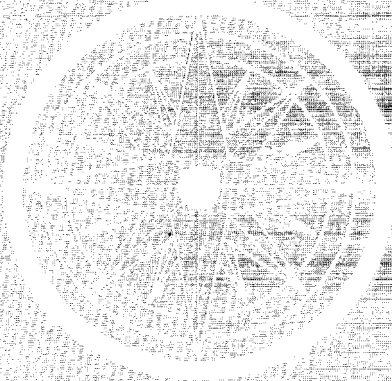


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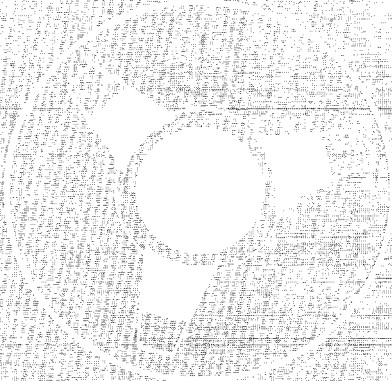


PHASE II FINAL REPORT

PROJECT CHIVE

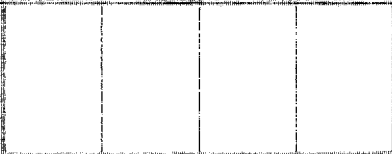
Volume III

IMPLEMENTATION PLAN FOR INITIAL SYSTEM



CHIVE/R-3-65
1 March 1965

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*U.S. Central Intelligence Agency,
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Project CHIVE:

Phase II Final Report

Volume III

IMPLEMENTATION PLAN
FOR THE INITIAL SYSTEM

CHIVE/R-3-65

1 March 1965

P&C	1	REV DATE	07/12/81	BY	018995
ORIG COMP	—	OPI	63	TYPE	01
ORIG CLASS	5	PAGES	80	REV CLASS	C
JUST	22	NEXT REV	2011	AUTH:	HR 10-2

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Chapter 3.1.

SUMMARY DESCRIPTION OF PHASE III PRODUCT

The basic goal of the Phase III effort is the creation of a well-established and organized EDP environment and the construction of an initial system component which shall be judged ready for operational testing. This component will be an experimental branch devoted to work on [REDACTED]. The operational test period should provide sufficient information to enable Agency management to make a decision on whether or not to proceed to full system implementation.

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The initial operational component, so far as is possible within the limitations of initial programming and available manpower, should:

- a. Provide a base leading toward the ultimate system objectives, i.e., broader coverage, more specific indexing, single point service, an all-source data base, capability to answer more complex questions, etc.

In addition, it should:

- b. Have a limited, well-defined data base.
- c. Benefit more than one customer group.
- d. Provide the seed from which the total system can grow in an evolutionary, not revolutionary, manner.

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- e. Require a minimum of input and retrieval coordination with the existing system.
- f. Offer a reasonably controlled environment for testing both man/machine relations as well as management techniques.
- g. Represent a wide range of the problems anticipated in the final system.
- h. Not have a disrupting effect on current service provided by OCR during the build-up period.

Indexing and file structuring concepts will be tested and refined and the operational simulation period, during the latter months of Phase III, should provide sufficient information to assist in making a final determination on the operational readiness of the initial increment.

The initial design will not stress sophisticated or unusual techniques per se. Humans will continue to do those things they are able to do best. While the ultimate goal may be extensive automation of the data input/output process, the initial steps must settle for less--a partially automated system utilizing a computer to mechanize all tasks which clearly need not be performed by hand.

While creation of a well-established and organized EDP environment may require a heavy initial investment with no immediate payoff when compared to the data base

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to which the investment is applied, the long-range objective of a broader data base, together with new concepts in system information management, would ultimately be satisfied with little additional investment in EDP techniques.

3.1.1. RECOMMENDATIONS FOR INITIAL INCREMENT

A further description of the organization, manning requirements, and tasks of the [REDACTED] Test Branch is included in later sections of this volume. The discussion which follows is included to set forth briefly the rationale behind the decision to begin initial system activity through the mechanism of the [REDACTED] element.

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3.1.1.1. Geographic Approach

While CHIVE has argued, in earlier documentation, that the central document/information reference system should be organized along geographic lines, this view was not automatically imposed on the initial system. Rather, a number of possible implementation paths - by document, by subject, by named object, and by area - were explored before a final selection was made. These various alternative approaches are examined below.

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3.1.1.2. Single Area Approach

In addressing the problem of selecting a point of entry from which the full scale system could evolve, the guidelines and objectives set forth at the beginning of this volume were adopted.

The table below portrays in summary form the extent to which various alternative initial system configurations appeared to satisfy those guidelines and objectives.

Table 3-1

Alternative Initial Organization Configurations

<u>Alternatives</u>	<u>Meets Objectives</u>	<u>Violates Objectives</u>
1. All documents, all subjects, all countries	a, c, e, g	b, d, f, h
2. Single document type, all subjects, all countries	b, f, h *	a, c, d, e, g
3. All documents, single subject, all countries	g	a, b, c, d, e, f, h
4. All documents, single named object, all countries	d, f, g, h	a, b, c, e
5. All documents all subjects, single country	a, b, c, ** d, e f, g, h	

* Depends on document category chosen.

**Depends on country chosen.

SUMMARY DESCRIPTION
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Alternative 1 is obviously unrealistic since it literally requires implementation of the complete system right at the very start. This means we would be confronted by every type of documentary problem, all indexer support tools would have to have been developed in advance, all plans worked out for supplanting every component activity of the existing system, all personnel reassigned and retrained, and so forth. More specifically, such an approach would violate the objective of a limited, well-defined data base; it would require a revolutionary development program, it would fail to provide a suitable environment for testing purposes; and the effects of failure might well be calamitous.

Alternative 2, while it would offer the limited data base and controlled environment we desire, is unattractive because it would not incorporate some of our ultimate system objectives (e.g., all-source document handling), and it would serve only those customers interested in this one source. In essence, the SR entry point, for example, merely defers (but does not solve) the problem of how the system is to evolve. Once Comint materials were under control, we would be faced with the task of incrementing the system by source, which would be most difficult since

SUMMARY DESCRIPTION
Recommendations
3.1.1.2.

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there is little to choose between the extremes of a single document series (e.g., State airgrams) and all collateral documents. Moreover, if we chose to evolve by document categories, the problems of coordinating with the existing system would be immense. Finally, the system would be criticized for having failed to address a sufficient variety of document problems which could be anticipated in the full-scale system and, therefore, having proved nothing about its long-run potential.

The notion represented by Alternative 3 is that the system would process all documents reporting information on all foreign countries, but that the subject matter of these documents would have to pertain to a single, though broad, subject area of intelligence interest, e.g., economic affairs, military activities, or other. Within the confines of this topical restriction, any kind of data might be stored and retrieved, including

25X1B [REDACTED] installations, locations, activities, and events.

If we began with such a system, it would presumably serve only one major component of the Agency, such as OCI or OSI. Its most important disadvantage, however, would be that the document base involved would inevitably

SUMMARY DESCRIPTION
Recommendations
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overlap with the existing system with consequent duplication of activity. This we can ill afford in view of the already tight manpower situation. Any request on the new system, with the exception of those asking only for the most recent information, would also have to be levied on the old since the established files could not be readily broken apart. In summary, the complexity of operating a system of this kind concurrently with the old would be great, its data base would be larger than we would want to handle in the initial system, and the consequences of failure would be serious.

