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INTEGRATED INFORMATION SYSTEM REQUEST FOR PROPOSALS

FEBRUARY 1968

DECLASS REVIEW by NIMA/DOD

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INTEGRATED INFORMATION SYSTEM

REQUEST FOR PROPOSALS

February 1968

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BACKGROUND AND SYSTEM CONCEPTS

Our concern in this Request for Proposal (RFP) is with imagery and the efficient exploitation of that imagery. This exploitation must be facilitated to the greatest possible extent. To accomplish this, the techniques and practices employed by the photo interpreter must be continually improved. A key to this improvement involves the capability of giving the photo interpreter complete, accurate, and timely information, thus enabling him to produce more meaningful intelligence per unit of work. One major aspect of such support involves the use of computers. A recent study, which analyzed information requirements for the imagery exploitation process, indicated that it could be improved through the more effective use of computers. This study also indicated that it is possible to store most of the required information on computer mass storage devices to which analysts would have direct and rapid access. This system concept is called the Integrated Information System (IIS) and embodies such obvious advantages as immediate access to data by photo interpreters producing imagery-derived reports and the capability of updating files immediately for subsequent reporting. Other advantages to this system include the more rapid dissemination of information in hard-copy reports to users and, eventually, the elimination of some requirements for finished reports by making possible direct queries of supporting data bases. Our primary purpose in issuing this Request for Proposal is to obtain a contractor and the necessary personnel who will be capable of assisting in implementing this system.

The IIS calls for a data base consisting of four major files:

- (1) the Installations Data File (IDF)
- (2) the Mensuration Parameters File (MPF)
- (3) the Objects Data File (ODF)
- (4) the Exploitation Products Data File (EPDF)

This data base will be maintained on UNIVAC Fastrand II drums. Indexes to the data base will reside on high-speed FH-880 drums. The drum memories are controlled by a UNIVAC 494 real-time operating system. Depending upon their function, personnel will communicate with this computer storage system through a variety of terminal devices. These devices will range from simple keyboards (used for entering information) to cathode ray tubes, which will be used for the verification, editing, and approval of displayed information.

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High-speed printers will produce output that does not involve real-time communication.

The IIS will support the photo interpreter during three major processes: prior to reporting, during reporting, and after reporting has been completed. Before the reporting process begins, the system will

- * predict those installations which will be imaged on film;
- * provide data to aid in the assignment of photo interpreters and in the scheduling of their workloads;
- * issue instructions for the delivery and control of film to assigned personnel; and
- * provide them with necessary data from the data base for the reporting process.

During the reporting process the system

- * will allow the photo interpreter to query the data base for additional information;
- * using the Mensuration Parameters File and other related programming packages, will permit on-line mensuration;
- * following the analytical process, facilitate the entry, verification, editing, and approval of reported information.

After the reporting process has been completed, the data derived from imagery analysis will be used to automatically update the Installation Data File (IDF) and to generate hard-copy reports in response to current production requirements. Photographic interpretation reports may contain collection interpretations for a given day or week. Although emphasis has been placed on the IDF, the program packages must be applicable to all files in the data base as indicated in the specifications.

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SYSTEM CONFIGURATION

The system configuration during the development and implementation stage includes hardware, software, as well as the data base files. The hardware configuration for the first stage is given below. A second UNIVAC-494 system will be installed in the future when the IIS has been implemented. Estimated installation date of the second system is April 1969. The associated remote terminals not listed will also be available during the development of the various program packages.

<u>UNIVAC Equipment</u> <u>(Model Number)</u>	<u>Unit</u>	<u>Quantity</u>
3012-00	Central processor	1
7005-97	Core memory, 132K	1
5008-17	Magnetic tape control	4
859-02	Magnetic tape unit VIIIC	12
6010-00	Fastrand II	2
5009-08	Fastrand II control unit	2
900-06	Communications terminal module controller	2
755-00	Printer	2
8120-02	Printer control	2
2010-06	1004 II-06 card processor, reader, punch, & printer	2
597-02	494/1004 adapter unit	2
2009	Card punch	2
7304-01	FH-880 drum	2
8103-03	FH-880 drum control	2

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Included as supplemental information are hardware specifications for remote devices which will be connected to the computer complex during system implementation. Although these hardware specifications are sufficiently detailed for proposal purposes, they are not to be considered final. These remote devices will be connected via the UNIVAC Standard Communication Subsystem.

The software system consists of an executive (RUM), a generalized real-time program (ART), and an assembly system (SPRYE) developed by the US Government. The RUM Executive System is a multiprogrammed operating system actuated by interrupts. The interrupts are either processed or logged for later processing before control is returned to the interrupted activity. RUM handles all normal executive services and communication interrupts, lists them, and passes control to the proper real-time service routines. Only real-time programs are allowed to converse with a given remote station, except for privileged IIS batch programs authorized to use Send-and-Receive operations. These operations will be implemented by the Government during the IIS development.

The combined services of RUM and ART are referred to as the RYE Executive System which provides the following services:

- a. Automatic scheduling and loading of programs
- b. Staging of remote input and output on mass storage
- c. Logging of CPU activity
- d. Conversation between remote stations and special application programs
- e. Standard peripheral interface handlers

For example, a customer initiates a request from a remote station for a particular program by inputting his request and data on an ASR-35 teletype or other remote device. The request for a program and associated data will be queued on a Fastrand drum. When the customer indicates that he is finished sending all the associated data, the program will be placed on the scheduling queue. The queue is periodically examined to determine which program is to be loaded next.

SECRET

SECRET

The following factors specify this determination: (a) core requirements; (b) the ratio of input/output to computer time; (c) peripheral requirements; and (d) priority.

Once the program has been loaded and logged, it will access its data by requesting RYE input.* As requested by the batch program, RYE will retrieve the data from the drum. The batch program processes the data and may also output the processed element through RYE. If output is required, RYE will accept the data and store it on the drum until an end-of-message is received from the batch program. RYE will transmit the data to the customer at remote-station speed when the device is free. Core and facility requirements of the batch program are released upon its termination even though the output has not been transmitted to the remote station.

Facilities located in the computer room may be accessed directly by using device-level input/output (RYE file control). Details on the use of and the restrictions regarding RYE may be found in the attached RYE manual.** Send-and-Receive concepts described in the RYE manual are accurate. However, significant modifications will be made to the Send-and-Receive functions so that provisions for IIS remote-device requirements (i.e., the volume restrictions and time constraints will be increased and/or upgraded) will be adequate.

The initial development of the IIS envisaged an additional real-time program (RT/3) which would service the needs of the program packages and accommodate up to three worker packages at one time. If this concept had been used, each package would have been designed to handle many remote stations. After analyzing this concept, the Government decided to modify the RYE system to allow special worker programs to converse with an individual remote station. This was accomplished by allowing the program to reside in core and request information from (RECEIVE) and send output to (SEND) a remote station. This data is intermediately staged on secondary storage by the RYE system. This choice simplified the design of the IIS application programs but required that multiple, time-shared copies of the program be core resident in a time-shared capacity at any given time. However, the advantages gained in following the existing RYE philosophy, the savings in design and programming, and the redundant

* Special Send-and-Receive operations will provide conversational requirements.

**NSA, RYE - 494 PROGRAMMER'S REFERENCE MANUAL, September 1966,
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SECRET

functions existing between the real-time programs warrant the use of the small amount of additional core storage.

Although the program specifications do not reflect this change, they are entirely satisfactory in scope and detail for RFP purposes. All references to RT/3 services will be replaced by Send-and-Receive implementation and/or assigned to other program packages such as file control, which will be written by the Government. The finalized versions of the program specifications will be available during the development of the work statement by the selected contractor but will not change the scope of the effort.

PROGRAM PACKAGES

The computer program packages of the IIS support the following functions:

1. Data Entry (DEN)

Accepting input data from various types of equipment (keyboard, card reader, CRT, etc.), error checking, and conversion and formatting of the data for further processing.

2. Verification, Editing, and Approval (VEA)

The retrieval, display, and modification of data in response to commands from consoles manned by verifiers, editors, and an approving authority.

3. Query Handling (PIRL)

The decoding of a user-oriented query language (PIRL) and the retrieval of desired sets of information from the data base.

4. Report Generation (RPG)

The automatic generation of hard-copy reports from information stored in the data base and/or work file.

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SECRET

5. Presentation Language (PRES)

The processing of an on-line language which permits a user to change or create output formats.

6. File Update and Maintenance (AUD)

The creation of sectors of data, the addition of data to, and the deletion of data from the data base.

7. Installation Prediction (PRED)

The selection of installations prior to preparation of reports.

8. Assignment (ASGN)

The assignment of film and necessary materials to photo interpreters prior to the preparation of reports.

9. Executive (RYE)

The control of the entire system is accomplished by a real-time program and an IIS file control program operating under the RUM Executive System.

The first five packages specified above are being offered for contractor bidding and assistance. The remaining four packages and the remainder of the system and the environment will be implemented by the Government.

IMPLEMENTATION SCHEDULE

The diversity of activity associated with the IIS requires careful planning so that the various modules will be phased in or implemented in an orderly fashion. Constraints resulting from such planning will affect the duration of the programming effort and the manpower loading and consequently the economics involved. For RFP purposes, the completion date for packages 1 through 4 is estimated to be 1 July 1969. The completion of the Presentation Language package may be deferred for up to six months after 1 July 1969. It

SECRET

SECRET

must be emphasized that these dates constitute no more than estimated time frames within which various programming packages must be developed, tested, and documented. These packages, or portions thereof, will be required as phases of the implementation evolve.

During the development of the work statement, the Government will provide to the selected contractor, a Critical Path Method (CPM) listing of the implementation plan for the IIS. During this time, specific dates for the delivery of packages 1 through 5 will be determined. The updated CPM and written progress reports, which will be submitted on a scheduled basis, will constitute a requirement for a contractor's progress report.

GOVERNMENT PROVISIONS AND RESPONSIBILITIES

Although many details will be discussed and negotiated in connection with the formulation of the work statement, which will be developed after the selection of a contractor, Government support of the contractor's work will be specified in this portion of the Request for Proposal.

Because the system configuration and operating environment are unique, our facilities will be made available to the contractor for the necessary testing and implementation of that portion of the system for which he is primarily responsible. The Government will provide, at no cost to the contractor, the necessary computer time for assemblies of all IIS-related programs the contractor develops, including all related equipment (such as magnetic tapes for source and object program libraries, paper stock for listings, etc.). Additionally, all available data for program maintenance and debug aids in production status or to be developed by the Government will be documented and made available to the contractor. The Government intends to provide a minimum of three time periods per week for the assembly of all related IIS programs. If activity warrants, this time can be increased, but assemblies will not exceed one per day.

All contractor keypunching requirements, including provisions for 80-column cards, will be the responsibility of the contractor, except that a keypunch machine and working area will be available at the Government installation for the preparation of a small volume of test data, correction cards, etc. Necessary supplies (coding sheets,

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SECRET

cards, paper, desks, etc.) will be provided for the contractor's convenience, particularly during the test and debug phase. Under no circumstances, however, is this working area to be used by the contractor for flow charting, coding, or documentation activities. This area will also be equipped with one ASR-35 and one CRT console which will be made available to the contractor.

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It is the Government's intention to charge the contractor for computer test time at [redacted] (in units not less than one-half hour or more than four hours). This time will be made available to the contractor at least twice a week (if this time is needed) at a mutually agreeable time. Essential operating personnel will be provided. It is anticipated that this time will be used by the contractor for component tests to determine whether acceptance specifications for the production of end items (Category I testing) have been complied with. As part of Category I testing, the contractor will be required to provide and/or develop all test files, test plans, and test input necessary to assure himself and the Government that Category I testing is complete. Because some hardware (such as CRT devices) and Government-supplied software (such as file control and test files) are unavailable, the necessary simulation will be the responsibility of the contractor. However, as part of the Government's responsibility, all necessary and related hardware and software will be made available to the contractor, documented, and site tested by 1 July 1969, so that Category II testing can commence no later than 1 July 1969.

Category II testing consists of subsystem tests to evaluate combinations of equipment, programs, and files which will provide a specific capability. It is the responsibility of the Government to design criteria, execute and evaluate Category II tests, and make available to the contractor the results of the evaluation. The contractor will be responsible for taking the required corrective action.

CONTRACTOR RESPONSIBILITIES

While we recognize that the specifications for the program packages, associated files, and program interfaces cannot be considered final, we want to emphasize that the basic functions to be performed and the related file structures will not be subject to major modifications. The Government will not change the IIS

SECRET

SECRET

philosophy. Therefore, the existing specifications and other information regarding contractor requirements make it possible for a contractor to bid realistically on this Request for Proposal.

First, the Government will require an implementation plan and schedule of the CPM/PERT type, which will indicate the plans and philosophy the contractor would use if he were selected for this project. Significant events must be frequent enough so that this schedule will be an effective tool for monitoring the implementation of the contractor's segment of the IIS.

Particular attention should be given to the documentation required to satisfactorily complete the contract. Requirements for documentation are specified in the attached Standards Manual with one exception: documentation need not be provided for a user.

Secondly, in the final work statement to be negotiated with the selected contractor, the Government intends to furnish to the contractor finalized job specifications, precise file formats, detailed interface requirements, and restrictions that circumscribe programs. However, the level of program specifications included in this RFP will not be more detailed than it is at present. For this reason, one of the contractor's initial deliverable products will be a written, more detailed specification for each major task. This product will be submitted to the Government before the contractor begins coding. Each of these specifications must be reviewed and approved by the Government. While we recognize that time and knowledge preclude the development of detailed specifications in response to this RFP, the work involved should be considered in the cost and manpower information in your proposal.

Thirdly, as part of the final development of the contracted program packages, the contractor must provide the items listed below.

1. Detailed job specifications (cf. Standards Manual) including the following:

- a. size of the program and time estimates
- b. error diagnostics and recovery techniques
- c. acceptance test plans through Category I testing
- d. secondary storage and allocation requirements
- e. macro flow chart or diagram

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2. Micro flow diagrams
3. Programming (including coding and assembly)
4. Testing
5. Finished documentation

These items must be detailed in the work statement.

Although it is not required, the submission of an initial CPM as part of the response to the RFP is desirable. Also helpful in your response to the RFP would be approximations regarding the following:

1. Manning or man-hour estimates for each program package to be contracted.
2. Estimates of the amount of computer test time that will be required for each program package

Although every individual associated with the implementation of the IIS program will probably not require a TOP SECRET security clearance, the contractor's project manager and perhaps one or two senior analysts and/or programmers will doubtless need such clearances. Please indicate those employees who have clearances and specify the types of clearances they hold. Please submit the names of uncleared employees who might be assigned to the project.

Since the primary purpose of this Request for Proposal is to obtain contractual personnel who are highly qualified and experienced, a formal training program to familiarize the contractor with equipment configuration and operating environment will not be required. However, orientation and familiarization meetings, spread over a maximum of one week, will be provided. In response to this RFP, we request that you include a short outline of the topics that you would like covered and/or emphasized.

Again, we would like to emphasize that the job specifications accompanying this RFP are primarily for information and estimative purposes. Suggestions, potential problem areas, and even a modified or different approach are welcome, provided that the impact does not radically change the IIS design goals and concepts. These factors may be included in your response to the Request for Proposal.

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SECRET

EVALUATION OF THE CONTRACTOR

Although we do not intend to underestimate the importance we place upon cost, we must indicate that cost will not be the only criterion used in the selection of a contractor. Many considerations will enter into our evaluation of your proposal. Of great importance will be the level of experience and the technical qualifications of those who will be assigned to the implementation of the system, which includes the preparation of detailed job specifications and the actual programming, testing, and documenting. This experience and technical expertise should be presented in the form of brief resumés which will summarize the background of those you intend to assign to the project. Particular emphasis should be given to the project leader or manager. Documented evidence of previous successes and customer satisfaction in similar or related activities would also be helpful.

As indicated previously, the system will be implemented on a UNIVAC 494 computer and its peripheral equipment. The peripheral equipment will consist principally of random-access mass storage with remote terminals ranging from KSR-35's to medium-sized CRT devices, all of which have capacities similar to the DIDS-400 or UNISCOPE-300. SPRYE, the programming language to be used, is similar to SPURT, the assembly language developed for the UNIVAC 490 computer system. Familiarity with this language and/or equipment is undoubtedly advantageous. However, more importance will be attached to a demonstrated ability to implement similar systems on a large-scale, word-oriented, remote-access and random mass storage computer complex where the language used is an assembly type rather than a compiler such as COBOL or FORTRAN.

It is expected that the executive system provided by the Government will satisfactorily remove the problems of time-critical remote input and output. Therefore, particular knowledge or strength in this area will receive no additional consideration nor will special importance be attached to it. Essentially, the contractor will have the problem of developing sophisticated application packages that will function as time-shared or multiprogrammed batch programs that accomplish a given function, at a given time, and with a given remote terminal. During the evaluation process a great deal of emphasis will be placed on previous contractor performances in similar application areas and on individuals who will be assigned to this project and who are technically qualified in the same areas.

SECRET

SECRET

SPECIFICATIONS
FOR
CONTRACTOR'S CONSIDERATION

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SECRET

INTEGRATED INFORMATION SYSTEM (IIS)

VEA PROGRAM SPECIFICATION

SS-2

8 February 1968

SECRET

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. SCOPE	1
2. APPLICABLE DOCUMENTS	1
3. REQUIREMENTS	1
4. VEA PROGRAM FLOW DIAGRAM	15

LIST OF TABLES

<u>Table</u>	<u>Page</u>
I. Data Format for Location VEA/IN	9
II. Command Structure	11

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. VEA PROGRAM INTERFACES	10
2. VEA PROGRAM FLOW CHART	16

SS-2

iii

SECRETVEA PROGRAM SPECIFICATION1. SCOPE

This specification describes the programming necessary to assist in the verification, editing and approval of data entered into the system by manual or automatic techniques and intended for eventual entry into the National Data Base and/or for inclusion in output products. The program utilizes a Working File as a source and repository for records in process and the Queue and Status Lists as an index to the location and current processing status of records in the Working File. The program controls the transmission of these records to a VEA console for review and modification and the return of these records from the VEA console and to the Working File. It should be noted that the VEA program is not responsible for actual modification of the displayed information. This function is carried out wholly within the console itself.

2. APPLICABLE DOCUMENTS

Status List/Queue List/Working File Specification (IS-1)
 IIS Real Time/3 Specification (SS-9)
 PIRL Program Specification (SS-4)
 File Control Program Specification (SS-12)
 RYE-494 Programmer's Reference Manual

3. REQUIREMENTS3.1 Functional Requirements

This program shall have the capability to locate records in the Working File via the FCL program; prepare sections of these records for display on a console; accept, as reviewed, portions of these records returned from the console; initiate transfer of reviewed records back to the Working File via FCL; temporarily store data returned from the console for such purpose; update certain status information in the Queue List via FCL, and perform the other functions described below.

3.1.1 Locate Records in the Working File

The VEA Program shall have the capability of locating records in the Working File in both of the following modes:

- (a) The VEA Program shall input to the FCL program the MRN supplied as program input (3.2.1) to determine the address parameters of the designated record in the Working File.

SS-2

SECRET

SECRET

- (b) The VEA Program shall interrogate the Queue List to determine the next record on the basis of console type and category group, record status and category, and record priority information in the Queue List (see 3.6.1) and then determine from the Queue List the starting address of the next record.

If there is no record that meets the necessary conditions the VEA Program shall prepare, in accordance with the Section 3.1.2.2a, b, and Section 3.2.2, a message that says, "RECORD ddddd IS NOT AVAILABLE." When the record address has been determined, the VEA Program shall prepare, in accordance with Section 3.1.2.2a, b, and Section 3.2.2, a message that says, "RECORD NUMBER ddddd IS AVAILABLE" (where ddddd is the machine reference number of the record located) and shall update the Queue List to indicate that record ddddd is in process.

3.1.2 Prepare Data for Display

3.1.2.1 Modes. - The VEA Program shall have the capability of delivering sections (as identified in the Working File Specification (FS-1)) of the record located as a result of the function specified in 3.1.1 in the following modes:

- (a) The VEA Program shall retrieve from the Working File and prepare for display, the section of the record corresponding to the number supplied as program input (3.2.1).
- (b) The VEA Program shall retrieve from the Working File and prepare for display the section following the section most recently displayed. If no sections of the record most recently located have been displayed, this function shall be interpreted to display the first section. If the section most recently displayed is the last section in the record, the VEA Program shall prepare a display message in accordance with 3.1.2.2a, b, and c(1) that gives each section designator and indicates whether or not reviewed data has been received for each section (see 3.1.3).
- (c) The VEA Program shall retrieve from the returned data (see 3.1.3) and prepare for display, the section of the record corresponding to the number supplied as Program Input (3.2.1).

SS-2

SECRET

SECRET

3.1.2.2 Display Format. - In either mode, the VEA Program shall generate a display message containing the section identified in 3.1.2.1 and meeting the following conditions:

- (a) The message shall be equal in length to the number of characters per line (N) times the number of lines on the console display as given in the Table of Console Characteristics for the console to receive the display.
- (b) The first N characters shall be blanks.
- (c) The second N characters shall contain:
 - (1) The machine reference number of the record from which the section is taken;
 - (2) The section numeric designator; and
 - (3) The section name as given in the Working File.
- (d) If the section contains more than one field, each field shall start at a character position which is an integral multiple of N plus one.
- (e) All character positions that do not contain data characters shall contain blank characters. A space character shall be considered a data character.
- (f) At least the last 2N characters shall be blank. If the section would otherwise use part or all of the last 2N character positions the procedure of Section 3.1.6 shall be used.

3.1.3 Receive Reviewed Data

The VEA Program shall receive, as Program Input, data which has been reviewed at a console. The number of data characters in the returned data may be equal to, less than, or greater than the number of data characters in the display message generated (3.1.2). The VEA Program shall use this returned data to generate a revised record for later insertion in the Working File. If data for a given section is returned more than once, the VEA Program shall use the data returned last in generating the revised record. The VEA Program shall terminate this portion of its operation by transferring to one of the following, dependent on the Command Statement received as part of the program input (3.2.1):

SS-2

SECRET

- (a) Prepare data for display in accordance with 3.1.2, mode a
- (b) Prepare data for display in accordance with 3.1.2, mode b
- (c) Transfer back to the RT/3 System; no display is required.

3.1.4 Return Records to the Working File

When all sections of a record have been reviewed, an "Update Status Information" command will be received as part of the Program Input and the VEA Program shall do the following:

- (a) Assemble the returned sections (3.1.3) into a revised record for reentry into the Working File. The sections shall be in the same order and format as in the original record and all command statements, the identifiers added by 3.1.2.2c, and any blank characters added to format and/or fill out the display message shall be deleted.
- (b) Inform the FCL Program of the total number of characters and request a new starting address in the Working File if the number of characters in the reviewed record exceeds the original number by more than one hundred.
- (c) Initiate an update of the Queue List entry for the record just reviewed by: (1) changing the status symbol to reflect the type of console that just completed reviewing the records; (2) changing the indicated starting address of the record in the Working File if required by (b) above; (3) changing the process status to indicate not-in-process; (4) informing the FCL Program of the location in core storage of the revised Queue List Entry; and (5) requesting the FCL Program to enter the revised entry in the Queue List.
- (d) Initiate the return of the revised record to the Working File by: (1) informing the FCL Program of the Working File address for the record and the storage location of the revised record; and (2) requesting the FCL Program to make the transfer.

SS-2

SECRET

The VEA Program shall terminate this portion of its operation by transferring to one of the following dependent on the Command Statement received as part of the Program Input:

- (a) Locate a record in accordance with 3.1.1, mode a
- (b) Locate a record in accordance with 3.1.1, mode b
- (c) Transfer back to the RT/3 System; no display is required.

3.1.5 Temporarily Store Displayed Data

The VEA Program shall have the capability of receiving a display message that is returned from a console for temporary storage and holding it until a Program Input is received requesting its return.

3.1.6 Partial Display of Sections

If part of a section display that is being generated in accordance with Section 3.1.2 would otherwise occupy part or all of the last 2N character positions of the display message (see Section 3.1.2.2.f), the VEA Program shall truncate the section so that the last 2N character positions remain blank. The VEA Program shall also place in the first line of the display message a command statement for displaying the remainder of the section. The command statement shall include an operand that indicates the number of lines of data from the bottom of the partial display of the section that are to be repeated at the top of the next partial display of the section. When a Program Input is received with this command statement, the VEA Program shall hold the data characters and shall generate a display message containing the next partial display of the section and meeting the conditions (a) through (f) of Section 3.1.2.2. When the last of the partial displays of a section has been received as a Program Input with the command statement indicating that display review is completed, the VEA shall assemble the data characters from the partial display messages in the proper sequence and continue in accordance with the requirements of 3.1.3.

3.1.7 Remove Bottom of Display

The VEA Program shall have the capability of removing a number of lines from the bottom of a display message appearing as a Program Input and generating new display message with the remaining data. This display message shall be considered a partial display message and it shall be generated and handled in accordance with the requirements of Section 3.1.6. The data removed shall be held and included in proper sequence in the next partial display of the section. The number of lines of data to be removed shall be determined from the operand of the command statement in the Program Input.

SS-2

SECRET

SECRET

3.1.8 Use of Secondary Storage

The VEA Program shall use blocks of secondary storage for holding returned data prior to their being returned to the Working File as reviewed data (3.1.3), temporarily stored data (3.1.5), partial displays of sections (3.1.6), and such other data and information that can be conveniently stored in secondary storage. The VEA Program shall keep track of the location of data and information within these data blocks and shall initiate transfer into and out of them in accordance with Section 3.2.4. The VEA Program shall contain procedures whereby the requirements for core storage are minimized to the extent practical by the use of secondary storage and the requirements for secondary storage are minimized to the extent practical by returning blocks of storage when they are no longer needed by the VEA Program.

3.1.9 Status Display Request

The VEA Program shall process commands from the approver console in order to create messages for displays that (1) relate the total system status for this mission by providing information on the total number of MRN's that were predicted, entered, verified, edited, and approved or (2) relate the unique status of any given MRN, i.e., entered, verified, etc.

3.1.9.1 System Status. - Upon receipt of the command "STA-----" the VEA Program shall tabulate the status counts in the Queue List by:

- (a) Total number of MRN - entered
- (b) Total number of MRN - verified
- (c) Total number of MRN - edited

Further, the VEA Program shall request the FCL Program to retrieve the status list from drum storage and again tabulate total number of MRN's for the following status:

- (a) Predicted
- (b) Approved

The approved status count shall be further subdivided to show four status counts by type, i.e.,

SS-2

SECRET

SECRET

Total Number of MRN's = BONUS
 Total Number of MRN's = Predicted not covered
 Total Number of MRN's = Cloud Covered
 Total Number of MRN's = Approved

The above status counts shall be calculated for three report types (A's and B's), (C's), and (P's). The VEA Program shall then produce a display message in the following format:

<u>Line #1</u>	SYSTEM STATUS	
	A & B	
	PRED	DDDD
	ENT	DDDD
	VER	DDD
	EDIT	DDD
	APPR B	DD
	NC	DDD
	CC	DDD
	T	DDDD
	C	
	PRED	DDDD
	ENT	DDDD
	VER	DDD
	EDIT	DDD
	APPR B	DD
	NC	DDD
	CC	DDD
	T	DDDD
	P	
	PRED	DDDD
	ENT	DDDD
	VER	DDD
	EDIT	DDD
	APPR B	DD
	NC	DDD
	CC	DDD
	T	DDDD

SS-2

SECRET

3.1.9.2 Unique Status of MRN. - Upon receipt of the input message "STA dddd" the VEA Program shall first search the Queue List for the appropriate MRN. If the MRN is located in the Queue List, the VEA Program shall decode the individual status code, i.e., status = entered, verified, edited or approved, and prepare the following message:

"MRN dddd STATUS - LLLL

Where LLLL for

Entered = ENTR
Verified = VERI
Edited = EDIT
Approved = APPR

If the MRN is not located in the Queue List, the VEA Program shall request the FCL program to retrieve the Status List. Again the VEA Program shall attempt to locate the MRN in the Status List. If it is found it will be processed in the same manner as the Queue List entry. If no MRN is located in either the Queue List or Status List, the VEA program shall produce the following message:

"MRN dddd STATUS - NULL

3.1.10 Disapprove Report

The VEA Program shall accept as an input message a command message to signify disapproval and also the status to set the report, i.e., return the status back to (1) edit, (2) verify, (3) enter, or (4) predicted. The input message is of the following format:

"DIS LL"

where LL is defined as follows for status back to:

(a) Edit = ED
(b) Verify = VE
(c) Entered = EN
(d) Predicted = PR

When LL = ED, VE, or EN, the VEA Program shall change the status indicator in the Queue List to equal the new status. If LL = PR, the VEA Program shall remove the entire entry from the Queue List.

3.1.11 Number of Consoles

The VEA Program shall be able to accomplish the requirements above for SS-2

SECRET

twenty-four VEA consoles that are being used simultaneously. Each console will be only concerned with one record at a time and no two consoles are concerned with the same record at the same time.

3.2 Interfaces

The interfaces between the VEA Program and the rest of the system are shown on Figure 1. Program Inputs originate at the VEA consoles and are transmitted to the VEA Program by the RT/3 Program. Display messages are generated by the VEA Program and transmitted to the VEA consoles by the RT/3 Program. Access to all system files and the block of secondary storage assigned to the VEA Program is obtained through the File Control Program, or the RT/3 Program.

3.2.1 Program Inputs

When the VEA Program is to operate, the RT/3 Program shall transfer to the starting location of the VEA Program and provide the starting location of the Program Input data from the console and the console identification. This information will be the format shown in Table I. The first line of the Program Input will contain a command code (the first three letters being VEA) and, if applicable, a command operand to designate which of the functions of Section 3.1 shall be performed. The codes and formats for these commands will be as shown in Table II.

Table I

Data Format for Location VEAIN

Word	Content
0	Transfer to VEA Program
1	Core address of input data string
2	Number of words of input data
3	V, E, or A console selection (bits 29-24) Identification of input console (bits 23-0)

SS-2

SECRET

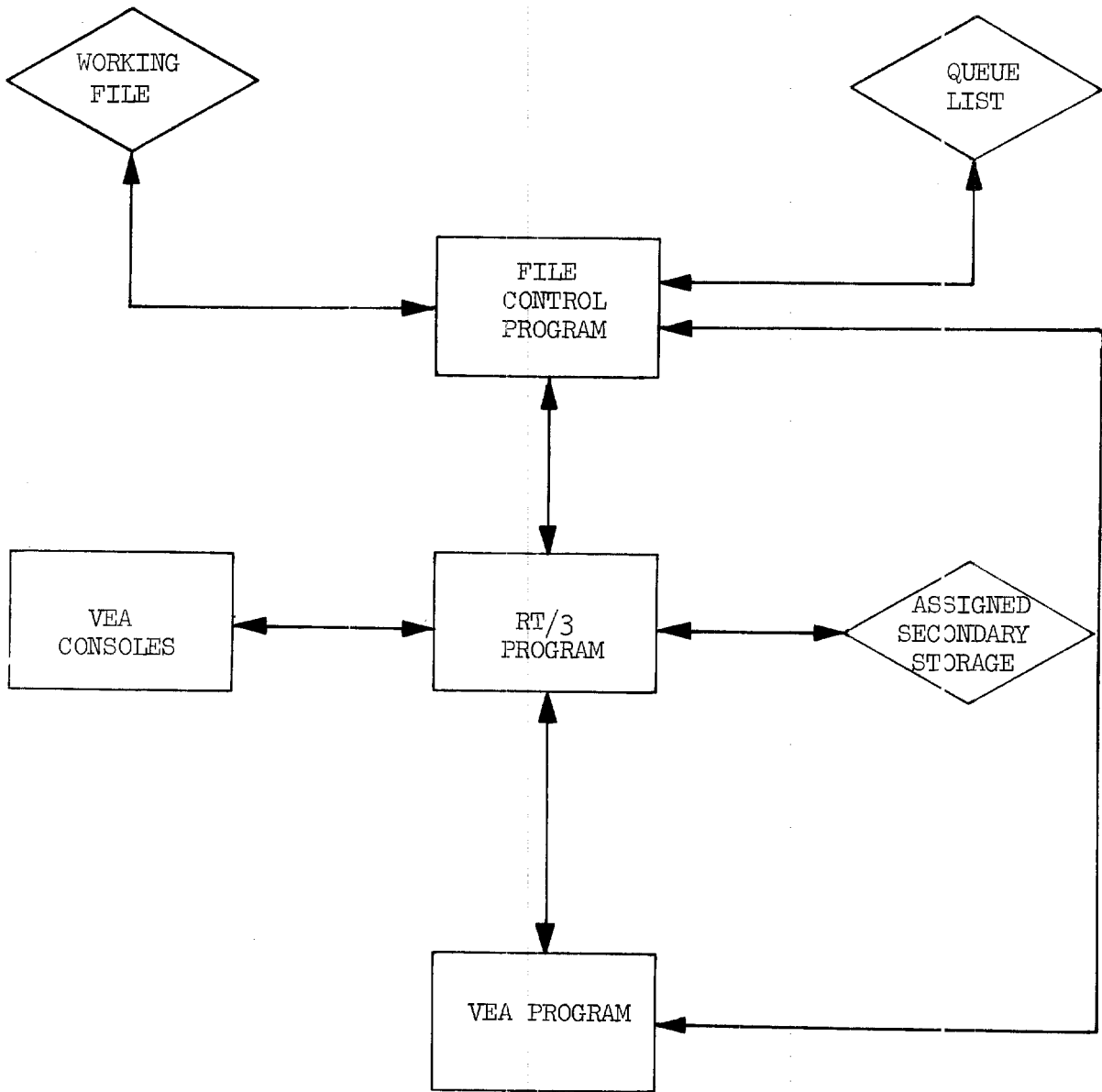


Figure 1 - VEA PROGRAM INTERFACES

SS-2

SECRET

Table II
Command Structure

Function		Command Code	Operand
Section Ref.	Name	Char. Pos. 5-7	Char. Pos. 9-13*
3.1.1a	Retrieve Record N	RNR	dddd
3.1.1b	Retrieve Next Record	RNR	NEXT-
3.1.2.1a	Display Section N	DNS	dd---
3.1.2.1b	Display Next Section	DNS	NEXT-
3.1.2.1c	Display Returned Section	DRS	dd---
3.1.5	Store Display Temporarily	SDT	----
3.1.5	Retrieve Stored Display	RSD	----
3.1.3a	Display Review Completed	DRC	dd---
3.1.3b	Display Review Completed	DRC	NEXT-
3.1.3c	Display Review Completed	DRC	s----
3.1.4a	Update Status Information	USI	dddd
3.1.4b	Update Status Information	USI	NEXT-
3.1.4c	Update Status Information	USI	s----
3.1.6	Continue Section Display	CSD	5----
3.1.7	Remove Bottom Lines	RBL	d----
3.1.9.1	System Status	STA	sssss
3.1.9.2	MRN Status	STA	dddd
3.1.10	Disapprove Report	DIS	11
	*d = a decimal digit - = indeterminate s = space l = letter		

SS-2

SECRET

3.2.2 Display Message

The VEA Program shall initiate the transmission of a Display Message to a VEA console by transmitting a calling sequence as described in the IIS RT/3 specification (SS-9).

3.2.3 Files

The description of the content of, and the procedures that shall be used to obtain data from, the three Systems Files used by the VEA Program are described in the "Status List/Wait List/Working File Specification" (FS-1).

3.2.4 Secondary Storage

The method of transferring data to and transferring data from secondary storage shall be as described in "IIS RT/3 Specification" (SS-9).

3.2.5 Other Communication with the Real Time /3 Program

The VEA Program shall be subject to the control procedures described in "IIS RT/3 Specification" (SS-9).

