problems are recognized by the responsible officers in OCS, and we are certain that they are conscientiously trying to overcome them. However, we do think it important that professional security officers of the Agency participate more in the considerations of ADP security matters. Many of the computer people are fairly new to the Agency and are extremely well qualified technicians in their fields, but they have not been brought up in the Agency, they do not have the built-in security consciousness as do experienced hands in counterintelligence or in the Office of Security. A recent, effective step taken to provide OS security participation was the creation on 1 December 1969 of the Information Processing Technical Facilities Committee. A representative of the Office of Security was included in the makeup of that committee. We believe that an additional helpful step in bringing to bear professional

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security considerations at an early date would be accomplished if the Office of Security could also have a representative attend meetings of the IP Board and the Technical Review Committee of OCS.

Recommendation No. 8

    a. That the IP Board invite a security advisor to be present at all Board meetings.

    b. That OCS have a security advisor present at all meetings of its Technical Review Committee.

3. The security constraints associated with the use of ADP may well be the key factor in determining how fast and how far the Agency can go in utilizing computerized inhouse and community-wide interactive and/or time-sharing information systems. More in-depth analysis is needed to clearly identify the degree of vulnerability and risk involved, and to devise and test the controls required in establishing acceptable security standards. The skills required for such studies and experiments are in short supply, and unless this task is accorded a high priority, the benefits contemplated from time-sharing interactive services will most likely have to be deferred pending the solution of security problems. Some tough decisions lie ahead for top-level management in connection with balancing the traditional requirements for security compartmentation of information against the advantages which might accrue from ADP interactive time-sharing services if these requirements were relaxed. Agency management will need all the expert advice and assistance it can get on

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this problem.

4. In spite of the foregoing recognized need for expert security advice, rather than increasing the OS capability in the ADP field as we believe is necessary, a recent decision was made to reduce the number of security people working on ADP matters. We fear that this may be false economy. The Agency will most certainly need an increased number of highly qualified individuals in the field of ADP security.

5. OCS participates in the Community On-Line Intelligence System experiment (COINS), first proposed by the President's Foreign Intelligence Advisory Board (PFIAB). This system has many of the same security problems as those outlined above.

6. Officials in OCS believe that COINS would best meet PFIAB hopes if it were a time-sharing, multi-classification level system. Such a system would allow a user to query only those files for which he was cleared or had a need-to-know. It would eliminate the need for all users to have all clearances for all files in the system. The adoption of such a system would also fit with the OCS proposal for one central COINS computer rather than the many now employed.

7. The Security people, however, have problems with such a system. Two OCS officials told us that our Office of Security believes that there is no way to make a COINS time-sharing system secure but that OS has not put their reasons in writing. OCS also expressed

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concern about the limited amount of effort OS was giving the time-sharing security problem. The OCS officials are convinced that a time-sharing multi-clearance level COINS can be made secure and seemed disturbed about what they viewed as an intransigent position on the part of OS. The OS officer responsible for Agency ADP security was then interviewed to determine if a true impasse existed.

8. The OS ADP officer, who is also Chairman of the ADP Security Subcommittee of the USIB Security Committee, confirmed the OCS view that Security believes time-sharing with the IBM 360/67 with multi-clearance level files has security problems. At the present time there are about 50 remote terminals tied to our Agency time-sharing 360/67. A great many people have access to the 50 terminals. More people have access to the computer and the files in OCS. If a 360/67 such as ours were then the one central computer for COINS, possibly thousands more would have access to the files. More thousands of people would be added if DIA ties the Unified and Specified Commands to COINS as they have proposed. Unlike the "old days" wherein Security concentrated on people and the files they kept in a few safe drawers, OS believes it is now faced with a problem over which it could lose all security control.

9. OS believes that the advent of the first ADP-based files multiplied the potential for spillage, tampering, and penetration of intelligence information. In their view, time-sharing has made the

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problem many, many times worse. OS then raises the question of the degree of security we can now accept with time-sharing and how this degree of security is to be established.

