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Description of CRIB, the GIPSY Retrieval Mechanism,
and the Interface to the General Electric
MARK III Service

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By James A. Calkins, Eleanor K. Keefer, Regina A. Ofsharick,
George T. Mason, Patricia Tracy, and Mary Atkins

CRIB, the Mineral Resources Data Bank
of the U.S. Geological Survey—
Guide for Public Users, 1977

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CONTENTS

	Page		Page
Abstract	A1	Search techniques	A9
Introduction	1	Word mode	9
CRIB—Computerized Resources Information		Number mode	10
Bank	2	Label-only mode	10
Scope and content	2	General Electric MARK III Service	11
Sources of information	3	GIPSY-MARK III interface (the foreground	
Quality and consistency of information	3	driver)	11
GIPSY—General Information Processing		Using the GIPSY-MARK III interface	11
System	3	Using the CRIB file	16
QUESTRAN—The retrieval mechanism	4	Common search patterns and search fields	16
Commands and parameters	5	Examples	17
Search structure	8	Glossary	18
Variable description statement	8	References cited	19
Logic statement	9		

ILLUSTRATIONS

		Page
FIGURE 1.	Standard reporting (input) form for the CRIB mineral resources computer file	A23
2.	Dummy record showing the standard output format of the CRIB mineral resources file	29
3.	Standard output record from the CRIB mineral resources file	34
4.	Inventory of the CRIB file by country and by States of the United States	36
5.	Inventory of the CRIB file by the number of occurrences of individual mineral commodities	37
6.	Example illustrating the procedure for accessing the CRIB file via the General Electric MARK III Service	38
7-9.	Conditions statements and the printed output resulting from:	
7.	An area search	42
8.	A numeric search	44
9.	A frequency count	48

TABLE

		Page
TABLE 1.	General inventory of records in the CRIB file as of November 1, 1976	A4

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OF THE U.S. GEOLOGICAL SURVEY—
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**DESCRIPTION OF CRIB, THE GIPSY RETRIEVAL MECHANISM, AND
THE INTERFACE TO THE GENERAL ELECTRIC MARK III SERVICE**

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ABSTRACT

The U.S. Geological Survey's Computerized Resources Information Bank (CRIB) is being made available for public use through the computer facilities of the University of Oklahoma and the General Electric Company, U.S.A. The use of General Electric's worldwide information-services network provides access to the CRIB file to a worldwide clientele. This manual, which consists of two chapters, is intended as a guide to users who wish to interrogate the file. Chapter A contains a description of the CRIB file, information on the use of the GIPSY retrieval system, and a description of the General Electric MARK III Service. Chapter B contains a description of the individual data items in the CRIB record as well as code lists.

CRIB consists of a set of variable-length records on the metallic and nonmetallic mineral resources of the United States and other countries. At present, 31,645 records in the master file are being made available. The record contains information on mineral deposits and mineral commodities. Some topics covered are: deposit name, location, commodity information, description of deposit, geology, production, reserves, potential resources, and references.

The data are processed by the GIPSY program, which maintains the data file and builds, updates, searches, and prints the records using simple yet versatile command statements. Searching and selecting records is accomplished by specifying the presence, absence, or content of any element of information in the record; these specifications can be logically linked to prepare sophisticated search strategies. Output is available in the form of the complete record, a listing of selected parts of the record, or fixed-field tabulations.

The General Electric MARK III Service is a computerized information services network operating internationally by land lines, satellites, and undersea cables. The service is available by local telephone to 500 cities in North America, Western Europe, Australia, Southeast Asia, Japan, and Saudi Arabia. An

interface called the "foreground driver" is used to link the GIPSY program to the General Electric system.

INTRODUCTION

The U.S. Geological Survey's (USGS) Computerized Resources Information Bank (CRIB) is being made available for public use through the computer facilities of the University of Oklahoma and the General Electric Company MARK III¹ Service. The objective in making this file available is to provide a central source of computerized mineral resources information to all interested parties. The use of General Electric's worldwide information services network provides access to the CRIB file to a worldwide clientele. Although the information is nonconfidential, it has not heretofore been readily available from a single source. Release of the CRIB file to the public allows professionals in the mineral industry, universities, and State, Provincial, and Federal government agencies better access to a wide range of data on mineral resources.

The purpose of this manual is to provide the documentation necessary for effective use of this information system. The manual consists of two parts. Chapter A describes the nature and content of the CRIB file and provides instructions on the use of the GIPSY retrieval mechanism and the General Electric MARK III Service. Chapter B contains a description of the individual data items in the record as well as code lists. Emphasis is placed upon file con-

¹ MARK III is a registered service mark of the General Electric Company, U.S.A.

tent and methods for utilizing the file, rather than upon details of computer programming. The file can be used effectively in a very short time without prior knowledge of computer technology.

Although the user needs to know the characteristics of the file in order to use it, he needs even more to know the field of mineral resources. Familiarity with the file and with retrieval methods and terminology can be acquired quickly by working with the system. A list of selected terms in common use in the computer field is contained in the glossary at the end of this report.

Information on the CRIB file, the program system (GIPSY) used to process the data, and the General Electric information system is available from the following sources:

1. U.S. Geological Survey, Office of Public Inquiries, National Center, Reston, VA 22092. (see Calkins and others, 1973; Zartman and others, 1976)
2. University of Oklahoma, Information Systems Programs, 1808 Newton Drive, Norman, OK 73069. Requests relating to the use of the file should be addressed to the Director, Information Systems Programs. (see Oklahoma Univ., Office Inf. Systems Programs, 1975; Oklahoma Univ. Inf. Systems Programs, 1976)
3. General Electric Company, U.S.A., Information Services Business Division, Rockville, MD 20850. (see General Electric Company, 1976a, b)
4. General sources. (see Clark and others, 1976; Sweeney and others, 1969)

CRIB—COMPUTERIZED RESOURCES INFORMATION BANK

SCOPE AND CONTENT

CRIB consists of a set of variable-length records on the metallic and nonmetallic mineral resources of the United States and other countries. As of November 1, 1976, the CRIB file contained approximately 51,000 records. At present, 31,645 records in the master file are being made available. The remaining 19,355 records are in several "holding" areas; these records are being moved into the master file, batch by batch, as editing and updating is completed. New records are continually being

added to the file at the rate of 200–600 each month.

No organized program exists for obtaining uniform geographic coverage or for obtaining uniform coverage of all mineral commodities. These factors are in great measure beyond our control, because contributions to the file are largely voluntary. Consequently, geographic coverage is still spotty, and data are lacking for some mineral commodities. These deficiencies are gradually correcting themselves automatically as more records are added to the file.

The file is oriented towards mineral deposits and mineral commodities, but there is a great deal of flexibility as to what constitutes a specific record. A given record may refer to a mineral deposit (mine, prospect, occurrence), a group of related deposits (mining district, mining group, mining area), a single mineral commodity, or a group of related commodities.

Most records refer to a specific location (mine, mining district) and to the mineral commodities associated with that location. Some records are summary records in which information on a given country, State, or Province, or on a given mineral commodity is summarized in some way. For example, zinc production is summarized country by country. A few records refer to some specialized aspect of a mineral commodity, such as, "Bauxite—Origin."

Information in the record consists of descriptive text, numeric data, codes, and certain keywords. Some topics accommodated are: deposit name, location, commodity information, description of deposit, geology, production, reserves, potential resources, and references. Approximately 400 data items are available, although all 400 data items are never utilized in any one record. Approximately 40 percent of the data items are organized into fixed-length fields or contain controlled information such as keywords. The remaining 60 percent contain free-text entries.

In figure 1, a sample reporting form—also called "input form" or "source document"—shows the main topics accommodated and most of the individual data items called for within each main topic. The reporting form serves as a means for organizing the raw data in a logical manner suitable for computer processing. All data items (fields) in the CRIB record have an associated label. Thus, the field name DEPOSIT NAME has the label A10 and the data

item COUNTRY has the label A40. The label is a data-field identifier and serves to identify the given data item to the computer.

The dummy output record (fig. 2) shows the fields as they are arranged in the standard output record, which has a predefined arrangement. For illustrative purposes, the labels associated with each field are also shown. The labels are not printed on the normal output record. An example of an actual output record from the CRIB file is shown in figure 3.

SOURCES OF INFORMATION

Information for the CRIB file comes from CRIB reporting forms (source documents, see fig. 1), which are filled out by geologists or technicians. The information on these forms is keyboarded onto magnetic tape for entry into the records file. The information is contributed on a voluntary or quasi-voluntary basis. Major and continuing sources of information are:

1. U.S. Geological Survey.—various internal files, including information on certain commodities contributed by a few mineral-resource specialists and by geologists working in specific areas.
2. Outside cooperative and data-exchange arrangements between the USGS and the following organizations: The Tennessee Valley Authority, the U.S. Forest Service, the U.S. Department of State, and the States of Idaho, Montana, South Dakota, and Minnesota.

In addition, a program of data exchange between the USGS and the U.S. Bureau of Mines (USBM) was initiated recently, and cooperative programs are underway or are being discussed with the U.S. Bureau of Land Management, the State of Utah, and with Canada, Peru, Bolivia, Colombia, Mexico, Brazil, and other countries.

Other sources of data for the CRIB file are the few previously devised specialized computerized mineral-resources files. Two such files, both from the USGS, are: a tape file containing metallogenic map data of North America and a tape file containing mineral data on Southeast Asia. As part of the USGS-USBM data-exchange program, mineral-location data from the USBM Mineral Industry Location System (MILS) file will be integrated into the CRIB file soon.

QUALITY AND CONSISTENCY OF INFORMATION

The records vary greatly in the amount, quality, and consistency of the contained information because of similar variations in the original data, the absence of a centralized data-reduction facility, and the voluntary nature of the contributions. Because of their different interests and specialities, contributors (called reporters) to the file differ in their emphases, preferences, and approaches to the subject. Therefore, the resulting records reflect these differences.

In addition, the subject of geology and mineral resources is broad in scope, the nomenclature varied and ambiguous, and the general subject matter loosely organized and awkward to deal with from the standpoint of a computer operation. However, the very complexity of the subject is a prime reason for computerizing it: we need to reduce the subject to manageable and addressable components so that data on geology and mineral resources can be better utilized by interested parties.

In order to accomplish the rapid file buildup of the past 2 years, using minimum staff, we have intentionally bypassed many details relating to editing. A systematic computer-assisted edit of the file is now being undertaken. Because the CRIB file is now approaching "critical size"—a condition in which at least some information is available in most areas of interest and a great deal of information is available for some topics—we feel that the file, even though not necessarily complete and not editorially perfect at present, nevertheless can be highly useful to a wide spectrum of users. Therefore, we consider it appropriate to make the file available for use now. A general inventory of records in the CRIB file as of November 1, 1976, is given in table 1. Figure 4 shows an inventory of the CRIB file by country and by States of the United States; figure 5 shows an inventory of the CRIB file by the number of occurrences of individual mineral commodities.

GIPSY—GENERAL INFORMATION PROCESSING SYSTEM

The General Information Processing System (GIPSY) is the program used to process the CRIB file. GIPSY is a file-management system which performs all the computer-processing requirements needed to build, operate, and main-

TABLE 1.—General inventory of records in the CRIB file as of November 1, 1976

[Except where indicated otherwise, records were contributed by specialists of the USGS. (D), detailed record; (S), short record.]

Number of records	Record content	Area covered
145 -----(D)	Mines and developed prospects	Mostly Montana and Idaho.
71 -----(D)	Large and medium mines	South America.
1,526 -----(S)	Metallogenic map data	North America.
1,736 -----(D)	Mines and occurrences	Mostly Tennessee and North Carolina. ¹
404 -----(S)	Large and medium mines	Southeast Asia.
118 -----(D)	Mines and occurrences	Idaho. ²
782 -----(S)	Summaries of zinc production	Country by country, worldwide; State by State, U.S.A.
84 -----(D)	Large and medium zinc districts	U.S.A. and other countries.
374 -----(S)	Titanium mines and occurrences	U.S.A.
286 -----(D)	Nickel-cobalt mines and occurrences	U.S.A. and other countries.
113 -----(D)	Fluorite mines and occurrences	U.S.A. and other countries.
325 -----(D)	Aluminum resources, bauxite mines, and districts.	U.S.A. and other countries.
78 -----(S)	Kyanite and sillimanite mines and occurrences.	U.S.A.
165 -----(D)	Copper mines	U.S.A. and South America.
741 -----(D)	Mines and occurrences	New York and Connecticut parts of the Albany and Hartford 2° quadrangles.
453 -----(D)	Mines and occurrences	Washington 2° quadrangle; Washington, D.C., and surrounding area.
2,969 -----(S)	Mines and occurrences (emphasis on bibliographic references).	Alaska.
300 -----(D)	Vanadium deposits	U.S.A. and other countries.
19,384 -----(S)	Most records describe mineral prospects and occurrences and are less than one printout page long; some records describe mines and are fairly complete.	U.S.A. Public Lands, mostly in the Western States (location is by township-range-section, except for Montana where location is by geodetic coordinates).

¹ Records contributed by the Tennessee Valley Authority.

² Records contributed by the Idaho Bureau of Mines and Geology and by other sources.

tain a storage and retrieval file. It operates on high-speed disk storage devices and was specifically designed to process variable-length records. Data in the record may be numbers, codes, or text. Highly selective searches can be made on the stored data. By means of the ITERATE feature, the user can conduct a search in step-by-step fashion to whatever level of refinement is desired. He also may go BACK to any previous step at any time during the retrieval. Retrieved records can be printed in different arrangements or passed to other programs for additional processing.

GIPSY functions as four separate but inter-related files: (1) the dictionary file, (2) the records file, (3) the selected records file (SRF), and (4) an optional index file.

The dictionary file consists of a list of labels and other information that identifies the data items (fields) contained in the records file; it also controls the format of the printed record.

The records file contains the records themselves, which are stored in random order on a disk. A single record may contain a maximum of 32,000 characters.

The selected records file (SRF) is preallocated disk storage space used to store the track addresses of those records selected as a result of a retrieval. Usually, the SRF is a transient file occupied only during a given retrieval and then freed.

The index file is an auxiliary indexed sequential search file of the parent records file. It consists of a directory of those key data items associated with a given label in the parent records file. Those labels indexed in the CRIB file are: A40 (country code), A50 (State code), and C10 (commodities present). In general, when an inquiry involves any of the above labels, faster response time results if the initial search is made on the index file rather than on the parent file.

QUESTRAN—THE RETRIEVAL MECHANISM

The search and retrieval module, called QUESTRAN (QUESTION TRANSLATER), provides the mechanism for retrieval, various kinds of intermediate processing, and printing. It is the vehicle by which the user communicates directly with the computer without the

need for an intermediate programmer. By means of a variety of QUESTRAN commands and qualifying parameters, the user translates his question into a set of commands and operations which are then understandable to the computer.

COMMANDS AND PARAMETERS

Thirteen QUESTRAN commands initiate a variety of tasks connected with the retrieval process. These commands are:

<i>Initial</i>	<i>Retrieval</i>	<i>Process</i>	<i>Output</i>	<i>Ancillary</i>
FORM	ITERATE SELECT BACK	SORT SUM TOTAL COUNT	PRINT LIST COPY	INDEX END

When the user types a given command, he is telling the system to perform a certain task. Most commands need additional specific information called parameters in order to perform the task. The parameters describe to the system the operational details of the inquiry. The function and use of the individual QUESTRAN commands and the necessary qualifying parameters associated with each are summarized in the following pages. An example follows each command to show the appropriate parts of the input stream as seen by the user at the terminal. In these examples, the user response is in boldface type; computer response is in italic type. After each user response, the user hits the return key to send his response and transfer control to the computer. Complete information on the QUESTRAN commands and parameters is contained in the GIPSY user's guide (Oklahoma Univ., Office Inf. Systems Programs, 1975).

The FORM command

The FORM command directs the system to a specific data file; the parameter is the name of the data file, in this guide, CRIB. The FORM command must be issued at the beginning of each session.

Enter Form Name?CRIB

The SELECT command

The SELECT command is used to initiate the retrieval mechanism of QUESTRAN; the system assumes that an inquiry is to be posed against the file identified under the FORM command. Three parameters are required: (1) the search type, (2) the variable description statement(s), and (3) the logic statement.

