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MEDICAL INFORMATION MANAGEMENT SYSTEM (MIMS): AN AUTOMATED HOSPITAL INFORMATION SYSTEM

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AN AUTOMATED HOSPITAL INFORMATION SYSTEM**

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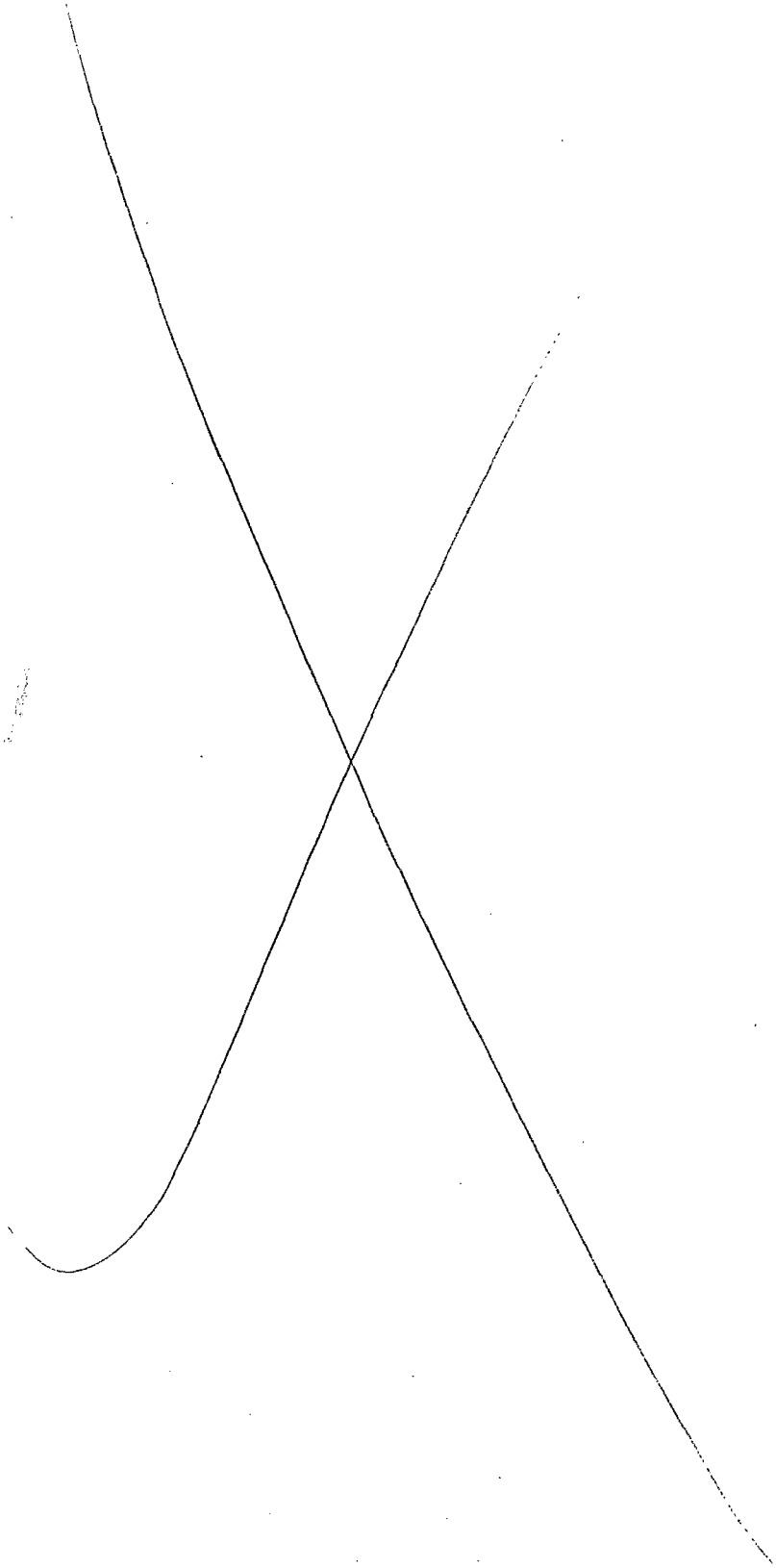
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September 1971

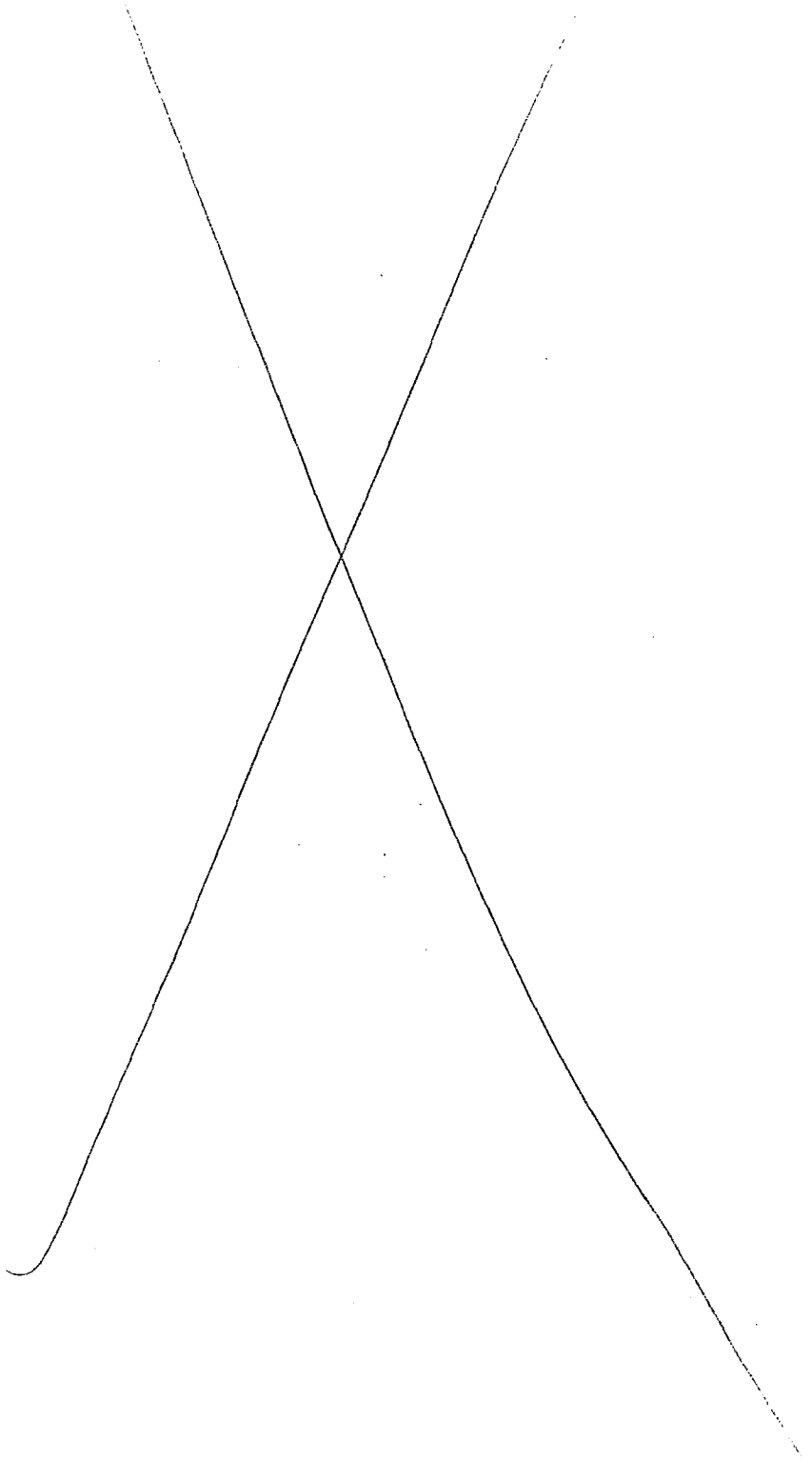
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ABSTRACT

This report describes an automated hospital information system that handles all data related to patient-care activities. The report is designed to serve as a manual for potential users—nontechnical medical personnel who will use the system. Examples of the system's operation, commentary on the examples, and a complete listing of the system program are included.



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MEDICAL INFORMATION MANAGEMENT SYSTEM (MIMS):
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by

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BACKGROUND AND FUNCTION OF MIMS

The capability of hospitals to maintain medical records is vital to the improvement of medical services for the average American citizen. These records are essential to the diagnosis and treatment of patients and provide an essential base for comparative analysis for medical research and hospital administration.

The Medical Information Management System (MIMS) is a real-time hospital information system with teletype input. Its function is to handle all aspects of data related to patient care. Its prime benefits are (1) the ability to recall the record of a specific patient (or patients) in a matter of seconds, (2) the ability to search for specific types of data among patients' records, and (3) the ability to do medical research with a rich and readily available data base.

A computer program initially was developed at NASA/Houston to monitor the health status of astronauts and subsequently was continued by Dr. Tate Minckler at the Presbyterian Hospital in Denver. However, Dr. Minckler's program was not fully operational and lacked the documentation required by potential users. This past summer², during the NASA/Morgan Workshop program conducted at GSFC, Prof. Ronald Schwarz of Federal City College updated the computer program so that it can be used by anyone and developed a users' manual containing complete, easy-to-follow instructions for operating the system. The MIMS package on which this users' guide is based is a redesigned and improved

¹Currently with Computing and Software, Inc.

²June 15 through August 30, 1971.

model of the previous work of Dr. Minckler; also, the cost of running MIMS on a day-in, day-out basis (one of the problems with the earlier system) has been reduced. MIMS is written in FORTRAN in a version developed by United Computing Systems, Inc. In its present form, MIMS can be run only on a CDC 6400 computer because of the size of the internal word structure.

The package is a generalized information storage and retrieval system that enables the user to accomplish four basic functions:

- Definition of file structure to accommodate individual needs.
- Data entry.
- Data retrieval.
- Data revision and file maintenance.

ORGANIZATION OF MIMS

The MIMS package consists of six programs, each of which operates independently but all of which are connected by references to common file names in the system. The segments are—

HEADER: creates categories of data.

STORE: stores data under the categories from HEADER.

RETRIEVE: recalls desired configurations of data.

UPDATE: alters or deletes specific data items.

SORTER: rearranges related (data) records.

MERGE: combines two sets of records.

The discussion of each of the six program units and the related examples should clarify for the potential user the way in which MIMS is used as an automated hospital information system.

The system is user oriented. No technical training is needed to interact with the system, except the ability to read and understand this guide. All program segments are conversational, with the user responding to questions generated by the system.

This guide includes examples for almost every option available in MIMS. Explanation is provided in the text material. System commands—those key words or phrases that control activities such as the activation and deactivation of the programs—are illustrated, with user responses underlined. In addition, a complete listing of the program is provided in the appendix.

DEFINITIONS

Several basic terms are used throughout the discussion. For easy reference, we define them here:

- **Headings:** labels or categories of data which are created during the HEADER program.
- **Header file:** a group of headings corresponding to a particular data record.
- **Header-file name:** an acronym by which a header file is known, formed from the first three letters of the department name and the first four letters of the record.
- **Data field:** any group of letters, words, or numbers (or combinations of the three) that is a response to a heading.
- **Data record:** a logically related set of heading-data pairs for an arbitrary header file.
- **Data file:** a group of data records.
- **Data-file name:** the designation by which a set of data records is known; it is given during the STORE program.
- **ID items:** the first four data fields in a record, namely SOC SEC #, DEPT, RECORD, and DATE.

MIMS: THE SIX PROGRAM UNITS

HEADER Program

The HEADER program creates a file of headings or labels for data that will subsequently be placed under these headings. Headings may consist of from one to 24 (a theoretical maximum) alphabetic and/or numeric characters. As many as 160 headings are possible under a single file name.

To call the HEADER segment, the user types EXEC, OLD, HEADER¹ (see Figure 1). After the teletype responds with READY, the user types RNH. This command initiates the running of the program.

To illustrate an unusual situation, let us assume that by coincidence a second user requests ADMINIT as the header file name for his set of headings after someone else has already used it. At the conclusion of this input, the second user will be informed that he can either place his headings under a new file name or replace the first header file with his own by typing an asterisk (Figure 2). In the former case, the user must be careful, in the future, to spell the name of the department and record in such a way that the creation of the seven-letter header file name matches the new one he has suggested.

If Instructions are Needed. New users may want to reply YES (or just Y) to the question DO YOU NEED OPERATING INSTRUCTIONS? In this case, a set of instructions on how to use HEADER is printed. The stop skip code (S) enables the user to skip selected headings when entering data later. (Figure 1).

Naming the Header File. A group of headings associated with a set of data must have a name by which the group can be identified. The name of a header file is formed from the first three letters of the department name and the first four letters of the record. Fewer letters are permissible as long as there is at least one letter from each. In the sample, ADMINIT is the name of the header file. It was created from ADMitting department and from an INITial visit record (Figure 1).

Level Codes and Headings. Each heading consists of a level code and a heading name. The level code, a number from zero to nine, specifies the degree of indentation of the heading. A colon must follow each heading for which a response is anticipated. Headings used for organizational purposes only, such as PULSE in the header file CARPULS (Figure 3), will not need a colon. [Caution: Because of spacing considerations, the higher the level code (that is, the greater the indentation of a heading) the fewer the characters available for that heading name.]

The user types an asterisk to indicate that all level codes and headings for a particular file have been supplied.

Four ID Items. The first four items in a file are used to identify individual records. These four entries uniquely identify the data associated with them.

¹ For illustration purposes only, all underlined items in the figures indicate user responses. Nonunderlined items are machine generated.

EXEC. OLD. HEADER

READY.

RNH

PROGRAM: HEADER DATE: 08/05/71 TIME: 14.57.28

THIS PROGRAM WILL BUILD A FILE OF LEVEL CODES AND HEADINGS. DO YOU NEED OPERATING INSTRUCTIONS ? YES OK, HERE'S HOW IT'S DONE. WHEN THE FIRST QUESTION MARK APPEARS, ENTER A LEVEL CODE (0-9). WHEN THE NEXT QUESTION MARK APPEARS , ENTER THE HEADING (FROM 1-24 CHARACTERS) THAT CORRESPONDS TO YOUR LEVEL CODE. FOR HEADINGS THAT WILL NORMALLY HAVE DATA FOLLOWING THEM ENTER A COLON AFTER THE HEADING. FOR BLIND HEADINGS (THOSE WHICH WILL NOT HAVE DATA FOLLOWING THEM) DO NOT ENTER THE COLON.

REPEAT THIS PROCESS UNTIL YOU HAVE NO MORE HEADINGS--THEN ENTER AN ASTERISK TO TERMINATE THE PROGRAM. IF YOU WISH TO ENTER A STOP SKIP CODE, ENTER AN "S" INSTEAD OF A LEVEL CODE. THEN ENTER THE LEVEL CODE AND HEADING AS USUAL FOLLOWING THE NEXT TWO QUESTION MARKS.

ENTER 3 LETTERS OF DEPT. NAME AND 4 LETTERS OF RECORD
---ENTER FEWER IF 7 ARE NOT AVAILABLE ? ADMINIT

BEGIN DATA INPUT.

? 0
? SOC SEC #:
? 0
? DEPT:
? 0
? RECORD:
? 0
? DATE:
? 1
? NAME:
? 1
? AGE:
? 1
? SEX:
? 1
? ADDRESS:
? 2
? PHONE:
? 1
? COMMENTS:
? *
"ADMINIT" HAS BEEN SAVED AS HEADER FILE.
END.

0.193 / 0.964 / 5

Figure 1. ADMINIT Created as Header File

EXEC, OLD, HEADER

READY.
RNH

PROGRAM: HEADER DATE: 08/05/71 TIME: 15.12.12

THIS PROGRAM WILL BUILD A FILE OF LEVEL CODES AND HEADINGS. DO YOU NEED OPERATING INSTRUCTIONS ? NO

ENTER 3 LETTERS OF DEPT. NAME AND 4 LETTERS OF RECORD
---ENTER FEWER IF 7 ARE NOT AVAILABLE ? ADMINIT

BEGIN DATA INPUT.

? 0
? SOC SEC #:
? 0
? DEPT:
? 0
? RECORD:
? 0
? DATE:
? 1
? NAME:
? 1
? EKG:
? 2
? HT:
? 2
? WT:
? 1
? HEART ATTACKS
? 2
? HOW MANY:
? 2
? DATE MOST RECENT:
? 2
? AVG DURATION:
? 2
? SEVERITY:
? 1
? PRESENT CONDITION:
? *

FILE ALREADY PERMANENT. ENTER NEW FILENAME OR
ENTER AN ASTERISK TO REPLACE CURRENT PERMANENT FILE: ? CARHIST
"CARHIST" HAS BEEN SAVED AS HEADER FILE.
END.

0.238 / 1.182 / 10

Figure 2. ADMINIT Has Been Created (Figure 1) and Is Already a Permanent Header File, so CARHIST Is Used as the Header File

EXEC, OLD, HEADER

READY.

RNH

PROGRAM: HEADER DATE: 08/05/71 TIME: 15.02.11

THIS PROGRAM WILL BUILD A FILE OF LEVEL CODES AND HEADINGS. DO YOU NEED OPERATING INSTRUCTIONS ? N

ENTER 3 LETTERS OF DEPT. NAME AND 4 LETTERS OF RECORD
---ENTER FEWER IF 7 ARE NOT AVAILABLE ? CARPULS

BEGIN DATA INPUT.

? 0
? SOC SEC #:
? 0
? DEPT:
? 0
? RECORD:
? 0
? DATE:
? 1
? NAME:
? 1
? PULSE
? 2
? SITTING:
? 2
? STANDING:
? 2
? AFTER EXERCISE
? 3
? IMMED AFTER:
? 3
? TWO MINUTES AFTER:
? *
"CARPULS" HAS BEEN SAVED AS HEADER FILE.
END.

0.175 / 0.874 / 5

Figure 3. CARPULS Created as Header File

It is suggested, but not mandatory, that the first four items in all header files be SOC SEC #, DEPT, RECORD, and DATE, all with level-code zero.

Nonrepetitive Use of HEADER. Once a file of headings has been created, HEADER need no longer be called for that file. The name of a particular header file, however, will be used regularly by other program segments to call up that file of headings. The user, therefore, must remember the precise

spelling of the department and record under consideration so that the program can accurately recreate the appropriate header-file name and find the corresponding header file.

RESTART Option in HEADER. If while entering level codes and headings the user wishes to start over, he simply types RESTART, and the program will begin again without aborting.

STORE Program

The STORE program enables the user to enter data under a specific header file requested by the user. The program recreates the header-file name from the DEPT and RECORD names supplied by the user and uses it to find the header file associated with it.

To call STORE, the user types EXEC, OLD, STORE (or just OLD, STORE if he has run any other program directly before STORE). In response to READY, he types RNH.

Naming the Data File. The name of a data file is a string of one to seven characters given to a specific set of data records. Data file names already in use will ordinarily not be used. In the usual case, one wishes to add new records to an existing data file. One could call the set of new records a name such as NEWDATA. He could sort NEWDATA, if necessary, using SORTER and could then call MERGE to merge NEWDATA into the appropriate existing data file having such records. This procedure could be performed regularly, perhaps daily, as a standard updating technique. The file NEWDATA could be cleared by the user at the conclusion of MERGE by typing UNSAVE, NEWDATA. Thus the name NEWDATA would be available for repeated use in this context.

Recalling the Proper Header File. The user's responses to DEPT? and RECORD? enable STORE to locate the appropriate header file. If misspelling of the department and/or record leads to the formation of a nonexistent header-file name, the user is so informed and is asked to enter valid data.

Data Entry: Proper Format. Each data entry must be followed by an asterisk. For data items requiring more than one line, one hits the carriage return and waits until the end of the entire data item to affix the asterisk. Numerical data, except SOC SEC #, must be enclosed in parentheses to accommodate the ranging function of RETREVE (see the RETREVE program section).

There are other musts for entering data. The date must be in DAY MONTH YR* form where DAY and YR are two-digit numbers and MONTH is the first three letters of the month. (e. g., DATE ? 08 JUL 71*). Be sure to leave one

space between DAY and MONTH and one between MONTH and YR. Also, the names must be in the format LAST, FIRST, MIDDLE*, with a space between the comma and the first name and between the first and middle names. Initials may be used for both the first and middle names.

If Another Patient. When a new patient's data are being processed, the user replies YES (or Y), and the program returns to the first header entry of the header file being used (Figure 4).

If No New Patient But Another Record. For a new record for the same patient, the user supplies the record, and a new header-file name is created. The corresponding header file is then used to question the user, who enters data under the new record within the same department (Figure 5).

If No More Patients and Records. The user is informed that his data file has been saved under the data file name given when he indicates he has no more patients and records to enter (Figure 4). If, however, his name was already used, he can either supply a new name for his file or replace the other data file with his by entering an asterisk.

End of Program. At the end of the program, a message indicating that the data file has been saved under the proper name is printed.

RESTART Option in STORE. Typing RESTART at any point during data entry commands the program to return to the beginning of the program.

RETREVE Program

The ability to recall information when it is wanted is the heart of any information storage and retrieval system. The RETREVE program (the seven-letter limitation precludes using "RETRIEVE") enables the user to define a search on very specific or very general information. To call the program, one types EXEC, OLD, RETREVE, and responds with RNH, M=13500 after READY appears.

ID Items. Retrieval is conversational, consisting of machine interrogation and user response. In all retrievals, the user answers seven questions. The more specific the responses to the ID items, the more efficient and less costly the search. For instance, a search on a specific SOC SEC # yields all records for that person. The program does not have to "look at" the records of persons whose SOC SEC # differs from the one in question; it has only to compare the SOC SEC #'s and pass on if no match is found.

CONDITION Question. If the search is defined by CONDITION (e.g., AGE: 70-75*), one might respond ALL* to the four ID items. Boolean connectors provide great

EXEC, OLD, STORE

READY.

RNH

PROGRAM: STORE DATE: 08/05/71 TIME: 15.17.48

IF AT ANY TIME YOU WISH TO START OVER, ENTER "RESTART".

ENTER NAME YOU WISH TO CALL THIS DATA FILE: ? ACTIVE

DEPT. ? ADMITTING
RECORD ? INITIAL

THIS PROGRAM WILL USE ADMINIT AS HEADER FILE.

BEGIN DATA INPUT.

SOC SEC #	? <u>111-11-1111*</u>
DEPT	<u>ADMITTING</u>
RECORD	<u>INITIAL</u>
DATE	? <u>05 AUG 71*</u>
NAME	? <u>CABLE, JAMES A*</u>
AGE	? <u>(35) YRS*</u>
SEX	? <u>M*</u>
ADDRESS	? <u>155 BRIDGE RD, ST. LOUIS*</u>
PHONE	? <u>222-4444*</u>
COMMENTS	? <u>NEW PATIENT*</u>

ANOTHER PATIENT ? Y

SOC SEC #	? <u>222-22-2222*</u>
DEPT	<u>ADMITTING</u>
RECORD	<u>INITIAL</u>
DATE	? <u>05 AUG 71*</u>
NAME	? <u>ABLE, ALICE A*</u>
AGE	? <u>(22) YRS*</u>
SEX	? <u>F*</u>
ADDRESS	? <u>RT 8, ROARING SPRINGS, PA*</u>
PHONE	? <u>565-5656*</u>
COMMENTS	? <u>HAS NO INSURANCE*</u>

ANOTHER PATIENT ? Y

SOC SEC #	? <u>999-99-9999*</u>
DEPT	<u>ADMITTING</u>
RECORD	<u>INITIAL</u>
DATE	? <u>05 AUG 71*</u>
NAME	? <u>SABLE, ALEX V*</u>
AGE	? <u>(57) YRS*</u>
SEX	? <u>M*</u>
ADDRESS	? <u>1015 VINE ST*</u>
PHONE	? <u>987-6543*</u>
COMMENTS	? <u>EMERGENCY ROOM CASE*</u>

Figure 4. ACTIVE Created as Data File

```

ANOTHER PATIENT ? Y
SOC SEC #           ? 222-22-2223*
DEPT                ADMITTING
RECORD              INITIAL
DATE                ? 06 AUG 71*
NAME                 ? ZABLE, MABLE C*
AGE                  ? (41) YRS*
SEX                  ? F*
ADDRESS              ? RIDGE RD, CHICAGO*
PHONE                ? 555-1234*
COMMENTS             ? NONE*

ANOTHER PATIENT ? N
ANOTHER RECORD ? N

```

```

"ACTIVE " HAS BEEN SAVED    AS DATA FILE.
STOP.