10. OS believes certain steps must be taken to establish the degree of security that is acceptable with the 360/67. These are as follows:

  a. Determine the security features in the ADP system.

  b. Determine the security flaws in the system.

  c. Test the system with a controlled experiment.

Each step has sub-steps. For example, in item b., Security would want to study the hardware for flaws. The executive software that controls the hardware would also have to be studied for flaws. They would also have to look at the individual job programs, the access control, the ease of penetration, etc.

11. OS feels that these three steps would then give them a "ball park" understanding of the system's security. OS does not now have the capability to do even this basic job. With this in mind, it is understandable why they have not done more with OCS to work out the security problems of a COINS multi-clearance, multi-access time-sharing system.

12. OS believes that the basic manpower requirement to do the "ball park" study outlined above would take a six-man group. The group would include two computer hardware design specialists, two

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computer systems programmers, and two security people, at least one of whom would have ADP experience.

13. The complex ADP security problem is hitting OS at a time when they are being asked to cut back in manpower. There is then the question of where OS allocates its effort. From the OCS's view, more should be directed toward the time-sharing ADP security problem. In our judgment, the Agency has made a large commitment to time-sharing ADP as well as to the COINS experiment. We doubt that our commitments in these two areas will diminish or even hold steady. An expanded effort appears inevitable. The IG Audit Staff is now acquiring an ADP audit capability in recognition of the continuing and expanding audit requirements in this area. We believe the Office of Security must also give ADP an increasing amount of attention.

Recommendation No. 9

That OCS and OS review their ADP security manpower requirements and develop measures to insure the secure, compartmented use of the OCS time-sharing 360/67 system both for CIA internal needs and for potential COINS applications.

14. Emergency Planning - One major unsolved problem in the OCS field of activities which has a security connotation is the lack of backup equipment in the event of disaster. There currently exists no formal contingency plan of any kind to provide for continuation

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of essential OCS computer activities. OCS realizes the Agency
computer backup vulnerability and has sought guidance from the
DD/S&T on the matter while pointing out several alternative courses
of action. The problem involves not only major disasters but also
minor ones, such as loss of power. Other Agency computer activities
are equally vulnerable.

Recommendation No. 10

That the IP Board prepare a contingency plan for
computer backup for all essential Agency ADP activities.

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E. Customer Attitudes and Problems

1. Interviews with customers of the OCS ADP services indicate the OCS is customer-oriented and responsive to customer requirements within the limits of their capabilities, and in raising some of the problems that disturb OCS customers we do not wish to suggest that their work goes unappreciated.

2. Some customers were mystified or perplexed by the highly stratified conceptual framework and organization of ADP system design and programming, and sometimes are frustrated by the unfamiliar jargon of computer specialists. There is much talk on the part of both customers and OCS people about the "communication gap." Most customers commented favorably on the cooperativeness and technical expertise of OCS members. They felt, however, that it is very important that systems analysts and programmers be assigned exclusively, or on a priority basis, to specific customer ADP work so that they could become acquainted with the substantive work objectives and problems. Most expressed the opinion that without such substantive knowledge a systems analyst or programmer could not design and maintain an ADP system responsive to their requirements. Several customers cited OCS systems analyst and programmer rotation/turnover as detrimental to the smooth handling of their ADP requirements. OCS officials agreed in principle that systems

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analysts and programmers work most effectively when they are acquainted with the substantive work and problems of the customer. As a matter of practice they assign analysts and programmers on this basis whenever possible. In our opinion, a more definitive analysis of customer requirements and a better priorities system would contribute to the improvements desired by the customer.

3. Customer attitudes toward ADP are influenced, perhaps unduly, by past experience with ADP systems and computers. Consequently, customers are skeptical about cost and time estimates because they do not believe they will be met, and almost all indicated that original projections have been grossly underestimated. Sometimes there is a tendency for functional managers to stand aloof from the process rather than associating themselves closely with it. We believe that such attitudes could contribute to the delay in implementation, or the misuse of ADP programs.