3.3 Diagnostics

3.3.1 Checks on Program Inputs

The VEA Program shall check each of the Program Inputs and if any of the following conditions are noted, an appropriate display message shall be generated and its transfer to the console initiated:

- (a) illegal command statement including operand
- (b) request for a record for which the machine reference number is not in the Wait List
- (c) request for a record for which the status code in the Queue List is not one level below the requesting console type (see 3.6.1)
- (d) request for a record for which the category code in the Queue List does not equal one of the category codes listed for the requesting console (see 3.6.1)
- (e) request for a record that is already in process (see 3.6.1)

SS-2

SECRET

- (f) request for data display (3.1.2) when the most recently located record (3.1.1) has already been returned to the Working File (3.1.4)
- (g) request for display of a returned section (3.1.2c) when data for that section has not yet been returned
- (h) a second request to restore displayed data temporarily before data stored on first request has been retrieved (3.1.5)
- (i) request from a console to locate a record (3.1.1) when that console has already located a record (3.1.1) that has not been returned to the Working File (3.1.4)
- (j) request from a console to receive data (3.1.3) when that console has not been sent data that can be returned
- (k) request from a console to receive new sections of data (3.1.3) before all partial displays of a current section (3.1.6 and 3.1.7) have been sent to the console
- (l) request for displaying the remainder of a section (3.1.6) when there is no partial display that has not been displayed
- (m) the machine reference number or section number on a display being returned from a console is not the same as it was in the display message most recently generated for that console.

3.4 Storage Allocation

SS-2

SECRET

3.4.1 Working Storage Allocation

3.4.1.1 Drum Storage Allocation. - The VEA is provided only drum working storage on the FH880, FH432 or FHL782 through a RT/3 request (see RT/3 specification for calling sequence). The maximum drum working storage allocated to the VEA Program shall be 14,760 drum words.

3.4.1.2 Core Storage Allocation. - Maximum core working storage is allocated 1,000 computer words.

3.5 General Design Features

3.5.1 Programming Language

The VEA Program shall be coded in the SPRYE Assembly Language.

3.5.2 Flexibility

The VEA Program shall be coded in modules by at least 10 major program functions corresponding to the functions of Section 3.1.1 through 3.1.10. If a function is not initially implemented, the control necessary to operate a "dummy" module shall be included in the program. When this dummy module is executed, a display message shall be generated that indicates that this operational function is not yet available in the IIS.
SS-2

3.5.3 Recovery Procedure

If the VEA Program is unable to fulfill an operating request because of machine error, the VEA Program shall initiate a display message requesting the VEA operator to re-enter the machine reference number and restart the review of the record.

3.6 Required Techniques

3.6.1 Determination of Next Record

In determining the next record as required by the mode b of 3.1.1, the Program shall find the highest priority record in the Wait List that meets the three following conditions:

- (a) The record category code in the Queue List is the same as one of the category codes for the console requesting the next record.

SS-2

SECRET

SQR 352

- (b) The record status in the Queue List is one level below the console type for the console requesting the next record. (The order of record status entries from top to bottom is Approved, Edited, Verified, Entered).
- (c) The process status given in the Queue List for the record is in the "not-in-process" condition.

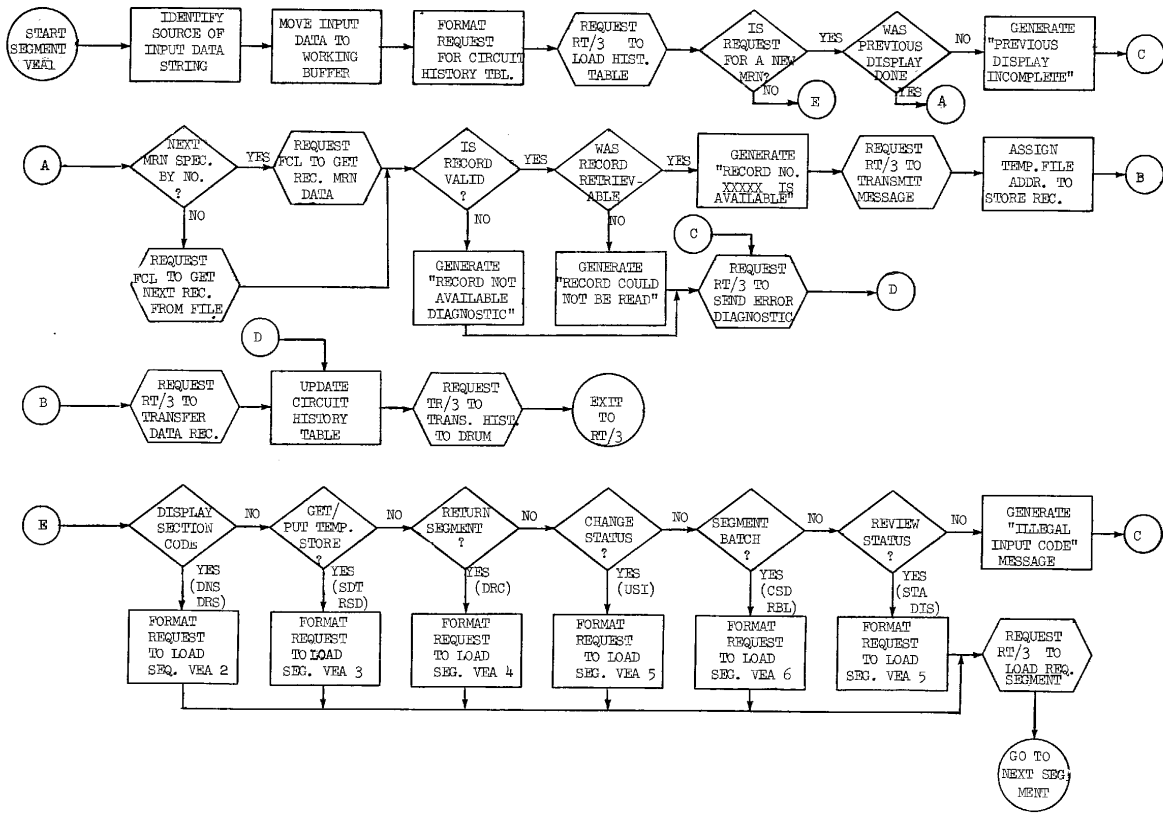
4. VEA PROGRAM FLOW DIAGRAM

Figure 2 represents the program flow logic of the functions in Section 3.1.

SS-2

SECRET

SS-2



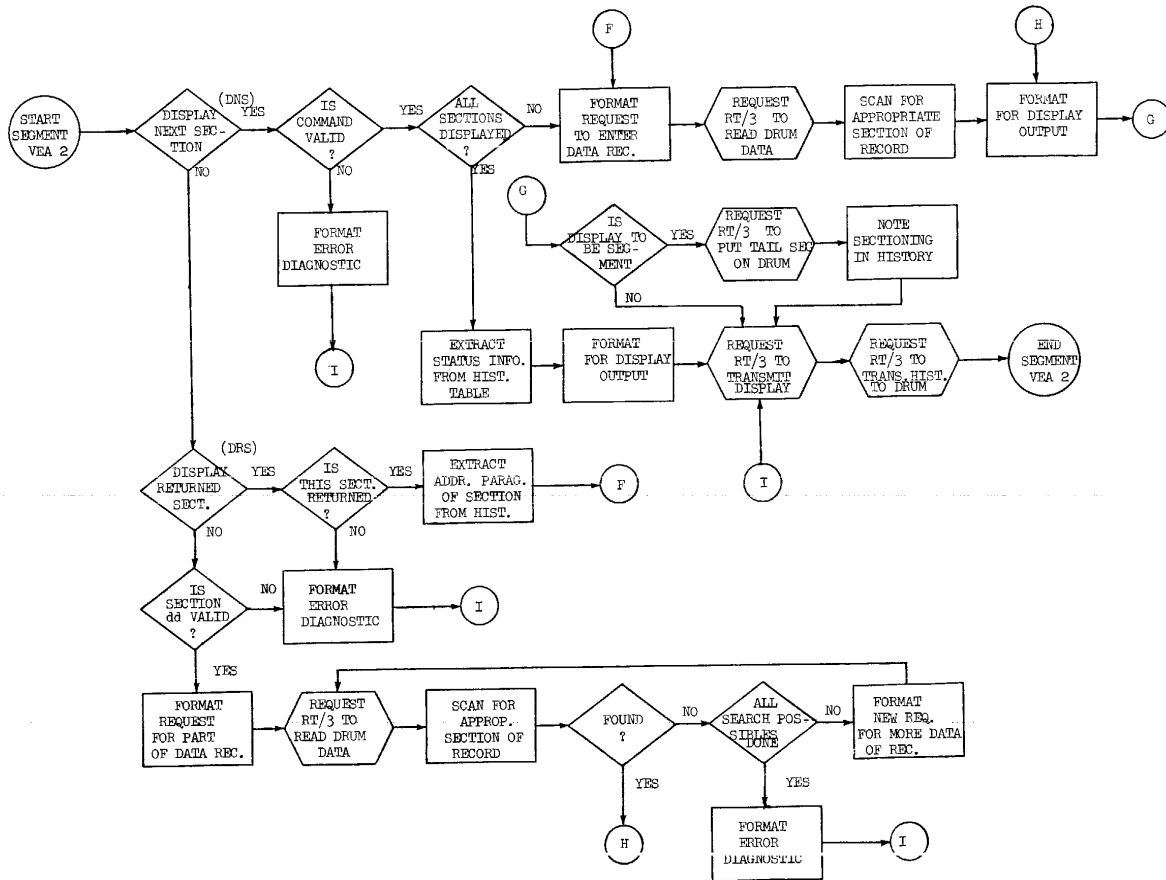
16

SECRET

SECRET

Figure 2 VEA PROGRAM FLOW CHART

SS-2



SECRET

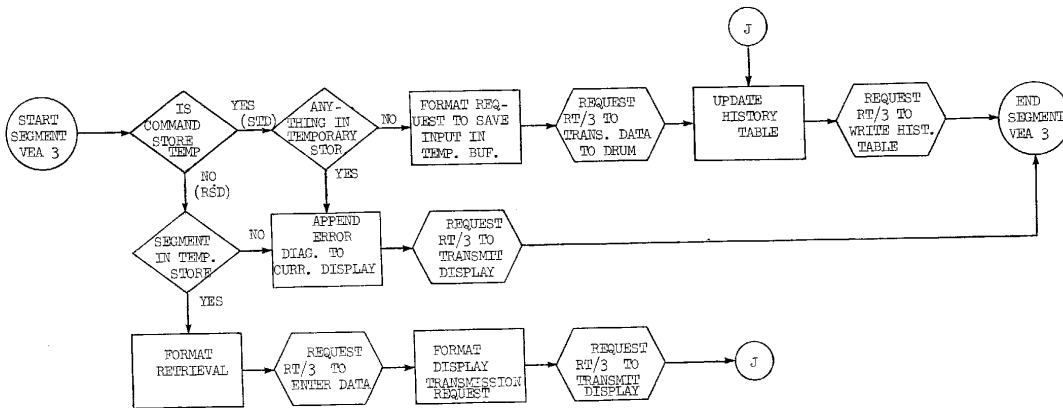
17

SECRET

Figure 2 VEA PROGRAM FLOW CHART

SCR 352

SS-2



18

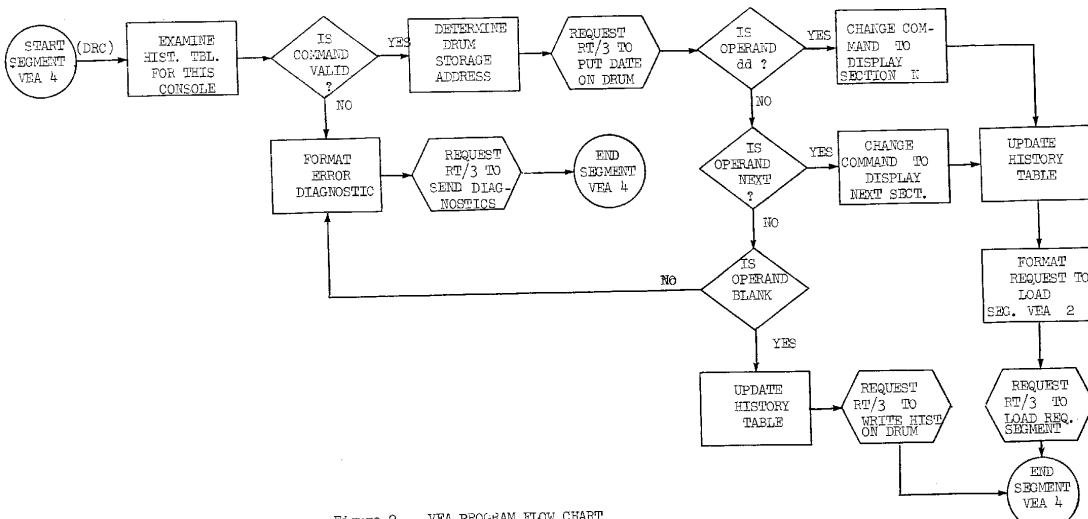


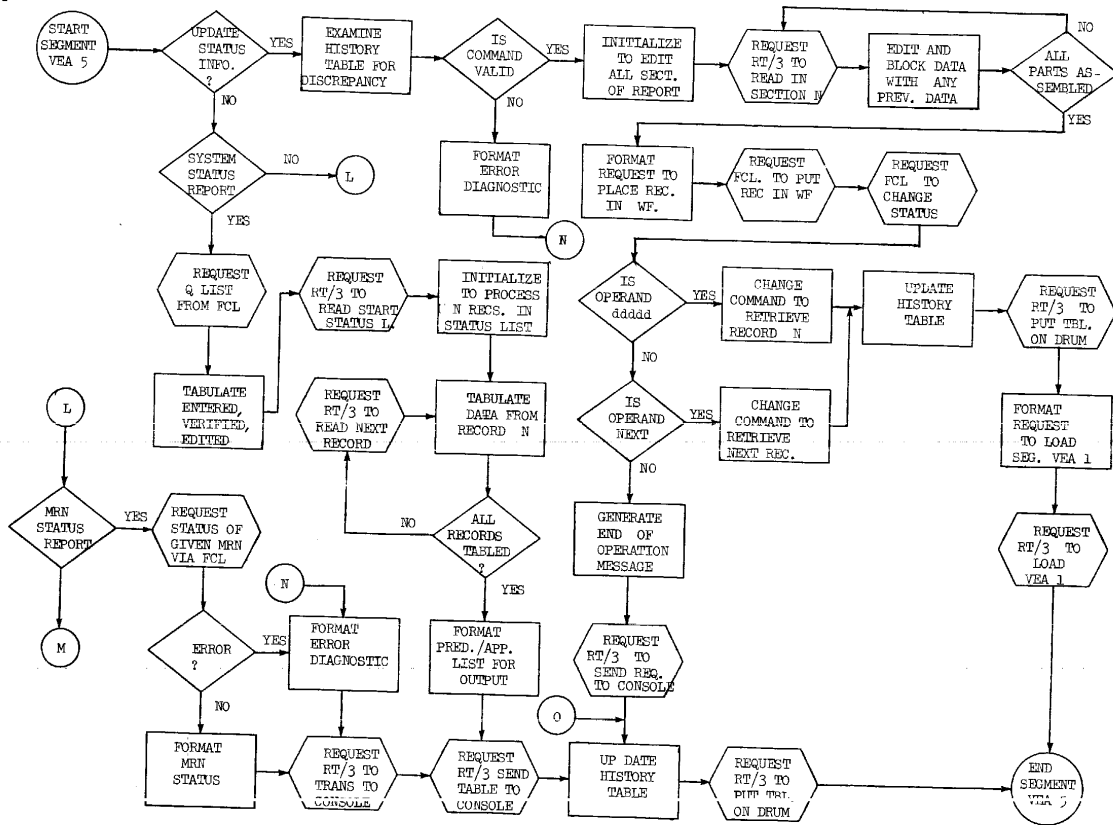
Figure 2 VEA PROGRAM FLOW CHART

SECRET

SECRET

SCR 352

SS-2



SECRET

19

Figure 2 VBA PROGRAM FLOW CHART

SECRET

SCR 352

SS-2

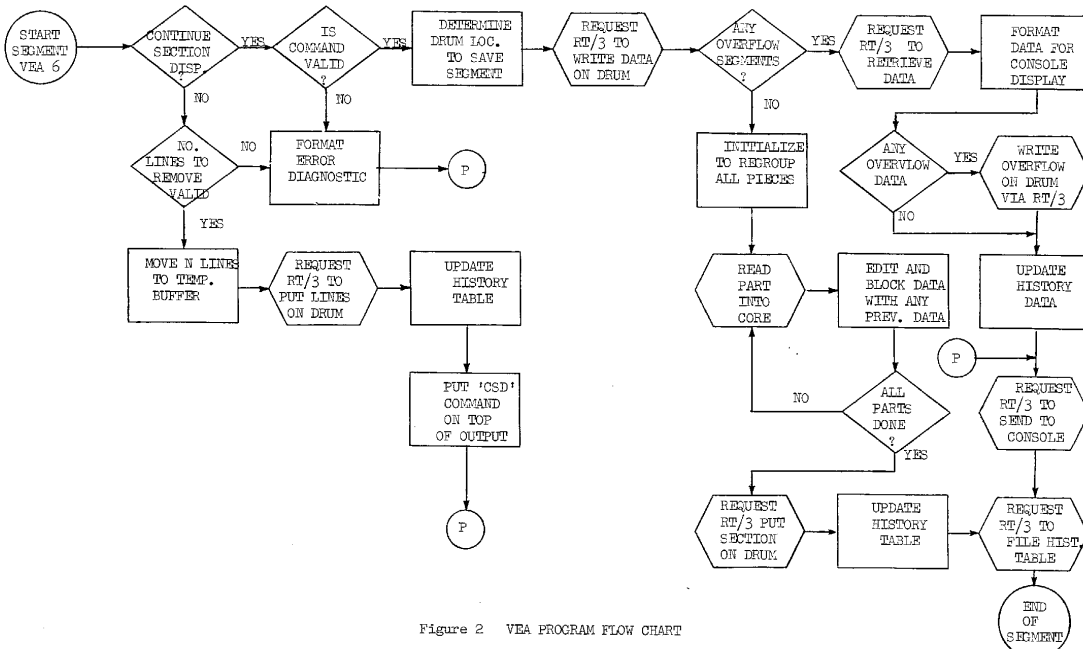
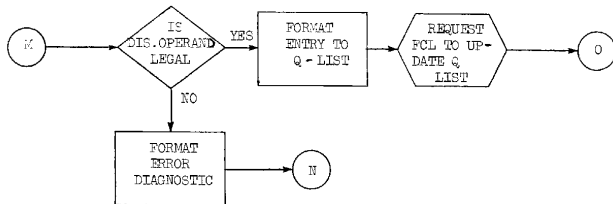


Figure 2 VEA PROGRAM FLOW CHART

SECRET

20

SECRET

SCR 352

SECRET

INTEGRATED INFORMATION SYSTEM (IIS)

DEN PROGRAM SPECIFICATION

SS-1

8 February 1968

SECRET

SECRET

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. SCOPE	1
2. APPLICABLE DOCUMENTS	1
3. REQUIREMENTS	1
4. DEN PROGRAM FLOW DIAGRAM	12

LIST OF TABLES

<u>Table</u>	<u>Page</u>
I Data Format for Location DENIN	6

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. DEN PROGRAM FLOW CHART	13

SS-1

SECRET

SECRET

SCR 352

DEN PROGRAM SPECIFICATION1. SCOPE

This specification describes the programming required to enter a record resulting from **an internally or an externally produced Phase I report** into the automated computer system. All such records (except a record which indicates that the target was "not-on-film") are entered into the Queue List and Working File. Records for the exceptional condition will cause only the setting of a status bit in the Status List. The program will incorporate the capability for receiving a record in several segments (i.e., messages) and outputting the record for the Working File as a single unit and provide additional services as described in detail in this specification.

2. APPLICABLE DOCUMENTS

Status List/Queue List/Working File Specification (FS-1)
PIRL Program Specification (SS-4)
IIS Real Time /3 Specification (SS-9)
File Control Program Specification (SS-12)
IIS National Data Base File Specification (FS-2)
RYE-494 Programmer's Reference Manual

3. REQUIREMENTS3.1 Functional Requirements

This program shall accept formatted input messages from multiple on-line DEN consoles; determine the message type; reformat the message or perform a line number free text merge; accumulate single messages to form an output record; and request record storage in the Working File.

3.1.1 Formatted Input Messages

Each input message will be started by a three character group of the format \$X\$. The X character defines the type of message and may be either numeric or alphabetic. Numeric identifiers will signal the start of a message set and alphabetic identifiers indicate the message is part of a subset. There are seven possible numeric message identifiers (1 through 7).

3.1.1.1 Numeric Message Sets. - On recognition of \$N\$, the DEN program shall perform the necessary initialization to begin formatting a record in accordance with the Status List/Queue List/Working File Specification (FS-1) for a Working File entry. Subsequent messages bearing an alphabetic identifier shall become sequential parts of the same record.

SS-1

SECRET

SECRET

SCR 352

When a numeric message is received from a given data entry device and is recognized as such by DEN, the latter shall interpret the numeric as a signal to terminate the last record received from that data entry device and initiate a request that the prior record be added to the Working File via the FCL (QLWF) element using the "new entry" function code, (Code 1). In addition numeric messages for targets "off-the-film" will result in a request for a change in the "target-off-film" indicator in the Status List by FCL (QLWF) using the "change status list" function code, (Code 9).

In response to Numeric Code 1 message, the DEN program shall format a "Queue List Entry" in accordance with the QLWF specification. If the "target-off-film" indicator is present in the message, a "100" indicator shall be set in the QL source and status bits and DEN shall terminate the record. For all other Numeric Code 1 messages the "20" indicator shall be set in the QL source and status bits and the DEN program shall accept alphabetic messages as additions to the numerically coded one.

Numeric Code 2 will condition the DEN program to accept only L and H alphabetic message types. The receipt of an L message will cause a new QLWF entry to be formatted and the receipt of an H message or a second L message will cause the record to be terminated and sent to the Working File via the FCL "New entry" function code. The DEN program will set the 40 indicator in the QL source bits.

Numeric Code 3 will instruct the DEN program to construct a QL entry with the "100" indicator set in the source bits.

Numeric Code 4 will instruct the DEN program to construct a QL entry using a machine reference number of 99999 on a source indicator of "400".

Numeric Code 5 will instruct the DEN program to construct a QL entry using a machine reference number 99999 with the "1000" indicator set in the source bits.

Numeric Code 6 shall also create a QL entry with the same machine reference number, i.e., 99999, but with the "200" indicator set in the source bits.

Numeric Code 7 shall cause a QL entry whose machine reference number is 99998 with the "2000" indicator set in the source bits.

3.1.1.2 Alphabetic Message Sets. - Each alphabetic message set is a subset of a numeric type. The expected format of each set is contained in Section 3.2.1.1. The subsets are added to the record without change, reformatted according to Section 3.2.2 or merged as outlined in Section 3.1.4 of this specification.

SS-1

2

SECRET

SECRET

SCR 352

3.1.2 Format Conversions

All messages, both numeric and alphabetic, received for numeric types 1, 2 and 3 require format conversion. These numeric types require insertion of a five character mnemonic, "WHEAD," at the beginning of the message in the Working File to indicate that the section contains header information. The appropriate five character mnemonic shall be inserted at the beginning of all other messages for these three record types to indicate the sector of the NDB to be updated by the message. In addition, those sections of the record which are to be used only for updating the NDB, e.g. PI notes, shall be identified by the insertion of a "U" immediately following the mnemonic indicator. Those messages which will be included only in an output message shall be identified by the insertion of an "R" following the five character mnemonic.

3.1.3 IDF Accesses

The majority of messages bearing Numeric Code 1 and some of those with alphabetic code B require that the IDF be accessed and that the returned information be included as part of the program output.

3.1.3.1 Code 1 Type Messages. - Numeric Code 1 type messages which do not contain a "target-off-film" indicator require some information from the Header sector of the IDF. Such messages shall cause the IDF Header sector for the given machine reference number to be requested (via the FCL element) with the following calling sequence:

WORD 1	Link to QRIN
WORD 2	IDF
WORD 3	Machine Reference Number
WORD 4	Blank
WORD 5	Buffer Transfer Address
WORD 6	Zero Indicator Word

The requested header will be returned to DEN in the format specified in the IIS National Data Base File Specification. DEN shall then extract the four fields (Installation Name, Country Code, Geo-Coordinates, and COMIREX Number) required for the output message and insert them in the latter. The "R" following the five character mnemonic section identifier shall be retained.

3.1.3.2 Type B Messages. - DEN will examine Type B messages to determine if there is an entry in P2 (see 3.2.1.1 below). If the message contains such an entry, DEN shall request the extraction of the Brief Description for the installation from the IDF (via FCL) with a calling sequence analogous to that for a Type G message (Section 3.1.4). Upon receiving the requested information, DEN shall insert the five character SS-1

SECRET

SECRET

SCR 352

mnemonic "WBRIE" followed by an "R" at the beginning of the retrieved information to indicate that it is for the output report only.

3.1.4 Text Modifications

Message Type G requires a merge operation with text obtained from the IDF. The first two digits of the five digit line number define the text that shall be obtained. These two digits and the sectors to be obtained are as follows:

<u>First 2 Digits</u>	<u>Sector Name</u>	<u>Sector ID</u>
31	New or significant collateral	ICOLL
51	Brief description	IBRIE
52	Fixed facilities	IFIXE
53	Changes	ICHAN
61	Notes	INOTE

The DEN program shall determine the required sector from the above table and request it from the IDF (via the FCL element) with the following calling sequence:

WORD 1	Link to QRIN
WORD 2	IDF
WORD 3	MRN
WORD 4	Sector Mnemonic
WORD 5	Buffer Transfer Address
WORD 6	Zero Indicator Word

The information will be returned to DEN in the format specified for the requested sector in the "NDB Specification."

The information extracted from the IDF does not contain line numbers. DEN shall establish the sequential line numbers by counting each 25 computer word group as one line. This determination will allow the changes indicated in the input message to be made to the retrieved information. The second parameter (P2) of a type G message will instruct the DEN program to add (A), change (C), or delete (D) after the given line number using the variable length text (P3) for the addition or change (P3 is omitted on a D). One of the following five character mnemonic section identifiers, "WUCOL," "WUBRI," "WUFIX," "WUCHA," or "WUNOT" shall be inserted as a section identifier preceding the text resulting from the merge of the retrieved data and the input message. The section identifier shall be followed by a "U" to indicate the information will be used only to update the NDB.

SS-1

SECRET

SECRET

SCR 352

3.1.5 Indicators

Message Type B shall set queue list indicators. The parameter/indicator correspondence table is shown below:

P1	200
P2	20
P3	100

This message shall not be entered in the working file.

3.1.6 Use of Secondary Storage

The DEN program shall use blocks of secondary storage while assembling the messages from a given Data Entry Console into a record until that record is transferred to the Working File (or to the Status List). The RT/3 Program shall inform the DEN program of the starting location and size of the storage block as described in Section 3.2.5. The DEN program shall maintain a record of the location of data and information within these assigned blocks and shall initiate transfer in and out of them in accordance with Section 3.2.4. The DEN Program shall include procedures which keep the requirements for core storage at a minimum through the use of secondary storage and shall also minimize its requirements for secondary storage by returning blocks of storage when they are no longer needed.

3.1.7 Number of Data Entry Consoles

The DEN program shall have the capability for providing the required services to ten Data Entry Consoles which may be entering data simultaneously. Each console shall be used to enter individual records in separate messages and no two consoles shall enter messages for the same record simultaneously.

3.2 Interfaces

Input messages shall originate at the Data Entry (keyboard only) Consoles. They are transmitted to the DEN program by the RT/3 Program. Messages are assembled into records by DEN which also requests the transfer of the records to the Working File and creation of an entry in the Queue List or the change of an entry in the Status List via the File Control Program. Access to other system files and the block of secondary storage assigned to the DEN program shall be obtained through the File Control Program.

3.2.1 Program Inputs

The DEN program shall be initialized by RT/3 which concurrently provides the starting location of the input message from a console and the SS-1

SECRET

SECRET

SCR 352

console identification. The format of this information shall be as shown in Table I. The first three characters of the Program Input consists of a coded message type in accordance with 3.1.1.

Table I

Data Format for Location DENIN

Word	Content
0	Transfer to DEN Program
1	Storage address of input data string
2	Number of words of input data
3	Identification of Data Entry Console

3.2.1.1 Input Message Formats. - Input messages are of either the coded numeric types 1 through 7 or bear a coded alphabetic indicator which may be one of the alphabetic characters A through L. The format of the input numeric type messages and their alphabetic subsets are as follows:

(a) \$1\$P1\$P2\$P3 (EOT)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	5	Machine reference number
P2	9	Mission number
P3	1	Target-not-on-film indicator
(EOT)	1	End of Transmission

SS-1

6

SECRET

SECRET

SCR 352

(1) \$A\$P1\$P2\$...P8 (EOL)

<u>Item</u>	<u>No. Characters*</u>	<u>Content</u>
P1	4	Pass
P2	14	Track segment
P3	9	Target x, y coordinates
P4	8	Limiting conditions
P5	1	Quality
P6	2	Coverage
P7	2	Mode
P8	8	Remarks
(EOL)	1	End of Line

*Indicates maximum allowed - may be fewer.

(2) \$B\$P1P2P3 (EOT)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	1	Validate
P2	1	Output
P3	1	Briefing board

(3) \$C\$ Variable length free text (changes) (EOT)

(4) \$D\$ Variable length free text (notes) (EOT)

(5) \$E\$P1\$P2\$P3 (EOL)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	6	Object class
P2	4	Object count
P3	20	Remarks in free text
(EOL)	1	End of Line

(6) \$F\$ Variable length free text (significant OB) (EOT)

(7) \$G\$P1\$P2\$P3 (EOL)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	5	Line number
P2	1	Change indicator
P3	V	Variable length line (may be omitted)
(EOL)	1	End of Line

NOTE: For types using EOL, the last EOL will be followed by an EOT.

SS-1

7

SECRET

SECRET

SCR 352

(b) \$2\$P1 (EOM)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	9	Mission number
(EOT)	1	End of Transmission

(1) \$L\$P1\$P2\$...P9 (EOL)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	5	Machine reference number
P2 thru P9 are each the same as P1 thru P8 of A type message.		
(EOL)	1	End of Line

(2) \$H\$P1 (EOT)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	1	Description valid
(EOT)	1	End of Transmission

(c) \$3\$P1 (EOT)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	5	Machine reference number
(EOT)	1	End of Transmission

(1) \$K\$P1\$P2\$...P11 (EOT)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	40	Installation name
P2	2	Country code
P3	4	Military district
P4	11	Geo coordinates
P5	10	BE number
P6	7	PIC number
P7	7	COMIREX number
P8	1	Status of target
P9	3	Target type
P10	5	Elevation
P11	1	Cross reference
(EOT)	1	End of Transmission

NOTE: Type K message may contain only the first four items or it may contain any number between 4 and 11.

SS-1

8

SECRET

SECRET

SCR 352

(d) \$4\$P1 (EOT)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	5	"99999" Machine reference number (IC)
(EOT)	1	End of Transmission

(1) \$J\$ Variable length free text (EOT)

(e) \$5\$P1 (EOT)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	5	"99999" Machine reference number (OC)
(EOT)	1	End of Transmission

(f) \$6\$P1 (EOT)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	5	"99999" Machine reference number (FC)
(EOT)	1	End of Transmission

(g) \$7\$P1 (EOT)

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P1	5	"99999" Machine reference number (Highlights)
(EOT)	1	End of Transmission

NOTE: Numeric message types 4, 5, 6, and 7 will all be followed by a J type message in variable length free text.

3.2.2 Output Message Formats

The format of the output messages for Type A messages and Type E messages is as follows:

SS-1

SECRET

SECRET

SCR 352

3.2.2.1 Output Message Format for Type A Messages. -

(a) \$\$A\$

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P0	9	Mission
P1	4	Track segment
P2	14	Frame
P3	9	Target x, y coordinates
P4	8	Limiting conditions
P5	1	Quality
P6	2	Coverage
P7	2	Mode
P8	8	Remarks
	3	Blanks

All fields are fixed fields. Information will be BCD left adjusted with trailing blanks.

3.2.2.2 Output Message Format for Type E Messages. -

(a) \$\$E\$

<u>Item</u>	<u>No. Characters</u>	<u>Content</u>
P0	10	Date/Time
P1	6	Object class
P2	4	Object count
P3	20	Remarks
.	.	.
.	.	.
.	.	.
P0		
P1		
P2		
P3		

3.2.2.3 Other Alphabetic Message Type. - All other alphabetic message types are placed in the working file format with no format change.

3.2.3 Files

The description of the contents of and the procedures required to transmit records to the Working File and the Queue List and to change entries in the Status List are contained in the Status List/Queue List/Working File Specification (FS-1). The contents of and the procedures which shall be used by the DEN Program to obtain data from the IDF are described in the IIS National Data Base File Specification (FS-2) and the SS-1

SECRET

SECRET

SCR 352

File Control Program Specification (SS-12).

3.2.4 Secondary Storage

The method of transferring data to and receiving data from secondary storage shall be in accordance with the procedures described in the IIS RT/3 Specification (SS-9).

3.2.5 Other Communications with the Real Time /3 Program

The DEN program shall be subject to the control procedures described in the IIS RT/3 Specification (SS-9).

3.3 Diagnostics

No diagnostics are required of the DEN program.

3.4 Storage Allocation

3.4.1 Working Storage Allocation

3.4.1.1 Drum Storage Allocation. - The DEN program is provided with drum working storage on only the FH432, FH880 or FHL782 through a RT/3 request with a calling sequence in accordance with the IIS RT/3 Specification (SS-9). The maximum drum working storage allocated to the DEN program shall provide for 20,000 words.

3.4.1.2 Core Storage Allocation. - Maximum core working storage allocated to DEN is 500 computer words which suffices for the maximum size of a formatted message and may require transfer of a record in segments from secondary storage to the Working File.

3.5 General Design Features

3.5.1 Programming Language

The DEN program shall be coded in the SPRYE Assembly Language.

3.5.2 Flexibility

The code of the DEN program shall be subdivided into modules by at least five major program functions corresponding to the functions stated in Section 3.1. If a program function is not implemented initially, the control needed to operate a "dummy" module shall be included in the program. When this dummy module is executed, the output record prepared by the program shall include a statement indicating that this operational function is not yet available in the IIS.

SS-1

SECRET

SECRET

SCR 352

3.5.3 Recovery Procedure

If the DEN program is unable to receive or assemble any portion of an entered message due to machine error, it shall discard the entire message unless the message can be distinguished as a numeric coded type and its machine reference number is decodable. If both of these conditions exist, it shall initiate formatting of a Queue List entry in accordance with Section 3.1.1.

4. DEN PROGRAM FLOW DIAGRAM

Figure 1 represents the program flow logic of the functions described in Section 3.1.