Alternative 4 would give us a variety of documentary inputs and the full spectrum of area problems. Only the type of data to be processed and retrieved (e.g., [REDACTED] organizational, or other) would be restricted. Unfortunately, like Alternative 3, it would be impossible to separate the documents on this basis, with the result that both systems would receive essentially the same inputs. Its other serious disadvantages would be that the initial system could not test its integrated indexing concept, the data base would be virtually that of the final system, and it would require close coordination of request handling with the established OCR systems.

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Alternative 5 seems to offer the most advantages and fewest disadvantages of the options listed and was the one selected. Using this approach, a single country would be selected as the entry point but the entire range of documentary receipts on that country, and all types of subject matter would be handled. This would permit us to identify an initial geographical component of our total organization and test it in a real environment. The data base could be reasonably well defined, and if the country selected was of sufficiently widespread intelligence interest a good cross section of customers would be involved. The evolutionary path would be clear cut, involving the addition of new geographic area responsibilities to the new system. During the period of evolution, both the new and existing systems would have a clear understanding of their storage and retrieval obligations, and the need for inter-system communication and coordination would be minimized except in the case of "international" requests.

Certain problems stemming from linguistic variables and other processing problems peculiar to individual countries would obviously not be addressed in this kind of an initial system. However, none of the alternatives

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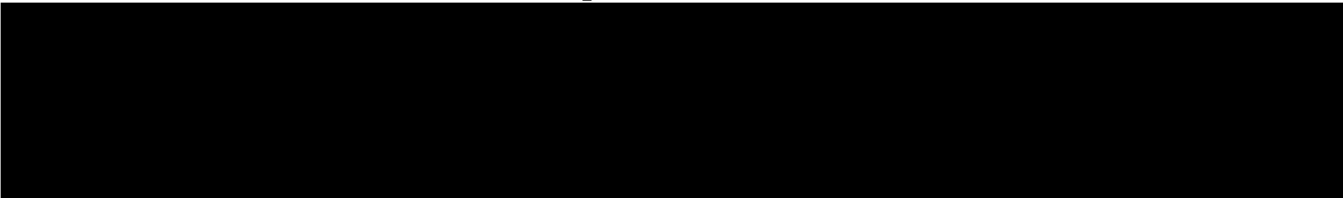
proposed except that which implements the complete system all at once would incorporate all the problems which would be reflected in the final system.

3.1.1.3. Country Selection

For initial implementation purposes it was felt that the country selected should have the following characteristics:

- A manageably low document volume, probably somewhere between 50,000 and 100,000 items per year.
- Considerable intelligence significance to generate more than average consumer interest.
- Documentation which gives a sampling of major topic areas--i.e., political, scientific and technical, military, economic.

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- Available personnel familiar with the geographic area and its documentation.

The USSR was eliminated from consideration immediately since it would be dangerous to begin the operation with the most strategic area of all, and because the volume of receipts on the USSR would be extremely high. Most of the West European, Near Eastern, Latin American and African countries are either too weak in documentation on major topics of general system interest, lack reporting

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needed skills identified. The test branch would be brought to operational strength around the tenth month of Phase III* and will move into an experimental indexing and training phase. (See timetable in Section 3.2.1.1.) Full system testing and operational simulation would begin in month 19 and the [REDACTED] branch would operate thereafter in parallel with current OCR operations until a decision could be made on the readiness of the initial component to assume operational responsibilities.

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To assist in the implementation of the test component, and to provide logistical assistance and operator advice to OCS, the CHIVE Support Staff (CSS) should be enlarged during month 1 to a five-man team consisting of four substantive analysts (probably representing [REDACTED] and one OCR support programmer who should have a knowledge of MD or SR maintained EAM authority files. Two additional OCR support programmers should join the staff at a later time. Personnel from GR and FDD could be committed on an ad hoc basis to work on inclusion of graphic indexes and on the problem of obtaining select machine-readable inputs from FDD and JPRS.

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*Note: Phase III milestones are given in months numbered serially from receipt of approval to proceed--month 1.

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Both the CSS and [REDACTED] could be slotted against OCR's T/O and would be under OCR management. The CSS, however, should be based in OCS/Development Division where work on the major system design problems and on development programming is assigned.

3.1.2.1. OCR Responsibilities

OCR should be responsible for guidance of the design activity, for establishing system boundaries and objectives and for review and acceptance of design decisions. The DD/I CHIVE Project Officer should be the responsible official for monitoring these functions. In addition, OCR should assume responsibility for providing the personnel of both the CSS and [REDACTED] Test Branch, and for obtaining clearances for these people. Provision of space for the [REDACTED] Branch as well as space in a secured area in which to establish the Document Delivery System, should be OCR's responsibilities. Personnel for the Document Delivery System could presumably be recruited from the present Library and SR document personnel and from MD's film personnel. Contracting and purchase of the Document System should also fall to OCR. Filming and key punch services related to implementation of the document system would also be OCR responsibilities.

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SUMMARY DESCRIPTION
Organization
3.1.2.1.

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3.1.2.2. OCS Responsibilities

Full design responsibility should rest with OCS. This includes system refinement and the execution and management of computer program design and development and system testing. In addition, OCS should be responsible for space to house the CHIVE design team, the CSS, the computer and attendant hardware. Contracting and costs of the computer equipment and optical character reader intended for system input should fall to OCS, as should contracting, housing, and management of the design and programming contract personnel. Contracts directly concerned with CHIVE should be coordinated with OCR. OCS should provide key punch and computer support to the system as it develops on a demand basis for requests and on a scheduled basis for input and maintenance.

3.1.2.3. Contractor Responsibilities

Under the guidance of OCS/DD, the contract personnel should be responsible for participating in and advising on all programming activities. This would include the development programming required for the initial system, and the programs required for extant OCR vocabulary control files designated for conversion to CHIVE formats.

SUMMARY DESCRIPTION
Organization
3.1.2.3.

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The contractor would be expected to make recommendations on program design, content and structuring, to propose economical and feasible EAM file conversion routes, and to continually bring to the system an awareness of new programming or EDP developments which might benefit the design activity. In addition, contract personnel should participate in system review, and take part actively in examination and evaluation of document delivery systems, character readers and remote I/O devices, including making recommendations on selection of equipment for the system.

3.1.3. THE OPERATIONAL TESTING CONCEPT

The conclusion of the Phase III effort should have modeled an initial CHIVE component which will be ready for testing. The first testing stage, beginning in month 19, will be a simulation of actual operational experience--a shakedown, in a sense, of the final configuration derived from the experimentation of the preceding months. Some further experimentation, adjustment of programs, and refinement of procedures will carry over into the initial testing stage. As far as possible, however, the initial component will act like a fully operational OCR component, i.e., it will receive,

SUMMARY DESCRIPTION
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3.1.3.

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analyze, and index documents, forward index records to the computer system, build files, and respond to queries. The major difference between the [REDACTED] Branch and a "live" OCR component will be that it will not assume actual operational responsibility to respond to queries, since these will be borrowed, or captured at the time of receipt, from the various OCR registers. It will also use the old OCR files maintained by the registers.

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The initial component must also prepare itself, to contribute to such OCR summary files or scheduled products as the [REDACTED] (distribution only), [REDACTED]

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In addition, the initial system must specify procedures for preparation of finished intelligence reports and the meeting of production deadlines for the scheduled products cited above.