```

```

0.728 /      5.823 /      56

```

Figure 4 (Concluded).

flexibility in specifying the CONDITION of the search. Parentheses can also be used to define a logical command. Figure 6 should give a feeling for the possibilities in defining a search.

ACTION Options. The response to ACTION defines the format of the data to be retrieved. The six options available are LIST, COUNT, TABULATE, TAB-SD, CROSSTAB, and COPY.

LIST generates a copy of the data requested.

COUNT gives the number of records fitting a given description.

TABULATE generates the data asked for in WHAT according to the attributes in CONDITION. It also provides a count of all such cases.

TAB-SD is identified with TABULATE but in addition generates statistical data such as mean, standard deviation, standard error, minimum data value, and maximum data value, as well as one and two standard-deviation confidence intervals.

CROSSTAB generates a grid of data.

The COPY, TABULATE, TAB-SD, and CROSSTAB options enable the user to specify information he wants to file under a new data file name. Ordinarily after information is retrieved and displayed for the user, it is not saved; it must be retrieved again if needed at a later date.

EXEC, OLD, STORE

READY.

RNH

PROGRAM: STORE DATE: 08/05/71 TIME: 15.28.28

IF AT ANY TIME YOU WISH TO START OVER, ENTER "RESTART".

ENTER NAME YOU WISH TO CALL THIS DATA FILE: ? NEWDATA

DEPT. ? CARDIOLOGY

RECORD ? HISTORY

THIS PROGRAM WILL USE CARHIST AS HEADER FILE.

BEGIN DATA INPUT.

SOC SEC #	? <u>222-22-2222*</u>
DEPT	<u>CARDIOLOGY</u>
RECORD	<u>HISTORY</u>
DATE	? <u>05 AUG 71*</u>
NAME	? <u>ABLE, ALICE A*</u>
EKG	? <u>NORMAL*</u>
HT	? <u>(60) IN*</u>
WT	? <u>(140) LBS*</u>
HEART ATTACKS	
HOW MANY	? <u>(2)*</u>
DATE MOST RECENT	? <u>22 MAR 71*</u>
AVG DURATION	? <u>(1) MINUTE*</u>
SEVERITY	? <u>MILD*</u>
PRESENT CONDITION	? <u>RESTING COMFORTABLY*</u>
ANOTHER PATIENT ? <u>Y</u>	
SOC SEC #	? <u>999-99-9999*</u>
DEPT	<u>CARDIOLOGY</u>
RECORD	<u>HISTORY</u>
DATE	? <u>06 AUG 71*</u>
NAME	? <u>SABLE, ALEX V*</u>
EKG	? <u>ERRATIC*</u>
HT	? <u>(72) IN*</u>
WT	? <u>(185) LBS*</u>
HEART ATTACKS	
HOW MANY	? <u>(3)*</u>
DATE MOST RECENT	? <u>28 JUL 71*</u>
AVG DURATION	? <u>(5) MINUTES*</u>
SEVERITY	? <u>VERY SHARP PAINS*</u>
PRESENT CONDITION	? <u>IN POOR SHAPE*</u>
ANOTHER PATIENT ? <u>N</u>	
ANOTHER RECORD ? <u>Y</u>	

Figure 5. NEWDATA Created as Data File

RECORD ? PULSE

THIS PROGRAM WILL USE CARPULS AS HEADER FILE.

BEGIN DATA INPUT.

```
SOC SEC #           ? 222-22-2222*
DEPT                CARDIOLOGY
RECORD              PULSE
DATE                ? 06 AUG 71*
NAME                ? ABLE, ALICE A*
PULSE
  SITTING           ? (60)*
  STANDING           ? (62)*
  AFTER EXERCISE
  IMMED AFTER        ? (90)*
  TWO MINUTES AFTER ? (75)*
```

ANOTHER PATIENT ? N

ANOTHER RECORD ? N

'NEWDATA' HAS BEEN SAVED AS DATA FILE.
STOP.

0.928 / 7.423 / 64

Figure 5 (Concluded).

COPY is commonly used to transfer a copy of a patient's record to another file name. For example, suppose there is a file called ACTIVE for current patients and one called INACTIV (just seven letters allowed) for past patients. One wants to transfer the records of a newly released patient from ACTIVE to INACTIV. He calls RETREVE and specifies the COPY option under ACTION for the patient(s) involved. He attaches a name such as TRANSFER to this group of records and merges TRANSFER into the INACTIV file. TRANSFER could then be erased after the merge by typing UNSAVE, TRANSFER.

One of the seven questions put to the user is CONDITION. CONDITION can specify numerical data intervals such as AGE: 20-29, AGE: 30-39, or AGE: 40-49. WHAT specifies the kind of data one wishes to count according to CONDITION. For instance, if WHAT is SEX:M OR SEX:F, the output is a set of six numbers in grid form indicating the number of 20 to 29 year-old, 30 to 39 year-old, and 40 to 49 year-old males and females.

For research purposes also, it is often desirable to be able to work with duplicated data records. In fact, the entire set of records in the system could be duplicated in this manner.

EXEC, OLD, RETREVE

READY.

RNH, M=13500

PROGRAM: RETRIEVE DATE: 08/06/71 TIME: 10.22.45

ENTER NAME OF DATA FILE: ? ACTIVE

SOC SEC # ? ALL*
DEPT ? ALL*
RECORD ? ALL*
DATE ? ALL*
CONDITIONS ? ALL*
ACTION ? COUNT*
WHAT ? ALL*
COUNT IS 7
***** THIS RETRIEVAL TOOK .333 SECONDS

SOC SEC # ? 111-11-1111*
DEPT ? ALL*
RECORD ? ALL*
DATE ? ALL*
CONDITIONS ? ALL*
ACTION ? LIST*
WHAT ? ALL*

111-11-1111

ADMITTING

5AUG71

NAME CABLE, JAMES A
AGE (35) YRS
SEX M
ADDRESS 155 BRIDGE RD, ST. LOUIS
PHONE 222-4444
COMMENTS NEW PATIENT

COUNT IS 1
***** THIS RETRIEVAL TOOK .427 SECONDS
SOC SEC # ? 111-11-1111*
DEPT ? ADMITTING*
RECORD ? INITIAL*
DATE ? ALL*
CONDITIONS ? ALL*
ACTION ? LIST*
WHAT ? NAME AND COMMENTS*

111-11-1111

ADMITTING

5AUG71

NAME CABLE, JAMES A
COMMENTS NEW PATIENT

COUNT IS 1
***** THIS RETRIEVAL TOOK .410 SECONDS

SOC SEC # ? ALL*
DEPT ? ALL*
RECORD ? ALL*
DATE ? ALL*
CONDITIONS ? AGE: 20 TO 60*
ACTION ? TABULATE*
WHAT ? NAME AND AGE*

Figure 6. All Options in RETREVE

	NAME	AGE
111-11-1 5AUG71	CABLE,	35
222-22-2 5AUG71	ABLE, A	22
222-22-2 6AUG71	ZABLE,	41
999-99-9 5AUG71	SABLE,	57

COUNT IS 4
 DID YOU COPY OR TAB ANY INFO YOU WANT TO SAVE: ? NO
 ***** THIS RETRIEVAL TOOK .420 SECONDS

SOC SEC # ? ALL*
 DEPT ? ALL*
 RECORD ? ALL*
 DATE ? ALL*
 CONDITIONS ? AGE: 20 TO 60*
 ACTION ? TAB-SD*
 WHAT ? NAME AND AGE*

	NAME	AGE
111-11-1 5AUG71	CABLE,	35
222-22-2 5AUG71	ABLE, A	22
222-22-2 6AUG71	ZABLE,	41
999-99-9 5AUG71	SABLE,	57

NO	4
MEAN	38
SD	12
SE	6
MAX	57
MIN	22
MEAN + 2SD	63
MEAN - 2SD	13

DID YOU COPY OR TAB ANY INFO YOU WANT TO SAVE: ? NO
 ***** THIS RETRIEVAL TOOK .481 SECONDS

SOC SEC # ? ALL*
 DEPT ? ALL*
 RECORD ? ALL*
 DATE ? ALL*
 CONDITIONS ? AGE: 20 TO 29 OR AGE: 30 TO 39 OR AGE: 40 TO 49*
 ACTION ? CROSSTAB*
 WHAT ? SEX: M AND SEX: F*

	SEX	SEX
	M	F
AGE 20.0- 29.0	0	1
AGE 30.0- 39.0	1	0
AGE 40.0- 49.0	0	1
COUNT IS	3	

***** THIS RETRIEVAL TOOK .401 SECONDS

SOC SEC # ? ALL*
 DEPT ? ALL*
 RECORD ? ALL*
 DATE ? 05 AUG 71*
 CONDITIONS ? ALL*
 ACTION ? COPY*
 WHAT ? ALL*

COUNT IS 4
 DID YOU COPY OR TAB ANY INFO YOU WANT TO SAVE: ? YES
 WHAT NAME DO YOU WANT TO CALL IT: ? TRANSFR
 TRANSFR HAS BEEN SAVED.
 STOP.

4.131 / 57.833 / 1092

Figure 6 (Concluded).

WHAT Question. The seventh question, WHAT, can be used to specify what to LIST (e. g., ALL* or AGE AND HT*), or it can be used to specify the horizontal axis under TABULATE, CROSSTAB, and TAB-SD.

Format for Requesting Data. An asterisk must follow the response to each of the seven questions. Since spacing is important, one must use the identical spacing in RETREVE that was used in STORE while entering data such as NAME and DATE.

Data Not There. If a search is specified by CONDITION and no existing data matches this specification (see Figure 6), the program will respond NONE OF THE SPECIFIED RECORDS THE INFO. If a search is conducted on a non-existent SOC SEC #, DEPT, RECORD, or DATE, the program response is SPECIFIED RECORD IS NOT IN FILE. Thus, the system does provide a definite response when no data is found to match a request.

RESTART Option in RETREVE. If for any reason the user wishes to restart a search, he simply types RESTART.

Multiple Retrieval of Data. Once the user has supplied the name of the data file he wishes to search, he may conduct as many searches as he wishes. The command END OF REQUEST signals that he is finished. However, the user may wish to search a data file different from the original one. To do this, he simply types NEW FILE; the program will request the name of the other file, and additional searches can be performed. Again, only when the user supplies END OF REQUEST will the running of this program terminate.

UPDATE Program

The UPDATE program alters data files by (1) changing an entry in a data record, (2) adding to a data record, and/or (3) deleting a heading and its corresponding data (or deleting an entire record or records). To call UPDATE, one types EXEC, OLD, UPDATE, and then RNH, M=11000 after READY appears.

ID Items. As in RETREVE, the user specifies what he wishes to update by responding to seven questions. The ID responses should be obvious, depending on need. The user may answer with ALL* or with specifics.

ACTION, WHAT, and TO. ACTION may be CHANGE*, ADD*, or DELETE* (see Figure 7). In the first case, WHAT and TO are asked in that order. If ADD* is used, TO and WHAT are asked in that order. For DELETE*, only WHAT is asked. If ACTION is CHANGE*, WHAT must be answered by a specific heading followed by a colon, followed by the precise string of characters that presently occurs in that data field. The response to TO is simply the new data entry (Figure 7). For ADD, the user follows the same procedure.

Updating of Additional Data Files. To update additional data files, the user enters NEW FILE, and the system will request the name of the file. The user continues by updating records in the new file.

When Finished Updating. When the updating is completed, the user enters DONE* to end the program. All changes will have been recorded on the permanent records.

SORTER Program

The SORTER program arranges records according to priorities given to the four ID items by the user. These priorities are indicated by typing 1, 2, 3, or 4 after each question mark, with no number used more than once. One also specifies if the records are to be sorted into ascending (A) or descending (D) order according to these priorities.

This segment is used to sort two data files prior to their merger and to enable the user to list data in a given order, i. e. , by SOC SEC #, by alphabetical order of DEPT or RECORD, or by DATE. Observe that grouping of data records by DEPT and RECORD always takes precedence over grouping by SOC SEC # or DATE.

The user types EXEC, OLD, SORTER to call the program, and responds with RNH after the teletype communicates READY (Figures 8 and 9).

MERGE Program

The MERGE program merges two sorted data files (see the STORE program section, which discusses merging two data files). New records cannot be placed into an existing permanent data file directly. They must first be placed into a new data file which is then merged with (i. e. , into) the related permanent file. The user can either save or erase this new data file.

In Figure 10, the response to the first question is the name of the permanent file: ACTIVE for current patients. NEWDATA is a file of records for new patients. Both files have been sorted into ascending (A) order. The user must again specify the priority of the ID items, as in SORTER. In the example, the user retains the merged data files under the name ACTIVE although a third file name could also have been given. To call MERGE, the user types EXEC, OLD, MERGE, and then types RNH, M=9000 after READY appears.

EXEC, OLD, SORTER

READY.

RNH

PROGRAM: SORTER DATE: 08/05/71 TIME: 15.43.19

DO YOU NEED OPERATING INSTRUCTIONS ? N

ENTER NAME OF THE DATA FILE TO BE SORTED ? ACTIVE

WILL THE DATA FILE BE SORTED INTO ASCENDING (A) OR
DESCENDING (D) SEQUENCE ? A

ENTER SORTING SEQUENCE HERE

? 1

? 3

? 4

? 2

SORT COMPLETED.
YOU HAVE SORTED 4 DATA RECORDS.
STOP.

0.632 / 5.055 / 104

Figure 8. ACTIVE is Sorted

EXEC, OLD, SORTER

READY.

RNH

PROGRAM: SORTER DATE: 08/05/71 TIME: 15.45.38

DO YOU NEED OPERATING INSTRUCTIONS ? N

ENTER NAME OF THE DATA FILE TO BE SORTED ? NEWDATA

WILL THE DATA FILE BE SORTED INTO ASCENDING (A) OR
DESCENDING (D) SEQUENCE ? A

ENTER SORTING SEQUENCE HERE

? 1

? 3

? 4

? 2

SORT COMPLETED.
YOU HAVE SORTED 3 DATA RECORDS.
STOP.

0.552 / 4.415 / 104

Figure 9. NEWDATA is Sorted

EXEC, OLD, MERGE

READY.
RNH, M=9000

PROGRAM: MERGE DATE: 08/05/71 TIME: 15.47.47

ENTER NAME OF THE FIRST FILE TO BE MERGED: ? ACTIVE
ENTER NAME OF THE SECOND FILE TO BE MERGED: ? NEWDATA

ARE THESE FILES IN ASCENDING (A) OR DESCENDING (D) SEQUENCE ? A
WHAT IS THE ORDER OF THE MERGE KEYS? ANSWER THE FOUR
QUESTION MARKS WITH A 1, 2, 3, OR 4.

? 1
? 3
? 4
? 2

7 DATA RECORDS HAVE BEEN MERGED.

UNDER WHAT NAME SHOULD ALL OF THE MERGED RECORDS NOW BE FOUND ? ACTIVE

FILE ALREADY PERMANENT. ENTER A NEW FILE NAME OR
ENTER "REPLACE" TO REPLACE CURRENT PERMANENT FILE: ? REPLACE

ACTIVE HAS BEEN REPLACED AS MERGED FILE.
STOP.

0.684 / 6.155 / 135

Figure 10. ACTIVE and NEWDATA are Merged Under the File Name ACTIVE

APPENDIX: LISTING OF THE SIX PROGRAMS IN MIMS¹

¹An introductory remark to several of these programs states that Paul Simmons is working at United Computing Systems, Inc., and Ronald Schwarz is with GSFC. This was true when these programs were developed. However, please note that Paul Simmons is currently working at Computing and Software, Inc., and Ronald Schwarz is now with Federal City College.

** "HEADER" -- CREATES MASTER HEADER RECORD FOR MIMS SYSTEM
07/30/71. 08.39.22.

```
00100C THIS PROGRAM WAS RE-DESIGNED AND DEVELOPED BY PAUL SIMMONS,
00110C UNITED COMPUTING SYSTEMS, INC., AND RONALD SCHWARZ, GODDARD
00120C SPACE FLIGHT CENTER, JULY, 1971.
00130C
00140 PROGRAM HEADER (INPUT,OUTPUT,TAPE4).
00150 DIMENSION IFORM(9),KODE(160),LCQ(160),LHEAD(3,160)
00160C
00170C CARRIAGE CONTROL TO PRODUCE THE HIERARCHIAL EFFECT RELATED
00180C TO LEVEL CODES WHEN HEADING INPUT IS REQUESTED.
00190C
00200 DATA IFORM/5H(1X'),5H(2X'),5H(3X'),5H(4X'),5H(5X'),
00210+5H(6X'),5H(7X'),5H(8X'),5H(9X')/
00220 CALL CLOCK(IX)
00230 CALL DATER(IS)
00240 PRINT 33,IS,IX
00250 3 PRINT, *THIS PROGRAM WILL BUILD A FILE OF LEVEL CODES AND*
00260 PRINT,*HEADINGS. DO YOU NEED OPERATING INSTRUCTIONS*,
00270 10 READ 200, IYORN
00280 IF (IYORN.EQ.1HN) GO TO 30
00290 IF (IYORN.EQ.1HY) GO TO 20
00300 PRINT,*A SIMPLE YES OR NO WILL DO.*,
00310 GO TO 00010
00320C
00330C OPERATING INSTRUCTIONS.
00340C
00350 20 PRINT,/,*OK, HERE'S HOW IT'S DONE. WHEN THE FIRST QUESTION*
00360 PRINT, *MARK APPEARS, ENTER A LEVEL CODE (0-9). WHEN THE NEXT*
00370 PRINT, *QUESTION MARK APPEARS, ENTER THE HEADING (FROM 1-24*
00380 PRINT, *CHARACTERS) THAT CORRESPONDS TO YOUR LEVEL CODE. FOR*
00390 PRINT, *HEADINGS THAT WILL NORMALLY HAVE DATA FOLLOWING THEM*
00400 PRINT, *ENTER A COLON AFTER THE HEADING. FOR BLIND HEADINGS*
00410 PRINT, *(THOSE WHICH WILL NOT HAVE DATA FOLLOWING THEM) DO NOT*
00420 PRINT, *ENTER THE COLON.*
00430 PRINT,/,*REPEAT THIS PROCESS UNTIL YOU HAVE NO MORE HEADINGS-THEN
(CONT'D) *
00440 PRINT, *ENTER AN ASTERISK TO TERMINATE THE PROGRAM.*
00450 PRINT, *IF YOU WISH TO ENTER A STOP SKIP CODE, ENTER AN "S"*
00460 PRINT, *INSTEAD OF A LEVEL CODE. THEN ENTER THE LEVEL CODE AND *
00470 PRINT, *HEADING AS USUAL FOLLOWING THE NEXT TWO QUESTION MARKS.*
00480 PRINT, *IF AT ANY TIME YOU WANT TO START OVER, ENTER "RESTART".*
00490 30 PRINT,/,*ENTER 3 LETTERS OF DEPT. NAME AND 4 LETTERS OF RECORD
(CONT'D) *
00500 PRINT,*---ENTER FEWER IF 7 ARE NOT AVAILABLE*,
00510 READ 77,IFILE
00520 PRINT,/,*BEGIN DATA INPUT.*./
00530C
00540C VARIABLE I IS COUNTER FOR NUMBER OF HEADINGS.
00550C
00560 I=0
00570 40 I = I + 1
00580 KODE(I) = 55B
00590 50 READ 200, LCQ(I)
```

** "HEADER" -- CREATES MASTER HEADER RECORD FOR MIMS SYSTEM
07/30/71. 08.39.22.

```
00600 IF (LCQ(I).EQ.7HRESTART) GO TO 3
00610 IF (LCQ(I).EQ.1HS) GO TO 5
00620 IF (LCQ(I).EQ.1H*) GO TO 60
00630C
00640C CONVERT LEVEL CODE FROM A1 FORMAT TO I1 FORMAT.
00650C
00660 LCQ(I) = (ISHIFT (LCQ(I),-54) - 33B) .AND. 77B
00670 IF ((LCQ(I).LT.0).OR.(LCQ(I).GT.9)) GO TO 99
00680 GO TO 00025
00690 5 KODE(I) = 64B
00700 GO TO 00050
00710C
00720C DETERMINE WHICH FORMAT STATEMENT (CARRIAGE CONTROL)
00730C CORRESPONDS TO THE LEVEL CODE FOR THIS HEADING.
00740C
00750 25 NN = LCQ(I) + 1
00760 M = IFORM(NN)
00770 PRINT M
00780 READ 240, (LHEAD(J,I),J=1,3)
00790 IF (LHEAD(1,I).EQ.7HRESTART) GO TO 3
00800 GO TO 00040
00810 99 PRINT, *UNACCEPTABLE LEVEL CODE, TRY AGAIN*
00820 GO TO 00050
00830 60 I = I - 1
00840C
00850C WRITE I(THE NUMBER OF HEADINGS), KODE(I)(THE STOP SKIP
00860C CODES), LCQ(I)(THE LEVEL CODES), AND LHEAD(L,I),L=1,3)(THE
00870C HEADING DATA) TO FILE #4.
00880C
00890 WRITE (4,210) I
00900 DO 80 K=1,I
00910 WRITE (4,220) KODE(K),LCQ(K),(LHEAD(L,K),L=1,3)
00920 80 CONTINUE
00930C
00940C ATTEMPT TO SAVE NEWLY CREATED HEADER FILE.
00950C
00960 84 CALL PFUR(3HSAV,4,IFILE,0,ISTA)
00970 IOP = 5HSAVED
00980C
00990C IF FILE ALREADY EXISTS, SAVE UNDER NEW NAME, OR REPLACE
01000C EXISTING FILE.
01010C
01020 IF (ISTA .EQ. 4) GO TO 44
01030 IF (ISTA .EQ. 0) GO TO 92
01040 44 PRINT,*FILE ALREADY PERMANENT. ENTER NEW FILENAME OR*
01050 PRINT,*ENTER AN ASTERISK TO REPLACE CURRENT PERMANENT FILE:*,
01060 IFILES = IFILE
01070 READ 77,IFILE
01080 IF (IFILE .EQ. 1H*) GO TO 66
01090C
01100C FILE IS TO BE SAVED UNDER ANOTHER FILE NAME.
01110C
```