4. Most customers were aware that delays in bringing ADP systems into operation and poor quality outputs were costly to them, but few seemed aware of the overall actual costs to the Agency in relation to the total benefits derived. Some indicated that ADP applications enabled them to process more data more effectively than before, and indicated that some tasks handled by ADP would clearly not be possible without the use of computers. Very few were willing to state that ADP had decreased the cost of their operations. In our opinion some

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reliable system of determining the cost of ADP programs is essential for the proper management of such activities. We have recommended in another part of this report, that such a system be established.

5. Customers who received outputs from ADP systems where the inputs were made by other organizational components tended to be critical or suspicious of the output product. On the other hand, customers who were responsible for inputs as well as being the user of the outputs tended to be satisfied with the substantive product, except in cases where defects in the product were attributable to inept programming or debugging processes. This attitude is probably attributable to the fact that it is generally difficult and time consuming for one component to identify the source of, and make the necessary correction of, procedural errors made by another component.

6. Several customers, as well as OCS members, voiced concern about the lack of reliability of the interactive time-sharing system, resulting from software problems and hardware "down" time. Some users think a "reliable" time-sharing system would be of great value to them, but are disappointed in the present unreliability of the system. OCS is devoting considerable time and attention to improvement of the time-sharing system and some progress has recently been made. They believe that the technical difficulties being experienced can be corrected and the system made reliable.

7. Some customers thought that better planning and closer

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working relationships between OCS and ORD were desirable. They believe this would lead to better mechanisms for estimating costs and evaluating results of ADP research and development than those which now exist. OCS and ORD officials also thought this was desirable. This is a complex technical area in which we do not feel competent to make specific recommendations, but we believe that closer attention to this problem on the part of OCS and ORD is indicated.

8. There were a variety of reactions from customers on the allocation of system analysts' and programmers' time, primarily a priority problem. Some were highly complimentary of analysts and programmers assigned to work with them on a full-time or high priority basis on their ADP systems and applications. Others were unhappy because of the low priority given their programs and the lack of sufficient analyst and programmer support provided by OCS. Some customers pointed out the lack of any clear-cut priority system for allocation of analyst and programmer time in relation to the substantive importance of the application. Some expressed the opinion that the present system needed to be tightened and formalized. They cited problems of the squeaky wheel getting all the grease, and of programmers preferring to work on exotic rather than prosaic applications. Several pointed out that time spent in completing the design and programming of a "bread and butter" system,

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or in debugging and refining an existing operating ADP application may pay better dividends than time spent on some more exotic new applications. We believe that the establishment of a priorities system is needed and have so recommended in another part of this report.

9. Several customers complained of the long delays in the installation of conduits for time-sharing outlets and peripheral equipment; sometimes as long as eight months.

10. A number of customers felt that officials of ADP-user components needed more training and that more attention should be given to designing training courses that dealt with the management aspects of ADP, the techniques and disciplines of systems analysis, and how to use ADP more effectively as a part of the total management process. Some expressed concern that ADP training courses placed undue emphasis on solving information handling and procedural problems through the exclusive use of computers, as opposed to the utilization of computers as only one facet of information processing. A recommendation on this subject is made in another part of this report.

11. Most customers thought their ADP systems or programs needed to be upgraded or improved in some way. Some wished to enlarge the substantive content or improve the quality of the information contained in their system. Others were concerned with reprogramming to get

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reports which are easier to read and use. A number pointed out that a great amount of manual processing and checking is usually required before computer outputs can be used because the information is not formated, arrayed, or displayed in the manner desired by the ultimate user. In our opinion these needed improvements can be effected by tightening and refining the management processes associated with requirements, system design and programming. This is discussed in greater detail in another part of this report.

12. In the main customers tended to be as critical of the ADP-related processes for which they themselves were responsible as they were of the services performed by OCS. Many were aware that the quality and reliability of their ADP product was not as good as it should be because insufficient attention had been given to defining substantive information requirements in the first instance, or that the proper degree and level of functional management interest and support had not always been provided to ensure good system design and reliable input procedures. Many of the customers believe that more explicit management standards and procedures pertaining to ADP are needed at the Agency level, and we share that belief.