SS-1

SECRET

SS-1

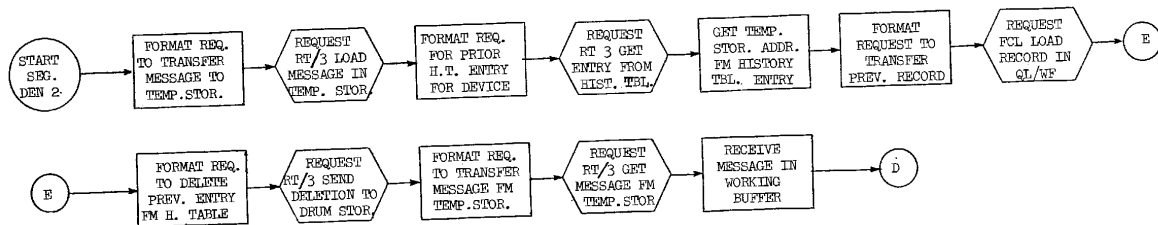
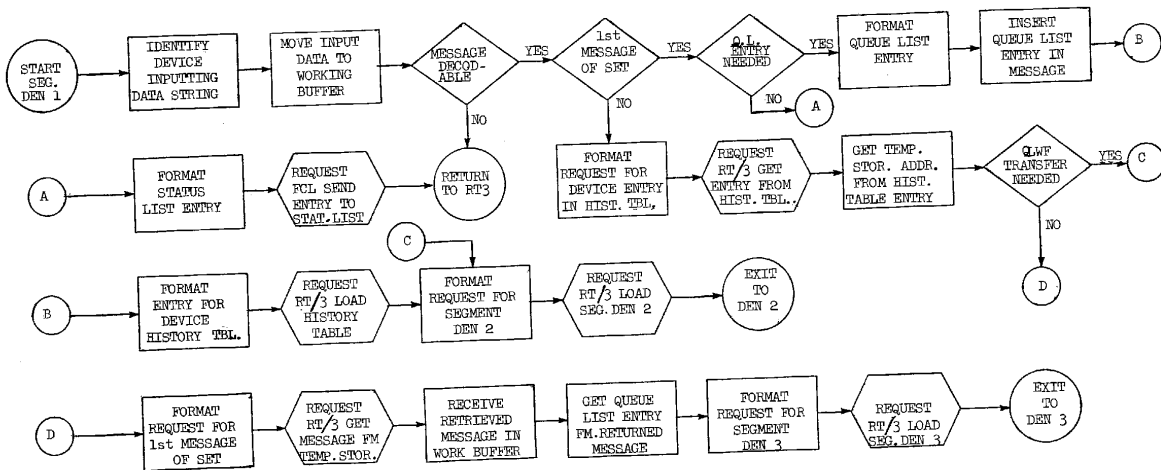


Figure 1 DEN PROGRAM FLOW CHART

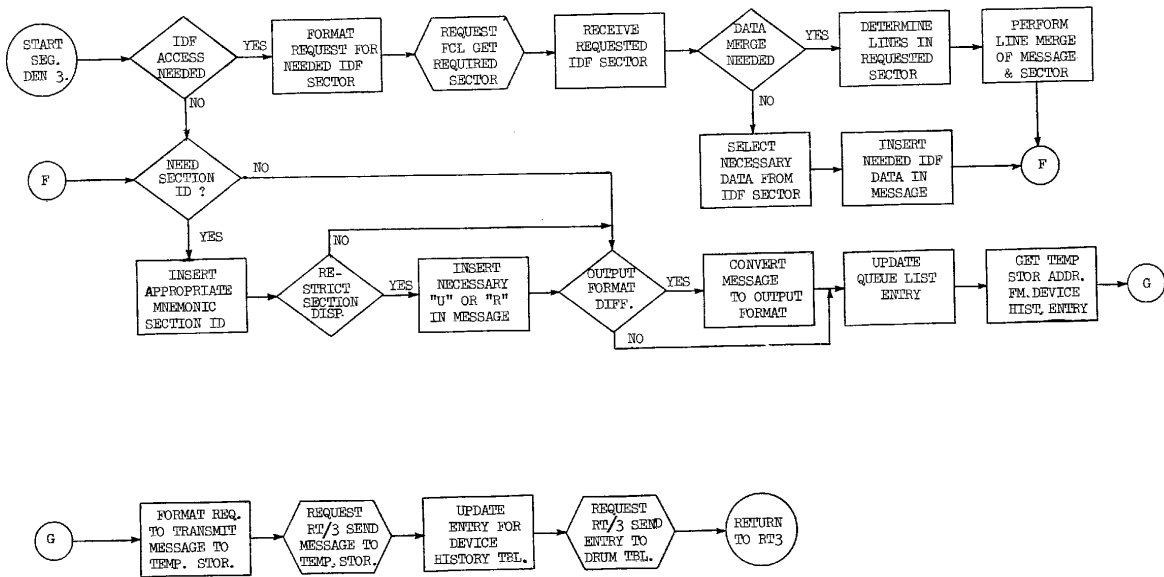
SECRET

13

SECRET

SCR 352

SS-1



SECRET

14

SECRET

Figure 1 DEN PROGRAM FLOW CHART

INTEGRATED INFORMATION SYSTEM (IIS)

PIRL PROGRAM SPECIFICATION

SS-4

8 February 1968

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. SCOPE	1
2. APPLICABLE DOCUMENTS	1
3. REQUIREMENTS	1
4. PIRL PROGRAM FLOW DIAGRAM	23

LIST OF TABLES

<u>Table</u>	<u>Page</u>
I Legal Command Statements	2
II End Control Statements	2

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. GEO-COORDINATE SEARCH AREA	15
2. PIRL PROGRAM FLOW CHART	24

SS-4

SECRET

SCR 352

PIRL PROGRAM SPECIFICATION1. SCOPE

This program specification describes the processing necessary to support an on-line query language used to retrieve substantive data from the National Data Base (NDB).

2. APPLICABLE DOCUMENTS

- File Control Program Specification (SS-12)
- IIS Real Time /3 Specification (SS-9)
- National Data Base (NDB) Specification (FS-2)
- Status List/Queue List/Working File Specification (FS-1)
- IIS Index and Index Records Specification (FS-3)
- VEA Program Specification (SS-2)
- RYE-494 Programmer's Reference Manual

3. REQUIREMENTS3.1 Functional Requirements

The PIRL program shall have the capability to decode and error check input query statements in order to retrieve specific data sets from the National Data Base. In turn, the retrieved information shall be formatted in terms of a visual display to be returned to the requestor.

3.1.1 Determine Query Function to be Performed

Each time RT/3 transfers an incoming message to the query language program, the program shall determine, from the command statement (first line entry of any query) what specific function of the query language program is to be performed. The legal command statements to the query language are shown in Table I.

If PIRL cannot match the first line of the query statements with one of the four commands shown in Table I, it shall produce the error message "ILLEGAL QUERY COMMAND" followed by the ten characters from the input message. This error message will consist of thirty-one characters representing a two line display. For example, if the abbreviation "INTERS." were used in place of "INTERSECT" the following error message would appear:

```

ILLEGAL QUERY COMMAND
INTERS.

```

Error messages shall be transferred to RT/3 together with the console identification of the original input console (see RT/3 specification).

SS-4

SECRET

SECRET

Table I

Legal Command Statements

	<u>Character Position</u>									
	1	2	3	4	5	6	7	8	9	10
Command Statement #1	R	E	T	R	I	E	V	E	.	\$
#2	A	L	S	O	.	\$	\$	\$	\$	\$
#3	I	N	T	E	R	S	E	C	T	.
#4	A	G	A	I	N	.	\$	\$	\$	\$
#5	U	P	D	A	T	E	.	*	\$	\$

\$ = Blank Character
 * = H, C, or D

3.1.2 End Control Statements

The query language shall determine the location of the last query statement in the input string of query statements. The last statement must be an End Control Statement as shown in Table II.

Table II

End Control Statements

	<u>Character Position</u>						
	1	2	3	4	5	6	7
End Control Statement #1	D	O	.				
#2	C	O	N	T	.		
#3	F	O	R	M	A	T	.

SS-4

SECRET

SECRET

3.1.2.1 DO Statement. - Detection of the "DO." statement as the end control statement shall direct the program to transfer to the Decode Statements Function (see 3.1.3), except in the case where the command statement is "AGAIN," in which case the function at 3.1.9 shall be performed.

3.1.2.2 CONTINUE Statement. - The "CONT." end control statement shall cause the program to:

- (a) Set a control flag which allows multiple display screens of query statements to be entered to the query program before a "DO" or "CONT" end control statement is encountered. Setting this CONT FLAG will inform the function described in 3.1.1 to bypass function determination.
- (b) Save the control statement determined in Section 3.1.1 by setting

QFUNC = to R, (Retrieve)
 A, (Also)
 I, (Intersect)
 G, (Again) or U (Update)

- (c) Request RT/3 to transfer remaining statements (minus control statements) to drum working storage by issuing the following executive command

Starting Address
 Length of Record
 Storage Media
 Error Return

- (d) Set user identification to equal console number in QUSE. Note: QUSE, QFUNC, CONT FLAG are registers saved in memory for future processing.

3.1.2.3 FORMAT Statement. - The "FORMAT" end control statement informs the query program that program output from this query will be directed to working storage, not a return display to the requester, for further processing by the presentation language.

3.1.3 Decode Query Statements and Error Check Format

3.1.3.1 Decode. - Each input query statement shall be decoded (separated) into three to five logical groups of character strings. Each logical group is delimited by commas (,) in the statement.

SS-4

SECRET

SECRET

SCR 352

The five logical groups are directly related to the standard query format:

FILE, UNIT RECORD/TERMS/, SECTOR, FIELD, ITEM, TIME

The groups consist of the following:

- (a) FILE ID - Three characters that identify the file of concern.
- (b) UNIT RECORD - Relates argument of desired unit record and is composed of the index name, argument and optional terms to qualify the argument.
- (c) SECTOR ID - Identifies subfield (Sector) of interest.
- (d) FIELD ID - Identifies field within a sector.
- (e) ITEM and TIME - This group contains those items that are to be searched in order to locate information within the sector.

3.1.3.2 Error Checking. - Format Error Checking shall be performed to insure that all query statements meet the following criteria:

- (a) The two groups (FILE and UNIT RECORD) must always be present with one exception: The FILE group followed by a double comma (,,) and a period (.) is a legal statement.
- (b) The FILE ID group must always contain the letters IDF, ODF, EPD, or MTF.
- (c) Each individual query statement must be terminated with a period (.).
- (d) No statement may contain more than five major groups.
- (e) The first four characters of the unit record term must correspond exactly to one of the entries in the following tables. Table selection is based upon the FILE identification group.

SS-4

SECRET

(1) IDF

N	A	M	E
C	O	M	I
B	E	§	§
N	P	I	C
C	O	U	N
M	I	L	I
M	R	N	§
G	E	O	§
T	Y	P	E
T	D	I	C

§ = Blank Character

(2) ODF

N	A	M	E
N	A	T	O
C	O	D	E

(3) EPD

N	A	M	E
G	E	O	§
T	Y	P	E
C	O	U	N

SS-4

SECRET

SECRET

(4) MIF

N	A	M	E
C	O	D	E

(f) The first four characters of the Sector group shall be a valid entry (for each file ID) as defined in the following tables:

(1) IDF

H	E	A	D
B	R	I	E
D	E	T	A
R	E	A	D
C	O	L	L
N	O	T	E
P	H	O	T
S	O	U	R
F	I	X	E
M	O	B	I
H	I	S	I
C	O	M	P

SS-4

SECRET

SECRET

(2) ODF

H	E	A	D
D	E	S	C
M	E	A	S
P	H	O	T
D	R	A	W
S	O	U	R
S	E	E	N
E	E	I	\$

(3) MTF

H	E	A	D
D	E	S	C
M	E	A	S
P	H	O	T
S	E	E	N

(4) EPDF None legal.

(g) If a field term is present, (1) correct corresponding file and sector terms must also be present, and (2) the first four characters of the field term must be correct as defined by the following tables:

SS-4

SECRET

SECRET

<u>File Term</u>	<u>Corresponding Sector Term</u>	<u>Valid Field Four Characters</u>
IDF	HEAD	NAME COMI BE\$\$ COUN MILI MRN\$ GEO\$ TYPE ELEV NPIC MRN\$
IDF	BRIEF	Field Term Illegal
IDF	DETAILED	Field Term Illegal
IDF	READ	Field Term Illegal
IDF	COLLATERAL	Field Term Illegal
IDF	NOTE	Field Term Illegal
IDF	PHOTO	BEST
IDF	SOURCE REFERENCE	Field Term Illegal
IDF	FIXED FACILITIES	Field Term Illegal
IDF	MOBILE EQUIPMENT	Field Term Illegal
IDF	HISTORY (CONCISE)	Field Term Illegal
IDF	COMPLETE HISTORY	Field Term Illegal
ODF	HEADER	NAME NATO CODE MRN\$ MANU
ODF	DESCRIPTION	Field Term Illegal
ODF	MEASUREMENT	SHAP LENG WIDT HEIG VOLU OTHE
ODF	PHOTO REF.	GROU AIR\$
ODF	DRAWING REF.	Field Term Illegal
ODF	SOURCE REF.	Field Term Illegal
ODF	WHERE SEEN	Field Term Illegal
ODF	EET	Field Term Illegal

SS-4

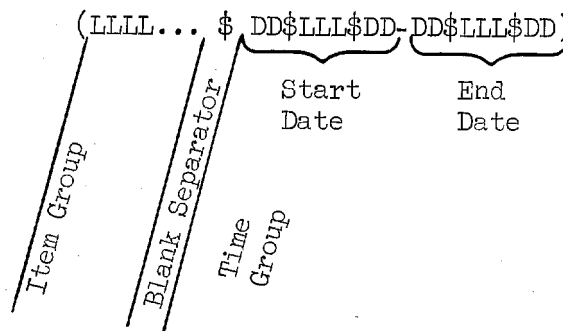
SECRET

SECRET

<u>File Term</u>	<u>Corresponding Sector Term</u>	<u>Valid Field Four Characters</u>
MTF	HEADER	NAME CODE MRN\$ MANU
MTF	DESCRIPTION	Field Term Illegal
MTF	MEASUREMENT	Field Term Illegal
MTF	PHOTO REFERENCE	Field Term Illegal
MTF	WHERE SEEN	Field Term Illegal

(h) If an Item and/or Time group, distinguished by terms enclosed with (), is present, the query statement must be checked and decoded for valid corresponding file, sector and field term in the following manner:

(1) Determine if item and/or time groups are present. This shall be determined by a blank between the item and time group, i.e.



(2) Presence of the item group shall cause the query program to check the alpha name against a table of legal designators. If the alpha item group matches an entry in the table, the eight (8) character group will be extracted from the table to become the item group of the decoded statement. If no match is made, the program shall produce the following message:

Original Query Statement
"Illegal Search Term"

SS-4

SECRET

- (3) Presence of the time groups shall cause the query program to error check one or two date groups for legal
 - a. date (DD=1-31)
 - b. month (LLL=Jan-Dec)
 - c. year (DD=5n-7n)

If an illegal term is found, the program shall produce the above (2) error message.

Error messages shall be generated for the above eight criteria as follows:

<u>Criteria</u>	<u>Error Message</u>
(a)	INCORRECT TERM GROUP NUMBER
(b)	FILE ID INCORRECT
(c)	(.) PERIOD OMITTED
(d)	TERM GROUPS > FIVE
(e)	ILLEGAL UNIT RECORD TERM
(f)	ILLEGAL SECTOR TERM
(g)	ILLEGAL FIELD TERM
(h)	ILLEGAL SEARCH TERM

Each of the above error messages shall be preceded with the message "INPUT QUERY ERROR," and the decoded statement (original statement in error). All query statements will be decoded and error checked up to a "DO" or "CONT" statement. At this time, any error statements that have been generated will be returned to the requestor along with the original input statements. Each error message shall follow the appropriate original input statement.

3.1.3.3 No Unit Record Term. - If no unit record term is encountered, i.e., the query statement is of the following format,

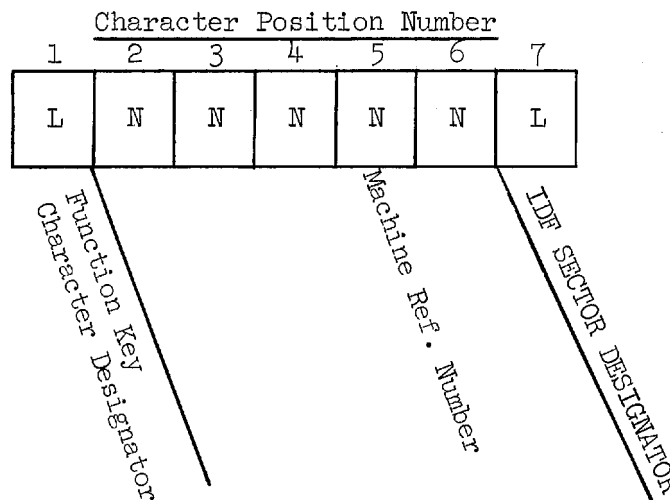
LLL,

PIRL shall interpret the statement to mean that the list of MRN's that apply have been previously calculated by the functions described in paragraphs 3.1.5.2, 3.1.5.3, 3.1.6 and 3.1.7 and if the query statement is of the form REPEAT NN. or DELETE NN., the PIRL program shall request the FCL to retrieve the previous query for this console. The program shall then determine the line number (NN) of the repeat or delete statement and locate the line number in the previous list of query statements. (A line number is defined by sequentially numbering input query statements 1, 2, 3... Each numbered statement is ended by a period (.)). The "Delete" Command SS-4

shall instruct the program to delete (blank out) this statement number. The "Repeat" Command shall instruct the query program to take this numbered statement as the next query statement in this current input string of query statements. In either case the processing continues with the next query input statement (see 3.1.3.2).

3.1.4 Perform Function Key Query

The query program shall be capable of processing a function key request received from RT/3 in the following format:



The seventh character position represents the specific sector of the TUR to be retrieved from the IDF. Legal sector designators are:

<u>Designator</u>	<u>IDF Sector</u>
H	IHEAD
B	IBRIE
D	ICHAN
E	IDETA
C	IREAD
N	ICOLL
P	INOTE
S	IPHOT
F	ISOUR
O	IFIXE
I	IMOB
J	ICONC

SS-4

3.1.4.1 Error Checking. - Function Key Requests will be error checked as follows:

- (a) Character positions 2-6 will be checked for a numeric value, any alpha character is assumed as an illegal function key request.
- (b) Character position 7 will be checked for a legal alpha character as shown in IDF Designators above, any other alpha character is an illegal function key request.
- (c) Any illegality encountered shall cause the query program to produce the following display message:

"ILLEGAL FUNCTION KEY REQ"

followed by the initial input statement, e.g.

ILLEGAL FUNCTION KEY REQ
124B50

3.1.4.2 Function Key Processing. - A legal function key request will be processed by:

- (a) Converting the seventh (7th) character position to the IDF sector name.
- (b) Placing the MRN (character positions 2-6) and the IDF sector name in a message for output through RT/3 to the File Control Element (QRIN) as follows:

Character Position Number								
1	2	3	4	5	6	7	8	9
N	N	N	N	N	L	L	L	L

e.g.

1	2	4	7	5	S	O	U	R
---	---	---	---	---	---	---	---	---

- (c) QRIN will return to the query program a return statement (see File Control Specification) containing request number, starting location and number of words of the sector retrieved.

SS-4

SECRET

- (d) The query program shall append the user station identification to the starting location and number of words (see IIS RT/3 Specification for format) and issue a request to RT/3 to transmit this retrieve sector to the appropriate users.

3.1.5 Processing "RETRIEVE" Type Query

Further decoding of the unit record group of terms is not necessary unless slashes (/) appear in this term group. Therefore the unit record term group must be searched for the presence of a slash. If there are no slashes, the function described in 3.1.5.1 is bypassed and processing of a RETRIEVE type query continues with the function 3.1.5.4.

3.1.5.1 Determine Argument Qualifiers. - When a slash is encountered in the unit record term group, the query program shall determine which one of three conditions are present:

- (a) Qualifiers to the argument expressed as a range of alphabetic or numeric terms.
- (b) Qualifiers to the "one degree square" argument specify a search to be performed using the geographical point as center of the search area. The search parameter is specified in terms of nautical miles.
- (c) Slashes are present, but condition 1 or 2 above cannot be determined. This results in the query program producing the error message as specified in 3.1.3.2, i.e., "ILLEGAL UNIT RECORD TERM."

3.1.5.2 Process Range of Terms. - The format for the UR term group that meets this condition is as follows:

, L L L L L \$ / N N N ... /T O/ N N N.../ ,

The diagram shows a sequence of characters: a comma, five 'L's, a '\$', a '/', three 'N's, an ellipsis, a '/', 'T', a '/', 'O', a '/', three 'N's, an ellipsis, and a final comma. Diagonal lines are drawn under each of these elements, and labels are placed below them: 'INDEX NAME' under the first 'L', 'SPACE' under the '\$', 'FIRST ARGUMENT' under the first 'N', 'SEPARATOR' under the first '/', 'T', and 'O', and 'LAST ARGUMENT' under the last 'N'.

- (a) The query program shall extract the first argument term and determine if the first term is alphabetic or numeric and for the presence of a null (?) character(s). If a null (?) character(s) is sensed, the PIRL SS-4

SECRET

SECRET

SCR 352

program proceeds to (b) below. The program shall then check the last argument term to insure compatibility of terms, i.e., if the first term is alphabetic, then the last term must also be alphabetic. If the first and last terms are not compatible, the query program shall produce the error message as specified in 3.1.

If the query program determines that the terms are legal, it shall transmit to (QRIN) the first call for the first argument consisting of:

- (1) Index Name
- (2) Argument
- (3) MRN (request MRN # in return)

The first (next) argument will then be incremented to its next alphabetic or numeric value (in turn using the calling sequence above to QRIN) until the last argument has been passed to QRIN. At this time the query program has a list of MRN for each return call from QRIN. The query program shall then calculate the total number of MRN's that apply to this query statement and will compose and transmit the following message to RT/3:

ORIGINAL INPUT STATEMENT

n n n n UNIT RECORDS APPLY

(b) The presence of a null character(s) shall cause the PIRL program to create the first logical numeric (0, 00...) or alpha (A, AA...) element and the last logical numeric (9, 99...) or alpha (Z, ZZ...) element. These first and last elements shall be utilized as the first and last argument and processed in accordance with 3.1.5.2(a) above.

3.1.5.3 Process Geographical Search Terms. - The format for the UR term group that meets this condition is as follows:

GEO \$	SEARCH	NNN	/NNNNL/NNNNNL/
INDEX NAME	FUNCTION WORD	SEARCH PARAMETER	GEO-COORDINATE IN DEGREES AND MINUTES

SS-4

SECRET

The query program shall extract the Geo-Coordinate Term. This point shall serve as the center point of a square having an X and Y dimensions equal to the search parameter (NNN) expressed in nautical miles.

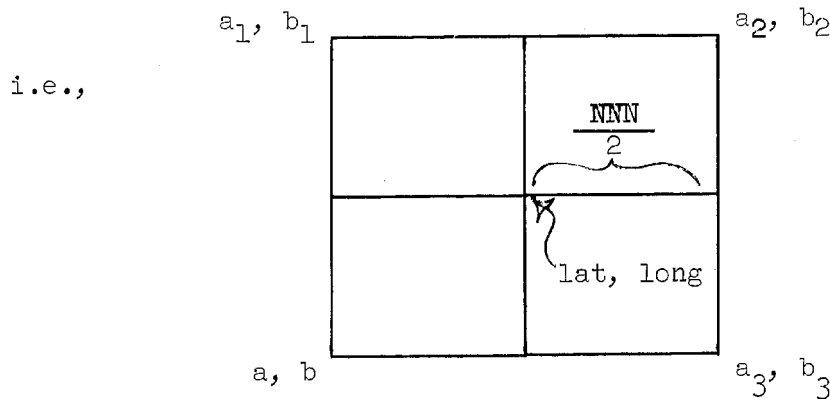


Figure 1 - GEO-COORDINATE SEARCH AREA

The query program shall calculate the geo-coordinates of four corner points of the area to be searched represented in Figure 1 as a, b ... a₃, b₃. The program shall then determine the one degree square(s) that overlay this search area. All one degree squares that meet this criteria shall be sent to the file control program (QRIN) with a calling sequence that includes the index term (1° square). The file control program will return to the query program a list of MRN's with minutes of lat, long for this index argument. The query program, utilizing the latitude and longitude of each MRN shall determine whether the MRN falls within the search area. All MRN's falling in the search area will be saved until all 1° squares that overlay the search area have been processed. At this time the query program shall request temporary drum storage for the created list of MRN's. In turn it shall determine the number of MRN's that apply to this search and produce the message specified for broad term indexes as stated in Section 3.1.5.4.

3.1.5.4 Sector Determination and Retrieval. - The sector term group will be extracted from the decoded query (3rd term group) and a calling sequence to QRIN (via RT/3) will be developed to include:

- (a) Index term
- (b) Sector term

QRIN will return to the query program the core address and number of words for either:

SS-4

SECRET

SECRET

SCR 352

- (a) The actual sector for a unique term index request.
- (b) A list of MRN that apply for a broad term index request.

In the first case, if there are no further term groups present, the query program shall request RT/3 to transmit the retrieved sector information to the user by the following calling sequence:

- (a) User ID
- (b) Core Starting Address
- (c) Number of Words
- (d) Error Return

For the second case, broad term index only, the query language shall determine the number of unit records that apply and produce the following message:

ORIGINAL QUERY STATEMENT

"n n n n UNIT RECORD APPLY"

This message shall be transferred to RT/3 by the above calling sequence. The query program will also request RT/3 for drum working storage to save the list of MRN's for future processing. (See calling sequence for drum working storage - IIS RT/3 Specification.)

3.1.5.5 Processing Field Term for Retrieve Type Query. - The field term (fourth term group) shall be extracted from the decoded query. The sector control block (see IIS National Data Base File Specification) will be searched to determine the address and length in the sector of the desired field. The fixed address and length will then become part of the calling sequence to RT/3 as follows:

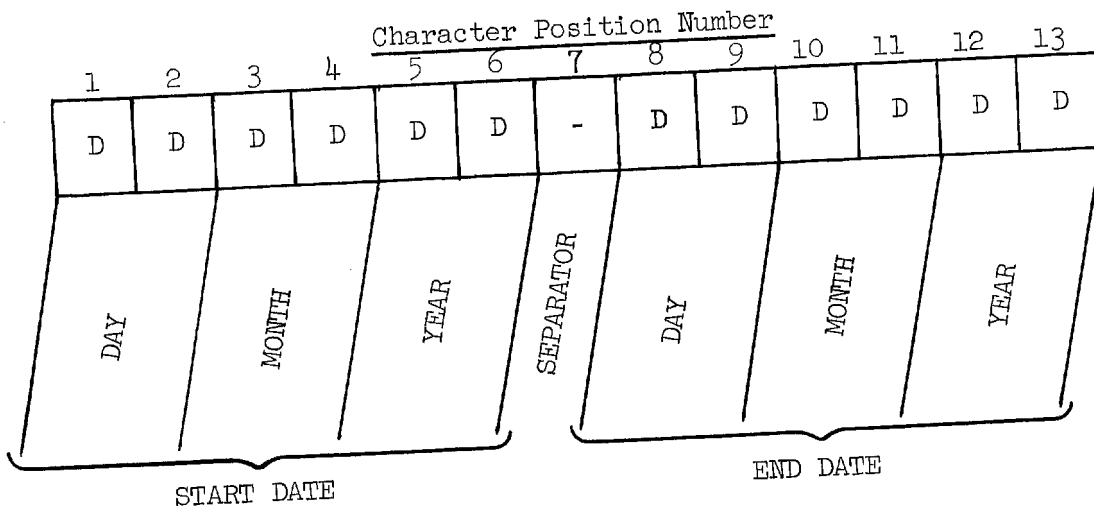
- (a) User ID
- (b) Starting Field Address (Core)
- (c) Number of Words
- (d) Error Return

SS-4

SECRET

3.1.5.6 Processing Search Terms. - The query program shall extract the search term group from the decoded statement, (this is the term group separated by () and contains one or two terms as follows):

- (a) Type term only - contains a coded category
- (b) Time term only - contains two (one optional) time groups, i.e.,



- (c) Type and Time Combination - both (a) and (b) above.

3.1.5.6.1 Type Term Only. - If only a type term is present, the query program will develop a search algorithm for this type code against the previous retrieved sector data (see IIS National Data Base File Specification - for category type coding). Each match in the sector with the search parameter will be extracted and accumulated in core until the entire sector has been searched. If no matches are found, the program shall produce the message:

ORIGINAL QUERY STATEMENT

"NULL SEARCH"

If one or more matches are found, the program shall direct the accumulated matched entries to RT/3 program.

3.1.5.6.2 Time Term Only. - If only a time term is present, the query program shall search the sector for all entries that fall on or between the two specified dates in the time group (program will use only one date if so specified) - (see IIS National Data Base File Specification SS-4)

SECRET

SCR 352

for coding of time items). All "matches" or "no matches" will be processed as the type matches above.

3.1.5.6.3 Type and Time Terms. - When both type and time terms are present the query program shall process both functions specified in paragraphs 3.1.5.6.1 and 3.1.5.6.2. The search is considered satisfied only if both search criteria are met.

3.1.6 Processing an "ALSO" Type Query

The query program shall determine the next to last statement in the statement string (i.e., the statement preceding the "DO" statement). The unit record term group will be examined for the presence of slashes. If slashes are present, the UR term will be processed in accordance to 3.1.5.2 for range of terms or 3.1.5.3 for geographical search terms and proceed to 3.1.6.1. If slashes are not present the query program shall issue the following calling sequence to RT/3 (QRIN):

- (a) Index Name
- (b) Argument
- (c) Error Return

In both cases, the query program shall have returned to it a list of MRN's that apply to this argument. This list shall be designated List A and will be saved to perform a logical AND on all subsequent lists retrieved. in 3.1.6.1.

3.1.6.1 Processing. - All remaining query statements in the statement string shall be processed in the same manner as above but the resulting MRN list(s) returned by QRIN will serve as a master list (List B) with which to perform the logical AND against List A of MRN's retrieved above.

3.1.6.2 Logical AND. - Perform a logical AND of Lists A and B and accumulate matching MRN's in memory. At the end of this operation, determine the resultant number of MRN's that apply and prepare the following message:

ORIGINAL QUERY STATEMENTS

"n n n n n UNIT RECORDS APPLY"

The resultant list of MRN's will be placed in working storage for future processing, by requesting RT/3 for drum storage (see calling sequence for drum working storage - IIS RT/3 Specification).

SS-4

SECRET

3.1.7 Processing An "INTERSECT" Type Query

The query program shall select the first statement after the control statement "INTERSECT." The unit record term shall be processed in the same manner as in 3.1.6. The resultant list of MRN's shall be used to perform a logical AND on the list of MRN's retrieved in the second query statement. Each subsequent query statement will in turn be ANDed with the previous resultant lists of MRN's until the "DO" statement is encountered. The last logical AND will produce a list of MRN's that is saved for future processing and displayed to the requestor in the same fashion as in 3.1.6.

3.1.8 Perform On-Line Update to National Data Base

This function is an extension to the query program allowing the user to maintain (corrections or additions) the NDB. The inputs to this function are the following query statements:

UPDATE, L.

FILE ID, UR, SECTOR.

DO.

It should be noted that input to the update function will always consist of three statements. The first statement is "UPDATE," the second statement is a query statement which contains only three term groups (FILE ID, Unit Record, Sector) and the third is the action statement "DO." The Update Query shall be handled as follows:

3.1.8.1 Decode and Error Checking. - The query statement shall be decoded and error checked by the procedure stated in paragraph 3.1.3, with the following additional checks:

- (a) Only one query statement follows an UPDATE request
- (b) Field and Search term groups must not be present
- (c) Console (requestor) status must be set in update status

A violation of any of the above checks will cause the program to produce the following message:

SS-4

SECRET

SCR 352

Original Query

"ILLEGAL UPDATE REQ LLL"

Where LLL = CON for console violation and
= FORM for illegal format

3.1.8.2 Sector Determination and Retrieval. - This shall be accomplished as specified in paragraph 3.1.5.4.

3.1.8.3 Handling Updated Sector Information. - The query program shall process retrieved data and add the necessary information to the Queue List and Working File for the VEA Program for three types of update data.

(a) Corrected Header.

The input statement for a correction to a header field is as follows:

UPDATE, H.

(b) Corrections and Additions to Other Sectors.

The input control statement for a correction or addition to other sectors is as follows:

UPDATE, C.

(c) Deletion of an Entire Sector.

The query program shall have the capability of entering a command to AUD program to delete a complete sector (partial deletion is accomplished by (b) above). The input command to the query program is:

UPDATE, D.

For legal update requests, PIRL shall request the File Control program (QRIN) to update the Queue List and the Working File by issuing the following calling sequences:

SS-4

Queue List Entry

MRN
Edited Status
Non Data Entry

Working File Entry

MRN
Sector Number (File ID and Sector Designator)
Core Address (of retrieved sector)
Number of Words

3.1.9 Provide Iterative Retrieval Display

The PIRL program shall provide the capability to regenerate the previous (last queue request) RETRIEVE query based on the following input statements:

"AGAIN."

"DO."

This shall be accomplished by saving in temporary drum storage the last RETRIEVE query for each query console. Then, when the PIRL program receives the "AGAIN" statement it will utilize the input console ID to determine the temporary drum address of the previous query. At this time the program will request RT/3 to retrieve this temporary drum record. This query, retrieved from temporary storage, shall then be handled as the next input query (see Section 3.1.1).

3.1.10 Number of Consoles

The PIRL Program shall be able to accomplish the requirements above for fifty Query consoles that are being used simultaneously.

3.2 Interfaces

3.2.1 Program Inputs

The input character string received from RT/3 by the PIRL program shall always contain in the first three characters, "QRY." These three characters are used for control of the IIS and are ignored in all subsequent PIRL program processing, i.e., the first meaningful character to the PIRL program begins on input line #2 (defined by a Carriage Return on an ASR or the character number on a CRT). All other detailed program inputs are described in Section 3.1.

SS-4

SECRET

3.2.2 Program Outputs

The program outputs of the PIRL program consist of retrieved portions of the NDB (see National Data Base File Specification for format). All data is outputted by calling sequences to RT/3.

3.2.3 Files

The description of the contents, and the procedures that shall be used to obtain data from the NDB, IX's, IR's, Queue List, Working File and secondary (temporary) storage are described in the documents referenced in 2.0.

3.3 Diagnostics

All PIRL program diagnostics are described in Section 3.1.

3.4 Storage Allocation

3.4.1 Working Storage Allocation

3.4.1.1 Drum Storage Allocation. - The PIRL program is provided drum working storage on either the FH380, FH432, or FHL782. The maximum drum working storage allocated shall be 20,000 drum words.

3.4.1.2 Core Storage Allocation. - Maximum core working storage/segment is allocated 1,000 494 words.

3.5 General Design Features

3.5.1 Programming Language

The PIRL program shall be coded in the NSA SPRYE Assembly Language.

3.5.2 Flexibility

The PIRL program shall be coded in modules corresponding to the functions of Sections 3.1.1 through 3.1.9. If a function is not initially implemented, the control necessary to operate a "dummy" module shall be included in the program. When this "dummy" module is executed, a display message shall be generated that indicates that this operational function is not yet available in the IIS.

SS-4

SECRET

4. PIRL PROGRAM FLOW DIAGRAM

Figure 2 represents a program flow logic of the functions described in Section 3.1.