** "HEADER" -- CREATES MASTER HEADER RECORD FOR MIMS SYSTEM
07/30/71. 08.39.22.

01120 GO TO 00084
01130 66 IFILE = IFILES
01140C
01150C FILE IS TO BE REPLACED.
01160C
01170 CALL PFUR(3HREP,4,IFILE,0,ISTA)
01180 IOP = 8HREPLACED
01190 92 PRINT 88,IFILE,IOP
01200C
01210C FORMAT STATEMENTS.
01220C
01230 33 FORMAT (/*PROGRAM: HEADER*,4X,*DATE:*,A9,4X,*TIME:*,A9,///
01240 77 FORMAT (A7)
01250 88 FORMAT("*,A7,*" HAS BEEN *,A8,* AS HEADER FILE.*)
01260 200 FORMAT (A1)
01270 210 FORMAT (1X,I3)
01280 220 FORMAT (1X,02,1X,I1,1X,3(A10))
01290 240 FORMAT (3(A10))
01300 250 FORMAT (A7)
01310 END

- - - T H E E N D - - -

** "STORE" -- CREATES DATA FILE ACCORDING TO HEADER FORMAT
07/30/71. 09.57.12.

```
00100C THIS PROGRAM WAS RE-DESIGNED AND DEVELOPED BY PAUL SIMMONS,  
00110C UNITED COMPUTING SYSTEMS, INC., AND RONALD SCHWARZ, GODDARD  
00120C SPACE FLIGHT CENTER, JULY, 1971.  
00130C  
00140 PROGRAM STORE (INPUT,OUTPUT,TAPE7,TAPE8,TAPE9)  
00150 COMMON N,IAND,IOR,IBK,ITAG,ID(8,4),LHEAD(3,160)  
00160 DIMENSION LCQ(160),IPNT(160),KODE(160),IDEPTS(4),IRECS(4),  
00170+ IANS(7),JANS(1000)  
00180 CALL CLOCK(IX)  
00190 CALL DATER(IS)  
00200 PRINT 79,IS,IX  
00210 79 FORMAT(/*PROGRAM: STORE*,4X,*DATE:*,A9,4X,*TIME:*,A9,///  
00220 PRINT,/,*IF AT ANY TIME YOU WISH TO START OVER, ENTER "RESTART".*  
00230 PRINT, /  
00240C NRD = NUMBER OF WORDS THAT CAN BE READ (4 FOR TELETYPE OR  
00250C DATAPOINT 3300 CRT ETC)  
00260 4 NRD = 5  
00270 IBK = 05500000000000000000  
00280 TWOMSK = 7777B  
00290 MASK = 77B  
00300 KOLN = 06362000000000000000  
00310 ISEVN = 00000777777777777777  
00320 IAND = 07700000000000000000  
00330 IOR = .NOT. IAND  
00340 PRINT,*ENTER NAME YOU WISH TO CALL THIS DATA FILE:*,  
00350 READ 78,IFILE  
00360 78 FORMAT(A7)  
00370 PRINT,/,/  
00380 19 PRINT,*DEPT.*,  
00390 READ 550, (IDEPTS(I),I=1,4)  
00400 5 PRINT,*RECORD*,  
00410 READ 550, (IRECS(I),I=1,4)  
00420 PRINT,* *  
00430 93 FORMAT(*THIS PROGRAM WILL USE *,A7,* AS HEADER FILE.*)  
00440 GO TO 00013  
00450 13 IDEPT = IDEPTS(1).AND.7777770000000000000000B  
00460 IREC = IRECS(1).AND.7777777700000000000000B  
00470 NAME = IDEPT.AND.770000000000000000000000B  
00480 KKK = ISHIFT(IDEPT,-48).AND.77B  
00490 IF (KKK.EQ.55B) GO TO 310  
00500 NAME = IDEPT.AND.777700000000000000000000B  
00510 KKK = ISHIFT(IDEPT,-42).AND.77B  
00520 IF (KKK.EQ.55B) GO TO 315  
00530 NAME = (IDEPT.AND.777777000000000000000000B).OR.ISHIFT(IREC,-18)  
00540 GO TO 320  
00550 310 NAME = NAME.OR.ISHIFT(IREC,-6)  
00560 GO TO 320  
00570 315 NAME = NAME.OR.ISHIFT(IREC,-12)  
00580 320 CALL PFUR(3HRET,7,NAME,0,ISTA)  
00590 IF(ISTA.EQ.5) GO TO 666  
00600 PRINT 93,NAME  
00610 PRINT,/,*BEGIN DATA INPUT.*,/
```

** "STORE" -- CREATES DATA FILE ACCORDING TO HEADER FORMAT
07/30/71. 09.57.12.

```
00620 10 DO 15 J=1,4
00630 15 IPNT(J) = 0
00640 JJ = 5
00650 II = 1
00660 IDD = 2H:J
00670C SET FIRST WORD OF 4 ID ANSWERS TO :J
00680 DO 20 J=1,4
00690 20 ID(1,J) = IDD
00700 IBLNK = 10H
00710C BLANK FINAL ANSWER ARRAY
00720 DO 22 J=1,1000
00730 22 JANS(J) = IBLNK
00740 DO 23 J=1,160
00750 23 LHEAD(1,J) = IBLNK
00760 IANDEX = 0
00770 IPT = 1
00780C READ HEADER FILE
00790 25 READ (7,510) IQNDEX
00800 DO 30 K=1,IQNDEX
00810 30 READ (7,630) KODE(K),LCQ(K),(LHEAD(L,K),L=1,3)
00820 DO 47 N=1,4
00830C ELIMINATE COLON IF THERE IS ONE
00840 CALL ECOLON
00850 47 CONTINUE
00860 CALL PRNT (LCQ(1),LHEAD(1,1),LHEAD(2,1),LHEAD(3,1))
00870 READ 550, (ID(L,1),L=2,5)
00880 51 IF (ID(2,1).EQ.7HRESTART) GO TO 5
00890 CALL PRNT (LCQ(2),LHEAD(1,2),LHEAD(2,2),LHEAD(3,2))
00900 ID(2,2) = IDEPTS(1)
00910 ID(3,2) = IDEPTS(2)
00920 ID(4,2) = IDEPTS(3)
00930 PRINT 500, (IDEPTS(I),I=1,3)
00940 CALL PRNT (LCQ(3), LHEAD(1,3),LHEAD(2,3),LHEAD(3,3))
00950 ID(2,3) = IRECS(1)
00960 ID(3,3) = IRECS(2)
00970 ID(4,3) = IRECS(3)
00980 PRINT 500, (IRECS(I),I=1,3)
00990 DO 55 L=2,8
01000 DO 55 J=1,3
01010 CALL ETERM(ID(L,J),MSWIT)
01020 55 CONTINUE
01030 CALL PRNT (LCQ(4),LHEAD(1,4),LHEAD(2,4),LHEAD(3,4))
01040C HANDLE DATE
01050 CALL DATE
01060C
01070C GUTS OF THE PROGRAM
01080C
01090 N = 5
01100 60 M=1
01110 ITAG = 0
01120 CALL ECOLON
01130 IF (ITAG .EQ. 1) GO TO 65
```

** "STORE" -- CREATES DATA FILE ACCORDING TO HEADER FORMAT
07/30/71. 09.57.12.

```
01140 CALL PRNT (LCQ(N),LHEAD(1,N),LHEAD(2,N),LHEAD(3,N))
01150 PRINT, * *
01160 IPNT(JJ) = 0
01170 JJ = JJ + 1
01180 GO TO 00125
01190 65 CALL PRNT (LCQ(N),LHEAD(1,N),LHEAD(2,N),LHEAD(3,N))
01200 71 READ 550, (IANS(L),L=1,NRD)
01210 74 IF(IANS(1) .EQ. 7HRESTART) GO TO 5
01220 IF (IANS(1).NE.5HSKIP*) GO TO 75
01230 72 LHEAD(1,N) = IBLNK
01240 N = N+1
01250 IF (N .GT. IQNDEX) GO TO 126
01260 IF (KODE(N) .NE. 64B) GO TO 72
01270 GO TO 00060
01280 75 IF ((IANS(1) .EQ. IBLNK) .AND. (M .EQ. 1)) GO TO 76
01290 GO TO 00077
01300 76 LHEAD(1,N) = IBLNK
01310 GO TO 00125
01320C IF NOT FIRST LINE OF ANSWER GO TO 100
01330 77 IF (M .NE. 1) GO TO 100
01340 NWD = IANS(1) .AND. IAND
01350 IF (NWD .EQ. 05100000000000000000) GO TO 85
01360 IPAD = KOLN
01370 DO 80 K=1,NRD
01380 NUSFT = IANS(K) .AND. TWOMSK
01390 IANS(K) = ISHIFT(IANS(K),-12)
01400 NUSFT = ISHIFT(NUSFT,48)
01410 IANS(K) = IANS(K) .AND. ISEVN
01420 IANS(K) = IANS(K) .OR. IPAD
01430 80 IPAD = NUSFT
01440 GO TO 00100
01450C ANSWER IS A NUMBER ENCLOSED IN PARENS
01460 85 ICHANG = 0620000000000000000000
01470 IANS(1) = IANS(1) .AND. IOR
01480 IANS(1) = IANS(1) .OR. ICHANG
01490 MZ = 1
01500 ICHANG = 0630000000000000000000
01510 90 ITAG = 0
01520 DO 95 K=1,10
01530 IANS(MZ) = ISHIFT(IANS(MZ),6)
01540 NUSFT = IANS(MZ) .AND. IAND
01550 IF (NUSFT .NE. 0520000000000000000000) GO TO 95
01560 IANS(MZ) = IANS(MZ) .AND. IOR
01570 IANS(MZ) = IANS(MZ) .OR. ICHANG
01580 ITAG = 1
01590 95 CONTINUE
01600 IF (ITAG .NE. 0) GO TO 100
01610 MZ = MZ+1
01620 GO TO 00090
01630C ELIMINATE TERMINATOR IF THERE IS ONE
01640 100 DO 105 K=1,NRD
01650 MSWIT = 0
```

** "STORE" -- CREATES DATA FILE ACCORDING TO HEADER FORMAT
07/30/71. 09.57.12.

```
01660 CALL ETERM(IANS(K),MSWIT)
01670 IF (IANS(K) .EQ. IBLNK .AND. MSWIT .EQ. 1) GO TO 120
01680C PUT ANSWER IN FINAL ANSWER ARRAY
01690 JANS(II) = IANS(K)
01700 IANS(K)=IBLNK
01710 II = II+1
01720 M = M+1
01730 IANDEX = IANDEX+1
01740 IF (MSWIT.EQ.1) GO TO 120
01750 105 CONTINUE
01760 PRINT 620
01770 GO TO 00071
01780 120 IPNT(JJ) = IPT
01790 IPT = IPT + M - 1
01800 JJ = JJ + 1
01810 125 N = N + 1
01820 IF (N .LE. IQNDEX) GO TO 60
01830 126 CONTINUE
01840C
01850C RESET LHEAD ARRAY FOR BLANK HEADINGS
01860 I = 1
01870 K = 2
01880 127 IF (LHEAD(1,I) .NE. IBLNK) GO TO 130
01890 DO 128 M=1,3
01900 128 LHEAD(M,I) = LHEAD(M,K)
01910 LCQ(I) = LCQ(K)
01920 LHEAD(1,K) = IBLNK
01930 129 K = K+1
01940 IF (K .GT. IQNDEX) GO TO 131
01950 JUICE = 1
01960 GO TO 00127
01970 I = I+1
01980 GO TO 00129
01990 130 IF (JUICE .NE. 1) K = K+1
02000 JUICE = 0
02010 I = I+1
02020 IF (K .LE. IQNDEX) GO TO 127
02030 131 DO 132 J=1,IQNDEX
02040 IF (LHEAD(1,J) .EQ. IBLNK) GO TO 133
02050 132 CONTINUE
02060 GO TO 00134
02070 133 IQNDEX = J - 1
02080 134 CONTINUE
02090C
02100C
02110C WRITE OUTPUT
02120 WRITE (8,560) IQNDEX,IANDEX
02130 DO 135 J=1,4
02140 135 WRITE (8,530) (ID(I,J),I=1,7)
02150 DO 140 M=1,IQNDEX
02160 140 WRITE (8,530) (LHEAD(L,M),L=1,3)
02170 IF (IQNDEX.LE.65) GO TO 145
```

** "STORE" -- CREATES DATA FILE ACCORDING TO HEADER FORMAT
07/30/71. 09.57.12.

```
02180 WRITE (8,520) (LCQ(K),K=1,65)
02190 WRITE (8,520) (LCQ(K),K=66,IQINDEX)
02200 GO TO 150
02210 145 WRITE (8,520) (LCQ(K),K=1,IQINDEX)
02220 150 MPT = 22
02230 M = 1
02240 155 N = M + 21
02250 IF (IQINDEX - MPT) 165,165,160
02260 160 WRITE (8,590) (IPNT(K),K=M,N)
02270 M = N + 1
02280 MPT = MPT + 22
02290 GO TO 00155
02300 165 WRITE (8,590) (IPNT (K), K=M,IQINDEX)
02310 J = 1
02320C COMPUTE HOW MANY LINES IT TAKES TO WRITE DATA
02330 IZAN = (IANDEX/6) + 1
02340 IPAN = (IZAN - 1)*6
02350 IF (IPAN .EQ. IANDEX) IZAN = IZAN-1
02360 DO 170 M = 1,IZAN
02370 K = J + 5
02380 WRITE (8,530) (JANS(I),I=J,K)
02390 170 J=J+6
02400 REWIND 7
02410 PRINT,/,*ANOTHER PATIENT*,
02420 175 READ 600, ICONT
02430 IF (ICONT.EQ.1HN) GO TO 180
02440 IF (ICONT.EQ.1HY) GO TO 10
02450 PRINT, *A SIMPLE YES OR NO, PLEASE*
02460 GO TO 175
02470 180 PRINT,*ANOTHER RECORD*,
02480 185 READ 600, ICONT
02490 PRINT,/
02500 IF (ICONT.EQ.1HN) GO TO 190
02510 IF (ICONT.EQ.1HY) GO TO 5
02520 PRINT, *PLEASE ANSWER YES OR NO*
02530 GO TO 00185
02540 190 CALL PFUR(3HSAV,8,IFILE,0,ISTA)
02550 IOP=5HSAVED
02560 IF (ISTA .EQ. 4) GO TO 44
02570 IF (ISTA .EQ. 0) GO TO 92
02580 44 PRINT,*FILE ALREADY PERMANENT. ENTER NEW FILENAME OR*
02590 PRINT,*ENTER ASTERISK TO REPLACE CURRENT PERMANENT FILE.*,
02600 IFILES=IFILE
02610 READ 78,IFILE
02620 IF (IFILE .EQ. 1H*) GO TO 66
02630 GO TO 190
02640 66 IFILE=IFILES
02650 CALL PFUR(3HREP,8,IFILE,0,ISTA)
02660 IOP=8HREPLACED
02670 92 PRINT 88,IFILE,IOP
02680 88 FORMAT(*"*,A7,*" HAS BEEN *,A8,* AS DATA FILE.*)
02690 500 FORMAT (3X,3A10)
```

** "STORE" -- CREATES DATA FILE ACCORDING TO HEADER FORMAT
07/30/71. 09.57.12.

```
02700 506 FORMAT (A7)
02710 510 FORMAT (1X,I3)
02720 520 FORMAT (1X,65I1)
02730 530 FORMAT (1X,7A10)
02740 540 FORMAT (R2,1X,A3,1X,R2)
02750 550 FORMAT (7A10)
02760 560 FORMAT (1X,2I5)
02770 590 FORMAT (1X,22I3)
02780 600 FORMAT (A1)
02790 620 FORMAT (22X:)
02800 630 FORMAT(1X,02,1X,I1,1X,3A10)
02810 667 FORMAT(*HEADER FILE "*,A7,*" NOT IN PERMANENT STORAGE.*)
02820 668 FORMAT (*ENTER CORRECT AND/OR VALID FILENAME.*)
02830 STOP
02840 666 PRINT 667,NAME
02850 PRINT 668
02860 GO TO 19
02870 STOP
02880 END
02890 SUBROUTINE ECOLON
02900 COMMON N,IAND,IOR,IBK,ITAG,ID(8,4),LHEAD(3,160)
02910 DO 10 J=1,3
02920 DO 10 I=1,10
02930 LHEAD(J,N) = ISHIFT(LHEAD(J,N),6)
02940 IWHAT = LHEAD(J,N) .AND. IAND
02950 IF (IWHAT .NE. 06300000000000000000) GO TO 10
02960 LHEAD(J,N) = LHEAD(J,N) .AND. IOR
02970 LHEAD(J,N) = LHEAD(J,N) .OR. IBK
02980 ITAG = 1
02990 10 CONTINUE
03000 RETURN
03010 END
03020 SUBROUTINE ETERM(NTERM,MSWIT)
03030C THIS SUBROUTINE ELIMINATES THE TERMINATOR
03040 IAND = 07700000000000000000
03050 IOR = .NOT. IAND
03060 IBK = 05500000000000000000
03070 IBLNK = 10H
03080 NNEW = NTERM .AND. IAND
03090 IF (NNEW .EQ. 04700000000000000000) GO TO 20
03100 DO 10 K=1,10
03110 NTERM = ISHIFT(NTERM,6)
03120 NNEW = NTERM .AND. IAND
03130 IF (NNEW .NE. 04700000000000000000) GO TO 10
03140 NTERM = NTERM .AND. IOR
03150 MSWIT = 1
03160 NTERM = NTERM .OR. IBK
03170 10 CONTINUE
03180 RETURN
03190 20 NTERM = IBLNK
03200 MSWIT = 1
03210 RETURN
```

** "STORE" -- CREATES DATA FILE ACCORDING TO HEADER FORMAT
07/30/71. 09.57.12.

```
03220 END
03230 SUBROUTINE PRNT (IAX,KHEAD,MHEAD,NHEAD)
03240 DIMENSION IFORM(26),JFORM(24),JHED(3)
03250 DATA IFORM/5H(1X*),5H(2X*),5H(3X*),5H(4X*),5H(5X*),5H(6X*),
03260+ 5H(7X*),5H(8X*),5H(9X*),6H(10X*),6H(11X*),6H(12X*),6H(13X*),
03270+ 6H(14X*),6H(15X*),6H(16X*),6H(17X*),6H(18X*),6H(19X*),
03280+ 6H(20X*),6H(21X*),6H(22X*),6H(23X*),6H(24X*),6H(25X*),6H(26X*)/
03290 DATA JFORM /5H(A1*),5H(A2*),5H(A3*),5H(A4*),5H(A5*),5H(A6*),
03300+ 5H(A7*),5H(A8*),5H(A9*),6H(A10*),9H(A10,A1*),9H(A10,A2*),
03310+ 9H(A10,A3*),9H(A10,A4*),9H(A10,A5*),9H(A10,A6*),9H(A10,A7*),
03320+ 9H(A10,A8*),9H(A10,A9*),7H(2A10*),10H(2A10,A1*),10H(2A10,A2*),
03330+ 10H(2A10,A3*),10H(2A10,A4*)/
03340C THIS SUBROUTINE ALLOWS PROGRAM TO PRINT HEADING AND READ
03350C ANSWER ALL ON THE SAME LINE
03360 KFIVE = 0550000000000000000000
03370 MASK = 0770000000000000000000
03380 DO 10 I=0,9
03390 IF (IAX .EQ. I) GO TO 20
03400 10 CONTINUE
03410 STOP
03420 20 K = I+1
03430 NN = IFORM(K)
03440 PRINT NN
03450 JHED(1) = KHEAD
03460 JHED(2) = MHEAD
03470 JHED(3) = NHEAD
03480 KCOUNT = 0
03490 KBLNK = 0
03500 DO 45 M=1,3
03510 DO 40 I=0,54,6
03520 KKK = ISHIFT(JHED(M),I)
03530 KKK = KKK .AND. MASK
03540 IF (KKK .NE. KFIVE) GO TO 30
03550 KBLNK = KBLNK + 1
03560 IF (KBLNK .EQ. 3) GO TO 50
03570 GO TO 00035
03580 30 KBLNK = 0
03590 35 KCOUNT = KCOUNT + 1
03600 40 CONTINUE
03610 45 CONTINUE
03620 PRINT, *HEADING TOO LONG --- ABORT*
03630 RETURN
03640 50 KCOUNT = KCOUNT - 2
03650 NN = JFORM(KCOUNT)
03660 IF (KCOUNT .GT. 20) GO TO 60
03670 IF (KCOUNT .GT. 10) GO TO 55
03680 PRINT NN, KHEAD
03690 GO TO 00065
03700 55 PRINT NN, KHEAD,MHEAD
03710 GO TO 00065
03720 60 PRINT NN, KHEAD, MHEAD, NHEAD
03730 65 NFORM = 22-(KCOUNT+K)
```


** "STORE" -- CREATES DATA FILE ACCORDING TO HEADER FORMAT
07/30/71. 09.57.12.

```
03740 NN = IFORM(NFORM)
03750 PRINT NN
03760 RETURN
03770 END
03780 SUBROUTINE DATE
03790 COMMON N, IAND, IOR, IBK, ITAG, ID(8,4), LHEAD(3,160)
03800 READ 10, IDATE
03810 10. FORMAT (A10)
03820 15 K1 = ISHIFT(IDATE, -54).AND.77B
03830 IF ((K1.GE.33B).AND.(K1.LE.44B)) GO TO 20
03840 IDY = 33333333333333333333B
03850 IMON = (IDATE.AND.77777700000000000000B).OR.00000055555555555555B
03860 IYR = ISHIFT(IDATE, -24).AND.7777B
03870 GO TO 00050
03880 20 IF (K1 - 36B) 30,30,40
03890 30 K2=ISHIFT(IDATE, -48).AND.77B
03900 IF (K2.EQ.55B) GO TO 40
03910 IDY = ISHIFT(IDATE, -48).OR.3333333333333333330000B
03920 IMON = (ISHIFT(IDATE, 18).AND.7777770000000000000000B).OR.
03930+000000555555555555555555B
03940 IYR = ISHIFT(IDATE, -6).AND.7777B
03950 GO TO 00050
03960 40 IDY = K1.OR.33333333333333333300B
03970 IMON = (ISHIFT(IDATE, 12).AND.7777770000000000000000B).OR.
03980+000000555555555555555555B
03990 IYR =ISHIFT(IDATE, -12).AND.7777B
04000 50 ID(2,4) = IYR.OR.3333333333333333330000B
04010 ID(4,4) = IDY
04020 IF (IMON.EQ.3HJAN) MON = 1
04030 IF (IMON.EQ.3HFEB) MON = 2
04040 IF (IMON.EQ.3HMAR) MON = 3
04050 IF (IMON.EQ.3HAPR) MON = 4
04060 IF (IMON.EQ.3HMAY) MON = 5
04070 IF (IMON.EQ.3HJUN) MON = 6
04080 IF (IMON.EQ.3HJUL) MON = 7
04090 IF (IMON.EQ.3HAUG) MON = 8
04100 IF (IMON.EQ.3HSEP) MON = 9
04110 IF (IMON.EQ.3HOCT) MON = 10
04120 IF (IMON.EQ.3HNOV) MON = 11
04130 IF (IMON.EQ.3HDEC) MON = 12
04140 IF (IMON.EQ.3HUNK) MON = 13
04150 ID(3,4) = MON
04160 RETURN
04170 END
```