The search type parameter (FULL or TERM) directs the system to a serial search of the main records file (FULL) or to an indexed sequential search of the index file (TERM).

The variable description statement(s) and the logic statement describe the conditions of the search and control the search strategy. Because these two parameters provide the user with such a wide assortment of techniques for formulating a search, they are discussed separately in the next section, "Search Structure."

Enter Form Name?CRIB
Batch Command?SELECT
Full or Term Search (F/T)?F
Condition
 A. ?A50<30>
 B. ?MAJOR<CU>
 C. ?(user hits return key)
Enter Logic
Logic?A AND B
Logic?(user hits return key)

The BACK command

The BACK command returns the system to any previous subset of records retrieved during the current session. The parameter to the command is the desired subset number, which is 1 for the records retrieved as a result of the first search (see following example), 2 for the results of the second search, and so on. The BACK command is followed by a processing command (such as, SUM, LIST) or by the ITERATE command if a search is to be made on that subset.

Batch Command?SELECT
Full or Term Search (F/T)?F
Condition
 A. ?C10<CU>
 B. ?(user hits return key)
Enter Logic
Logic?A (First search produces subset 1)
Logic?(user hits return key)
Batch Command?ITERATE
Condition
 A. ?C10<NI>
 B. ?(user hits return key)
Enter Logic
Logic?A (Second search produces subset 2)
Logic?(user hits return key)
Batch Command?PRINT
Batch Command?BACK
Subset Number?1
Batch Command?ITERATE
Condition
 A. ?M15<LARGE>
 B. ?(user hits return key)
Enter Logic

*Logic?*A (Third search produces subset 3)
Logic?(user hits return key)
*Batch Command?*PRINT

The INDEX command

The INDEX command is automatically initiated by the system whenever a TERM (index) search is asked for; therefore, it is not a user-activated command. The INDEX command converts the set of record addresses associated with the index file and contained in the SRF to the set of record addresses of the corresponding parent records file.

The PRINT command

The PRINT command directs the system to print the selected records in the standard output record, a predefined format stored in the dictionary. In response to the PRINT command, the entire record is printed. The PRINT command needs no parameters.

*Batch Command?*SELECT
*Full or Term Search (F/T)?*F
Condition

- A. ?C10<CU>
- B. ?M15<LARGE>
- C. ?(user hits return key)

Enter Logic

Logic? A AND B

Logic?(user hits return key)

*Batch Command?*PRINT

*Batch Command?*END

The LIST command

The LIST command is used to print designated parts of those records selected instead of the entire record. The parameters to the LIST command are the labels of the items to be printed plus a slash (/) to terminate the list. The items are printed one below the other in single spacing (see fig. 7). If an item overlaps a print line, the printing is continued on the next line, indented two spaces.

*Batch Command?*SELECT
*Full or Term Search (F/T)?*F
Condition

- A. ?A40 < SF >
- B. ?C10 < COA >
- C. ?(user hits return key)

Enter Logic

Logic? A AND B

Logic?(user hits return key)

*Batch Command?*LIST

Enter Labels

- ?B10
- ?A10
- ?C10
- ?BTU

?/

*Batch Command?*END

The COPY command

The COPY command is used to produce fixed-length output (fixed-field, fixed-length records) from the variable-length GIPSY record. The output may be directed to the user terminal, to another terminal, or to a workfile, which may be a tape, disk, printer, or card punch. The COPY function provides the connection between GIPSY and fixed-field processing systems, and makes it possible to exit from GIPSY in fixed-field format and carry out additional processing using fixed-field programs. The maximum length for the fixed-length COPY records is 2,000 characters; a maximum of 99 parameters is allowed each time the COPY command is invoked. The parameters to the COPY command specify the information to be copied from the selected records and any literals to be inserted into the output record. A literal is defined as a string of characters bounded by single quotes.

*Batch Command?*SELECT
*Full or Term Search (F/T)?*F
Condition

- A. ?A50 < SF >
- B. ?(user hits return key)

Enter Logic

Logic? A

Logic?(user hits return key)

*Batch Command?*COPY

Enter Copy Parameters

Parameters?' '

*Parameters?*B10 8

*Parameters?*A10 35

*Parameters?*C10 20

Parameters?' '

*Parameters?*A21 'ACTIVE' '

*Parameters?*A22 'INACTIVE' '

*Parameters?*NEW RECORD

Parameters?' '

Parameters?'BTU:'

*Parameters?*BTU 6.0

Parameters?'ASH (%):'

*Parameters?*ASH 4.1

Parameters?' '

Parameters?'FIXED CARBON (%):'

*Parameters?*CARB 4.1

Parameters?/

*Batch Command?*END

The copy parameters are any of the following:

1. Label and number of alphanumeric characters to be copied; for example, A10 35 will copy the first 35 characters of the

- deposit name. If no name is present, blanks are inserted.
2. Label and number of numeric characters (digits) to be copied and the position from the right of the assumed decimal point; for example, ASH 4.1 will copy the first four characters (four digits or three digits and punched decimal point) from the field labeled ASH (ash content). A decimal point is assumed to be one place from the right. If no number is in the field, the output record is filled in by blanks. The largest number accommodated is 16 digits without a punched decimal or 15 digits and a punched decimal.
 3. Label followed by two mutually exclusive literals; for example, M120 'SURFACE' will print SURFACE (the first literal) if the label M120 is present in the record. If the label M120 is not present, the output will be seven blanks (the second literal). Both literals should be the same length. The maximum size for either literal is 10 characters. Literals must be enclosed in single quotes.
 4. Any literal; for example, 'ASH (%)' will print ASH (%). A literal may be inserted at any place in the COPY record. The output will be the characters between the single quotes. As many as 57 characters may appear between the quotes.
 5. NEW RECORD, which causes the preceding parameters to be output as a separate record. Parameters following the NEW RECORD parameter begin a new record. This parameter provides for the building of multiple output records from a single input record. For printed output, the NEW RECORD parameter means NEW LINE; that is, the next set of fields to be copied will be printed on the next line. All output records must be the same length.

The SORT (SORTD) command

The SORT (SORTD) command is used to sort the selected records in the desired sequence, in either ascending order (SORT) or descending order (SORTD). The records can be sorted by one or more fields, which are specified in the parameters. The parameters to the SORT command are the label(s) of the fields to be sorted, the number of characters of each

to be sorted, and a slash (/) to end the list. The parameters are entered in order of sorting priority, the primary field being entered first, followed by the secondary field, and so on. As many as 25 fields may be used as sort criteria providing the total of characters in the fields is less than 100. Each parameter listed is specified for either an alphanumeric (character) sort or a numeric sort as follows:

- A10 10 A character sort. The entries under label A10 (deposit name) are sorted to the first 10 characters.
- ASH 4.1 A numeric sort. The entries under label ASH are sorted to four digits having an assumed decimal point one digit from the right. The maximum number of digits allowed for numeric sorting is eight.

```
Batch Command?SORT
Enter Parameters
Parameters?A10 10
Parameters?ASH 4.1
Parameters?/
```

The COUNT command

The COUNT command is used to list different data strings in a set of selected records and to provide counts of the number of times each of the different data strings occur. The parameters to the COUNT command are the labels of the fields, the desired length of the data string, and a slash (/) to end the parameter list. The maximum length allowed for the data string is 70 characters. The maximum number of parameters allowed is 25. The parameters are specified in the same manner as the COPY and SORT commands, namely:

- A60 10 A character-string count.
- ASH 4.1 A numeric count.

For example, A60 10 will list the first 10 characters of the different data strings that are found in the field A60 in all records of the retrieved subset. Another example of a COUNT is shown in figure 9.

```
Batch Command?COUNT
Enter Parameters
Parameters?A60 10
Parameters?/
```

The SUM command (within-field summation)

The SUM command produces the summation and other statistical values of a specified nu-

meric field across the selected records. As many as nine separate fields can be individually summed in one pass under the SUM command. The parameters are the labels of the fields to be summed plus the slash (/) to end the parameter list. SUM will add together all numerical occurrences of a specified field and produce (1) the number of occurrences of the field in the selected records (Blank fields are not included in the count, nor are nonnumeric occurrences.), (2) the arithmetic mean, (3) the algebraic mean, (4) the maximum value, and (5) the minimum value.

In the following example, the SUM command would provide a sum of all the numeric occurrences under label D1A (annual production, line 1) and, in a separate operation, would also provide a sum of all the numeric occurrences under label D2A (annual production, line 2).

```
Batch Command?SUM
Enter Labels
Labels?D1A
Labels?D2A
Labels?/
```

The TOTAL command (within- and across-field summation)

The TOTAL command will provide the same "within-field" information as the SUM command, but in addition will also provide a total across those fields specified. The parameters to the command are the labels of the fields to be totaled and a slash (/) to terminate the parameter list. A maximum of 20 fields can be totaled in one pass under the TOTAL command. In the following example, the TOTAL command would produce a sum of field D1A and a sum of field D2A and also would provide a total of the two fields.

```
Batch Command?TOTAL
Enter Labels
Labels?D1A
Labels?D2A
Labels?/
```

The END command

The END command is used to end the current GIPSY retrieval operation although the user is still in communication with the GE General Electric system. The END command needs no parameters. After the END command, the GE system will print a listing of the retrieval statements for review by the user. The user may make changes and corrections at this time.

After the user makes any needed changes, he then is prompted to submit the job for processing.

Batch Command?END

SEARCH STRUCTURE

Following the SELECT or ITERATE commands, the user formulates the details of the search by means of one or more variable description statements and a logic statement.

THE VARIABLE DESCRIPTION STATEMENT

The variable description statements translate an inquiry into a set of logical operations that can be performed by the computer. For example, if the question, "What presently active mines in Peru produce lead, zinc, and silver?" were asked by the user, he could disassemble the question into its key parts as shown below on the left and convert them into a set of variable description statements as shown on the right:

A. Country is Peru	-----A.	A40<PE>
B. Presently active mines	---B.	A21
C. Produces lead	-----C.	D1<PB>
D. Produces zinc	-----D.	D1<ZN>
E. Produces silver	-----E.	D1<AG>

The variable description statements convey the key parts of the question to the system. A maximum of 26 variable description statements is allowed in each search.

The variable description statement is composed of three, or, in some instances, two segments, as shown below:

Variable designator	Label	Condition description
A	A40	
B	A21	<PE>

Variable designator

The variable designator is a unique letter used to distinguish one variable description from another in a single question. As many as 26 letters may be used in a given question.

Label

The label is the identifier for a single data item within the record and is equivalent to a field name. Usually, the label signifies the presence of an entry of some kind within the file, such as a textual entry, a code, or a number. In the above example, the entry associated with the label A40 (country code) is PE, the country code for Peru. Some labels have no associ-

ated entry; the label itself stands for the data, as the label A21 stands for "mine is active" in the above example.

Condition description

The condition description specifies the search conditions that will be imposed on the data entry (variable) identified by the associated label. The data may consist of text, numeric data, a code, or keywords and may occupy fixed-length or variable-length fields. In the above example, the data entry PE is the country code for Peru. The conditions imposed upon the data entry can be specified in three modes: word mode, number mode, and label-only mode. These are discussed in the section entitled, "Search Techniques."

THE LOGIC STATEMENT

The logic statement is the final parameter entered in the SELECT (or ITERATE) command. The logic statement defines the logical associations to be imposed between the specified variables. The operators used are AND, OR, and NOT. The following single character equivalents may also be used to designate the three operators: *=AND, +=OR, and ¬=NOT. Parentheses may be used to avoid ambiguous interpretations of the logic statement. For example, if a question contained three variables, identified as A, B, and C, and the logic description statement were written as:

LOGIC A AND B OR C,

it would be an ambiguous statement. Parentheses should be used to resolve the ambiguity in one of the following ways:

LOGIC (A AND B) OR C
LOGIC A AND (B OR C).

SEARCH TECHNIQUES

A wide assortment of techniques are available to the user for retrieving information from the CRIB file. This section includes the most frequently used search methods as well as some comments on general search strategies. Additional search methods are discussed in the GIPSY user's guide (Oklahoma Univ., Office Inf. Systems Programs, 1975) and in Zartman and others (1976). The conditions of the search fall into one of three modes: word mode, number mode, and label-only mode.

WORD MODE

The word mode searches for a single word, phrase, or part of a word throughout the total entry associated with a given label. A word is defined as one or more alphanumeric characters bounded by blanks. Any data entry (field), including numeric fields, can be searched in the word mode. The word or phrase to be searched for is enclosed by the delimiters < and > in the condition description. These delimiters mark the beginning and end of the character string sought. Summarized below are the four basic methods (items 1-4), as well as a compound method (item 5), for specifying a search in the word mode.

1. *Word search* C30< KAOLINITE >
A word search is specified by inserting both a leading and ending blank in the condition description. For example, the condition description, C30 < KAOLINITE > would cause the system to search for the word "KAOLINITE" in the field labeled C30 (ore minerals). This would find KAOLINITE, but not KAOLIN or KAOLINITIC.
2. *Prefix search* C30< KAOL> A prefix search is specified by inserting a leading blank in the condition description. For example, C30< KAOL> would cause the system to search for a word in the field labeled C30 (ore minerals) that began with the letters "KAOL," and would find KAOLIN, KAOLINITE, and KAOLINITIC.
3. *Suffix search* A70<N > A suffix search is specified by inserting an ending blank after the desired word in the condition description. For example, A70 <N > would cause the system to find all latitudes ending with N (those north of the equator) in the field labeled A70 (latitude).
4. *Existence search* N70<FAULT> An existence search is specified by no leading or ending blanks in the condition description. For example, N70 <FAULT> would cause the system to search for the character string "FAULT" at the beginning, middle, or end of any word in the field labeled N70 (significant local structures). For instance, the sys-

tem would find FAULT, FAULTING, DOWNFAULTED.

5. *Character-range search* L10<1950>
THRU <1955> A character-range search is specified by entering in the condition description the two ends of the range sought. For example, L10<1950> THRU <1955> would cause the system to retrieve all records in which L10 (year of discovery) contained entries in the collating sequence 1950 to 1955. An existence search is specified in this example, as indicated by no leading or ending blanks. Both ends of the range must be specified in the same way; if a prefix search is specified for the low end of the range, then a prefix search must also be specified for the high end of the range. Caution should be used with the character-range search. The search is based upon the collating sequence of the standard print-character set, and some results may be other than expected. For example, the entry "B+5" would be in the range < AID> THRU < BEST>. Also, if the second member of the range is longer than the first member, it will be truncated to the length of the first; if it is shorter, it will be padded to the length of the first. Another example of a character-range search is shown in figure 7.

NUMBER MODE

The number mode searches for numeric data only. However, the given field can contain either numeric data only or mixed numeric/non-numeric data, provided that the number is separated from the nonnumeric data by blanks. The system searches the given field until it encounters the first number and then compares it with the specified condition. All textual material contained in that field is ignored. Therefore, fields containing both nonnumeric and numeric data may be treated as numeric fields. The system converts numbers into a standard concatenated form for true comparisons. Thus, in the number mode, +5, 05.0, 5., and 5 would all be equal. The number may be written with or without sign, leading zeros, commas, or decimal points.

The number mode is specified by using one of the following operators in the condition

statement: EQ (equal), LT (less than), GT (greater than), or THRU (value A through B). These four methods plus the intrarecord comparison are discussed below.

Equal M60 EQ 10.0 The condition statement: M60 EQ 10.0 would cause the system to search for the first number in the entry labeled M60 (maximum thickness) and then to check whether the number was algebraically equal to 10. This search would find +10, 10.00, or 0010, but not -10 nor 10.001.

Less than M60 LT 20.5 The condition statement: M60 LT 20.5 would cause the system to search for the first number in the entry labeled M60 and then to check whether the number was algebraically less than 20.5. For instance, the system would find 19, -30, 20.0, or +10, but not 20.5 nor 30.

Greater than C45 GT 25.0 The condition statement: C45 GT 25.0 would cause the system to search for the first number in the field labeled C45 (percent volatile material in coal) and then to check whether the algebraic value of the number was greater than 25.0. For instance, the system would find 25.001, +26, or 028., but not -26, 24.999, nor 25.0.