SS-4

SECRET

SS-4

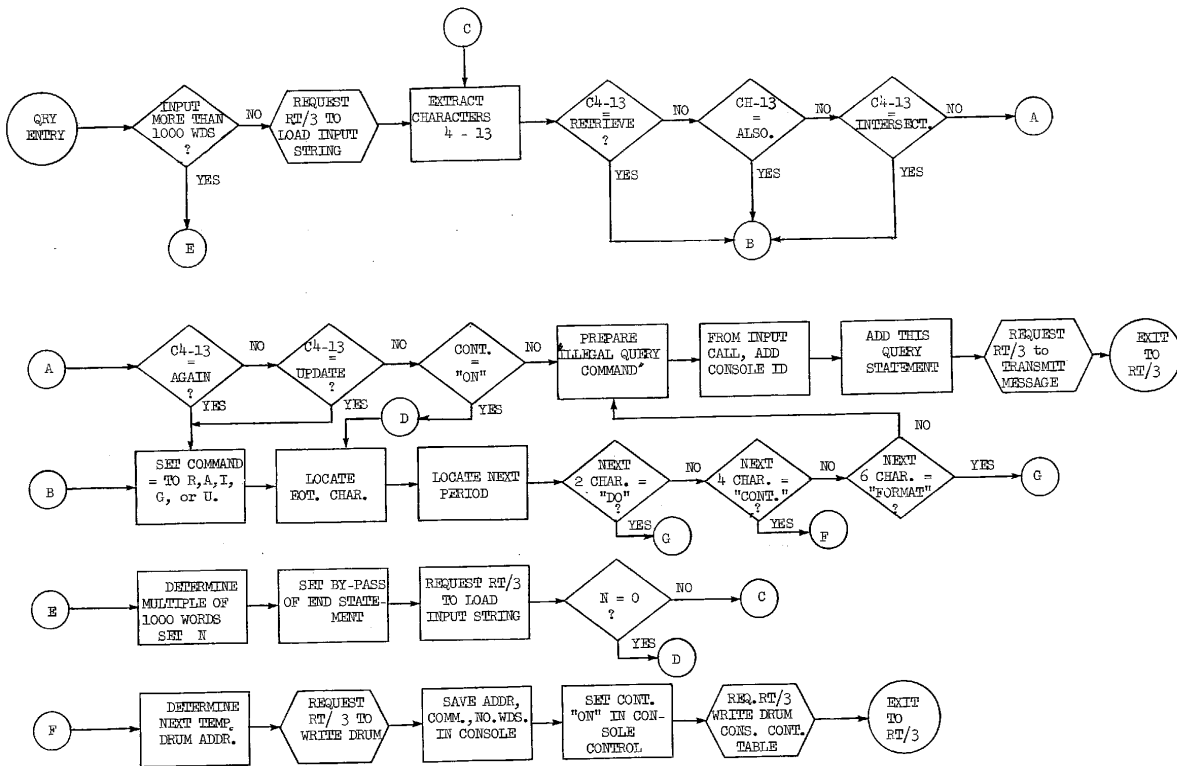


Figure 1 PIRL PROGRAM FLOW CHART

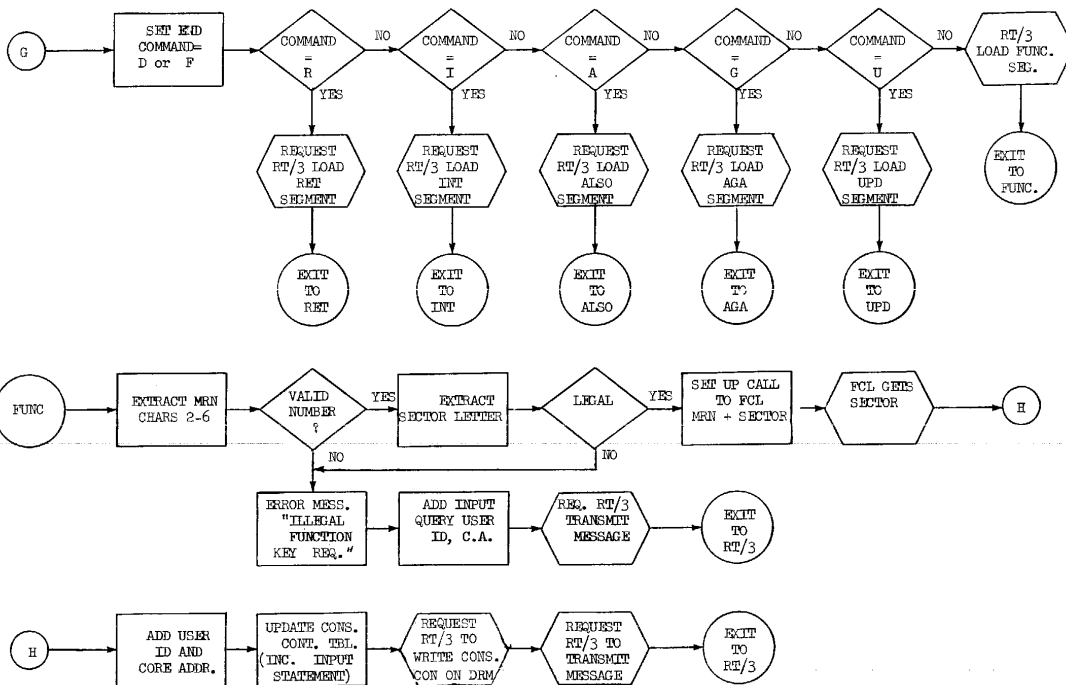
SECRET

24

SECRET

SCR 352

SS-4



SECRET

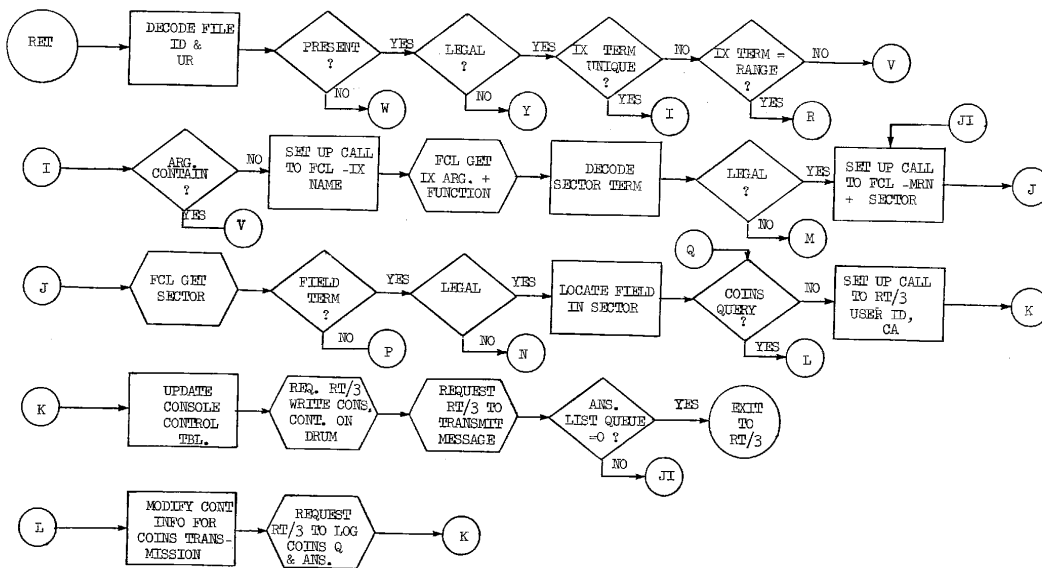
25

SECRET

Figure 1 PIRL PROGRAM FLOW CHART

SCR 352

SS-4

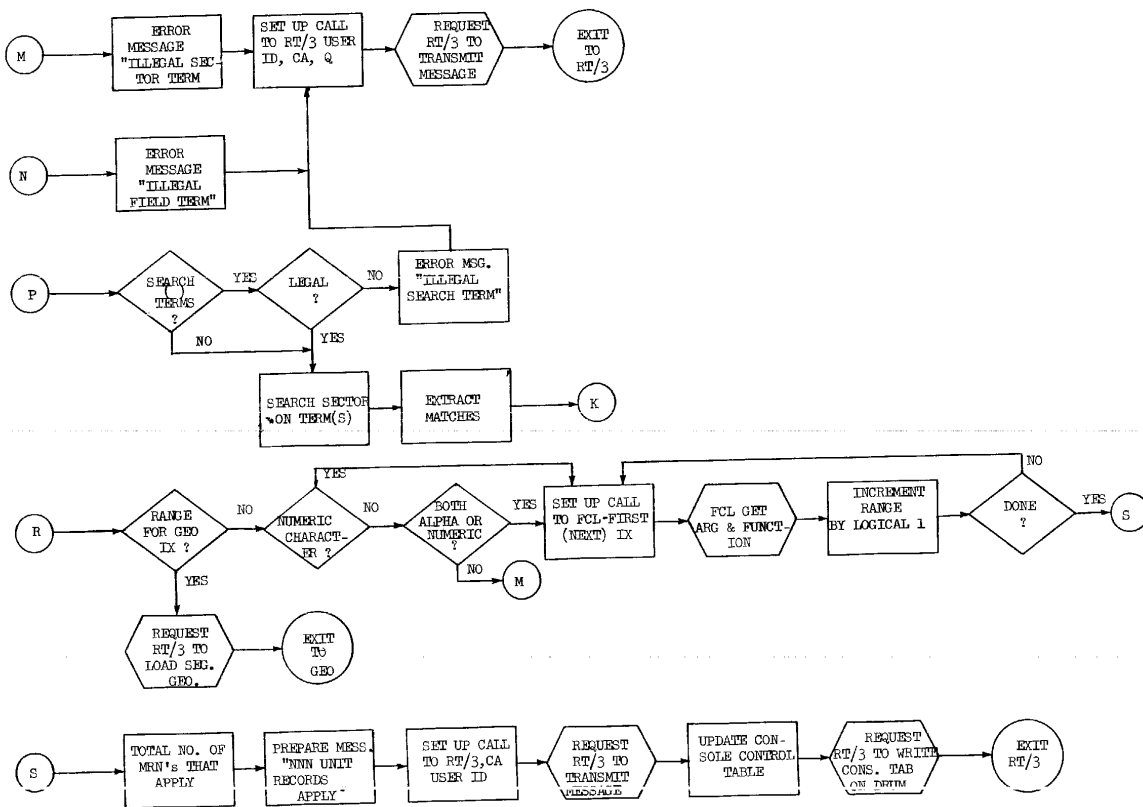


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Figure 1 PIRL PROGRAM FLOW CHART

SS-4



SECRET

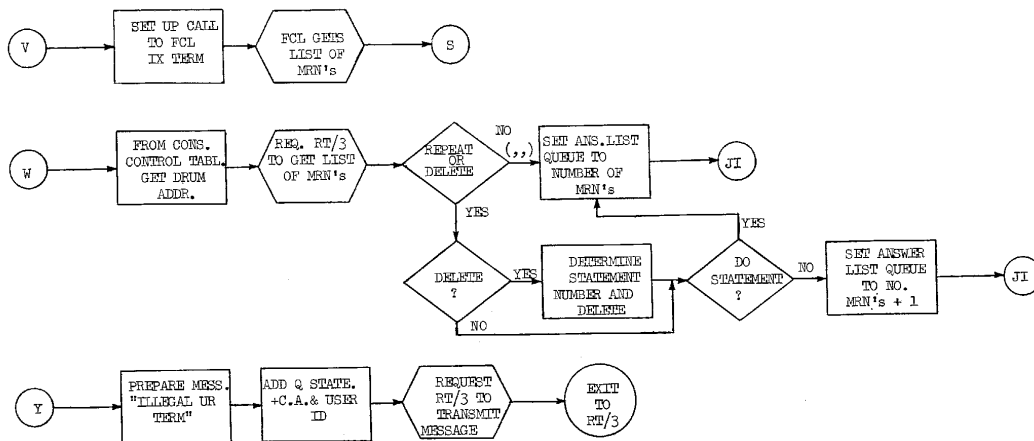
27

SECRET

SCR 352

Figure 1. PIRL PROGRAM FLOW CHART

SS-4



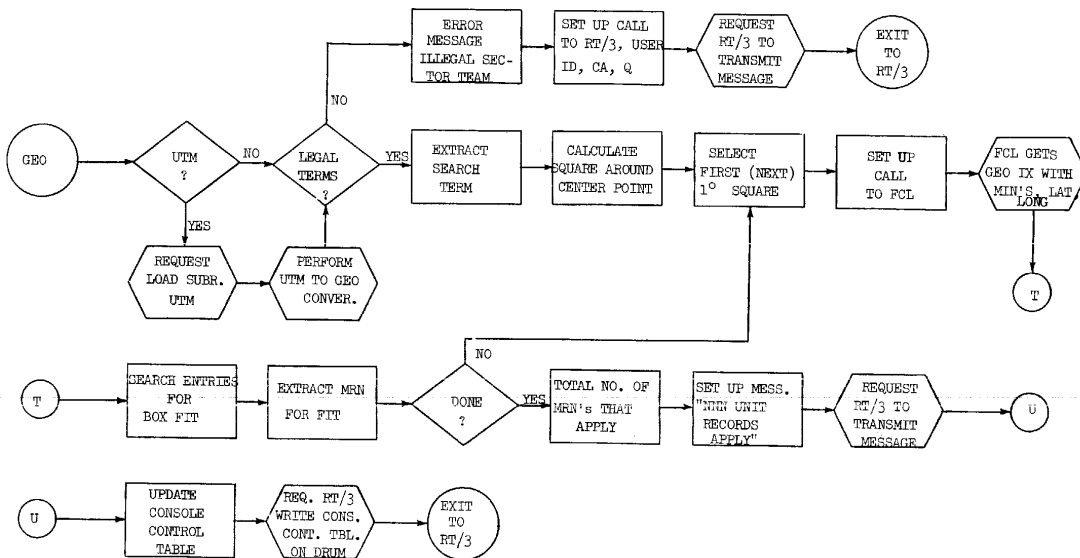
28

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Figure 1. PIRL PROGRAM FLOW CHART

SS-4



SECRET

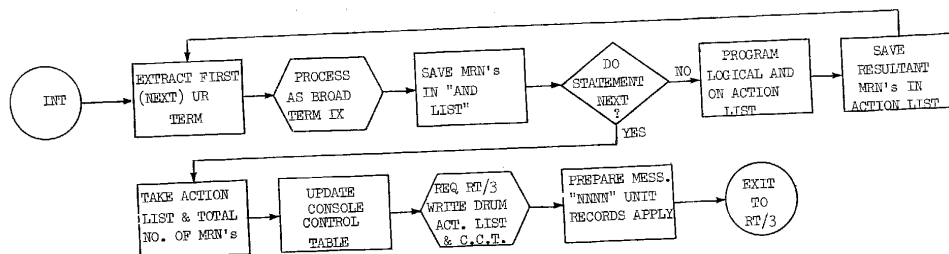
29

SECRET

Figure 1 PIRL PROGRAM FLOW CHART

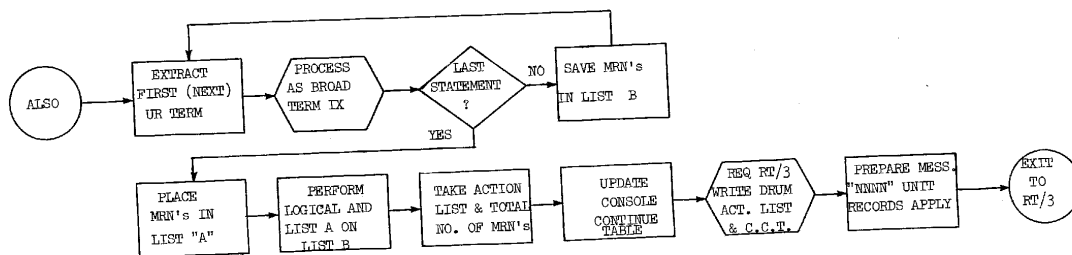
SCR 352

SS-4



SECRET

30

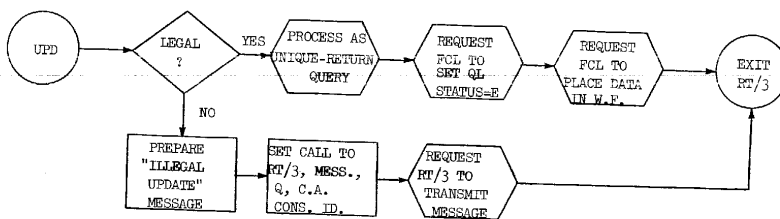
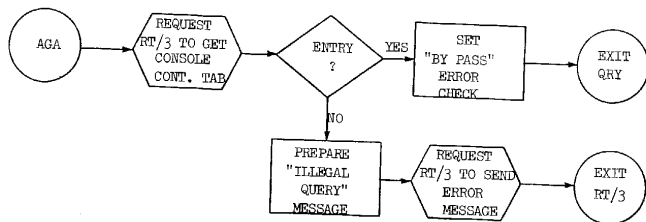


SECRET

SCR 352

Figure 1 PIRL PROGRAM FLOW CHART

SS-4



31

SECRET

SECRET

Figure 1 PIRL PROGRAM FLOW CHART

INTEGRATED INFORMATION SYSTEM (IIS)

REPORT GENERATOR PROGRAM SPECIFICATION

SS-5

8 February 1968

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. SCOPE	1
2. APPLICABLE DOCUMENTS	1
3. REQUIREMENTS	1
4. REPORT GENERATOR PROGRAM FLOW DIAGRAM	11

<u>Table</u>	<u>Page</u>
I Report Generator Inputs	7
II Report Generator Outputs	8

LIST OF FIGURES

<u>Figures</u>	<u>Page</u>
1. REPORT GENERATOR PROGRAM FLOW CHART	12

SS-5

SECRET

SCR 352

REPORT GENERATOR PROGRAM SPECIFICATION

1. SCOPE

The IIS Report Generator programs shall be capable of handling three different types of reports and operating in two different modes. The two modes are a real-time mode and a batch processing mode. The report types are individual target reports, collected target reports and Basic Intelligence Reports.

Individual target reports shall be generated in the real-time mode, one at a time, as soon as the readout for the targets is approved. The reports of this type are the immediate routine and flash cables and the notes for briefing board candidates.

The collected target reports shall be generated in the batch mode and contain the readout data for many targets in a single document. This report type is mission oriented and is made up of the following documents: First Phase Report, First Phase Supplement, and Significant Change Report.

The Basic Intelligence Report shall be generated in the batch mode and is non-mission oriented. It is possible to have an initial or update type of Basic Intelligence Report.

Each of these report types will be handled differently by the Report Generator. The real-time segment of the Report Generator operates under RT/3 and the batch processing segment operates under RUM/ART. The functions of each shall be described separately.

2. APPLICABLE DOCUMENTS

IIS RT/3 Specification (SS-9)
RYE-494 Programmer's Reference Manual
Status List/Queue List/Working File Specification (FS-1)

3. REQUIREMENTS

The real-time segment of the Report Generator shall be executed for each target which requires a cable report or is a briefing board candidate. The Queue List supplies indicators for these among the Disposition bits (see Status List/Queue List/Working File Specification). The indicators are checked and if either is set, then the real-time report generator shall be called by RT/3. Included in the calling sequence shall be the MRN of the target.

SS-5

SECRET

SECRET

SCR 352

3.1 Functional Requirements (Real Time and Batch Processing)

3.1.1 Functional Requirements (Real-Time Module)

The real-time segment of the Report Generator shall have the capability to access the Report Format File (see Section 3.6 for internal file descriptions) for the formats of the individual target reports, extract data from the Working File, format the data for output, and output the data.

3.1.1.1 Access the Report Formats File - The Report Formats File describes the contents of and formats for IIS generated reports (see Section 3.6). The Report Generator shall determine which report is to be generated from the calling sequence information and then search the Report Formats File for the proper sector.

3.1.1.2 Extract Data from the Working File - The Report Generator program shall use the Queue List entry for the given target to acquire the Working File address for this target. The Working File entry shall be read into core. The content field of the Report Formats sector (from the Reports Format File) shall be used to extract items from the Working File entry. The data shall be formatted for output as it is extracted.

3.1.1.3 Format the Data For Output - As data is extracted from the Working File entry, the format field shall be checked before each extraction so that the data may be adjusted to fit the output format. Each item shall occupy one line or record of output if it is less than the specified number of characters in length. Items of free-text data will be divided into whole lines or records of the desired length. The program shall also make sure that individual words of free text data are not divided between two lines of output. The program shall insert spaces between items of data.

3.1.1.4 Output the Data - The formatted data shall be placed in a buffer area of core for output. The Report Generator Program shall call the RT/3 Program with the proper calling sequence to output the data (See RT/3 Program Specification). The Briefing Board Individual Target Reports shall be directed to a line printer. The Cable Individual Target Reports shall be directed to a line printer and a tape punch.

3.1.2 Batch Processing Report Generator

The Batch Processing Report Generator is run under the control of RUM/ART. The program is initialized using the remote calling sequence to execute a program under RUM/ART as specified in "RYE-494 Programmer's

SS-5

SECRET

Reference Manual", Chapter VII under Preparation of Input Data for RYE,
i. e.

Alt. Mode
Control-SMK
Standard Header Information
Alt. Mode
Control-EOS

Alt. Mode
Control-SOS
...data...
Alt. Mode
Control-EOS

Where ...data... shall define the type of report to be generated. There are three mission oriented reports (First Phase Report, First Phase Supplement, and Significant Change Report) and one non-mission oriented report (Basic Intelligence Report).

If any of the reports is to be produced in more than one part, the Report Generator shall be initialized more than once with the same input data. For mission oriented reports, the cable versions and sterile versions shall be generated at the same time as the basic report.

3.1.3 Functional Requirements (Mission Oriented Reports)

The batch processing segment of the Report Generator shall have the capability to access the Report Formats File for the proper format record, select and sort the targets according to the format record, extract the data from the Working File, extract supplementary data, format the data for output, output the data, generate a cable version if required and generate a sterile version if required.

3.1.3.1 Access the Report Formats File - The Report Generator Program shall use the input data for the run to select the proper record from the Formats tape.

The Report Formats File shall be accessed more than once if a cable version and/or a sterile version of the report is required.

3.1.3.2 Select and Sort the Targets - The Report Generator Program shall have the capability of selecting among all targets in the Working File those which are to be reported in the given document and sorting them according to the order required in the document.

SS-5

The Report Generator Program shall locate in the Status List the targets with the proper priority indicator for the report that is to be generated. The program shall check status and disposition indicators to determine that the entry has been approved and that it is to be included in a report.

After all targets have been selected, the program shall sort them according to the specifications in the Report Formats File.

3.1.3.3 Extract Data From the Working File - The Report Generator shall extract data from the Working File by making use of the working file address which is part of the Status List entry for each target. The Report Formats File shall be used to determine which items are to be extracted from the total Working File entry for a given target.

3.1.3.4 Extract Supplementary Data - Not all of the data for the report comes from the Working File. The Report Generator program shall also extract data from the Supplementary Data File. The program will recognize content codes in the Report Formats File which require supplementary data and extract the data from the Supplementary Data File (see Section 3.6) using the proper sector identification to locate the data in the file.

3.1.3.5 Format the Data For Output - As data is extracted, the Report Format File shall be checked so that the data is adjusted to fit the output format. Each item shall occupy one line or record of output if it is less than the specified number of characters in length. Items of free-text data shall be divided into whole lines or records of the desired length. The program shall not allow individual words of free-text data to be divided between two lines of output. The program shall insert spaces between items of data. Also, for printed documents, the program shall start a new page for each section of the report.

3.1.3.6 Output the Data - The formatted data shall be placed in a buffer for output, and shall be available for display at an edit console before a hard copy is printed. The buffering shall be such that whenever a full page of data is available, it may be displayed and then printed.

3.1.3.7 Generate Cable Version - The Report Formats record for a given document shall contain an indicator indicating whether this document is to be put out in a cable version. This indicator shall be checked after the format record is read in and if a cable version is required, the format record for the cable version shall be read in also. This indicator shall be checked again during the formatting and output functions. If a cable version is required, then the data shall be formatted and output for the cable at the same time that these functions are executed for the basic printed version.

SS-5

3.1.3.8 Generate Sterile Version - An indicator in the formats record for a given document is also set if a sterile version of this document is to be generated. The Report Generator programs shall check this indicator before outputting the data. If it is set, then the program shall check each target against the proper sector of the Sterile Target List before it is printed to see if it should be included in a sterile version. Targets to be included in a sterile version shall be stored and printed after the basic copy. If there is more than one sterile version of a given document, this shall be indicated in the Formats Record and each target shall be checked against all the required sectors of the Sterile Target List. Each Sterile version shall be stored separately. They will be printed one at a time after the basic report.

3.1.4 Functional Requirements (Non-Mission Oriented Report)

The only non-mission oriented report which is generated by the Batch Processing Report Generator is the Basic Intelligence Report. The programs which produce BIR's shall have the following capabilities; Acquire the data to be contained in the report, Format the data, Display and print, Update the Basic Intelligence Reports File. These functions are defined below.

3.1.4.1 Acquire Data for the Report - Each section of the report is a separate data element in a temporary file in which the report input data is stored. The Report Generator shall extract these one at a time for processing.

3.1.4.2 Format the Data - The formats for this report shall be built into the program. Each section shall be formatted after it has been extracted from the temporary file. The same criteria are applicable here as were mentioned above in section 3.1.3.5 regarding line lengths, spacing, page ejection, etc.

3.1.4.3 Display and Print the Data - The program shall display the data for these reports at an edit console so that it can be examined before printing. After it has been formatted, the data shall be stored in a buffer from which it may be displayed and printed one page at a time.

3.1.4.4 Update the Basic Intelligence Reports File - The textual material for all Basic Intelligence Reports shall be stored in the Basic Intelligence Reports File (see Section 3.6). Each section of the report shall be saved after it is printed so that it may be stored in this file. If the report is an initial report, a new sector shall be created in the file made up of all sections of the new report. If the report is an update report, the program shall search the file for the basic report and replace those sections of the report which have been updated. The designation of update or initial report is part of the input data which is

SS-5

SECRET

entered when the Batch Processing Report Generator is initiated through RT/1.

3.2 Interfaces

3.2.1 Program Inputs

The program inputs differ according to the types of reports. Most of the inputs are described in other documents. Table I lists the inputs for each type of Report Generator execution.

3.2.2 Program Outputs

All reports with the exception of the Basic Intelligence Report are concerned with installation data either individually, or collectively. In each case where this data is generated it shall contain the following information:

Header Data (Name, COMIREX Number, Country Code,
Geo-Coordinates)
Film Reference
Description (Charge Only)
Variable Installations Data
OB Data

The contents of each report are given in Table II. Where Installation Data is given under contents, it is implied that each of the above mentioned items is present for each target in the report. In Table II under Form, only the final version of the report is considered. It must be remembered that for the reports generated under batch processing, the individual pages have been sent through an edit console and this must also be considered as an output of the Report Generator Program.

3.2.3 Files

All files used by the Report Generator Program are described in the appropriate documents listed in Table I or in Section 3.6.

3.2.4 Secondary Storage

The method of requesting, releasing, and transferring data to and from secondary storage shall comply with the specifications and restrictions of RUM/ART or RT/3.

3.2.5 Other Communications with the Executive Program

The method of initiating and terminating the program and performing all I/O transfers shall comply with the specifications and restrictions of RUM/ART or RT/3.

SS-5

SECRET

SS-5

Table I

Report Generator Inputs

<u>TYPE OF REPORT</u>	<u>INPUT NAME</u>	<u>DESCRIPTION OR DOCUMENT REFERENCE</u>
Real Time	Queue List Data Status List Data Working File Data Report Format	Status List/Queue List/Working File Spec. Status List/Queue List/Working File Spec. Status List/Queue List/Working File Spec. Report Formats File (3.6)
Batch Processor (Mission Oriented)	Input Data Status List Data Working File Data Report Format Supplementary Data Sterile Target List	"1PHSE", "SUPP" or "SIG" Status List/Queue List/Working File Spec. Status List/Queue List/Working File Spec. Report Formats File (3.6) Supplementary Data File (3.6) Sterile Target List
Batch Processor (Non-Mission Oriented)	Input Data Basic Intelligence Report File	"BIRIN" or "BIRUP" and Report Number Basic Intelligence Report File (3.6)

SECRET

7

SECRET

SCR 352

SS-5

Table II
Report Generator Outputs

<u>REPORT NAME</u>	<u>CONTENTS</u>	<u>FORM</u>
"Flash" Cable	Mission Number Installation Data	Punched Tape Hard Copy
Briefing Board Notes	Mission Number Installation Data	Hard Copy
First Phase Report and Supplement	Mission Number Preface Highlights Installation Data Index	Hard Copy Punched Tape
Sterile Version of First Phase Report and Supplement	Mission Number Preface Installation Data Index	Hard Copy
Significant Change Report	Mission Number Preface Installation Data Index	Punched Tape
Basic Intelligence Report	USIB Header Abstract Photo References Collateral References Statement of Periodicity Target Description Table of Items Visible in Map and Plots with Measurement Data	Hard Copy

8

SECRET

SECRET

SCR 352

SECRET

3.3 Diagnostics

There are no diagnostics generated by the Report Generator.

3.4 Storage Allocation

3.4.1 Working Storage Allocation

3.4.1.1 Drum Storage Allocation - The real-time portion of the Report Generator uses no working drum storage. The maximum drum storage allocation for the batch processed Report Generator shall be 14,000 words on the FH 880, FH 432 or FH 1782.

3.4.1.2 Core Storage Allocation - The maximum core working storage for each module of the Report Generator not including program instructions is as follows:

Real-Time - 1000 494 words
Mission Oriented - 5000 494 words
Non-Mission - 5000 494 words

3.5 General Design Features

3.5.1 Programming Language

The Report Generator shall be coded in the SPRYE assembly language.

SS-5

SECRET

SECRET

SCR 352

3.5.2 Flexibility

The Report Generator shall be coded in 3 modules, one each for the real-time portion, the mission oriented batch processed portion and the non-mission oriented batch processed portion. Each module shall be coded and implemented separately.

3.6 Required Techniques

Four internal files shall be created and maintained in order to perform the functions of the Report Generator Program, i.e. (1) Report Formats File, (2) Sterile Target List, (3) Supplementary Data File, and (4) Basic Intelligence Reports File. The scope and content of all four follow.

3.6.1 Report Formats File

The purpose of this file is to define the formats of the IIS products. These products represent the system outputs of the IIS.

Each product is represented in the file as a separate sector. The order of sections of the reports is given together with the required contents of the sections. The page formats for hard copy documents are given and tape or message formats are given for non-hard copy products.

3.6.2 Sterile Target List

This file provides the information which allows the report generator programs to produce special versions of the first and second phase reports for certain recipients who are authorized to receive data only on certain targets. Several individual recipients may have the same list of targets on which they receive information. The report generator programs use these lists to determine which targets are to be included in these "sterile" reports.

3.6.3 Supplementary Data File

The purpose of this file is to supply to the report generator programs, data which is not a direct result of PI readout and which does not change from mission to mission. It also provides storage space for mission oriented information which is keyed-in for inclusion in the first and second phase reports. Specifically the file contains the Prefaces for the First Phase Report and Supplement and Significant Change Report, and the Highlights for the First Phase Report and Supplement. The information is inserted by the report generator programs when these reports are assembled.

SS-5

SECRET

SECRET

3.6.4 Basic Intelligence Reports File

This file is used to store the textual material for all Basic Intelligence Reports which are generated at NPIC. When any of the reports are to be updated, they are retrieved from the file and the appropriate sections changed, hard copies are produced, and the updated report stored back in the file.

4. REPORT GENERATOR PROGRAM FLOW DIAGRAM

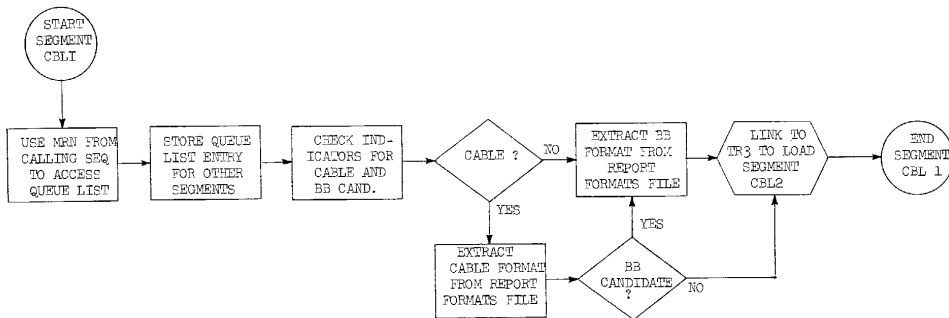
Figure 1 represents the program flow logic of the functions described in Section 3.1.