- - - T H E E N D - - -

** "RETRV" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```

00100 PROGRAM RETRVL(INPUT,OUTPUT,TAPE13,TAPE15)
00110 DIMENSION IOUTBL(6)
00120     DIMENSION IQ(18,7),JCONSV(200),JWHTSV(200)
00130 COMMON IQINDEX,IINDEX,ID(8,4),           IDATAN(420),
00140+ IDATAO(300),ISHFTL(10),ISHFTR(10),KALL(7),IA(18,7),IQU(6,10),
00150+ INEG(10),IPRIME(10),IHNDX(10,10),IANOSZ(10),ILHEAD(10),
00160+ IDATAR(10,2,10),IDTSIZ(10,10),IELEM(10,10),XDATAR(2,10),
00170+ ICONN(10),XSAVE(10),IMAXQ,IFWAA(120),LCQ(120),IDAT(6),
00180+ IHD(6,2,10),INDIVQ(10),IOUTMX,ICOMP,INMAX,IMAXA,ICHAR,ICH,
00190+ IWD,IWDSIZ,JCHAR,JWD,KNO,IRET,IOUT,ISHFLI,KA,KB,KC,KD,KE,KF,
00200+ KG,KH,KI,KJ,KK,KL,KN,KO,KP,KQ,KR,KS,KT,KU,KV,KW,KX,KY,KZ,
00210+ KCOLON,KHYPHN,KLP,KRP,KSTAR,KTAB,KDOLLR,KDELTA,KAPOST,KBACKS,
00220+ KRET,IBLNKS,IBLNK,KDEC,KCOMMA,KCENT,LOWER,ITERM,IQNO,NOQ,
00230+ IMAXAC,IMAXQC,ISTRSW,ISTART,NOQUES,LIST,LAST,IGETSW,ISAVE(20),
00240+ KEQUAL,NTAPE,KOLON,ICRSUM(10,10),NUMANS(10),IANALY,ICOPY,
00250+ ICOUNT,ICROSS,ITAB,IANSW(10),IO,X(10),X2(10),XCT(10),IBEGA,
00260+ NO,XMEAN(10),XSD(10),XMAX(10),XMIN(10),NODECS(10),ID1(12,6),
00270+ KZERO,KNINE,IMONTH(22),           IHEAD(3,160),
00280+           IOO(10),KMASK(10),JMASK(10)
00290 COMMON /MODESW/ RETMODE
00300 DATA RETMODE / 6HREMOTE /
00310     DIMENSION ITITLE (8)
00320     DIMENSION IARRAY(2)
00330     DATA IARRAY/0000004,0000020/
00340 DATA ITITLE/2HNO,4HMEAN,2HSD,2HSE,3HMAX,3HMIN,1OHMEAN + 2SD,
00350+ 1OHMEAN - 2SD/
00360 DATA IOUTBL/4HLIST,4HCOPY,5HCOUNT,6HTAB-SD,8HTABULATE,
00370+ 8HCROSSTAB/
00380 CALL CLOCK(IX)
00390 CALL DATER(IS)
00400 PRINT 33,IS,IX
00410 33 FORMAT(*PROGRAM: RETRIEVE*,4X,*DATE:*,A9,4X,*TIME:*,A9,///)
00420 100 CALL DROPI (13)
00430 REWIND 13
00440 PRINT,*ENTER NAME OF DATA FILE:*,
00450 19 READ,NAME
00460 18 FORMAT (A7)
00470 KTIME = 1
00480 CALL PFUR(3HRET,13,NAME,0,ISTA)
00490 IF (ISTA .EQ. 5) GO TO 61
00500     IF (RETMODE .EQ. 5HBRATCH) GO TO 9951
00510     IF (RETMODE .EQ. 6HPSEUDO) GO TO 9949
00520 9949 DO 9950 I=1,8
00530     DO 9950 J=1,7
00540 9950 IQ(I,J) = 10H
00550     IQ(3,1)=10H(ALL OR SP
00560     IQ(4,1)=10HECIFY ONE
00570     IQ(5,1)=10HTO SIX)
00580     IQ(3,2)=IQ(3,3)=IQ(3,5)=IQ(3,7)=IQ(3,1)
00590     IQ(4,2)=IQ(4,3)=10HECIFY ONE)
00600     IQ(3,4)=10H(ALL, ONE,
00610     IQ(4,4)=10H OR RANGE

```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
 08/05/71. 12.34.08.

```

00620      IQ(5,4)=10HOF DATES)
00630      IQ(4,5)=IQ(4,7)=10HECIFY)
00640      IQ(3,6)=10H(LIST,COPY
00650      IQ(4,6)=10H,COUNT,ANA
00660      IQ(5,6)=10HLYZE,TABUL
00670      IQ(6,6)=10HATE,CROSS-
00680      IQ(7,6)=10HTAB)
00690      IQ(1,5) = 10HCONDITIONS
00700      IQ(1,6) = 10HACTION
00710      IQ(1,7) = 10HWHAT
00720      GO TO 9952
00730  9951 READ 105, ((IQ(I,J),I=1,8),J=1,7)
00740      105 FORMAT (7A10, A2)
00750  9952 CONTINUE
00760      NTAPE = 13
00770      KLUNK = 0
00780      LIST = IOUTBL(1)
00790      ICOPY = IOUTBL (2)
00800      ICOUNT = IOUTBL (3)
00810      IANALY = IOUTBL (4)
00820      ITAB = IOUTBL (5)
00830      ICROSS = IOUTBL (6)
00840      CALL INIT
00850  115 REWIND NTAPE
00860      CALL REDREC
00870      DO 120 K=1,4
00880      DO 120 J=1,2
00890  120 IQ(J,K) = IHEAD(J,K)
00900      GO TO 129
00910  125 IF ((IO.EQ.2).OR.(IO.EQ.4).OR.(IO.EQ.5)) GO TO 112
00920      GO TO 129
00930  112 PRINT,*DID YOU COPY OR TAB ANY INFO YOU WANT TO SAVE:*,
00940      READ 980, KEEP
00950      980 FORMAT (A1)
00960      IF (KEEP.EQ.1HY) GO TO 380
00970  129 REWIND 15
00980      REWIND NTAPE
00990      IF (NTAPE - 14) 127, 126, 127
01000  126 NTAPE = 13
01010      REWIND NTAPE
01020  127 CONTINUE
01030      IF (KLUNK .EQ. 0) GO TO 128
01040      IF (KTIME .EQ. 0) GO TO 128
01050      CALL SECOND(TTTT)
01060      TPRINT = TTTT - TTO
01070      PRINT 9912, TPRINT
01080  9912 FORMAT (5H*****,* THIS RETRIEVAL TOOK*F6.3,* SECONDS*)
01090  128 CONTINUE
01100      ICOMP=0
01110      IABORT=0
01120      DO 140 I=1,10
01130      XMAX(I) = -9999999

```

** "RETRVEVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```

01140      XMIN(I) = 9999999
01150      IANSW(I) = 0
01160      IANOSZ(I)=0
01170      INEG(I)=1
01180      X(I) = 0
01190      X2(I) = 0
01200      XCT(I) = 0
01210      NODECS(I) = 0
01220      DO 140 J=1,10
01230      ICRSUM(I,J) = 0
01240      IDTSIZ(I,J)=0
01250      IELEM(I,J)=0
01260      DO 135 K=1,IMAXQ
01270      IQU(K,J)=IBLNKS
01280      DO 135 L=1,2
01290      XDATAR(L,J) = 0
01300      IDATAR(I,L,J) = IBLNKS
01310 135  IHD(K,L,J)=IBLNKS
01320 140  ICONN(I)=0
01330 DO 145 I=1,IMAXA
01340 DO 145 J=1,6
01350 145 ID1(I,J) = IBLNKS
01360      ICOMP=0
01370      ILAST=0
01380      DO 150 I=1,20
01390 150  ISAVE(I)=IBLNKS
01400      IF (KLUNK .EQ. 1) GO TO 9900
01410      CALL SECOND(TTO)
01420 9900 CALL SECOND(TTTT)
01430 9911 FORMAT (5H*****,* CP TIME IS*F6.3,4H ***)
01440      TTO = TTTT
01450 151  KLUNK = 1
01460      DO 265 I=1,7
01470 152  KNO=I
01480      IF (IQ(1,I)-IBLNKS) 155,260,155
01490 KODE = 0
01500 155 IF (KODE .NE. 1) PRINT,/,/
01510 KODE = 1
01520 PRINT 160,(IQ(J,I),J=1,2)
01530 160 FORMAT (A10,A9:)
01540      CALL TYPEN
01550      GO TO (370,165,245,166,125,100), IRET
01560 166  GO TO (265,265,265,265,201,265,211), I
01570 165  GO TO (265,265,265,170,203,230,213), I
01580 170  CALL DATEIN
01590      GO TO (175,175,175,265), IRET
01600 175  PRINT 180
01610 180  FORMAT (16H BAD DATE
01620      GO TO 255
01630 201 DO 202 J=1,200
01640 202 IDATAN(J) = JCONSV(J)
01650 GO TO 205

```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```
01660 203 DO 204 J=1,200
01670 204 JCONSV(J) = IDATAN(J)
01680 205 IF (KALL(5).EQ.1) GO TO 265
01690     KNO=1
01700     NOQ = 10
01710     ICOMP = 10
01720 210 CALL WHAT
01730     IBEGA=ICOMP+1
01740     GO TO (220,265), IRET
01750 211 DO 212 J=1,200
01760 212 IDATAN(J) = JWHTSV(J)
01770 GO TO 215
01780 213 DO 214 J=1,200
01790 214 JWHTSV(J) = IDATAN(J)
01800 215 IF (KALL(7).EQ.1) GO TO 265
01810     KNO=ICOMP+1
01820     NOQ=10
01830     GO TO 210
01840 220 PRINT 222
01841 222 FORMAT(4H****,* DELIMITORS ENTERED INCORRECTLY.*)
01850     GO TO 255
01860 230 IOUT=IA(2,6)
01870     DO 235 K=1,6
01880     IO = K
01890     IF (IOUT-IOUTBL(K)) 235,265,235
01900 235 CONTINUE
01910 PRINT 221
01911 221 FORMAT(4H****,* ACTION TYPE INCORRECT. MUST BE: LIST,*
01912+ * COPY, COUNT, TAB-SD,*,/,* TABULATE, OR CROSSTAB.*/,)
01920     GO TO 255
01930 245 PRINT 250, I
01940 250 FORMAT(4H****,* NO TERMINATING CHARACTER IN QUESTION*
01941+ *,I6,*. RE-ENTER.*)
01950 255 GO TO 152
01960 260 KALL(KNO)=1
01970 265 CONTINUE
01980     IF (IABORT) 125,270,125
01990 270 IFREC=0
02000     IFIND=0
02010 IF (IO - 4) 290,275,275
02020 275 CONTINUE
02030 ISTART = ICOMP + 1
02040     PRINT 285, (IQU(1,J),J=ISTART,LAST)
02050 WRITE (15,285) (IQU(1,J),J=ISTART,LAST)
02060 285 FORMAT (/21X,5(1X,A10))
02070     IF (ICROSS - IOUT) 290,286,290
02080 286 PRINT 287, ((IDATAR(K,1,J),K=1,8),J=ISTART,LAST)
02090 287 FORMAT (17X,5(3X,8R1))
02100     PRINT 288, ((XDATAR(I,J),I=1,2),J=ISTART,LAST)
02110 288 FORMAT (17X,5(F5.1,1H-,F5.1))
02120 290 CALL REDREC
02130     GO TO (320,295,930,424,920), IRET
```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```

02140 295 CALL CKID
02150 GO TO (290,300,320),IRET
02160 300 IFREC=1+IFREC
02170 CALL BOOL
02180 305 GO TO (290,306,900,910,920,424,600),IRET
02190 306 IFIND = IFIND + 1
02200 IF (IOUT.EQ.IOUTBL(2)) CALL WRITREC
02210 GO TO 290
02220 320 IF (IFREC) 360,360,325
02230 325 IF (IFIND) 350,350,327
02240 327 IF (IOUT - IANALY) 328,500,328
02250 328 IF (IOUT - ICROSS) 330,450,330
02260 330 PRINT 335, IFIND
02270 335 FORMAT (9HCOUNT IS ,I6)
02280 337 GO TO 125
02290 IF (IDATAN(1).EQ.8HRESTART*) GO TO 250
02300 350 PRINT 355
02310 355 FORMAT (/* NONE OF THE SPECIFIED RECORDS CONTAIN THE INFO*)
02320 GO TO 125
02330 360 PRINT 365
02340 365 FORMAT (//32H SPECIFIED RECORD IS NOT IN FILE)
02350 GO TO 125
02360 370 PRINT 375
02370 375 FORMAT (15H END OF PROGRAM)
02380 GO TO 435
02390 380 PRINT,*WHAT NAME DO YOU WANT TO CALL IT:*,
02400 383 READ 18,JSAVE
02410 CALL PFUR(3HSAV,15,JSAVE,0,ISTA)
02420 IF (ISTA .EQ. 4) GO TO 381
02430 PRINT 382,JSAVE
02440 GO TO 370
02450 381 PRINT 386,JSAVE
02460 PRINT,*RE-ENTER ANOTHER NAME:*,
02465 GO TO 383
02480 382 FORMAT(A7,* HAS BEEN SAVED.*)
02490 386 FORMAT(A7,* ALREADY A PERMANENT FILE.*)
02500 435 STOP
02510 450 IFIND = 0
02520 DO 460 INDEX = 1,ICOMP
02530 IBEGA = ICOMP + 1
02540 IF (IDTSIZ(1,INDEX) - 1000) 456,451,451
02550 451 CONTINUE
02560 PRINT 455, IQU(1,INDEX),(XDATAR(1,INDEX),I=1,2),
02570+ (ICRSUM(INDEX,J),J=IBEGA,LAST)
02580 455 FORMAT (A4,F5.1,1H-,F5.1,5(4X,17))
02590 DO 453 J=IBEGA,LAST
02600 453 IFIND = IFIND + ICRSUM(INDEX,J)
02610 GO TO 460
02620 456 JWD = 1
02630 JCHAR = 0
02640 IDATA0(1) = IBLNKS
02650 ISTRSW = 3

```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
 08/05/71. 12.34.08.

```

02660      DO 457 I=1,10
02670      ICHAR = IDATAR(I,1,INDEX) .AND. 77B
02680      CALL STRCH
02690      457 CONTINUE
02700 458 FORMAT (1X,A4,1X,A10,1X,5(4X,I7))
02710 PRINT 458, (IQU(I,INDEX),IDATA0(I),
02720+ (ICRSUM(INDEX,J),J=IBEGA,LAST))
02730 DO 459 J=IBEGA,LAST
02740 459 IFIND = IFIND + ICRSUM(INDEX,J)
02750      460 CONTINUE
02760      IDATA0(1) = IBLNKS
02770      GO TO 330
02780      500 IOUT=LIST
02790      CALL FORMA
02800      CALL FORMA
02810      DO 550 I = 1,8
02820      IDATA0(1) = ITITLE(I)
02830      JWD = 2
02840      JCHAR = 6
02850      DO 540 J=IBEGA,LAST
02860      KNO = J
02870      IF (XCT(KNO)-2) 502,502,501
02880      501 IANSW(KNO) = 1
02890      GO TO 505
02900      502 IANSW(KNO) = 0
02910      IF (XCT(KNO)) 529,529,505
02920      505 IF (IANOSZ(KNO)) 520,520,510
02930      510 IF (IDTSIZ(1,KNO) - 1000) 530,520,520
02940      520 GO TO (521,522,523,524,525,526,527,528), I
02950      521 CONTINUE
02960      XSAVE(KNO) = XCT(KNO)
02970      GO TO 529
02980      522 CONTINUE
02990      XMEAN(KNO) = X(KNO)/XCT(KNO)
03000      XSAVE(KNO) = XMEAN(KNO)
03010      GO TO 529
03020      523 CONTINUE
03030 XSD(KNO) = SQRT(X2(KNO)/XCT(KNO)-XMEAN(KNO)*XMEAN(KNO))
03040      XSAVE(KNO) = XSD(KNO)
03050      GO TO 529
03060      524 CONTINUE
03070      XSAVE(KNO) = XSD(KNO)/(SQRT(XCT(KNO)))
03080      GO TO 529
03090      525 XSAVE(KNO) = XMAX(KNO)
03100      GO TO 529
03110      526 XSAVE(KNO) = XMIN(KNO)
03120      GO TO 529
03130      527 XSAVE(KNO) = XMEAN(KNO) + 2 * XSD(KNO)
03140      GO TO 529
03150      528 XSAVE(KNO) = XMEAN(KNO) - 2 * XSD(KNO)
03160      529 CALL PFLFIX
03170      GO TO 540

```

** "RETRVEVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```
03180 530 ICHAR = IBLNK
03190      DO 535 M = 1,13
03200 535 CALL STRCH
03210 540 CONTINUE
03220 550 CALL FORMA
03230      GO TO 125
03240 600 PRINT 601
03250 601 FORMAT(4H****,* FATAL ERROR - ATTEMPTED TO WRITE ON NEW*
03251+ * COPY FILE.*)
03260      GO TO 435
03270 900 PRINT 901
03280 901 FORMAT(4H****,* FATAL ERROR - EOF ON WRITE.*)
03290      GO TO 435
03300 910 PRINT 911
03310 911 FORMAT(4H****,* FATAL ERROR - DEVICE ERROR.*)
03320      GO TO 435
03330 920 PRINT 921
03340 921 FORMAT(4H****,* FATAL ERROR - END OF TAPE ON WRITE.*)
03350      GO TO 435
03360 930 PRINT 931
03370 931 FORMAT(4H****,* FATAL ERROR - EOF ON READ.*)
03380      GO TO 435
03390 424 PRINT 426
03400 426 FORMAT(4H****,* FATAL ERROR - ICK ERROR.*)
03410      GO TO 435
03420 61 PRINT,* *
03430 PRINT 62,NAME
03440 PRINT,*RE-ENTER CORRECT DATA FILE NAME:*,
03450 GO TO 19
03460 62 FORMAT(A7,* NOT IN PERMANENT STORAGE.*)
03470      END
03480 SUBROUTINE REDREC
03490 COMMON IQNDEX,IANDEX,ID(8,4),          IDATAN(420),
03500+ IDATA0(300),ISHFTL(10),ISHFTR(10),KALL(7),IA(18,7),IGU(6,10),
03510+ INEG(10),IPRIME(10),IHNDX(10,10),IANOSZ(10),ILHEAD(10),
03520+ IDATAR(10,2,10),IDTSIZ(10,10),IELEM(10,10),XDATAR(2,10),
03530+ ICONN(10),XSAVE(10),IMAXQ,IFWAA(120),LCQ(120),IDAT(6),
03540+ IHD(6,2,10),INDIVQ(10),IOUTMX,ICOMP,INMAX,IMAXA,ICHAR,ICH,
03550+ IWD,IWDSIZ,JCHAR,JWD,KNO,IRET,IOUT,ISHFL1,KA,KB,KC,KD,KE,KF,
03560+ KG,KH,KI,KJ,KK,KL,KM,KN,KO,KP,KQ,KR,KS,KT,KU,KV,KW,KX,KY,KZ,
03570+ KCOLON,KHYPHN,KLP,KRP,KSTAR,KTAB,KDOLLR,KDELTA,KAPOST,KBACKS,
03580+ KRET,IBLNKS,IBLNK,KDEC,KCOMMA,KCENT,LOWER,ITERM,IQNO,NOQ,
03590+ IMAXAC,IMAXQC,ISTRSW,ISTART,NOQUES,LIST,LAST,IGETSW,ISAVE(20),
03600+ KEQUAL,NTAPE,KOLON,ICRSUM(10,10),NUMANS(10),IANALY,ICOPY,
03610+ ICOUNT,ICROSS,ITAB,IANSW(10),IO,X(10),X2(10),XCT(10),IBEGA,
03620+ NO,XMEAN(10),XSD(10),XMAX(10),XMIN(10),NODECS(10),ID1(12,6),
03630+ KZERO,KNINE,IMONTH(22),          IHEAD(3,160),
03640+          IOO(10),KMASK(10),JMASK(10)
03650 DIMENSION IARRAY(2)
03660      DATA IARRAY/0000004,0000020/
03670      1 DO 105 I=1,IOUTMX
03680 105  IDATA0(I)=IBLNKS
```


** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```
03690          ISTAT = 0
03700          IC = 0
03710 DO 106 I=1,4
03720 106 ID(8,I) = IBLNKS
03730 READ (NTAPE,180) IQNDEX,IANDEX
03740 IF (EOF,NTAPE) 140,107
03750 107 DO 108 I=1,4
03760 108 READ (NTAPE,170) (ID(J,I),J=1,7)
03770 DO 110 I=1,IQNDEX
03780 110 READ (NTAPE,170) (IHEAD(J,I),J=1,3)
03790 IF (IQNDEX .LE. 65) GO TO 112
03800 READ (NTAPE,160) (LCQ(I),I=1,65)
03810 READ (NTAPE,160) (LCQ(I),I=66,IQNDEX)
03820 GO TO 114
03830 112 READ (NTAPE,160) (LCQ(I),I=1,IQNDEX)
03840 114 MPT = 22
03850 MZT = 1
03860 115 MWT = MZT + 21
03870 IF (IQNDEX-MPT) 117,117,116
03880 116 READ (NTAPE,190) (IFWAA(I),I=MZT,MWT)
03890 MPT = MPT + 22
03900 MZT = MWT + 1
03910 GO TO 115
03920 117 READ (NTAPE,190) (IFWAA(I),I=MZT,IQNDEX)
03930 J = 1
03940 IZAN = (IANDEX/6) + 1
03950 IPAN = (IZAN-1)*6
03960 IF (IPAN .EQ. IANDEX) IZAN=IZAN-1
03970 DO 120 M=1,IZAN
03980 K = J+5
03990 READ (NTAPE,170) (IDATAN(I),I=J,K)
04000 120 J=J+6
04010 ID(3,4) = ID(3,4) .AND. 77B
04020 125 IRET = 2
04030 IF (IQNDEX-1) 130,130,135
04040 130 IRET = 1
04050 RETURN
04060 135 I = IQNDEX+1
04070 IFWAA(I) = IANDEX+1
04080 LCQ(I) = 1
04090 NOQUES = IQNDEX
04100 JWD = 0
04110 RETURN
04120 140 IQNDEX = 1
04130 IANDEX = 1
04140 GO TO 130
04150 160 FORMAT (1X,65I1)
04160 170 FORMAT (1X,7A10)
04170 180 FORMAT (1X,2I5)
04180 190 FORMAT (1X,22I3)
04190 END
04200          SUBROUTINE BOOL
```