Number range M20 0 THRU 100.0 The condition statement: M20 0 THRU 100.0 would cause the system to search the field labeled M20 (depth to top of ore body) to determine whether the entered value was algebraically between 0 and 100.00 inclusive. For instance, the system would find 0, +3, 23.0, or 100.0, but not 100.01, -10, nor 230.

Intrarecord comparison C42B GT C42D The intrarecord comparison allows one field to be compared numerically with another field in the same record. The operators allowed are EQ (equal), LT (less than), or GT (greater than). For example, the condition statement: C42B GT C42D would cause the system to retrieve those records in which the development costs (C42B) were greater than the cost of the mill (C42D).

LABEL-ONLY MODE

The label-only mode searches for the presence of a label only. No search operations are performed upon the data entry, if any, associated with the given label. The condition statement: SML, for example, would find all records containing the label SML (small deposit).

GENERAL ELECTRIC MARK III SERVICE

The General Electric MARK III Service is a computerized information-services network operating internationally by land lines, satellites, and underseas cables. The service is available by local telephone to subscribers in 500 cities in North America, Western Europe, Australia, Southeast Asia, Saudi Arabia, and Japan. The CRIB file and the GIPSY program are installed at the General Electric Company's facilities in Maryland, and public use of the CRIB file and of the GIPSY program is accomplished through the General Electric MARK III Service. An interface, called the "foreground driver," is used to link the GIPSY program to the MARK III Service.

For users of the CRIB file, the MARK III Service consists of two steps: (1) an input session using the interactive foreground service, followed by (2) an output session using the remote batch VS (virtual storage) background service.

When the user makes an inquiry against the CRIB file, he enters the job using the interactive foreground service and then signs off. The job is then processed in batch mode and placed in the output queue. A short time later the user dials the computer and receives the results on his terminal. Turn-around time is usually 1-2 hours. In addition to a display of output at his terminal, the user may request his output to be punched on cards, entered on magnetic tape, or printed on the high-speed printer at the Maryland center and then sent to him by courier. An example of a CRIB retrieval using the MARK III Service is shown in figure 6.

GIPSY-MARK III INTERFACE (THE FOREGROUND DRIVER)

The GIPSY-MARK III interface, called the "foreground driver" (OUINFSYS), is a command procedure that links the CRIB software (GIPSY) to the General Electric MARK III system. The interface provides an interactive mode of operation allowing users of the GIPSY program to communicate directly with the computer in order to direct and control the course of their inquiry and to retrieve the output of the run when the processing is completed. The foreground driver is initiated automatically after the user has signed on and has given his user number, password, and ID. The use of the

foreground driver is discussed in the next section, and an example of an actual job run is shown in figure 6.

The specific functions of the foreground driver are as follows:

1. Obtain from the user information necessary for completing the job control language required for remote-batch input.
2. Prompt the user in the process of entering the search, retrieval, and output commands.
3. Give the user the ability to edit his command stream and resubmit a job.
4. Allow the user to retrieve output, review results, and route output to wherever desired.

At various times during the execution of the foreground driver, the user may interrupt certain activities and proceed to the next step. The user should be careful to hit the interrupt button only once. Otherwise, he may inadvertently end execution of the foreground driver. The one exception to this rule is that when using a 1200-baud terminal, the user must always hit the interrupt button twice if he desires to interrupt.

During the process of using this program, the user will be allowed to set up files in both the foreground and the background environment. Individual users have the responsibility to be sure that these files are purged from the system. If users do not maintain proper house-keeping of these files, large monthly storage costs may be incurred.

USING THE GIPSY-MARK III INTERFACE

The procedure for using the GIPSY-MARK III interface has been prepared by Patricia Tracy (Oklahoma Univ., Inf. Systems Programs, 1976, p. 34-45). The step-by-step explanation that follows (p. 12-16) is quoted from the original publication. The procedure consists of a sequential set of questions and answers—a controlled conversation between the user and computer—in which the computer prints messages and responds to commands issued by the user. User response is in boldface type; computer response, slightly modified, is in italic type; and explanatory remarks are in roman type. After each response by the user, he must hit the return key to transfer control to the computer.

- Step 1 **INFORM WAS LAST UPDATED
XX-XX-XX LIST INFORM(Y,N)?**
- Reply Y, if you wish to see a listing of users messages.
Reply N, otherwise.
Hit break to stop the inform listing.
- Step 2 **DO YOU WISH TO—(C) Create a new
Control file
(E) Execute an
existing Control
file
(L) List the dictionary
(R) Retrieve Printed
Output
(S) Stop**
- Reply C, if you wish to submit a run against a file; go to Step 6.
Reply E, if you wish to submit an existing control file; go to Step 6.
Reply R, if you wish to retrieve output; go to Step 29.
Reply L, if you wish to list the dictionary; go to Step 3.
Reply S, if you wish to end execution of QUINFYSYS; go to Step 28.
- Step 3 **ENTER DATASET NAME OF DICTIONARY TO BE LISTED.**
The name of the dictionary is CRIB.
- Step 4 **DO YOU WISH THE LISTING IN ALPHABETICAL ORDER OR DICTIONARY SEQUENCE?**
- Reply A, if you wish a total or partial listing of the dictionary in alphabetical order by label. (This will allow you to generate a listing immediately at the terminal.) Go to Step 5.
Reply D, if you wish a listing of the dictionary with labels in their actual sequence. (This will submit a background job to create a dictionary listing. This output may be printed later when you retrieve the results of the job which was submitted.)
- The following message will print:
**YOUR CONTROL FILE IS .XXXX.XX
PURGE IT AFTER YOU RETRIEVE
OUTPUT**
- Delete this foreground file as soon as you retrieve the dictionary listing.
Go to Step 27.
- Step 5 **ENTER BEGINNING CHARACTER OR "ALL."**
- If you enter "ALL," an alphabetical listing of the dictionary will print at your terminal.
- If you enter any other character string, the labels will start listing from that point.
Hit the interrupt button when you wish to stop the listing.
Go to Step 27.
- Step 6 **ENTER CONTROL FILE NAME.**
- The control file is the subsequent command stream you set up. It is stored in a foreground file under the ad hoc name you give it at this time.
This file should be purged when you have no more need for it.
- Step 7 **ENTER NAME OF THE DATA BASE TO BE SEARCHED.**
- The name of the data base is CRIB.
- Step 8 **DO YOU WISH TO USE AN EXISTING SRF?**
- Reply Y, if the SRF has already been established; go to Step 9.
Reply N, if this is a new SRF; go to Step 10.
- Step 9 **ENTER SRF FILE NAME.**
- This name must be the same name that was assigned to the SRF when it was previously established.
- Step 10 **DO YOU WISH TO KEEP THIS SRF?**
- Reply Y, if you need to keep this background file for further use.
Reply N, if this file can be deleted at the end of the run.
- Step 11 If response to Step 8 was N, and response to Step 10 was Y,
ENTER SRF FILE NAME.
- This can be any 1- to 8-character alphanumeric name (first character should be alphabetic). It should not have been assigned to any previous background files that have been set up.
You are responsible for deleting this background file when you have finished using it.
- Step 12 Go to Step 23 if you are executing an existing control file.
Steps 13 through 22 pertain to the prompting of the user while he is setting up his command stream. If, during the process of entering parameters to a command, you wish to wipe out that command and all its parameters, enter an *D and return the carriage.

See the section describing the commands and the formats of their parameters. Labels will be checked for validity. No other editing is done at this time. This is done after the job has been submitted to background. The user should be as careful as possible to eliminate unsuccessful runs.

Step 13 *ENTER FORM NAME.*

The form name is CRIB.

Step 14 *ENTER BATCH COMMAND.*

Acceptable batch commands are:

**SELECT ITERATE INDEX BACK
PRINT LIST COPY SORT SORTD SUM
TOTAL COUNT FORM**

Enter **END** if you do not wish to enter any more batch commands; go to Step 23.

Step 15 If batch command was **SELECT**, you will be prompted with the following questions:

A. *FULL OR TERM(F,T)?*

Reply F, if a search on the full record file is desired.

Reply T, if a search of the index file is desired. A term search can be performed on Country (A40), State (A50), and Commodity Code (C10).

B. *ENTER CONDITION.*

A.

You must define at least one condition using the format(s) defined in the instructions on using the **SELECT** command.

After entering the first condition, you will be prompted for additional conditions. If you have entered all conditions desired, hit the carriage return to indicate you have completed entering all conditions.

C. *ENTER LOGIC LOGIC?*

You must define at least one logic, on which a subset of records (SRF) is to be established.

You will be prompted for additional logics which you may use to obtain counts on records meeting the logic specifications. Hit the carriage return to indicate that all logics desired have been entered.

If the a term search has been specified, the command **INDEX** will be automatically inserted in the command stream after the last logic statement in the **SELECT** stream.

No verification of conditions or logic is done at this time.

Go to Step 14.

Step 16 If batch command was **ITERATE**, go to Step 15B.

Step 17 If batch command was **COPY**:

ENTER COPY PARAMETERS (one parameter per line).
PARAMETERS:?

At least one parameter must be entered for each **COPY**. If output is to printer, the first character generated should be a carriage control character; that is, " " for single spacing, "ø" for double spacing, or "-" for triple spacing.

After all parameters have been entered, enter a slash (/) to indicate all parameters have been entered.

Labels entered under the **COPY** command will be verified. The entire parameter format is not verified at this time.

Go to Step 14.

Step 18 If the batch command was **PRINT**:

A. *DO YOU WISH TO PRINT A HEADING?*

Reply Y, if you want to put a heading in the records.

Reply N, otherwise.

B. *ENTER HEADING.*

Up to 60 characters may be inserted as the heading.

Go to Step 14.

Step 19 If batch command was **LIST**, **SUM**, or **TOTAL**:

ENTER LABELS (one label per line).

At least one label must be entered per command. Enter slash (/) to indicate all labels have been entered.

Labels are verified at this time.

Go to Step 14.

Step 20 If batch command was **BACK**:

ENTER SUBSET NUMBER.

Enter the number of the subset to which you wish to return.

Go to Step 14.

Step 21 If batch command was **SORT**, **SORTD**, or **COUNT**:

ENTER PARAMETERS (one parameter per line).
PARAMETERS?

At least one parameter must be entered per line. A slash (/) must be entered to indicate all parameters have been entered. Labels only are verified at this time. Go to Step 14.

Step 22 If batch command was **FORM**:

ENTER FORM NAME.

Enter name of form to be used. **FORM** names for different data bases cannot be invoked in the same run.

Go to Step 14.

Step 23 Immediately after all batch commands have been entered, a listing of the command stream (control file) to be submitted is listed so that the user may verify his input.

Hit interrupt to stop listing of control file.

A. DO YOU WISH TO MAKE ANY CHANGES?

Reply **Y**, if you need to modify the command stream. Go to Step 23B.

Reply **N**, otherwise. Go to Step 24.

B. ENTER LINE NUMBER.

Enter the number of the line to be inserted, deleted, or replaced.

C. ENTER TOTAL LINE TO BE INPUT.

If the line is to be deleted, hit the carriage return.

If the line is to be inserted or replaced, enter the new line information. If the line being inserted or replaced contains a command, begin the line with the command.

If the line being inserted or replaced contains a parameter to a command, begin the line with a space followed by the parameter.

NOTE: No verification of commands, labels, or format is made at this time.

D. MORE CHANGES?

Reply **Y**, if more changes need to be made; go to Step 23B.

Reply **N**, if all necessary changes have been made; go to Step 24.

Step 24 **A. IS THE COPY COMMAND PART OF YOUR CONTROL FILE(Y,N)?**

Reply **N**, if **COPY** is not part of the stream of commands to be processed; go to Step 25.

Reply **Y**, if **COPY** is part of the command stream. The following questions must then be answered.

B. DATA OUTPUT MAY BE TO TAPE (T), DISK (D), OR PRINTED AT TERMINAL (P).

Reply **P**, if you wish to print copy output; go to Step 24D.

Reply **D**, if you wish output to go to disk; go to Step 24D.

Reply **T**, if you wish output to go to tape. This tape and all printed output associated with the job that set up the tape will be sent to your office via RMS [Remote Media Service]. The following message will print:

C. *YOUR TAPE WILL BE RETURNED TO YOU VIA AIR COURIER. YOU WILL BE ASKED TO ENTER ADDRESS FOR RETURN.**

D. RECORD LENGTH (NUMERIC VALUE).

Enter number of characters output by **COPY**. If output is to print; go to Step 25.

E. BLOCKSIZE (NUMERIC VALUE MULTIPLE OF RECORD LENGTH)?

F. DATA SET NAME.

If output is to disk; go to Step 25.

For tape output only, the following questions will be asked.

G. DENSITY 800 OR 1600 BPI (800,1600)?

H. STANDARD LABELS OR NO LABELS (S,N)?

I. ENTER UP TO 6 LINES OF ADDRESS, ONE LINE AT A TIME. ENTER 'END' TO STOP BEFORE 6 LINES.

The user should enter the address to which he wants the tape and associated print routed.

Step 25 **STANDARD RUN, OVERNITE, NO RUN (S,O,N)?**

Reply **S**, if standard processing is desired. Output can ordinarily be retrieved within 30 minutes to 2 hours from the time the job was submitted; go to Step 26.

Reply **O**, if you wish to take advantage of the overnight processing rates. Output can be retrieved the following day; go to Step 26.

Reply **N**, if you do not wish to submit the job at the present time; go to Step 27.

Step 26 The job is submitted to background. The JOB ID will be listed. You will need to know this ID when you go back to retrieve your output.

Step 27 *RUN AGAIN OR END THE SESSION (R,E)?*

Reply R, if you wish to submit another job, list a dictionary or retrieve output; go to Step 2.

Reply E, if you wish to end execution of the driver program; go to Step 28.

Step 28 ****END OF SESSION****

Execution of the foreground driver is ended. You may then end your terminal session, execute a new Mark III command, or re-initiate the foreground driver by entering RUN QUINFSYS.

Step 29 *ENTER 4 CHARACTER JOB ID, OR CARRIAGE RETURN TO GET LIST OF JOB NUMBERS, OR STOP TO STOP.*

This is the JOB ID that was assigned at the time the job was submitted. If you do not know your JOB ID, hit the carriage return to get a list of active JOB ID's under your user ID; go to Step 29.

Enter STOP to get out of the retrieval; go to Step 27.

The following information will be output concerning the job: Job Status.

If the job has completed, the number of CRU's [Computer Resource Units] used, the number of PSU's returned, number of lines printed, and number of report files generated will also print.

The job summary will then print out.

Step 30 *DO YOU WANT TO: LIST THE REPORT NOW (LIST) QUEUE FOR HIGH-SPEED PRINT (HSS) PRINT REPORT VIA RMS (RMS) MOVE TO PERMANENT FILE (MOVE) NONE OF THE ABOVE (NONE)*

Step 31 If the reply is LIST, the printed output will print at the terminal after the user responds to the following message: *POSITION PAPER AND HIT CARRIAGE RETURN.*

If you wish your terminal print to start printing at the top of a page, adjust the

paper at this time. Hit the carriage return when ready for the print to start.

Hit the interrupt when ready to stop the terminal list.

After the list has finished printing, or after it has been interrupted, go to Step 30.

Step 32 If reply is HSS, the user must be validated for high-speed service by General Electric. See your General Electric representative for further information.

ENTER LTID.

Enter the high-speed service ID assigned by General Electric.

If the LTID is accepted, the following message will print: *FILES HAVE BEEN QUEUED FOR PRINTING*

If the LTID is not accepted, try re-entering it. If you keep getting an "INVALID ID" message, hit the interrupt to get out of this loop.

Go to Step 30.

Step 33 If the reply is RMS, the user will need to move the printed output to foreground storage to insure that it will still be available for access when the RMS is processed. Also, the user must set up a work order for processing the RMS request. The following questions will be asked to accomplish the above tasks.

A. *ENTER NAME OF FILE TO RECEIVE RMS.*

The printed output is copied to a foreground file under the name assigned by the user. This file should be purged by the user as soon as the RMS request has been processed.

B. *WIDE (14 $\frac{7}{8}$ x11) OR NARROW (8 $\frac{1}{2}$ x11) (W,N).*

Reply W, if output is to be printed on wide paper.

Reply N, if output is to be printed on narrow paper.

C. *NUMBER OF PARTS PAPER (1,2,3,4).*

Indicate number of copies to be printed.