SS-5

SECRET

REPORT GENERATOR
REAL-TIME MODULE

SS-5



SECRET

12

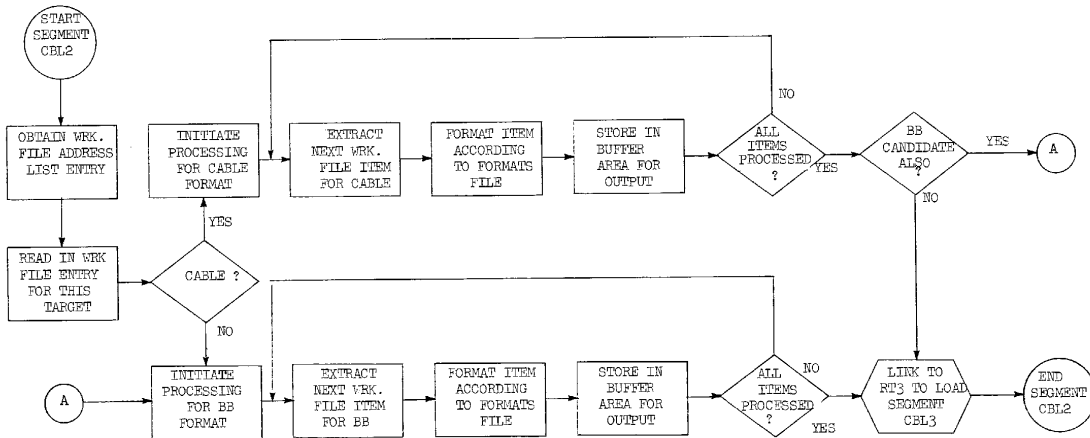


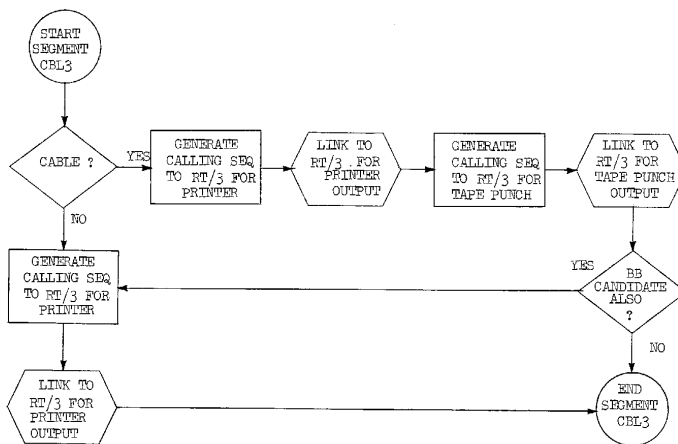
Figure 1 REPORT GENERATOR PROGRAM FLOW CHART

SECRET

SCR 352

SS-5

REPORT GENERATOR
REAL-TIME MODULE



SECRET

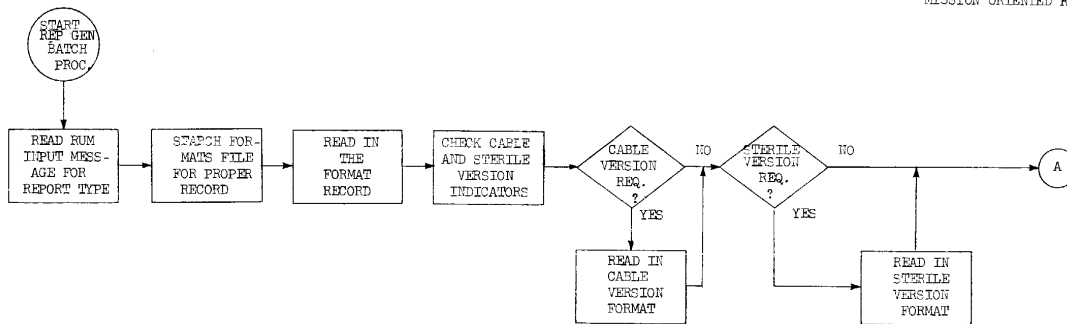
13

SECRET

Figure 1 REPORT GENERATOR PROGRAM FLOW CHART

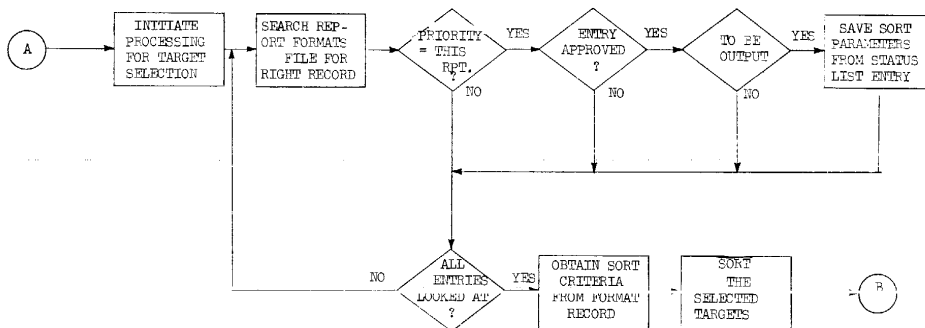
SS-5

REPORT GENERATOR
 BATCH PROCESSING MODULE
 MISSION ORIENTED REPORTS



SECRET

14



SECRET

SCR 352

Figure 1 REPORT GENERATOR PROGRAM FLOW CHART

REPORT GENERATOR
BATCH PROCESSING MODULE
MISSION ORIENTED REPORTS

SS-5

SECRET

15

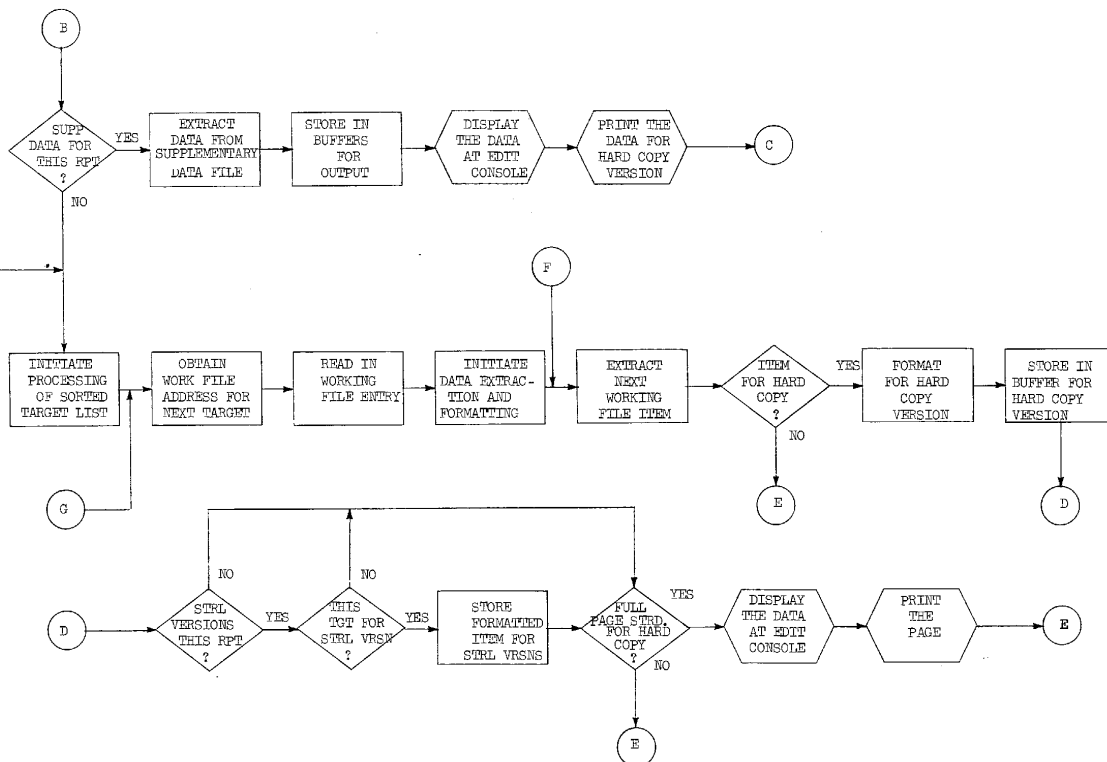


Figure 1 REPORT GENERATOR PROGRAM FLOW CHART

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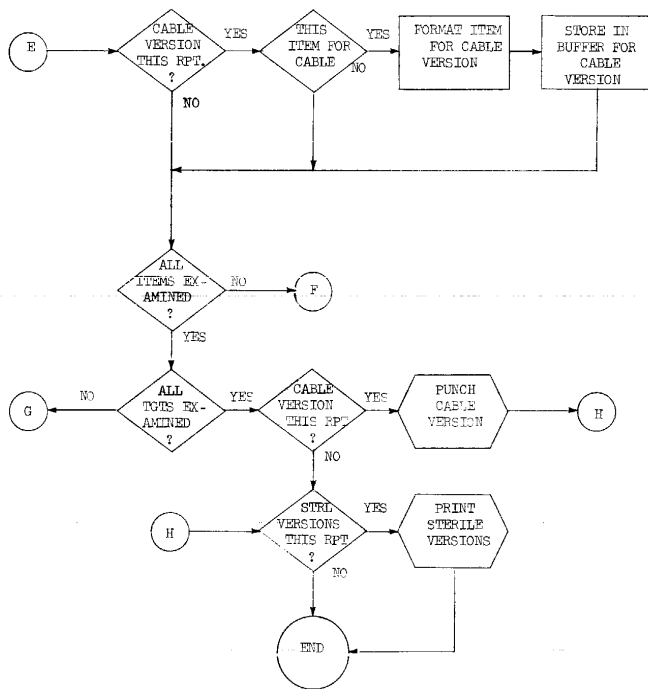
SCR 352

SS-5

REPORT GENERATOR
BATCH PROCESSING MODULE
MISSION ORIENTED REPORTS

SECRET

16



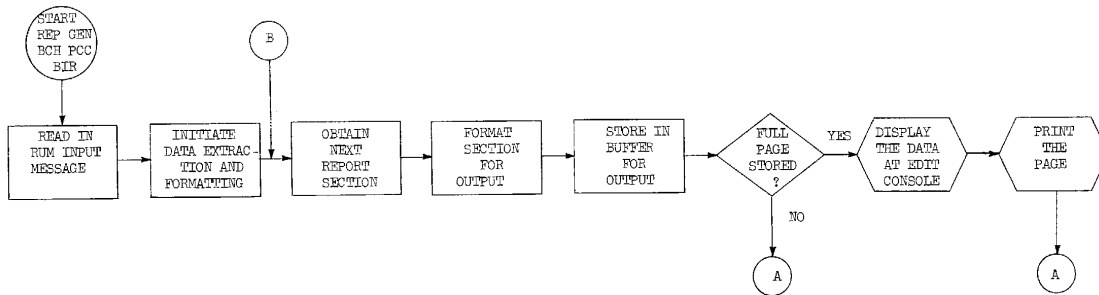
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SCR 352

Figure 1 REPORT GENERATOR PROGRAM FLOW CHART

SS-5

REPORT GENERATOR
BATCH PROCESSING MODULE
BASIC INTELLIGENCE REPORT



SECRET

17

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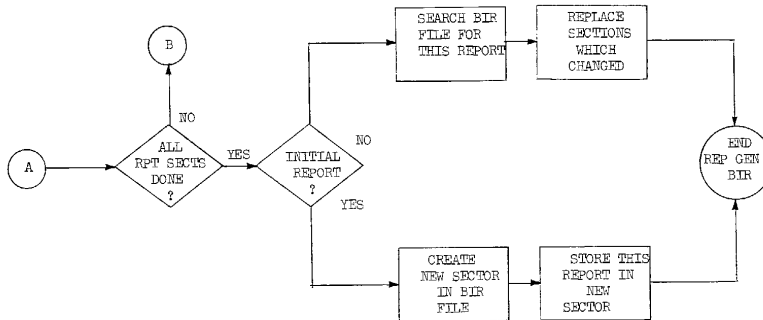


Figure 1 REPORT GENERATOR PROGRAM FLOW CHART

SCR 352

SECRET

SCR 352

INTEGRATED INFORMATION SYSTEM (IIS)

PRESENTATION LANGUAGE SPECIFICATION

SS-6

8 February 1968

SECRET

SECRET

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. SCOPE	1
2. APPLICABLE DOCUMENTS	1
3. REQUIREMENTS	1
4. PRESENTATION LANGUAGE PROGRAM FLOW DIAGRAM	11

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1 FRL FORMAT	10
2 PRESENTATION LANGUAGE PROGRAM FLOW DIAGRAM	12

iii
SECRET

SECRET

SCR 352

PRESENTATION LANGUAGE SPECIFICATION1. SCOPE

This specification defines the programming necessary to accomplish the presentation, in a pre-described format, of data extracted by the PIRL Query Language. The Presentation Language statements correspond to a page or CRT format description. In addition to general page layout guidelines, a facility is provided to symbolically specify the ordering and placement of information using the same terms as are used in the Query Language. Working in conjunction with the Query Language, the Presentation Language automatically formats, for CRT or hardcopy presentation, data which is retrieved from the IIS data base.

2. APPLICABLE DOCUMENTS

PIRL Program Specification SS-4
 IIS RT/3 Specification SS-9
 IIS National Data Base File Specification FS-2
 File Control Program (FCL) SS-12

3. REQUIREMENTS

The Presentation Language programs shall have the capabilities of deciphering and making use of the seven statements which make up the language. A presentation statement list generated by a user of the system is preceded by the FORMAT statement. The statements and their contents shall be as follows:

FORMAT - Control statement (defines beginning of statement string)
 TITLE - Output page or display heading. (BCD)
 LINES - Number of lines per page or display. (Numeric)
 CHAR - Number of characters per line. (Numeric)
 COL - Column Number. (Numeric)
 Column Heading. (BCD. Term Mnemonic)
 Maximum Number of Characters. (Numeric)
 Number of Spaces to the next Column. (Numeric)
 TEXT - Sector Mnemonic. (BCD)
 MODE - Output mode in BCD. (3 choices; Print, CRT, or Tape)
 SORT - Item upon which the data will be ordered.
 (BCD. Term Mnemonic)
 Indicator for SORT ordering. (BCD)

SS-6

SECRET

SECRET

SCR 352

- CLASS - Hardcopy security classification level. (BCD)
 Hardcopy control Number. (BCD) (optional)
- DO - Control Statement (defines end of statement string)

The statements LINES, CHAR and MODE are required each time the Presentation Language is used. All other statements except control statements are optional. There may be more than one COL and SORT statement per FORMAT.

The item in the SORT statement which is used to order the data is a "term" used in the query statement and provides a link between the presentation statement and the Format Retrieve List (FRL). The indicator in the SORT statement shall be used to determine SORT order. Three forms of this indicator are permissible:

- H - Numeric items to be ordered with high values first.
- L - Numeric items to be ordered with the low values first.
- A - Alphabetic items to be ordered alphabetically.

3.1 Functional Requirements

The Presentation Language Program (PLP) shall have the capability to perform the following functions:

1. Decode and error check the Presentation Language input statements.
2. Process the decoded format statements to generate data and reformat the FRL to desired output form.
3. Request output of the FRL data.

These functions are described below.

3.1.1 Decode and Error Check the Input Statements

The Presentation Language Program shall store the input statement data for later use and at the same time check this data for incompatibilities and errors. The RT/3 executive program processes the input statements and routes them from the console to a system storage area (See IIS RT/3 Specification, SS-9). The Presentation Language input string is defined by the first three characters, i.e. PLP.

The Presentation Language Program shall read the input statements one at a time and store the data for each statement in internal tables. The program shall examine each statement for format and content correctness before its data is stored. It shall also monitor the data for incompatibilities between input statements and for incompatibilities with physical equipment characteristics.

SS-6

SECRET

SECRET

SCA 352

The Presentation Language Program shall generate error diagnostics for the user whenever errors or discrepancies are found. The program shall process all input statements for one total input message before it presents any diagnostics to the user. The program shall present all the original input statements along with their diagnostics and request transmission via RT/3. When the input message with the corrected statements is re-entered into the system, the Presentation Language shall be re-initiated by RT/3. If there are no errors in the input data, the Presentation Language Program shall store the data in the internal tables and continue with the function specified in 3.1.2. The conditions which cause error diagnostics to be generated are listed in Section 3.3.

3.1.2 Process the Decoded Format Statement and Reformat the Format Retrieve List to the Desired Output Form

To generate the output described by the Format Statement, the Presentation Language Program shall use the following sources of data; the internal tables described in Section 3.1.1 above, the Format Retrieve List (FRL), and the File Format Table (FFT). FRL and FFT are described in Section 3.6. The program shall use a predetermined set of terms in order to interpret the data which it uses. These are called Sector Mnemonic and Term Mnemonics and are defined in the IIS National Data Base File Specification FS-2.

The basic element of retrieval is the file sector. Only one sector (or sub element-field) per target shall be retrieved for any one query. File sectors consist of one of two types of data: free-text data or formatted data which contains several individual elements. The Presentation Language Program shall be capable of presenting both types of data. Which type is to be presented is defined by the COL and TEXT statement. COL indicates formatted data and TEXT indicates free-text data. There may be more than one COL statement in the input message because more than one individual data item may be desired. There can be only one TEXT statement however, because only one sector per target may be retrieved. The following combinations of these statements may be present:

- (a) COL statements and no TEXT statement. In this case all the data is retrieved from formatted sectors and the COL statements define which fields are to be presented. The COL statement can be used to request any Header field in order to provide an identification item when formatted data from many targets is requested. The program shall extract the proper Header item from FRL.

SS-6

SECRET

SECRET

SCR 352

- (b) TEXT statement and no COL statement. In this case free-text information for only one target is requested by the input statement. If free-text data for many targets is desired the next combination is used.
- (c) Both COL and TEXT statements. In this case the COL statement(s) define the Header data which is necessary to identify the target to which the free-text data belongs.

The Presentation Language Program shall compare the content of the COL and TEXT statements and the Sector ID in FRL with the proper entry in FFT in order to determine compatibility of retrieved data with Format Statement. A diagnostic shall be generated if an incompatibility exists.

If the SORT statement is used, the Presentation Language Program shall determine the order of output from the contents of the SORT statement prior to extracting any data from FRL. Sorting shall be done when the retrieved data represents multiple MRN's. The sort parameters which are used may be of two types: a Header Sector item or an individual item among the formatted data which was retrieved. Either free-text or formatted data may be sorted on Header items. Only formatted data may be sorted on a formatted data item. The program shall check for compatibility between the input statement and the type of data retrieved and generate a diagnostic message if an error exists.

The Presentation Language Program shall use the Term Mnemonic from the SORT statement in order to extract the sort parameters from table FRL. It shall search FRL and extract each sort parameter using the File Format Table (FFT) to determine the format and size of the parameter. The program shall retain a record of each parameter and its location in table FRL. After all of FRL has been processed in this way, the program shall order the new record according to the indicator for sort ordering in the SORT statement.

In sorting the data and later in extracting it, the correct mnemonics must be available in the input statements. If the Presentation Language Program cannot match the given mnemonic with one in FFT and/or FRL, a diagnostic shall result.

When sorting is complete, the program shall use the ordered internal table to determine the sequence of data output. It shall use the FRL table location which has been saved in this internal table to index into FRL at the proper address for each target.

SS-6

SECRET

SECRET

SCR 352

The data which is extracted shall be stored in the proper format in a buffer to await output. The data shall be segmented according to the maximum number of characters in a page or display and the heading data entered in the TITLE statement shall be the first entry for each segment. Next shall be column headings if the retrieved data is all formatted data. If a combination of COL and TEXT is called for there shall be no column headings.

In extracting data from FRL the program shall use table FFT to determine formats and order of the retrieved data. Formatted type data shall be entered in the buffer according to the specifications given in the COL statements. Free-text data shall conform to the information given in the LINES and CHAR statements.

3.1.3 Format and Output the Data

All input and output for the IIS is handled through the executive program RT/3. The Presentation Language Program, in order to generate the proper output, shall build the proper calling sequence from the data in the internal tables and other information. It shall also generate the proper iteration controls around this calling sequence in order to handle multiple calls. This function shall also execute the calling sequence to the executive program.

The program shall check the MODE entry in the internal tables. If it is TAPE, the program shall generate a message to the computer operator so that a blank tape will be given the proper logical assignment. If it is PRINT, the message shall tell what size paper to use. The program shall also check the CLASS statement input and tell the operator what classification the printout or tape will be. The program shall determine the proper device for output and place the proper information in the calling sequence. For PRINT or TAPE, this information is predetermined and carried as program constants. For CRT, the program must acquire the correct CRT number so that it can route the display properly. This number is made available in the calling sequence to the Presentation Language Program.

The program shall determine if there are to be multiple presentations, namely more than one display (CRT Mode), more than one page (PRINT Mode), or more than one file (TAPE Mode). For multiple presentations, the program shall set up the proper output buffer indexing and calling sequence execution iterations.

After the calling sequence to the executive program has been generated, the Presentation Language Program shall execute the calling sequence.

SS-6

5

SECRET

SECRET

SCR 352

3.2 Interfaces

The Presentation Language Program has interfaces with several areas of the IIS system. The inputs and outputs are defined below.

3.2.1 Program Inputs

- (a) Calling Sequence. The calling sequence to the Presentation Language Program contains the following items:

Core address of console input data
Number of data words
Input console identifier

- (b) Console Data. This is the data defined by the Format Statement. Its content is different for each program execution. The format of these input messages is shown in Section 3.
- (c) Format Retrieve List. This is the data which was retrieved by the PIRL Program. The format and content of this list are shown in Section 3.6.1.
- (d) File Format Table. This table describes the format of each sector of the National Data Base Files. It is described in Section 3.6.2.

3.2.2 Program Outputs

- (a) Diagnostics. The Presentation Language Program shall communicate with the user concerning the correctness of his input through diagnostic messages to the console. The situations which cause diagnostic messages are outlined in Section 3.3.
- (b) Computer Console Operator Messages. These messages instruct the operator to prepare I/O devices for program output. Their content is given below.
- (1) MOUNT BLANK TAPE ON LOGICAL SERVO NO. XX
CLASSIFICATION = XXXXX
- (2) READY PRINTER WITH XXXXX PAPER
CLASSIFICATION = XXXXX

SS-6

SECRET

SECRET

SCR 352

- (c) Output Data. This is the substantive data which is generated by the program. Its content and format are different for each program execution and depend on the input Format Statement.

3.2.3 Files

The files used by the Presentation Language Program are discussed in Section 3.2.1.

3.2.4 Secondary Storage

The method of requesting, releasing, and transferring data to and from secondary storage shall comply with the specifications and restrictions of RT/3.

3.2.5 Other Communications With The Executive Program

The method of initiating and terminating the program and performing all I/O transfers shall comply with the specifications and restrictions of RT/3.

3.3 Diagnostics

3.3.1 Checks on Input Statement Data

The Presentation Language Program shall check each of the input statements and if any of the following conditions are found, an appropriate display message shall be generated:

- (a) The first word of the string is not FORMAT.
- (b) The first word of any individual statement is not one of the predetermined set.
- (c) Any input statement does not conform to its predetermined format.
- (d) The number of lines given is too large for the page or CRT screen.
- (e) The number of characters per line given is too large for the page or CRT screen.
- (f) The sum of characters and spaces for all COL statements exceeds the maximum for the page or CRT screen.

SS-6

7
SECRET

SECRET

SCR 352

- (g) The second word in a MODE statement is not PRINT, CRT, or TAPE.
- (h) The indicator for sort ordering is not compatible with the data type of the item upon which the data will be ordered.
- (i) The security classification given is not one of a predetermined set.
- (j) There is no DO statement at the end.

3.3.2 Checks For Incompatibilities Between Format Statements and Retrieved Data

- (a) The type of data requested by COL, TEXT, or SORT statements does not agree with the type of data which was retrieved and placed in table FRL.
- (b) Incorrect mnemonics used in the Format Statements.

3.4 Storage Allocation

3.4.1 Working Storage Allocation

3.4.1.1 Drum Storage Allocation. - The PLP program is provided drum working storage on the FH880, FH432, or FH1782 through an RT/3 request (see RT/3 specification for calling sequence). The maximum drum working storage allocated to the PLP program shall be 10,000 drum words. Working storage does not include that required for the Executive Sort/Merge routine.

3.4.1.2 Core Storage Allocation. - Maximum core working storage is allocated 1000 computer words.

3.5 General Design Features

3.5.1 Programming Language

The PLP Program shall be coded in the SPRYE Assembly Language.

3.5.2 Flexibility

The PLP Program shall be coded such that new statements may be conveniently added to the presentation language as required. If any statement is not initially implemented, the program will generate a diagnostic informing the user of this fact and ignore the statement contents.

SS-6

SECRET

SECRET

SCR 352

3.5.3 Recovery Procedure

If the PLP Program is unable to fulfill an operating request because of machine error, the PLP program shall initiate a display message requesting the console operator to reinitiate the request.

3.6 Required Techniques

In order to perform the function requirements stated in Section 3.1 the PLP shall utilize the Format Retrieve List (FRL) and an internal table, File Format Table. The content of both follow.

3.6.1 Format Retrieve List (FRL)

The FRL is generated by the use of the PIRL Program (see PIRL Program Specification SS-4) and is temporarily stored in drum working storage. The FRL contains the substantive data retrieved from the National Data Base plus identity and control information for the PLP. The format of the FRL is shown in Figure 1.

3.6.2 File Format Table (FFT)

A File Format Table shall be created as a modular table of the PLP. This table shall contain an entry for each sector of the IDF, ODF, MTF, and EPDF. The contents of each entry shall describe the format of each individual sector. The National Data Base File Specification FS-2, specifies present sector format. The FFT shall be designed as a modular table in order to accommodate file structure changes without re-programming the PLP.

SS-6

SECRET

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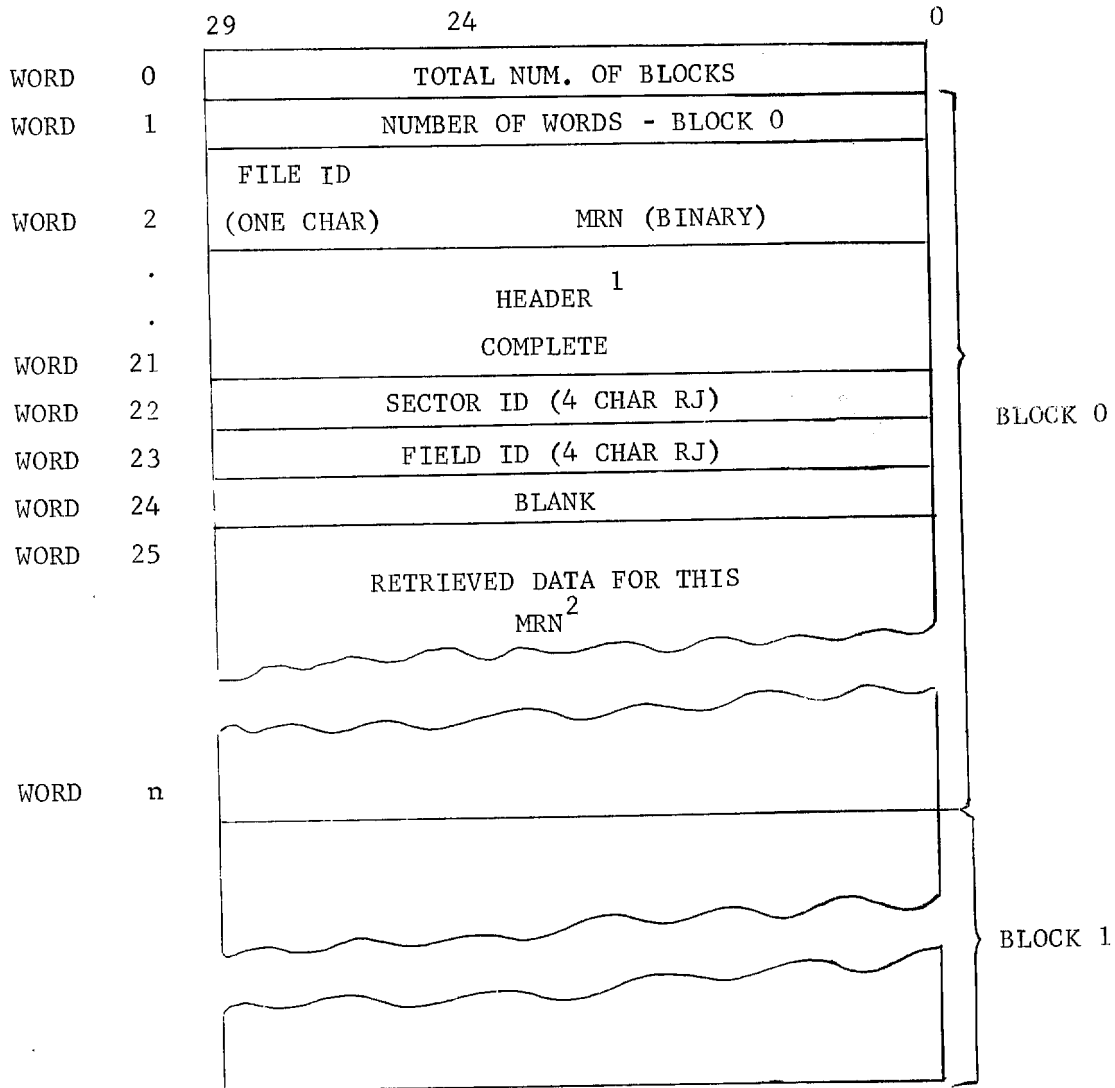


Figure 1 FRL FORMAT

- Header - Data for the header depends on file ID, i.e. IDF - 19 words, ODF - 14 words, MTF - 12 words, EPDF - 36 words.
- Retrieved Data - The format of this data is the same as the format for the NDB (see National Data Base File Specification FS-2)

SS-6

SECRET

SECRET

SCR 352

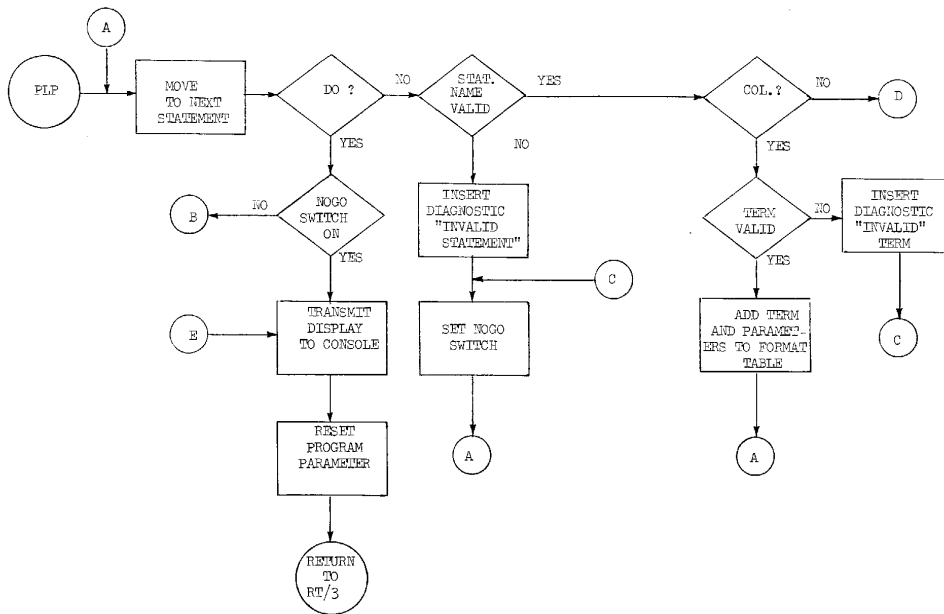
4. PRESENTATION LANGUAGE PROGRAM FLOW DIAGRAM

Figure 2 represents the program flow logic of the functions described in Section 3.1.

SS-6

SECRET

SS-6

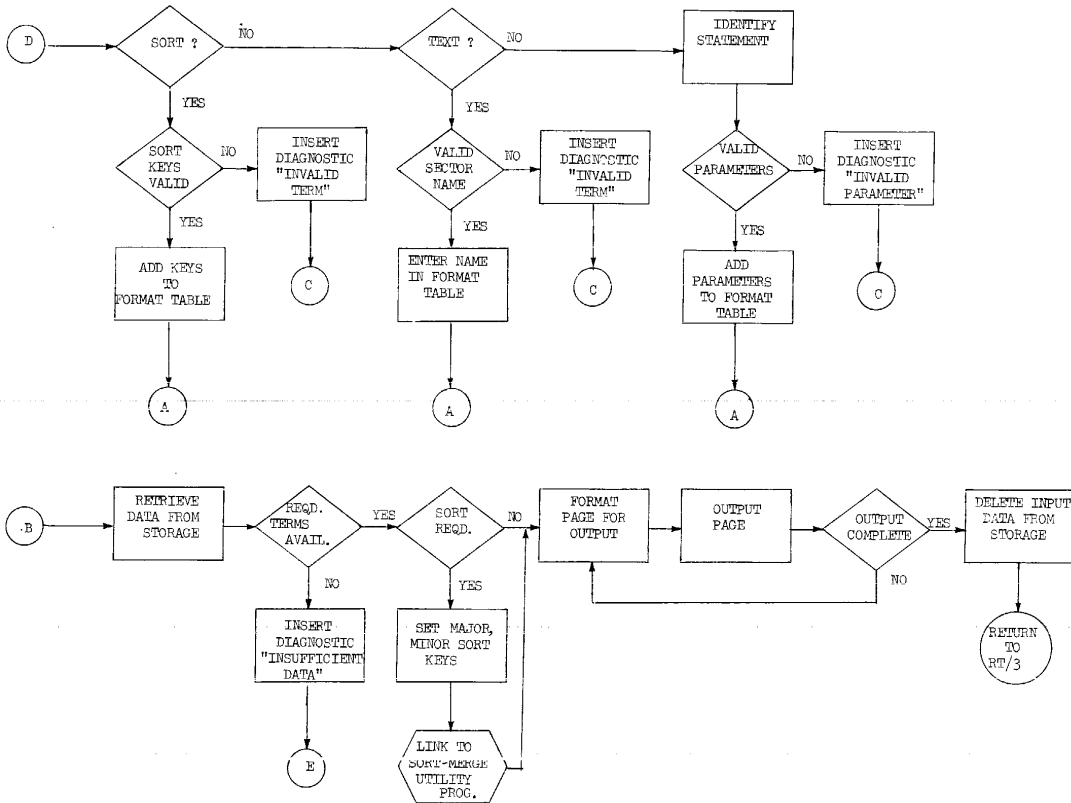


SECRET
12

SECRET

Figure 2 PRESENTATION LANGUAGE PROGRAM FLOW DIAGRAM

SS-6



SECRET
13

SECRET

Figure 2 PRESENTATION LANGUAGE PROGRAM FLOW DIAGRAM Sheet 2 of 2

SCF 352

SECRET

BACKGROUND SPECIFICATIONS

SECRET

SECRET

SCR 352

INTEGRATED INFORMATION SYSTEM (IIS)

STATUS LIST/QUEUE LIST/WORKING FILE SPECIFICATION

8 February 1968

FS-1

SECRET

SECRET

SCR 352

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. SCOPE	1
2. APPLICABLE DOCUMENTS	1
3. FILE DESCRIPTION	1

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. QUEUE LIST ENTRY FORMAT	3
2. WORKING FILE ENTRY (WF)	4
3. WORKING FILE SECTION FORMAT	2
4. STATUS LIST FORMAT	5

FS-1

SECRET

SECRET

SCR 352

STATUS LIST/QUEUE LIST/WORKING FILE SPECIFICATION1. SCOPE

The Queue List/Working File serves as a central dynamic buffer for all NDB information entering the IIS. The principle source of data will be the Data Entry program. Once the data has been entered into the Working File, it is retained for use by the VEA and AUD programs. When an entry has been cycled through the various functions specified in the disposition indicators it is deleted from the Queue List/Working File and transferred to the Status List.

The Status List is generated for each mission based on the prediction program (see Prediction Program Specification -SS-7). It is used by the DEN (Data Entry Program) to check legal entries to the Queue List and Working File. It is also used by the approver under the VEA program function to obtain status information regarding the total number of targets predicted and approved. The Status List is further used to index and retrieve data from the Working File after an entry has been approved (this use is for the approver only, allowing changes to approved entries and the ability to retrieve approved entries to aid in writing report high lights).

2. APPLICABLE DOCUMENTS

Cable and Report Generator Program Specification (SS-5)
File Control Specification (SS-12)

Data Entry Program Specification (SS-1)
Verify, Edit and Approve Program Specification (SS-2)

3. FILE DESCRIPTION

The Queue List serves as an index to Working File entries and provides status information. It is anticipated that at any one time there will be at most 50-100 entries (entered but not yet approved) in the Queue List. In this range, the Queue List is small enough (150-300 words) to be maintained in core. The FCL program is responsible for generation and control of QL entries.

The Working File serves as a temporary storage buffer for all information entering the system from the readout activities or any other source which will have an effect on the NDB files. Each entry will relate to a particular target or object. Legal WF formats are shown in Section 3.2.

The Status List serves as a temporary mission oriented index accumulating all readout information that has completed the VEA process. The SL is used by the report generator as an index to accumulated information to be included in the preparation of the various reports.

FS-1

SECRET

SECRET

SCR 352

3.1 File Formats

3.1.1 Queue List Entry Format

Each QL entry is three 30 bit words in length and structured as shown in Figure 1.

3.1.2 Working File Entry Format

Each WF entry is made up of two basic parts. The first is a fixed set of words providing pointers to logical sections within an entry. The second basic part of the WF is one or more logical sections usually representing a particular NDB file sector. Provision has been made of 15 logical sections which requires 15 index words at the beginning of each WF entry. Each word will contain an incremental word count representing the number of words between the first word of the entry and the first word of the logical section. For example, to access a particular section requires the incremental count be added to the first entry word address. The structure of the Working File is shown in Figure 2.

3.1.3 Working File Section Format

Each logical section of a WF entry contains a five character identifying mnemonic followed by 30 bits reserved for further identification or special indicators where necessary. Section 3.2 of this specification contains a list of legal WF section mnemonics. The last full word of each section will contain binary ones (77777 Octal).

