OFFICE OF DATA PROCESSING

LONG-RANGE
DATA PROCESSING MANAGEMENT PLAN
FY 1979 – FY 1984

14 February 1979

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EXECUTIVE SUMMARY

This long-range plan, addressing the period from FY 1979 into FY 1984 was written to assist Office of Data Processing (ODP) managers in concentrating their collective efforts toward remaining responsive to the ADP requirements of the Agency and the Intelligence Community, and in allocating and scheduling their resources through this planning period. Also it is anticipated that this plan will be useful to senior managers throughout the Agency in their planning for ODP support.

The goals established for this Office are summarized as follows:

1. Provide adequate common use and special-purpose Automatic Data Processing (ADP) resources to fulfill approved requirements.

2. Anticipate resource requirements in advance of user demands and provide adequate ADP service to meet these requirements.

3. Provide users and managers with information about their use of ADP resources.

4. Increase ODP's participation in CIA's management of ADP.

5. Improve ADP security and contingency planning.

Principal issues confronting ODP management during this period are summarized as:

1. Increased CIA demand for ADP support in the face of limited resources (e.g., personnel, space, utilities, and funds).

2. Loss of uniquely skilled ADP specialists to higher paying positions.

3. Increasing interdependencies of information management/handling technologies.

4. Restrictive GSA and OMB ADP directives, and imposed budgetary and logistical constraints to orderly ADP growth.

5. Increased external oversight from within the Agency and from outside (e.g. IRO).

6. Increasing requirements for support to community ADP activities.

After taking as a 'given' the assumption that Federal budgets will continue to impose ADP growth limitations, ODP enters into this planning period with the belief that the two most severe problems we face are the limited and tightly controlled computer hardware floorspace, and the increasing difficulty in recruiting, retaining, and expanding our complement of skilled and motivated ADP professional personnel. Floorspace is a critical item, since the expanding requirements for ADP support identified by customer offices cannot be met without incremental increases in hardware space, despite the increased miniaturization being introduced into computer technology. A continuing drain of certain highly technical and uniquely skilled ADP personnel, lured away by a highly competitive job market, will jeopardize our ability to continue to offer the advanced level of computer support ODP provides today.

Major resources available within ODP at the start of this planning period include:

1. Central Processors

   In terms of large-scale Central Processing Units (CPU), ODP has a current inventory of ten machines, three IBM 370/168's, three IBM 370/158's, and one each IBM 3033, IBM 360/65, IBM 360/67, and AMDAHL 470V/6.

2. Personnel

The FY 1979 authorized strength of ODP is [   ] 25X9

3. Budget

The FY 1979 approved budget for ODP is [   ] 25X1A

4. Space

ODP hardware and personnel occupy 88,401 square feet of Agency floorspace.

Requirements for ADP support, as identified by customer offices, reflect a continual increase in practically all of the services offered today. Batch processing requirements continue to increase at a rate of approximately 10 to 15 percent per year. Online requirements reflect a comparable annual increase, and requirements for remote terminals and printers during this planning period project an increase of over three times the present level of approximately 1,000 remote devices. Although projecting quantifiable long-range requirements for applications software development is more nebulous than projecting hardware requirements, the backlog of applications development requests continues unabated, and the ODP assumption that this situation will continue remains unchallengeable. The success of the ODP rotational assignment program for its officers is attested to by the continuing and increasing provision of positions by customer offices to be filled by ODP rotational assignees.

Major ODP plans that are addressed in this paper include the following:

1. Hardware

During this planning period, ODP expects to release the remaining IBM 360-series machines and either release one of the three IBM 370/158s, or, based on a predictable increase in community-wide computer involvement, retain the freed IBM 370/158 and dedicate it for possible use as a community host computer servicing community applications. Four new, as yet unidentified, CPUs will be installed to expand the existing capacity during this time frame, replacing existing CPUs of lesser capacity. Three machines will be used to upgrade the COMIREX and Operations Directorate support in the ODP Special Computer Center. The fourth will be used to replace an existing lower-capacity machine, thereby expanding the batch processing and GIMS capacity in the ODP Ruffing Computer Center. Based on the predicted growth in use of the VM interactive system, the existing central processor supporting VM will be saturated by the FY 1983-1984 timeframe. Advances in technology through this planning period will dictate whether this saturation should be resolved by replacing the existing CPU or augmenting it with an additional CPU. This issue will be better defined in subsequent years.

2. Personnel

As the growth in central and distributed hardware continues, so too must the increase in ADP personnel continue in order to manage, program, maintain, and operate this hardware. ODP should increase its assigned strength at the rate of approximately 5 percent per year during this planning period. Additionally, the establishment of the SAFE Computer Center in FY 1981 will call for an initial cadre of not less than seven personnel, and will grow to a need for approximately 29 operations personnel by the end of this planning period. Given that the SAFE Project Office will be permitted a programmed increase in manning through the SAFE development phase, these personnel will be available from within that organization.

3. Budget

The decreasing cost of computer hardware will be offset by the increasing cost of personnel and software, thus the budget projections through this planning period remain relatively level.

4. Space

By the close of this planning period, ODP projects that not less than 6,000 additional square feet of hardware space to support the Ruffing Center, 21,300 additional square feet of hardware and personnel space to support the SAFE Center, and approximately 11,000 additional square feet in Headquarters and [   ] to accommodate staff, contractor, and vendor personnel will be needed.

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SECTION 1—INTRODUCTION

1.1 Purpose of Plan

This plan is written to assist management personnel within ODP in focusing their collective efforts toward planning, scheduling, and projecting resource allocations for the period from Fiscal Year 1979 through Fiscal Year 1984. Inasmuch as this plan is based on the requirements for ODP support identified by all Agency managers, it is anticipated that it will be of interest to management personnel throughout the Agency as well as within ODP. This plan will be updated annually to reflect the changing conditions and will provide the basis for progress reporting and selected budgeting actions.

The purpose of this plan is to identify and enunciate the goals of this office over the next five years, and to identify actions that must be taken, issues that must be resolved, and budget authorizations that must be achieved in order to reach these goals.

In recognition of the uncertainties associated with long-range planning in a techno-logically volatile environment and based on often ill-defined customer requirements, the reader is cautioned that this plan is subject to major changes as the years unfold.

The main body of this plan is contained within Sections 3, 4, and 5. Section 3, "ODP Resources", describes the present major activities and resources within ODP, Section 4, "Requirements", describes the identified user requirements for ADP support, and Section 5, "Plans", describes the action that ODP must undertake to satisfy these requirements. Section 5 also identifies new initiatives that ODP must consider to permit enhancement of services to all users, in general.

1.2 Goals and Objectives

The content of this plan is based on the following goals and objectives that have been identified by ODP management:

GOAL 1

ODP will provide adequate common-use ADP resources, operated as a utility, to satisfy externally generated, justified, and approved requirements.

Objectives to meet this goal include:

1. Design, installation, operation, and maintenance of adequate hardware and system software.

2. Development, installation, and maintenance of adequate applications software.

3. Recruitment, training, and retention of properly skilled ADP technicians.

GOAL 2

ODP will anticipate user needs and have adequate resources in advance of demands.

Objectives to meet this goal include:

1. Tracking of resource utilization trend lines and projection of these into the future.

2. Solicitation of user projection data.

3. Evaluation of new technology and assessment of its impact on user needs.

4. Budgeting for resources needed to fulfill user requirements.

GOAL 3

ODP will provide users and managers with sufficient resources utilization information to evaluate cost versus benefits of central ADP services.

Objectives to meet this goal include:

1. Development and distribution of terminal utilization reports.

2. Refinement, enhancement, and continued distribution of the Project Activity Reports.

3. Identification to Agency senior managers of those user activities that are actual or projected major consumers of ADP resources and evaluation of the impact of this consumption on ODP resources.

4. Continued development and refinement of software/hardware performance-evaluation techniques to optimize use of existing resources.

GOAL 4

ODP will provide special purpose (standalone--not served from common use system) ADP resources to satisfy externally generated, justified, and approved requirements.

Objectives to meet this goal include:

1. Design, installation, operation and maintenance of appropriate special purpose hardware systems.

2. Development and maintenance of appropriate special-purpose software.

3. Recruitment or assignment and training of personnel to operate and maintain the ADP resources.

GOAL 5

Increase ODP's participation in CIA's management of ADP.

Objectives to meet this goal include:

1. Promulgation of Agency-wide software development standards.

2. Development of Agency minicomputer standards.

3. Earlier participation in the ADP planning and procurement process for non-ODP activities.

4. Greater involvement in Agency, Inter-Agency, and Federal ADP programs and activities.

GOAL 6

Provide for continuation of essential ADP services during periods of disaster.

Objectives to meet this goal include:

1. Development and maintenance of an Office disaster plan.

2. Identification of potential sources of hardware backup.

GOAL 7

Improve the security of ODP ADP facilities and resources.

Objectives to meet this goal include:

1. Redesign of computer access points.

2. Implementation of dataset, applications, and production security techniques.

3. Enhanced password/userid management.

4. Tighter control over magnetic storage media.

5. Improved operational standards and procedures.

1.3 Policies and Guidelines

a. Policies

Policies of the Director of Data Processing, relevant to this Long-Range Plan include:

(1) *Standardization*

Additional emphasis will be placed on the importance of the development of standard systems in both hardware and software. Duplicate services, be they in hardware, software, or in personnel, should be identified and reduced or eliminated where possible.

(2) *Security*

Security issues will be identified and prioritized and given special management attention. The security of all ODP computers, output, and data sets will be controlled and enhanced to the highest practical degree.

(3) *Minicomputers*

ODP will select and standardize a family of compatible minicomputers for Agency-wide use. New applications will be designed for standardized, customer-funded, customer-housed minicomputers, when feasible and cost-effective. ODP will provide a full range of support services to the standardized minicomputers provided sufficient funds and personnel are available.

b. Guidelines

(1) Limited-use software packages will be discouraged and a means will be found to review the use of and need for existing packages (languages, compilers, etc.) with an end objective being to eliminate obsolete or marginal software facilities.

(2) Requests for additional customer facilities, more terminals, more concurrent user access to online systems, or other enhancements, should be carefully evaluated for their effect on total system performance.

1.4 Assumptions

This plan was developed based on the following assumptions:

a. Federal budgets will continue to be austere and will limit of real ADP growth in the Agency.

SECTION 2—ENVIRONMENT

2.1 Intelligence Community Environment

The members of the Intelligence Community are receiving progressively stronger pressure to function more as a cooperative team rather than as individual agencies. The recent re-emphasis of the community role of the Director of Central Intelligence, followed by his establishment of community organizations, such as the National Intelligence Tasking Center and the Resource Management Staff (RMS), are clear indications of this direction.