This testing will take place in parallel with existing OCR operations for a span of six months or longer, or until system and Agency management are satisfied that the initial component is ready to accept operational responsibility. At that time [REDACTED] operations in the OCR divisions would be closed out and their personnel and [REDACTED] and FIB-type working files transferred to

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Testing Concept
3.1.3.

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the new [REDACTED] component. The manpower balance of the initial increment would not be increased, however, since the seasoned personnel would begin work on incrementation of the next geographic area as soon as the new personnel were trained.

Early experimentation, beginning after month 10, might involve an attempt to cope with the entire [REDACTED] document flow on a "no-backlog" basis. (It is understood that backlogging might occur in an operation mode, but, as no query would be going on during indexing, an attempt to avoid backlogs should be made.) Plans would call for capturing a one month take of [REDACTED] documents from all sources. Following the initial training period in concepts and procedures, the staff would be required to index these documents in one working month. If they were unable to do this, the indexing would be cut back and the identical documents would be indexed again within the identical time constraints. This process would be repeated until a match was obtained between document receipts and time available for indexing. At this point a second month's document take would be introduced and the entire process repeated to verify the successful indexing procedure.

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SUMMARY DESCRIPTION
Testing Concept
3.1.3.

During this iterative indexing period, a basic set of query problems would be developed and passed against the indexed data following each iteration. Presumably a trade-off point would be reached between reduction of indexing and intelligibility of query response which would aid in the determination of the final indexing plan. Indexing levels for each iteration would be worked out in close cooperation with CSS, who would recommend exclusion standards and reflect requirements of their various OCR components, and with OCS/DD where index changes affected EDP requirements and specifications.

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██████████ Branch may assist in the development of such requirements and standards.

CHIVE's present organizational thinking postulates a group of geographic divisions staffed with area/topic-specialized information/query analysts who would mark elements of information in documents for later indexing by a large, separate staff of indexing personnel in a "Content Indexing Group" (see Vol. 5). Phase III should permit experimentation with this, and other, possible personnel configurations, but will not exclude the possibility of limiting its ultimate approach to document control, saving the ██████████/installation "analysis" problem for a later time.

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SUMMARY DESCRIPTION
Testing Concepts
3.1.3.

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██████████ and organizational specialists from ██████████ and FIB could be brought into the test prior to the start of the general training period. These people would already have been given ISC training. They would go through the general CHIVE training program, but with particular emphasis on the query and file building aspects. Once experimental indexing was begun, however, their participation would be directed toward specification of named object content for document indexing and on preparation of special ██████████ and installation information and summary files.

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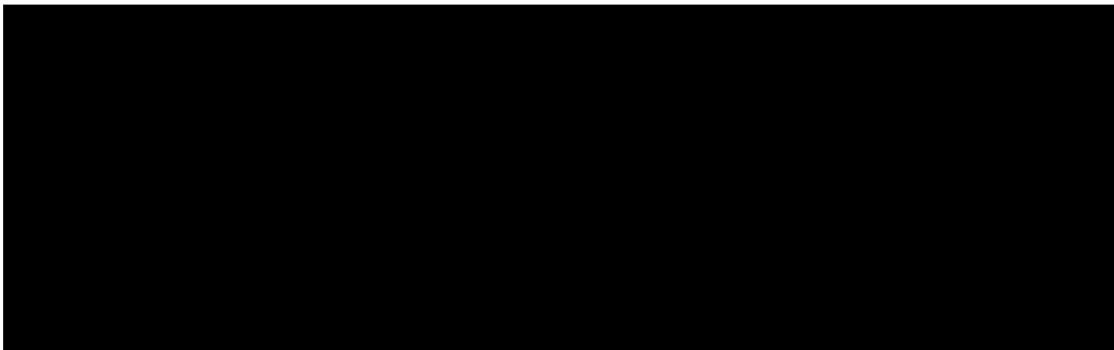
25X1B

By the time the indexing/retrieval balance was tentatively established, the CTB would have reached full operational strength. The document flow would be started and routine indexing commence.

3.1.3.1. Phasing in of New Areas

Since the planned system would increment by geographic

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should have begun by mid-1968, with full integration of the Far East completed by the end of 1969. At this point, assuming that system concepts are working out as planned, the major priority area, the USSR, could be attacked. Eastern Europe might be the third point of incrementation, followed by the Near East and Africa, Western Europe, and Latin America.

As new geographic areas are added, a repetition of many of the implementation tasks performed for the initial component will be required, e.g., vocabulary control file building (although not on the scale required for the initial component), document and data selection, file identification, and training.

Since CHIVE's recommended organizational configuration assumes geographically oriented information/query analysts marking elements of information in documents for later coding by a large, possibly separate, indexing staff, physical separation of the expanding indexing and analytical staffs and their files may become a system consideration as soon as a planned Far Eastern increment is added to the initial component.

Here, the idea of OCR adopting a "pre-CHIVE" configuration which will ease this transition becomes

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attractive. Following one possible line that OCR reorganization might take, the CHIVE indexer staff, as it expands, could become a component of an OCR "document processing center"; the information analyst staff could be based in an information center--a component formed by merging present OCR information functions under a single manager. As the system grows, the personnel from the older document and information components could move into the new activities often without physical or managerial relocation. Trained by co-workers, they would simply move from one processing mode to another.

3.1.3.2. File Co-location

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No co-location of [REDACTED] files with the initial increment is planned for the operational test stage.

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Access to major document, [REDACTED] and EAM files will become a major problem only with the beginning of real

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operational activity by the [REDACTED] component. OCR document and microimage files could be placed under a single management, and every effort made to centralize their storage and maintenance. Failing this, repeated file relocation will be required as new areas are added to the developing system, and a large amount of analyst activity will be required to tap all of the older, unrelocatable files

SUMMARY DESCRIPTION
Testing Concepts
3.1.3.2.

which may be involved in query activity. This matter is elaborated somewhat in Section 3.2.3.1.

3.1.3.3. Exclusions

As indicated in Volume IV and in previous CHIVE documentation, a number of OCR functions are excluded from initial system attention. These include dissemination, acquisition, book cataloging and circulation, translation services, EAM support to other offices of the Agency, and the activities of OCR's liaison and administrative staffs.

Each of these functions presents a separate set of problems which will, in all likelihood, require separate solutions. They have been excluded from initial consideration because they are not central to the initial implementation plan. While OCS resources are available to OCR to attack any of these problems, concentration on these functions by the CHIVE Design Staff at this time could not but impede the course of initial system development.

One area which is of concern to system development will be explored during Phase III. This is the matter of translation services. CHIVE is in close contact with EDP developments on this front through the ALP project.

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3.1.3.3.

However, the problem of obtaining selected translated materials as machine-readable system inputs is of significance as it impacts on the manpower requirements of the developing system, and a plan for obtaining such inputs should be ready for implementation prior to month 19. Some further discussion of how this activity might be carried out is available in Volume V.

Dissemination would probably be the next area to be addressed, and would involve the development of an automatic dissemination system, based on machine-stored user interest profiles which would be kept constantly under update and review. Automatic document dissemination could probably be linked to the initial header data indexing activity so that centralized dispatch of documents to CHIVE components, to user analysts, and to the central document store could be effected in one set of actions.