D. *DESIGNATE ADDRESS (1- OR ENTER 0 TO SELECT THE PRIMARY ADDRESS.*

Up to 6 addresses may be validated for RMS per user number. Indicate the number assigned to the address to which the output is to be mailed.

E. A copy of the RMS work under is printed at this time. The user may obtain additional copies of the work order if desired.

WANT ANOTHER COPY OF WORK ORDER (Y,N)?

F. IS WORK ORDER OK (Y,N)?

If N, go to Step 30.

G. WORK ORDER NUMBER=XXXXXX.

The work order is submitted and given a work order number. Keep this number to check the status of the RMS request at a later time.

NOTE: The work order is set up in a foreground file. This file has the name . . . RMS . . . and should be deleted by the user as soon as the RMS has been processed.

Go to Step 30.

Step 34 If the reply is MOVE, then the print files will be moved to permanent storage in foreground. This option is available because printed output will be stored on the batch output library for a period of 36 hours only.

ENTER NAME OF FILE TO RECEIVE MOVE.

This is an 8-character alphanumeric name assigned to the file to be moved. The first character should be an alpha character.

The system will check to see if this file already exists in foreground. If it does, the following message will print:

EXISTS. MAY IT BE REPLACED (Y,N)?

Reply Y, if the new file can replace the old file.

Reply N, if otherwise.

Go to Step 30.

Step 35 Reply NONE, if no more output is desired. Go to Step 29.

USING THE CRIB FILE

When making an inquiry against a computerized subject file of information, the user is availing himself of a highly effective tool. No other means are presently available by which it is possible in a few minutes to examine a file of information, locate the relevant information, and then print the results in one of several possible arrangements.

While in direct communication with the computer, the user guides and controls each step of the inquiry and has the ability to go BACK (ITERATE) to earlier stages of the inquiry at any time during the session. A wide variety of

user-controlled search methods make possible highly detailed searches.

COMMON SEARCH PATTERNS AND SEARCH FIELDS

Because of the emphasis of the CRIB record—on mineral locations and (or) mineral commodities—a search of the CRIB file usually involves only one of a limited set of basic search approaches. Some of the common search approaches and search fields (labels) are summarized below.

Area search.—The user is interested in the mineral resources in general (across all commodities) of a given area—a country, State or Province, or smaller political area; a map quadrangle; or some physiographic or geologic region. Two general ways are available for defining a given area: (1) by defining the country, State or Province, and county (or counties), or (2) by defining a rectangular area based upon geodetic coordinates (latitude-longitude), or public-land surveys (township-range-section-meridian).

Commodity search.—The user is interested in a particular mineral commodity or in a group of related commodities wherever they may be found. Whenever a commodity is involved in a retrieval, records containing that commodity will be found by searching the commodities present field (label C10).

Combination area/commodity search.—Probably the most common search involves the quest for information on one or a small group of commodities within a given area. A search of this type is easily accomplished by combining the search parameters of area and commodity.

Fields used frequently as search parameters are listed below with their labels:

Country	-----	A40
State	-----	A50
County	-----	A60
Latitude-Longitude	-----	A70, A80
Township-range-		
section	-----	A77, A78, A79
Commodities present	---	C10
Ore minerals	-----	C30
Deposit type	-----	C40
Size	-----	M15
Status of exploration		
and development	----	A20
Property is:	ACTIVE	A21
Production:	YES	YES
Production/reserves		
tables	-----	(see p. 27 and 28, fig. 1)

EXAMPLES

The following examples provide additional familiarization with the structure and content of the CRIB file and illustrate some of the common retrieval methods.

Example 1. (see fig. 7).

Question: What mineral resource information is available for the area around Hartford, Conn.

Search method: A selection of all records on Connecticut, followed by a search of a small area around Hartford, Conn., using a latitude-longitude rectangular search. In this example, the initial search is made against the index files (country index and State index).

Output option: COPY—copies those fields specified in fixed-field format.

A rectangular area search may be based upon any one of the following grid systems: geodetic (latitude-longitude); Universal Transverse Mercator system (UTM); State grid coordinates, or public-land surveys (township-range system). In this example, the geodetic system is used, and all records within the 30-minute by 37.5-minute area surrounding Hartford, Conn. are retrieved. The parameter statements and the first page of printed output, sorted by latitude, are shown in figure 7.

In this example, the initial search is made against the State index file, which is an index on the States of the United States, and the country index file. The parameter TERM is used to initiate the search on the index files. A search in the word mode is first made for US (United States) in the country code field (A40) and for 09 (Connecticut) in the State code field (A50). Thirty-seven indexed records are selected and placed in subset 1.

The command INDEX converts the retrieved record addresses resulting from the index search to the corresponding set of records in the main record file (403 records in subset 1).

The system is directed back to the previous subset of 403 records (ITERATE), and a suffix search is made for those records in the north latitudes (suffix N in the latitude field A70) and in the west longitudes (suffix W in the longitude field A80). The resulting subset of 401 records is placed in subset 2. A second ITERATE command directs the system back to the previous subset of 401 records (subset 2) and a character-range search on the latitude-longitude fields is made of a rectangular area surrounding Hartford, Conn. for those records of areas between lat 41°30' and 42° N. and long

72°22'30" and 73° W. Of those 401 records searched in subset 2, 152 are selected and placed in subset 3.

The resulting records are sorted by latitude in order to prepare the data for a possible map plot. Use of the COPY command causes certain selected fields to be printed in fixed-field format, one line for each record. The fields printed include the record number, deposit name, latitude, longitude, major commodities, use, and whether or not the deposit has been productive.

Example 2: (see fig. 8).

Question: The user wishes to obtain specific information on those mines in the United States in which the workings are 100–1,000 m deep and more than 100 m long.

Search method:

Numeric search—specified by entering GT (greater than), LT (less than), or EQ (equal) in the conditions statements.

Existence search—<XXXXXX> specified by entering the desired character string, without leading or trailing blanks, between the delimiters.

Output option: LIST—prints only those fields specified, one below the other in single spacing.

This question involves the labels (fields) M160 (depth of workings), M170 (length of workings), M161 and M171 (the corresponding units fields), and A40 (country code). The parameter statements and the printed output are shown in figure 8. The file is searched first for those records in which the depth of workings is less than 1,000 m (M160 LT 1000) and greater than 100 m (M160 GT 100), and in which the length of workings is greater than 100 m (M170 GT 100). The conditions statements C and E restrict the records selected to those containing M (meters) in the units fields. Of 33,400 records searched, 14 were selected and placed in subset 1. The ITERATE command directs the system back to the immediately preceding subset (subset 1), and this subset of 14 records is searched on the country code field (A40) for those records located in the United States. Of the 14 records searched eight are selected. In this example, the user is interested only in certain fields, and the LIST command is used. The fields to be printed are specified by their labels, which are typed in by the user during the input session. If the data contained in a given field exceeds the length of a print line, they overflow to the next line.

Example 3. (see fig. 9).

Question: To begin a study of the mineral resources of Tennessee, the user wishes to obtain some pre-

liminary information on their distribution as reflected in the CRIB file.

Search method: Word search—< XXXX > specified by a blank before and after the word sought.

Output: A frequency count by county, and total.

The conditions statements and the resulting output are shown in figure 9.

The main file is first searched on the country code field (A40< US >) and the State code field (A50< 47 >) for those records located in the United States (US) and in Tennessee (47). From the main file, 1,397 records are selected and placed in subset 1. The COUNT command is then entered and is followed by the conditions statement, A60 40, which results in a count of the county field (A60) showing the number of records containing the same entry in that field. The number 40 in the conditions statement specifies the number of spaces to be considered during the count. That part of any entry exceeding 40 spaces is ignored during the count and is truncated on the output. The resulting output is a listing, sorted to 40 spaces by the county field and showing a frequency count for each different entry, plus the total count across all entries. The first entry of the output (fig. 9) is blank, which indicates that 70 records have no entry in the county field. Logically, one would expect a given county name to appear only once. However, this is the case only if all entries for a given county are identical. If a county name is misspelled, it is counted as a different data string. For example, Unicoi County appears in three separate counts (fig. 9): (1) Unicoi County, (2) Unicol County, and (3) Unicoi and Washington Counties.

GLOSSARY

Alphanumeric information (alpha-numeric, alphanumeric)—Information consisting of any combination of digits (0-9), letters (A-Z), and special characters (such as /, \$, or ?).

Assumed decimal point (implied decimal point)—A decimal point the position of which is known, but which is not physically entered (punched) into a numeric field.

Batch processing—The sequential processing of records as a group (batch), one group at a time. Batch processing is in contrast to on-line processing, during which each unit of data is processed immediately at the time

of presentation—as in the airline reservation system.

Baud—The speed of data transmission in bits per second.

Command Procedure—A user-oriented program composed of a prearranged set of operations steps and driven by user-controlled command words, specifications, and options.

Conversational (interactive) mode—The user is communicating with the computer system in a “conversational” manner from a terminal by sending commands to the system. The system executes the commands and sends the reply back to the terminal. One type of on-line processing.

Data item (data element, information item, field)—The smallest unit of information to which reference is made, for example, “country,” “State.” A set of related data items constitutes a record.

Direct access—The process of finding information in storage, where the time required is independent of the location of other information in storage. A disk is a direct-access device. This is in contrast to the sequential access of tapes.

Disk (disk pack)—A storage device consisting of a circular metal plate that has magnetic material on both sides and that is mounted on a rotating shaft. Read-write heads service both sides of the disk. Ten stacked disks constitute a disk pack.

Field (data item, information item)—A specified category of data treated as a whole. The basic unit of a record.

File—A collection of related records treated as a unit; for example, the records file and dictionary file of CRIB. Also, in the general sense, a collection of related files; for example, the CRIB file.

File maintenance—Modification of file content; for example, insertions, deletions, transfers, and corrections.

Fixed fields (fixed-length fields)—An arrangement in which the fields in a record are set beforehand to a specified length.

Fixed-length records—Records of predefined length. Loosely used to mean that both record length and field length are set beforehand to specified lengths.

Floating decimal—A decimal point without a predetermined fixed position within a numeric field. In a six-position number field, for example, the decimal may be in any of the six positions, depending upon the size of the number.

Foreground—Interactive (conversational, on-line) mode of operation in which the user is communicating directly with the computer.

Foreground driver—The command procedure program forming the interface between the GIPSY program and the General Electric Mark III system.

Format—A predefined arrangement of characters, fields, print lines, and so forth. The term, "arrangement," is never used in computer work.

Interface—A program or device that translates an initial program or signal into a form compatible with the next program or device.

Job control language (JCL)—The language used to supply the necessary information to the computer system so that it can run your job. Includes such items as the name and address of the data file to be processed, the name of the program to be executed, what to do with the results, and so forth.

Label—As used in GIPSY, a set of one to seven alphanumeric characters used to identify a data item or field to the GIPSY program.

Literal—In the GIPSY system, a set of characters inserted into the output record of the COPY command.

Parameter statements (search variables)—A list of the data elements the computer is to search for during a retrieval.

Program—A set of instructions that tells the computer how to solve a problem.

Retrieval operation—The actions connected with the recovery of information stored in a computer storage device.

RPG (report program generator)—An IBM program language that provides a convenient programming method for producing reports, performing calculations, and manipulating data.

Software—Programs that help run the different components of a computer center and

help the user to communicate with the computer.

Spanned record—A record that overflows from the end of one track on a disk to the beginning of the next track.

Subroutine—A program that is linked to a larger program and that performs a single specific task whenever the main program calls upon it to do so.

Track address—A number identifying the location where information is stored on disk.

Utility programs—Programs used to perform certain standard functions, called house-keeping functions; for example, update, transfer data from one device to another, sort programs, and so forth.

Variable fields (variable-length fields)—Fields having no predefined lengths.

Variable-length records (variable-length format)—Records of no predefined length.

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FIGURES 1-9

REPORTING FORM FOR CRIB MINERAL RESOURCES COMPUTER FILE

RECORD IDENTIFICATION:

Record No. B10 < _____ >
 Deposit No. B40 < _____ >
 File Link ID B50 < _____ >

U (circle U if form used for update and fill in labels G3 and G4)

USGS

REPORTER:

G1 < Yr Mo > G2 < Last name first initial >

UPDATE: G3 < Yr Mo > By: G4 < Last name first initial >

NAME:

Deposit Name A10 < _____ >
 Synonym Name(s) A11 < _____ >

LOCATION:

Mining District/Area/Subdist. A30 < _____ >
 Country A40 < [] [] > (enter code TWICE from list C)
 State A50 < [] [] > (enter code twice from list D if in US)
 County A60 < _____ >
 Position from nearest prominent locality A82 < _____ >

GIVE 1 OR MORE OF THE 4 LOCATIONS PRESENTED BELOW:

UTM Northing A120 < _____ >	Latitude A70 < [] [] - [] [] - [] [] [] [] N/S >
UTM Easting A130 < _____ >	Longitude A80 < [] [] [] - [] [] - [] [] [] [] E/W >
UTM Zone No. A110 < [] [] >	
State X Coord. A71 < _____ >	Township(s) A77 < [] [] [] [] [] [] [] [] >
State Y Coord. A72 < _____ >	Range(s) A78 < [] [] [] [] [] [] [] [] >
State Zone No. A73 < [] [] [] >	Section(s) A79 < [] [] [] [] [] [] [] [] [] [] >
Altitude A107 < _____ >	Meridian(s) A81 < _____ >
Quad Scale A100 < _____ >	Land Classification A64 < [] [] > (LIST Q)
Quad No. or Name A90 < _____ >	
Drainage Area (list J) A62 < [] [] _____ >	
Physiographic Province (list K) A63 < [] [] _____ >	
Location Comments A83 < _____ >	

CRIB FORM 10(5-76)

FIGURE 1.—Standard reporting (input) form 10 (9-76) for the CRIB mineral resources computer file.

Reports Available L100< _____>

Comments L110< _____>

DESCRIPTION OF DEPOSIT

Deposit Type(s) (List F) C40< _____>

Deposit Form/Shape (List N) M10< _____>

Max Thickness M60< _____> M61< _____> (units) Size M15< _____>

Depth to Top M20< _____> M21< _____> Strike M70< _____>

Depth to Bottom M30< _____> M31< _____> Dip M80< _____>

Max Length M40< _____> M41< _____> Plunge M90< _____>

Max Width M50< _____> M51< _____> Plunge dir. M100< _____>

Property is: (Active) A21 (Inactive) A22 (Circle One)

Comments M110< _____>

DESCRIPTION OF WORKINGS

Workings are: (Surface) M120 (Underground) M130 (Both) M140 (Circle Appropriate Labels)

For Underground Workings: (units)

Depth Below Surface M160< _____> M161< _____>

Length of Workings M170< _____> M171< _____>

For Open Workings (surface and underground): (units)

Overall Length of Mined Area M190< _____> M191< _____>

Overall Width of Mined Area M200< _____> M201< _____>

Overall Area M210< _____> M211< _____>

Comments M220< _____>

GENERAL REFERENCES

1) F1< _____>

2) F2< _____>

3) F3< _____>

4) F4< _____>

GEOLOGY AND MINERALOGY

(Record No.) 4.
Age (List O)

Host Rocks and Age K1 < | | | | | | | | | | | | | | | | | | | | | | >

Assoc. Igneous Rocks and age K2 < | | | | | | | | | | | | | | | | | | | | | | >

Age of Mineralization K3 < | | | | | | | | | | | | | | | | | | | | | | >

Pertinent Mineralogy Other than Ore Minerals K4 < _____ >

Important Ore Control or Locus K5 < _____ >

Major Regional Structures or Trends N5 < _____ >

Tectonic Setting N15 < _____ >

Significant Local Structures N70 < _____ >

Significant Alteration N75 < _____ >

Process of Concentration or Enrichment N80 < _____ >

	Age (List O)	Age, Names of Formations or Rock Types
N30	< >	
N35	< >	
N40	< >	
N45	< >	

	Age (List O)	Age, Names of Igneous Units or Rock Types
N50	< >	
N55	< >	
N60	< >	
N65	< >	

Comments (Geology and Mineralogy) N85 < _____ >

GENERAL COMMENTS GEN < _____ >

PRODUCTION (past or present)
 PROD YES NO SML MED LGE (circle appropriate labels)
 ANNUAL PRODUCTION (ore and commodities)

DH	(item)	(accuracy)	(amount)	(thousand units)	(year)	(grade or use)
1)	D1<	D1A<	D1B<	D1C<	D1D<	
2)	D2<	D2A<	D2B<	D2C<	D2D<	
3)	D3<	D3A<	D3B<	D3C<	D3D<	
4)	D4<	D4A<	D4B<	D4C<	D4D<	
5)	D5<	D5A<	D5B<	D5C<	D5D<	
6)	D6<	D6A<	D6B<	D6C<	D6D<	
7)	D7<	D7A<	D7B<	D7C<	D7D<	

CUMULATIVE PRODUCTION (Ore, Commodities, Concentrates, Overburden)

DH2	(item)	(accuracy)	(amount)	(thousand units)	(years)	(grade or use)
8)	G7<	G7A<	G7B<	G7C<	G7D<	
9)	G8<	G8A<	G8B<	G8C<	G8D<	
10)	G9<	G9A<	G9B<	G9C<	G9D<	
11)	G10<	G10A<	G10B<	G10C<	G10D<	
12)	G11<	G11A<	G11B<	G11C<	G11D<	
13)	G12<	G12A<	G12B<	G12C<	G12D<	
14)	G13<	G13A<	G13B<	G13C<	G13D<	
15)	G14<	G14A<	G14B<	G14C<	G14D<	
16)	G15<	G15A<	G15B<	G15C<	G15D<	

ANNUAL PRODUCTION (overburden and concentrates)

DH4	(item)	(accuracy)	(amount)	(thousand units)	(year)	(grade or remarks)
17)	P1<	P1A<	P1B<	P1C<	P1D<	
18)	P2<	P2A<	P2B<	P2C<	P2D<	
19)	P3<	P3A<	P3B<	P3C<	P3D<	
20)	P4<	P4A<	P4B<	P4C<	P4D<	
21)	P5<	P5A<	P5B<	P5C<	P5D<	
22)	P6<	P6A<	P6B<	P6C<	P6D<	
23)	P7<	P7A<	P7B<	P7C<	P7D<	

Source of Information D9<

Production Comments D10<

RESERVES AND POTENTIAL RESOURCES

(Record No.