The Information Resources Office (IRO), a component of the Resource Management Staff, has been charged with undertaking "the coordination, development and implementation of a coordinated ADP plan for the U.S. Intelligence Community..." * In this role, IRO intends to integrate the long-range plans of all member agencies into a community-wide plan, followed by a determination of whether or not to adopt and publish the plan as a community effort.**

2.2 Management Environment

CIA management is taking steps to focus more management attention on the manner in which its ADP dollar is being spent. On 22 June 1976 the Executive Advisory Group (EAG), consisting of the Deputy Director of Central Intelligence (DDCI) as Chairman, the Comptroller, the General Counsel, and the four Directorate Deputies, was formed to (among other purposes) "identify important Agency-wide issues." On 16 December 1976, the DDCI identified four fundamental ADP issues for the EAG to consider, including (1) monitoring and controlling the use of ADP resources, (2) planning for future ADP requirements, (3) insuring the proper balance between centralized and decentralized computer facilities, and (4) studying the desirability of consolidating related data processing activities. In a memorandum dated 26 July 1978, the DDCI further charged the EAG with becoming familiar with, and passing judgement on, each of the major computer applications either existing or under development. This executive-level awareness of major ADP expenditures has caused a rippling effect throughout the levels of CIA management, and is beginning to cause middle managers to become more actively involved in ADP planning and management than ever before.

As the increasing size of the Agency ADP budget became more visible to top management, a means was sought by which Agency management could identify, track, and pass judgement on the major consumers of ADP resources. The existing ODP project accounting system, which reports monthly on each offices' use of ODP resources, by project, served as the initial vehicle for this effort. In this context, a "project" is defined as a unique application or group of applications developed to resolve a particular ADP requirement for a customer office. Some projects are quite small, consuming barely measurable ODP resources, and others are comparatively massive, requiring a significant amount of ODP resources. Further, other projects being processed for a single customer component are sufficiently similar to allow them to be considered as a group of related projects, thus qualifying them to be defined as a composite of projects.

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* DCI Report to Senate Select Committee on Intelligence, Intelligence Community Management and Use of ADP and Information Handling Resources, dated February 1978. (pp 13-14)

** Working Paper to IHC Subcommittee dated 11 September 1978 from [   ], Chairman, DCI Intelligence Information Handling Committee.

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Although there currently are about 1,000 "projects" which have been identified to ODP, analysis has revealed that less than 30 of these projects or composites of projects account for the consumption of some 80 percent of ODP's annual ADP resources.

These projects, which are reviewed and rejustified annually to the EAG, are briefly described in Appendix B of this plan. This description also includes an indication of their current ODP activity, and their expected ODP resource requirements through this planning period. Justification and rejustification for these projects are performed by the user component and requires emphasis on the contribution that will be made by the continuation of the project to the mission effectiveness of the user office.

As is true in most service organizations, ODP has limited opportunity to validate customer requirements. Although ODP does have concurrence authority for certain automatic data processing equipment procurement, the Office is not empowered to approve or disapprove an ADP requirement raised by other Agency components. In an effort to reduce the possibility of receiving poorly justified customer requests, each customer office and directorate has been asked to identify one senior individual as the organization "ADP Control Officer" to serve as the organizational approving officer for ADP-related activities. It is in both ODP's and the customer offices' interest that the selected individual possess a thorough background in ADP management through either experience or formal training. Several organizations, with an ODP rotational assignee on their staff, have chosen to designate this individual as their ADP Control Officer. This practice has proven to be highly successful, in that it permits a trained data processing professional to both validate and prioritize the computer support requested.

2.3 ADP Environment

2.3.1 General

During this planning period ODP does not envision any startling new developments in ADP technology; however, breakthroughs in technology are exceptionally difficult to predict. The most significant advances that can be anticipated are increased miniaturization of hardware components, greatly increased central processor speeds, faster peripheral devices, network architectures, increased interactive applications, graphical capability, and mini/micro introduction. Toward the end of this period, the distinction between large central processors and minicomputers will become increasingly obscured.

During the next five years, there will be more extensive use of minicomputers either in lieu of or in combination with large computers. Distributed computer power will be more directly available to the user at his working station, but the need for and growth of large mainframe facilities will continue. The major advances in this decade will be in peripheral devices based on the improvement of existing technology and in exploitation of such fields as magnetic bubbles, cryogenics, microprogramming, networks, and communications protocols. Expanded use of improved memory, high-speed tape drives, disk storage, and mass-storage will be seen. In combination, improved hardware and software will significantly increase the amount of online information directly accessible to ODP's users.

Major advances will occur in communications. Use of remote terminals located at great distances from the computer, supporting users not now being served, will substantially increase, as will the use of direct communication between computers. Because of increased processing speeds coupled with communication advances, improved software, and lower lease costs, the ADP hardware product cost should lessen substantially. ADP processor hardware prices will decrease, resulting in an improved price/performance ratio; however, the labor to create software (and the price) will increase, but at a more constant rate.

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2.3.2 Effect on ODP

The effect of advances in technology on ODP during the next decade will be primarily in the area of space utilization and cost effectiveness. The most compelling reasons for replacing existing hardware during the next five years are improved hardware and system software reliability, increased capacity and capability because of increasing consumer requirements, and limited floorspace available for expansion. Also, there will be an increasing use of minicomputers for a variety of applications, including scientific and engineering, as well as business applications. Finally, there will be a definite and dramatic trend for increased use of data management software (such as RAMIS), and the relatively static use of standard language compilers, such as FORTRAN and PL/I.

2.4 ODP Environment

The Director of Data Processing is responsible for providing a central computer service to satisfy ADP requests from Agency components, and from the Intelligence Community, as assigned. Data processing services range from such traditional activities as data conversion and over-the-counter batch processing, to more exotic and diverse activities such as remote graphics, online text composition and database management. The ODP computer activiues currently account for about half of the CIA's ADP budget.

Major milestones in the history and growth of this Office include the following:

- Formed in 1963 as the Office of Computer Services within the Science and Technology Directorate.

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- By 1965, had an assigned strength of ☐ personnel.

- Redesignated as the Office of Joint Computer Support in 1973 and transferred to the Management and Services (now Administration) Directorate.

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- In 1973, subsumed the computer support that had been provided by the Central Reference Service (now the Office of Central Reference) Computer Center. Authorized strength up to ☐ personnel.

- In 1974, assigned operational management of the Operations Directorate Computer Center.

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- In 1976, redesignated as the Office of Data Processing and reorganized into the current structure of the Office of the Director, Management Staff, Administrative Staff, Special Projects Staff, and two Deputy Directors—Processing and Applications. Applications programmers were moved to ☐ Current authorized strength is ☐ personnel.

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- In 1978, the position of Deputy Director/ODP was reestablished.

The transition of this office during the past five years from a predominately batch processing environment to an online and real-time batch capability has allowed ODP to offer computer support to its users comparable to the most sophisticated facilities in the country.

2.5 SAFE

Early in the 1970s, the Office of Central Reference (OCR, then the Central Reference Service) began studying the feasibility of reducing the flow and storage of hardcopy documents. This study led to the concept of the SAFE (Support to the Analysts File Environment) project, which was envisioned as leading to a "paperless office," with all information being received, indexed, stored, and created in an online environment. Using the existing software packages available in OCR, an interim "test-bed" SAFE was introduced, by

which OCR performed exhaustive studies and surveys of selected analysts and offices who were participating in the pilot project.

On determining the feasibility of SAFE, CIA authorized the development of the project subject to considerable management oversight, and assigned development responsibility to ODP.

In 1975, the ODP Special Projects Staff, originally composed of ODP and CRS personnel, was established to undertake the further study and development of SAFE. In 1978, this complement was appreciably increased by personnel from the Defense Intelligence Agency (DIA) when it became apparent to Congress that the similarities between SAFE and DIA ADISS (Advanced Defense Intelligence Support System) might justify a joint development effort. At that time, the Special Projects Staff was redesignated as the Consolidated SAFE Project Office (CSPO).

Project SAFE is referenced frequently in this plan, and serves as one of the major influences on the validity of this plan as SAFE passes through its development milestones. If, for example, the development of SAFE is delayed, ODP can anticipate being asked to divert more of its existing resources to expansion and enhancement of the current "Interim SAFE" effort. Conversely, if SAFE continues on schedule, the resultant decrease in central resource usage brought about by the termination of "Interim SAFE" may be more than offset by the serendipitous effect on the neophyte SAFE user, who becomes exposed to the wide range of computer facilities available in the Ruffing Center.

As currently planned, the consolidated SAFE System-Acquisition Phase will begin in March 1979 when one of the two design competition contractors will be selected as a prime contractor to design and implement the system. The system will be developed and introduced into service in phases, resulting in an Initial Operational Capability (IOC-1) in 1982 for direct analyst support capabilities, an IOC-2 in 1983 for large, structured database capabilities, and a consolidated initial operational capability (Consolidated IOC) in 1984.

As SAFE passes through its operational developmental stages the requirements for operations manning will incrementally increase, calling for an initial cadre of seven personnel by FY 1981, then expanding rapidly to a manning level comparable to the ODP Special Center (29 personnel) by FY 1982. It is anticipated that these personnel will be recruited into the Consolidated SAFE Project Office during the developmental stages of SAFE, and that they, as well as the encumbent hardware and software ADP professionals will be absorbed into ODP as the final system becomes operational. Notwithstanding the probability that SAFE will become operational during this planning period and that there will be a requirement for additional personnel as the operation and management of the SAFE Computer Center becomes integrated into ODP, this plan does not address specific SAFE hardware requirements and plans. This information is or will be thoroughly covered in SAFE project documentation.

SECTION 3—ODP RESOURCES

3.1 Hardware

This subsection describes the major resources available within ODP at the beginning of this planning period and, where appropriate, touches on some of the history as to why these resources exist.

3.1.1 Ruffing Computer Center (GC03)

The Ruffing Computer Center provides general computer support to fifty separate CIA components, including the IC Staff.

a. Central Processing Units

The current CPU configuration is:

CPU Type	O/S	Primary Functions
IBM 3033	VM	Interactive Timesharing
IBM 370/168(1)	MVT	OCR Support/Batch
IBM 370/168(2)	MVS	Network Control/Batch
IBM 370/168(3)	MVT	Management Information (GIM/P)
AMDAHL 470V/6	MVS	Batch Processing
IBM 360/65	MVT	Management Information (GIM/D)

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b. Functions

1. *Interactive Timesharing System*

   About 2,500 users are authorized to use the primary Interactive system. During prime time, there are over 170 concurrent users, which represents an increase of approximately 17 percent over the previous year.

2. *Batch Processing System*

   A daily average of 2,250 jobs are processed through the Ruffing Center batch network, which represents an increase of 55 percent of job count and 15 percent of CPU utilization over the previous year.

3. *Data Base Management System*

   About 900 users are authorized to use GIMS, the primary database management system. During prime time there are an average of 75 concurrent users who generate an average of 14,000 prime shift GIMS transactions.
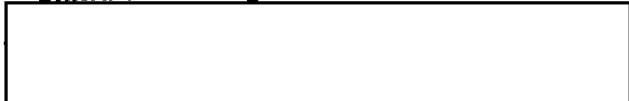
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is expected to become fully operational in the third quarter, FY 1979. It will support eight graphics terminals, 18 general-purpose CRT's, and two plotters.

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5. *Office of Central Reference (OCR) Support*

Support for OCR consists of six online programs and a number of batch support programs. The online programs are the data input applications⬚ and⬚ the database applications AEGIS and RECON, and the free text search application⬚ MAD, a batch application, is run periodically during the day and uses tapes from the OCR minicomputer as input to update the database. The online programs are available during the prime shift of each working day.