3.1.3.4. Inadequacies

The initial system, while it will model the total system objectives, will suffer from certain constraints imposed by development costs and rates and because of the existence of the old system. A heavy reliance on old document and EAM files can be anticipated through the first several years of operation, and this will require

SUMMARY DESCRIPTION
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3.1.3.4.

considerable manual labor in preparing products for system customers. The variety of output products involved in searches of the inherited or old files and new CHIVE files will also prevent the production of a truly integrated system response to many requests. Also, a variety of query routes will have to be a part of the new system in order to provide access to older EAM-based files. Specialists in old file maintenance and query will have to be involved in query activities on many occasions.

Limitations in the EDP environment of the new system will also create certain hardships. Since a general purpose program for query and file structuring will not be available by the time of initial implementation, files will be structured on the basis of requirements known to exist in the various OCR registers. When unanticipated types of system outputs are required, special programs will have to be created by the information analyst specifying his requirements to programmers or "EDP file analysts." The need for special programming actions, however, need not mean that special input processing will be required.

3.1.3.5. Initial EDP System Products

The initial EDP system will provide a capability to produce an entire document index record--header data plus

SUMMARY DESCRIPTION
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information indexed to the document--or to select combinations of data from the index record, suppressing unwanted indexing and arranging the required information in meaningful combinations at the direction of the system user. The initial system will provide machine assistance in the production of extensive, updated, and non-redundant formatted summary files of information on people, installations and commodities or topics. One great power in the EDP system is its ability to collect and arrange independent data elements from many index records to aid the analyst in producing non-redundant synthesized reports which can be stored, updated or printed at the operator's command. The system will also provide a limited capacity for remote visual review of index records, will output printed indexes, listings and summary reports, and will retrieve documents and make them available in either hard copy or microform.

3.1.3.6. Problems

The path of initial implementation, extending through the Phase IV live operational tests, is beset with a number of major problems. It is possible at this time to suggest tentative solutions to many of these, but, in most cases, definitive answers can be

SUMMARY DESCRIPTION
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derived only from testing and experimentation. Not the least of these problems is how best to organize the central reference activities to make maximum use of the advantages which EDP support can provide. While CHIVE has suggested a number of organizational configurations which appear to permit meeting system objectives as CHIVE sees them, primary responsibility for decisions in this area must rest with OCR. As yet no organization configuration has been hit upon which solves all system problems. OCR must judge CHIVE proposals in the light of its own experience and with a view toward providing continuity for major OCR functions. Hopefully, OCR will limit the number of organizational options by adopting a "pre-CHIVE" configuration which does not disrupt major functions and yet permits experimentation without inhibiting the development of the sound elements of the design and without drastic and repeated overhauling of major component outlines.

Another critical problem area is refinement of the indexing procedures which, are as yet, excessively complex and difficult to apply (see Volume V). An extensive training period is required to master the indexing technique, and even after this period the indexer

SUMMARY DESCRIPTION
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3.1.3.6.

on occasion finds himself in doubt about how various segments of the technique are to be applied to differing problems. Reduction of the indexing complexity will be a major Phase III activity.

Closely tied to indexing problems is the matter of selectivity both of documents and of information within documents. It is clear at this point that available manpower cannot cope with the depth of indexing and the range of document categories anticipated in early stages of the design. The requirements of the various registers, however, are such that in an integrated system no simple exclusions by document category can be made without adverse effects on one or another of OCR's requirements. No major attack on this problem as yet has been undertaken, but it must be carefully studied during Phase III in close cooperation with the OCR divisions.

Still another major problem area is how the initial CHIVE component is to interact with the the OCR divisions as yet untouched by CHIVE. This involves not only such problems as duplication of indexing with geographic areas not yet included within CHIVE, or access to unconverted files, but the involvement of CHIVE in such scheduled outputs of OCR as the IPI and [REDACTED] publications.

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SUMMARY DESCRIPTION
Testing Concepts
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System accessibility to unclassified requestors must also be examined during the Phase III activity. This matter will require careful study prior to any major investment in information file building. Safeguards to unauthorized disclosure of information must be constructed without placing limitations on the system's ability to provide service to customers who are not SI-cleared or who require information below the SI level. The capacity of the system to go as high as SI/T/KH or higher in answer to a query, but not to require the customer to accept data at this classification level whether he needs it or not, is a basic implementation objective.

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Chapter 3.2.

IMPLEMENTATION TASKS

3.2.1. BASIC SCHEDULE

Given below is a timetable for passing major implementation milestones during the Phase III effort:

3.2.1.1. Major Tasks (See chart following p. 35)

<u>Date</u>	<u>Complete</u>
Month 1	Phase II work and Phase III plan review completed EDP equipment ordered (IBM System/360 Model 60) Secure specifications of operating System/360 (software) <u>Begin</u> Enlarged CSS on board ██████ Test Branch nucleus formed Begin building indexer aids Begin specification of information and summary files Begin definition of input/output procedures Program design underway Review of indexing procedures begins
Month 2	<u>Complete</u> Document Image System selected and ordered Analysis of OCR/CHIVE indexing experiment completed Specifications for page reader completed; page reader selected and ordered <u>Begin</u> Study of Map Library and Graphics Register inputs begins

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IMPLEMENTATION TASKS
Basic Schedule
3.2.1.1.

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Month 3 Complete

Forms design completed

Begin

Begin outlining dissemination procedures

Month 4 Complete

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██████ Test Branch T/O identified
EDP equipment (IBM 360/Mod 30) on site
Review of indexing procedures completed
Program design completed

Begin

Development programming begins

Month 5 Begin

Program unit testing begins

Month 6 Complete

Support file design completed

Month 7 Complete

Detailed design procedures for Document Image
System completed

Month 8 Complete

Document site selected and prepared

Month 9 Complete

Document Image System installed
Job sheets written for ██████
Support files ready
Indexing procedures established
System test plan completed

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Begin

System test plan development started

IMPLEMENTATION TASKS
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Month 10 Complete

Dissemination procedures completed
[REDACTED] brought to full operational strength

Begin

Indexer training begins

Month 11 Complete

Initial information files fully defined
Basic operating System/360 available (software)
Page reader delivered and checked out

Begin

Start experimental indexing

Month 12 Complete

360/Mod 60 equipment installed

Month 13 Complete

System operating procedures completed

Month 14 Complete

System test development completed

Month 15 Completed

Indexing tests completed
Program unit testing completed
Graphics and Map Library inputs ready

Begin

Definition of interaction with OCR (projects,
inherited files)

Month 16 Complete

Secure full operating System/360 (software)

IMPLEMENTATION TASKS
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Begin

Final program checkout begins
Document dissemination started
Graphic and map inputs begin

Month 18 Begin

Detail procedures for customer access to [REDACTED] Branch
Customer training begins

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Month 19 Begin

Operational testing begins

3.2.1.2. Manning

The suggested manning requirements to accomplish Phase III tasks are shown on the charts included below.

Manning requirements for an operational [REDACTED] component would be substantially those of the [REDACTED] Test Branch. In addition, four people (GS-4/6) will be required to operate the Document Delivery System. Only the manpower required for the design and implementation activities is given here. Support manpower requirements, such as key punch and computer operator manning, are summarized in the Appendix 2A to Volume II of this report.

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It must be recognized that manning levels, as assigned to various tasks during initial planning, must be somewhat arbitrary and are subject to change as problem areas are explored or as more realistic estimates of the

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amount of manpower required by certain tasks are reached. It has been assumed that skilled OCR personnel can be borrowed by CHIVE for short periods to assist in such activities as file building. As a result, manning requirements, as listed for some major tasks, may prove to be conservative.