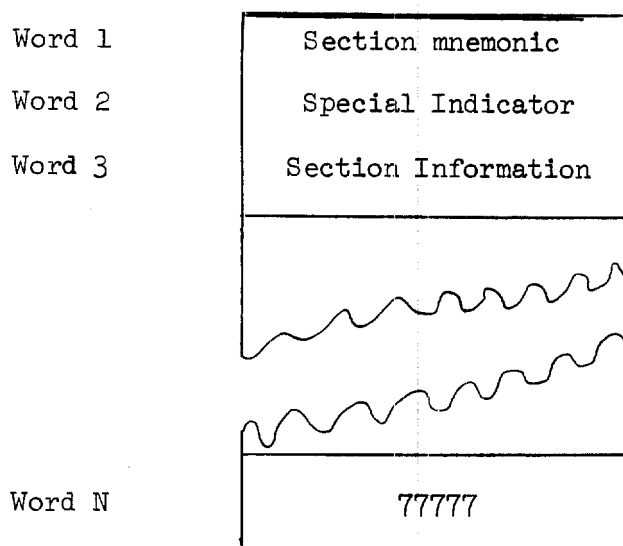


Figure 3 - WORKING FILE SECTION FORMAT

FS-1

SECRET

SECRET

SCR 352

29	13	12	0	29	12	11	0	29	0
MACHINE REF #	DISPOSITION		STATUS	NUMBER WORDS IN WORKING FILE		WORKING FILE ADDRESS			
A	B		C	D		E			
WORD 1			WORD 2			WORD 3			

- A. 17 bits-Machine reference number, binary, right adjusted
- B. 13 bits-Disposition indicators

<u>DISPOSITION</u>	<u>CODE</u>
Verification required	00001
Editing required	00002
Approval required	00004
Not used	00010
Output Description	00020
Cable required (Flash)	00040
Briefing board candidate	00100
Validate description	00200
la	00400
lb	01000
lc	02000
Other	04000
Not used	10000

<u>SOURCE AND STATUS</u>	<u>CODE</u>
In process	000001
Verification completed	000002
Editing completed	000004
Approved	000010
Basic Worksheet	000020
Special Worksheet	000040
New target form	000100
Cable (Flash)	000200
Cable (Incoming P)	000400
Cable (Outgoing P)	001000
Highlights	002000
Online entry (CSD, VEA)	004000
Target off film	010000

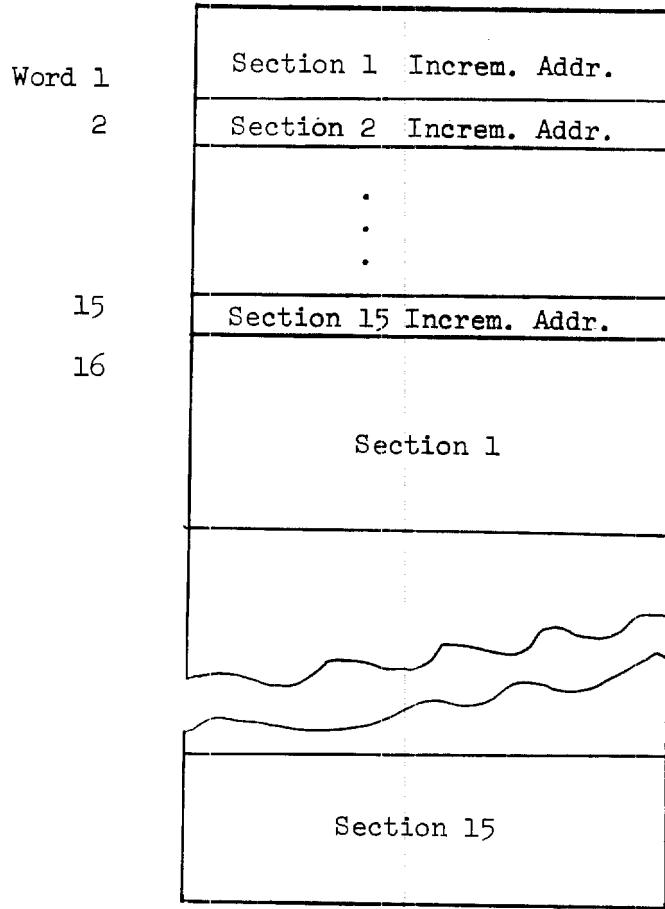
- D. 12 bits-Number of words in Working File entry
 - E. 30 bits-Working File address
- Figure 1 - QUEUE LIST ENTRY FORMAT

FS-1

SECRET

SECRET

SCR 352



FS-1

Figure 2 - WORKING FILE ENTRY (WF)

SECRET

SECRET

SCR 352

3.1.4 Status List Format

The format of the SL is shown in Figure 4. The list is initially constructed by the Prediction program. Information is added to the SL by the FCL program after a target readout has been verified, edited, and approved. The SL entries are in multiples of 16 words.

Word 0	#Words in SL	
Word 1	MRN	Disposition
Word 2	Status	#WDS in WF
Word 3	WF address	
Word 4	Counting Code	COMIREX
Word 5	Number	
Word 6	Geo	
Word 7	Coordinates	
Word 8	Not Used	
Word 9	Name	
Word 10		
Word 16		

Figure 4 - STATUS LIST FORMAT

FS-1

SECRET

SECRET

SCR 352

3.1.5 Maintenance Responsibility

The Data Entry program or VEA program will have the responsibility for formatting both the Queue List entry and the Working File entry in accordance with the previously defined formats. All appropriate disposition indicators must be set by the formatting program. The only exception is the Working File Address (WFA) which will be entered by the File Control program. Once the QL/WF entries have been stored, further control of the information is the responsibility of the File Control program.

3.2 Working File Section Mnemonics

<u>MNEMONIC</u>	<u>MEANING</u>	<u>FORMAT</u>
WPHOT	Photo ref. from basic work sheet.(BSW).	70 Chars. formatted as specified in IPHOT. Multiple references are multiple of 70 char.
WCHAN	Changes entered from BSW	Variable length free text.
WNOTE	PI notes from BSW	Variable length free text.
WMOBI	Mobile OB from BSW	See IMOBI
WCABL	Cables (Flash or PACAF)	
WUCOL	Collateral Data Updated for BSW	Variable length free text.
WUBRI	Brief description updated from BSW	Variable length free text.
WUFIX	Fixed facilities updated from BSW	Variable length free text.
WUCHA	Changes updated from BSW	Variable length free text.
WUNOT	PI notes updated from BSW	Variable length free text.
WHIGH	Mission Highlights	Variable length free text.

FS-1

SECRET

SECRET

SCR 352

The following mnemonics are National Data Base sector mnemonics and are described in the NDB specification, FS-2.

IHEAD	OHEAD
IBRIE	ODESC
ICHAN	OMEAS
IDETA	OPHOT
IREAD	ODRAW
ICOLL	OSOUR
INOTE	OWHER
IPHOT	OEEI
ISOUR	MHEAD
IFIXE	MDESC
IMOB	MMEAS
ICONC	MPHOT
ICOMP	MWHER
	EHEAD

FS-1

SECRET

SECRET

SCR 352

INTEGRATED INFORMATION SYSTEM (IIS)

NATIONAL DATA BASE FILE SPECIFICATION

8 February 1968

FS-2

SECRET

SECRET

SCR 352

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. SCOPE	1
2. APPLICABLE DOCUMENTS	1
3. FILE DESCRIPTION	1

FS-2

SECRET

SECRET

SCR 352

NATIONAL DATA BASE FILE SPECIFICATION

1. SCOPE

The National Data Base (NDB) serves as a central repository of substantive information concerning targets and objects of interest to the intelligence community. Various elements of interest are formatted in order that they may be retrieved by automatic methods. Further formatting of the sectors described in this specification shall be necessary due to future expected requirements. The design of the NDB shall take this factor into account and the file shall be easily adaptable to such changes.

2. APPLICABLE DOCUMENTS

Index and Index Records File Specification FS-3
File Control Program Specification SS-12

3. FILE DESCRIPTION

The National Data Base shall consist of four files which are as follows:

1. Installations Data File (IDF).
2. Objects Data File (ODF).
3. Moving Targets File (MTF).
4. Exploitation Products Data File (EPDF).

The method of indexing each of the files is explained in the Index and Index Record Specification (FS-3). Each file is broken into one or more sectors of homogeneous information. Sections 3.1 through 3.4 define the contents and format of each file and file sectors.

FS-2

1

SECRET

SECRET

ECR 352

3.1 Installations Data File (IDF)3.1.1 IDF Header

Sector Mnemonic: IHEAD

Structure This sector is a fixed format segment of information. Fields which are marked with an asterisk are indexed elements.

<u>NMEM</u>	<u># Char.</u>	<u>Contents</u>
NAME	40	* Installation name
COUN	2	* Country code
MILI	4	* Military district
GEO\$	11	* Geo. coordinates
BE\$\$	10	* BE number (WAC + BE)
NPIC	7	* PIC number
COMO	7	* COMIREX number
STAT	1	Status of target
TYPE	3	* Target type
MRN\$	5	Machine reference number
ELEV	5	Elevation
	<u>1</u>	Cross reference
	95	

Maintenance - This sector is generated and maintained via on-line consoles.

\$ = Blank character

FS-2

2

SECRET

SECRET

SCR 352

		29		13	12		0
WORD	0	MRN		00001			
	1	INSTALLATION NAME					
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9	COUNTRY		MILITARY			
	10	DISTRICT		GEO			
	11	COORDINATES					
	12	BE NUMBER					
	13						
	14	PIC				NUMBER	
	15	NUMBER					
	16	COMIREX NUMBER					
	17	STATUS		TYPE			
	18	M R N					
	19	ELEVATION					
	20	CHECK SUM					

IDF HEADER SECTOR

FS-2

SECRET

SECRET

SCR 352

3.1.2 IDF Brief Description

Sector Mnemonic: IBRIE

Structure This sector contains a brief target description and is a combination of fixed and variable fields.

<u># Char.</u>	<u>Contents</u>
4	Origin of description
1	Phase of reporting
6	Date
2	Not used
2	Number of photo references
70	* <u>1st</u> photo reference
.	.
.	.
70	n <u>th</u> photo reference
∞	Variable length free text

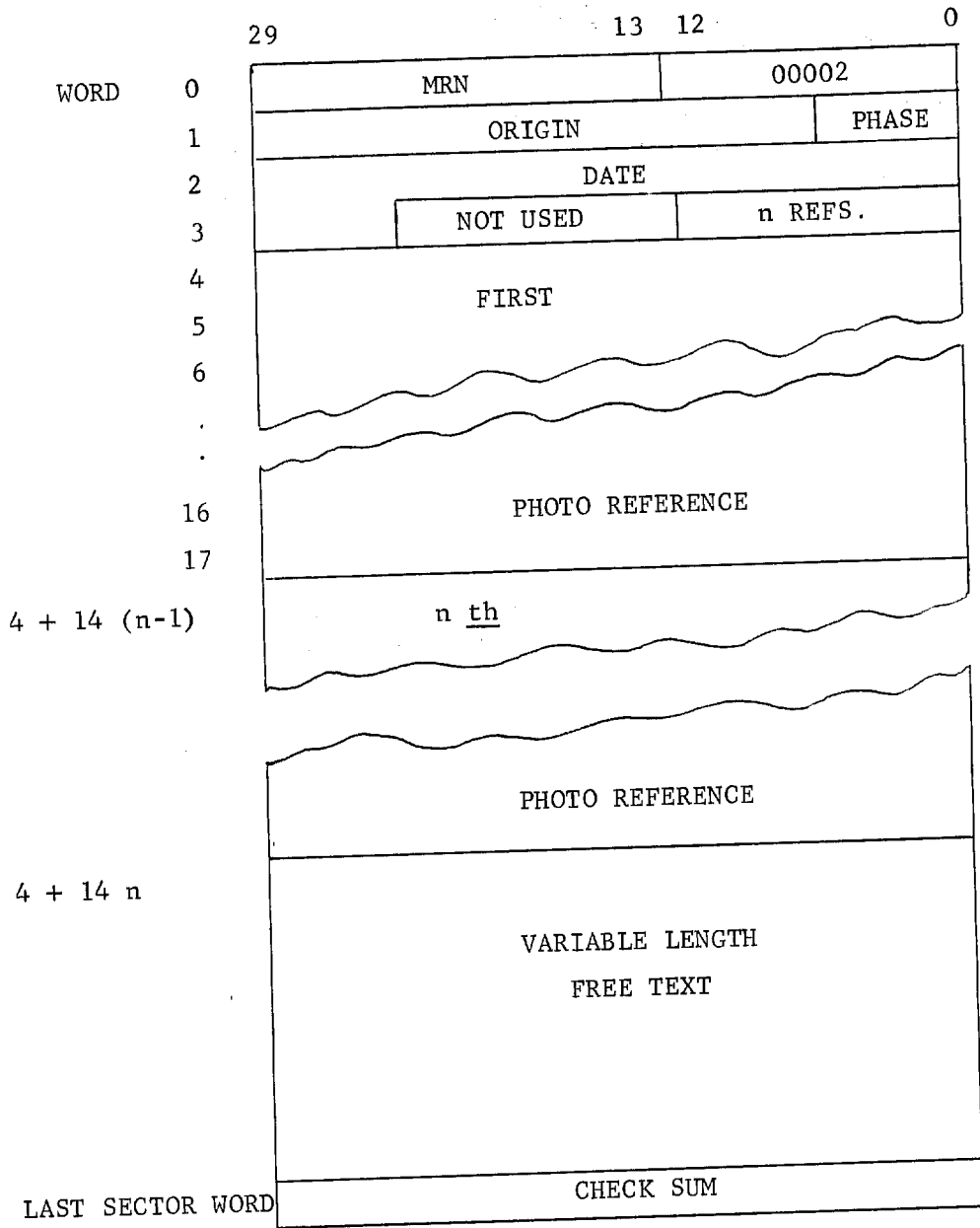
Maintenance - This sector is maintained via the Presentation sheet and basic worksheet. The photo references are automatically maintained by the AUD program.

* Photo references formatted per IPHOT sector.

FS-2

SECRET

SECRET



IDF BRIEF DESCRIPTION

FS-2

SECRET

SECRET

SCR 352

3.1.3 IDF Changes to Brief Description

Sector Mnemonic: ICHAN

Structure This section contains changes which eventually will be added to the brief description. The format is a combination of fixed and variable formats.

<u># Char.</u>	<u>Contents</u>
4	Origin of changes
1	Phase of reporting
6	Date
4	Not used
70	* <u>1st</u> photo reference
.	
.	
70	n <u>th</u> photo reference
V	Variable length free text

Maintenance - This sector is maintained by the Basic Worksheet. Additions may be added to the end of the sector in the above format.

* Photo references formatted per IPHOT sector.

FS-2

SECRET

SECRET

SCR 352

		29	13	12	0
WORD	0	MRN		00003	
	1	ORIGIN			PHASE
	2	DATE			
	3	NOT USED			
	4	FIRST			
	5				
	6				
	16	PHOTO REFERENCE			
	17	n <u>th</u>			
4 + 14 (n-1)					
		PHOTO REFERENCE			
	4 + 14 n	VARIABLE LENGTH FREE TEXT			
		REPEATS OF ABOVE FORMAT (WORD 0 NOT REPEATED)			
LAST SECTOR WORD		CHECK SUM			

IDF CHANGES TO BRIEF DESCRIPTION

FS-2

SECRET

SECRET

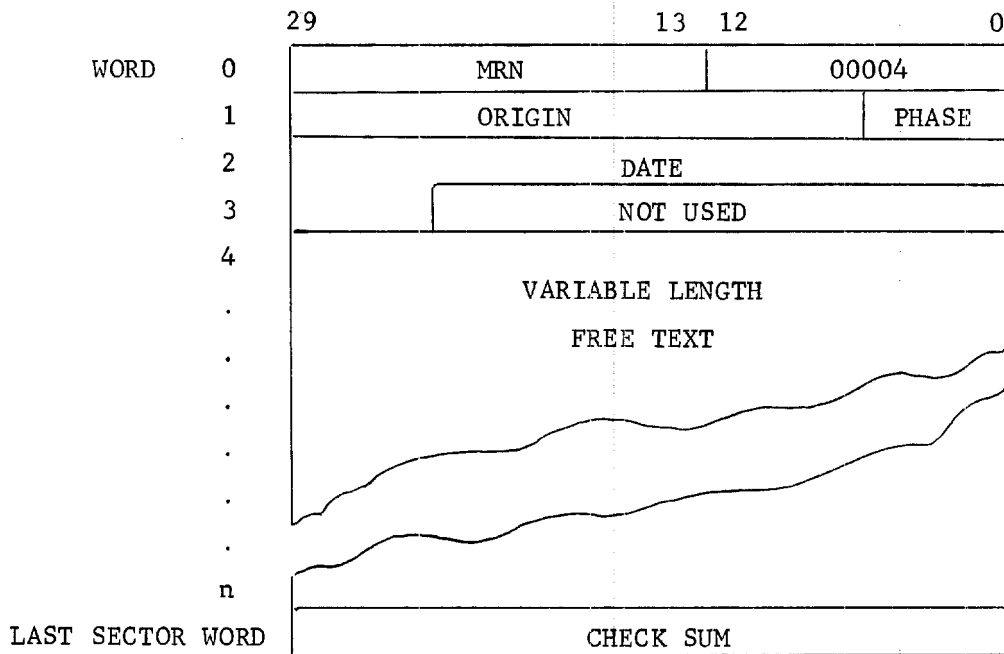
3.1.4 IDF Detailed Description

Sector Mnemonic: IDETA

Structure This sector contains the detailed target description and is a combination of fixed and variable formats.

<u># Char.</u>	<u>Contents</u>
4	Origin of description
1	Phase of reporting
6	Date
4	Not used
V	Variable length free text

Maintenance - This sector is maintained via an on-line console.



IDF DETAILED DESCRIPTION

FS-2

SECRET

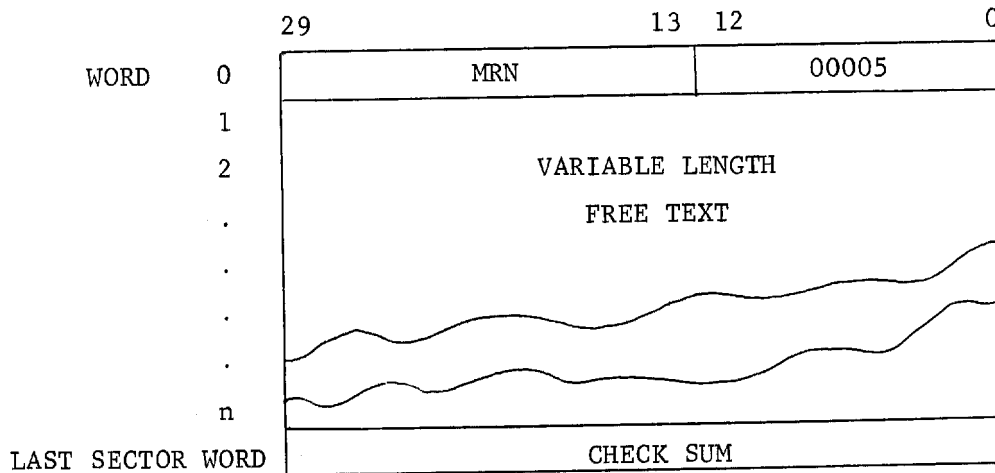
3.1.5 IDF Readout Requirements

Sector Mnemonic: IREAD

Structure This sector contains a free text description of the reporting requirements.

<u># Char.</u>	<u>Contents</u>
v	Variable length free text.

Maintenance - This sector is maintained via an on-line console.



IDF REPORTING REQUIREMENTS

SECRET

SCR 352

3.1.6 New or Significant Collateral

Sector Mnemonic: ICOLL

Structure This sector contains new or significant collateral information in free text form.

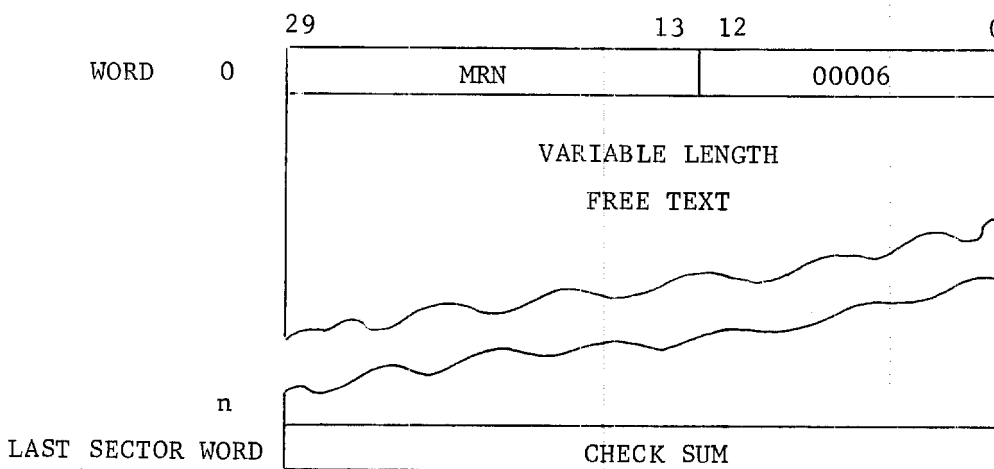
Char.

Contents

V

Variable length free text.

Maintenance - This sector is maintained via an on-line console.



IDF NEW OR SIGNIFICANT COLLATERAL

FS-2

SECRET

SECRET

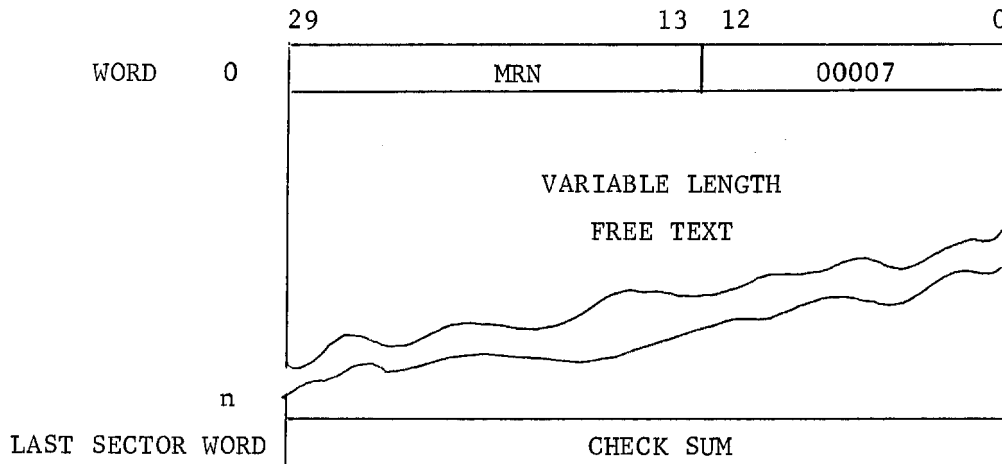
3.1.7 IDF Notes

Sector Mnemonic: INOTE

Structure This sector contains PI notes in variable length free text form.

<u># Char.</u>	<u>Contents</u>
V	Variable length free text.

Maintenance - This sector is maintained by the Presentation and basic worksheets. Additions may be added to the end of the sector in free text.



IDF PI NOTES

FS-2

SECRET

SECRET

SCR 352

3.1.8 IDF Photo References

Sector Mnemonic: IPHOT

Structure This sector contains a chronological list of all photo references for a given target. The first photo reference is either the best or most recent.

<u># Char.</u>	<u>Contents</u>
9	Mission number
4	Track segment
14	Frame
9	Target x, y coordinates
8	Limiting conditions
1	Quality
2	Coverage
2	Mode
8	ID/NAC mission #
13	Not used

Maintenance - This sector is maintained from the basic worksheet. The AUD program will add photo references to the end of the sector.

FS-2

12

SECRET

SECRET

SCR 352

		29		13	12	0
WORD	0	MRN			00010	
	1	MISSION NUMBER				
	2	TRACK				
	3	SEGMENT				
	4	FRAME NUMBER				
	5					
	6	TARGET X, Y				
	7	COORDINATES				
	8	LIMITING				
	9	CONDITIONS				QUAL
	10	COVERAGE	MODE			
	11	ID/NAC				
	12					
	13	NOT USED				
	14					
	15	REPEATS OF ABOVE FORMAT (WORD 0 NOT REPEATED)				
	.					
	.					
	.					
	.					
	.					
	n					
LAST SECTOR WORD		CHECK SUM				

IDF PHOTO REFERENCE

FS-2

SECRET

SECRET

SCR 352

3.1.9 IDF Source Data References

Sector Mnemonic: ISOUR

Structure This sector contains source data references (library reference numbers of a selected set of reports pertaining to this target). The sector is variable length free text.

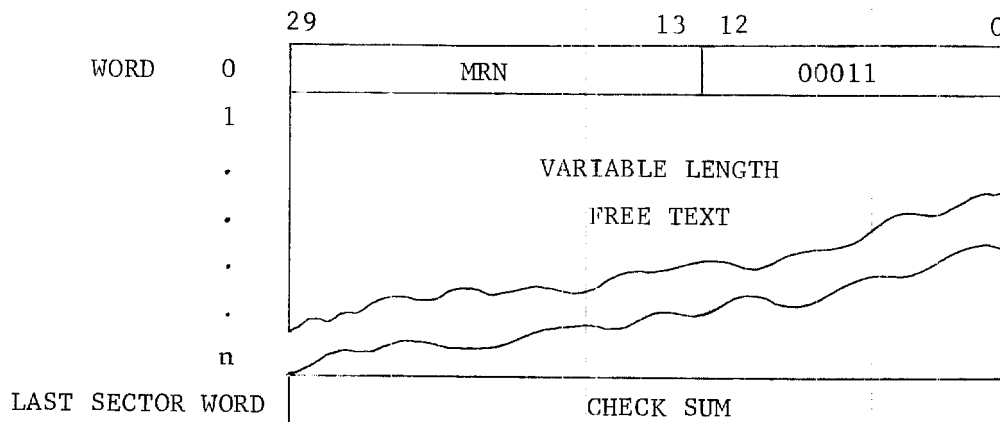
Char.

Contents

V

Variable length free text

Maintenance - This sector is maintained via an on-line console.



IDF SOURCE DATA REFERENCES

FS-2

SECRET

SECRET

3.1.10 Formatted Fixed Facilities

Sector Mnemonic: IFIXE

Structure This section is treated as free text even though there may be an internal arrangement of column information.

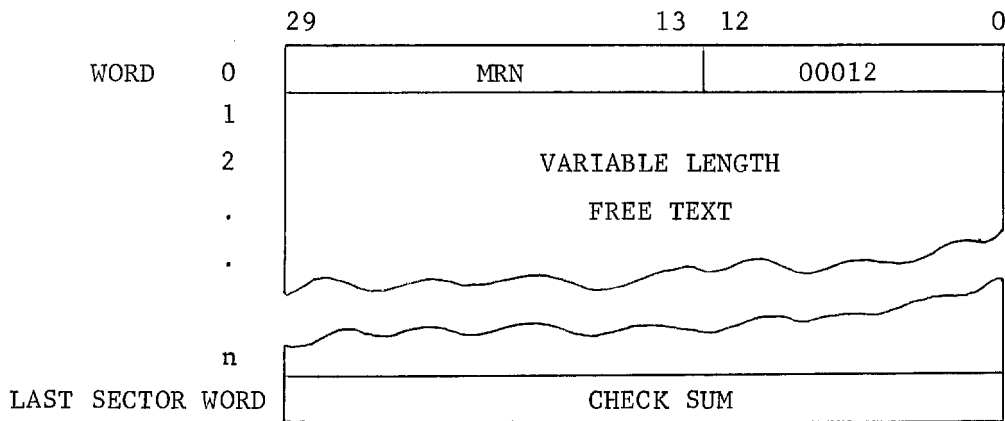
Char.

Contents

V

Variable length free text

Maintenance - This sector is maintained by the presentation and basic worksheets.



IDF FORMATTED FIXED FACILITIES

SECRET

SECRET

3.1.11 IDF Formatted Mobile Equipment

Sector Mnemonic: IMOBI

Structure This sector contains formatted fields representing mobile equipment names and counts. Each entry is in a fixed format.

<u># Char.</u>	<u>Contents</u>
10	Date time
6	Object class
4	Object count
20	Remarks

Maintenance - This sector is maintained by the basic worksheet. Additions are made to the end of the sector.

		29	13	12	0				
WORD	0	MRN		00013					
	1	DATE TIME							
	2								
	3	OBJECT CLASS							
	4	OBJECT COUNT							
	5								
	6					REMARKS			
	7								
	8								
	9	REPEAT OF ABOVE FORMAT							
	.								
	.								
	n								
LAST SECTOR WORD		CHECK SUM							

IDF FORMATTED MOBILE EQUIPMENT

FS-2

SECRET

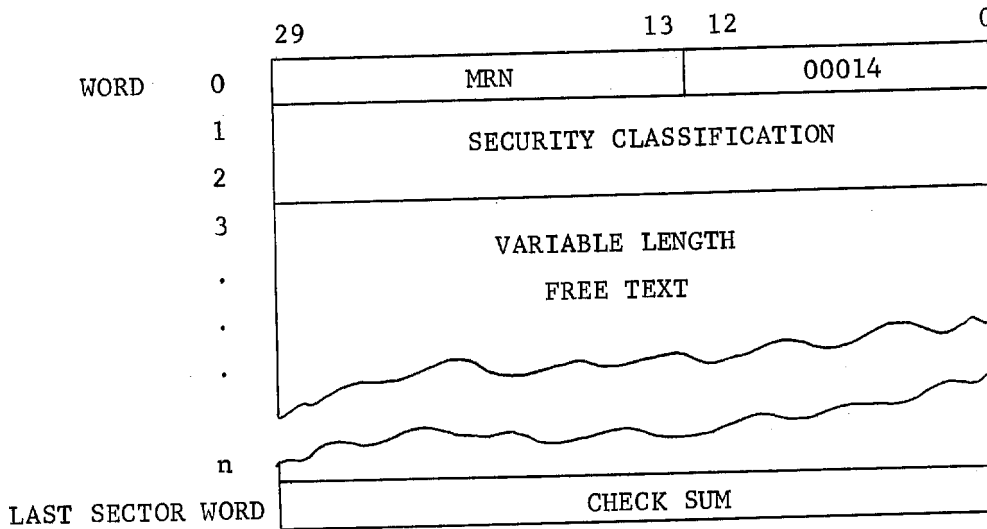
3.1.12 IDF Concise Installation History

Sector Mnemonic: ICONC

Structure This sector contains the first report of a target and all subsequent changes. The sector has one fixed field followed by free text.

<u># Char.</u>	<u>Contents</u>
10 V	Security classification Variable length free text

Maintenance - This sector is maintained from the basic worksheet. Additions are made to the end of the sector.



IDF CONCISE INSTALLATION HISTORY

FS-2

SECRET

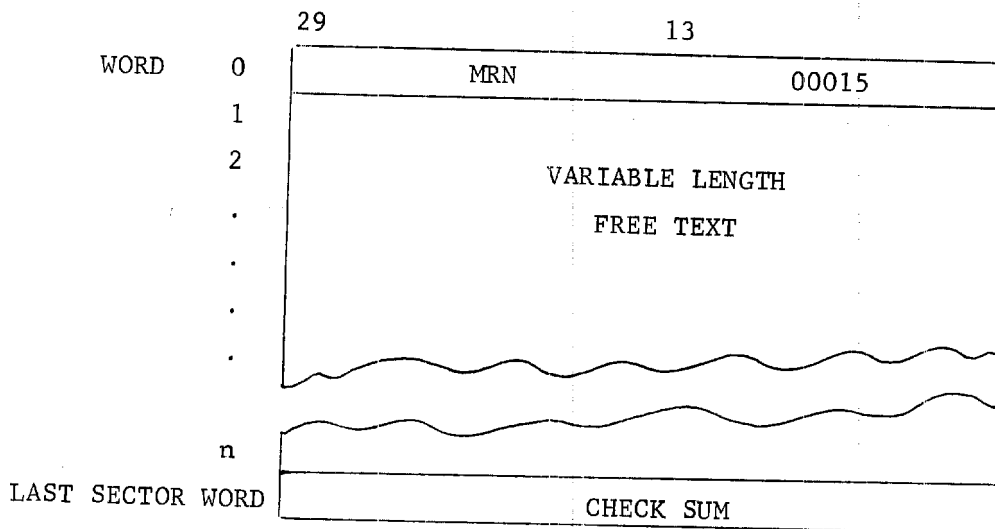
3.1.13 IDF Complete Installation History

Sector Mnemonic: ICOMP

Structure This sector contains all reporting of a particular target in variable length free text.

<u># Char.</u>	<u>Contents</u>
V	Variable length free text

Maintenance - This sector is maintained by the basic worksheet. Additions are made to the end of the sector.



IDF COMPLETE INSTALLATION HISTORY

FS-2

SECRET

SECRET

SCR 352

3.2 Objects Data File3.2.1 ODF Header

Sector Mnemonic: OHEAD

Structure This sector is a fixed format segment of object information. Fields marked with asterisks are index elements.

<u>NMEM</u>	<u># Char.</u>	<u>Contents</u>
NAME	40	* Name
NATO	8	* US/NATO name
CODE	7	* Numeric Object Code
MRN\$	5	Machine reference number
MANU	6	Manufacturer

Maintenance - This sector is generated and maintained via an on-line console.

\$ = Blank character

FS-2

SECRET

SECRET

SCR 352

		29		13	12		0
WORD	0	MRN		00016			
	1	OBJECT NAME					
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9	US/NATO NAME					
	10	NUMERIC OBJECT CODE					
	11	MRN					
	12	MANUFACTURER					
	13	NOT USED					
	14	CHECK SUM					
	15	CHECK SUM					

ODF HEADER

FS-2

20

SECRET

SECRET

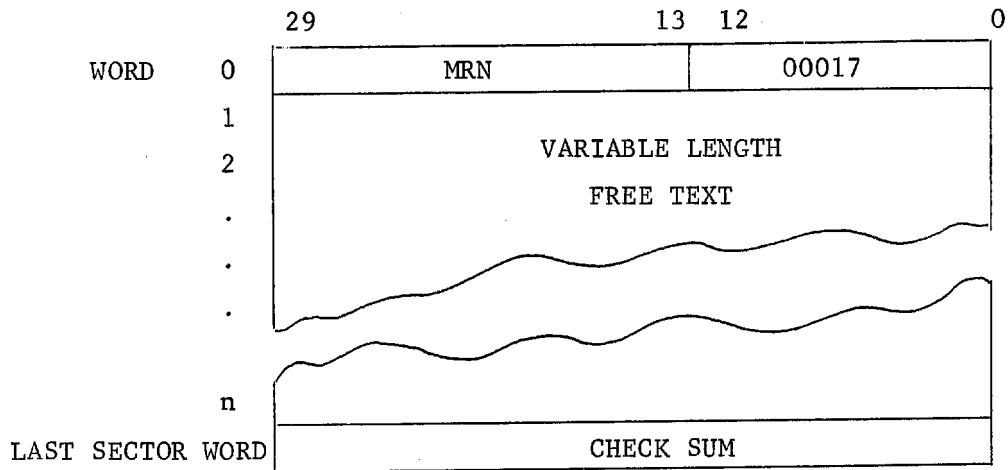
3.2.2 ODF Description

Sector Mnemonic: ODESC

Structure This sector is a free text object description.

<u># Char.</u>	<u>Contents</u>
V	Variable length free text

Maintenance - This sector is maintained via an on-line console.



ODF DESCRIPTION

SECRET

SECRET

SCR 352

3.2.3 ODF Measurements

Sector Mnemonic: OMEAS

Structure This sector contains formatted fixed fields representing various dimensional attributes.

<u>NMEM</u>	<u># Char.</u>	<u>Contents</u>
SHAP	1	Shape
LENG	4	Length
WIDT	3	Width
HEIG	3	Height
	4	NOT USED
VOLU	10	Volume
OTHE	20	Other

Maintenance - This sector is maintained via an on-line console.

WORD	0	13	12	0
	MRN		00020	
1	SHAPE	LENGTH		
2	WIDTH		HEIGHT	
3	HEIGHT	NOT USED		
4	VOLUME			
5				
6				
7				
8	OTHER			
9				
10	CHECK SUM			

ODF MEASUREMENTS

FS-2

SECRET

SECRET

SCR 352

3.2.4 ODF Photo References

Sector Mnemonic: OPHOT

Structure This sector contains photo references for film on which the object has been seen. There are two types of fixed fields that can be intermixed. The first character specifies the field type.

<u># Char.</u>	<u>Contents</u>
1	G
9	Ground photo index
	or
1	A
4	Unused
70	Aerial photo reference (Same as IPHOT sector)

Maintenance - This sector is maintained via an on-line console or the basic worksheet.