These programs, plus those described in Appendix B as "Subject Index" and "Interim SAFE," represent the major support to OCR that is expected to be absorbed into the SAFE Computer Center when operational. These systems are processed on an IBM 370/168 in the Ruffing Computer Center and account for approximately 40 percent of the CPU utilization for this machine during prime time.

6. *Message Processing*

ODP is currently distributing approximately 29,400 cables per week from the Office of Communications Signal Center Cable Dissemination System to provide "electronic mail" service for the Agency.

3.1.2 Special Center (GC47)

The Special Computer Center provides dedicated computer support to two organizations—the DDO Information Management Staff (IMS), and the DCI Imagery Requirements and Exploitation Committee (COMIREX).

a. Central Processing Units (CPU's)

Current CPU configuration is:

CPU Type	O/S	Primary Functions
IBM 370/158(R)	MVS	DDO ALLSTAR
IBM 370/158(B)	SVS	Batch/DDO-CAMS backup
IBM 370/158	MVT	CAMS Production

b. Functions

1. *DDO Support*

Support to the DDO in the Special Computer Center is through both online (STAR and NIPS) and batch services. STAR is an information storage and retrieval system, and NIPS is a database management system. Typically the DDO will have 90 online users during prime time, and a daily batch workload of 200 jobs.

2. *COMIREX Support*

CAMS provides both batch and online support, with a daily maximum of 50 concurrent online users, and a batch workload of 130 jobs.

3.2 Software

This subsection describes the major systems software resources available within ODP and the ODP applications development and maintenance process.

3.2.1 System Software

a. Batch Processing

Agency-wide batch processing services are provided in the Ruffing Computer Center on a complex of loosely coupled CPUs. Jobs are received and scheduled, and output is processed under the control of IBM's Job-Entry Subsystem Three (JES3). JES3 runs under the Multiple Virtual Storage (MVS) operating system on a single CPU but controls the scheduling of batch work to be run on all the machines defined in its complex. In terms of both the amount of computational work and resources dedicated to it, the batch service is significantly larger and impacts more customers than any other ODP service. All of the online services together, however, do represent a larger resource investment than the batch service. Further, a considerable portion of the batch work is done in response to or as an extension of the online services.

The MVS/JES3 CPU receives jobs directly from online card readers and via teleprocessing lines from the VM machine, remote job entry (RJE) stations, and from the OC message-processing system. This work is scheduled and run on either MVS- or MVT-driven CPUs. Conversion to a completely MVS-driven batch environment is underway and will be completed in FY 1979.

In addition to reducing the amount of software to be maintained and to simplifying the user's interface, complete conversion to MVS will provide the Agency with the most secure and reliable operating system available for batch processing on its equipment. MVS was designed for large systems as those operated in ODP, contains added recovery capability, and is fully supported by IBM. JES3 has the advantage, in a multiple CPU environment, of optimizing the scheduling of work across all the machines and peripheral equipment within its complex. It also presents a single-system image to the operator, thereby reducing the number of consoles and operations personnel required to operate the service.

To meet the user requirements for compartmentation, batch processing in the Special Computer Center is provided in an electronically isolated environment. The DDO/IMS batch jobs generally are processed on the IBM 370/158 (Blue). Currently the DDO machines are tasked for batch work only through online card readers and NIPS batch facilities.

CAMS batch jobs are processed on the IBM 370/158 dedicated to supporting this project. The CPU receives jobs either directly from online software or from RJE stations.

b. Generalized Information Management System (GIMS)

GIMS is the database-management facility provided by ODP for those customers who have large, complex, information-handling requirements. GIMS is capable of managing multiple data base applications on the same CPU. Each application is logically secured from access by other non-authorized GIMS users. This service is provided on a single CPU in the Ruffing Computer Center for 26 distinct production applications.

Because of the complexity of the update and extract command functions available to the GIMS user, untested user commands could cause system loops or other forms of system degradation which could have widespread implications to all GIMS users. To ensure that the production applications serviced by GIMS are not degraded by new application testing, a GIMS development system is provided on another machine in the Ruffing Computer Center, the IBM 360/65.

c. Virtual Machine (VM)

The VM operating system is used by ODP to satisfy Agency requirements for timesharing services. A full range of facilities is offered, including; online file construction and update, compilation and interactive execution of programs, and the capability to submit input to, and receive output from the batch processing service.

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Examples of the facilities available through VM are the RAMIS database management system,⬚⬚⬚⬚ continuous system simulation facility, APL and BASIC interactive programming languages, and SCRIPT text processing. VM also provides for the capability of concurrently running other operating systems under its control on the same machine. This facility is used by personnel from the Systems Programming Division (SPD) of ODP to test new releases of the operating systems and other software packages which they maintain.

VM is run on a single CPU in the Ruffing Computer Center. Because it is the primary access to the batch processing service and because its other facilities are so universally in demand, this service will be provided in an uninterrupted mode to the user community on a 24 hour basis as of FY 1979.

d. National Military Command System, Information Processing System (NIPS)

NIPS is a database-management system in use for both batch and online applications. NIPS provides an information storage and retrieval capability to support the DDO operating Divisions and Staffs, and other Agency components. Applications include equipment use and location files,⬚⬚⬚⬚ indexes into various DDO records systems, and administrative support information. NIPS files comprise a data base of half a billion bytes and are accessed both in batch mode and online through a set of 34 terminals. Online applications (developed and employed by the DDO personnel) are being considered for conversion to some other type of system, since external support for the NIPS online system software is being discontinued. Although there are about 10 CIA projects that use batch NIPS, that number is not expected to grow appreciably during this planning period, as the trend within the Agency is more toward online applications. Applications programmers have been encouraged to rely more on GIMS or RAMIS for new applications that include database-management considerations.

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3.2.2 Applications Software

a. Development

Applications development is performed in response to a request for support initiated by any Agency component. Requests are forwarded through the ODP Deputy Director/Applications to one of the four Applications development Divisions, based on such factors as the expected type and scope of work, and the relative workloads within the Divisions.

Once the task is assigned to an individual Applications analyst, the feasibility of the task is examined. This may or may not lead to a formal project proposal, which may identify development milestones, manning requirements and estimated project completion. Inasmuch as a "task" as defined herein can be anything from a one-day, one-person undertaking up to a multiyear, multiperson undertaking, the formality of the feasibility study varies accordingly.

A completed project, depending on the situation, is either returned to the customer as a finished package, or submitted to the ODP Production Division for scheduled processing. In the former case, the customer assumes responsibility for scheduling his own processing. In the latter case, the source and all pertinent operation

documentation falls under the control and responsibility of the Production Division. Program maintenance, modification, and enhancements remain the responsibility of the Applications' Division, but are implemented only after clear coordination with, testing of, and approval by the Production Division and the user.

b. Maintenance *

The ODP Applications Divisions have been charged not only with the maintenance of software developed within the Divisions, but also with maintenance of several specific computer programs and systems developed by outside contractors. To react responsively to customer requests for program modifications and maintenance, the Deputy Director for Applications has assigned primary and secondary maintenance responsibility for all software applications to members of the Applications Divisions. Through this process, the ability to maintain a level of expertise and familiarity with a given software application is assured.

3.3 Personnel

3.3.1 Composition

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The current staff of ____ personnel provides ODP with the capability to:

a. Design, operate, and maintain two complex general-purpose computer centers.

b. Perform data conversion, database management, production processing, terminal maintenance, training, and consulting services for user components.

c. Perform maintenance and enhancements to systems software.

d. Manage the design and implementation of special purpose dedicated ADP systems (e.g., CAMS, ____ SAFE).

25X1

e. Develop and maintain applications software systems in response to justified requirements from any component of the Agency or the Intelligence Community.

Contractor personnel are employed, as needed, to provide specialized support, such as unique software development, hardware management, software and hardware maintenance, and technical publications.

To provide specialized support to customer components, ODP has approximately 35 ODP personnel on rotational assignment to these components. These assignments range from one individual assigned to an entire Directorate, to clusters of ODP personnel assigned to a component within an Office.

3.3.2 Training

As the decade ends, ODP has seen a significant transition in the ODP training role. Early in the 1970s the rationale for maintaining and enhancing the ODP component training was clear, straight forward, and indisputable--ODP was rapidly expanding, skilled programmers were relatively scarce, and what CIA EDP expertise that existed was internal to ODP. The decision to continue to charge ODP with EDP training was not only sanctioned by the Office of Training (OTR), but was encouraged. The primary training effort was dedicated to elevating newly hired or newly identified novice programmers up to a level where they could perform acceptable programming tasks. This was accomplished through prolonged, multi-week, intensive, and highly competitive training courses known as ADEPT, loosely formed from the phrase "A Developmental EDP Professional Training." Although this training was made available to all Agency components, the student body was almost exclusively made up of programmers assigned to the three Headquarters computer installations, the DDO Systems Group, the Central Reference Service (now OCR) programming

component, and, predominantly, the ODP programming components. As the 1970 era progressed, an evolution of Agency EDP training needs began, brought about by the following developments:

  a. A slowing of the rapid expansion of ADP components.

  b. The newly hired computer specialist was not only more likely to have had comparable EDP training, but eventually was required to have had a rich computer background.

  c. The introduction of remote terminals, interactive computing, online information-management systems, and online query systems, all of which encouraged direct computer usage by subject-matter specialists in every component of the Agency.

Emphasis has switched from teaching the programmer how to program to teaching the secretary, the analyst, the staff officer, or the manager how to employ the computer services that were now within arm's reach in an effective, efficient, and a productive manner. The training for the ODP computer specialists had become directed more toward maintaining and sharpening skills and introducing new hardware and system software.

3.4 Space

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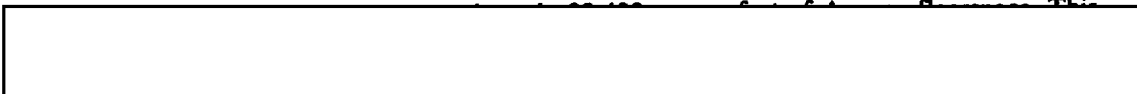
building. Early in this planning period the Headquarters floorspace identified for use by the Project SAFE Computer Center will have to be vacated and renovated.

Containing the existing hardware inventory in the Headquarters area designated for computer hardware has been an extremely difficult task, and has reached a level of near-unmanagability. Having long since pre-empted for other uses space originally designated for storage of supplies and equipment, ODP has more and more frequently resorted to storing and staging supplies in Headquarters hallways, which has been a continued source of concern.

Personnel work areas, in addition to being less than the Agency average, are badly fragmented, leading to potential management complexities, as functional units are split between several Agency occupied buildings.

3.5 Communications

Historically OC has served as the focal point for all CIA overt communications, both internal voice communications and radio communications to and from distant CIA facilities. During the past decade data communications (i.e., man-to-computer and computer-to-computer communications) has assumed an ever-increasing role in the breadth of responsibilities subsumed by OC. Since the connection of the first ODP remote terminal to the first computer using the existing grid communications system in 1968, the need for close and coordinated involvement between OC and ODP has grown. OC is supporting close to 1,000 remote terminals connected to ODP computers, An OC/ODP Planning Group was established to deal more effectively with the tactical and strategic data communications problems which both Offices share.