13. Customers in the Support Directorate who use MSD/OCS services reported that they received reasonably good service with respect to delivery of computer runs and reports scheduled by MSD under current on-going programs. Instances were cited of occasional

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late reports or errors in reports attributable to machine malfunctions, scheduling problems, or the temporary absence of some key person in MSD. However, these lapses did not appear to occur regularly and were not regarded as serious problems by most customers. Several customers were very complimentary about MSD's responsiveness in emergency situations. They cited instances wherein MSD people had "worked around the clock" to ensure that payrolls and critical reports were processed within the established deadlines. Some customers expressed concern, however, about the practical effects of deferred improvements in on-going programs because of constraints placed on adopting any new ADP applications which might compete with the SIPS effort.

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F. Cost System

1. The recent establishment of the IP Board by the Executive Director-Comptroller was for the purpose of exercising effective management control over computer usage. In order to effect such control properly, one of the factors which should be considered is the cost of a proposal or alternate proposals. Similarly, costs of on-going projects should be available to management to consider in determining whether or not to continue programs.

2. At present, OCS has no established method of measuring costs of users' proposed requirements or of on-going projects. We realize that a costing system on all of the activities which go into the analysis, design, programming and operation of an ADP system cannot be a precise one, but it does appear essential that a reasonably reliable cost system be established.

3. There are several methods or approaches which might be used in establishing such a system. OCS has taken a first step with Project PRISM which describes each ADP project and records the units of man-hours and machine-time used to service each one. PRISM could be expanded to include average cost factors for man-hours and machine time and percentage factors for overhead cost.

Recommendation No. 11

That OCS with the assistance of O/PPB establish a system for costing ADP services provided Agency components by OCS.

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G. Training

1. OCS is responsible for satisfying ADP requirements that are handled centrally or as services of common concern. One of its services of common concern is to develop and conduct ADP training programs to meet Agency-wide requirements [   ]. The   25X
Office, through its ADP Training Staff, provides such training, sponsors its own student co-op and summer intern programs, arranges for some of the vendor training (IBM, GE, etc.), and together with the Office of Training, provides guidance and counsel for those seeking courses at other government agencies, and universities and colleges. Other elements of the Agency provide certain specialized training for their personnel in coordination with OCS.

2. OCS offers the following training courses:

ADP Orientation. This is a three-day full-time introduction to the world of computer science. During the last year it was attended by 326 students.

Basic ADEPT. This is a developmental ADP programmer training course to prepare employees for full-time programming positions. It runs full-time for 15 weeks and was attended by 42 students last year.

Modified ADEPT. This course runs five weeks full-time and is for the programmer analysts who are not

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sufficiently familiar with IBM Systems 360. Fourteen students participated last year.

Interactive Course. This is a one-week part-time introductory course on computer terminals and their applications. It is conducted by General Electric. It was attended by 100 students during the past year.

Operating System/360. This is a course on handling this system and the data management connected with it. It is given by IBM and runs half-time for two weeks. Three hundred and sixty students participated last year.

Programming Language/I. This is for training experienced programmers in the complete set of PL/I facilities. This is done either in one full week or in two weeks part-time. It had an attendance of 31 individuals during the past year.

PL/I Programming Techniques. This course runs one full week. Its purpose is to teach applications programmers intermediate programming techniques in connection with the PL language.

ALC Macro Writing. This is a full-time one-week course for those requiring basic knowledge of ALC. Students are trained to write assembly language macros

for applications programs. Eight students attended last year.

APL 360. This course runs five days half-time and provides an introduction to APL/360 and to the APL programming language. The mechanics of using the system and writing effective programs over a wide range of applications is covered. Twenty students participated during the last year.

Linear Programming. A total of 18 employees took this three-day course last year. It provides an introductory knowledge of linear programming.

Operators Course. This course started recently and will run for 15 consecutive Saturday mornings. It accommodates 30 students at a time and provides a basic knowledge of the IBM 360 Computer System.

Mathematics for Systems Analysts. This is a series of four sessions presented by General Electric to provide systems analysts with a better understanding of problems involving mathematical theories. Eleven students attended last year.