** "RETRVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

04210     DIMENSION IARRAY(2)
04220     DIMENSION ITRUE(10)
04230 COMMON IQNDEX,IANDEX,ID(8,4),           IDATAN(420),
04240+  IDATA0(300),ISHFTL(10),ISHFTR(10),KALL(7),IA(18,7),IQU(6,10),
04250+  INEG(10),IPRIME(10),IHINDEX(10,10),IANOSZ(10),ILHEAD(10),
04260+  IDATAR(10,2,10),IDTSIZ(10,10),IELEM(10,10),XDATAR(2,10),
04270+  ICONN(10),XSAVE(10),IMAXQ,IFWAA(120),LCG(120),IDAT(6),
04280+  IHD(6,2,10),INDIVQ(10),IOUTMX,ICOMP,INMAX,IMAXA,ICHAR,ICH,
04290+  IWD,IWDSIZ,JCHAR,JWD,KNO,IRET,IOUT,ISHFL1,KA,KB,KC,KD,KE,KF,
04300+  KG,KH,KI,KJ,KK,KL,KM,KN,KO,KP,KQ,KR,KS,KT,KU,KV,KW,KX,KY,KZ,
04310+  KCOLON,KHYPHN,KLP,KRP,KSTAR,KTAB,KDOLLR,KDELTA,KAPOST,KBACKS,
04320+  KRET,IBLNKS,IBLNK,KDEC,KCOMMA,KCENT,LOWER,ITERM,IQNO,NOQ,
04330+  IMAXAC,IMAXQC,ISTRSW,ISTART,NOQUES,LIST,LAST,IGETSW,ISAVE(20),
04340+  KEQUAL,NTAPE,KOLON,ICRSUM(10,10),NUMANS(10),IANALY,ICOPY,
04350+  ICOUNT,ICROSS,ITAB,IANSW(10),IO,X(10),X2(10),XCT(10),IBEGA,
04360+  NO,XMEAN(10),XSD(10),XMAX(10),XMIN(10),NODECS(10),IDI(12,6),
04370+  KZERO,KNINE,IMONTH(22),           IHEAD(3,160),
04380+  IOO(10),KMASK(10),JMASK(10)
04390 DATA IARRAY/0000004,0000020/
04400     IROW = 0
04410     ICOL = 0
04420     LOWER=0
04430     IF (KALL(5)) 145,145,105
04440 105   IF (IOUT-ICOUNT) 110,310,110
04450 110   IF (KALL(7)) 220,220,115
04460 115   IF (IOUT-IANALY) 120,310,120
04470 120   IF (IOUT-ICOPY) 135,125,135
04480 125   IQNDEX=NOQUES
04490     IF (NTAPE - 15) 126, 400, 400
04500 400   IRET = 7
04510     RETURN
04520 126   IC = 0
04530 1107  IDETEC = IARRAY(2) .AND. ISTAT
04540     IF (IDETEC) 920, 310, 920
04550 135   CALL HEADIN
04560     DO 140 I=5,NOQUES
04570     IQNDEX=I
04580     CALL FORMT
04590 140   CONTINUE
04600     GO TO 305
04610 145 DO 180 K=1,ICOMP
04620     KNO = K
04630     ISTART = 1
04640 150   CALL FINDQ
04650     GO TO (175,155), IRET
04660 155   IF (IANOSZ(KNO)) 170,170,160
04670 160   CALL MACHDT
04680     I = IRET*INEG(KNO)
04690     IF (I) 165,165,170
04700 165   ISTART = IQNDEX + 1
04710     GO TO 150
04720 170   INDIVQ(KNO) = 1
  
```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```
04730 GO TO 180
04740 175 INDIVQ(KNO) = -1
04750 180 CONTINUE
04760     DO 210 I=1,ICOMP
04770     IGROUP=ICOMP-I+1
04780     ISUM=ICONN(IGROUP)
04790     DO 195 IQNO=1,ICOMP
04800     J=IELEM(IQNO,IGROUP)
04810     IF (J-1) 195,190,185
04820 185   J=ITRUE(J)
04830     GO TO 195
04840 190   J=INDIVQ(IQNO)
04850 195   ISUM=ISUM+J
04860     IF (ISUM) 200,205,205
04870 200   ITRUE(IGROUP)=-1
04880     GO TO 210
04890 205   ITRUE(IGROUP)=1
04900 210   CONTINUE
04910     IF (ITRUE(1)) 215,105,105
04920 215   IRET=1
04930     RETURN
04940     220 CONTINUE
04950     DO 240 I=IBEGA, LAST
04960     KNO=I
04970     INDIVQ (KNO) = 0
04980     IANSW(KNO) = 0
04990     NUMANS(KNO) = 0
05000     ISTART=1
05010     CALL FINDQ
05020     GO TO (240,230), IRET
05030     230 IF (IOUT - LIST) 235,240,235
05040     235 CALL MACHDT
05050     IF (IRET) 240,239,239
05060     239 INDIVQ (KNO) = 1
05070     240 CONTINUE
05080     241 CONTINUE
05090     246 IF (IOUT - ICROSS) 244,325,244
05100     244 IF (IO - 4) 255,245,245
05110     245 CONTINUE
05120     ISTRSW=1
05130     JWD=1
05140     JCHAR=0
05150     IQNDEX=4
05160     KNO=4
05170     IA(1,4)=IBLNKS
05180     IA(2,4)=IBLNKS
05190     CALL FORMT
05200     K=ICOMP+1
05210     ISTRSW = 3
05220     JWD = 1
05230     JCHAR = 0
05240     DO 1290 M = K, LAST
```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

05250      KNO = M
05260      IF (IDTSIZ(1,KNO) - 1000) 1250,1270,1250
05270 1250 J = NUMANS(KNO)
05280 DO 242 JH = 1,NOQUES
05290 IF (IQU(1,KNO).EQ.IHEAD(1,JH)) GO TO 243
05300 242 CONTINUE
05310 GO TO 1270
05320 243 JDAT = IFWAA(JH)
05330 KPROS = ISHIFT(IDATAN(JDAT),-54).AND.77B
05340 IF (KPROS.EQ.63B) GO TO 247
05350 GO TO 1270
05360 247 IDATAN(JDAT) = IDATAN(JDAT).AND.7777777777777777B
05370 DO 1255 I = 1,4
05380 ICHAR = IBLNK
05390 1255 CALL STRCH
05400 I = 8
05410 DO 249 K = 1,7
05420 I = .I - 1
05430 249 IDATAR (I,J,KNO) = ISHIFT(IDATAN(JDAT),-(6*K)).AND.77B
05440 DO 1268 I = 1,7
05450 ICHAR = IDATAR(I,J,KNO)
05460 1268 CALL STRCH
05470 GO TO 1290
05480 1270 CALL PFLFIX
05490 1290 CONTINUE
05500      PRINT 250, ID(2,1),IA(1,4),(IDATAO(I),I=1,6)
05510 WRITE (15,250) ID(2,1),IA(1,4),(IDATAO(I),I=1,6)
05520 250 FORMAT (A8,A8,5A10,A5)
05530      DO 252 I = 1,28
05540 252 IDATAO(I) = IBLNKS
05550      GO TO 310
05560 255 IF (IOUT-ICOPY) 260,125,260
05570 260 CALL HEADIN
05580 DO 300 K=IBEGA,LAST
05590      KNO=K
05600 265 J=IPRIME(KNO)
05610      IF (J) 300,300,270
05620 270 DO 295 I=1,J
05630      IQNDEX=IHINDEX(1,KNO)
05640      IF (IQNDEX) 275,295,275
05650 275 IF (IQNDEX-ILHEAD(1)) 280,295,280
05660 280 IF (J-1) 290,285,290
05670 285 LOWER=1
05680 290 ILHEAD(I)=IQNDEX
05690      CALL FORMT
05700 IF (ISAME.EQ. 1) GO TO 305
05710      LOWER=0
05720 295 CONTINUE
05730 296 ISTART=IQNDEX+1
05740      CALL FINDQ
05750      GO TO (300,265), IRET
05760 300 CONTINUE

```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

05770 305 CALL FORMA
05780 308 PRINT 315
05790 315 FORMAT (10H***** )
05800 310 IRET=2
05810 RETURN
05820 325 DO 350 I = 1,ICOMP
05830 IF (INDIVQ(I)) 350,350,330
05840 330 DO 340 J = IBEGA, LAST
05850 IF (INDIVQ(J)) 340,340,335
05860 335 ICRSUM(I,J) = ICRSUM(I,J) + 1
05870 340 CONTINUE
05880 350 CONTINUE
05890 GO TO 310
05900 900 IRET = 3
05910 RETURN
05920 920 IRET = 5
05930 RETURN
05940 END
05950 SUBROUTINE CKID
05960 COMMON IQNDEX, IANDEX, ID(8,4), IDATAN(420),
05970+ IDATA0(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
05980+ INEG(10), IPRIME(10), IHINDEX(10,10), IANOSZ(10), ILHEAD(10),
05990+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
06000+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),
06010+ IHD(6,2,10), INDIVQ(10), IOUTMX, ICOMP, INMAX, IMAXA, ICHAR, ICH,
06020+ IWD, IWDSIZ, JCHAR, JWD, KNO, IRET, IOUT, ISHFL1, KA, KB, KC, KD, KE, KF,
06030+ KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ,
06040+ KCOLON, KHYPHN, KLP, KRP, KSTAR, KTAB, KDOLLR, KDELTA, KAPOST, KBACKS,
06050+ KRET, IBLNKS, IBLNK, KDEC, KCOMMA, KCENT, LOWER, ITERM, IQNO, NOQ,
06060+ IMAXAC, IMAXQC, ISTRSW, ISTART, NOQUES, LIST, LAST, IGETSW, ISAVE(20),
06070+ KEQUAL, NTAPE, KOLON, ICRSUM(10,10), NUMANS(10), IANALY, ICOPY,
06080+ ICOUNT, ICROSS, ITAB, IANSW(10), IO, X(10), X2(10), XCT(10), IBEGA,
06090+ NO, XMEAN(10), XSD(10), XMAX(10), XMIN(10), NODECS(10), ID1(12,6),
06100+ KZERO, KNINE, IMONTH(22), IHEAD(3,160),
06110+ IOO(10), KMASK(10), JMASK(10)
06120 DIMENSION KLAST(8)
06130 DATA IFORM/6HFORMAT/
06140 I=1
06150 IF (KALL(I)) 15,15,10
06160 10 IF (ID(2,1) - IFORM) 100,145,100
06170 15 L=1
06180 KTRK = 0
06190 DO 20 J=2,IMAXA
06200 KCT=1
06210 L=L+1
06220 KLAST(L) = ID(J,I)
06230 DO 50 KLK = 0,54,6
06240 LOOK = ISHIFT(IA(J,I),KLK).AND.77000000000000000000B
06250 IF (LOOK.EQ.55000000000000000000B) KTRK = KTRK + 1
06260 IF (KTRK - 2) 60,70,70
06270 60 KCT = KCT + 1
06280 50 CONTINUE

```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

06290 20    CONTINUE
06300 70    LMN = KCT-1
06310 KLAST(L) = ID(J,I)
06320      DO 90 J = 2,L
06330      IF (IA(J,I) - KLAST(J)) 145,90,145
06340 90    CONTINUE
06350 100   I = I + 1
06360      IF (I - 3) 105,105,115
06370 105   II = I
06380      IF (KALL(I)) 15,15,100
06390 115   CONTINUE
06400      IF (KALL(4)) 120,120,140
06410 120   DO 125 I=1,3
06420      J=I+1
06430      IF (ID(J,4)-IDAT(I)) 145,125,130
06440 125   CONTINUE
06450      GO TO 140
06460 130   DO 135 I=2,4
06470      J=I+2
06480      IF (ID(I,4)-IDAT(J)) 140,135,150
06490 135   CONTINUE
06500 140   IRET=2
06510      GO TO 170
06520 145   IRET=1
06530      GO TO 170
06540 150   IF (II-1) 155,165,155
06550 155   N=II-1
06560      DO 160 J=1,N
06570      IF (KALL(J)) 160,160,145
06580 160   CONTINUE
06590 165   IRET=3
06600 170   RETURN
06610      END
06620      SUBROUTINE DATEIN
06630 COMMON IQNDEX, IANDEX, ID(8,4),          IDATAN(420),
06640+ IDATA0(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
06650+ INEG(10), IPRIME(10), IHNDX(10,10), IANOSZ(10), ILHEAD(10),
06660+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
06670+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),
06680+ IHD(6,2,10), INDIVQ(10), IOUTMX, ICOMP, INMAX, IMAXA, ICHAR, ICH,
06690+ IWD, IWDSIZ, JCHAR, JWD, KNO, IRET, IOUT, ISHFL1, KA, KB, KC, KD, KE, KF,
06700+ KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ,
06710+ KCOLON, KHYPHN, KLP, KRP, KSTAR, KTAB, KDOLLR, KDELTA, KAPOST, KBACKS,
06720+ KRET, IBLNKS, IBLNK, KDEC, KCOMMA, KCENT, LOWER, ITERM, IQNO, NOQ,
06730+ IMAXAC, IMAXQC, ISTRSW, ISTART, NOQUES, LIST, LAST, IGETSW, ISAVE(20),
06740+ KEQUAL, NTAPE, KOLON, ICRSUM(10,10), NUMANS(10), IANALY, ICOPY,
06750+ ICOUNT, ICROSS, ITAB, IANSW(10), IO, X(10), X2(10), XCT(10), IBEGA,
06760+ NO, XMEAN(10), XSD(10), XMAX(10), XMIN(10), NODECS(10), ID1(12,6),
06770+ KZERO, KNINE, IMONTH(22),          IHEAD(3,160),
06780+          IOO(10), KMASK(10), JMASK(10)
06790 DATA IFILLO/033333333333333333330000/
06800 N=1

```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```
06810      I=0
06820      MM=1
06830      IDAY1 = KZERO
06840      IDAY2 = KZERO
06850      GO TO 145
06860 110   I=I+1
06870      IF (IA(I,4)-ITERM) 135,115,135
06880 115   IDAT(4)=IDAT(1)
06890      IDAT(5)=IDAT(2)
06900      IF (IFLAG) 125,120,125
06910 120   IDAT(6) = (KZERO+3)*ISHFL1+(KZERO+1)+IFILLO
06920      GO TO 130
06930 125   IDAT(6)=IDAT(3)
06940 130   IRET=4
06950      RETURN
06960 135   IF (IA(I,4)-KHYPHN) 137,140,137
06970 137   IF (IA(I,4)-KT) 190,138,190
06980 138   I=I+1
06990 140   MM=2
07000      N=4
07010      IDAY1 = KZERO + 3
07020      IDAY2 = KZERO + 1
07030 145   IFLAG=0
07040 150   I=I+1
07050      ICHAR=IA(I,4)
07060      IF (ICHAR - KNINE) 155, 155, 175
07070 155   IF (ICHAR - KZERO) 175, 160, 160
07080 160   IFLAG=IFLAG+1
07090      GO TO (165,170), IFLAG
07100 165   IDAY1 = KZERO
07110      IDAY2=ICHAR
07120      GO TO 150
07130 170   IDAY1=IDAY2
07140      IDAY2=ICHAR
07150      I=I+1
07160      ICHAR=IA(I,4)
07170 175   K=ICHAR
07180      I=I+1
07190      L=IA(I,4)
07200      I=I+1
07210      IDATE1=ISHFL1*ISHFL1*K+ISHFL1*L+IA(I,4)
07220      DO 180 M=1,22
07230      MO=M
07240      IF (IDATE1-IMONTH(M)) 180,185,180
07250 180   CONTINUE
07260      IRET=2
07270      RETURN
07280 185   I=I+1
07290      K=IA(I,4)
07300      I=I+1
07310      IDAT(N) = IABS(ISHFL1*K)+IA(I,4)+IFILLO
07320      N=N+1
```

** "RETRVEVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

07330      IDAT(N)=MO
07340      N=N+1
07350      IDAT(N) = IABS(IDAY1*ISHFL1) + IDAY2 + IFILLO
07360      GO TO (110,130), MM
07370 190   IRET=3
07380      RETURN
07390      END
07400      SUBROUTINE FINDQ
07410 COMMON IQNDEX, IANDEX, ID(8,4),          IDATAN(420),
07420+ IDATAO(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
07430+ INEG(10), IPRIME(10), IHNDEX(10,10), IANOSZ(10), ILHEAD(10),
07440+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
07450+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),
07460+ IHD(6,2,10), INDIVQ(10), IOUTMX, ICOMP, INMAX, IMAXA, ICHAR, ICH,
07470+ IWD, IWDSIZ, JCHAR, JWD, KNO, IRET, IOUT, ISHFL1, KA, KB, KC, KD, KE, KF,
07480+ KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ,
07490+ KCOLON, KHYPHN, KLP, KRP, KSTAR, KTAB, KDOLLR, KDELTA, KAPOST, KBACKS,
07500+ KRET, IBLNKS, IBLNK, KDEC, KCOMMA, KCENT, LOWER, ITERM, IQNO, NOQ,
07510+ IMAXAC, IMAXQC, ISTRSW, ISTART, NOQUES, LIST, LAST, IGETSW, ISAVE(20),
07520+ KEQUAL, NTAPE, KOLON, ICRSUM(10,10), NUMANS(10), IANALY, ICOPY,
07530+ ICOUNT, ICROSS, ITAB, IANSW(10), IO, X(10), X2(10), XCT(10), IBEGA,
07540+ NO, XMEAN(10), XSD(10), XMAX(10), XMIN(10), NODECS(10), ID1(12,6),
07550+ KZERO, KNINE, IMONTH(22),          IHEAD(3,160),
07560+          IOO(10), KMASK(10), JMASK(10)
07570 105 DO 115 I=ISTART,NOQUES
07580 DO 110 J=1,IMAXQ
07590      IQNDEX=I
07600      IF (IQU(J,KNO)-IHEAD(J,IQNDEX)) 115,110,115
07610 110   CONTINUE
07620      GO TO 125
07630 115   CONTINUE
07640      DO 120 I=1,10
07650 120   IHNDEX(I,KNO)=0
07660      IRET=1
07670      IPRIME(KNO)=0
07680      RETURN
07690 125   I=IQNDEX-1
07700      LCQUES=LCQ(IQNDEX)
07710      IPRIME(KNO)=LCQUES
07720      DO 140 J=5,I
07730      K=LCQ(J)
07740      IF (K-LCQUES) 130,140,140
07750 130   IHNDEX(K,KNO)=J
07760      KK=K+1
07770      DO 135 KKK=KK,10
07780 135   IHNDEX(KKK,KNO)=0
07790 140   CONTINUE
07800      LSTART=1
07810      I=LCQUES-1
07820      DO 165 L = 1,2
07830      LL = 3-L
07840      IF (IHD(1,LL,KNO)-IBLNKS) 145,165,145

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** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

07850 145 DO 160 M=LSTART,I
07860 N=IHNDEX(M,KNO)
07870 IF (N) 150,160,150
07880 150 DO 155 J=1,IMAXQ
07890 IF (IHD(J,LL,KNO)-IHEAD(J,N)) 160,155,160
07900 155 CONTINUE
07910 LSTART=M
07920 GO TO 165
07930 160 CONTINUE
07940 ISTART=IQNDEX+1
07950 GO TO 105
07960 165 CONTINUE
07970 IHNDEX(LCQUES,KNO)=IQNDEX
07980 IRET=2
07990 RETURN
08000 END
08010 SUBROUTINE FORMA
08020 COMMON IQNDEX,IANDEX,ID(8,4), IDATAN(420),
08030+ IDATAO(300),ISHFTL(10),ISHFTR(10),KALL(7),IA(18,7),IQU(6,10),
08040+ INEG(10),IPRIME(10),IHNDEX(10,10),IANOSZ(10),ILHEAD(10),
08050+ IDATAR(10,2,10),IDTSIZ(10,10),IELEM(10,10),XDATAR(2,10),
08060+ ICONN(10),XSAVE(10),IMAXQ,IFWAA(120),LCQ(120),IDAT(6),
08070+ IHD(6,2,10),INDIVQ(10),IOUTMX,ICOMP,INMAX,IMAXA,ICHAR,ICH,
08080+ IWD,IWDSIZ,JCHAR,JWD,KNO,IRET,IOUT,ISHFL1,KA,KB,KC,KD,KE,KF,
08090+ KG,KH,KI,KJ,KK,KL,KM,KN,KO,KP,KQ,KR,KS,KT,KU,KV,KW,KX,KY,KZ,
08100+ KCOLON,KHYPHN,KLP,KRP,KSTAR,KTAB,KDOLLR,KDELTA,KAPOST,KBACKS,
08110+ KRET,IBLNKS,IBLNK,KDEC,KCOMMA,KCENT,LOWER,ITERM,IQNO,NOQ,
08120+ IMAXAC,IMAXQC,ISTRSW,ISTART,NOQUES,LIST,LAST,IGETSW,ISAVE(20),
08130+ KEQUAL,NTAPE,KOLON,ICRSUM(10,10),NUMANS(10),IANALY,ICOPY,
08140+ ICOUNT,ICROSS,ITAB,IANSW(10),IO,X(10),X2(10),XCT(10),IBEGA,
08150+ NO,XMEAN(10),XSD(10),XMAX(10),XMIN(10),NODECS(10),IDI(12,6),
08160+ KZERO,KNINE,IMONTH(22), IHEAD(3,160),
08170+ IOO(10),KMASK(10),JMASK(10)
08180 IF (JWD) 145,130,105
08190 105 IF (IOUT-LIST) 110,120,110
08200 110 PRINT 115
08210 115 FORMAT (22H INVALID OUTPUT DEVICE)
08220 GO TO 135
08230 120 CALL PRINT
08240 GO TO 135
08250 130 JWD=IOUTMX
08260 135 DO 140 I=1,JWD
08270 140 IDATAO(I)=IBLNKS
08280 145 JWD=1
08290 JCHAR=0
08300 RETURN
08310 END
08320 SUBROUTINE FORMT
08330 COMMON IQNDEX,IANDEX,ID(8,4), IDATAN(420),
08340+ IDATAO(300),ISHFTL(10),ISHFTR(10),KALL(7),IA(18,7),IQU(6,10),
08350+ INEG(10),IPRIME(10),IHNDEX(10,10),IANOSZ(10),ILHEAD(10),
08360+ IDATAR(10,2,10),IDTSIZ(10,10),IELEM(10,10),XDATAR(2,10),

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** "RETRVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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08370+ ICONN(10),XSAVE(10),IMAXQ,IFWAA(120),LCQ(120),IDAT(6),
08380+ IHD(6,2,10),INDIVQ(10),IOUTMX,ICOMP,INMAX,IMAXA,ICHAR,ICH,
08390+ IWD,IWDSIZ,JCHAR,JWD,KNO,IRET,IOUT,ISHFL1,KA,KB,KC,KD,KE,KF,
08400+ KG,KH,KI,KJ,KK,KL,KM,KN,KO,KP,KQ,KR,KS,KT,KU,KV,KW,KX,KY,KZ,
08410+ KCOLON,KHYPHN,KLP,KRP,KSTAR,KTAB,KDOLLR,KDELTA,KAPOST,KBACKS,
08420+ KRET,IBLNKS,IBLNK,KDEC,KCOMMA,KCENT,LOWER,ITERM,IQNO,NOQ,
08430+ IMAXAC,IMAXQC,ISTRSW,ISTART,NOQUES,LIST,LAST,IGETSW,ISAVE(20),
08440+ KEQUAL,NTAPE,KOLON,ICRSUM(10,10),NUMANS(10),IANALY,ICOPY,
08450+ ICOUNT,ICROSS,ITAB,IANSW(10),IO,X(10),X2(10),XCT(10),IBEGA,
08460+ NO,XMEAN(10),XSD(10),XMAX(10),XMIN(10),NODECS(10),ID1(12,6),
08470+ KZERO,KNINE,IMONTH(22), IHEAD(3,160),
08480+ I00(10),KMASK(10),JMASK(10)
08490 IF (IOUT-LIST) 110,105,110
08500 105 ISTRSW=3
08510 110 IGETSW=1
08520 IWD=2
08530 ILIMIT = IMAXAC
08540 IPROSE=1
08550 LCORIG=LCQ(IQNDEX)
08560 IF (IQNDEX-4) 185,275,115
08570 115 J=LCQ(IQNDEX)
08580 CALL FORMA
08590 ICHAR=IBLNK
08600 IF (J) 130,130,120
08610 120 DO 125 I=1,J
08620 125 CALL STRCH
08630 130 IGETSW=2
08640 IWD=1
08650 ICH=0
08660 IBLKCT=0
08670 DO 160 I=1,24
08680 CALL GETCH
08690 IF (ICHAR-IBLNK) 140,135,140
08700 135 IBLKCT=IBLKCT+1
08710 GO TO 160
08720 140 IF (IBLKCT) 155,155,145
08730 145 M=ICHAR
08740 ICHAR=IBLNK
08750 DO 150 J=1,IBLKCT
08760 150 CALL STRCH
08770 IBLKCT=0
08780 ICHAR=M
08790 155 CALL STRCH
08800 160 CONTINUE
08810 IGETSW=3
08820 IWD=IFWAA(IQNDEX)
08830 IF (IWD) 270,270,165
08840 165 I=IQNDEX+1
08850 170 ILWA=IFWAA(I)
08860 IF (ILWA) 175,175,180
08870 175 I=I+1
08880 GO TO 170