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SECTION 4—REQUIREMENTS

4.1 General

Requirements for ODP services are continuing to grow at a steady, yet rapid rate, consistent with growth in the Federal Government but less than in the U.S. private sector.

Appendix B of this plan identifies the major projects supported by ODP (i.e., those that account for some 80 percent of ODP computer resources). This appendix succinctly describes the projects, ODP resources expended during FY 1978, and customer projections of ODP resources required during this planning period. A review of these projects reveals that almost every requirement is predicted to experience an annual growth rate of up to 50 percent per year through this planning period, averaging about 15 percent per year. This generally is true, regardless of the type of support required by the application. These projects, with these requirements for increased batch CPU hours, VM interactive connect hours, GIMS transactions, continued software development, and additional remote processing capability, represent the major driving force behind ODPs predictable need to continue its expansion of computer hardware and software support.

RAMIS (Rapid-Access Management-Information System) recently was installed on the VM Interactive System, and has become increasingly popular as a technique for creating, manipulating, and retrieving data. Because of the convenience of RAMIS to the wide population of VM users, and because of the relative ease of developing modest sized office files, use of RAMIS is expected to grow at a rapid rate during this planning period.

Inasmuch as interactive RAMIS is a VM-resident software system, the growth in the use of RAMIS is not further quantified as it will be reflected in the growth of VM use, as described in paragraph 5.2.1, "Central Processors."

Newly identified potential VM users are increasing at a rate of from 100 to 150 per year, user online diskspace is in increasing demand, and concurrent online users of the VM system (perhaps the most significant measurement of the interactive system performance) are steadily increasing at about 30 additional prime-time users per year.

The most accurate measure of batch processing workload currently available is the IBM 360/65 equivalent CPU hour. This metric evaluates only central processor utilization and, for work run on different types of CPUs, is derived by multiplying the amount of CPU time used by a performance coefficient.

Using the IBM 360/65 equivalent CPU hour, ODP computes daily batch throughput values for all of its batch machines and compiles historical data on the average daily batch workload processed. Data on the number of jobs processed also are available and are of some value for trends but are not as useful as CPU time for determining workload. These historical data, along with user information about planned additional loading, then are used to project batch service requirements into the future. From FY 1975 through FY 1977, the batch workload has grown, each year, at the rate of about 10 IBM 360/65 equivalent CPU hours per day, each year. Measurement data, compiled for FY 1978, indicate an increase in the yearly growth rate of up to 19 IBM 360/65 equivalent CPU hours per day per year.

Table 1, "ODP Workload Summary," summarizes ODP's projected batch service growth rate through FY 1983. The current batch workload in IBM 360/65 equivalent CPU hours

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Table 1

ODP Workload Summary (Data are start of Fiscal Year values)

	FY-79	FY-80	FY-81	FY-82	FY-83	FY-84
VM (daily peak concurrent users)	180	210	240	270	300	330
BATCH (average peak daily IBM 360/65 CPU hours)	169	187	206	225	244	263
GIMS (average peak prime shift transactions)	14,000	16,500	19,000	21,500	24,000	26,500
OCR (percent of an IBM 370/168 over 24 hours)	40	50	50	50	50	50
CAMS online transactions per day (average)	4,000	10,500	13,000	15,000	16,500	18,000
DDO/IMS						
Estimated concurrent prime shift users	106	142	190	215	235	254
Estimated prime shift transactions	9,000	12,000	17,000	19,000	21,000	23,000

averages about 135 equivalent hours a day; however, single-day peak loads have been measured at 200 equivalent IBM 360/65 CPU hours a day and the average of the high five days a month is 169 equivalent IBM 360/65 hours. Batch capacity in the Ruffing Computer Center is calculated to be 215 equivalent IBM 360/65 CPU hours per day. This falls a little short of the peak value (average of five high days a month) projected for the end of FY 1981.

4.2 Major Projects

4.2.1 SAFE

SAFE will be required to offer around-the-clock online computer and associated microform service for over 2,000 users. SAFE will be required to manage access to intelligence documents and open source information received by CIA in hardcopy and electrical form, and used in the process of intelligence analysis and production. Electrical documents, arriving at the rate of approximately 3,500 messages per day, will be stored in various computer-controlled files within the SAFE system. Hardcopy documents will be stored either in the analysts' local work areas or in a central microform system named Automated Document Storage and Retrieval (ADSTAR).

4.2.2 DDO Support

a. Collection of Operational Messages Electronically Transmitted (COMET)

COMET, one of the most significant new projects in the DDO, has major and lasting effects on DDO computer facility requirements since it involves the collection and digital storage of about 1,000 electrically transmitted documents each day. This reflects a continuous increase in long-term disk storage requirements and a major increase in the need for terminals.

The project is in its initial phase at this time—having become operational during April 1978. At that time COMET began collecting the electrically transmitted documents from the Cable Dissemination System, storing them on disk in the Special Computer Center, and hardcopy printing in response to terminal requests by document identification number.

Future phases of COMET provide for online retrieval, computer-assisted indexing, and abstracting of these documents, using techniques derived in conjunction with those for the SAFE system.

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b. Automated Field Stations

Another project of primary importance to the DDO is the provision of automated information services to DDO users, both in the field and in Headquarters. This will result in substantial requirements pertaining to centrally supported DDO systems installed in the Headquarters, such as COMET, ALLSTAR, and _____ (the DDO version of ADSTAR).

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The first phase of this effort, expected to be completed by FY 1981, will provide for computer-supported dissemination of electrical messages to DDO managers and country branches in the CIA Headquarters building. These messages are to be distributed to the same set of terminals used for online document retrieval by the COMET system. A capability is also planned to transmit outgoing messages composed at these terminals by using the CDS system in the reverse direction.

c. Batch Processing

DDO/IMS batch processing, averaging about 200 jobs per day, is expected to increase by approximately 15 percent per year through this planning period. Although this increase is less clearly defined at the project level, COMET development activity is expected to account for the majority of this increase.

DDO requirements for ALLSTAR and NIPS during this planning period consist primarily of additional disk storage space and remote terminals. Additional ALLSTAR and NIPS disk storage requirements will equal approximately two IBM 3350 type diskpacks per year, and an average of about eight CRT terminals per year.

d. Online Support

The DDO concept requires that DDO programmers have terminals located in their office environment and that these terminals be connected to the Special Center. Supporting these terminals would be time sharing and editing software in the Special Center with interface to the system software used for DDO program library storage. Also required in support of this online programming function is the ability to switch the remote job processing station located in the DDO programming offices from connectivity with the Ruffing Center to connectivity with the Special Center, where it can serve as a RJE device, and can be used to print the output resulting from jobs submitted at the nearby online programming terminals.

Consistent with the principle of using online programming facilities is the concept of providing online testing facilities for DDO programmers and analysts. This requires installing two test terminals in their offices connected in local mode to the Special Computer Center systems, and installing a printer to output operator console messages.

4.2.3 OCR Support

The most recent OCR requirements document cites requirements in terms of IBM 370/158 CPU utilization through FY 1984. For the purposes of this Plan, ODP estimated that the OCR Service will use a uniform 50 percent of an IBM 370/168 during prime time throughout this period. ODP further assumes that the SAFE project will be implemented on schedule and that an expansion to "Interim SAFE" will not be undertaken. These estimates are consistent with OCR plans and projections, providing a High Speed Text Search (HSTS) capability is not funded. HSTS is discussed in paragraph 5.1.2 "New Initiatives."

4.2.4 CAMS

CAMS batch processing, averaging about 130 jobs per day, is expected to increase to over 500 jobs per day by the end of this planning period. This increase is directly related to the

increased use of CAMS which was brought about by (1) expanded databases, (2) larger user population, and (3) the greater collection and exploitation capacity of the collection systems with which CAMS interfaces.

CAMS information storage and retrieval requirements also will increase significantly during this planning period, as more and larger files are assembled and made available to the user. Disk storage requirements will double during FY 1979, and then will increase at the rate of approximately 300 M-bytes (or the equivalent of one IBM 3350-type disk-pack) per year through FY 1983. Remote CRT terminal requirements will increase at an average of 10 to 15 terminals per year through this planning period.

4.2.5 Automated Message Processing System (AMPS)

AMPS service, although it serves only a subset of the ODP customer base, is a generalized ADP facility for handling Agency cable traffic. AMPS receives, from the Office of Communications Cable-Dissemination Systems (CDS), cable traffic for various Agency components and files these data for future processing.

This service is intended to supplement the normal cable traffic distribution system when the output must be available to the user within a relatively short time after entry of the cable traffic into the ODP computer system. In this environment, the ODP batch processing system has a near-real-time processing requirement.

STATSPEC   This service is currently provided for OCR, OWI, OC,☐and DDO's COMET system.

During this Fiscal Year, ODP will initiate the next phase of AMPS, which addresses routing of outbound Headquarters-prepared cable traffic to the field stations. This phase is now known as Field Automated Message Processing System (FAMPS), but as these services become stable, both acronyms will be replaced and the system will be known as Message Processing System (MPS).

One of the first projects to capitalize on this two-way data communication technique is OF's Electronic Time and Attendance Reporting (ETAR) project. This project is designed to permit field generated T&A reports to be automatically stored in computer files for subsequent payroll processing, and also to permit OF originated T&A traffic to be transmitted to the field.

4.3 Remote Processing

4.3.1 Minicomputers.

As requirements for central computer support are growing, so too are the requirements for computing capability within the various Agency components. As computer hardware becomes more economical, smaller, faster, and self-contained, acquisition and installation of either standalone or centrally connected minicomputers becomes more feasible. Applications that were either never computerized, because of their sensitivity, or are now processed centrally but at varying degrees of inconvenience to the customer, are being re-examined with the thought of establishing them on these dedicated systems.

4.3.2 Remote Terminals

The most significant bond connecting almost all of the requirements identified in this section is the increasing dependency on remote terminals. Not only does CIA have a major investment in the current inventory of remote terminals, but the projected increases through this planning period are significant.

Table 2, "User Terminal Projections," projects a dramatic increase in remote devices, directly or indirectly interacting with ODP computers. As illustrated by this table, if projected

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4.3.3 Communications

A closer OC and ODP relationship is essential in order to mutually resolve the data communications needs of the Agency. More frequent joint working groups, more authority directed to the existing joint planning group, an increased exchange of officers, and even the merger of closely interrelated functions into one office should all be explored to ensure that the data communications needs of the Agency are surfaced, addressed, and resolved.

The projected growth in CRT terminals, hardcopy terminals, medium-speed printers, graphics terminals, and miscellaneous other remote computer devices will require a dramatic increase in communications capabilities during this planning period. The communications grid operates on the principle of dedicated lines—one line per terminal. This concept extended to remote locations is inefficient in its use of equipment and communications bandwidth. Project SAFE, alone, calls for installation of a data communications capability exceeding that in use today. Additional projects such as the DDO Field Station Prototype, COMET projects, and COMIREX support, also require a significant increase in remote terminals during this planning period.