(items 1-6 are for reporting combined ore, mixed commodity ore, and individual commodities. If figures not available, indicate potential by placing SMU, MED, or LGR in accuracy column.)

BH	(item)	(accuracy)	(amount)	(thousand units)	(yr. of est.)	(grade or use)
1)	E1<	[]>	E1A<	[]>	E1C<	[]>
2)	E2<	[]>	E2A<	[]>	E2C<	[]>
3)	E3<	[]>	E3A<	[]>	E3C<	[]>
4)	E4<	[]>	E4A<	[]>	E4C<	[]>
5)	E5<	[]>	E5A<	[]>	E5C<	[]>
6)	E6<	[]>	E6A<	[]>	E6C<	[]>
Source of Information E7<						
Comments E8<						

RESERVES ONLY

IH	(item reported)	(accuracy)	(amount)	(thousand units)	(yr. of est.)	(grade or use)
1)	H1<	[]>	H1A<	[]>	H1C<	[]>
2)	H2<	[]>	H2A<	[]>	H2C<	[]>
3)	H3<	[]>	H3A<	[]>	H3C<	[]>
4)	H4<	[]>	H4A<	[]>	H4C<	[]>
5)	H5<	[]>	H5A<	[]>	H5C<	[]>
6)	H6<	[]>	H6A<	[]>	H6C<	[]>
Comments H7<						
Source of Information H8<						

POTENTIAL RESOURCES (exclusive of reserves)

JH	(item reported)	(accuracy)	(amount)	(thousand units)	(yr. of est.)	(grade or use)
1)	J1<	[]>	J1A<	[]>	J1C<	[]>
2)	J2<	[]>	J2A<	[]>	J2C<	[]>
3)	J3<	[]>	J3A<	[]>	J3C<	[]>
4)	J4<	[]>	J4A<	[]>	J4C<	[]>
5)	J5<	[]>	J5A<	[]>	J5C<	[]>
6)	J6<	[]>	J6A<	[]>	J6C<	[]>
Comments J7<						
Source of Information J8<						

Figure 1.—Continued.

CRIB MINERAL RESOURCES FILE 10

```

RECORD IDENTIFICATION (Header BH1)
B10 RECORD NO..... W999999
  (U) RECORD TYPE..... U (Header B20)
  (USGS) COUNTRY/ORGANIZATION. USGS
B30 SOURCE..... XXXXX
B50 FILE LINK ID..... XXXXX
B40 DEPOSIT NO..... XXXXX
B51 GEOLOGIC CODE..... XXXXX

REPORTER (Header GH1)
G2 NAME: XXXXXX, XXXXXXX X.
G1 DATE: 76 08
G3 UPDATE(S): 76 09
G4 BY: XXXXXX, XXXXXXX X.
    
```

```

NAME AND LOCATION (Header A1)
A10 DEPOSIT NAME..... XXXXX
A11 SYNONYM NAME..... XXXXX

A30 MINING DISTRICT/AREA/SUBDIST. XXXXX
A31 SUBDISTRICT..... XXXXX

A32 CONTINENT OR GLOBAL AREA..... XXXXXX
A40 COUNTRY CODE..... US
A50 STATE CODE..... 08

A60 COUNTY..... XXXXX
A67 NAME OF FOREST..... XXXXX
A61 CONGRESSIONAL DIST..... XXXXX
A62 DRAINAGE AREA..... XX
A63 PHYSIOGRAPHIC PROV..... XX
A64 LAND CLASSIFICATION..... XXXXX
    
```

```

QUAD SCALE QUAD NO OR NAME (Header AH2)
A100 1: 9999999 A90 XXXXX
A91 1: 9999999 A92 XXXXX
    
```

```

LATITUDE LONGITUDE (Header AH3)
A70 XX-XX-XXX A80 XXX-XX-XXX

A107 ALTITUDE.. 9999 FT
    
```

```

UTM NORTHING UTM EASTING UTM ZONE NO (Header AH4)
A120 9999999.9 A130 999999.9 A110 +99
    
```

```

STATE X COORDINATE STATE Y COORDINATE STATE ZONE NU (Header AH5)
A71 999999999.9 A72 999999999.9 A73 9999
    
```

NOTE: Circled label indicates that no text accompanies the label.

```

MAP X-Y COORDINATES (Header AH6)
      A74X
      1:250,000....X 999 A74Y Y 999 (Header A74)
      1: 63,360....X 999 A75Y Y 999 (Header A75)
      A75X
    
```

```

A77 TWP..... XXXX XXXX
A78 RANGE.... XXXX XXXX
A79 SECTION.. XX XX XX XX XX XX
A81 MERIDIAN. XXXXX
    
```

A82 POSITION FROM NEAREST PROMINENT LOCALITY: XXXXX

A83 LOCATION COMMENTS: XXXXX

```

COMMODITY INFORMATION (Header COMINFO)
C10 COMMODITIES PRESENT: XXX XXX XXX XXX XXX XXX XXX
    
```

```

SIGNIFICANCE: (Header C15)
MAJOR MAJOR..... XXX
MINOR MINOR..... XXX
COPROD COPRODUCT.. XXX
BYPROD BYPRODUCT.. XXX
POTEN POTENTIAL.. XXX
OCCUR OCCURRENCE. XXX XXX
    
```

C20 COMMODITY SPECIALIST INFORMATION: XXX

C21 SPECIAL FIELD 1 XXXXX

C22 SPECIAL FIELD 2 XXXXX

C23 SPECIAL FIELD 3 XXXXX

FIGURE 2.—Dummy record showing the standard output format of the CRIB mineral resources file.

C30 ORE MATERIALS (MINERALS, ROCKS, ETC.):
XXXXX

C41 COMMODITY SUBTYPES OR USE CATEGORIES:
XXXXX

C50 COMMODITY COMMENTS:
XXXXX

ANALYTICAL DATA (Header ANALD)

C44 SOURCE REFERENCE.. XXXXX
 BTU BTU..... 99999
 SUL SULFUR..... 99.9 %
 ASH ASH..... 99.9 %
 CARB FIXED CARBON..... 99.9 %
 C45 VOLATILES..... 99.9 %
 C46 MOISTURE..... 99.9 %
 C47 THICKNESS OF COAL. 999.9 FT

C43 ANALYTICAL DATA (GENERAL)
XXXXX

MINERAL ECONOMICS FACTORS (Header MINECON)

C42A EXPLORATION M\$...... 99
 C42B DEVELOPMENT M\$...... 99
 C42C EXPANSION M\$...... 99
 C42D MILL M\$...... 99
 C42E TOTAL INVESTMENTS M\$...... 99
 C42F MILL CAPACITY PER YR. (THOUS. UNITS).. 99 MET TONS
 C42G YR APPLICABLE..... 1974

C42 ECONOMIC COMMENTS:
XXXXX

EXPLORATION AND DEVELOPMENT (Header LHI)

A20 STATUS OF EXPLOR. OR DEV. X
 (A21) PROPERTY IS ACTIVE
 (A22) PROPERTY IS INACTIVE

L10 YEAR OF DISCOVERY..... 1965
 L20 BY WHOM..... XXXXX
 L30 NATURE OF DISCOVERY..... X
 L40 YEAR OF FIRST PRODUCTION. 1970
 A12 PRESENT/LAST OWNER..... XXXXX
 A13 PRESENT/LAST OPERATOR.... XXXXX

WORK DONE BY USGS (Header LH2)

YEAR	WORK TYPE	GEOLOGIST	RESULTS	(Header LH3)
L41 1) 1965	XXXXXXXX	XXX		
L42 2) 1966	XXXXXXXX	XXX		
L43 3) 1967	XXXXXXXX	XXX		

WORK DONE BY OTHER ORGANIZATIONS (Header LH4)

YEAR	WORK TYPE	ORGANIZATION	RESULTS	(Header LH5)
L50 1) 1965	XXXXXXXX	XXX		
L60 2) 1967	XXXXXXXX	XXX		
L70 3) 1969	XXXXXXXX	XXX		
L80 4) 1971	XXXXXXXX	XXX		
L90 5) 1973	XXXXXXXX	XXX		

L100 REPORTS AVAILABLE:
XXXXX

L110 EXPLOR. AND DEVELOP. COMMENTS:
XXXXX

DESCRIPTION OF DEPOSIT (Header MHI)

C40 DEPOSIT TYPES:
XXXX

M10 FORM/SHAPE OF DEPOSIT: XXXX

SIZE/DIRECTIONAL DATA (Header MH2)

M15 SIZE OF DEPOSIT..... XXX
 M20 DEPTH TO TOP 999 M21 FT
 M30 DEPTH TO BOTTOM..... 999 M31 FT
 M40 MAX LENGTH..... 999 M41 FT
 M50 MAX WIDTH..... 999 M51 FT
 M60 MAX THICKNESS..... 999 M61 FT
 M70 STRIKE OF OREBODY.... XXX
 M80 DIP OF OREBODY..... XXX
 M90 PLUNGE OF OREBODY.... XXX
 M100 DIRECTION OF PLUNGE.. XXX
 M110 COMMENTS (DESCRIPTION OF DEPOSIT):
XXXXX

FIGURE 2.—Continued.

DESCRIPTION OF WORKINGS (Header M13)

M120 SURFACE
M130 UNDERGROUND
M140 SURFACE AND UNDERGROUND

DESCRIP. OF UNDERGRND WORKINGS (Header M150)
M160 DEPTH OF WORKINGS BELOW SURFACE. 999 M161 FT
M170 LENGTH OF WORKINGS..... 999 M171 FT

DESCRIP. OF OPEN WORKINGS (SURFACE OR UNDERGRND) (Header M180)
M190 OVERALL LENGTH OF MINED AREA.... 999 M191 FT
M200 OVERALL WIDTH OF MINED AREA..... 999 M201 FT
M210 OVERALL AREA..... 999 M211 SQ FT

M220 COMMENTS(DESCRIP. OF WORKINGS):
XXXXX

PRODUCTION (PROD is Label and Header)

YES YES
NO NO PRODUCTION
LGE LARGE PRODUCTION
MED MEDIUM PRODUCTION
SMB SMALL PRODUCTION

DH ANNUAL PRODUCTION (ORE AND COMMODITIES) (DH is Label and Header)

		ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE	OR USE	(Header DH1)
D1	1	XXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
D2	2	XXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
D3	3	XXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
D4	4	XXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
D5	5	XXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
D6	6	XXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
D7	7	XXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		

D1A-D7A D1B-D7B D1C-D7C D1D-D7D

DH2 CUMULATIVE PRODUCTION (ORE, COMMOD., CONC., OVERBUR.) (DH2 is Label and Header)

		ITEM	ACC	AMOUNT	THOUS.UNITS	YEARS	GRADE	OR USE	(Header DH3)
G7	8	XXXX	XXX	99999999	XXXXXXXXXX	1970-1974	XXXXX		
G8	9	XXXX	XXX	99999999	XXXXXXXXXX	1970-1974	XXXXX		

G7A-G8A G7B-G8B G7C-G8C G7D-G8D

G9	10	XXXX	XXX	99999999	XXXXXXXXXX	1970-1974	XXXXX		
G10	11	XXXX	XXX	99999999	XXXXXXXXXX	1970-1974	XXXXX		
G11	12	XXXX	XXX	99999999	XXXXXXXXXX	1970-1974	XXXXX		
G12	13	XXXX	XXX	99999999	XXXXXXXXXX	1970-1974	XXXXX		
G13	14	XXXX	XXX	99999999	XXXXXXXXXX	1970-1974	XXXXX		
G14	15	XXXX	XXX	99999999	XXXXXXXXXX	1970-1974	XXXXX		
G15	16	XXXX	XXX	99999999	XXXXXXXXXX	1970-1974	XXXXX		

G9A-G15A G9B-G15B G9C-G15C G9D-G15D

DH4 OVERBURDEN AND CONCENTRATES (ANNUAL) (DH4 is Label and Header)

		ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE	REMARKS	(Header DH5)
P1	17	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
P2	18	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
P3	19	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
P4	20	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
P5	21	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
P6	22	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		
P7	23	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1970	XXXXX		

P1A-P7A P1B-P7B P1C-P7C P1D-P7D

D8 PRODUCTION YEARS..... 1970-1974

D9 SOURCE OF INFORMATION.. XXXXX

D10 PRODUCTION COMMENTS.... XXXXX

EH RESERVES AND POTENTIAL RESOURCES (EH is Label and Header)

		ITEM	ACC	AMOUNT	THOUS.UNITS	YEAR	GRADE	OR USE	(Header EHL)
E1	1	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1975	XXXXX		
E2	2	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1975	XXXXX		
E3	3	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1975	XXXXX		
E4	4	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1975	XXXXX		
E5	5	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1975	XXXXX		
E6	6	XXXXXXXXXX	XXX	99999999	XXXXXXXXXX	1975	XXXXX		

E1A-E6A E1B-E6B E1C-E6C E1D-E6D

E7 SOURCE OF INFORMATION.. XXXXX

E8 COMMENTS..... XXXXX

FIGURE 2.—Continued.