3.2.2. PERSONNEL TASKS

In the following discussion it is assumed that Phase III task initiation and completion will adhere to the implementation time-table (or schedule of milestones) listed in the preceding section of this report. Tasks tend to break out into two closely related paths:

1) management tasks - those related to T/O problems, training, clearances, site location and preparation, procurement, dissemination, and relocation of people and their files; 2) substantive tasks - those involving preparation of indexer aids, refinement of index procedures, specification of CHIVE information and summary file formats, EAM file conversion, and data selection.

Management tasks relating to larger aspects of system implementation - equipment procurement, site preparation, data gathering, and OCR liaison and support

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Personnel Tasks
3.2.2.

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should be the responsibility of the enlarged CSS working with OCS and the [REDACTED] Test Branch management.

3.2.2.1. Substantive Personnel Tasks

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The first implementation step could be to organize the enlarged CSS. At the same time, the senior personnel who had taken part in the Phase II Indexing Experiment, together with a number of support personnel, and at least one EDP systems analyst to advise on EDP possibilities, could be organized into the nucleus of the future [REDACTED] Test Branch. The personnel destined for the [REDACTED] Test Branch could be organized on a task basis to work with CSS and the Design Staff on the problems of preparing or improving the basic indexer aids (organization dictionary, location dictionary, etc.) needed for indexing in an operational component.

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Once the work on these basic tasks is well underway, the indexer group--those responsible, for example, for ISC revision and creation of new area rules--would devote their main attention to working with OCS and CSS on establishing and simplifying the indexing procedures, setting up suggested indexing levels by document series, and describing indexing levels for [REDACTED] data. Presumably these tasks will be experimental and will be

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under revision and modification throughout the Phase III activity. Experimental indexing should begin as soon as the basic tools are constructed, the revised indexing procedures defined, and interim EDP support made available.

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██████████ Branch, CSS, and OCS design personnel should coordinate work on other major system procedures tasks such as forms design, specification of summary and information file input/output formats, maintenance and query routines, customer access problems, and training.

3.2.2.2. Management Tasks

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Management tasks for the outset of the ██████████ Branch activity would involve, first of all, the setting of individual task schedules and the monitoring of progress. Continual liaison with CSS and OCR must be maintained on both substantive and administrative matters. In the latter area the early identification of OCR personnel to be detailed to file building is of prime importance, and it is assumed that persons with special skills or file knowledge may be borrowed from time to time from OCR to aid in the creation of indexer aids or summary files.

Once the initial increment of knowledgeable personnel is found and engaged in system tasks, ██████████

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IMPLEMENTATION TASKS
Personnel Tasks
3.2.2.2.

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Branch management can proceed to attack the problem of the numbers and skills of the people to be involved in the indexing activity, identify when their participation is to begin, arrange for clearances, and begin preparation of draft job sheets describing the duties to be performed and skills required for the personnel of an operational [REDACTED] component. The proposed T/O would be set during this period. Other matters requiring detailed definition are the security procedures for the operational testing phase, the establishment of dissemination patterns, and the coordination of initial system activities with the OCR registers, particularly in areas where CHIVE activities and those of an OCR division overlap.

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Management tasks devolving on the CSS will include advising on selection, procurement, site preparation, and manpower problems relating to the Document Delivery System, study of the problems of co-location of the OCR document files, securing OCR support for data collection and other design activities, and coordination with OCS on EAM and EDP support requirements relating to [REDACTED] activities.

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IMPLEMENTATION TASKS
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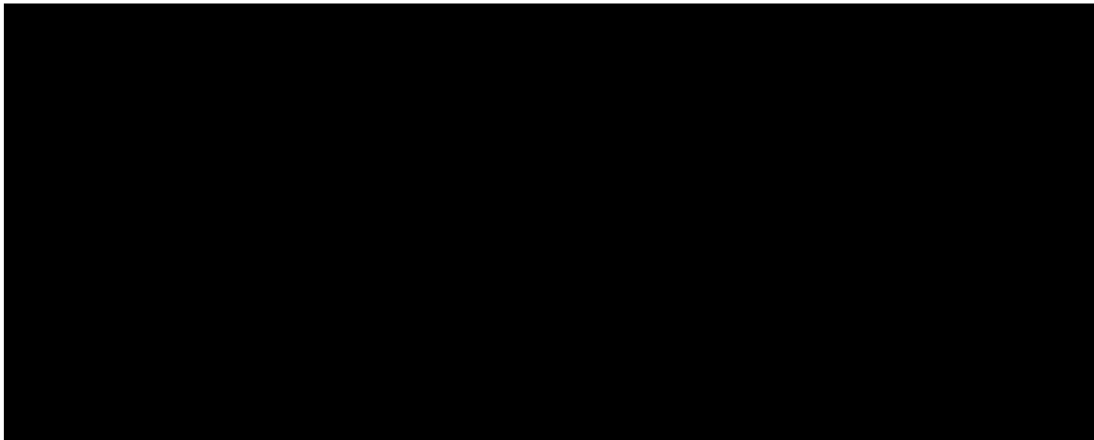
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3.2.2.3. [REDACTED] Organization

The manning of the CHIVE Support Staff has been described above. Manpower for the [REDACTED] Test Branch can only be tentatively suggested at present since a final determination will depend upon whether the test component is established as an independent unit or is attached, for administrative and logistical support, to one of the extant OCR divisions. In either event,

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clericals would be required for header data indexing, document control, filing and routine administrative tasks. Specification of the exact manpower distribution can be made only after final analysis of the results of the OCR/CHIVE Indexing Experiment (see Volume V).

Since the primary aim of the [REDACTED] Branch is to launch a parallel program which, after a period of experimentation, could become the first operational

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3.2.2.3.

CHIVE increment, test indexing should be at the earliest feasible date. It is assumed that the full complement of [REDACTED] members would be on board by month 10 so that ample time may be allowed for training.

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3.2.2.4. Operator and User Training

Operator training, in its early stages, would repeat the training pattern established for the Phase II Indexing Experiment: three weeks of training on the revised ISC book, an OTR [REDACTED] course if required, and an intensive training period in CHIVE indexing concepts and techniques. Rotational ISC training of OCR [REDACTED] analysts selected for later participation could take place well in advance of their assignment to [REDACTED]. At the conclusion of this training they could return to their home components while awaiting assignment to the [REDACTED] component. Training in a larger, practical sense would continue throughout the early experimental indexing stages of [REDACTED] Branch activities. Training in the CHIVE query language would be started as soon as indexing personnel were well grounded in indexing procedures.

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IMPLEMENTATION TASKS
Personnel Tasks
3.2.2.4.

A full scale program of communication with potential system users would be undertaken during the weeks just prior to assuming operational responsibility. A special series of briefings could be given potential users, and a short brochure describing the [REDACTED] Branch, its data base, files, and functions, could be prepared and distributed widely. In the final operational check-out period, during the last months of testing, many of the ultimate system users could be involved in testing and evaluating the system through query of the reference and information files.

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3.2.3. LOGISTICS TASKS

Logistical problems involving the computer center are the responsibility of the Operations Division and Administrative Staff of OCS and are not detailed in this report except as noted in the milestone chart given in Section 3.2.1.1.