The large number of Agency SAFE users (over 2,000) and the need to distribute page images from microfilm copy make the communications facility a critical design issue for SAFE. The large majority of SAFE users will be located in the Headquarters building. The physical requirements for wiring the large number of SAFE terminal/work stations within the existing Headquarters communications grid and the need for wideband communications technology to accommodate the page image remote distribution requirement make a conventional wiring plan impractical. Consequently, a Wideband Bus Communications System (WBCS) design has been included in the SAFE Design Competition. A major issue in the WBCS design has been whether to require an end-to-end encrypted ("black") system or an unencrypted ("red") system. The decision to proceed with a "black" system design was based on technical feasibility, cost, and security considerations, and has generated a requirement for a unique cryptographic subsystem. The National Security Agency (NSA) was assigned the task of developing this cryptographic subsystem.

4.4 Personnel

4.4.1 Rotational Assignments

Agency components are becoming increasingly aware of the benefits in having trained computer specialists from ODP assigned to their organizations. These benefits include the abilities to recognize internal functions that lend themselves to automation, modify and enhance existing data processing applications, resolve technical and communications difficulties, and serve as a liaison between ODP and the customer component. New requirements for such personnel continue to be received from customer offices currently without ODP personnel assigned to their components.

4.4.2 Training

During this planning period there will be a greater number of skilled ODP professionals assigned to customer offices. Although the source of these professionals will be from the Applications development Divisions, there will be an increasing need for these personnel to have skills that transcend the traditional applications boundaries. These personnel will be expected to demonstrate skills in such areas as graphics programming, minicomputer systems, and in interface protocols with centralized large scale computers.

Ever-changing technology in both hardware and software demands that ODP computer professionals be kept aware of these changes and up-to-date on the state-of-the-art. As the use of minicomputers within the Agency increases, a void in the experience of many of our computer professionals becomes apparent. Appropriate training courses must be provided to help fill this void.

SECTION 5—PLANS

5.1 General

5.1.1 Space

Despite increasing miniaturization of computer hardware, the fact remains that ODP hardware space is saturated, and additional hardware is projected to be required during this planning period. This section discusses planned hardware acquisition which includes at least the following:

a. The high-speed, text-search hardware for OCR support will require 400 square feet of space.

b. Minicomputer installation for the CAMS graphics support will require at least 300 square feet.

c. Retention of an IBM 370/158 CPU to perform dedicated processing for Intelligence Community (IC) projects, if required, will require approximately 2,500 additional square feet.

Also, approximately 11,000 more square feet are needed for staff personnel, contractors, and vendors, 6,000 more square feet to provide necessary expansion of the Ruffing Computer Center, and 21,000 square feet to house the SAFE Computer Center. To meet these requirements, ODP plans to continue to pursue vigorously the acquisition of sufficient floor-space. Inability to obtain this space will dramatically impact ODP's capability to support the growing ADP needs of the Agency and the Intelligence Community.

5.1.2 New Initiatives

The following are a number of activities which ODP is exploring or is planning to explore that are sufficiently general purpose in nature or application to warrant inclusion in this subparagraph.

a. **Batch Print**

ODP computer systems process a daily average in excess of 3,000 jobs, per weekday, which is significant in two respects: (1) it is approximately double the number of jobs processed as recently as two years ago; and, (2) it reflects a measure of the vast amount of paper processed through the batch printers. ODP consumes approximately 200 boxes (at 3,200 pages per box) of computer paper per week. During this planning period, ODP will explore techniques for controlling the quantity of computer paper output. The feasibility of such options as routing more output to remote terminals, selectively printing output based on job condition codes, and direct microfilm output will be examined.

b. **Mass Storage**

Conversion to some form of new mass-storage is essential to ODP, as hardware space requirements become more critical. Although this office is not actively pursuing installation of the current mass-storage media, the subject will continue to be examined during FY 1979 and FY 1980. Meanwhile, ODP's tape storage problem

forces the use of secondary locations to house all but the most essential tapes currently needed in the computer centers.

c. **Minicomputers**

ODP's effort to to operate GIMS on a minicomputer (Project GIMINI) is to determine if a mainframe-compatible database management-system can be operated on a minicomputer, with the difference in operating environment being transparent to the user. If successful, it will lead to the migration of several independent applications from central hardware to user-located minicomputers, and will allow an application to be developed on one system and put in production on another.

For those minicomputer applications that will ultimately interface with ODP mainframe processors, ODP must exhibit sufficient "in-house" expertise in minicomputer hardware and software so as to establish an Agency-wide acceptance of credibility. This expertise will lead to customers referring to this office for more support in studying their requirements before a decision is made to develop a minicomputer system, rather than after an office commitment has been made. By this step, it is anticipated that the need for ODP to develop interface software for each type of minicomputer will be minimized. Although it is recognized that current procurement policies discourage the standardization of minicomputer hardware, ODP will make every effort to minimize the variety of minicomputers which it must support.

ODP will produce a "Minicomputer Selection and Installation Guide" during FY 1979, to include information on the capabilities and requirements (space, power, and air conditioning) for several minicomputers widely used and available to the Agency.

d. **Office Automation**

Although there is no customer-generated demand for ODP to explore and promote the concept of office automation/electronic mail on a global basis during this planning period, it will remain a subject of continued interest to ODP managers. This Office anticipates major growth in this field during this planning period and, in preparing itself for this growth, is undertaking studies of networking and communication technology. Currently, two active projects, SAFE and the DDO automated field stations, contain many of the concepts of automated offices. Additionally electronic mail, which addresses terminal-to-terminal communication, already is an accepted communications technique by the approximate 20 percent of the Agency employees who have been granted terminal access. Acceptance of the philosophy that "every officer will have a desktop terminal" should occur as a natural evolutionary process.

Under the DCI's Goals Management Program, work is proceeding on a proposal to undertake a comprehensive study of the Agency's information-handling problem. The results of any such study can be expected to have some, as yet unmeasured, impact on ODP's information-handling activities.

e. **Production Printout**

Production output from the ODP computer centers is processed in a variety of ways, based on customer needs and the capabilities of the ODP facilities. ODP facilities for printed production output are limited to computer printout, reproduced copies of computer printout, and reproductions of print files resident on magnetic tape. In all cases, the quality of the reproduced characters is comparable to that produced on standard high-speed computer printers.

Customer offices in need of high-quality computer output are provided with the facility to route their output directly to the Printing and Photography Division (P&PD), Office of Logistics (OL), by way of the Electronic Text-Editing and

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Composition System (ETECS). This link, to be accomplished in FY 1979, will permit printed output to be transmitted electrically to P&PD for finished, high-quality composition and printing.

The need exists within ODP to provide an interim quality of computer printout—higher than the traditional off-line printer, yet not of the quality and expense of the P&PD product. During FY 1979, ODP plans to install a centralized printer to produce both rapid and customized high-quality output.

f. **Remote Printout**

The increase in remote terminals has spawned the concept of customer "cluster rooms" throughout the Agency and has led to an increasing demand for more complete remote computer facilities, including low quality, but high-speed printer output. During this planning period, ODP plans to install up to 10 remote printers per year in order to meet this projected requirement.

g. **Computer Output Microfilm (COM)**

Although ODP has historically supported the concept of reducing computer output to microfilm, the process has remained sufficiently cumbersome, time consuming, and awkward from the customers' viewpoint, that it has received limited customer endorsement. With the ever-increasing quantity of essential, yet limitedly distributed computer output, ODP must re-examine COM support currently offered and explore the feasibility of in-house, same-day COM production.

h. **Data Entry**

Until recent years, preparing computer input was confined to a group of specialists designated as keypunch operators. Technology has both improved the productivity and efficiency of the traditional keypunch operator, and has also distributed a significant portion of the data-entry requirement to the end user through either online data entry, key-to-disk data entry, or optical character reader (OCR) devices.

Although the current need to perform a central data entry service will not end, this Office will expand and enhance the data-entry capability of the end user during this planning period. Improved input menus, improved data-validation software, and more-advanced OCR equipment (able to process conventional type fonts) will be expected.

The ODP VM facility that allows displays of "menus" on the CRT for ease of data entry will be substantially upgraded to facilitate the creation of formatted displays and data-validation specifications. As the new ODP terminals (with floppy-disk facilities) become more readily available, ODP should expect to see more data entry and validation performed from floppy-disk storage directly into the central systems. This concept will create new opportunities for using terminals in remote locations, with data being sent to the central system by mailed floppy disks.

i. **Communications**

The wideband bus communication system (WBCS) to be installed in the Headquarters building will permit ODP outyear planning to include redistribution of the remote devices from the current grid system to the WBCS and reconfiguration of these devices from "red" to "black" communications protocols.

j. **High-Speed Text Search**

A high-speed text search (HSTS) software/hardware system, designed to optimize the speed of free-text search is being studied for its potential use for an OCR

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online application. Acceptance of this new text searching technique will greatly enhance the ability of OCR analysts to search massive text files, and will reduce the rate of growth of OCR work on the existing mainframe CPU.

5.1.3 Security

During this planning period ODP plans to initiate several additional security measures in both the Ruffing Computer Center and in the Special Computer Center, as follows:

Ruffing Computer Center:

    a. Installation of a dataset access-control facility on the MVS system, which will require user and dataset password verification, and permit audit analysis of dataset manipulation.

    b. Modification of the over-the-counter control point to provide greater control over release of computer print-out and other media to users.

    c. Further reduction of the flow and processing of non-standard magnetic tapes into and out of the computer center.

Special Computer Center:

    a. Completion of installation of the more secure MVS operating system on all CPUs. central processing units.

    b. Relocation of the computer center management personnel so as to reduce the flow of non-operational human traffic.

    c. Installation of a dataset access control facility on the MVS system, which will require user and dataset password verification, and permit audit analysis of dataset manipulation.

    d. Modification of the over-the-counter control point to provide greater control over the release of computer print-out and other media to the users.

5.2 Hardware

5.2.1 Central Processors

a. Batch

This Plan calls for the upgrade of the IBM 360/65 computer in the Ruffing Computer Center to a more powerful, MVS-compatible machine by FY 1981. Initially this upgrade will be accomplished by replacing the IBM 360/65 with an in-house IBM 370/158 in FY 1979; however, this is considered an interim upgrade, and requirements remain to upgrade to an even larger scale central processor by FY 1981. During FY 1981 a new processor will be procured to fulfill the increased demands for central services within the Ruffing Computer Center. This machine will physically replace the IBM 370/158, which then will be allocated to [   ] to replace the IBM 360/67, which will be released. The primary reasons for this upgrade are to (1) provide increased capacity to meet growing demand in the GIMS and batch systems, and (2) provide capability for an improved backup configuration should a CPU failure occur in either the VM or batch service. Release of the IBM 360/65 (which is not compatible with the IBM MVS Operating System) will permit the coupled CPU's in the Ruffing Computer Center to all operate under the more secure and reliable MVS system. ODP has identified an expenditure of $1,200,000 per year for five years beginning in FY 1981 toward the purchase and maintenance of this CPU.