(HH) RESERVES ONLY (HH is Label and Header)

ITEM	ACC	AMOUNT	THOUS. UNITS	YEAR	GRADE OR USE	(Header HHI)
H1 1	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
H2 2	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
H3 3	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
H4 4	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
H5 5	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
H6 6	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
		H1A-H6A	H1B-H6B	H1C-H6C	H1D-H6D	
H7	COMMENTS.. XXXXX					
H8	SOURCE OF INFORMATION XXXXX					

(JB) POTENTIAL RESOURCES (EXCLUSIVE OF RESERVES) (JH is Label and Header)

ITEM	ACC	AMOUNT	THOUS. UNITS	YEAR	GRADE OR USE	(Header JHI)
J1 1	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
J2 2	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
J3 3	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
J4 4	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
J5 5	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
J6 6	XXXXXXXX	XXX 99999999	XXXXXXXX	1975	XXXXX	
		J1A-J6A	J1B-J6B	J1C-J6C	J1D-J6D	
J7	COMMENTS.. XXXXX					
J8	SOURCE OF INFORMATION XXXXX					

GEOLOGY AND MINERALOGY (Header KH1)

K7 GENERAL GEOLOGICAL ENVIRONMENT..... XXXXX

K1 AGE/NAMES OF HOST ROCKS..... XXXXXXXXXXX XXXXX

K2 AGE/NAMES OF ASSOC. IGNEOUS ROCKS.. XXXXXXXXXXX XXXXX

K3 AGE OF MINERALIZATION..... XXXXXXXXXXX

K4 PERTINENT MINERALOGY..... XXXXX

K5 IMPORTANT ORE CONTROL OR LOCUS..... XXXXX

K6 GEOLOGICAL DESCRIPTIVE NOTES..... XXXXX

GEOLOGY (SUPPLEMENTARY INFORMATION) (Header NH1)

REGIONAL GEOLOGY (Header NH2)

N5 MAJOR REGIONAL STRUCTURES.. XXXXX

N10 REGIONAL TRENDS..... XXXXX

N15 TECTONIC SETTING..... XXXXX

N20 MAJOR LITHOLOGIC/STRATIGRAPHIC UNITS:
XXXXX

N25 COMMENTS XXXXX

LOCAL GEOLOGY (Header NH3)

AGE/NAMES OF FORMATIONS OR ROCK TYPES (Header NH4)

N30 1) XXXXXXXXXXX XXXXX

N35 2) XXXXXXXXXXX XXXXX

N40 3) XXXXXXXXXXX XXXXX

N45 4) XXXXXXXXXXX XXXXX

AGE/NAMES OF IGNEOUS UNITS OR ROCK TYPES (Header NH5)

N50 1) XXXXXXXXXXX XXXXX

N55 2) XXXXXXXXXXX XXXXX

N60 3) XXXXXXXXXXX XXXXX

N65 4) XXXXXXXXXXX XXXXX

FIGURE 2.—Continued.

N70 SIGNIFICANT LOCAL STRUCTURES:
XXXXX

N75 SIGNIFICANT ALTERATION:
XXXXX

N80 GEOLOGICAL PROCESSES OF CONCENTRATION OR ENRICHMENT:
XXXXX

N85 COMMENTS (GEOLOGY AND MINERALOGY):
XXXXX

GEN GENERAL COMMENTS
XXXXX

GENERAL REFERENCES (Header FH1)

F1 1) XXXXX
F2 2) XXXXX
F3 3) XXXXX
F4 4) XXXXX

5) XXXXX }
6) XXXXX } Illustrates paragraph function

FIGURE 2.—Continued.

CRIB MINERAL RESOURCES FILE 10

RECORD IDENTIFICATION
 RECORD NO..... W012708
 RECORD TYPE..... L
 COUNTRY/DRGANIZATION. USGS

REPORTER
 NAME: SWEETWOOD, CHARLES W.
 DATE: 76 05

NAME AND LOCATION

DEPOSIT NAME..... VEREENIGING-CLYDESDALE COALFIELD
 SYNONYM NAME..... CORNELIA COLLIERY

MINING DISTRICT/AREA/SUBDIST. OLD SPRINGFIELD

COUNTRY CODE..... SF
 COUNTRY NAME:
 SOUTH AFRICA

STATE CODE..... ORANGE FREE STATE

COUNTY..... SASOLBURG

LATITUDE LONGITUDE
 26-42- S 027-57- E

ALTITUDE.. 1433 M

POSITION FROM NEAREST PROMINENT LOCALITY: 3 KILOMETERS SOUTHEAST OF VEREENIGING

COMMODITY INFORMATION

COMMODITIES PRESENT: COA3

SIGNIFICANCE:

MAJOR..... COA3

ORE MATERIALS (MINERALS, ROCKS, ETC.):

SUBBITUMINOUS COAL FROM VEREENIGING-CLYDESDALE COALFIELD SEAM NO.2 (THICKNESS: 7.0 METERS)

ANALYTICAL DATA

SOURCE REFERENCE.. COAL, GOLD & BASE MINERALS OF SOUTHERN AFRICA; MAY 1975
 BTU..... 08514
 SULFUR..... 01.0 %
 ASH..... 27.0 %
 FIXED CARBON..... 43.4 %
 VOLATILES..... 22.8 %
 MOISTURE..... 06.8 %
 THICKNESS OF COAL. 007.0

ANALYTICAL DATA (GENERAL)

THE ANALYSES, ABOVE, ARE CRUSHED COAL ONLY FROM CORNELIA: BERTHA NO.1 SHAFT. CORNELIA: BERTHA NO. 2 SHAFT PRODUCES CRUSHED COAL ALSO (AS PART OF TOTAL MINE OUTPUT), WITH GENERALLY SIMILAR ANALYSES, AND BOTH SHAFTS PRODUCE COBBLE A AND PEA TYPE COALS AS ADDITIONAL PRODUCTS.

MINERAL ECONOMICS FACTORS

MILL CAPACITY PER YR. (THOUS. UNITS).. 4.0 MIL. MET. T/YR. 1960

ECONOMIC COMMENTS:

SUPPLIER OF CRUSHED COAL TO SOUTH AFRICAN ELECTRICITY SUPPLY COMMISSION'S (ESCOM) VAAL AND KLIP POWER STATIONS (70 PERCENT OF OUTPUT), AND PRODUCER OF COBBLE A AND PEA COALS (30 PERCENT OF OUTPUT) FOR DOMESTIC MARKET.

EXPLORATION AND DEVELOPMENT

STATUS OF EXPLOR. OR DEV. 4
 PROPERTY IS ACTIVE
 YEAR OF DISCOVERY..... 1878
 BY WHOM..... G.W. STOW
 YEAR OF FIRST PRODUCTION. 1895
 PRESENT/LAST OWNER..... ANGLO AMERICAN CORPORATION LIMITED
 PRESENT/LAST OPERATOR.... AMALGAMATED COLLIERIES OF SOUTH AFRICA LIMITED

REPORTS AVAILABLE:

COAL, GOLD & BASE MINERALS OF SOUTHERN AFRICA; MARCH 1974 ANGLO AMERICAN CORPORATION ANNUAL REPORTS; 1972-1974

FIGURE 3.—Standard output record from the CRIB mineral resources file.

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:

BEDDED

FORM/SHAPE OF DEPOSIT: TABULAR/BLANKET

SIZE/DIRECTIONAL DATA

SIZE OF DEPOSIT..... LARGE
DEPTH TO TOP 55.0 M
DEPTH TO BOTTOM..... 95.5 M
MAX THICKNESS..... 27.5 M
DIP OF OREBODY..... 0-2 DEG

COMMENTS(DESCRIPTION OF DEPOSIT):

THE MAXIMUM THICKNESS FIELD REFLECTS A TOTAL OF THREE MINABLE SEAMS (UPPER: 7.0 METERS; 2B: 5.5 METERS; 2A: 15.0 METERS). THE UPPER AND 2B SEAMS ARE SEPARATED BY 12.0 METERS OF SHALE AND 2B AND 2A. THE DEPTH TO TOP FIELD REFLECTS DEPTH TO TOP OF RECOVERABLE COAL IN UPPER SEAM. THE DEPTH TO BOTTOM FIELD REFLECTS DEPTH TO BOTTOM OF 2A SEAM.

DESCRIPTION OF WORKINGS

UNDERGROUND

DESCRIP. OF UNDERGRND WORKINGS

DEPTH OF WORKINGS BELOW SURFACE. 55.0 M

DESCRIP. OF OPEN WORKINGS (SURFACE OR UNDERGRND)

COMMENTS(DESCRIP. OF WORKINGS):

TWO VERTICAL SHAFTS CURRENTLY IN OPERATION: BERTHA NO. 1 AND BERTHA NO. 2 (THOUGH THERE WERE OTHERS IN EARLIER YEARS). OVERALL PRODUCTION OF MINE DURING 1895-1974: 113.5 MILLION METRIC TONS OF COAL.

PRODUCTION

YES

ANNUAL PRODUCTION (ORE AND COMMODITIES)

ITEM ACC AMOUNT THOUS.UNITS YEAR GRADE OR USE
1 COA3 ACC 3307.380 MET TONS 1974 SEE "ANALYTICAL DATA" ENTRIES

CUMULATIVE PRODUCTION (ORE, COMMOD., CONC., OVERBUR.)

ITEM ACC AMOUNT THOUS.UNITS YEARS GRADE OR USE
8 COA3 ACC 9618.507 MET TONS 1972-1974 CRUSHED COAL (AIR DRY BASIS): H2O 6.7%, ASH 26.4%, V.M. 23.1%, F.C. 43.8%, S 0.9%, BTU 8,613

GEOLOGY AND MINERALOGY

AGE/NAMES OF HOST ROCKS..... PERM SANDSTONE AND SHALES

AGE OF MINERALIZATION..... PERM

PERTINENT MINERALOGY..... SANDSTONES & CARBONACEOUS SHALES

IMPORTANT ORE CONTROL OR LOCUS..... GENTLE UPLIFT OF CONTINENTAL MASS FOLLOWED BY SUCCESSION OF FRESH WATER SEDIMENTS (WITH FOSSIL VEGETATION)

GEOLOGY (SUPPLEMENTARY INFORMATION)

REGIONAL GEOLOGY

MAJOR REGIONAL STRUCTURES.. FLAT-LYING WITH MINOR DISTURBANCES ONLY
TECTONIC SETTING..... PLATFDRM

LOCAL GEOLOGY

AGE/NAMES OF FORMATIONS OR ROCK TYPES
1) PERM ECCA SERIES, KARROD SYSTEM; SHALE, SANDSTONE & COAL

SIGNIFICANT LOCAL STRUCTURES:

FLAT-LYING BEDS; MINOR FAULTING ONLY

GENERAL REFERENCES

- 1) SOUTH AFRICA'S COAL RESOURCES; COAL ADVISORY BOARD; FEBRUARY 1969
2) REPORT OF THE COMMISSION OF INQUIRY INTO THE COAL RESOURCES OF THE REPUBLIC OF SOUTH AFRICA; DEPARTMENT OF MINES, REPUBLIC OF SOUTH AFRICA; APRIL 3, 1975
3) MINERAL RESOURCES OF SOUTH-CENTRAL AFRICA; PELLETIER, R.A.; 1964

FIGURE 3.—Continued.

COUNTRY CODE	COUNTRY NAME	NO. OF RECORDS	COUNTRY CODE	COUNTRY NAME	NO. OF RECORDS
	UNKNOWN	29	PP	PAPUA AND NEW GUINEA.....	2
AG	ALGERIA.....	15	RM	ROMANIA.....	22
AO	ANGOLA.....	17	RO	ROMANIA.....	18
AR	ARGENTINA.....	51	RP	PHILIPPINES.....	160
AS	AUSTRALIA.....	64	RQ	PUERTO RICO.....	2
AU	AUSTRIA.....	21	SA	SAUDI ARABIA.....	1
BC	BOTSWANA.....	1	SB	ST. PIERRE AND MIQUELON.....	1
BF	BAHAMAS.....	1	SP	SOUTH AFRICA.....	79
BL	BOLIVIA.....	49	SF	SPAIN.....	26
BM	BURMA.....	19	SS	SPANISH SAHARA.....	1
BP	BRITISH SOLOMON IS.....	4	SW	SWEDEN.....	19
BR	BRAZIL.....	205	TH	THAILAND.....	97
BU	BURBIA.....	17	TS	TUNISIA.....	17
BY	BURUNDI.....	1	TU	TURKEY.....	18
CA	CANADA.....	1,313	TW	REPUBLIC OF CHINA.....	32
CB	CAMBODIA.....	47	TZ	TANZANIA.....	17
CF	CONGO REPUBLIC.....	16	UG	UGANDA.....	19
CM	COMMUNIST CHINA.....	19	UK	UNITED KINGDOM.....	20
CI	CHILE.....	61	UR	SOVIET UNION.....	56
CJ	CAYMAN ISLANDS.....	1	US	UNITED STATES:	
CM	CAMEROON.....	4		UNKNOWN	62
CO	COLOMBIA.....	27	UN	UNKNOWN	1
CU	CUBA.....	27	01	ALABAMA	64
CY	CYPRUS.....	1	02	ALASKA	3,030
CZ	CZECHOSLOVAKIA.....	15	04	ARIZONA	4,885
DR	DOMINICAN REPUBLIC.....	3	05	ARKANSAS	109
EC	ECUADOR.....	17	06	CALIFORNIA	88
EG	UNITED ARAB REPUBLIC.....	15	08	COLORADO	5,970
EI	IRELAND.....	14	09	CONNECTICUT	403
ES	EL SALVADOR.....	14	11	DIST OF COLUMBIA	24
ET	ETHIOPIA.....	1	12	FLORIDA	15
FM	FRENCH GUIANA.....	1	13	GEORGIA	124
FI	FINLAND.....	26	15	HAWAII	5
FJ	FIJI.....	1	16	IDAHO	1,250
FR	FRANCE.....	40	17	ILLINOIS	39
FT	FRENCH TERRITORY OF AFARS AND ISSAS.....	1	19	IOWA	28
GB	GABON.....	1	20	KANSAS	31
GC	GERMANY, SOVIET ZONE.....	16	21	KENTUCKY	88
GE	GERMANY, FEDERAL REPUBLIC.....	19	23	MAINE	35
GH	GHANA.....	3	24	MARYLAND	153
GL	GREENLAND.....	47	25	MASSACHUSETTS	207
GR	GREECE.....	24	26	MICHIGAN	25
GT	GUATEMALA.....	17	27	MINNESOTA	5
GV	GUINEA.....	3	28	MISSISSIPPI	14
GK	GUAYANA.....	3	29	MISSOURI	36
HK	HONG KONG.....	16	30	MONTANA	4,283
HO	HONDURAS.....	14	32	NEVADA	443
HU	HUNGARY.....	25	33	NEW HAMPSHIRE	29
ID	INDONESIA.....	30	34	NEW JERSEY	36
IN	INDIA.....	41	35	NEW MEXICO	133
IR	IRAN.....	15	36	NEW YORK	241
IS	ISRAEL.....	1	37	NORTH CAROLINA	802
IT	ITALY.....	24	38	NORTH DAKOTA	161
JA	JAPAN.....	20	39	OHIO	1
JM	JAMAICA.....	14	40	OKLAHOMA	34
KE	KENYA.....	2	41	OREGON	2,009
KN	NORTH KOREA.....	14	42	PENNSYLVANIA	40
KS	REPUBLIC OF KOREA.....	96	44	RHODE ISLAND	3
LA	LAOS.....	27	45	SOUTH CAROLINA	113
MA	MADAGASCAR.....	6	46	SOUTH DAKOTA	32
MI	MALAWI.....	1	47	TENNESSEE	1,414
MO	MOROCCO.....	27	48	TEXAS	45
NR	MAURITANIA.....	1	49	UTAH	2,812
NX	MEXICO.....	51	50	VERMONT	4
NY	MALAYSIA.....	4	51	VIRGINIA	412
NZ	MOZAMBIQUE.....	4	53	WASHINGTON	1,187
NC	NEW CALEDONIA.....	8	54	WEST VIRGINIA	1
NI	NIGERIA.....	14	55	WISCONSIN	30
NM	NAMIBIA.....	2	56	WYOMING	2,283
NS	SURINAM.....	4	US	UNITED STATES.....	33,239
NU	NICARAGUA.....	14	UV	UPPER VOLTA.....	2
NY	NORWAY.....	26	VE	VENEZUELA.....	9
NZ	NORWAY.....	16	VN	NDRTH VIET-NAM.....	26
PE	PERU.....	200	VS	REPUBLIC OF VIET-NAM.....	9
PK	PAKISTAN.....	17	WA	SOUTH WEST AFRICA.....	16
PL	POLAND.....	17	YO	YUGOSLAVIA.....	28
PN	PANAMA.....	2	ZA	ZAMBIA.....	25
PO	PORTUGAL.....	15	ZR	ZAIRE.....	26

FIGURE 4.—Inventory of the CRIB file by country and by States of the United States.