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** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```
08890 180 ILIMIT=(ILWA-IWD)*IWDSIZ
08900      IPROSE=0
08910 185 ICH=0
08920      ICODE=0
08930      IDATE = 0
08940      IMIDDT = 0
08950      IBLKCT=0
08960      DO 265 J=1,ILIMIT
08970      CALL GETCH
08980      IF (ICCHAR-KTAB) 195,190,195
08990 190 JWD=3
09000      JCHAR = 4
09010      IBLKCT=0
09020      GO TO 265
09030 195 IF (ICCHAR-KRET) 205,200,205
09040 200. CALL FORMA
09050      JWD=1
09060      JCHAR=0
09070      GO TO 265
09080 205 IF (ICCHAR-IBLNK) 214,210,214
09090 210 IBLKCT=IBLKCT+1
09100      GO TO 265
09110 214 IF (IPROSE)215,215,245
09120 215 IF (IDATE) 216,216,219
09130 216 IF (IMIDDT) 217,217,227
09140 217 IF (ICCHAR - KEQUAL) 218,226,218
09150 218 IDATE = 1
09160 219 IF (ICCHAR - KOLON) 230,220,230
09170 226 IMIDDT = 1
09180      GO TO 265
09190 227 IF (IMIDDT - 7) 228,228,229
09200 228 CALL STRCH
09210      IMIDDT = IMIDDT + 1
09220      GO TO 265
09230 229 IDATE = 1
09240      IF (IBLKCT) 219,219,221
09250 221 M = ICHAR
09260      ICHAR = IBLNK
09270      DO 222 I = 1,IBLKCT
09280 222 CALL STRCH
09290      ICHAR = M
09300 999 IBLKCT = 0
09310      GO TO 219
09320 220 IPROSE=1
09330      IF (ICODE) 265,265,225
09340 225 ICHAR=KRP
09350      CALL STRCH
09360      GO TO 265
09370 230 IF (IPROSE) 235,235,245
09380 235 IF (ICODE) 240,240,245
09390 240 M=ICCHAR
09400      ICODE=1
```

** "RETRVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

09410      ICHAR=KLP
09420      CALL STRCH
09430      ICHAR=M
09440 245   IF (IBLKCT) 260,260,250
09450 250   M=ICHAR
09460      ICHAR=IBLNK
09470      DO 255 I=1,IBLKCT
09480 255   CALL STRCH
09490      IBLKCT=0
09500      ICHAR=M
09510      260 CALL STRCH
09520 265   CONTINUE
09530 270   IF (LOWER) 285,285,290
09540 275   IGETSW=1
09550      IWD=4
09560      ICH=IWDSIZ-2
09570      CALL GETCH
09580      ISUM = ICHAR - KZERO
09590      IF (ISUM) 276,276,277
09600 276   ICHAR = IBLNK
09610 277   CALL STRCH
09620      CALL GETCH
09630      ISUM = ISUM + ICHAR - KZERO
09640      IF (ISUM) 278,278,279
09650 278   ICHAR = IBLNK
09660 279   CALL STRCH
09670      IWD=3
09680      ICH = IWDSIZ - 1
09690      CALL GETCH
09700      ID(3,4) = IMONTH(ICHAR)
09710      IWD=3
09720      ICH=IWDSIZ-3
09730      DO 280 I=1,3
09740      CALL GETCH
09750 280   CALL STRCH
09760      IWD=2
09770      ICH=IWDSIZ-2
09780      CALL GETCH
09790      CALL STRCH
09800      CALL GETCH
09810      CALL STRCH
09820 285   RETURN
09830 290   IQNDEX=IQNDEX+1
09840      J=LCQ(IQNDEX)
09850      IF (LCORIG-J) 115,285,285
09860      END
09870      SUBROUTINE GETCH
09880 COMMON IQNDEX, IANDEX, ID(8,4),          IDATAN(420),
09890+ IDATA0(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
09900+ INEG(10), IPRIME(10), IHNDEX(10,10), IANOSZ(10), ILHEAD(10),
09910+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
09920+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),

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** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

09930+ IHD(6,2,10),INDIVQ(10),IOUTMX,ICOMP,INMAX,IMAXA,ICHAR,ICH,
09940+ IWD,IWDSIZ,JCHAR,JWD,KNO,IRET,IOUT,ISHFL1,KA,KB,KC,KD,KE,KF,
09950+ KG,KH,KI,KJ,KK,KL,KM,KN,KO,KP,KQ,KR,KS,KT,KU,KV,KW,KX,KY,KZ,
09960+ KCOLON,KHYPHN,KLP,KRP,KSTAR,KTAB,KDOLLR,KDELTA,KAPOST,KBACKS,
09970+ KRET,IBLNKS,IBLNK,KDEC,KCOMMA,KCENT,LOWER,ITERM,IQNO,NOQ,
09980+ IMAXAC,IMAXQC,ISTRSW,ISTART,NOQUES,LIST,LAST,IGETSW,ISAVE(20),
09990+ KEQUAL,NTAPE,KOLON,ICRSUM(10,10),NUMANS(10),IANALY,ICOPY,
10000+ ICOUNT,ICROSS,ITAB,IANSW(10),IO,X(10),X2(10),XCT(10),IBEGA,
10010+ NO,XMEAN(10),XSD(10),XMAX(10),XMIN(10),NODECS(10),ID1(12,6),
10020+ KZERO,KNINE,IMONTH(22),          IHEAD(3,160),
10030+                                100(10),KMASK(10),JMASK(10)
10040 DIMENSION SLOT(10)
10050 TYPE INTEGER CHOICE,SLOT
10060 DATA LASTCH / 10HXXXXXXXXX9 /
10070 DATA IBG / 0000077 /
10080 ICH = ICH + 1
10090 IF (ICH .LE. IWDSIZ) GO TO 5
10100 ICH = 1
10110 IWD = IWD + 1
10120 5 CONTINUE
10130 GO TO (10,20,30) IGETSW
10140 10 CHOICE = ID(IWD,IQINDEX)
10150 GO TO 40
10160 20 CHOICE = IHEAD(IWD,IQINDEX)
10170 GO TO 40
10180 30 CHOICE = IDATAN(IWD)
10190 40 CONTINUE
10200 IF (CHOICE .EQ. LASTCH) GO TO 50
10210 LM = 0
10220 DO 45 I=1,10
10230 LM = LM + 6
10240 SLOT(I) = ISHIFT(CHOICE,LM)
10250 45 SLOT(I) = SLOT(I) .AND. IBG
10260 50 ICHAR = SLOT(ICH)
10270 LASTCH = CHOICE
10280          RETURN
10290 END
10300          SUBROUTINE HEADIN
10310 COMMON IQINDEX,IANDEX,ID(8,4),          IDATAN(420),
10320+ IATAO(300),ISHFTL(10),ISHFTR(10),KALL(7),IA(18,7),IQU(6,10),
10330+ INEG(10),IPRIME(10),IHINDEX(10,10),IANOSZ(10),ILHEAD(10),
10340+ IDATAR(10,2,10),IDTSIZ(10,10),IELEM(10,10),XDATAR(2,10),
10350+ ICONN(10),XSAVE(10),IMAXQ,IFWAA(120),LCQ(120),IDAT(6),
10360+ IHD(6,2,10),INDIVQ(10),IOUTMX,ICOMP,INMAX,IMAXA,ICHAR,ICH,
10370+ IWD,IWDSIZ,JCHAR,JWD,KNO,IRET,IOUT,ISHFL1,KA,KB,KC,KD,KE,KF,
10380+ KG,KH,KI,KJ,KK,KL,KM,KN,KO,KP,KQ,KR,KS,KT,KU,KV,KW,KX,KY,KZ,
10390+ KCOLON,KHYPHN,KLP,KRP,KSTAR,KTAB,KDOLLR,KDELTA,KAPOST,KBACKS,
10400+ KRET,IBLNKS,IBLNK,KDEC,KCOMMA,KCENT,LOWER,ITERM,IQNO,NOQ,
10410+ IMAXAC,IMAXQC,ISTRSW,ISTART,NOQUES,LIST,LAST,IGETSW,ISAVE(20),
10420+ KEQUAL,NTAPE,KOLON,ICRSUM(10,10),NUMANS(10),IANALY,ICOPY,
10430+ ICOUNT,ICROSS,ITAB,IANSW(10),IO,X(10),X2(10),XCT(10),IBEGA,
10440+ NO,XMEAN(10),XSD(10),XMAX(10),XMIN(10),NODECS(10),ID1(12,6),

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** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

10450+ KZERO,KNINE,IMONTH(22),          IHEAD(3,160),
10460+                                100(10),KMASK(10),JMASK(10)
10470 105  CALL FORMA
10480      CALL FORMA
10490      DO 120 I = 1,4
10500      IQNDEX = I
10510      CALL FORMT
10520      ICHAR=IBLNK
10530      CALL STRCH
10540      CALL STRCH
10550      J = 2*I
10560      IF (J-JWD) 110,110,120
10570 110 CALL FORMA
10580 120 CONTINUE
10590      CALL FORMA
10600      DO 130 I=1,10
10610 130 ILHEAD(I) = 0
10620      RETURN
10630      END
10640      SUBROUTINE INIT
10650 COMMON IQNDEX,IANDEX,ID(8,4),          IDATAN(420),
10660+ IDATAO(300),ISHFTL(10),ISHFTR(10),KALL(7),IA(18,7),IQU(6,10),
10670+ INEG(10),IPRIME(10),IHINDEX(10,10),IANOSZ(10),ILHEAD(10),
10680+ IDATAR(10,2,10),IDTSIZ(10,10),IELEM(10,10),XDATAR(2,10),
10690+ ICONN(10),XSAVE(10),IMAXQ,IFWAA(120),LCQ(120),IDAT(6),
10700+ IHD(6,2,10),INDIVQ(10),IOUTMX,ICOMP,INMAX,IMAXA,ICHA,ICH,
10710+ IWD,IWDSIZ,JCHAR,JWD,KNO,IRET,IOUT,ISHFL1,KA,KB,KC,KD,KE,KF,
10720+ KG,KH,KI,KJ,KK,KL,KM,KN,KO,KP,KQ,KR,KS,KT,KU,KV,KW,KX,KY,KZ,
10730+ KCOLON,KHYPHN,KLP,KRP,KSTAR,KTAB,KDOLLR,KDELTA,KAPOST,KBACKS,
10740+ KRET,IBLNKS,IBLNK,KDEC,KCOMMA,KCENT,LOWER,ITERM,IQNO,NOQ,
10750+ IMAXAC,IMAXQC,ISTRSW,ISTART,NOQUES,LIST,LAST,IGETSW,ISAVE(20),
10760+ KEQUAL,NTAPE,KOLON,ICRSUM(10,10),NUMANS(10),IANALY,ICOPY,
10770+ ICOUNT,ICROSS,ITAB,IANSW(10),IO,X(10),X2(10),XCT(10),IBEGA,
10780+ NO,XMEAN(10),XSD(10),XMAX(10),XMIN(10),NODECS(10),ID1(12,6),
10790+ KZERO,KNINE,IMONTH(22),          IHEAD(3,160),
10800+                                100(10),KMASK(10),JMASK(10)
10810 DIMENSION IMON(22)
10820 DATA IMON/0120116,0060502,0150122,0012022,0150131,0122516,
10830+ 0122514,0012507,0230520,0170324,0161726,0040503,0251613/
10840      IWDSIZ = 10
10850      IMAXA = 8
10860      IMAXQC = 24
10870      IMAXQ = 3
10880      IMAXAC = IMAXA * IWDSIZ
10890      IOUTMX = 300
10900      KNINE = 36
10910      KZERO = 27
10920      ISHFTL(1) = 1
10930      ISHFTL(2) = 2**6
10940      ISHFTL(3) = 2**12
10950      ISHFTL(4) = 2**18
10960      ISHFTL(5) = 2**24

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** "RETRIEVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

11490      KT = 20
11500      KU = 21
11510      KV = 22
11520      KW = 23
11530      KX = 24
11540      KY = 25
11550      KZ = 26
11560      KRET = 53
11570      KHYPHN = 38
11580      KLP = 41
11590      KRP = 42
11600      KSTAR = 39
11610      KTAB = 50
11620      KEQUAL = 44
11630      KDOLLR = 43
11640      KDELTA = 123
11650      KAPOST = 58
11660      KBACKS = 128
11670      KOLON = 51
11680      KCOLON = 51
11690      KCOMMA = 46
11700      KDEC = 47
11710 1111 CONTINUE
11720      ISHFL1 = 2**6
11730      ISHFL2 = ISHFL1**2
11740      DO 100 I=1,22
11750 100 IMONTH(I) = IMON(I)
11760      ITERM = KSTAR
11770      RETURN
11780      END
11790      SUBROUTINE STRCH
11800 COMMON IQNDEX, IANDEX, ID(8,4),          IDATAN(420),
11810+ IDATA0(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
11820+ INEG(10), IPRIME(10), IHNDEX(10,10), IANOSZ(10), ILHEAD(10),
11830+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
11840+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),
11850+ IHD(6,2,10), INDIVQ(10), IOUTMX, ICOMP, INMAX, IMAXA, ICHAR, ICH,
11860+ IWD, IWDSIZ, JCHAR, JWD, KNO, IRET, IOUT, ISHFL1, KA, KB, KC, KD, KE, KF,
11870+ KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ,
11880+ KCOLON, KHYPHN, KLP, KRP, KSTAR, KTAB, KDOLLR, KDELTA, KAPOST, KBACKS,
11890+ KRET, IBLNKS, IBLNK, KDEC, KCOMMA, KCENT, LOWER, ITERM, IQNO, NOQ,
11900+ IMAXAC, IMAXQC, ISTRSW, ISTART, NOQUES, LIST, LAST, IGETSW, ISAVE(20),
11910+ KEQUAL, NTAPE, KOLON, ICRSUM(10,10), NUMANS(10), IANALY, ICOPY,
11920+ ICOUNT, ICROSS, ITAB, IANSW(10), IO, X(10), X2(10), XCT(10), IBEGA,
11930+ NO, XMEAN(10), XSD(10), XMAX(10), XMIN(10), NODECS(10), ID1(12,6),
11940+ KZERO, KNINE, IMONTH(22),          IHEAD(3,160),
11950+          IOO(10), KMASK(10), JMASK(10)
11960      DIMENSION FMT(10)
11970 DATA FMT/7H(R1,R9),10H(A1,R1,R8),10H(A2,R1,R7),10H(A3,R1,R6),
11980+ 10H(A4,R1,R5),10H(A5,R1,R4),10H(A6,R1,R3),10H(A7,R1,R2),
11990+ 10H(A8,R1,R1),7H(A9,R1)/
12000      TYPE INTEGER CHOICE

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** "RETRVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

12010 100 JCHAR = JCHAR + 1
12020 107 IF (JCHAR - IWDSIZ)115,115,110
12030 110 JCHAR = 1
12040 JWD = JWD + 1
12050 115 L = 54 - 6*(JCHAR - 1)
12060 KCHAR = ISHIFT(ICHAR,L)
12070 GO TO (108,208,308) ISTRSW
12080 108 IA(JWD,KNO)=(IA(JWD,KNO).AND.100(JCHAR)).OR.KCHAR
12090 GO TO 400
12100 208 IQU(JWD,KNO)=(IQU(JWD,KNO).AND.100(JCHAR)).OR.KCHAR
12110 GO TO 400
12120 308 IF (JWD - IOUTMX)120,120,910
12130 120 IDATA0(JWD) = (IDATA0(JWD).AND.100(JCHAR)).OR.KCHAR
12140 400 RETURN
12150 910 PRINT 911
12160 911 FORMAT (30H OUTPUT BUFFER EXCEEDED )
12170 CALL FORMA
12180 JWD = 0
12190 GO TO 110
12200 END
12210 SUBROUTINE TYPEN
12220 COMMON IQNDEX, IANDEX, ID(8,4), IDATAN(420),
12230+ IDATA0(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
12240+ INEG(10), IPRIME(10), IHNDEX(10,10), IANOSZ(10), ILHEAD(10),
12250+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
12260+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),
12270+ IHD(6,2,10), INDIVQ(10), IOUTMX, ICOMP, INMAX, IMAXA, ICHAR, ICH,
12280+ IWD, IWDSIZ, JCHAR, JWD, KNO, IRET, IOUT, ISHFL1, KA, KB, KC, KD, KE, KF,
12290+ KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ,
12300+ KCOLON, KHYPHN, KLP, KRP, KSTAR, KTAB, KDOLLR, KDELTA, KAPOST, KBACKS,
12310+ KRET, IBLNKS, IBLNK, KDEC, KCOMMA, KCENT, LOWER, ITERM, IQNO, NOQ,
12320+ IMAXAC, IMAXQC, ISTRSW, ISTART, NOQUES, LIST, LAST, IGETSW, ISAVE(20),
12330+ KEQUAL, NTAPE, KOLON, ICRSUM(10,10), NUMANS(10), IANALY, ICOPY,
12340+ ICOUNT, ICROSS, ITAB, IANSW(10), IO, X(10), X2(10), XCT(10), IBEGA,
12350+ NO, XMEAN(10), XSD(10), XMAX(10), XMIN(10), NODECS(10), ID1(12,6),
12360+ KZERO, KNINE, IMONTH(22), IHEAD(3,160),
12370+ I00(10), KMASK(10), JMASK(10)
12380 COMMON /MODESW/ RETMODE
12390 DATA IEND1/10HEND OF REQ/, IEND2/5HUEST*/
12400 DATA NONE/4HNONE/
12410 DATA JALL/3HALL/
12420 INONE=NONE-(IBLNK*ISHFTL(IWDSIZ-4))+(ITERM*ISHFTL(IWDSIZ-4))
12430 IALL=JALL-(IBLNK*ISHFTL(IWDSIZ-3))+(ITERM*ISHFTL(IWDSIZ-3))
12440 ICT = 1
12450 ISTRSW=1
12460 IGETSW=3
12470 IHYP=0
12480 DO 50 I=1,20
12490 50 IDATAN(I) = IBLNKS
12500 105 READ 110, (IDATAN(I), I=1,6)
12510 JJ = 7
12520 JP = 60