3.2.3.1. Space

As indicated above, logistical tasks related to the [REDACTED] Test Branch and the Document Delivery System would be the responsibility of OCR. The present 2G24 site of the OCR/CHIVE Index Experiment provides a logical

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3.2.3.1.

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point from which to begin [REDACTED] Branch operations.

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Additional secure work space must be located and prepared by month 10, however, in order to house the full [REDACTED] complement and its files, and to provide some requestor work space. If possible, final space selection for this component should take into consideration its potential to expand to a full Far Eastern division and its proximity to a central document store. Total space required by the initial operational component will be approximately 2000 sq. feet - 1670 sq. ft. for personnel and approximately 330 sq. ft. for files.* Initially, the Document Delivery System should require no more than 675 sq. ft. of space in a secure area. Assuming co-location of the present Library Circulation Branch (Documents) and the SR Document Library with the Document Delivery System, a total secured area of about 6,825 sq. ft. will be required.

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The problem of the accessibility of the various OCR document stores during the development of an all-source system will arise as soon as [REDACTED] Branch begins operational

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*File space is required for indexer aids, some reference works, and documents in various stages of processing. Final file space requirements will depend, in part, on the operational status of the microimage system.

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life. In preparation for this event, centralization of the largest stores of documents and EAM files in OCR could be considered as a way to provide a common document repository out of which both the developing CHIVE system and the areas not yet affected by CHIVE could work. If the main library area on the first floor could be revamped for this purpose, the SR document files, the library hard copy and aperture card files and the new document delivery system could all be located together. The area on corridor 1H1, where the Librarian's office is located, could also be studied as a possible site for this common file. This area is also adjacent to the ■ file rooms. Placing the first floor "H" corridor area behind the SI barrier would permit free movement of system personnel through this file space, and also allow access to the nearby FIB files. Relocation of the large files would permit central access to all major files by operators of the old and new systems. It would also prevent repeated relocation of file segments as new geographic areas are added to the CHIVE initial component. Maintenance and retrieval from the central file store could be placed under a single management.

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3.2.3.1.

EAM files and equipment might also be located in one central area, possibly under a single management. There would thus be a single point of address for EAM support for non-CHIVE files or from inherited files, and a single address point for document support whether by system users or operators.

Area background files, special project manual files, and smaller working files of interest to particular groups of information analysts or particular geographic areas would be housed with the information analysts as system implementation progresses. CSS has a full inventory of [REDACTED] files and file sizes (see Volume V). An exact determination of total space requirements can easily be made as soon as the size and configuration of the initial system is agreed upon.

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3.2.3.2. Site Preparation

The site of the Document Delivery System must be located and prepared by month 8 so that equipment can be delivered and checked out. If centralization of OCR document stores is undertaken, considerable reconstruction and preparation will be required in the area chosen to house this facility. The same is true for EAM files and machinery. CSS has obtained a plan of OCR floor

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3.2.3.2.

space, including secure areas, and an inventory of equipment and shelf and cabinet files, and could advise and assist in site planning and preparation.

3.2.3.3. Auxiliary Equipment and Supplies

New equipment required for initial implementation includes the Document Delivery System (basic card files, cameras, printers, etc.) itself, and the optical page reader designed for system inputs. Specially equipped typewriters to prepare transcript sheets for acceptance by the page reading devices will probably not be required. The IBM "Elite" type appears to be the most common Agency typewriter font, and the basic font for the page reader and printers should probably be selected on the basis of the availability of this font. Final selection of a type font, however, and a possible subsequent requirement for additional typewriters, will both be contingent on the specifications established for the optical recognition equipment. Other auxiliary equipment might include two or more remote input/query stations (keyboard or CRT) or, possibly, a long-distance Xerography link.

Whenever possible, equipment now owned or rented by OCR or OCS will be used to support the initial system. Examples of this would include Xerox 914 machines now stationed in OCR, and OCR-owned film processors and

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3.2.3.3.

keypunch equipment which can be utilized to support the Document Delivery System. A number of these are cited in the Appendix 2.A. in Volume II. The complete inventory of OCR equipment completed during the past year will be used to determine whether needed equipment is available or must be obtained.

The 360/Mod 60 computer system and attendant hardware is an OCS requirement, with or without CHIVE, and may therefore be considered available Agency equipment. Initially, OCR will share this computer with other users. However, the CHIVE machine-processing load should probably be reviewed after the first two years of operation to determine the best ultimate course to follow in managing the computer element of the system.

A number of remote communication terminals (IBM 1050 keyboard/printer, 1015 CRT Inquiry Display Terminal, and 2250 large CRT with light gun) are included in the system/360 equipment package being considered by OCS for installation in the Headquarters Building Computer Center. These terminals will be available for experimental purposes, and it is planned that one will be used to link the [REDACTED] with the Computer Center. While these terminals will provide only a limited capability, as initially

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programmed, they can permit remote display of index records or remote examination of query response while a search is going on. Initial experimentation may help in determining whether or not a total system requirement for such remote display devices is likely to develop. In a total system remote inquiry/output devices could be used to link the geographic divisions with the Computer Center or to connect either of these areas with such remote requestor locations such as OO, NPIC, or OCI Operations Center. Both ends of the remote terminal will be in a secure area; security of the cable will be explored as soon as a selection from the various available remote devices has been made.

3.2.3.4. Move Schedules

Preparation of move schedules, beyond those needed for relocation of the expanded [REDACTED] by Month 9 or 10, and those required to prepare space for the Document Delivery System, must await a decision on when the initial system is ready to assume operational responsibility. During a period of parallel operation, collocation of any OCR files with a CHIVE component would work a hardship on current OCR operations.

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Collocation of [REDACTED] plant and town

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3.2.3.4.

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folders, or large document collections has not been included in the basic task schedule. However, movement of some of these files to a centralized location has been recommended earlier in this volume. Designation of the files to be relocated, a final estimate of their floor-space requirements, identification of their containers, preparation of new containers as needed, labeling of files and their placement in the work area is all comprised in this task. CSS should play an advisory role in this task so that procedures for CHIVE access to relocated files may be defined well in advance of operational activity by the [REDACTED]

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Delivery of the Document Delivery System has been scheduled tentatively for month 8. Moving of files and clearing of floorspace to accommodate this system and its personnel should be completed by late October. Movement of files destined to be housed with the Document Delivery System need not wait upon installation and checkout of that system, but could be scheduled for relocation as soon as the determined site was cleared of other occupants and secured for [REDACTED]

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3.2.4. DATA SPECIFICATION TASKS

This group of tasks involves the selection of the documents and document series to be indexed in the initial system, the identification and preparation of information and support files, the conversion of OCR EAM files required by the system, and establishment of selection criteria for the initial system indexers.