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Functionally the new processor, scheduled for FY 1981, will be added to the batch service, and the current workload of the existing CPUs will be altered accordingly to provide increased GIM production capacity. Upgrading the processing capacity of the Ruffing Computer Center in this manner is expected to provide adequate processing capacity, increased reliability and redundancy, and will fulfill the batch needs of the Agency until the latter portion of this planning period. Despite the upgrade of the batch capacity in FY 1981, as illustrated in Figure 1, "Ruffing Center Batch Capacity vs. Workload," straight-line projections of CPU capacity versus annual growth in batch requirements indicate batch CPU saturation by the end of this planning period. There are, however, sufficient unknowns, specifically in the area of GIMS growth and OCR requirements, to make projecting the time an additional batch CPU upgrade will be required too indistinct at this time.

Figure 1 depicts batch capacity in terms of IBM 360/65 hours since, as explained in paragraph 4.1, "General," this common unit of measurement is the best available method for representing a single capacity for a wide inventory of CPUs.

b. GIMS

Current user production requirements include an additional five GIMS database applications for FY 1979. While this rate of growth matches the historic rate, it is expected that at least one unprogrammed GIMS application also will become operational on GIMS during FY 1979. The rate of growth in terms of transactions per day is approximately 2,500 transactions annually. Daily transactions as of the end of FY 1978, are averaging nearly 14,000. Projections for this planning period (Figure 2, "GIMS Capacity vs. Workload"), are that GIMS transactions will follow a linear growth of from 16,500 daily transactions in FY 1979 to 26,500 daily transactions by FY 1984.

FY 1979 and FY 1980 projections state that the current ratio of transactions will continue through this planning period and the capacity of the current GIMS CPU will be exceeded by FY 1981. To accommodate the increased GIMS workload by FY 1981, ODP plans to move GIMS production from the IBM 370/168 to the more powerful AMDAHL 470V/6, which will become available upon installation of the new batch processor.

GIMS development requirements (as opposed to GIMS production requirements), are expected to remain roughly the same during this planning period. However CAMS development, which is a special use of GIMS, has increased sharply at the end of FY 1978 and will remain at that high level at least until the installation of the new release of CAMS software scheduled for March 1979. GIMS has proven to be a highly successful and utilitarian information management system, and is expected to serve the needs of the office throughout this planning period. As one of the principle users of the GIMS system software, ODP must continue to allocate human resources to the maintenance and enhancement of this system.

c. VM

With the wide range of user facilities it provides, VM should continue to satisfy the needs of the Agency for interactive support during this planning period. The unit of measure generally used by ODP to report on current VM utilization and to estimate future VM requirements, is the "Maximum Concurrent User" level. This metric represents the largest number of logged-on users accommodated on any given day.

Although logged-on users alone do not represent a drain on VM resources, the correlation between this metric and the many others that measure specific resource

DAILY 360/65 CPU HOURS

Figure 1. Ruffing Center Batch Capacity vs. Workload
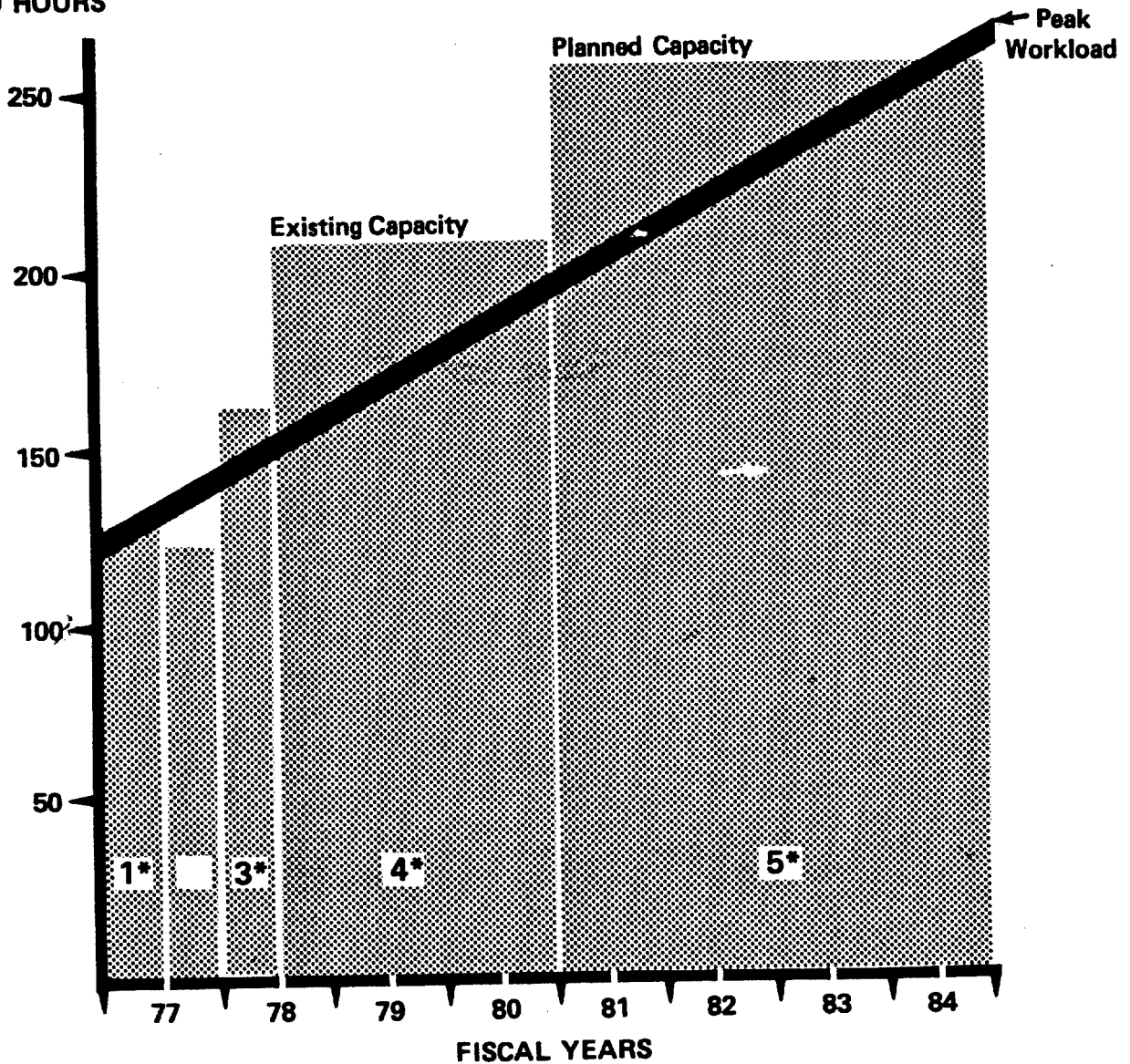
Period	Configuration	Total 360/65 Equivalent Hours
*1	158–1x.5, 168–2x.25, and 195	129
*2	158–1x.5, 168–2, 168–3x.5, and 195	125
*3	158–1x.5, 168–2x0.15, 168–3x.6, and 195	159
*4	65–2x.5, 168–1x.75, 168–2x.25, 168–3x.5, and 470V/6	216
*5	168–1x.75, 168–2x.25, 168–3x.75, 470V/6–1, and either 470V/6–2x.2	248
	or 3033–2x.3	265

SECRET

PRIME SHIFT
TRANSACTIONS
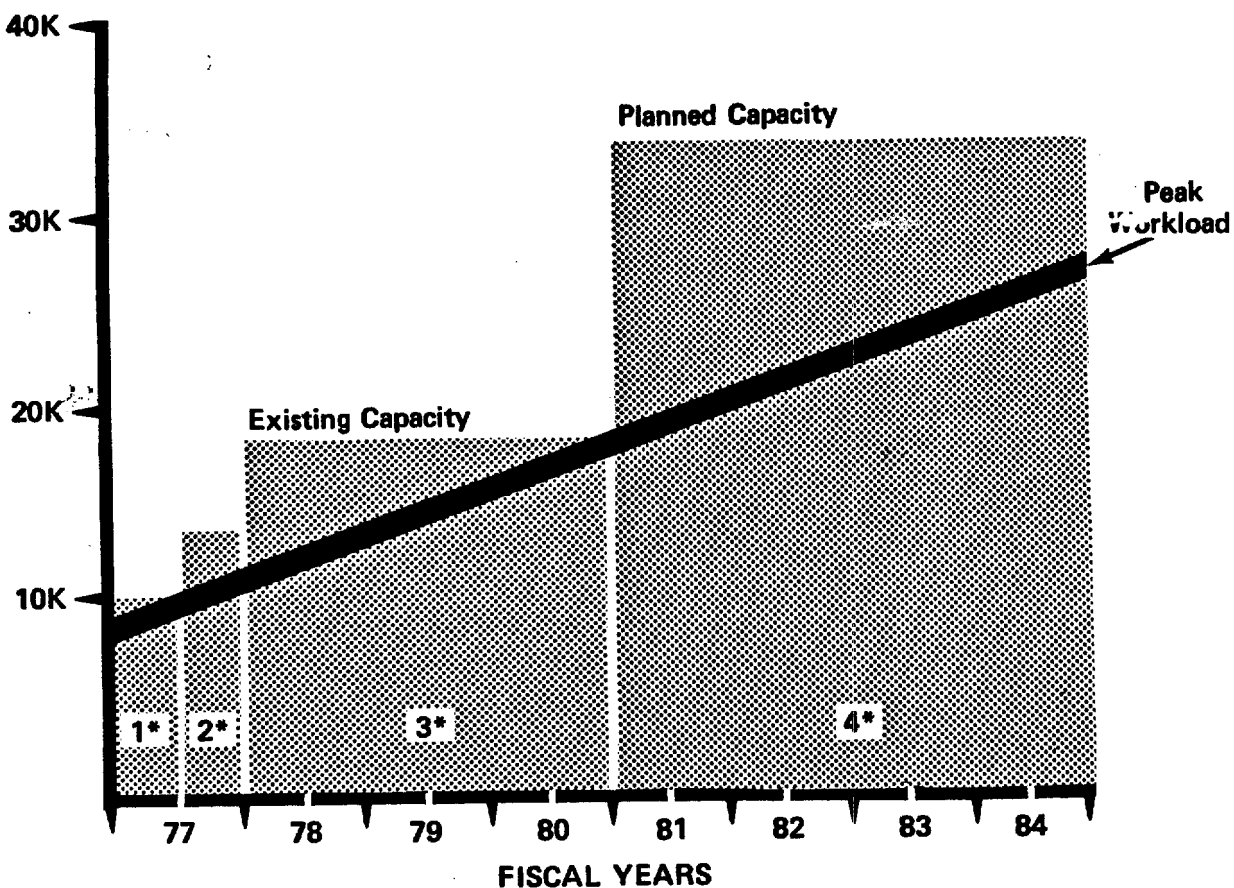
*1   168—2x.5
*2   195x.5
*3   168—3
*4   Either 470V/6 or 3033

Figure 2. GIMS Capacity vs. Workload

SECRET

requirements, is sound. Besides being a single measure, well-correlated to other more-specific workload metrics, "Maximum Concurrent Users" has the advantage of presenting to management a measure of the number of concurrent customers for whom VM is providing service. Current VM activity on the IBM 3033 CPU is at the 180 "Maximum Concurrent User" level. Table 2, "ODP Workload Summary," presents ODP's projected VM workload requirement through FY 1983. These estimates are based on historic trends and project an increase of 30 "Maximum Concurrent Users" each year. Given this rate of workload increase and assuming no significant change in the load the average user puts on the system, the IBM 3033 should meet ODP's VM requirements into FY 1983.