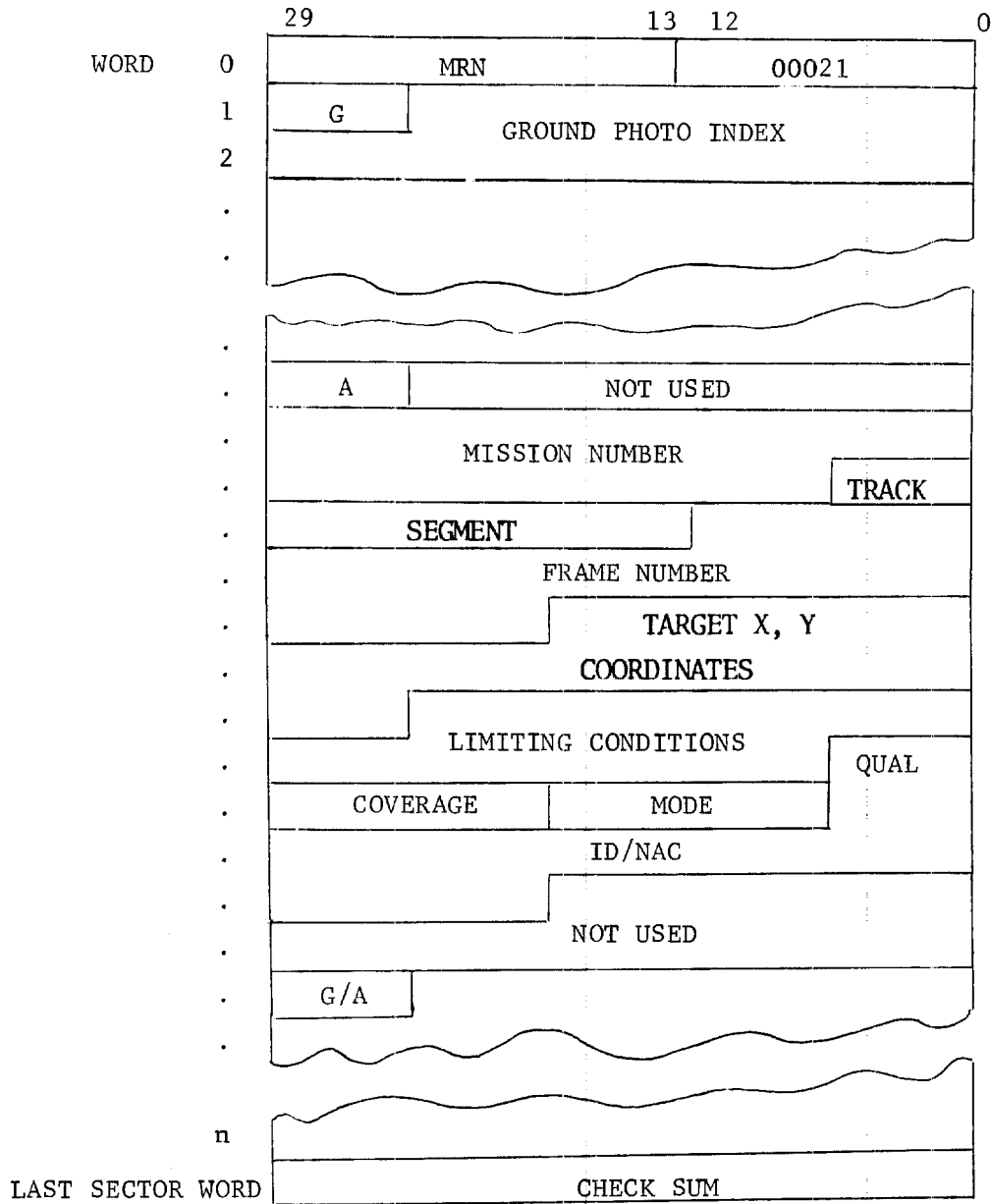
FS-2

23

SECRET

SECRET

SCR 352



- G - ENTRIES ARE 10 CHARS IN LENGTH
- A - ENTRIES ARE 75 CHARS IN LENGTH
- G and A - ENTRIES MAY BE RANDOMLY INTERMIXED

ODF PHOTO REFERENCES

FS-2

SECRET

SECRET

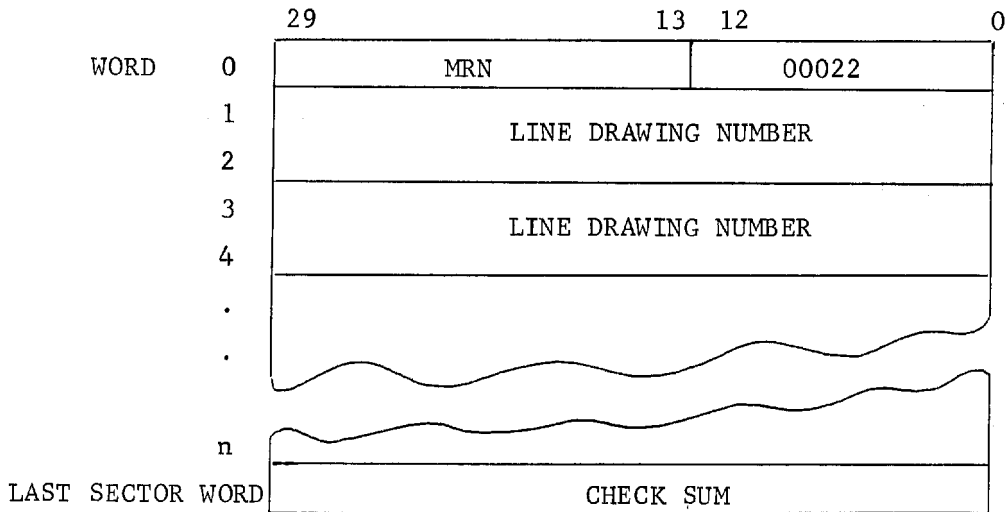
3.2.5 ODF Drawing References

Sector Mnemonic: ODRAW

Structure This sector contains a fixed field for a line drawing index number.

<u># Char.</u>	<u>Contents</u>
10	Line drawing number.

Maintenance - This sector is maintained via an on-line console.



ODF DRAWING REFERENCES

SECRET

SECRET

SCR 352

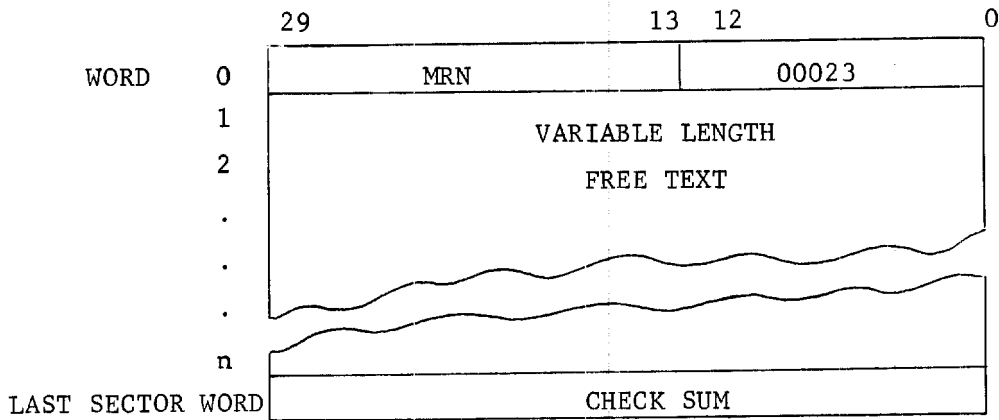
3.2.6 ODF Object Source References

Sector Mnemonic: OSOUR

Structure This sector contains library source references of information pertaining to a particular object.

<u># Char.</u>	<u>Contents</u>
V	Variable length free text

Maintenance - This sector is maintained via an on-line console.



ODF SOURCE REFERENCES

FS-2

SECRET

SECRET

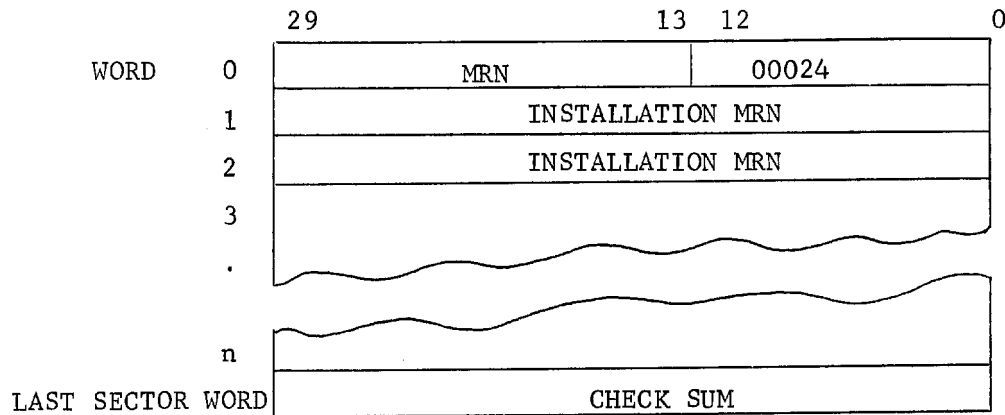
3.2.7 ODF Where Seen

Sector Mnemonic: OWHERE

Structure This sector contains installation machine reference numbers defining where objects have been sighted.

<u># Char.</u>	<u>Contents</u>
5	Installation MRN (unique MRN's only)

Maintenance - This sector is maintained via the basic worksheet.



ODF WHERE SEEN

SECRET

SECRET

SCR 352

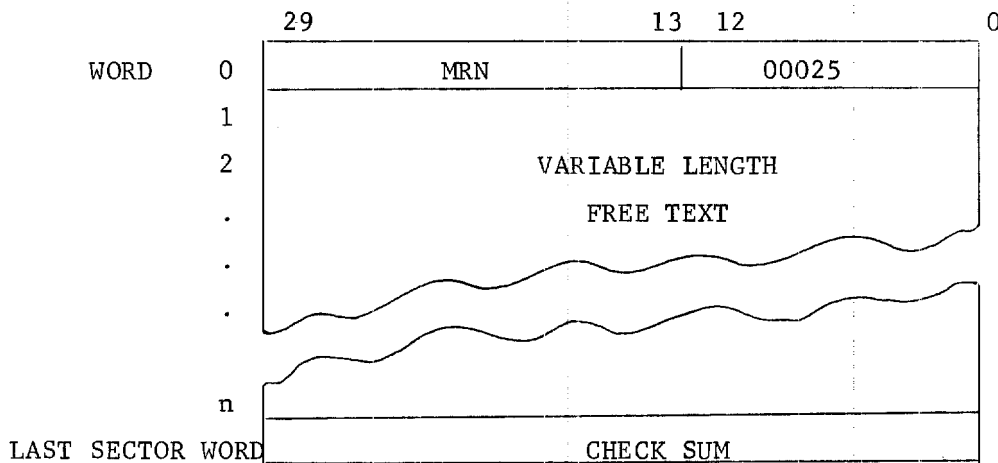
3.2.8 ODF Essential Elements of Information

Sector Mnemonic: OEEI

Structure This sector contains essential elements of information in free text form.

<u># Char.</u>	<u>Contents</u>
V	Variable length free text

Maintenance - This sector is maintained via an on-line console.



ODF ESSENTIAL ELEMENTS OF INFORMATION

FS-2

SECRET

SECRET

SCR 352

3.3 Moving Targets File3.3.1 MTF Header

Sector Mnemonic: MHEAD

Structure This sector contains fix formats fields.
Fields which are flagged by an asterisk
are index elements.

<u>NMEM</u>	<u># Char.</u>	<u>Contents</u>
NAME	40	* Name
CODE	10	* Coded identifier
MRN\$	5	Machine reference number
MANU	5	Manufacturers code

Maintenance - This sector is generated and maintained via
an on-line console.

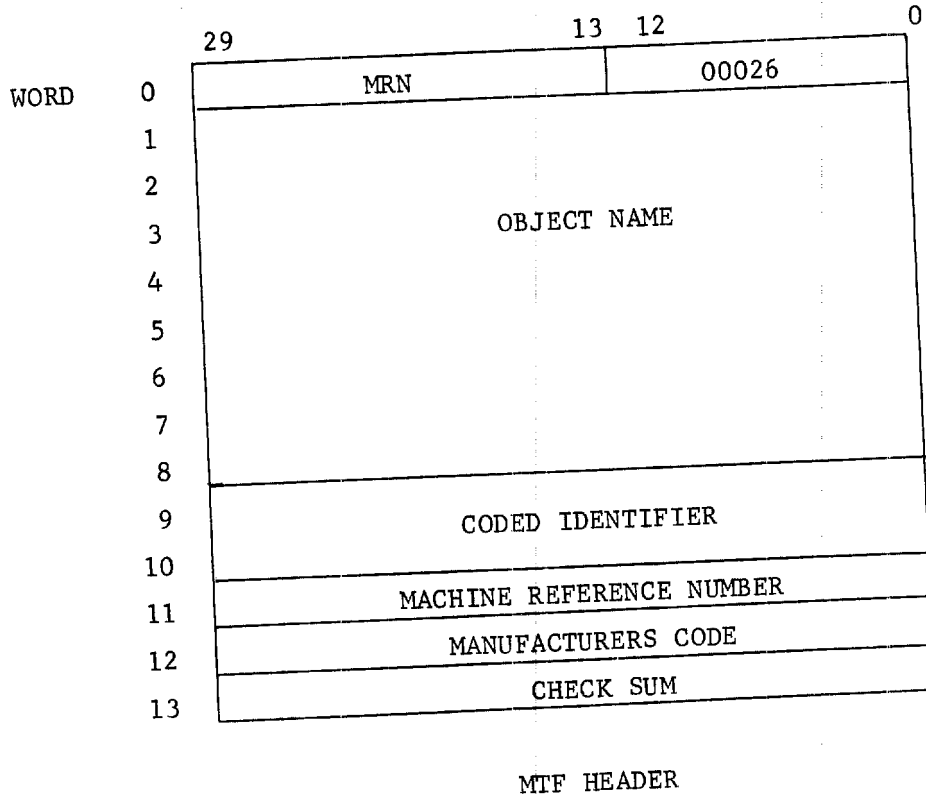
\$ = Blank character

FS-2

SECRET

SECRET

SCI 352



FS-2

SECRET

SECRET

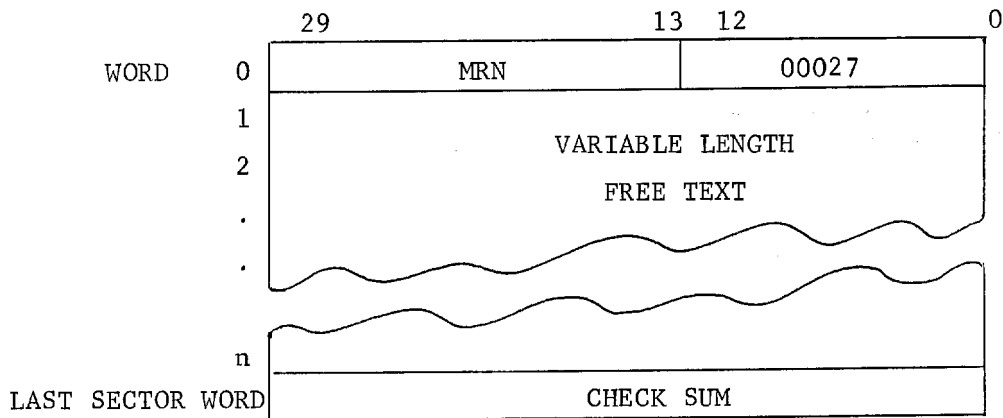
3.3.2 MTF Description

Sector Mnemonic: MDESC

Structure This sector is a free text moving object description.

<u># Char.</u>	<u>Content</u>
V	Variable length free text

Maintenance - This sector is maintained via an on-line console.



MTF DESCRIPTION

SECRET

SECRET

SCR 352

3.3.3 MTF Measurements

Sector Mnemonic: MMEAS

Structure This sector contains formatted fixed fields representing various object dimensional attributes.

<u>NMEN</u>	<u># Char.</u>	<u>Contents</u>
SHAP	1	Shape
LENG	4	Length
WIDT	3	Width
HEIG	3	Height
	4	NOT USED
VOLU	10	Volume
OTHE	20	Other

Maintenance - This sector will be maintained via an on-line console.

WORD	0	13	12	0
	MRN		00030	
1	SHAPE	LENGTH		
2	WIDTH		HEIGHT	
3	HEIGHT	NOT USED		
4	VOLUME			
5				
6				
7				
8	OTHER			
9				
10	CHECK SUM			

MTF MEASUREMENTS

FS-2

SECRET

SECRET

SCR 352

3.3.4 MTF Photo References

Sector Mnemonic : MPHOT

Structure This section contains photo references for film that the object has been seen. There are two types of fixed fields that can be intermixed. The first character specifies the field type.

<u># Char.</u>	<u>Contents</u>
1	G
9	Ground photo index
1	A
4	Unused
70	Aerial photo reference (Same as IPHOT sector)

Maintenance - This sector will be maintained via an on-line console or the basic worksheet.

FS-2

SECRET

SECRET

SCR 352

		29		13	12	0
WORD	0	MRN			00031	
	1	G	GROUND PHOTO INDEX			
	2					
	.					
	.					
	.					
	.	A	NOT USED			
	.	MISSION NUMBER				TRACK
	.	SEGMENT				
	.	FRAME NUMBER				
	.	TARGET X, Y				
	.	COORDINATES				
	.	LIMITING CONDITIONS				QUAL
	.	COVERAGE		MODE		
	.	ID/NAC				
	.	NOT USED				
	.	GIA				
	.					
	.					
	n					
LAST SECTOR WORD		CHECK SUM				

G ENTRIES ARE 10 CHARS IN LENGTH

A ENTRIES ARE 75 CHARS IN LENGTH

G AND A ENTRIES MAY BE RANDOMLY INTERMIXED

MTF PHOTO REFERENCES

FS-2

SECRET

SECRET

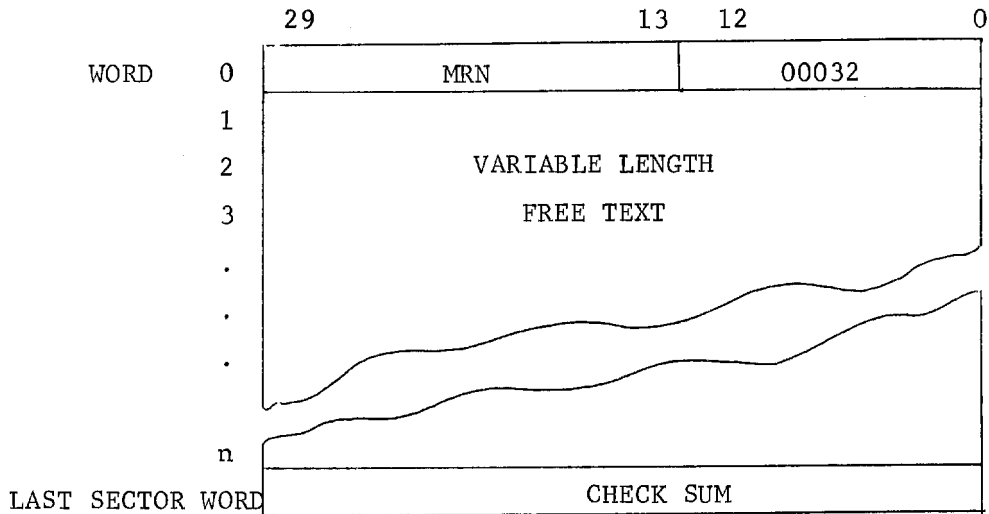
3.3.5 MTF Where Seen

Sector Mnemonic: MWER

Structure This sector contains a verbal description of where the mobile target was seen.

<u># Char.</u>	<u>Contents</u>
V	Variable length free text

Maintenance - This sector will be maintained via an on-line console.



MTF WHERE SEEN

FS-2

SECRET

SECRET

SCR 352

3.4 Exploitation Data Products File

3.4.1 EPDF Header

Sector Mnemonic: EHEAD

Structure This sector is a fixed format segment of information. Fields which are marked with an asterisk are index elements.

<u># Char.</u>	<u>Contents</u>
40	* Name (Title)
2	* Country
3	* Target type
11	* Geo coordinates
7	Accession number
7	Mission number
6	Date
4	Report type
10	Report number
6	Origin
80	2 - 40 Char. possible alternate titles

Maintenance - This sector will be maintained via an on-line console.

FS-2

SECRET

SECRET

		29	13	12	0
WORD	0	MRN		00033	
	1	TITLE			
	2				
	.				
	.				
	9	COUNTRY	TARGET TYPE		
	10	GEO COORDINATES			
	11	ACCESSION NUMBER			
	12				
	13	MISSION NUMBER			
	14				
	15	DATE			
	16	REPORT TYPE			
	17	REPORT NUMBER			
	18				
	19	ORIGIN			
	20	NOT USED			
	21	ALTERNATE			
	22				
	23				
	.				
	.	TITLES			
	37				
	38	CHECK SUM			
	39				

EPDF HEADER

FS-2

SECRET

SECRET

SCR 352

INTEGRATED INFORMATION SYSTEM (IIS)

IIS INDEX AND INDEX RECORDS SPECIFICATION

8 February 1968

FS-3

SECRET

SECRET

SCR 352

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. SCOPE	1
2. APPLICABLE DOCUMENTS	1
3. INDEX STRUCTURE	1

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. INDEX A FORMAT	1
2. INDEX B FOR UNIQUE TERMS	3
3. INDEX B FOR BROAD TERMS	4
4. C LEVEL INDEX FORMAT	5
5. D LEVEL INDEX	6
6. GEO INDEX FORMAT	6
7. TIR	7
8. OIR	8
9. MIR	9
10. EIR	9

FS-3

111

SECRET

SECRET

SCR 352

IIS INDEX AND INDEX RECORDS SPECIFICATION

1. SCOPE

This document defines the form and format of the indexes and index records to be created and maintained for the National Data Base (NDB). Several levels of indexing have been created for the purpose of minimizing access times for data retrieval. Due to the large volume of data and indexes required, a minimum of two or three drum accesses will be required to retrieve a specific data base sector depending on the retrieval request.

The indexes and index records are utilized in the IIS by the following programs:

File Control Program (SS-12)
Automatic Update (AUD) Program (SS-3)

2. APPLICABLE DOCUMENTS

IIS National Data Base File Specification (FS-2)

3. INDEX STRUCTURE

Five types of indexes are required to control the IIS NDB.

3.1 Index A

This index is a list of valid index names and where their first entry is located. It shall be core resident and modifiable only by a program change. The format of Index A is shown in Figure 1.

	29		24		0
WORD 1	NUMBER OF INDEXES (BINARY)				
WORD 2	FILE ID (One Char.)	INDEX NAME (Four Characters)			
WORD 3	INDEX B ₁ CORE ADDRESS				
WORD 4	FILE ID	INDEX NAME			
WORD 5	INDEX B ₂ CORE ADDRESS				
⋮					
WORD 21					

Figure 1 - INDEX A FORMAT

FS-3

SECRET

SECRET

SCR 352

The IIS shall provide 10 IIS NDB indexes. Index A will therefore require 21 words of core storage.

The 10 Indexes, the NDB files they index and the four character alpha code used in Index A follows:

<u>Index</u>	<u>File Indexed</u>	<u>Alpha Code</u>
1. Name	IDF, ODF, MTF, EPDF	NAME
2. COMIREX Number	IDF	COMO
3. BE Number	IDF	BE\$\$
4. Country	IDF, EPDF	COUN
5. WAC/PIC Number	IDF	PIC\$
6. Geo Coordinates	IDF, EPDF	GEO\$
7. Military District	IDF	MIL\$
8. Type	IDF, EPDF	TYPE
9. Object NATO Name	ODF	NATO
10. Object Code	ODF, MTF	CODE

The one character file code used in Index A for the four NDB files is as follows:

<u>NDB File</u>	<u>Alpha Code</u>
IDF	I
ODF	O
MTF	M
EPDF	E

3.2 Index B for Unique Terms

These indexes provide for rapid access to sections within any one of the larger indexes on the C level. There shall be six indexes in level B for unique term indexes, i.e., NAME, COMO, BE, PIC, NATO, and CODE. The format for Index B is shown in Figure 2.

The first four words of each B level index shall be identical in format but the total index length may be variable depending on the total number of entries. The C level indexes shall be broken into 1000 word blocks. The B level indexes shall record each block address and the first 30 bits of the first term in the block. To search for an item in the C level index, the B level index will be scanned first to identify in which 1000 word block the item is located.

FS-3

SECRET

SECRET

SCR 352

WORD 1	INDEX NAME	
WORD 2	ARGUMENT LENGTH	MULTIPLE ¹
WORD 3	U B	ORDER
		STORAGE MEDIA
	BLOCK SIZE	NUMBER OF BLOCKS
.	BLOCK ADDRESS 1	
.	SIGS ²	
.	BLOCK ADDRESS 2	
	SIGS	
	⋮	
	BLOCK ADDRESS n	
	SIGS	

Figure 2 - INDEX B FOR UNIQUE TERMS

3.3 Index B for the GEO Index

Because the 1⁰ square geo-coordinate index is the only broad term index that requires segmenting (into blocks) it shall be handled in the same manner as Index B for Unique Terms.

3.4 Index B for Other Broad Term Indexes

The general format for the COUN, MIL, and TYPE index shall be as follows:

1. Total length of argument and function(s).
2. Represents the first 30 significant bits of the first argument in block addressed.

FS-3

SECRET

SECRET

SCR 352

WORD 1	NUMBER OF WORDS IN INDEX
2	NUMBER OF WORDS PER ARGUMENT
3	FUNCTION WORD(S) ¹

Figure 3 - INDEX B FOR BROAD TERMS

The number of words per entry is shown below.

<u>Index</u>	<u>Char/Arg</u>	<u>No. of Wds/Arg</u>	<u>Wds/Func</u>	<u>Total Wds/Entry</u>
Country	2	1	2	3
Mil. Dist.	4	1	1	2
Type	2	1	2	3

3.5 Index C

The structure of the C level indexes may differ depending on which of the seven indexes is under consideration. The general form shall be as shown in Figure 4.

1. If the index term indexes one file only, e.g. C Number, only one function word (address to index record) is required. But, when an index term references 2 or more files, e.g. Country, then two function words are present, the first addressing the TIR, the second the EIR.

FS-3

SECRET

SECRET

SCR 352

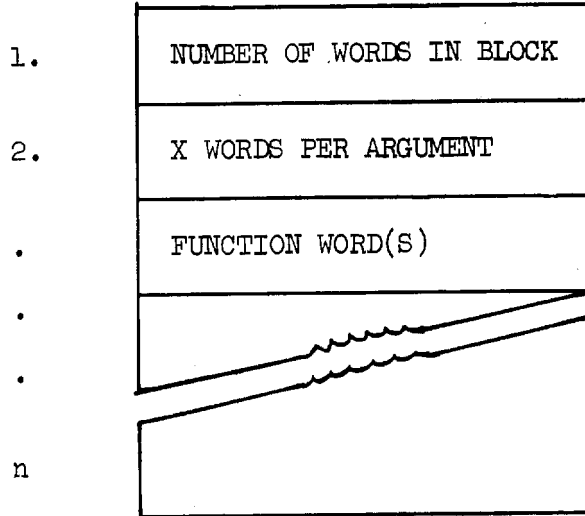


Figure 4 - C LEVEL INDEX FORMAT

The number of words per argument is shown below:

<u>Index</u>	<u>Char/Arg</u>	<u>No. of Wds/Arg</u>	<u>Wds/Func</u>	<u>Total Wds/Entry</u>
Name	40	8	4	12
COMIREX Number	7	2	1	3
BE Number	6	2	1	3
WAC/PIC Number	8	2	1	3
Object NATO Name	10	2	1	3
Object Code	8	2	2	4
Geo-Coordinate	5	1	3	4

3.6 D Level Indexes

This level of index is used in association with all broad terms. The broad term entries in the B level shall contain such entries as lists of countries. The associated block address is a D level address. This level of index shall contain only a list of the MRN's which apply to a particular broad term. For example, a D level index may contain all machine reference

SECRET

SECRET

SCR 352

numbers representing all targets in a particular country. The general form shall be as shown in Figure 5.

WORD 1.	NUMBER OF WORDS
WORD 2.	MRN1
WORD 3.	MRN2
.	.
.	.
.	.
n	MRNX

Figure 5 - D LEVEL INDEX

An exception to the general form for D level indexes will be the geo-coordinate index which shall have the following form:

WORD 1.	NUMBER OF WORDS
WORD 2.	MRN 1
WORD 3.	MINUTES OF LAT. & LONG.
WORD 4.	MRN 2
WORD 5.	MINUTES OF LAT. & LONG.
D	.
	.
	.

Figure 6 - GEO INDEX FORMAT

FS-3

SECRET

SECRET

SCR 352

3.7 Index Records (IR)

All machine reference numbers (MRN's) are pointers to index records for the various NDB files, i.e., IDF-TIR, ODF-OIR, MTF-MIR, and EPDF-EIR. The index record is used to further locate the substantive (sectors) information in the NDB.

3.7.1 Target Index Record (TIR)

The format of the TIR shall be as shown in Figure 7. There shall be one TIR for each Unit Record (UR) in the IDF.

	29	25	23	22	20	19	0
Word 0		UNIT ²	UNIT ¹	DRUM ADDRESS			
Word 1	NUMBER OF WORDS IHEAD SECTOR						
Word 2		UNIT	UNIT	DRUM ADDRESS			
Word 3	NUMBER OF WORDS IBRIE SECTOR						
Word 4							
Word 5							
⋮							
⋮							
⋮							
Word 22		UNIT	UNIT	ADDRESS			
Word 23	NUMBER OF WORDS ICOMP SECTOR*						
Word 24	CHECK SUM						

*For ICOMP, Word 22 will contain a tape address or a hard copy reference number.

Figure 7 - TIR

1. UNIT = Operational FASTRAND Drum Number
2. UNIT = Back-up FASTRAND Drum Number

FS-3

SECRET

SECRET

SCR 352

3.7.2 Object Index Record (OIR)

The format for the OIR shall be as shown in Figure 8. There shall be one OIR for each object in the ODF.

	29	25	22	20	19	0
Word 0		UNIT	UNIT	DRUM ADDRESS		
Word 1	NUMBER OF WORDS OHEAD SECTOR					
Word 2		UNIT	UNIT	DRUM ADDRESS		
Word 3	NUMBER OF WORDS ODESC SECTOR					
⋮						
Word 14		UNIT	UNIT	DRUM ADDRESS		
Word 15	NUMBER OF WORDS OEEI SECTOR					
Word 16	CHECK SUM					

Figure 8 - OIR

FS-3

SECRET

SECRET

3.7.3 Moving Target Index Record (MIR)

The format of the MIR shall be as shown in Figure 9. There shall be one MIR for each target in the MIF.

	29	25	22	20	19	0
Word 0		UNIT	UNIT	DRUM ADDRESS		
Word 1	NUMBER OF WORDS MHEAD SECTOR					
Word 2		UNIT	UNIT	DRUM ADDRESS		
Word 3	NUMBER OF WORDS MDESC SECTOR					
⋮	⋮					
Word 8		UNIT	UNIT	DRUM ADDRESS		
Word 9	NUMBER OF WORDS MWER SECTOR					
Word 10	CHECK SUM					

Figure 9 - MIR

3.7.4 EPDF Index Record (EIR)

The format of the EIR shall be shown in Figure 10. There shall be one EIR for each product in the EPDF.

	29	25	22	20	19	0
Word 0		UNIT	UNIT	DRUM ADDRESS		
Word 1	NUMBER OF WORDS EHEAD SECTOR					
Word 2	CHECK SUM					

Figure 10 - EIR

SECRET

SECRET

SCR 352

INTEGRATED INFORMATION SYSTEM (IIS)

FILE CONTROL PROGRAM SPECIFICATION (FCL)

SS-12

8 February 1968

SECRET

SECRET

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1.	SCOPE	1
2.	APPLICABLE DOCUMENTS	1
3.	REQUIREMENTS	1
4.	FCL PROGRAM FLOW DIAGRAM	11

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
1.	SECTOR RETRIEVAL CALLING SEQUENCE	1
2.	ALLOWABLE COMBINATIONS	3
3.	SECTOR INDEX REPLACEMENT	5
4.	QUEUE LIST/WORKING FILE CALLING SEQUENCE	7
5.	FILE CONTROL PROGRAM FLOW CHART	12

SS-12

iii

SECRET

SECRETFILE CONTROL PROGRAM SPECIFICATION (FCL)1. SCOPE

This specification describes the programming necessary to create and maintain random access National Data Base Files, the Queue List (QL), Working File (WF), and the Status List (SL). In general, any request or modification of NDB or QL/WF/SL information must pass through the FCL program. This program shall provide various services as specified in this specification.

2. APPLICABLE DOCUMENTS

IIS National Data Base File Specification (FS-2)
 Status List/Queue List/Working File Specification (FS-3)
 IIS Index and Index Records Specification (FS-1)
 RYE-494 Programmer's Reference Manual

3. REQUIREMENTS3.1 Functional Requirements

This program shall be divided into three logical sections according to their functions. The three functions are Sector/Index retrieval, Sector/Index replacement, and Queue List/Working File control.

3.1.1 Sector/Index Retrieval

This section of the File Control program shall retrieve NDB sectors, lists of machine reference numbers from the broad term indexes, and portions of NDB indexes. The incoming request shall uniquely specify the desired information in terms of unique terms, broad terms, sector names, etc. The input calling sequence shall be as shown in Figure 1. Since the calling sequence must cover information for all possible retrievals, the allowable combinations shall be as shown in Figure 2. There are four unique responses or modes necessary depending on the combination in Figure 2.

WORD 1	Link to QRIN
WORD 2	File Name
WORD 3-10	Unique Term or MRN or Broad Term
WORD 11	Sector Mnemonic
WORD 12	Buffer Transfer Address
WORD 13	Index Indicators
WORD 14	Not Found Return

Figure 1 - SECTOR RETRIEVAL CALLING SEQUENCE

SS-12

SECRET

SECRET

Explanation and Codes:

WORD 1 File Name - BCD left adjusted - trailing blanks

IDF
ODF
MTF
EPDF

WORD 3-10 Unique Term or MRN or Broad Term

Unique terms are BCD left adjusted with trailing blanks. Maximum 40 characters. See NDB File Specification (FS-2) for allowable terms.

MRN's are 17 bit binary numbers left adjusted in first word.

Broad terms are BCD left adjusted with trailing blanks. See NDB Index/Index Record Specification (FS-1).

WORD 11 Sector Name or Number Codes

Sector names are BCD left adjusted with trailing blanks. Maximum of 5 characters. See NDB specification (FS-2) for sector names.

A right adjusted numeric code of 77 octal indicates unique term to MRN conversion with no sector retrieval.

WORD 12 Buffer Transfer Address (BTA)

The BTA is a binary storage address where the retrieved information is to be placed.