3.2.4.1. Document Selection

The document base and volume for [REDACTED] were determined prior to the Phase II CHIVE Indexing Experiment, and a description of this is given in Volume V of this report. Of the document categories known to be destined for inclusion in the initial system, those received through established Agency distribution channels; i.e., the basic USIB reporting, have been called "repository" documents. These will automatically receive header indexing. A number of document categories which are of interest to only certain information analysts [REDACTED]

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[REDACTED] and journal clippings, etc.) have been called "non-repository" documents. These can be excluded from

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mandatory header indexing since these documents would be selected and marked for indexing by the information analysts. Only the "non-repository" documents selected for content indexing and storage in the Document Delivery System would require header indexing. Non-repository documents which do not pass through regular dissemination or are obtained by subscription, will pose a special problem for the initial system. These documents will have to be identified and copies directed to the [REDACTED]

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STATSPEC The general flow of IR's, finished intelligence, cables, FDD and [REDACTED] published materials should pose no dissemination or procurement problem. However, a number of document series (FDD scientific abstract items, SI teletypes) which could eventually be received in machine-readable form will have to be provided for. The system personnel will have to (a) accept the idea that these materials will not be indexed until they can be machine prepared or (b) allow for additional manpower and indexing time to input these documents, or (c) make provision in Phase III to prepare these inputs for system acceptance in machine language by the end of Month 18. While the latter of these alternatives is the most desirable, it will require special study and the allocation of development manpower to make

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these inputs ready by the start of [REDACTED] testing activities.

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Disposition of TS documents and certain special categories now controlled in SR will also require study during the Phase III effort. A program for dealing with these classes of documents will have to be worked out before the start of Phase IV.

Even with information specialist marking of documents for indexing, the document flow intended for coding may prove too deep for available manpower. At a minimum, present NODEX standards, and indexing levels applied to various document series by the various registers, must be examined to assist in determining whether any major document series can be excluded from indexing or, if indexed, to what level indexing must be applied.

3.2.4.2. Data Selection

This is one of the most difficult of the tasks to be undertaken during Phase III. A selectivity standard based on current operational needs can be developed if the information specialists are asked to only mark items to be indexed in their documents and the indexing and transcription of this material provided by a separate

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group. Indeed, if this system proved satisfactory to the information retrieval personnel, it might never be necessary to specify a set of general system selection criteria for named object indexing except, perhaps, for some series. The danger in this approach is that the information specialist, with a free hand to mark items for someone else to process, may use very little discrimination in what he marks for indexer attention. A thorough review of processing criteria by geographic area for [REDACTED] and installational indexing would have to be made by the [REDACTED] and FIB management with selectivity criteria defined by the working personnel. FIB appears to have made a good start in this direction already, and [REDACTED] could probably formalize its processing requirements for [REDACTED] as an initial attack on this problem.

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Levels of data specification by document series, as currently applied in the various registers, would have to be summarized and compared with CHIVE minimum requirements and with the needs of the information registers. Some series could be handled at the header level only, still others would require only minimal named-object indexing. Others (diplomatic lists, plant

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brochures, finished [REDACTED] reports) could be given header indexing but could be retained in hard copy for the topic or area to which they pertained.

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3.2.4.3. Map Library and Graphics Register Inputs

During the Phase II activity, informal agreements were worked out between OCS, ORR/Map Library, and OCR/Graphics Register to provide for the development of compatible index standards which would enable either the CHIVE analyst, or the graphics or map analysts, to search the central computer system for index records to maps, photos and films. A major Phase III task will be the coordination of index development, the establishment of index levels, and arriving at index compatibility with Map Library and GR so that computer inputs can be ready for acceptance by October 1966. Development Division personnel will be assigned to this task and persons familiar with the GR and Map Library systems and requirements will, presumably, be loaned to the development activity by the map and graphics components.

It is not planned that the map and graphics document files be made a part of a central document delivery system. The physical proximity of these files to the central system is, however, desirable. GR is already located in an area

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adjacent to the first floor location which has been suggested as a possible site of a central document store. Conceivably, the small Map Library Headquarters collection could be located nearby.

3.2.4.4. Vocabulary Control Files

The construction of indexer tools and vocabulary control files would be among the very first implementation tasks. These are discussed below.

3.2.4.4.1. Area Dictionary

The area rule problems as applied during the CHIVE Indexing Experiment will be examined. Intelligence Subject Code area rules would be modified and a special area indexing procedure generated especially for CHIVE's indexing problems. A Master Location Dictionary for ██████████ based on the ISC dictionary and NIS Gazetteer would be developed.

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3.2.4.4.2. Intelligence Subject Code

Suggested revisions to the ISC book would be collected and incorporated into a CHIVE version of the ISC. In addition, the ISC would be expanded to include those subject/codes peculiar to Comint materials.

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3.2.4.4.3. Occupation and Function Code

Special occupation and organization function listings for personality and installation indexing will be developed. The ISC in its present form would not be used for this purpose.

3.2.4.4.4. Organization Identifier File

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A [REDACTED] Organization Identifier File will be developed consolidating the organizational information available in SR, FIB, and [REDACTED] cross-referenced and non-redundant, and reformatted for computer. This would probably be the most sizeable of the file building tasks and could be expected to extend through the first six months of the Phase III effort. Specialists on [REDACTED] organizations would be borrowed from appropriate OCR divisions to advise during this activity. One of these people would probably be identified as the organization dictionary editor of the future [REDACTED] Branch. At least two subtasks would be involved in this effort: (a) establishing a liaison procedure with SR, FIB and [REDACTED] to pick up newly identified [REDACTED] organizations and to record changes in established ones, and (b) analysis of the political organization problem peculiar to [REDACTED] category files to determine whether these files are

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suitable for incorporation in the basic organization dictionary or whether they are more efficiently maintained in manual form.

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3.2.4.4.5. [REDACTED] File

The possibility of reformatting the [REDACTED] listing for use both as an index to [REDACTED] and as a basic reference aid must be studied. The entire card deck for each [REDACTED] entry could be rearranged so that all elements of information coded to the [REDACTED] could be listed after the name entry.

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3.2.4.4.6. Header Data Dictionary

Creation of a more detailed Header Data Dictionary is required to establish standardized control terminology for recording and displaying data contained in the bibliographic or header portion of documents.

3.2.4.5. File Conversion

Present planning calls only for initial conversion of those EAM-based OCR files which are required by CHIVE to provide vocabulary control aids for the system. These are listed in the preceding section. Conversion of the EAM card base for the Intellofax, SR, FIB, or [REDACTED] document or [REDACTED] presents a number of severe

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problems and will require careful examination of the most feasible conversion routes for the most active files. This matter is being studied and some further discussion of the problem and its approaches is given in Volume V.

3.2.4.6. Information Files

EDP-based summary information files would be created by the information specialists assigned to the [redacted] Test Branch. These files would be begun on the basis of an established requirement for the maintenance of such files in [redacted] FIB, or any other OCR component.

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An all-source [redacted] would face at once the problems of all-source [redacted] and installation summary files. These would include organizational and target installation listings, some of which may be identical with or derived from, identifier lists. Construction of non-redundant, summary [redacted] and installation summaries could be begun as soon as experimental indexing was started. Construction of these files would make use, wherever possible, of work already done in [redacted] and FIB.

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Other summary files, such as [redacted] (a contribution only), leader appearances, travel listings, may also be required. In addition the initial system must

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be prepared to simulate or specify procedures for the preparation of finished intelligence reports and meeting production deadlines for the products cited above.

The system should also experiment with the preparation of summary information files from unsynthesized data in the index records, and should attempt to gain experience in preparation of these outputs. Timeliness, both of input and output, will be a significant factor in judging the success of the unsynthesized file approach in filling requirements for such closely scheduled system products as leader appearance listings.

Information files will be constructed at the lowest possible classification level. Here, the problem of all-source inputs will be a significant factor, since the files must be ready to serve a wide range of system customers who will want products at the all-source level and below.