Systems Analysis. This two-week full-time course for experienced project leaders (program and systems analysts) covers the application of advanced or third generation

techniques to ADP systems design. The course had 24
students last year.

3. The OCS instructional programs were evaluated and reported
upon by the Office of Training in October 1969. The report concluded
that the instructional programs met stated objectives, that the sub-
stance and training methods met required standards, and that the
training was effective and worthwhile. From our own discussions
with the user offices and with OCS personnel, we concluded that the
training programs offered by OCS have been extremely helpful. The
ADP orientation course has given a large number of Agency personnel
at all levels a basic exposure to the computer world. The basic
ADEPT course has been most useful in providing computer programming
training both to new personnel and to personnel working in other
Agency components. It has been estimated that the course is the
equivalent of from one to two years of on-the-job experience. It
has helped solve the problem of hiring experienced personnel and
has brought a higher degree of standardization in programming tech-
niques.

4. The ADP training of high-level Agency managers was not
discussed in the Office of Training report. Many customers of OCS
and most officers within OCS feel strongly that there should be more
training for these managers in ADP appreciation and uses. In view

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of the Agency's large money and manpower commitments to ADP, it is not necessary for us to emphasize the need for this training. We realize there are many practical reasons which prevent high-level management from devoting the time required to become familiar enough in the ADP field to deal with it personally. We also realize that in recent months top management in the Agency has become more deeply involved in the coordination of ADP matters and has taken steps to establish new procedures and criteria applicable to future developments as well as on-going projects and programs. We feel that these steps have been slow in coming but that these are excellent ones and that they should improve management in many respects. We believe, however, that high-level Agency managers could benefit by an increased appreciation of ADP potentials and limitations.

5. One of the basic problems recognized by the computer people and the users is the difficulty of talking to one another in understandable terms. The users complain that the computer people do not understand the users' substantive work and problems related to it. As a consequence, it is extremely difficult for the computer people to arrive at a reasonable understanding of the users' real requirements and to design an ADP service that satisfies them. On the other hand, computer people complain that the users know too little about computer capabilities and what is involved in establishing systems and programs. Serious study, therefore, should be made to determine the type of

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training programs required to bridge this communications gap and, once determined, to establish the required courses.

Recommendation No. 12

That OCS and the IP Board members, together with members of the Directorates and OTR, work to establish, either within OCS or the Office of Training, courses which would (a) assist high level managers in making ADP decisions, and (b) overcome the communications obstacles between computer specialists and ADP users.

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M. Space

1. We believe OCS has a space problem. It occupies [____] square feet, all but 613 square feet in the headquarters building. Available employee office space equates to [_] square feet per person. The headquarters average is [_] square feet per person. The State Department, in comparison, averages 178; the Pentagon 115. The overall Agency average is [_] square feet. In our judgment, the [_] square foot figure is poor, even after considering the overall Agency space problem.

2. Our concern is heightened when we consider both the nature of the OCS work and the type of people we must recruit and hold if we are to do this highly technical work. Sufficient privacy is required to permit a high order of concentration, especially in the applications divisions and the Technical Staff of the Operations Division. Properly partitioned space seems basic to fulfilling this requirement. The interdependence of ADP work also makes a contiguous working area desirable though not mandatory. OCS is now occupying various areas of the ground floor, the first floor, and the second floor. We believe the Training Staff also needs additional area. The [_____] of the Operations Division and some sections of Management Support Division need a neater, more pleasant working environment.

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3. The technical people that carry out our ADP efforts are highly trained and skilled specialists. Competition for their services is intense. However, OCS has been able to hire these people, but holding them has been more difficult. We believe that OCS would hold more than they do if the Office working environment could be expanded and improved.

4. The OCS management is fully aware of the space problem and has struggled toward a solution. The Office managers are concerned about rearranging, cleaning, and brightening up their work areas, and taking steps to cut down on the noise level. In our judgment, however, more remains to be done.

Recommendation No. 13

That DDS arrange for a thorough study of OCS space needs and, upon completion, take whatever action possible to satisfy the needs.

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