Figure 1 - SECTOR RETRIEVAL CALLING SEQUENCE (Cont'd)

SS-12

SECRET

SECRET

WORD 13 Index Indicators

The index indicators are right adjusted binary numbers using the following codes:

- 1 Index mod/primary
- 2 Index mod/primary/first block
- 4 Index mod/secondary
- 10 Null sector indicator
- 20 - 2000000 not used
- 4000000 Name
- 10000000 PIC Number
- 20000000 COMIREX Number
- 40000000 BE Number
- 100000000 Country
- 200000000 Geo. Coordinate
- 400000000 Type
- 1000000000 Military District
- 2000000000 Object NATO Name
- 4000000000 Object Code

Figure 1 - SECTOR RETRIEVAL CALLING SEQUENCE (Cont'd)

	Mode 1		Mode 2		Mode 3	Mode 4	
Unique	X	X				X	
MRN			X	X			
Broad					X		X
Sector		X		X			
Index Indicator						X	X

Figure 2 - ALLOWABLE COMBINATIONS

3.1.1.1 Unique Term/Sector - Mode 1. - The unique term and sector designators uniquely identify the desired information unit. The appropriate unique term index (specified from Word 13) shall be searched using the term in words 3-10 as the search argument. The term shall then be converted to

SS-12

SECRET

SECRET

SCR 352

its MRN equivalent. With the MRN to locate the index record and sector location in the index record, the address of the sector shall be obtained and the sector retrieved. If the sector number 77₀ is used, the unique term shall be converted to its MRN and returned with no sector retrieved. If no sector indicator is given and 77 not present, the header sector shall be assumed. If the unique term search is unsuccessful, the "not found" return in the calling sequence shall be used. If the sector has no data associated with it, the appropriate bit in the indicator word shall be set indicating a null sector. Null sectors are recognized by zero addresses in the index records.

3.1.1.2 MRN/Sector - Mode 2. - This mode shall be identical to Mode 1 except that a unique term search shall not be executed. It should be noted that the 77 sector option cannot be specified.

3.1.1.3 Broad Term - Mode 3. - This mode deals only with broad term searches. The broad term index (specified in Word 3) shall be searched using the broad term specified in words 3-4 as the search argument. The broad term shall be converted to an index address which contains only MRN's associated with the broad term. The MRN list shall be retrieved and returned to the calling program.

3.1.1.4 Index Modifications - Mode 4. - This mode shall be used only by the AUD program and shall obtain portions of indexes rather than NDB sectors. If a unique term index modification is indicated from Word 13, the unique term index shall be searched using the unique term as the search argument. If the term is found, the block of terms shall be returned. If the first block is indicated (signifying an index addition) the 1st block of the index shall be returned.

For broad term indexes, there are two levels of indexing - primary and secondary. For example, a primary index may contain a list of countries and for each country a secondary index is maintained containing all MRN's of targets in a particular country. Thus, for broad terms, the primary or secondary index (with first block option) must be specified. In any case, the index block shall be returned.

3.1.2 Sector/Index Replacement

This section of the File Control program shall be designed to return modified sectors and index blocks to the data base and to make address and storage adjustments when necessary. Another function shall be to assign new MRN's and create the appropriate index record. The calling sequence for this section shall be as shown in Figure 3.

SS-12

SECRET

SECRET

WORD 1 Link to SECRP (Sector/Index Replacement)
 WORD 2 MRN
 WORD 3 Sector
 WORD 4 Buffer Transfer Address
 WORD 5 Indicators

Explanation and Codes:

WORD 2 MRN

MRN's are 17 bit binary right adjusted.

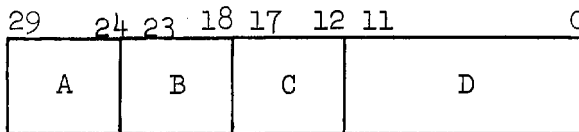
WORD 3 Sector

Sector mnemonics are 5 BCD characters.

WORD 4 Buffer Transfer Address (BTA)

The BTA is a binary storage address where the data is available.

WORD 5 Indicators



- A - 6 Bits - Index number if index replacement.
- B - 6 Bits - Index action
 - 01 Unique term
 - 02 Unique term/1st block
 - 03 Broad term/primary
 - 04 Broad term/primary/1st block
 - 05 Broad term/secondary
 - 06 Broad term/secondary/1st block
- C - 6 Bits - Action
 - 01 Index maintenance required
 - 02 New MRN request (IDF)
 - 03 New MRN requested (ODF)
 - 04 New MRN requested (MTF)
 - 05 New MRN requested (EPDF)
- D - 12 Bits - Binary number of words to be transferred.

Figure 3 - SECTOR/INDEX REPLACEMENT

SS-12

SECRET

SECRET

3.1.2.1 Sector Replacement. - The program shall accept modified NDB sectors from the AUD program and return them to the NDB. The AUD program must specify the MRN, sector number, and size. If the size is less than or equal to the previous size (as determined from the index record), the index record yielding the sector address shall be obtained and the modified information written over the old information. If the size is either greater than the previous record or non-existent, the sector shall be stored in the next available storage address, registering the new address and number of words in the index record.

3.1.2.2 Index Replacement. - The program shall accept the index block that has been modified and replace it in its original location. If the "maintenance required" indicator in Word 5 is set, the index shall be scheduled with the executive for a sort/merge to reorganize the index. Essentially, the unsorted entries in the first index block shall be merged into their proper position resulting in an empty first block.

3.1.2.3 New MRN. - If the "new MRN" indicator is set in Word 5, the program shall assign the next available machine reference number and return the number to the calling program through the BTA location. Since the MRN is used with a storage address algorithm, no further action is required. The MRN assignment shall be based on the file used and so indicated by the indicators.

<u>File</u>	<u>MRN Range</u>
IDF	0 -49999
ODF	50000-51999
MTF	52000-52999
EPDF	53000-99900

3.1.3 Queue List/Working File Control

This section of the File Control program shall provide for the complete operation and use of the Queue List and the Working File. Functionally, there are nine logical sectors or services which shall be provided in this section. A function code in the calling sequence identify the desired activity. The calling sequence shall be as shown in Figure 4. All references to items in the Queue List shall be made by means of a machine reference number with two exceptions (next record functions 5 and 6).

SS-12

SECRET

SECRET

WORD 1	Link to QLWF
WORD 2	Function Code
WORD 3	MRN
WORD 4	Buffer Transfer Address
WORD 5	Indicator Word
WORD 6	Q.L. Status Indicators

Explanation and Codes:

WORD 2 Function Code

The function code is a right adjusted binary number identifying the desired activity.

<u>F.C.</u>	<u>Meaning</u>
1	New Entry
2	Data Request
3	Data Return
4	Delete Entry
5	Next Record-Edit
6	Next Record-Approve
7	Change Status
8	Request Status
9	Target Off Film
10	Move entry to Status List

WORD 3 MRN

17 Bit - left adjusted binary machine reference number.

WORD 4 Buffer Transfer Address (BTA)

The BTA is a binary core address where data is to be placed or obtained depending on the function.

WORD 5 Indicators

1	-	Entry not in QLWF
2	-	Error condition
4	-	Not used
10	-	Return only approved record
20-4000	-	Not used

Figure 4 - QUEUE LIST/WORKING FILE CALLING SEQUENCE

SS-12

7

SECRET

SECRET

10000 Status to Verified
 20000 Status to Edited
 40000 Status to Approved

NUMBER OF WORDS	INDICATORS
-----------------	------------

Figure 4 - QUEUE LIST/WORKING FILE CALLING SEQUENCE (Cont'd)

3.1.3.1 New Entry (FC 1). - This function is specified whenever a new entry is to be added to the QLWF. Only the BTA must be specified in the calling sequence in addition to the function code. The first two words of the data shall become the first two words of the queue list entry as specified in the Queue List/Working File specification. The third word of the new entry shall become the first word of the Working File entry. The File Control program shall store the data in the working file and add the entry to the queue list, inserting the WFA.

3.1.3.2 Data Request (FC 2). - This function shall supply the complete entry (specified by the MRN) from the working file to the calling program. The BTA is used as the address of where to deposit the information. If no data is available (MRN not in QL) the "Entry not in QLWF" bit in the indicator work shall be set. The "in process" indicator in the QL shall be set denying the requested entry to all other programs.

3.1.3.3 Data Return (FC 3). - This function shall return data to the Working File. The MRN, function code, BTA, and number of words must be contained in the calling sequence. The program shall locate the entry in the QL and compare the number of words against the original number. If the number is less than or equal to the original number, the data shall be returned to the Working File in its original location as specified by the WFA. If the number of words has been increased, the data shall be stored in the next available location and its WFA altered. Once the data has been transferred from the BTA to the Working File, its "in process" indicator shall be reset.

3.1.3.4 Delete Entry (FC 4). - This function shall be used to delete entries from the Working File. The only required information is the MRN. In essence, the entry is deleted from the queue list eliminating the WF reference. However, before the entry is deleted, the program shall record the entry on the transaction tape.

SS-12

SECRET

SECRET

3.1.3.5 Next Record - Edit (FC 5). - This function shall automatically select the next record available for editing and supply the data to the requesting program. A next edit record list shall be maintained by the program when record status is changed to indicate "verification completed." The "in process" indicator shall be set.

3.1.3.6 Next Record - Approve (FC 6). - This function is the same as 3.1.3.5 except that the approval record list shall supply the next record. The approval record list shall be maintained by the program when record status is changed to indicate "editing completed."

3.1.3.7 Change Status (FC 7). - This function shall be used to change the status of a Working File entry. The MRN and the indicator word shall be set by the calling program. The program shall identify the status to which the entry is to be changed and make the appropriate change in the Queue List entry. If the change is to "verified", the MRN shall be placed in the "next record to be edited list." If the change is to "edited," the MRN shall be placed in the "next record to be approved" list.

3.1.3.8 Request Status (FC 8). - The function is used when the current status of a particular Working File entry is desired. The calling program shall specify the MRN and a BTA. The status word (or words for multiple entries) shall be transferred to the BTA.

3.1.3.9 Target Off Film (FC 9). - This function code is used by the DEN program to specify a target off film. A QL entry shall not be created for the MRN. However, a set of indicators shall be set in the with a zero WF address.

3.1.3.10 Move Entry to Status List (FC 10). - This function is used to move a WF entry from the Queue List to the Status List. The FCL program shall obtain the QL entry and search the predefined SL to locate the MRN setting the disposition, source, and status indicators, working file address and number of words. The QL entry and WF entry shall be recorded on the transaction tape prior to deletion of the QL entry.

3.2 Interfaces

3.2.1 Program Inputs

The input calling sequences are shown and defined in Sections 3.1.1, 3.1.2, and 3.1.3. Input data formats are defined in the SL/QL/WF specification (FS-3), the NDB Index/Index Record specification (FS-1), and the NDB File specification (FS-2).

SS-12

SECRET

SECRET

3.2.2 Program Outputs

Output data formats are defined in the SL/QL/WF specification, the NDB Index/Index Record specification, and the NDB File specification.

Each record on the transaction shall consist of the three word Queue List entry followed by the Working File entry.

3.2.3 Files

The description and content of files used by the FCL program are described in the Status List/Wait List/Working File Specification (FS-1).

3.2.4 Secondary Storage

The method of transferring data to and transferring data from secondary storage shall be as described in IIS/RT/3 Specification (SS-9).

3.2.5 Other Communication with the Real Time /3 Program

The FCL program shall be subject to the control procedures described in IIS RT/3 Specification (SS-9).

3.3 Diagnostics

3.3.1 Checks on Program Inputs

The FCL Program shall detect and indicate the following error conditions to the calling program:

- (a) MRN not in Queue List.
- (b) Illegal NDB file request.
- (c) Illegal NDB file sector request.
- (d) Illegal unique or broad index term.
- (e) Requested Working File entry "in process."

The RUM Executive program will generate any necessary input/output diagnostics.

SS-12

SECRET

SECRET

3.4 Storage Allocation

3.4.3 Working Storage Allocation

3.4.1.1 Drum Storage Allocation. - The FCL program is provided drum working storage on the FH880, FH432, or FH1782 through an RT/3 request (see RT/3 specification for calling sequence). The maximum drum working storage allocated to the FCL program shall be 40,000 words.

3.4.1.2 Core Storage Allocation. - Maximum core working storage is allocated 3000 computer words.

3.5 General Design Features

3.5.1 Programming Language

The FCL program shall be coded in the SPRYE assembly language.

3.5.2 Flexibility

Not applicable.

3.5.3 Recovery Procedure

Not applicable.

3.6 Required Techniques

Not applicable.

4. FCL PROGRAM FLOW DIAGRAM

Figure 5 represents the program flow logic of the functions described in Section 3.1.

SS-12

SECRET

SS-12

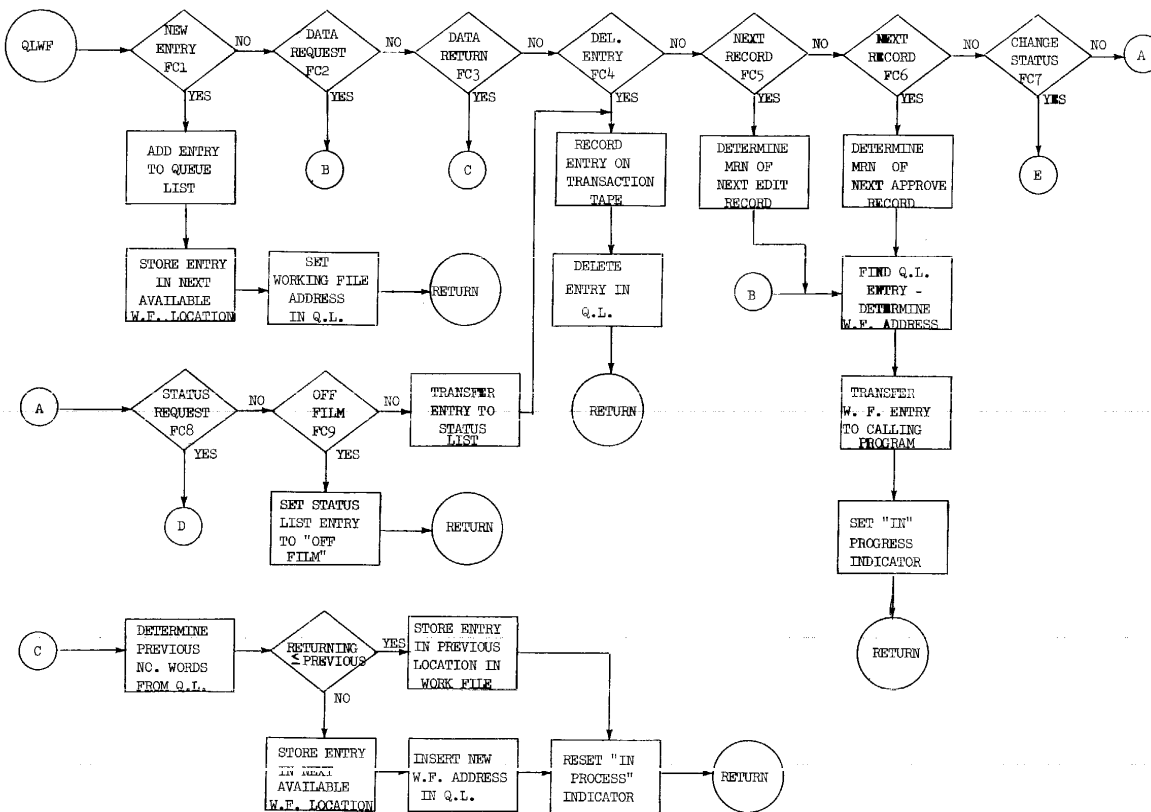


FIGURE 5 FILE CONTROL PROGRAM FLOW CHART

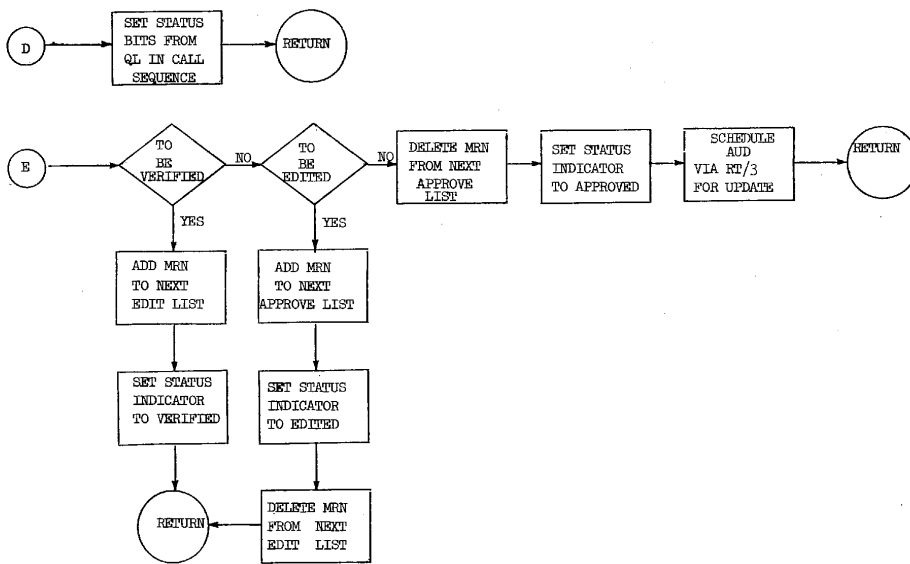
SECRET

12

SECRET

SCR 352

SS-12



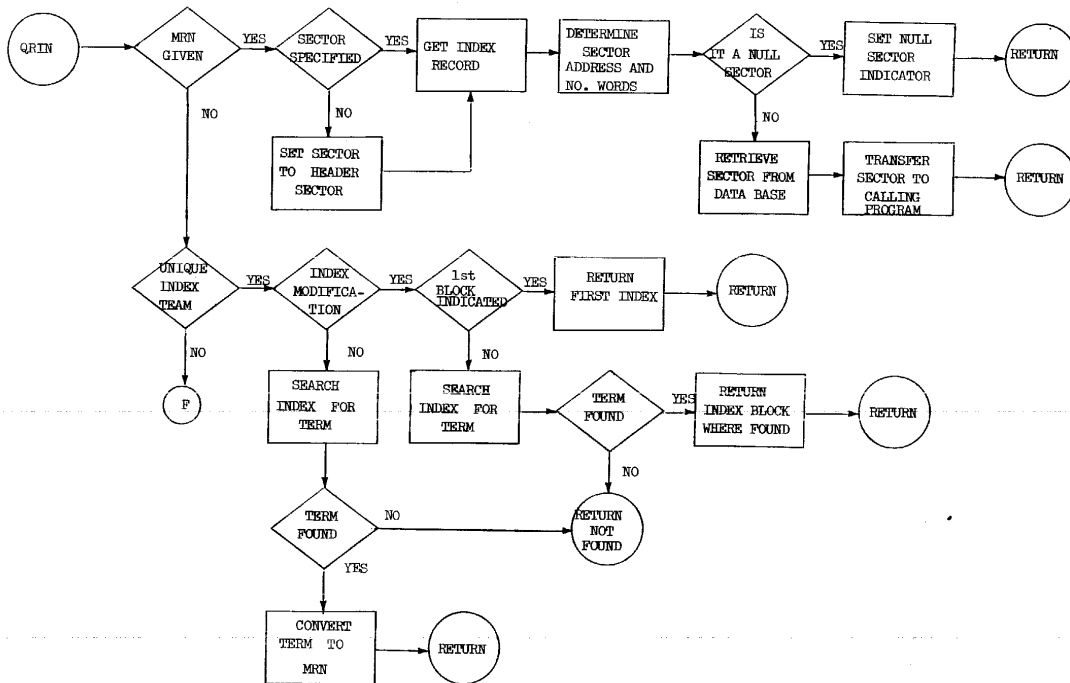
SECRET

13

SECRET

FIGURE 5 FILE CONTROL PROGRAM FLOW CHART

SS-12



SECRET

14

SECRET

FIGURE 5 FILE CONTROL PROGRAM FLOW CHART

SCR 352

SS-12

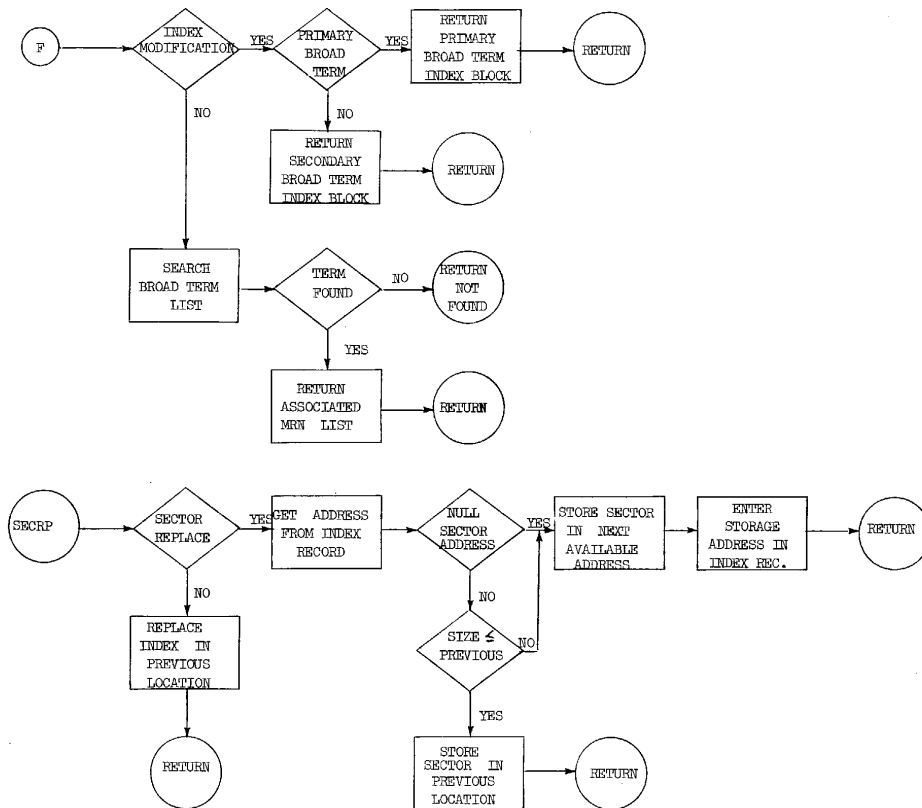


FIGURE 5 FILE CONTROL PROGRAM FLOW CHART

Sheet 4 of 4

SECRET

SECRET

SCR 352

SECRET

SCR 352

INTEGRATED INFORMATION SYSTEM (IIS)

AUTOMATIC UPDATE PROGRAM SPECIFICATION

SS-3

8 February 1968

SECRET

SECRET

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1. SCOPE	1
2. APPLICABLE DOCUMENTS	1
3. REQUIREMENTS	1
4. AUD PROGRAM FLOW DIAGRAM	5

LIST OF TABLES

<u>Table</u>	<u>Page</u>
I Working File Mnemonics	3

LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1 AUD PROGRAM FLOW CHART	6

SS-3

SECRET

AUTOMATIC UPDATE PROGRAM SPECIFICATION (AUD)

1. SCOPE

This specification describes the programming necessary for Automatic Update of the National Data Base. Functionally the sole source of input is through the Queue List/Working File. The AUD program is the only program in the IIS authorized to make substantive change to the NDB files and indexes. The AUD program shall work in conjunction with the File Control Program (FCL) which handles the storage and retrieval of the NDB information and indexes.

2. APPLICABLE DOCUMENTS

File Control Program Specification	(SS-12)
National Data Base File Specification	(FS-2)
Status List/Queue List/Working File Specification	(FS-1)
IIS Index and Index Record Specification	(FS-3)

3. REQUIREMENTS

3.1 Functional Requirements

The AUD program shall have sole responsibility for modifying the National Data Base indexes and information. It shall use the Working File (WF) as its sole source of input. Upon activation by IIS RT3, the AUD program shall be provided with the machine reference number (MRN) of the working file entry that has been approved for inclusion in the NDB. Functionally the AUD program shall request working file entries; identify source and contents of an entry; update the NDB indexes based on WF contents; request NDB sector replacements based on WF contents; decode cables for target information; and modify NDB sectors when required.

3.1.1 Input From Working File

The AUD program shall obtain the MRN from the calling location plus one. The MRN shall be coded as five six-bit field data characters. Using the MRN, the AUD program shall request the working file entry using the following calling sequence.

Word 1	Link to QLWF
Word 2	Function Code 2
Word 3	MRN
Word 4	Buffer transfer address (specified by AUD)
Word 5	000000010 ₈ (Approved records only)

SS-3

SECRET

Each WF entry may contain up to 15 sections and is formatted as specified in the SL/QL/WF specification. The AUD program shall use only one WF section at a time. Each section carries identifiers as to section content which provide AUD the information necessary for further action. The legal WF sector identifiers formats, and required AUD action shall be as shown in Table I. When AUD has completed action on a WF entry, the FCL shall be notified via FC 10 to initiate transfer of information from the Queue List to the Status List or FC 4 if the WF entry was generated online (VEA, PIRL).

3.1.2 Index Maintenance

All NDB indexes shall be maintained by information contained in the header sectors for each NDB file. When a header section of a WF entry is recognized, the AUD program shall determine its source from the source and status information of Word 6 of the QLWF calling sequence. If the source was a "New Target Form" or "Object Form" the MRN for the new target or object shall be added to each index specified by the index elements of the header.

If the header is not derived from a New Target Form, the header for the target shall be requested from the NDB via the QRIN in the File Control program. Each element of the header shall be compared to the new entry to detect new additions or changes. For addition, AUD shall request the "index first block" via FCL and add the index term and/or MRN in its proper position and return the index block to FCL. If the addition results in a full index block, the "maintenance required" indicator in the calling sequence shall be set. For changes, the index blocks containing the term shall be obtained and deleted and the change entered as though it were a new addition using the "first block" scheme.

3.1.3 Sector Replacement

The AUD program shall examine the QL source bits for every WF entry received to determine how the entry was placed in the WF. The two major divisions are online (VEA, PIRL) and data entry (DEN).

3.1.3.1 Online Entries. - Each NDB sector in a WF entry (usually one NDB sector is equivalent to a WF section) shall be returned to the data base with no modifications. It is the responsibility of the program or individual to preserve or construct any prescribed internal NDB sector format. The AUD program shall utilize the FCL program to transfer the sector to the NDB. (See File Control Program Specification for calling sequences)

SS-3

SECRET

3.1.3.2 Worksheet Entries. - Information that has entered the IIS through the data entry program (DEN) may require a variety of actions depending on the particular worksheet used for entry and the individual sections of the worksheet. Table I identifies the various entries and the action required in AUD before the sectors are placed in the NDB. It should be noted that under some conditions, a section of the WF is not intended for data base update. The second word of each WF section shall contain a right adjusted character "U" if the information is to be integrated into the data base.

3.1.4 Cable Decode

The one exception to the working file structure is the presence of cables in the WF. For a cable, there is only one section in the WF but the section shall be decoded to extract information relative to more than one target. The format of the PI cable worksheet may be obtained from the customer. Information concerning one target shall be extracted from the cable and added to the complete history sector for that target. The AUD program shall first extract the target name and request the FCL program to search the NAME index to obtain the target MRN. The AUD program shall then request the complete history sector, add the new cable information to the sector and request the FCL program to return the sector to the NDB. The process shall be repeated until all targets have been extracted from the cable.

Table I

Working File Mnemonics

<u>Working File Mnemonic</u>	<u>Action</u>
WPHOT	Add Photo References to IPHOT sector.
WCHAN	Combine WPHOT and WCHAN and add to end of ICHAN sector. [Add to end of ICONC [Do after WUCHA
WNOTE	Add text to end of INOTE sector. [Do after WUNOT
WMOBI	Add formatted text to end of IMOBI. [Add WPHOT to OPHOT sector.
WCABL	See section 3.1.4
WUCOL	Replace sector ICOLL
WUBRI	Replace sector IBRIE
WUFIX	Replace sector IFIXE
WUCHA	Replace sector ICHAN
WUNOT	Replace sector INOTE
SS-3	

SECRET

SECRET

All NDB sector mnemonics as given in the NDB specification are valid and indicate a sector replacement with no AUD modification providing the WF section has a "U" in the special indicator word following the section mnemonics.

If the Source indicator 00200 is set (validate description) on a WF entry, the WPHOT shall replace the formatted photo references at the beginning of IBRIE.

3.2 Interface

3.2.1 Program Inputs

The AUD program shall be activated by a call from IIS RI/3 program indicating that a working file entry is ready for NDB integration. All input interfaces are specified in the applicable documents listed in Section 2. of this specification.

3.2.2 Program Outputs

All AUD program outputs are specified in the applicable documents listed in section 2.

3.2.3 File

All AUD program file access shall be via the File Control Program. The specific accessed files are specified in the applicable documents listed in section 2.

3.2.4 Secondary Storage

The method of transferring data to and from secondary storage shall be as described in "IIS RT/3 Specification" (SS-9).

3.2.5 Other Communication with the Real Time/3 Program

The AUD program shall be subject to the control procedures described in "IIS RT/3 Specification" (SS-9).

3.3 Diagnostics

Not Applicable.

SS-3

SECRET

SECRET

3.4 Storage Allocation

3.4.1 Working Storage Allocation

3.4.1.1 Drum Storage Allocation. - The AUD program is provided only drum secondary storage on the FH880, FH432, or FH 1782 through an RT/3 request (See RT/3 specification for calling sequence). The maximum drum working storage allocated to the AUD shall be 3,000 drum words.

3.4.1.2 Core Storage Allocation. - Maximum core working storage is allocated 2,000 computer words.

3.5 General Design Features

3.5.1 Programming Language

The AUD program shall be coded in the SPRYE assembly language.

3.5.2 Flexibility

Not Applicable.

3.5.2 Recovery Procedure

Not Applicable.

3.6 Required Techniques

Not Applicable.

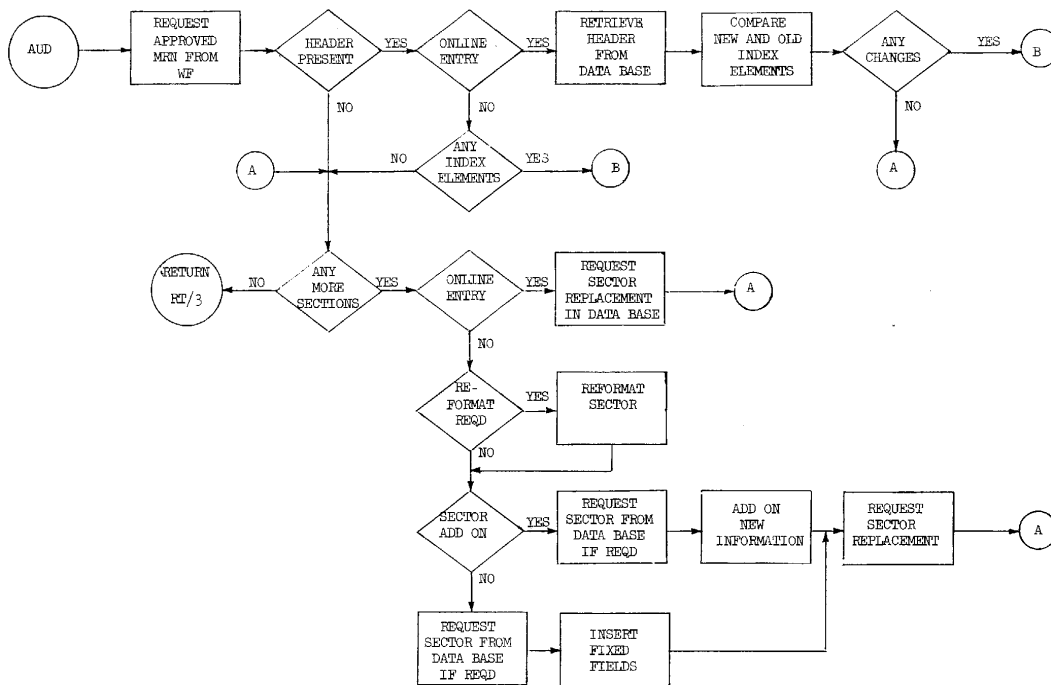
4. AUD PROGRAM FLOW DIAGRAM

Figure 1 represents the program flow logic of the functions described in section 3.1.

SS-3

SECRET

SS-3



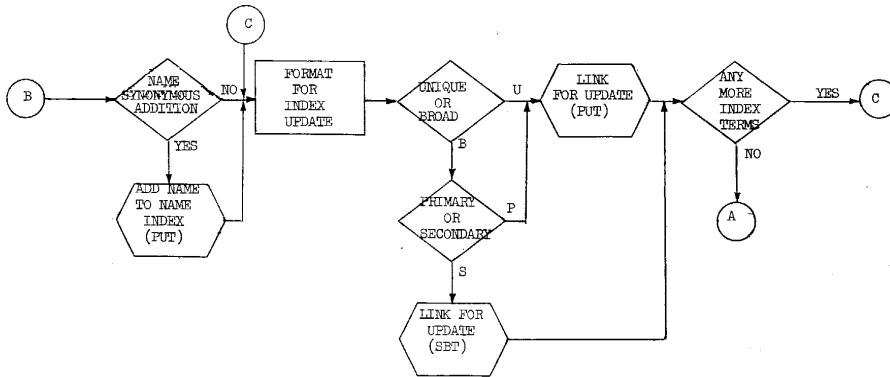
SECRET

6

SECRET

Figure 1 AUD PROGRAM FLOW CHART

SS-3



7

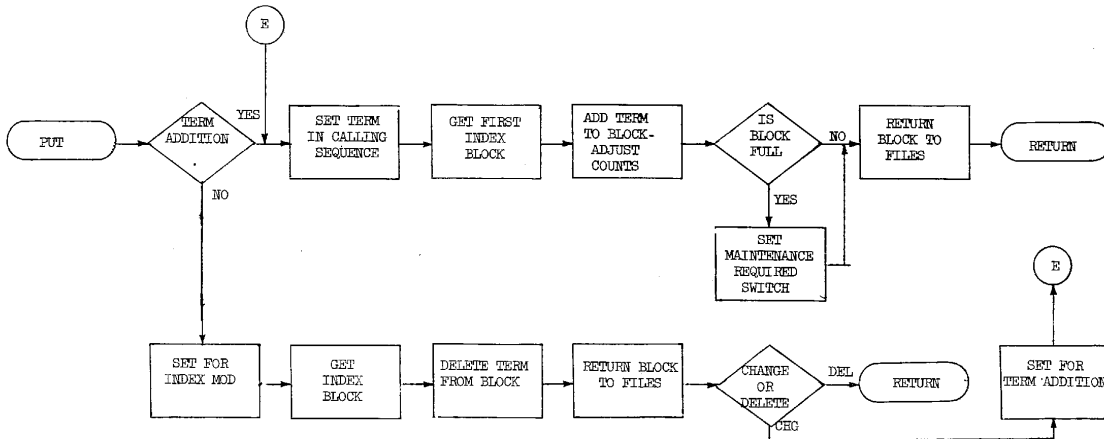


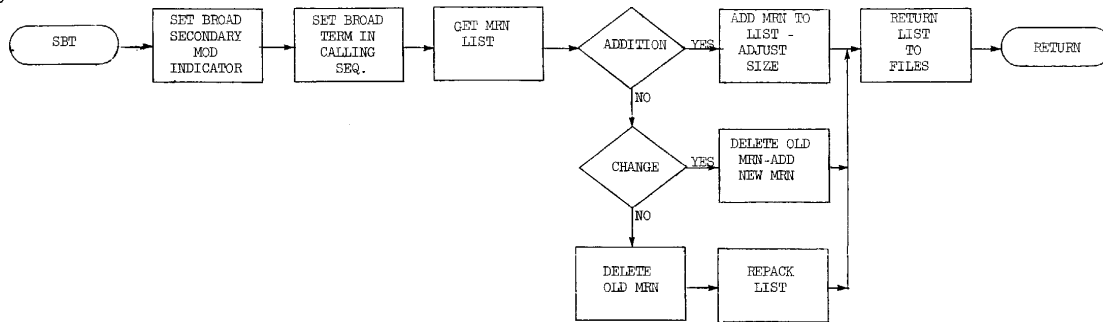
Figure 1 AUD PROGRAM FLOW CHART

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SCR 352

SS-3



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Figure 1 AUD PROGRAM FLOW CHART

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