As the VM workload increases and as the resultant user response time degrades, ODP plans to increase the VM capacity in the latter portion of this planning period, either through replacement of the current CPU or through augmentation with an additional Central Processor. Concurrently, ODP will study the feasibility of subdividing the management of minidisk space and terminals available on each CPU. In projecting the growth rate in the use of the interactive service, ODP is projecting that the current IBM 3033 CPU will reach saturation by FY 1983 (Figure 3, "VM Capacity vs. Workload "). Beginning in FY 1983, $1,250,000 per year for five years has been identified for payment and maintenance on this new processor.

d. CAMS

Based on the major software upgrades and increased CAMS usage scheduled to begin in FY 1979, the IBM 370/158, dedicated to support COMIREX (the CAMS project), will be inadequate to meet the increase in CAMS activity anticipated during this planning period (Figure 4, "CAMS Capacity vs. Workload"). In FY 1979, a large-scale CPU will be installed in the Special Computer Center to replace this IBM 370/158. On release of this machine, it will be relocated to the Ruffing Computer Center as an interim replacement for the IBM 360/65. Approximately $1,000,000 per year for the five year period beginning in FY 1979 was allocated for payments and maintenance on the new CAMS CPU.

As CAMS is enhanced to meet the expanding COMIREX requirements, the IBM 370/158 (Blue), the DDO batch processor employed to backup both CAMS and the ALLSTAR system, will become increasingly incapable of providing the fully redundant, undegraded support currently possible. Inasmuch as the CAMS software enhancements will be implemented over several years, the effects of this increasingly degraded support will not become critical until the FY 1981 time-frame, at which time ODP, at the request of COMIREX, plans to replace the IBM 370/158 (Blue) with a processor of comparable capacity as the primary CAMS processor. This replacement machine will be fully redundant with and will provide an immediate backup to the CAMS operational processor. ODP has identified [   ] per year for the five-year period, starting in FY 1981, for purchase and maintenance of this CPU.

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e. DDO

The two IBM 370/158s supporting the DDO Information Management Staff do not provide sufficient capacity and redundancy to meet the expanding requirements of that organization. To provide interim relief for this problem, these two processors were upgraded in FY 1978. This action increased the capacity of each CPU by about 70 percent, and will prolong the useable life of these processors for an estimated period of two to three years. ODP estimates that the increased DDO-identified workload, particularly the growth in the COMET system in FY 1980, will be such that the
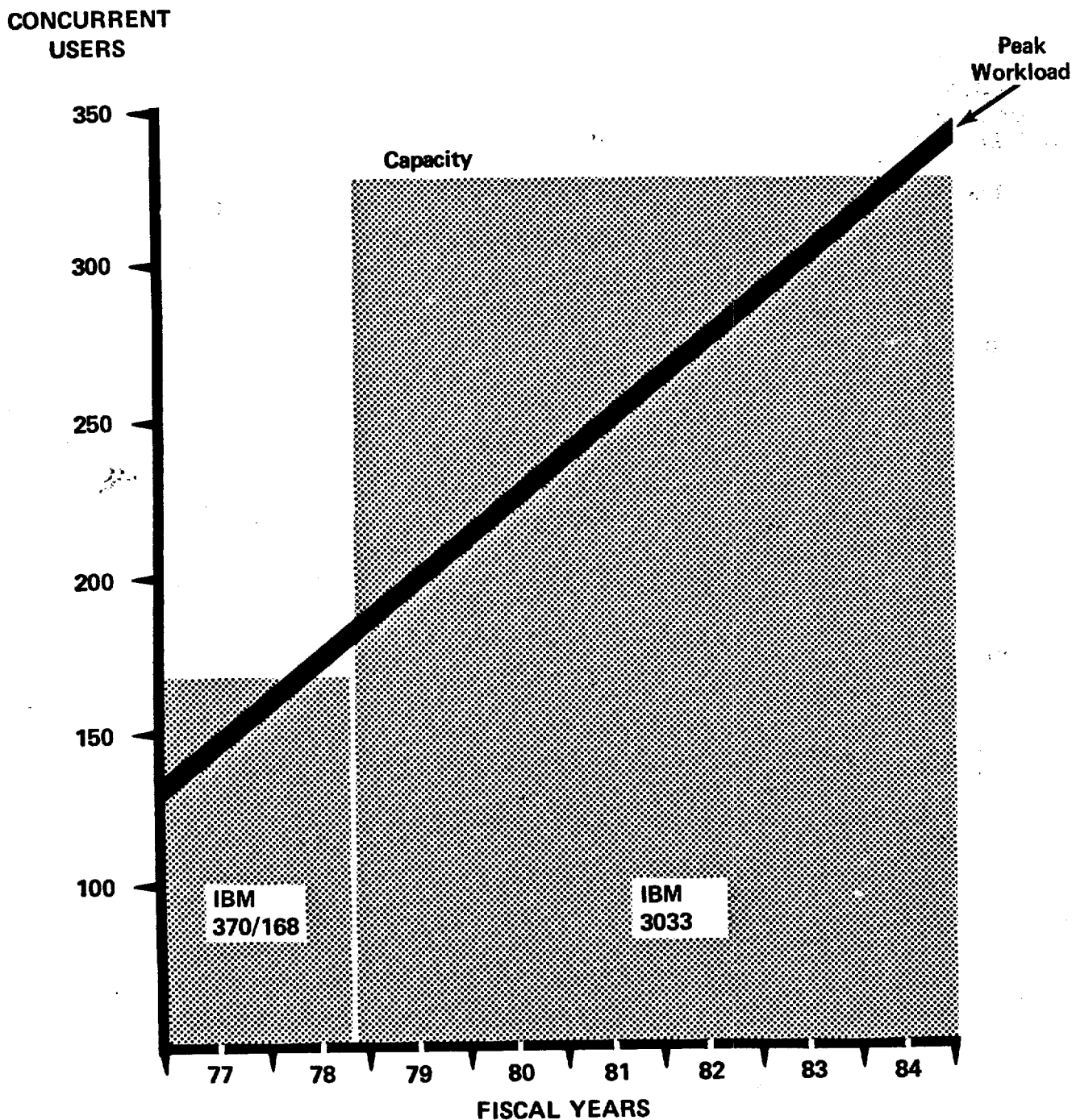
28

CONCURRENT
USERS

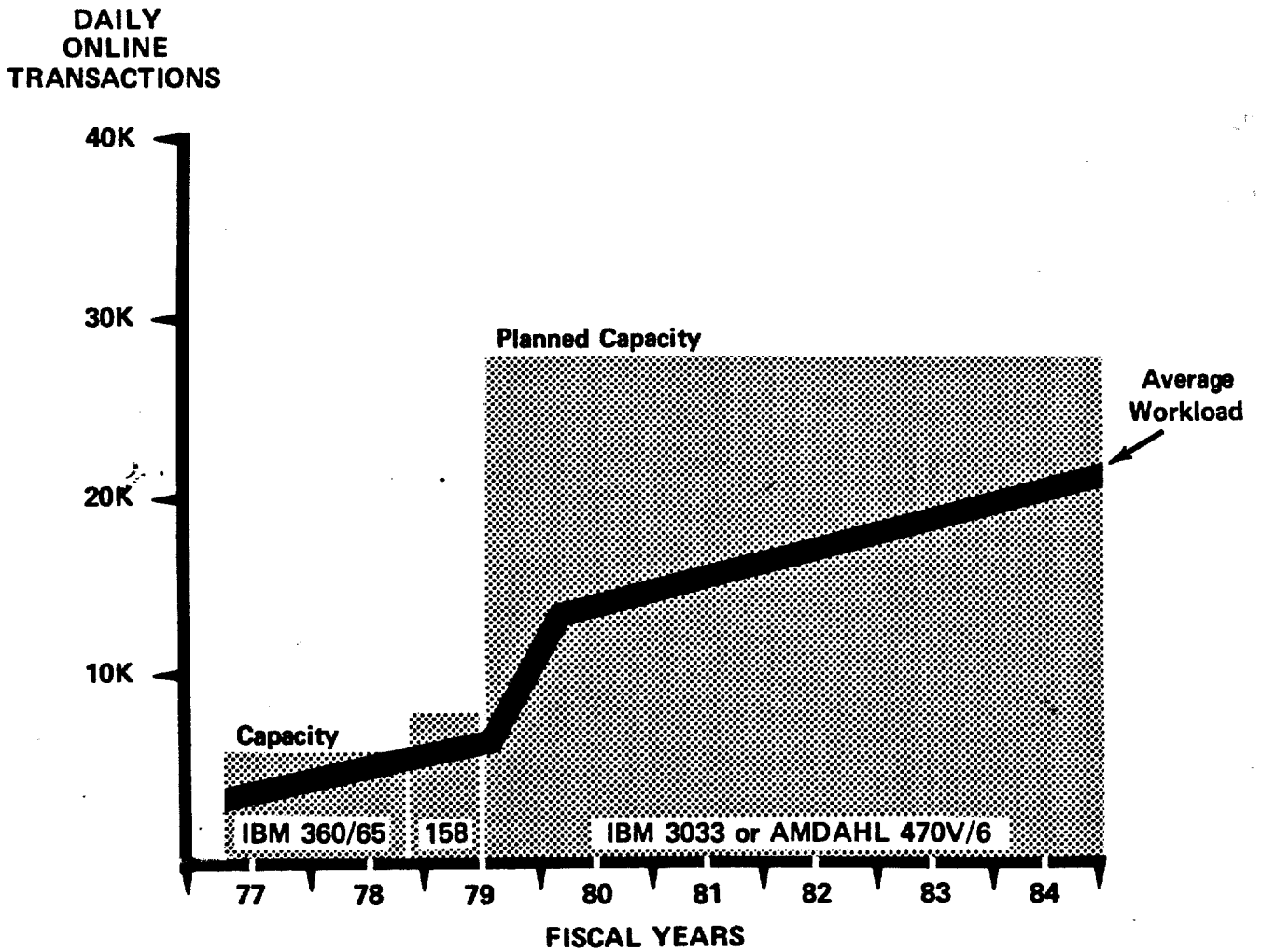Peak
Workload

Figure 3. VM Capacity vs. Workload

Figure 4. CAMS Capacity vs. Workload

primary DDO online system (ALLSTAR) will saturate the IBM 370/158 (Red) by FY 1982 or FY 1983, see Figure 5, "DDO CPU Capacity vs. Workload." With the replacement of the IBM 370/158 (Blue) by the CAMS backup processor in FY 1981, ODP and DDO/IMS must ensure sufficient balancing of mainframe workloads is done in order to maintain the most effective utilization of these central processors.