```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```
12530 110 FORMAT (6A10)
12540 111 ICH=0
12550 IWD=1
12560 IF (RETMODE .EQ. 6HREMOTE) GO TO 9950
12570 PRINT 115, (IDATAN(I),I=1,8)
12580 115 FORMAT (7A10,A2)
12590 9950 CONTINUE
12600 IF (IHYP) 120,120,185
12610 120 CALL GETCH
12620 IF (ICHAR-ITERM) 125,235,125
12630 125 ICH=0
12640 DO 130 J=1,IMAXA
12650 130 IA(J,KNO)=IBLNKS
12660 KALL(KNO)=1
12670 IF (IDATAN(1) - INONE) 135, 225, 135
12680 135 IF (IDATAN(1)-IALL) 140,230,140
12690 140 KALL(KNO)=0
12700 IF (IDATAN(1).EQ.8HRESTART*) GO TO 250
12710 IF (IDATAN(1).EQ.9HNEW FILE*) GO TO 260
12720 IF (IDATAN(1)-IEND1) 150,145,150
12730 145 IF (IDATAN(2)-IEND2) 150,240,150
12740 150 IF (KNO-4) 155,200,170
12750 155 JWD=2
12760 JCHAR=0
12770 DO 165 K=1,IMAXAC
12780 CALL GETCH
12790 IF (ICHAR - ITERM) 160,166,160
12800 160 CALL STRCH
12810 165 CONTINUE
12820 166 IF (KNO - 1) 167,167,169
12830 167 DO 168 I = 1,IMAXA
12840 168 ID1(I,ICT) = IA(I,1)
12850 ICT = ICT + 1
12860 IF (ICHAR - ITERM) 196, 169, 196
12870 169 IRET = 2
12880 RETURN
12890 170 IF (KNO-6) 175,155,184
12900 175 DO 180 I=1,20
12910 180 ISAVE(I)=IDATAN(I)
12920 184 IHYP = 49
12930 185 DO 195 K=1,JP
12940 CALL GETCH
12950 IHYP=IHYP+1
12960 IDATAN(IHYP) = ICHAR
12970 IF (ICHAR-ITERM) 190,220,190
12980 190 IF (IHYP-338) 195,215,215
12990 195 CONTINUE
13000 K = JJ+7
13010 196 READ 197, (IDATAN(I),I=JJ,K)
13020 197 FORMAT (8A10)
13030 JJ = JJ+8
13040 JP = 80
```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```

13050 DO 198 K=1,20
13060 198 ISAVE(K) = IDATAN(K)
13070 GO TO 185
13080 200 NDEX=1
13090 DO 210 K=1,IMAXAC
13100 CALL GETCH
13110 IF (ICCHAR-IBLNK) 205,210,205
13120 205 IA(NDEX,4)=ICCHAR
13130 NDEX=NDEX+1
13140 IF (ICCHAR-ITERM) 210,220,210
13150 210 CONTINUE
13160 215 IRET=3
13170 RETURN
13180 220 IRET=2
13190 RETURN
13200 225 ISAVE(1)=NONE
13210 GO TO 235
13220 230 IA(2,KNO)=JALL
13230 235 IRET=4
13240 RETURN
13250 240 IRET=1
13260 RETURN
13270 250 IRET=5
13280 RETURN
13290 260 IRET = 6
13300 RETURN
13310 END
13320 SUBROUTINE MACHDT
13330 COMMON IQNDEX, IANDEX, ID(8,4), IDATAN(420),
13340+ IDATAO(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
13350+ INEG(10), IPRIME(10), IHNDEX(10,10), IANOSZ(10), ILHEAD(10),
13360+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
13370+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),
13380+ IHD(6,2,10), INDIVQ(10), IOUTMX, ICOMP, INMAX, IMAXA, ICHAR, ICH,
13390+ IWD, IWDSIZ, JCHAR, JWD, KNO, IRET, IOUT, ISHFL1, KA, KB, KC, KD, KE, KF,
13400+ KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ,
13410+ KCOLON, KHYPHN, KLP, KRP, KSTAR, KTAB, KDOLLR, KDELTA, KAPOST, KBACKS,
13420+ KRET, IBLNKS, IBLNK, KDEC, KCOMMA, KCENT, LOWER, ITERM, IQNO, NOQ,
13430+ IMAXAC, IMAXQC, ISTRSW, ISTART, NOQUES, LIST, LAST, IGETSW, ISAVE(20),
13440+ KEQUAL, NTAPE, KOLON, ICRSUM(10,10), NUMANS(10), IANALY, ICOPY,
13450+ ICOUNT, ICROSS, ITAB, IANSW(10), IO, X(10), X2(10), XCT(10), IBEGA,
13460+ NO, XMEAN(10), XSD(10), XMAX(10), XMIN(10), NODECS(10), ID1(12,6),
13470+ KZERO, KNINE, IMONTH(22), IHEAD(3,160),
13480+ I00(10), KMASK(10), JMASK(10)
13490 LCLIM=LCQ(IQNDEX)
13500 LFWAA=IFWAA(IQNDEX)
13510 XTOT = 0
13520 IANS = 0
13530 IGETSW=3
13540 105 INDEX=IQNDEX+1
13550 120 IANSZ1=IANOSZ(KNO)
13560 IWD=IFWAA(IQNDEX)

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** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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```

13570      KWD = IWD
13580      ICH=0
13590      IF (IWD) 196, 196, 110
13600 110  ILWA=IFWAA(INDEX)-1
13610      IF (ILWA) 115,115,124
13620 115  INDEX=INDEX+1
13630      GO TO 110
13640 124  IF (IANSZ1) 210,210,125
13650 125  DO 195 IANO=1,IANSZ1
13660      NUMANS(KNO) = IANO
13670      IWD = KWD
13680      ICH = 0
13690 129  ISIZ = IDTSIZ(IANO,KNO)
13700      IF (ISIZ) 210,210,130
13710 130  IF (ISIZ - 1000) 135,210,135
13720 135  CALL GETCH
13730      IF (IWD-ILWA) 140,140,195
13740 140  IF (ICHAR- KOLON) 135,145,135
13750 145  I=1
13760 150  CALL GETCH
13770      IF (IWD-ILWA) 155,155,195
13780 155  IF (ICHAR-IDATAR(I, IANO,KNO)) 160,190,160
13790 160  IF (ICHAR-IBLNK) 165,150,165
13800 165  IF (ICHAR-KHYPHN) 170,150,170
13810 170  IF (ICHAR-KRET) 175,150,175
13820 175  IF (ICHAR-KTAB) 180,150,180
13830 180  XTOT=0
13840      IF (ICHAR-IDATAR(1, IANO,KNO)) 145,185,145
13850 185  I=1
13860 190  I=I+1
13870      IF (I - ISIZ) 150,150,300
13880 195  CONTINUE
13890 196  IF (LFWAA) 310, 197, 310
13900 197  NUMANS(KNO) = 0
13910 200  J = IQNDEX + 1
13920      I = LCQ(J)
13930      IF (LCLIM-I) 205,315,315
13940 205  IQNDEX = J
13950      GO TO 105
13960 210  IEXP=0
13970      XTOT=0
13980      ICOLON=0
13990 215  CALL GETCH
14000      IF (IWD-ILWA) 2215, 2215, 196
14010 2215 IF (ICHAR - KEQUAL) 218,216,218
14020 216  DO 217 I = 1,7
14030 217  CALL GETCH
14040      GO TO 215
14050 218  IF (ICHAR -KRP ) 219,275,219
14060 219  IF (ICHAR-KDOLLR) 220,215,220
14070 220  IF (ICHAR-KCOMMA) 225,215,225
14080 225  IF (ICHAR-IBLNK) 230,215,230

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** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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14090 230   IF (ICHAR-KTAB) 235,215,235
14100 235   IF (ICHAR-KRET) 240,215,240
14110 240   IF (ICHAR- KOLON) 245,400,245
14120   400 IF (IANS) 410,410,280
14130   410 ICOLON = 1
14140       GO TO 215
14150   245 IF (ICHAR-KDEC)250,255,250
14160   250 IF (ICOLON - 1) 251,460,251
14170   460 IF (ICHAR - KLP) 275,470,275
14180   470 ICOLON = 2
14190       GO TO 215
14200   251 XCHAR = ICHAR - KZERO
14210       IF (IEXP) 265,265,260
14220 255   IEXP=1
14230       GO TO 215
14240 260   XTOT=XTOT+XCHAR/10.**IEXP
14250       IEXP=IEXP+1
14260       GO TO 270
14270 265   XTOT=XTOT*10.+XCHAR
14280 270   IANS=1
14290       GO TO 215
14300 275   IF (IANS) 310,310,280
14310   280 IF (IANSZ1) 305,305,285
14320 285   IF (XDATAR(1,KNO)-XTOT) 290,300,295
14330 290   IF (XDATAR(2,KNO)-XTOT) 295,300,300
14340   295 CONTINUE
14350       GO TO 196
14360   300 CONTINUE
14370 305   IRET=1
14380       XCT(KNO) = XCT(KNO) + 1
14390       X(KNO) = X(KNO) + XTOT
14400       X2(KNO) = X2(KNO) + XTOT*XTOT
14410       IF (XTOT - XMAX(KNO)) 307,307,306
14420   306 XMAX(KNO) = XTOT
14430   307 IF (XTOT - XMIN(KNO)) 308,320,320
14440   308 XMIN(KNO) = XTOT
14450       GO TO 320
14460   310 XTOT = 0.
14470 315   IRET=-1
14480   320 XSAVE(KNO)=XTOT
14490       IANSW(KNO) = IANS
14500       I = IEXP - 1
14510   325 IF (NODECS(KNO) - I) 330,340,340
14520   330 NODECS(KNO) = IEXP - 1
14530   340 RETURN
14540       END
14550       SUBROUTINE WHAT
14560       DIMENSION ICHAIN(10)
14570 COMMON IQNDEX, IANDEX, ID(8,4),          IDATAN(420),
14580+ IDATA0(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
14590+ INEG(10), IPRIME(10), IHNDEX(10,10), IANOSZ(10), ILHEAD(10),
14600+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),

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** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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14610+ ICONN(10),XSAVE(10),IMAXQ,IFWAA(120),LCQ(120),IDAT(6),
14620+ IHD(6,2,10),INDIVQ(10),IOUTMX,ICOMP,INMAX,IMAXA,ICHAR,ICH,
14630+ IWD,IWDSIZ,JCHAR,JWD,KNO,IRET,IOUT,ISHFL1,KA,KB,KC,KD,KE,KF,
14640+ KG,KH,KI,KJ,KK,KL,KN,KO,KN,KO,KP,KQ,KR,KS,KT,KU,KV,KW,KX,KY,KZ,
14650+ KCOLON,KHYPHN,KLP,KRP,KSTAR,KTAB,KDOLLR,KDELTA,KAPOST,KBACKS,
14660+ KRET,IBLNKS,IBLNK,KDEC,KCOMMA,KCENT,LOWER,ITERM,IQNO,NOQ,
14670+ IMAXAC,IMAXQC,ISTRSW,ISTART,NOQUES,LIST,LAST,IGETSW,ISAVE(20),
14680+ KEQUAL,NTAPE,KOLON,ICRSUM(10,10),NUMANS(10),IANALY,ICOPY,
14690+ ICOUNT,ICROSS,ITAB,IANSW(10),IO,X(10),X2(10),XCT(10),IBEGA,
14700+ NO,XMEAN(10),XSD(10),XMAX(10),XMIN(10),NODECS(10),ID1(12,6),
14710+ KZERO,KNINE,IMONTH(22), IHEAD(3,160),
14720+ I00(10),KMASK(10),JMASK(10)
14730 105 ICH = 49
14740 IQNO=KNO
14750 IGROUP=1
14760 IF (KNO-ICOMP) 110,110,125
14770 110 ILEVEL=0
14780 INEXTA=1
14790 115 CONTINUE
14800 IELEM(IQNO,IGROUP)=INEXTA
14810 ILEVEL=ILEVEL+1
14820 ICHAIN(ILEVEL)=INEXTA
14830 IGROUP=ICHAIN(ILEVEL)
14840 IF (INEXTA-NOQ) 120,120,300
14850 120 INEXTA=INEXTA+1
14860 125 IBLKSW=0
14870 130 JWD=1
14880 JCHAR=0
14890 135 CALL GETWH
14900 GO TO (320,265,115,140,145,145,200,225,190,175,200),IRET
14910 140 ILEVEL=ILEVEL-1
14920 IGROUP=ICHAIN(ILEVEL)
14930 IBLKSW=1
14940 GO TO 130
14950 145 IF (IBLKSW) 200,200,150
14960 150 CALL CKWHAT
14970 GO TO (320,265,115,140,160,155,200), IRET
14980 155 I=1
14990 GO TO 165
15000 160 I=-1
15010 165 IQNO=IQNO+1
15020 IF (KNO-ICOMP) 170,170,125
15030 170 ICONN(IGROUP)=ICONN(IGROUP)+I
15040 GO TO 125
15050 175 IF (IHD(1,2,KNO)-IBLNKS) 310,180,310
15060 180 DO 185 III=1,6
15070 IHD(III,2,IQNO) = IHD(III,1,IQNO)
15080 IHD(III,1,IQNO)=IQU(III,IQNO)
15090 IQU(III,IQNO)=IBLNKS
15100 185 CONTINUE
15110 GO TO 125
15120 190 IF (JCHAR) 135,135,195

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** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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15130 195  IBLKSW=1
15140      GO TO 205
15150 200  IBLKSW=0
15160 205  ISTRSW=2
15170      IF (IGNO-ICOMP) 210,210,215
15180 210  IELEM(IGNO,IGROUP)=1
15190 215  KNO=IGNO
15200      CALL STRCH
15210      GO TO 135
15220 220  INEG(IGNO)=-1
15230 225  CALL GETWH
15240      IF (ICHAR-IBLNK) 230,225,230
15250 230  IF (ICHAR - KZERO) 240, 235, 235
15260 235  IF (ICHAR - KNINE) 245, 245, 240
15270 240  IF (ICHAR-KDEC) 260,245,260
15280 245  CALL WHCODE
15290      GO TO (320,265,115,140,160,155,250), IRET
15300 250  PRINT 255
15310 255  FORMAT (40H ILLEGAL CHAR FOLLOWING CODED DATA
15320      GO TO 330
15330 260  CALL WHPROS
15340      GO TO (320,265,115,140,160,155,220), IRET
15350 265  IF (IGROUP-1) 270,280,270
15360 270  PRINT 275
15370 275  FORMAT (26H PARENTHESIS COUNTED WRONG)
15380      GO TO 330
15390 280  IF (KNO-ICOMP) 285,285,290
15400 285  ICOMP=IGNO
15410      GO TO 295
15420 290  LAST=IGNO
15430 295  IRET=2
15440      RETURN
15450 300  PRINT 305
15460 305  FORMAT (29H TOO MANY SETS OF PARENTHESIS)
15470      GO TO 330
15480 310  PRINT 315
15490 315  FORMAT (19H TOO MANY MODIFIERS)
15500      GO TO 330
15510 320  PRINT 325
15520 325  FORMAT (30H DATA CANNOT EXCEED 288 CHARS )
15530 330  IRET=1
15540      RETURN
15550      END
15560      SUBROUTINE CKWHAT
15570 COMMON IQNDEX, IANDEX, ID(8,4),          IDATAN(420),
15580+ IDATA0(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
15590+ INEG(10), IPRIME(10), IHINDEX(10,10), IANOSZ(10), ILHEAD(10),
15600+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
15610+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),
15620+ IHD(6,2,10), INDIVQ(10), IOUTMX, ICOMP, INMAX, IMAXA, ICHAR, ICH,
15630+ IWD, IWDSIZ, JCHAR, JWD, KNO, IRET, IOUT, ISHFL1, KA, KB, KC, KD, KE, KF,
15640+ KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ,

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** "RETRVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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15650+ KCOLON, KHYPHN, KLP, KRP, KSTAR, KTAB, KDOLLR, KDELTA, KAPOST, KBACKS,
15660+ KRET, IBLNKS, IBLNK, KDEC, KCOMMA, KCENT, LOWER, ITERM, IQNO, NOQ,
15670+ IMAXAC, IMAXQC, ISTRSW, ISTART, NOQUES, LIST, LAST, IGETSW, ISAVE(20),
15680+ KEQUAL, NTAPE, KOLON, ICRSUM(10,10), NUMANS(10), IANALY, ICOPY,
15690+ ICOUNT, ICROSS, ITAB, IANSW(10), IO, X(10), X2(10), XCT(10), IBEGA,
15700+ NO, XMEAN(10), XSD(10), XMAX(10), XMIN(10), NODECS(10), ID1(12,6),
15710+ KZERO, KWINE, IMONTH(22), IHEAD(3,160),
15720+ I00(10), KMASK(10), JMASK(10)
15730 ICUR=ICH
15740 IHOLD=ICHAR
15750 GO TO (150,150,150,150,105,120,150,140,140,140,140), IRET
15760 105 CALL GETWH
15770 IF (ICHAR-KN) 140,110,140
15780 110 CALL GETWH
15790 IF (ICHAR-KD) 140,115,140
15800 115 CALL GETWH
15810 IRET=5
15820 GO TO 130
15830 120 CALL GETWH
15840 IF (ICHAR-KR) 140,125,140
15850 125 CALL GETWH
15860 IRET=6
15870 130 IF (ICHAR-IBLNK) 135,150,135
15880 135 IF (ICHAR-KLP) 140,145,140
15890 140 ICH=ICUR
15900 ICHAR=IHOLD
15910 IRET=7
15920 RETURN
15930 145 ICH=ICH-1
15940 150 RETURN
15950 END
15960 SUBROUTINE GETWH
15970 DIMENSION IWH(10)
15980 COMMON IQNDEX, IANDEX, ID(8,4), IDATAN(420),
15990+ IDATA0(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
16000+ INEG(10), IPRIME(10), IHINDEX(10,10), IANOSZ(10), ILHEAD(10),
16010+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
16020+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),
16030+ IHD(6,2,10), INDIVQ(10), IOUTMX, ICOMP, INMAX, IMAXA, ICHAR, ICH,
16040+ IWD, IWDSIZ, JCHAR, JWD, KNO, IRET, IOUT, ISHFL1, KA, KB, KC, KD, KE, KF,
16050+ KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ,
16060+ KCOLON, KHYPHN, KLP, KRP, KSTAR, KTAB, KDOLLR, KDELTA, KAPOST, KBACKS,
16070+ KRET, IBLNKS, IBLNK, KDEC, KCOMMA, KCENT, LOWER, ITERM, IQNO, NOQ,
16080+ IMAXAC, IMAXQC, ISTRSW, ISTART, NOQUES, LIST, LAST, IGETSW, ISAVE(20),
16090+ KEQUAL, NTAPE, KOLON, ICRSUM(10,10), NUMANS(10), IANALY, ICOPY,
16100+ ICOUNT, ICROSS, ITAB, IANSW(10), IO, X(10), X2(10), XCT(10), IBEGA,
16110+ NO, XMEAN(10), XSD(10), XMAX(10), XMIN(10), NODECS(10), ID1(12,6),
16120+ KZERO, KWINE, IMONTH(22), IHEAD(3,160),
16130+ I00(10), KMASK(10), JMASK(10)
16140 105 ICH=ICH+1
16150 ICHAR = IDATAN(ICH)
16160 IF (ICH-338) 115,115,110

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** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
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16170 110   IRET=1
16180      RETURN
16190 115   IF (ICH-50)125,120,125
16200 120   IWH(2)=ITERM
16210      IWH(3)=KLP
16220      IWH(4)=KRP
16230      IWH(5)=KA
16240      IWH(6)=KO
16250      IWH(7)=KN
16260      IWH(8)=KCOLON
16270      IWH(9)=IBLNK
16280      IWH(10)=KCOMMA
16290 125   DO 130 I=2,10
16300      IRET=I
16310      IF (ICHAR-IWH(I)) 130,140,130
16320 130   CONTINUE
16330      IF (ICHAR - KRET) 135,105,135
16340 135   IRET=11
16350 140   RETURN
16360      END
16370      SUBROUTINE WHPROS
16380 COMMON IQNDEX,IANDEX,ID(8,4),          IDATAN(420),
16390+ IDATAO(300),ISHFTL(10),ISHFTR(10),KALL(7),IA(18,7),IQU(6,10),
16400+ INEG(10),IPRIME(10),IHINDEX(10,10),IANOSZ(10),ILHEAD(10),
16410+ IDATAR(10,2,10),IDTSIZ(10,10),IELEM(10,10),XDATAR(2,10),
16420+ ICONN(10),XSAVE(10),IMAXQ,IFWAA(120),LCQ(120),IDAT(6),
16430+ IHD(6,2,10),INDIVQ(10),IOUTMX,ICOMP,INMAX,IMAXA,ICHAR,ICH,
16440+ IWD,IWDSIZ,JCHAR,JWD,KNO,IRET,IOUT,ISHFL1,KA,KB,KC,KD,KE,KF,
16450+ KG,KH,KI,KJ,KK,KL,KN,KO,KP,KQ,KR,KS,KT,KU,KV,KW,KX,KY,KZ,
16460+ KCOLON,KHYPHN,KLP,KRP,KSTAR,KTAB,KDOLLR,KDELTA,KAPOST,KBACKS,
16470+ KRET,IBLNKS,IBLNK,KDEC,KCOMMA,KCENT,LOWER,ITERM,IQNO,NOQ,
16480+ IMAXAC,IMAXQC,ISTRSW,ISTART,NOQUES,LIST,LAST,IGETSW,ISAVE(20),
16490+ KEQUAL,NTAPE,KOLON,ICRSUM(10,10),NUMANS(10),IANALY,ICOPY,
16500+ ICOUNT,ICROSS,ITAB,IANSW(10),IO,X(10),X2(10),XCT(10),IBEGA,
16510+ NO,XMEAN(10),XSD(10),XMAX(10),XMIN(10),NODECS(10),ID1(12,6),
16520+ KZERO,KNINE,IMONTH(22),          IHEAD(3,160),
16530+          IOO(10),KMASK(10),JMASK(10)
16540      IANO=1
16550 105   IBLKSW=0
16560      IDCH=1
16570      IANOSZ(IQNO)=IANO
16580 110   GO TO (170,170,170,170,170,115,115,125,150,180,175,150),IRET
16590 115   IF (IBLKSW) 150,150,120
16600 120   CALL CKWHAT
16610      GO TO (170,170,170,170,170,170,150), IRET
16620 125   ICURR=ICH
16630      IF (IDCH-1) 150,130,150
16640 130   CALL GETWH
16650      IF (ICHAR-KO) 145,135,145
16660 135   CALL GETWH
16670      IF (ICHAR-KT) 145,140,145
16680 140   CALL GETWH

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** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```

16690      IRET=7
16700      IF (ICCHAR-IBLNK) 145,170,145
16710 145  ICH=ICURR
16720      ICHAR=KN
16730 150  CONTINUE
16740 155  IDTSIZ(IANO,IQNO)=IDCH
16750      IBLKSW=0
16760 160  IDATAR(IDCH,IANO,IQNO)=ICCHAR
16770      IDCH=IDCH+1
16780 165  CALL GETWH
16790      GO TO 110
16800 170  RETURN
16810 175  CALL GETWH
16820      IANO=IANO+1
16830      GO TO 105
16840 180  IF (IDCH-1) 165,165,185
16850 185  IELKSW=1
16860      GO TO 160
16870      END
16880      SUBROUTINE WHCODE
16890 COMMON IQNDEX,IANDEX,ID(8,4),          IDATAN(420),
16900+ IDATAO(300),ISHFTL(10),ISHFTR(10),KALL(7),IA(18,7),IGU(6,10),
16910+ INEG(10),IPRIME(10),IHNDEX(10,10),IANOSZ(10),ILHEAD(10),
16920+ IDATAR(10,2,10),IDTSIZ(10,10),IELEM(10,10),XDATAR(2,10),
16930+ ICONN(10),XSAVE(10),IMAXQ,IFWAA(120),LCQ(120),IDAT(6),
16940+ IHD(6,2,10),INDIVQ(10),IOUTMX,I COMP,INMAX,IMAXA,ICCHAR,ICH,
16950+ IWD,IWDSIZ,JCHAR,JWD,KNO,I RET,I OUT,ISHFL1,KA,KB,KC,KD,KE,KF,
16960+ KG,KH,KI,KJ,KK,KL,KM,KN,KO, KP,KQ, KR,KS,KT,KU,KV,KW,KX,KY,KZ,
16970+ KCOLON,KHYPHN,KLP,KRP,KSTAR,KTAB,KDOLLR,KDELTA,KAPOST,KBACKS,
16980+ KRET,IBLNKS,IBLNK,KDEC,KCOMMA,KCENT,LOWER,ITERM,IQNO,NOQ,
16990+ IMAXAC,IMAXQC,I STRSW,I START,NOQUES,LIST, LAST,IGETSW,ISAVE(20),
17000+ KEQUAL,NTAPE,KOLON,ICRSUM(10,10),NUMANS(10),IANALY,ICOPY,
17010+ ICOUNT,ICROSS,ITAB,IANSW(10),IO,X(10),X2(10),XCT(10),IBEGA,
17020+ NO,XMEAN(10),XSD(10),XMAX(10),XMIN(10),NODECS(10),IDI(12,6),
17030+ KZERO,KNINE,IMONTH(22),          IHEAD(3,160),
17040+          IOO(10),KMASK(10),JMASK(10)
17050      ILOWHI = 1
17060      IDTSIZ(1,IQNO)=1000
17070 105  XDATA=0
17080      XDATAS=0
17090      IEXP=0
17100 110  IQUCH=ICCHAR
17110 115  IF (IQUCH - KZERO) 125, 120, 120
17120 120  IF (IQUCH - KNINE) 180, 180, 125
17130 125  IF (IQUCH-KHYPHN) 130,145,130
17140 130  IF (IQUCH-KT) 155,135,155
17150 135  CALL GETWH
17160      IF (ICCHAR-KO) 175,140,175
17170 140  ILOWHI=2
17180      XDATAR(1,IQNO)=XDATA:XDATAS
17190      CALL GETWH
17200      GO TO 105