ALUM.....	38	GARNET.....	114	PHOSPHOROUS - PHOSPHATE.....	359
ALUMINUM (GEN.).....	97	GAS (NATURAL).....	2	PLATINUM.....	107
BAUXITE.....	240	GEMSTONES.....	166	PLATINUM GROUP METALS.....	19
ALUMINUM (OTHER).....	17	GERMANIUM.....	5	POTASSIUM.....	156
ALUNITE.....		GLAUCONITE.....	2	PUMICE.....	131
AMBER.....		GDLD.....	10,277	PYRITE.....	20
ANTIMONY.....	442	GRANITE, GRANITIC BNEISS.....	26	PYRRHOTITE.....	32
ARSENIC.....	154	GRAPHITE.....	67	PYROPHYLLITE.....	213
ASBESTOS.....	209	GYPSPUM, ANHYDRITE.....	307	QUARTZ.....	8
BARIUM.....	560	HAFNIUM.....		RADIUM.....	240
BERYLLIUM.....	276	HALITE.....	30	RADIO-ACTIVE MATERIALS.....	53
BISMUTH.....	151	HELIUM.....	1	RHENIUM.....	
BITUMENS.....	45	HYDRDBEN.....		RHODIUM.....	
BORON - BORATES.....	1	INDIUM.....		IRIDIUM.....	
BRINES/SALINES.....	49	IODINE.....	2	RUTHENIUM.....	
BROMINE.....		IRON.....	2,026	SAND AND GRAVEL.....	1,664
CADMIUM.....	51	KYANITE, SILLIMANITE, ANDALUSITE.....	127	SAND, MOLDING.....	21
CALCIUM.....	102	LATERITE, SAPROLITE.....		SANDSTONE.....	75
CARBON.....	3	LEAD.....	6,614	SCANDIUM.....	2
CARBONATES.....	34	LIMESTONE (GEN.).....	269	SELENIUM.....	19
CEMENT ROCK.....	1	ULTRA-PURE LIMESTONE.....	4	SHALE.....	41
CERIUM.....	18	HIGH CALCIUM LIMESTONE.....	6	SILICA.....	102
CESIUM.....	1	LITHIUM.....	52	SILVER.....	6,628
CHLORINE.....		LIGHTWEIGHT AGGREGATE.....	5	SLATE.....	8
CHROMIUM.....	441	MAGNESITE.....	7	SODIUM.....	19
CLAY (GEN.).....	273	MAGNESIUM.....	23	STONE (GEN.).....	209
BENTONITE.....	256	MANGANESE.....	1,152	CRUSHED/BROKEN STN MATERIAL.....	246
FULLER'S EARTH.....	17	MARBLE.....	108	DIMENSION DR BUILDING STONE.....	219
KADLIN OR KAOLINITIC CLAY.....	82	MERCURY.....	451	STRONTIUM.....	23
BALL CLAY.....	48	MICA.....	303	SULFIDES.....	8
FIRE CLAY.....	185	SHEET MICA.....	160	SULFUR.....	117
BLOATING MATERIAL.....	27	SCRAP MICA.....	33	SULFURIC ACID.....	
COMMON BRICK CLAY.....	29	FLAKE MICA.....	1	TALC, SDAPSTONE.....	163
COAL.....	1,470	MINERAL PIGMENTS.....		TANTALUM.....	90
ANTHRACITE.....	12	MOLYBDENUM.....	654	TELLURIUM.....	20
BITUMINOUS.....	321	MONAZITE.....	64	THALLIUM.....	1
SUB-BITUMINOUS.....	188	NICKEL.....	564	THORIUM.....	325
LIGNITE.....	42	NIObIUM.....	155	TIN.....	219
COBALT.....	298	NITRDBEN - NITRATES.....	4	TITANIUM.....	691
CONCENTRATE.....		OSMIUM AND IRIIDIUM.....		TUNGSTEN.....	1,199
COPPER.....	6,625	OIL SANDS.....	2	UNIDENTIFIED COMHDDITY.....	1,328
CORUNDUM.....	41	DIL SHALE.....	168	URANIUM.....	2,605
DIAMOND.....	9	OLIVINE.....	28	VANADIUM.....	737
DIATOMITE.....	55	DRE.....		VOLCANIC MATERIALS.....	51
DOLOMITE.....	45	OSMIUM.....		VERMICULITE.....	87
ULTRA-PURE DOLOMITE.....	1	OVERBURDEN.....		WOLLASTONITE.....	1
HIGH MASNESIAN DOLOMITE.....		OXIDES.....		YTRTIUM.....	16
EMERY.....	12	OXYGEN.....		ZEDLITES.....	8
EVAPORATES.....	147	PALLADIUM.....	9	ZINC.....	4,601
FELDSPAR.....	391	PEAT.....	16	ZINC OXIDE.....	1
FLUORINE, FLUORITE.....	565	PERLITE.....	44	ZIRCONIUM.....	196
FLUORINE GAS.....		PETROLEUM.....	108		
GALLIUM.....	7				

37-036 CRIB RECORDS DN FILE

FIGURE 5.—Inventory of the CRIB file by the number of occurrences of individual mineral commodities.

1000 FORM
1020 CRIB
1040 SELECT
1060 A. A50<30>
1080 B. MAJOR<CU>
1100 LOGIC A AND B
1120 SORT
1140 A10 8
1160 COPY
1180 ' '
1200 B10 8
1220 A50 2
1240 ' '
1260 A10 30
1280 ' '
1300 A70 10
1320 A80 12
1340 MAJOR 12
1360 A20 2
1380 A21 'ACTIVE'
1400 A22 'INACTIVE'
1420 C40 25

System displays your job for checking and correction before execution.

DO YOU WISH TO MAKE CHANGES (Y/N)?N

IS THE COPY COMMAND PART OF YOUR CONTROL FILE (Y/N)?Y

DATA OUTPUT MAY BE TO TAPE (T), DISK (D),
OR PRINTED AT TERMINAL (P)?P

Housekeeping details needed by computer before execution of job.

RECORD LENGTH (NUMERIC VALUE)?120

STANDARD RUN, OVERNITE RUN, NO RUN (S,O,N)?S

***** PLEASE KEEP THIS *****

JOB ID = W8D3

Your job identification for use when receiving output.

***** PLEASE KEEP THIS *****

RUN AGAIN OR END THE SESSION (R/E)?E

**** END OF SESSION ****

USED 12.25 UNITS
GOODBYE
00012.36 CRU 0000.16 TCH 0002.16 KC
OFF AT 11:25EDT 09/01/76

End of session.

OUTPUT SESSION

User response underlined
Computer response not underlined

HHH
U#-WBO68001,
PASSWORD

ID:ATK

THE UNIVERSITY OF OKLAHOMA IS RESPONSIBLE FOR
THE SOFTWARE THAT IS UTILIZED BY THE PETROLEUM DATA SYSTEM

.INFORM WAS LAST UPDATED 08-24-76

LIST INFORM (Y/N)?N

(C) CREATE NEW CONTROL FILE
(E) EXECUTE EXISTING CONTROL FILE
(L) LIST DICTIONARY
(R) RETRIEVE OUTPUT
(S) STOP
ENTER CHOICE (C,E,L,R,S)?R

ENTER 4-CHARACTER JOB ID
OR CARRIAGE RETURN TO GET LIST OF JOB ID'S
OR STOP TO STOP
?W8D3

FIGURE 6.—Continued.

3 REPORT FILE(S) RETURNED

JOB ID = W8D3

```
+++++
+      J O B   S U M M A R Y   R E P O R T   +
+ JOBNAME: BW8D300  ENTERED: 76-245 11:26:53  STARTED: 76-245 12:17:03  +
+   CRU:      .0393 Q-TIME:      50:10   ENDED: 76-245 12:22:10  +
+   CCODE: 19D8   SYSTEM: T71BGI128   ELAPSED:      5:07  +
+   CPU:      19. MOUNTS: 0   MAX REGION USED: 112K  +
+++++
```

PSU'S RETURNED = 10

DO YOU WANT TO:
LIST THE REPORT NOW (LIST)
QUEUE FOR HIGH-SPEED PRINT (HSS)
PRINT REPORT VIA RMS (RMS)
MOVE TO PERMANENT FILE (MOVE)
OR NONE OF THE ABOVE (NONE)
YOUR CHOICE: ?LIST

POSITION PAPER AND HIT CARRIAGE RETURN

BEGIN FILE - W8D30201

FORM

CRIB

Output includes retrieval statements,
search statistics, and retrieval results.

SELECT

A. A50<30>
STATE CODE.....

B. MAJOR<CU>
MAJOR.....

LOGIC A AND B

SEARCH
12:18:16.5 SEARCH BEGINNING
12:20:23.6 SEARCH COMPLETED

SEARCHED 31646

SELECTED 15 SUBSET 1

VARIABLES SATISFIED

A 4171

B 824

SORT

A10 8
END OF SORT

COPY

, ,

B10 8

A50 2

, ,

A10 30

, ,

A70 10

A80 12

MAJOR 12

A20 2

A21 'ACTIVE'

A22 'INACTIVE'

C40 25

FIGURE 6.—Continued.

M060806	30	AMADOR MINE	47-06-33N	115-00-30W	CU			4	INACTIVE	VEIN-SHEAR ZONE	
W002875	30	AUSTIN DISTRICT	46-40-	N 112-14-	W	A8	CU	PB	4	INACTIVE	CONTACT METAMORPHISM
W007441	30	BLUE BELL MINE				PB	CU	AU	4	INACTIVE	VEIN: REPLACEMENT
US30039	30	BUTTE DIST (SUMMIT VALLEY)	46-00-	N 112-31-	W	CU	ZN	PB			STOCKWORKS PIPES & IRREGU
W002863	30	BUTTE-BERKELEY DISTRICT	46	02	N 112 32	W	CU		4	ACTIVE	VEIN PORPHYRY INTRUSION
M060811	30	DAILY	46-21-30N	112-06-35W		A8	CU	PB	4	INACTIVE	VEIN/SHEAR ZONE
W002871	30	ELKHORN	46-17-	N 111-57-	W	A8	AU	PB	4	INACTIVE	REPLACEMENT AND CDNTACT M
W007436	30	FOREST ROSE				PB	ZN	A8	4	INACTIVE	REPLACEMENT
M060807	30	GREEN MOUNTAIN MINE	47-15-41N	114-24-18W		CU	AU	A8	4	INACTIVE	VEIN/SHEAR ZONE
US30046	30	HELLGATE GULCH DIST	46-41-	N 111-35-	W	CU					VEINS AND SHEAR ZONES
W002864	30	LONE PINE	45-43-18N	111-40-11W		A8	CU		4	ACTIVE	REPLACEMENT
M060197	30	NANCY HANKS MINE	46-49-29N	113-20-30W		AU	A8	CU	4	INACTIVE	VEINS AND REPLACEMENT
US30050	30	RADERSBURG DIST	46-10-	N 111-42-	W	AU	A8	PB			VEINS AND SHEAR ZONES
W002692	30	SPAR LAKE PROSPECT	48-14-	N 115-53-	W	CU			3	ACTIVE	SEDIMENTARY
US30002	30	SPAR LAKE DEPOSIT	48-14-	N 115-53-	W	CU					STRATBOUND DISSEMINATED
W002703	30	TWIN BRIDGES DISTRICT	45	34	N 112 09	W	CU		4	ACTIVE	VEIN
W007458	30	WASA MINE				ZN	PB	A8	4	INACTIVE	REPLACEMENT SHOOTS
W002863	30	YELLOW BAND MINE	45-20-36N	112-54-47W		AU	A8	CU	4	INACTIVE	SHOOT

LIST, HSS, RMS, MOVE, STOP, OR NONE? STOP

RUN AGAIN OR END THE SESSION (R/E)? E

**** END OF SESSION ****

USED 7.74 UNITS
 GOODBYE
 00007.82 CRU 0000.08 TCH 0004.56 KC

OFF AT 15:34EDT 09/01/76

FIGURE 6.—Continued.

FORM
 CRIB
 SELECT
 TERM
 A. A40< US >
 COUNTRY CODE.....
 B. A50< 09 >
 STATE CODE.....
 LOGIC A AND B
 SEARCH
 15:52:46.7 SEARCH BEGINNING
 15:52:49.2 SEARCH COMPLETED
 SEARCHED 2067
 SELECTED 37 SUBSET 1
 VARIABLES SATISFIED
 A 1045
 B 37

INDEX
 SUBSET 1 HAS 403 RECORDS

ITERATE
 A. A70<N >
 LATITUDE
 B. A80<W >
 LONGITUDE
 LOGIC A AND B
 SEARCH
 15:52:59.3 SEARCH BEGINNING
 15:53:01.8 SEARCH COMPLETED
 SEARCHED 403
 SELECTED 401 SUBSET 2
 VARIABLES SATISFIED
 A 401
 B 401
 (continued in next column)

ITERATE
 A. A70< 41-30- N > THRU < 42-00-00N >
 LATITUDE
 B. A80< 072-22-30W > THRU < 073-00-00W >
 LONGITUDE
 LOGIC A AND B
 SEARCH
 15:53:02.0 SEARCH BEGINNING
 15:53:04.1 SEARCH COMPLETED
 SEARCHED 401
 SELECTED 152 SUBSET 3
 VARIABLES SATISFIED
 A 243
 B 193
 SORT
 A70 9
 END OF SORT

COPY
 ' '
 B10 8
 A10 30
 ' '
 A50 3
 A70 10
 A80 12
 MAJOR 12
 ' '
 C41 30
 ' '
 YES 'YES' ' '
 NO 'NO' ' '

W000484	FELDSPAR PEGMATITE QUARRY NO.	09	41-30-01N	072-31-41W	FLD	CERAMICS	YES
W000485	GRANITIC GNEISS ROCK QUARRY NO	09	41-30-06N	072-30-10W	STN	CONSTRUCTION STONE	YES
W000397	FELDSPAR PEGMATITE DIKE QUARRY	09	41-30-10N	072-33-39W	FLD	CERAMICS	YES
W000406	GRANITIC GNEISS ROCK QUARRY NO	09	41-30-17N	072-30-45W	STN	CONSTRUCTION STONE	YES
W000405	ROCK LANDING FELDSPAR QUARRIES	09	41-30-31N	072-31-23W	FLD	CERAMICS	YES
W000494	GRANITIC GNEISS ROCK QUARRY NO	09	41-30-32N	072-32-58W	STN	CONSTRUCTION STONE	YES
W000493	GRANITIC GNEISS ROCK QUARRY NO	09	41-30-53N	072-32-48W	STN	CONSTRUCTION STONE	YES
W000404	ANDERSON MICA MINES AND SWANSO	09	41-30-56N	072-31-16W	LI MIC	LITHIUM AS DEOXIDIZER, MICA FO	YES
W000403	ENEGREN (POWER) MICA MINE	09	41-31-00N	072-31-17W	MIC	ELECTRICAL INSULATORS	YES
W000298	CRUSHED DIABASE ROCK QUARRY NO	09	41-31-01N	072-55-31W	STN1	CRUSHED ROCK	YES
W000402	FELDSPAR PEGMATITE PROSPECTS N	09	41-31-07N	072-31-53W		CERAMICS	NO
W000396	FELDSPAR PEGMATITE QUARRY NO.	09	41-31-08N	072-35-47W	FLD	CERAMICS	YES
W000304	CHESHIRE BARYTES CO. MINE	09	41-31-09N	072-54-44W	BA		YES
W000944	COPPER MINE NO. DJ-038	09	41-31-11N	072-49-27W	CU	METAL	YES
W000491	GRANITIC GNEISS ROCK QUARRY NO	09	41-31-14N	072-33-45W	STN	CONSTRUCTION STONE	YES
W000943	BROWNSTONE SANDSTONE ROCK QUAR	09	41-31-18N	072-53-25W	STN2	BROWNSTONE BUILDING STONE	YES
W000599	UPPER TRIASSIC COPPER PROSPECT	09	41-31-32N	072-32-05W			NO
W000492	GRANITIC GNEISS ROCK QUARRY NO	09	41-31-34N	072-31-11W	STN	CONSTRUCTION STONE	YES
W000395	FELDSPAR PEGMATITE QUARRY NO.	09	41-31-41N	072-35-54W	FLD	CERAMICS	YES
W000401	EAST SELDEN MICA, BERYL, FELDS	09	41-31-47N	072-31-44W	FLD MIC	FELDSPAR FOR FLOOR-CLEANING C	YES
W000297	CRUSHED DIABASE ROCK QUARRY NO	09	41-31-47N	072-54-56W	STN1	CRUSHED ROCK	YES
W000659	SLATER'S FELDSPAR PEGMATITE QU	09	41-31-50N	072-20-18W	FLD	CERAMICS	YES
W000394	TOLLGATE MICA-FELDSPAR MINE	09	41-31-56N	072-36-40W	FLD	CERAMICS, ELECTRICAL INSULATOR	YES
W000296	CRUSHED DIABASE ROCK QUARRY NO	09	41-31-58N	072-54-39W	STN1	CRUSHED ROCK	YES
W000303	NATHAN BOOTH AND WILLIAM HINMA	09	41-31-58N	072-54-29W	BA		YES
W000658	SLOCUM BERYL FELDSPAR MINE	09	41-32-16N	072-27-59W	FLD	CERAMICS	YES
W000600	MAROMUS GRANITE GNEISS ROCK QU	09	41-32-17N	072-33-59W	STN2	BUILDING STONE	YES
W000301	COPPER PROSPECT NO. DJ-012	09	41-32-35N	072-53-03W			NO
W000601	BENVENUE GRANITE GNEISS ROCK Q	09	41-32-38N	072-34-49W	STN2	BUILDING STONE	YES
W000302	CHESHIRE MINING AND MANUFACTUR	09	41-32-39N	072-54-17W	BA		YES

FIGURE 7.—Conditions statements and the printed output resulting from an area search using latitude and longitude. The search was for those deposits located around Hartford, Conn.