5.2.2 Data Storage

The online disk storage configuration in the Ruffing Computer Center is a mixture of basically three levels of technology, specifically, the earlier IBM 2314-type technology, the more recent IBM 3330-type technology, and the most recent IBM 3350-type technology. With each iteration of technology, the reliability and data-storage capacity was markedly improved, with the latest technology permitting storage of approximately 10 times the data capable of being stored on the IBM 2314-type devices.

To accommodate the customer requirements for ever increasing online data storage, to provide the most secure and reliable disk storage facilities that technology is offering, and yet to maximize the use of the critically limited floorspace available to the Ruffing Computer Center, ODP plans to implement during this period a phased upgrade of the disk-storage devices. With the exception of the stand alone [____] the disk-storage devices in the Ruffing Computer Center will be exclusively either IBM 3330- or IBM 3350-type devices by the close of FY 1979. Future disk storage upgrades will be influenced by the state of disk technology in the coming years. The release of the IBM 360 series CPUs also will permit release of the IBM 2301 drum storage devices.

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During FY 1979, the CAMS CPU in the Special Computer Center will be fitted with three banks of IBM 3330-type disk-storage devices and two banks of IBM 3350-type disk-storage devices. It is expected that this amount of data storage capacity will be adequate for the first several years of this planning period. Future disk-storage upgrades will be influenced by the state of disk technology in the coming years. The expected increase in tape processing will be accommodated through the addition of eight more drives on CAMS.

During FY 1979, the DDO CPUs in the Special Computer Center will be reconfigured to total three banks of IBM 3330-type disk storage devices and six banks of IBM 3350-type disk-storage devices. Two additional banks of IBM 3350-type devices will be added during FY 1980, and during FY 1982.

5.3 Software

5.3.1 Systems Software

a. Batch

The most significant batch system software effort imminent during this planning period is the completion of the conversion of the Ruffing Computer Center, then the Special Computer Center to the IBM MVS operating system. Besides reducing the amount of software to be maintained, this conversion will provide the most secure and reliable operating system available to these machines and will allow greater dataset security control.

Additional planned batch processing enhancements include:

1. Simplifying the review of batch output at terminals.

2. Improved archiving of data over prolonged periods of time.

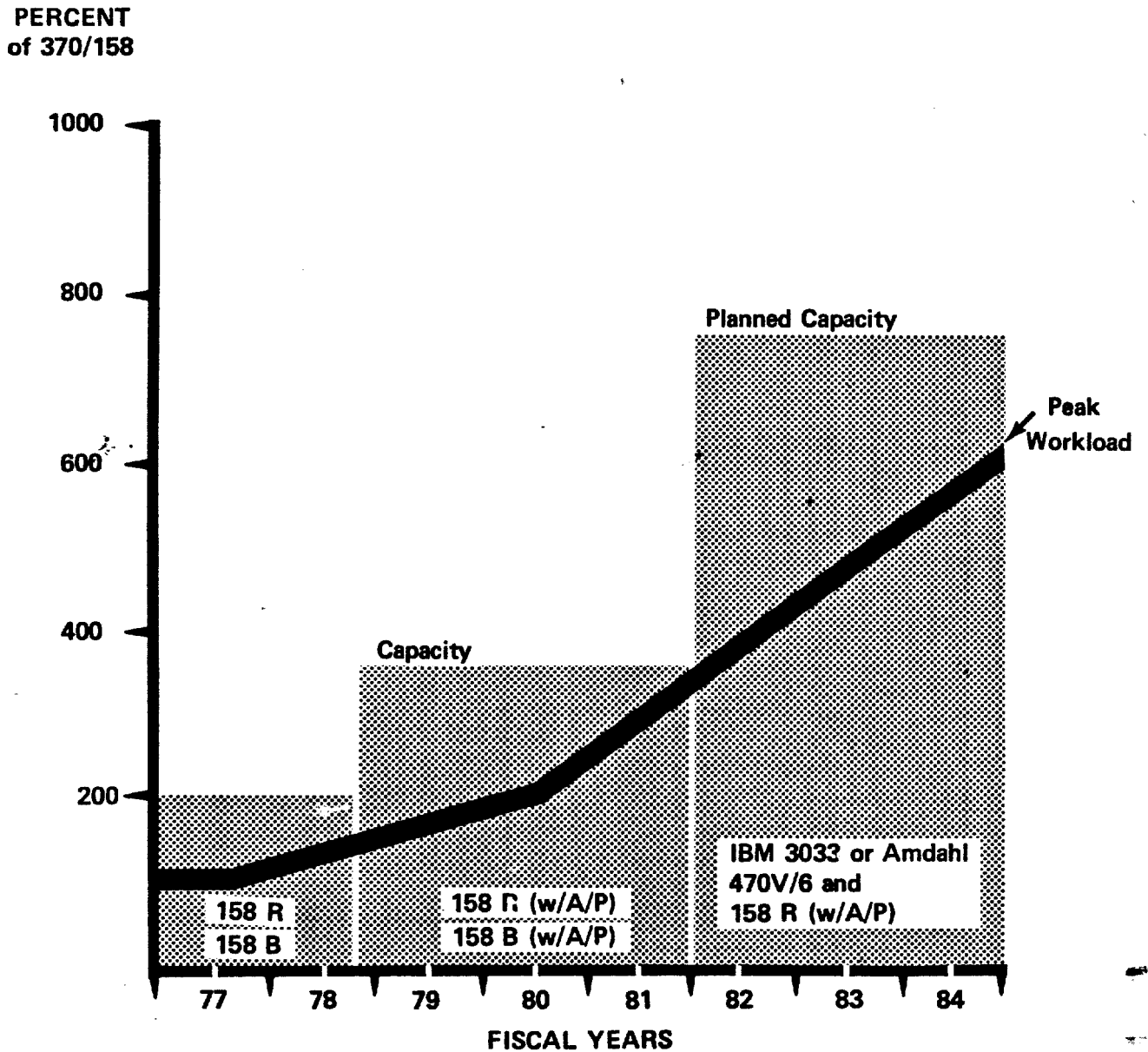3. More efficient access to data from both the timesharing and batch systems.

Figure 5. DDO CPU Capacity vs. Workload

b. VM

Major enhancements planned for VM during this period include:

1. More efficient mechanisms for specifying screen formats and data validation.

2. Easier to use text processing facilities.

3. Improved "help", and interactive "debugging" facilities.

4. Implementation of GIMS on a minicomputer.

c. Time-Sharing Option (TSO)

TSO, an IBM program product, provides the applications programmer with the capability to perform online development through the use of remote terminals. To provide the online programming facilities requested by DDO/IMS, ODP will install a limited version of IBM's TSO facility. An editing capability similar to that available under VM will be included to allow DDO programmers to edit symbolically stored programs, edit data and job control card images and submit jobs for execution.

d. GIMS

Enhancements planned for GIMS software during this planning period include:

1. Improving the performance and maintainability of the update processor.

2. Incorporation of a text search function.

3. Enhancement to the GIMS EDIT function.

4. Addition of a "help" function, similar to that which is available on the VM system.

5.3.2 Applications Software

a. Development

In the past the approach to applications development had been historically a "can do" attitude. Although this had been regarded as a healthy attitude, it led to some degree of customer dissatisfaction, ranging from slight to severe. Overly optimistic completion dates, misunderstanding of the requirements, and unintentional misrepresentation of system capabilities all have contributed to this dissatisfaction.

During this planning period ODP must continue to recognize the pivotal activity and importance of complete systems analysis during the design and development of a data processing system. The analysis should be timely, and should provide explanations of options that may be available. Continued emphasis must be placed on documentation and programming standards, as well as on project management methodology. ODP must ensure that complete involvement in the requirements, design, implementation and installation of a computer system is expected of the customer, programmer/analyst, and production specialists.

With increasing emphasis on viewing the Intelligence Community as an entity requiring computer applications support, more single computer systems will be required. This will greatly complicate the applications development process, as user involvement and enthusiasm will vary from organization to organization.

b. Maintenance

Applications development is a continuing process. Despite the increasing trend toward decentralization, there is no indication that the need for a centralized bank of skilled applications programmers will diminish during this planning period. Thus, as

new applications are completed, the likelihood of more resources being diverted to applications maintenance increases. In order to maintain increasingly complex applications programs, it is essential that program development be undertaken with "maintainability" as a goal of equal importance as the goal of fulfilling the customers need. ODP plans to continue to emphasize "Program Maintainability" by someone other than the author. This change will have several affects on how future programs are maintained. For simple modifications, it should be easier to find what should be changed and actually do it. For complex modifications, it again may be easier to find what should be changed, but may take longer to actually make the change. The end results, however, are that ODP systems will have expanded life cycles and should not have to be scrapped because they cannot handle one more simple change.

5.4 Personnel

5.4.1 Strength

To meet the increasing requirements for ODP services, this office will need to increase its strength through this planning period. Additional large scale CPUs, the establishment of the SAFE Computer Center, the increasing demands for distributed processors and terminals, the identification of more community software-development projects, and the increasing role that ODP is playing in Agency-wide ADP management can not be met with a static manning ceiling. During this planning period, ODP plans to continue requesting that this ceiling be incrementally raised at a rate of approximately 10 new positions per year.

5.4.2 Training

To continue and enhance the quality and quantity of training demanded of the Training Staff, and assuming that user-oriented training will continue to be provided by ODP, ODP plans the following:

a. Provide more technical training for ODP careerists on such subjects as minicomputers, advanced programming topics, and systems analysis.

b. Provide greater depth to existing user-oriented training courses.

c. Seek more vendor-supplied training for such courses that do not need to be tailored to the CIA.

d. Expand and enhance video training and self-improvement training courses, and further explore the feasibility of introducing more computer-assisted-instruction (CAI) courses to the online user.

e. Segment in-house video courses such that potential viewers may more readily review specific features of a given course.

f. Improve its training planning to ensure maximum benefit to ODP and to its employees from limited training resources.

MIPS	Medical Information Processing System
MPS	Message Processing System
MVS	Multiple Virtual Storage
MVT	Multiple Jobs with Variable Tasking
NFAC	National Foreign Assessment Center
NITC	National Intelligence Tasking Center
NPIC	National Photographic Interpretation Center
OC	Office of Communications
OCR	Office of Central Reference
OCR	Optical Character Reader
OD&E	Office of Development and Engineering
ODP	Office of Data Processing
OER	Office of Economic Research
OF	Office of Finance
OGCR	Office of Geographic & Cartographic Research
OL	Office of Logistics
OMB	Office of Manpower and Budget
OMS	Office of Medical Services
OP	Office of Personnel
O/S	Operating System
OS	Office of Security
OSO	Office of SIGINT Operations
OSR	Office of Strategic Research
OWI	Office of Weapons Intelligence
P&PD	Printing and Photography Division
RAMIS	Rapid-Access Management-Information System
RJE	Remote Job Entry
RMS	Resource Management Staff
SAFE	Support for the Analysts' File Environment
STAR	Special Trace and Retrieval
TSO	Time-Sharing Option
VM	Virtual Machine
WBCS	Wideband Bus Communication System

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