3.2.5. PROCEDURES TASKS

The tasks described below are related to the problems of how the system is to operate once it enters an experimental indexing mode and thereafter. A number of activities touched on in preceding sections, experimental

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use of remote input/inquiry devices, for example, might also be considered procedures tasks.

3.2.5.1. Indexing/Transcription Procedures

An indexing guide was developed for the OCR/CHIVE Indexing Experiment (see Appendix 5.C). For an operational system the manual needs considerable expansion to cover:

- Indexing procedures unique to ██████ as an area. 25X1A
- Special indexing rules which should be developed out of the experience gained in the experiment.
- Document selection procedures unique to ██████ as an area. 25X1A

Header data and content data transcription sheets have also been developed, but experimental use indicates some need for revision. A single header data transcription sheet was developed for all sources for use in the experiment. It has been recommended that during Phase III several forms be developed to accommodate various series and that the use of continuous roll forms be investigated as an aid to expedite typing. Both the header data form and the content data form which is used to retype the content data from the indexer's handwritten transcription form will have to be developed with the requirements for character reader input in mind.

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3.2.5.2. Other Forms Design Requirements

3.2.5.2.1. Summary File Forms

25X1B

██████████ and installation summary files may require special input/output forms. The content requirements of these files can be established by the appropriate OCR divisions. However, considerable study of formatting problems may be required.

3.2.5.2.2. Transaction Processing

A general form on which to record information about processing activity will also be required. A version of the input transcription form can be passed through the page reader for computer action; however, additional data about the query transaction must be captured. Possibly some variation of the data collection forms used in the OCR/CHIVE Indexing Experiment can be employed initially and revised as new requirements come to light.

3.2.5.2.3. Document Requests

Another form will be required for communication with the Document Delivery System when large numbers of documents or files are requested and it would be burdensome to transmit document numbers by telephone.

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3.2.5.2.4. Error Correction

An error correction form may also be required so that items in index records rejected as incorrect by the computer can be corrected by the indexer with a minimum of reindexing or retyping.

3.2.5.2.5. Index Instruction

A form may be needed through which the information analyst can specify his input or maintenance instructions to the indexing staff. In many instances, marking the documents themselves may not be feasible. This area of analyst/indexer communications is, as yet, unexplored territory, and detailed procedures specification in this area will become a major system requirement.

3.2.5.3. Operator/User Communications

No novel operator/user communication techniques are planned for the initial system. Communication with system customers will take place by mail, by personal customer visit, by black and gray phone communication, and through use of the Headquarters Building tube systems. Agency mail and courier service will be used between [REDACTED] and remote locations.

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The major task in the communications area will be to define and simplify [REDACTED] contact with customers who

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are not cleared at the all-source level. A special work area will have to be established for customers who cannot visit the Branch itself, and [REDACTED] analysts will have to meet with customers in this area to discuss requests, make files available, and explain query products.

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Establishing feedback procedures to record and describe customer reactions to the developing system will be another essential system task. Feedback can be captured verbally, by CHIVE analyst comment on his requestor's reactions, and also by followup forms attached to distributed query products. Circulation of a questionnaire to known system customers at the conclusion of the initial operational test period will also be considered.

3.2.5.4. Maintenance/Query Procedures

An extensive set of file maintenance and query capabilities has been designed for the initial EDP system. Appendix 7.A. describes the query language by which the information analyst will request the performance of these functions by the EDP system. The optical page reader will accept the user coding sheets for maintenance and query as well as for index record input. Experimental usage of the query language will

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be required to determine whether improvements can be made in its ease of use and capabilities. Possible changes might involve altering the syntax of the language, the coding forms, or, most importantly, the functions performed by the language.

The structuring of new files, new output reports, and new input formats will be carried out initially by the programming staff by way of the assembly/compiler languages of the system/360. As additional operating experience is gained, higher level, problem-oriented languages will be developed for the structuring of files, inputs, and reports.

3.2.5.5. Management Reporting Procedures

Throughout the implementation phase it is assumed that both periodic and ad hoc reports to OCR and OCS management will be made through CSS, [REDACTED] and Development Division personnel. Written reports will be produced as various milestones are passed or as management approval for design decisions is required. [REDACTED] will report routine management information on work accomplished, personnel actions, etc., in the manner of a line OCR component. As soon as experimental indexing has begun, logical products of this activity, e.g., volume figures,

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indexer rates, key punch times, and transaction speeds can be collected. The initial component will have the capacity to produce manually any of the data now reported routinely to OCR management by its operating components, and to generate automatically information on machine activity of interest to OCS management and to design personnel.

3.2.5.6. Procedures Documentation

Input, maintenance, and output procedures for the CHIVE document index files will be summarized and described throughout the initial implementation period. Indexing manuals will be created and kept under revision. In addition, a query guide, which will also include access and maintenance routines for summary files, vocabulary control files, and other identifier listings, will have to be drawn up. Capabilities of and access to external OCR files of interest to the CHIVE system will also be described, as will procedures for interaction or feed-in to on-going OCR programs which may be influenced by CHIVE developments.

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3.2.6. PROGRAMMING TASKS

3.2.6.1. Program Design

The CHIVE System Design has specified an overall system flow, system loads (input, processing, and output), system priorities, system queues, etc. This information will be used in Phase III for program design.

The program designers will specify the logical program units that must be written. These program specifications will delineate all of the relevant parameters associated with each program unit. These parameters include;

- input data formats, devices and volumes;
- processing requirements for file building, maintenance and query;
- output devices, volumes, and formats;
- storage allocations; and
- interface between program units.

3.2.6.2. Development Programming

This task involves the translation of the CHIVE Program Design into an operational program. The first step in accomplishing this task is to prepare flow charts of all EDP functions. These flow charts will be reviewed by project management to insure that the

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system design has been properly interpreted. The next step is coding into an appropriate language which can be read by a computer processor. Testing will then be performed on program units which will later be assimilated into program modules for further testing. While a program unit performs limited functions such as sorting, merging, and report structuring, these units will be combined into program modules (such as output processing, file searching, and file maintenance) for further testing.

3.2.6.3. System Testing

During the program development task a set of objective criteria will be established to be used as a final test of the programming system. This test will demonstrate to management the capabilities of the CHIVE Operational program.

The complete program system must finally be tested for proper interaction among the program modules and to insure that the program units and modules properly interface with the operating system. Input conditions are established and data used to simulate operational conditions. This testing will uncover flaws in the program design, flow charting, and coding efforts. These errors will be corrected under this task.

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The final phase of testing will consist of using the previously developed set of criteria for system testing in order to secure management approval of the systems operation.

3.2.6.4. Support Programming

The development of an operational EDP system requires a variety of computer programs other than the operational program itself. Support programming on CHIVE has been carried on for several months in support of the document indexing experiment. This effort will be continued and will expand to include the programs necessary to convert existing files into formats that can be efficiently processed by a computer as well as the development of support files such as authority lists. The capabilities of existing programs will be exploited before special purpose programs are written since efficiency of program operation is not a significant factor in this task.

3.2.6.5. IBM System 360 Software

Major decisions have yet to be reached on the degree to which the more sophisticated IBM programming packages can be exploited in the development of the CHIVE EDP system. The target dates for availability of these packages are such that severe delays could be encountered in providing the initial capability if full reliance on

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IBM software is planned. While reliance on these programs is advisable because of their power and the need for Agency programming standards, the need to get on with the job may require that some initial work be undertaken without these programs being available.

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