W000400	REEB MICA MINE	09	41-32-48N	072-32-10W	MIC	MICA FOR ELECTRICAL INSULATORS	YES
W000398	MARKHAM MICA MINE	09	41-32-58N	072-32-07W	MIC	ELECTRICAL INSULATORS	YES
W000300	NEW HAVEN MINERAL CO. BARITE M	09	41-33-01N	072-53-42W	BA		YES
W000628	GRANITE GNEISS ROCK QUARRIES N	09	41-33-02N	072-34-42W	STN	BUILDING STONE	YES
W000295	BARITE OCCURRENCE NO. DJ-010	09	41-33-05N	072-53-58W	BA		YES
W000490	METAMORPHIC ROCK QUARRY NO. CJ	09	41-33-08N	072-35-02W	STN	CONSTRUCTION MATERIAL	YES
W000393	WHITE ROCK PEGMATITE QUARRIES	09	41-33-17N	072-35-52W	FLD	CERAMICS	YES
W000489	ARKOSE ROCK QUARRY NO. CJ-037	09	41-33-19N	072-36-54W	STN2	BUILDING STONE	YES
W000293	CRUSHED BASALT ROCK QUARRY NO.	09	41-33-32N	072-47-54W	STN1	CRUSHED ROCK	YES
W000294	YORK HILL TRAPROCK CO. QUARRY	09	41-33-34N	072-45-14W	STN1	CRUSHED ROCK	YES
W000603	MIDDLETOWN LEAD-SILVER MINE	09	41-33-34N	072-36-44W	PB AG		YES
W000292	CRUSHED BASALT ROCK QUARRY NO.	09	41-33-40N	072-47-47W	STN1	CRUSHED ROCK	YES
W000392	BERYL FELDSPAR PEGMATITE PROSP	09	41-33-49N	072-35-56W		SPECIAL METAL ALLOYS, CERAMICS	NO
W000291	CRUSHED BASALT ROCK QUARRY NO.	09	41-33-51N	072-47-28W	STN1	CRUSHED ROCK	YES
W000317	NO NAME GIVEN	09	41-34- N	072-33- W			YES
W000488	GRANITE GNEISS ROCK QUARRY NO.	09	41-34-02N	072-34-18W	STN	BUILDING STONE	YES
W000391	FELDSPAR PEGMATITE QUARRY NO.	09	41-34-15N	072-34-17W	FLD	CERAMICS	YES
W000390	STATE FOREST NO. 2 MICA MINE	09	41-34-30N	072-33-09W	MIC	ELECTRICAL INSULATORS	YES
W000604	CHATHAM GREAT HILL COBALT NICK	09	41-34-38N	072-33-03W	AS FE CO		YES
W000389	HALE-WALKER BERYL PROSPECT AND	09	41-35-13N	072-35-17W	FLD	CERAMICS	YES
W000602	AMPHIBOLITE GNEISS ROCKQUARRY	09	41-35-21N	072-35-39W	STN	NATURAL BUILDING MATERIAL	YES
W000380	STRICKLAND-CRAMER FELDSPAR-MIC	09	41-35-32N	072-35-31W	FLD MIC	CERAMICS, ELECTRICAL INSULATOR	
W000406	GREAT HILL STATE FOREST NO. 1	09	41-35-45N	072-32-28W	MIC	BOOK MICA, SCRAP MICA FOR ELEC	YES
W000646	BASALT ROCK QUARRY NO. CJ-071	09	41-36-08N	072-41-16W	STN1	CRUSHED STONE	YES
W000387	FELDSPAR PEGMATITE QUARRY NO.	09	41-36-17N	072-34-21W	FLD	CERAMICS	YES
W000645	BARITE OCCURRENCES NO. CJ-070	09	41-36-53N	072-43-34W	BA	DRILLING MUDS	NO
W000290	CRUSHED BASALT ROCK QUARRY NO.	09	41-37-04N	072-47-40W	STN1	CRUSHED ROCK	YES
W000299	BERLIN MOORE'S MILL BARITE MIN	09	41-37-09N	072-47-40W	BA		YES
W000289	LIMESTONE QUARRY NO. DJ-002	09	41-37-09N	072-49-51W	LST	HYDRAULIC CEMENT	YES
W000386	GOTTA-WALDEN FELDSPAR PROSPECT	09	41-37-09N	072-35-39W	FLD	CERAMICS	YES

FIGURE 7.—Continued.

FORM

CRIB

SELECT

- A. M160 LT 1000
DEPTH OF WORKINGS BELOW SURFACE.
- B. M160 GT 100
DEPTH OF WORKINGS BELOW SURFACE.
- C. M161<M>
UNITS
- D. M170 GT 100
LENGTH OF WORKINGS.....
- E. M171<M>
UNITS

LOGIC (A*B*C)*(D*E)
SEARCH

11:23:04.5 SEARCH BEGINNING
11:34:36.3 SEARCH COMPLETED

SEARCHED 33400
 SELECTED 14 SUBSET 1

VARIABLES	SATISFIED
A	451
B	374
C	88
D	412
E	55

ITERATE

- A. A40< US >
COUNTRY CODE.....

LOGIC A
SEARCH

11:34:36.5 SEARCH BEGINNING
11:34:37.2 SEARCH COMPLETED

SEARCHED 14
 SELECTED 8 SUBSET 2

VARIABLES	SATISFIED
A	8

FIGURE 8.—Conditions statements and the printed output resulting from a numeric search. The search was for those deposits in the United States in which the depth and length of workings were within certain limits.

LIST

B10

A40

A50

A10

C10

MAJOR

M15

M160

M161

M170

M171

M220

A21

A22

YES

NO

RECORD NO..... W006916
COUNTRY CODE..... US
STATE CODE..... 21
DEPOSIT NAME..... DYERS HILL FLUORSPAR DEPOSITS
COMMODITIES PRESENT: F ZN PB CD GE GA
MAJOR..... F
DEPTH OF WORKINGS BELOW SURFACE. 210
UNITS M
LENGTH OF WORKINGS..... 1440
UNITS M
COMMENTS (DESCRIP. OF WORKINGS): DYERS HILL NO. 1 WHICH IS MINED OUT, WAS
MINERALIZED WITH FLUORSPAR FOR A LENGTH OF 1280 M. IN THE MAIN FAULT. MINABLE
ORE HAD A 120 M. VERTICAL EXTENT AND VEIN WIDTHS OF 0.3 TO 10 M.
PROPERTY IS INACTIVE

YES

FIGURE 8.—Continued.

RECORD NO..... W006927
COUNTRY CODE..... US
STATE CODE..... 32
DEPOSIT NAME..... DAISY FLUORSPAR MINE
COMMODITIES PRESENT: F CLY CA QTZ U HG
MAJOR..... F
SIZE OF DEPOSIT..... LARGE
DEPTH OF WORKINGS BELOW SURFACE. 150
UNITS M
LENGTH OF WORKINGS..... 270
UNITS M
COMMENTS(DESCRIP. OF WORKINGS): DAISY MINE WORKINGS ARE A COMPLEX MAZE WITH 14
LEVELS AND SUBLEVELS IN AN AREA 270 M. LONG AND 100 M. WIDE. LARGEST SINGLE
ORE SHOOT WIDTH ENCOUNTERED IS 24 M.
PROPERTY IS ACTIVE

YES

RECORD NO..... W006929
COUNTRY CODE..... US
STATE CODE..... 35
DEPOSIT NAME..... WHITE EAGLE FLUORSPAR MINE
COMMODITIES PRESENT: F QTZ
MAJOR..... F
SIZE OF DEPOSIT..... LARGE
DEPTH OF WORKINGS BELOW SURFACE. 158
UNITS M
LENGTH OF WORKINGS..... 236
UNITS M
COMMENTS(DESCRIP. OF WORKINGS): SURFACE CUTS ARE AS DEEP AS 30 M.
PROPERTY IS INACTIVE

YES

RECORD NO..... W006934
COUNTRY CODE..... US
STATE CODE..... 35
DEPOSIT NAME..... GREENLEAF FLUORSPAR MINE
COMMODITIES PRESENT: F QTZ
MAJOR..... F
SIZE OF DEPOSIT..... LARGE
DEPTH OF WORKINGS BELOW SURFACE. 152
UNITS M
LENGTH OF WORKINGS..... 281
UNITS M
COMMENTS(DESCRIP. OF WORKINGS): AGGREGATE LENGTH OF WORKINGS IS ABOUT 900 M.
AVERAGE VEIN WIDTH IS 1.2 M. LENGTH OF WORKINGS IS LONGEST AT THE 106.5 M.
LEVEL (281 M.).
PROPERTY IS INACTIVE

YES

RECORD NO..... W006935
COUNTRY CODE..... US
STATE CODE..... 35
DEPOSIT NAME..... SHRINE FLUORSPAR MINE
COMMODITIES PRESENT: F QTZ FE AU AG
MAJOR..... F
SIZE OF DEPOSIT..... LARGE
DEPTH OF WORKINGS BELOW SURFACE. 192
UNITS M
LENGTH OF WORKINGS..... 230
UNITS M
COMMENTS(DESCRIP. OF WORKINGS): INDIVIDUAL VEINS OF FLUORSPAR ARE ONLY UP TO
0.6 M. WIDE
PROPERTY IS INACTIVE

YES

FIGURE 8.—Continued.

RECORD NO..... W006936
COUNTRY CODE..... US
STATE CODE..... 35
DEPOSIT NAME..... BURRO CHIEF FLUORSPAR MINE
COMMODITIES PRESENT: F CU FE QTZ
MAJOR..... F
SIZE OF DEPOSIT..... LARGE
DEPTH OF WORKINGS BELOW SURFACE, 198
UNITS M
LENGTH OF WORKINGS..... 365
UNITS M
COMMENTS(DESCRIP. OF WORKINGS): INDIVIDUAL ORE SHOOT'S ARE UP TO 11 M. WIDE AND
120 M. LONG SOUTHWARD, DIVERGES ABOUT 10 M. FROM THE FIRST FAULT THEN REMAINS
PARALLEL FOR THE EXTENT OF THE MAPPED AREA.
PROPERTY IS INACTIVE

YES

RECORD NO..... W007431
COUNTRY CODE..... US
STATE CODE..... 30
DEPOSIT NAME..... HIDDEN LAKE MINE
COMMODITIES PRESENT: AU AG
MAJOR..... AU
SIZE OF DEPOSIT..... SMALL
DEPTH OF WORKINGS BELOW SURFACE, 150
UNITS M
LENGTH OF WORKINGS..... 700
UNITS M
COMMENTS(DESCRIP. OF WORKINGS): EARLL (1972) REPORTS MILL ON PROPERTY BUT IN
POOR CONDITION. MINE DEVELOPED BY ADIT AND INCLINED SHAFT. SOFT VEIN MATERIAL

NEAR THE SURFACE ENABLED LOW GRADE ORE TO BE MINED PROFITABLE.
PROPERTY IS INACTIVE

YES

RECORD NO..... W007441
COUNTRY CODE..... US
STATE CODE..... 30
DEPOSIT NAME..... BLUE BELL MINE
COMMODITIES PRESENT: PB CU ZN AU AG
MAJOR..... PB CU AU AG
SIZE OF DEPOSIT..... SMALL
DEPTH OF WORKINGS BELOW SURFACE, 150
UNITS M
LENGTH OF WORKINGS..... 220
UNITS M
COMMENTS(DESCRIP. OF WORKINGS): MINE CONSISTS OF 220 M ADIT INTO VEIN WHICH
OUTCROPS ON EAST WALL OF STEEP CANYON. VEIN TERMINATED BY FAULTING AT CANYON
BOTTOM. SHAFT AT MOUTH OF ADIT PROBABLY NOT DEEP - NO HOISTING MACHINERY. ALL
WORKINGS ARE NOW CAVED AND WERE FLOODED IN 1960.
PROPERTY IS INACTIVE

YES

FIGURE 8.—Continued.

FORM

CRIB

SELECT

A. A40< US >
COUNTRY CODE.....

B. A50< 47 >
STATE CODE.....

LOGIC A AND B
SEARCH
12138140.3 SEARCH BEGINNING
12142113.8 SEARCH COMPLETED

SEARCHED 33400

SELECTED 1397 SUBSET 1

VARIABLES SATISFIED

A 29647

B 1397

COUNT

A60 40

VALUE

FREQUENCY

ANDERSON	70
ASHE	33
BEDFORD	1
BENTON	1
BLEDSON	38
BLOUNT	3
BRADLEY	14
CAMPBELL	6
CANNON	34
CARROLL	13
CARTER	12
CLAIBORNE	51
CLAIBORNE AND UNION, TENNESSEE	91
CLAY	1
COCKE	13
COFFEE	21
CUMBERLAND	9
DAVIDSON	11
DE KALB	11
DECATUR	2
DEKALB	4
DICKSON	69
DYER	1
FAYETTE	2
FENTRESS	7
FRANKLIN	7
GIBSON	7
GILES	1
GRAINGER	18
GRAINGER, HANCOCK, HAWKINS, AND UNION	11
GREENE	1
GREENE AND WASHINGTON	24
GRUNDY	1
HAMBLEY	4
HAMILTON	3
HANCOCK	7
HARDEMAN	10
HARDIN	2
HAWKINS	7
HENDERSON	9
HENRY	12
HICKMAN	26
HUMPHREYS	18
JACKSON	2
JEFFERSON	17
JEFFERSON, KNOX, AND SEVIER	7
JOHNSON	1
	8

FIGURE 9.—Conditions statements and the printed output resulting from a frequency count using the COUNT command of the CRIB file on Tennessee, by county.

KNOX	11
LAUDERDALE	9
LAWRENCE	1
LINCOLN	3
LOUDON	25
MACON	8
MADISON	3
MARION	13
MARSHALL	3
MAURY	68
MC MINN, MONROE, LOUDON	1
MCMINN	36
MCNAIRY	2
MEIGS	1
MITCHELL	1
MONROE	139
MONROE-MCMINN	1
MONTGOMERY	1
MOORE	5
MORGAN	6
OBION	6
OVERTON	4
PERRY	1
PICKETT	5
POLK	8
PUTNAM	19
RHEA	1
ROANE	8
ROBERTSON	3
RUTHERFORD	8
SCOTT	17
SEQUATCHIE	8
SEVIER	10
SHELRY	23
SMITH	9
STEWART	2
SULLIVAN	18
SUMNER	11
TROUSDALE	4
UNICOI	39
UNICOI AND WASHINGTON	2
UNICOI	2
UNION	25
VAN BUREN	6
WARREN	3
WASHINGTON	19
WASHINGTON AND UNICOI	1
WAYNE	2
WEAKLEY	25
WHITE	2
WILLIAMSON	37
WILSON	11
TOTAL	----- 1397

G I P S Y - UNIVERSITY OF OKLAHOMA 12:43 P.M. TUESDAY SEPTEMBER 15, 1976

FIGURE 9.—Continued.