```

** "RETRIEVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```

17210 145   IF (XDATAS) 140,150,140
17220 150   XDATAS=-1
17230      GO TO 200
17240 155   IF (IQUCH-KDOLLR) 160,200,160
17250 160   IF (IQUCH-KCENT) 165,200,165
17260 165   IF (IQUCH-KTAB) 170,200,170
17270 170   IF (ICHAR-KDEC) 172,225,172
17280 172   IF (IQUCH-IBLNK) 185,200,185
17290 175   ICHAR=KT
17300      ICH=ICH-1
17310      GO TO 185
17320 180   XCHAR = ICHAR - KZERO
17330      IF (IEXP) 185,185,230
17340 185   XDATA=XDATA*10.+XCHAR
17350 190   IF (XDATAS) 200,195,200
17360 195   XDATAS=1
17370 200   CALL GETWH
17380      GO TO (210,210,185,210,205,205,185,185,200,200,110), IRET
17390 205   CALL CKWHAT
17400      GO TO (210,210,210,210,210,210,185), IRET
17410 210   GO TO (215,220), ILOWHI
17420 215   XDATAR(1,IQNO)=XDATA*XDATAS
17430 220   XDATAR(2,IQNO)=XDATA*XDATAS
17440      IANOSZ(IQNO)=1
17450      RETURN
17460 225   IEXP=1
17470      GO TO 200
17480 230   XDATA=XDATA+XCHAR/10.**IEXP
17490      IEXP=IEXP+1
17500      GO TO 190
17510      END
17520      SUBROUTINE PFLFIX
17530 COMMON IQNDEX, IANDEX, ID(8,4), IDATAN(420),
17540+ IDATA0(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
17550+ INEG(10), IPRIME(10), IHINDEX(10,10), IANOSZ(10), ILHEAD(10),
17560+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
17570+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),
17580+ IHD(6,2,10), INDIVQ(10), IOUTMX, ICOMP, INMAX, IMAXA, ICHAR, ICH,
17590+ IWD, IWDSIZ, JCHAR, JWD, KNO, IRET, IOUT, ISHFL1, KA, KB, KC, KD, KE, KF,
17600+ KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ,
17610+ KCOLON, KHYPHN, KLP, KRP, KSTAR, KTAB, KDOLLR, KDELTA, KAPOST, KBACKS,
17620+ KRET, IBLNKS, IBLNK, KDEC, KCOMMA, KCENT, LOWER, ITERM, IQNO, NOQ,
17630+ IMAXAC, IMAXQC, ISTRSW, ISTART, NOQUES, LIST, LAST, IGETSW, ISAVE(20),
17640+ KEQUAL, NTAPE, KOLON, ICRSUM(10,10), NUMANS(10), IANALY, ICOPY,
17650+ ICOUNT, ICROSS, ITAB, IANSW(10), IO, X(10), X2(10), XCT(10), IBEGA,
17660+ NO, XMEAN(10), XSD(10), XMAX(10), XMIN(10), NODECS(10), ID1(12,6),
17670+ KZERO, KNINE, IMONTH(22), IHEAD(3,160),
17680+ IOO(10), KMASK(10), JMASK(10)
17690 NOPLAC = 9
17700 NODEC = NODECS(KNO)
17710      IF (NODEC) 1,1,2
17720      1 NOINT = NOPLAC

```

** "RETRVEVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```
17730      GO TO 3
17740      2 NOINT = NOPLAC - NODEC - 1
17750      3 CONTINUE
17760      ISTRSW = 3
17770      ICHAR = IBLNK
17780      CALL STRCH
17790      CALL STRCH
17800      IF (IANOSZ(KNO)) 420, 420, 410
17810      410 IF (INDIVQ(KNO)) 280, 280, 10
17820      420 IF (IANOSZ(KNO)) 280, 280, 10
17830      10 IF (XSAVE(KNO)) 15, 310, 20
17840      15 ICHAR = KHYPHN
17850      CALL STRCH
17860      XSAVE(KNO) = -XSAVE(KNO)
17870      NOINT = NOINT - 1
17880      20 NUNUM = XSAVE(KNO)
17890      XNUNUM=NUNUM
17900      XNUDEC = XSAVE(KNO)      - XNUNUM
17910      IANS=0
17920      IF(NUNUM-10**NOINT)30,250,250
17930      30 DO 80 J=1,NOINT
17940      K=NOINT-J
17950      ICHAR=NUNUM/10**K
17960      NUNUM=NUNUM-ICHA*10**K
17970      IANS=IANS+ICHA
17980      ICHAR = ICHAR + KZERO
17990      IF(IANS)40,40,50
18000      40 ICHAR=IBLNK
18010      CALL STRCH
18020      GO TO 80
18030      50 CALL STRCH
18040      80 CONTINUE
18050      IF (NODEC) 340,340,90
18060      90 ICHAR = KDEC
18070      CALL STRCH
18080      XNUDEC = XNUDEC+.5/10.**NODEC
18090      100 DO 110 K=1,NODEC
18100      XNO=XNUDEC*10.**K
18110      ICHAR=XNO
18120      CHAR=ICHA
18130      ICHAR = ICHAR + KZERO
18140      CALL STRCH
18150      XNUDEC=XNUDEC-CHAR/10.**K
18160      110 CONTINUE
18170      GO TO 340
18180      250 ICHAR = KX
18190      GO TO 290
18200      280 ICHAR=IBLNK
18210      290 DO 300 K=1,NOPLAC
18220      CALL STRCH
18230      300 CONTINUE
18240      GO TO 340
```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```

18250 310 ICHAR=IBLNK
18260 M=NOINT-1
18270 DO 320 K=1,M
18280 CALL STRCH
18290 320 CONTINUE
18300 ICHAR = KZERO
18310 CALL STRCH
18320 IF (NODEC) 321, 340, 321
18330 321 ICHAR = KDEC
18340 CALL STRCH
18350 ICHAR = KZERO
18360 DO 330 K=1,NODEC
18370 CALL STRCH
18380 330 CONTINUE
18390 340 CONTINUE
18400 RETURN
18410 END
18420 SUBROUTINE PRINT
18430 COMMON IQNDEX, IANDEX, ID(8,4), IDATAN(420),
18440+ IDATAO(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
18450+ INEG(10), IPRIME(10), IHNDEX(10,10), IANOSZ(10), ILHEAD(10),
18460+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
18470+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),
18480+ IHD(6,2,10), INDIVQ(10), IOUTMX, ICOMP, INMAX, IMAXA, ICHAR, ICH,
18490+ IWD, IWDSIZ, JCHAR, JWD, KNO, IRET, IOUT, ISHFL1, KA, KB, KC, KD, KE, KF,
18500+ KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ,
18510+ KCOLON, KHYPHN, KLP, KRP, KSTAR, KTAB, KDOLLR, KDELTA, KPOST, KBACKS,
18520+ KRET, IBLNKS, IBLNK, KDEC, KCOMMA, KCENT, LOWER, ITERM, IQNO, NOQ,
18530+ IMAXAC, IMAXQC, ISTRSW, ISTART, NOQUES, LIST, LAST, IGETSW, ISAVE(20),
18540+ KEQUAL, NTAPE, KOLON, ICRSUM(10,10), NUMANS(10), IANALY, ICOPY,
18550+ ICOUNT, ICROSS, ITAB, IANSW(10), IO, X(10), X2(10), XCT(10), IBEGA,
18560+ NO, XMEAN(10), XSD(10), XMAX(10), XMIN(10), NODECS(10), ID1(12,6),
18570+ KZERO, KNINE, IMONTH(22), IHEAD(3,160),
18580+ IOO(10), KMASK(10), JMASK(10)
18590 NWD=JWD
18600 IF (JWD - 7) 10,10,20
18610 10 IF ((JWD .EQ. 1) .AND. (IDATAO(1) .EQ. IBLNKS)) GO TO 15
18620 PRINT 50, (IDATAO(I), I=1, JWD)
18630 RETURN
18640 15 PRINT, **
18650 RETURN
18660 20 PRINT 50, (IDATAO(I), I=1, 7)
18670 JWD = JWD - 7
18680 K = 8
18690 30 J = K + 4
18700 PRINT 60, (IDATAO(I), I=K, J)
18710 K = J+1
18720 JWD = JWD-5
18730 IF (JWD) 40,40,30
18740 40 JWD=NWD
18750 RETURN
18760 50 FORMAT (8A10)

```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

```
18770 60 FORMAT (22X,5A10)
18780 END
18790 SUBROUTINE WRITREC
18800 COMMON IQNDEX, IANDEX, ID(8,4), IDATAN(420),
18810+ IDATAO(300), ISHFTL(10), ISHFTR(10), KALL(7), IA(18,7), IQU(6,10),
18820+ INEG(10), IPRIME(10), IHINDEX(10,10), IANOSZ(10), ILHEAD(10),
18830+ IDATAR(10,2,10), IDTSIZ(10,10), IELEM(10,10), XDATAR(2,10),
18840+ ICONN(10), XSAVE(10), IMAXQ, IFWAA(120), LCQ(120), IDAT(6),
18850+ IHD(6,2,10), INDIVQ(10), IOUTMX, ICOMP, INMAX, IMAXA, ICHAR, ICH,
18860+ IWD, IWDSIZ, JCHAR, JWD, KNO, IRET, IOUT, ISHFL1, KA, KB, KC, KD, KE, KF,
18870+ KG, KH, KI, KJ, KK, KL, KM, KN, KO, KP, KQ, KR, KS, KT, KU, KV, KW, KX, KY, KZ,
18880+ KCOLON, KHYPHN, KLP, KRP, KSTAR, KTAB, KDOLLR, KDELTA, KAPOST, KBACKS,
18890+ KRET, IBLNKS, IBLNK, KDEC, KCOMMA, KCENT, LOWER, ITERM, IQNO, NOQ,
18900+ IMAXAC, IMAXQC, ISTRSW, ISTART, NOQUES, LIST, LAST, IGETSW, ISAVE(20),
18910+ KEQUAL, NTAPE, KOLON, ICRSUM(10,10), NUMANS(10), IANALY, ICOPY,
18920+ ICOUNT, ICROSS, ITAB, IANSW(10), IO, X(10), X2(10), XCT(10), IBEGA,
18930+ NO, XMEAN(10), XSD(10), XMAX(10), XMIN(10), NODECS(10), IDI(12,6),
18940+ KZERO, KNINE, IMONTH(22), IHEAD(3,160),
18950+ I00(10), KMASK(10), JMASK(10)
18960 WRITE (15,100) IQNDEX, IANDEX
18970 DO 10 J = 1,4
18980 10 WRITE (15,110) (ID(I,J), I=1,7)
18990 DO 20 M = 1, IQNDEX
19000 20 WRITE (15,110) (IHEAD(L,M), L=1,3)
19010 IF (IQNDEX.LE.65) GO TO 30
19020 WRITE (15,120) (LCQ(K), K=1,65)
19030 WRITE (15,120) (LCQ(K), K=66, IQNDEX)
19040 GO TO 40
19050 30 WRITE (15,120) (LCQ(K), K=1, IQNDEX)
19060 40 MPT = 22
19070 M = 1
19080 50 N = M + 21
19090 IF (IQNDEX - MPT) 70,70,60
19100 60 WRITE (15,130) (IFWAA(K), K=M,N)
19110 M = N + 1
19120 MPT = MPT + 22
19130 GO TO 50
19140 70 WRITE (15,130) (IFWAA(K), K=M, IQNDEX)
19150C COMPUTE HOW MANY LINES IT TAKES TO WRITE DATA
19160 J = 1
19170 IZAN = (IANDEX/6) + 1
19180 IPAN = (IZAN-1) * 6
19190 IF (IPAN.EQ.IANDEX) IZAN = IZAN - 1
19200 DO 80 M = 1, IZAN
19210 K = J + 5
19220 WRITE (15,110) (IDATAN(I), I=J,K)
19230 80 J = J + 6
19240 RETURN
19250 100 FORMAT (1X,2I5)
19260 110 FORMAT (1X,7A10)
19270 120 FORMAT (1X,65I1)
19280 130 FORMAT (1X,22I3)
```

** "RETRIVE" -- RETRIEVAL PROGRAMS FOR MIMS SYSTEM
08/05/71. 12.34.08.

19290 END

- - - T H E E N D - - -

** "UPDATE" -- ALTERS DATA RECORDS AND POINTERS
08/05/71. 11.31.33.

```
00100C THIS PROGRAM WAS RE-DESIGNED AND DEVELOPED BY PAUL SIMMONS,  
00110C UNITED COMPUTING SYSTEMS, INC., AND RONALD SCHWARZ, GODDARD  
00120C SPACE FLIGHT CENTER, JULY, 1971.  
00130C  
00140 PROGRAM UPDATE (INPUT,OUTPUT,TAPE4,TAPES)  
00150 COMMON IQ(3,7),ISEVN(10),KHEAD(3),MHEAD(3),KDATA(500),MDATA(500),  
00160+ ITYPE(500),IA(7,5),ID(7,4),LHEAD(3,160),LCQ(160),IPNT(160),  
00170+ JANS(1000),JALL,IBLNK,JCHANGE,JDELETE,JADD,JACTION,KAND,KOLON,  
00180+ JCHNGHD,KBLNK,NRTAPE,NWTAPE,LANS,JSHFT,JCHAR,NANS,IRET,  
00190+ IPUT,KHCT,KDCT,MHCT,MDCT,MCOUNT,KK,KJ,IQINDEX,IANDEX,MTCH,JJ,  
00200+ KTERM,IDATE(18),JMASK(10),KNEW(20)  
00210 COMMON IEND, MACH  
00220 DIMENSION KDAT(22)  
00230 CALL CLOCK(IX)  
00240 CALL DATER(IS)  
00250 PRINT 8886,IS,IX  
00260 8886 FORMAT(/*PROGRAM: UPDATE*,4X,*DATE:*,A9,4X,*TIME:*,A9,///)  
00270 PRINT,*DO YOU WANT TO MAKE MORE THAN ONE CHANGE*,  
00280 READ 2, ICYCLE  
00290 2 FORMAT (A1)  
00300 CALL INIT  
00310 3378 PRINT,*ENTER THE NAME OF THE FILE TO BE UPDATE*,  
00320 3379 READ 3,MDAT  
00330 3 FORMAT (A7)  
00340 CALL PFUR(3HRET,NRTAPE,MDAT,0,ISTJ)  
00350 IF (ISTJ .EQ. 5) GO TO 9214  
00360 NEW = 0  
00370 JSKIP=0  
00380C SET UP QUESTIONS TO BE ASKED  
00390 CALL READREC  
00400 REWIND NRTAPE  
00410 DO 5 J=1,4  
00420 DO 5 I=2,3  
00430 K = I-1  
00440 5 IQ(I,J) = LHEAD(K,J)  
00450 6 MTCHH = 0  
00460 DO 7 I=1,3  
00470 KHEAD(I)=IBLNK  
00480 7 MHEAD(I)=IBLNK  
00490 DO 8 I=1,500  
00500 KDATA(I)=IBLNK  
00510 8 MDATA(I)=IBLNK  
00520 DO 9 I=1,20  
00530 9 KNEW(I)=IBLNK  
00540 11 DO 12 I=1,5  
00550 DO 12 K=1,7  
00560 12 IA(K,I) = IBLNK  
00570 PRINT,/  
00580 DO 20 I=1,3  
00590 PRINT 10, (IQ(J,I),J=2,3)  
00600 10 FORMAT (2A10,7X:)  
00610 KTERM = 1
```


** "UPDATE" -- ALTERS DATA RECORDS AND POINTERS
08/05/71. 11.31.93.

```
00620 CALL TYPEN
00630C PUT ANSWER IN IA ARRAY
00640 IF (ITYPE(1) .EQ. 4HDONE) ICYCLE = 1H
00650 IF (ITYPE(1) .EQ. 4HDONE) GO TO 90
00660 IF (ITYPE(1) .EQ. 7HRESTART) GO TO 11
00670 IF (ITYPE(1) .EQ. 8HNEW FILE) NEW = 1
00680 IF (NEW .EQ. 1) ICYCLE = 1H
00690 IF (NEW .EQ. 1) GO TO 90
00700 IF (NANS .EQ. 0) GO TO 20
00710 DO 15 J=1,NANS
00720 K = J+1
00730 15 IA(K,1) = ITYPE(J)
00740 20 CONTINUE
00750C INPUT AND CONVERT DATE
00760 16 PRINT 10, (IQ(J,4),J=2,3)
00770 READ 22, (KDAT(I),I=1,22)
00780 22 FORMAT (22R1)
00790 IF (KDAT(1) .EQ. 22B .AND. KDAT(2) .EQ. 05B) GO TO 11
00800 IF (KDAT(1) .EQ. 47B) GO TO 30
00810 NDEX = 1
00820 DO 24 I=1,22
00830 ICHAR = KDAT(I)
00840 IF (ICHAR - 45)23,24,23
00850 23 IDATE(NDEX)= ICHAR
00860 NDEX = NDEX + 1
00870 24 CONTINUE
00880 IF (KDAT(1) .EQ. 01B .AND. KDAT(2) .EQ. 14B) GO TO 25
00890 IPUT = 1
00900 CALL DATEIN
00910 GO TO (26,26,26,30) IRET
00920 26 PRINT, *BAD DATE*
00930 GO TO 16
00940 25 IA(2,4) = JALL
00950C ACTION
00960 30 PRINT 10, (IQ(J,5),J=2,3)
00970 KTERM = 1
00980 CALL TYPEN
00990 IF (NANS .EQ. 0) GO TO 35
01000 IF (NANS .NE. 1) GO TO 70
01010 IF (ITYPE(1) .EQ. 7HRESTART) GO TO 11
01020 IF (ITYPE(1) .EQ. JCHANGE) JACTION = JCHANGE
01030 IF (ITYPE(1) .EQ. JDELETE) JACTION = JDELETE
01040 IF (ITYPE(1) .EQ. JADD) JACTION = JADD
01050 IF (JACTION .NE. JADD) GO TO 35
01060 PRINT 10, (IQ(J,7),J=2,3)
01070 GO TO 36
01080C WHAT
01090 35 PRINT 10, (IQ(J,6),J=2,3)
01100 36 KTERM = 0
01110 CALL TYPEN
01120 IF (ITYPE(1) .EQ. 7HRESTART) GO TO 11
01130 IF (ITYPE(1) .NE. 4HALL*) GO TO 40
```

** "UPDATE" -- ALTERS DATA RECORDS AND POINTERS
08/05/71. 11.31.33.

```
01140 KDATA(1) = JALL
01150 IF (JACTION .EQ. JDELETE) GO TO 40
01160 PRINT, *CANNOT CHANGE OR ADD ALL*
01170 GO TO 35
01180 40 IPUT = 1
01190 CALL BUILD
01200 GO TO (55,299,35). IRET
01210 55 IF (JACTION.NE.JADD) GO TO 56
01220 PRINT 10, (IQ(J,6),J=2,3)
01230 GO TO 61
01240 56 IF (JACTION.EQ.JDELETE) GO TO 90
01250C CHANGE 'TO' SOMETHING
01260 60 PRINT 10, (IQ(J,7),J=2,3)
01270 61 KTERM = 0
01280 CALL TYPEN
01290 IF (ITYPE(1) .EQ. 7HRESTART) GO TO 11
01300 IPUT = 4
01310 CALL BUILD
01320 GO TO (90,299,60) IRET
01330C USER WANTS TO CHANGE A HEADING... MUST INSERT A ROUTINE HERE TO
01340C DECIDE WHETHER OR NOT HE IS AUTHORIZED TO CHANGE HEADINGS
01350 70 JACTION = JCHNGHD
01360 GO TO 35
01370C EITHER CHANGING A HEADING OR THERE IS NO HEADING AND MUST SHIFT
01380C HEADING TO DATA
01390 75 IF (JACTION .EQ. JCHNGHD) GO TO 90
01400 DO 80 I=1,3
01410 80 MDATA(I) = MHEAD(I)
01420 MDCT = MHCT
01430C READ RECORD AND LOOK FOR MATCH
01440 90 IF (JSKIP .EQ. 1) GO TO 92
01450 CALL READREC
01460 IF (IEND .EQ. 2) GO TO 95
01470 IF (IRET .EQ. 1) GO TO 105
01480 92 JSKIP=0
01490 GO TO 105
01500 95 IF (MATCHXS .EQ. 1) PRINT 76
01510 76 FORMAT(/4H****,* NO MATCH FOR ID INFORMATION.*)
01520 IF (MATCHH .EQ. 1) PRINT 77
01530 77 FORMAT(/4H****,* NO MATCH FOUND FOR HEADER INFORMATION.*)
01540 ENDFILE NWTAPE
01550 REWIND NRTAPE
01560 REWIND NWTAPE
01570 CALL PFUR(3HREP,NWTAPE,MDAT,0,ISTA)
01580 47 IF (ISTA .NE. 0) GO TO 49
01590 CALL PFUR(3HRET,NRTAPE,MDAT,0,ISTB)
01600 IEND = 0
01610 MATCHX = 0
01620 MATCHXS = 0
01630 MATCHH = 0
01640 IF (ICYCLE .EQ. 1HY) GO TO 6
01650 IF (NEW .EQ. 1) GO TO 3378
```

** "UPDATE" -- ALTERS DATA RECORDS AND POINTERS
08/05/71. 11.31.33.

```
01660      STOP
01670 49 GO TO 47
01680 STOP
01690 105 MATCHX = 0
01700      CALL IDMATCH
01710 IF (IRET .EQ. 2) MATCHX = 1
01720 IF (MATCHXS .EQ. 2) GO TO 841
01730 MATCHXS = MATCHX
01740 IF (IRET .EQ. 1) MATCHXS = 2
01750 841 CONTINUE
01760 GO TO (115, 110) IRET
01770C ID DOESN'T MATCH...WRITE RECORD AND GO ON
01780 110 IF (ICYCLE .EQ. 1HY .AND. MTCHH .EQ. 1) GO TO 112
01790 CALL WRITREC
01800 GO TO 90
01810 112 JSKIP=1
01820 GO TO 6
01830C ID MATCHES...WHAT NOW?
01840 115 IF (JACTION .NE. JDELETE) GO TO 125
01850 IF (KHEAD(1) .NE. JALL) GO TO 1150
01860 PRINT 1167, (ID(2,I),I=1,3)
01870 IF (ICYCLE .EQ. 1HY) GO TO 6
01880 GO TO 90
01890C FIND THE HEADING TO BE ELIMINATED AND BLANK IT OUT
01900 1150 MATCHH = 0
01910      CALL MATCH
01920      IF (IRET .EQ. 2) MATCHH = 1
01930 GO TO (116,110),IRET
01940 116 LHEAD(1,MTCH) = LHEAD(2,MTCH)=LHEAD(3,MTCH)=IBLNK
01950 LCQ(MTCH) = IBLNK
01960C SHIFT THE ANSWER ARRAY
01970 PRINT 1167, (ID(2,I),I=1,3)
01980 1167 FORMAT (*MATCH ON *3(A10,1X))
01990 MTCHH=1
02000 117 J = MTCH+1
02010 K = IPNT(MTCH)
02020 IF (J .GT. IQNDEX) GO TO 1172
02030 1171 M = IPNT(J)
02040 IF (M .NE. 0) GO TO 118
02050 J = J+1
02060 GO TO 1171
02070 1172 IQNDEX = IQNDEX - 1
02080 IANDEX = IPNT(MTCH) - 1
02090 K = IANDEX + 1
02100 M = K + 5
02110 DO 1174 I=K,M
02120 1174 JANS(I) = IBLNK
02130 GO TO 110
02140 118 MAX = 1000 - (IPNT(J)-IPNT(K))
02150 IPT = IPNT(J) - IPNT(MTCH)
02160 DO 119 I=K,MAX
02170 JANS(I) = JANS(M)
```

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```
02180 119 M = M+1
02190C SHIFT IPNT,LCQ, LHEAD ARRAYS
02200 DO 123 K=MTCH,159
02210 J = K+1
02220 IPNT(K) = IPNT(J)
02230 IF (IPNT(K) .NE. 0) IPNT(K)=IPNT(K)-IPT
02240 LCQ(K) = LCQ(J)
02250 DO 121 M=1,3
02260 121 LHEAD(M,K) = LHEAD(M,J)
02270 123 CONTINUE
02280 IQNDEX = IQNDEX - 1
02290 IANDEX = IANDEX - IPT
02300 GO TO 110
02310 124 PRINT, *SORRY, YOU CAN'T DELETE THAT*
02320 STOP
02330 125 IF (JACTION .NE. JADD) GO TO 160
02340C ADD DATA TO AN ALREADY EXISTING ANSWER
02350     MATCHH = 0
02360     CALL MATCH
02370     IF (IRET .EQ. 2) MATCHH = 1
02380 GO TO (127,110) IRET
02390 127 K = MTCH + 1
02400 IF (MTCH .LE. 4) GO TO 159
02410 PRINT 1167, (ID(2,I),I=1,3)
02420 MTCHH=1
02430 IF (K .GT. IQNDEX) GO TO 131
02440 128 IF (IPNT(K) .NE. 0) GO TO 129
02450 K = K+1
02460 GO TO 128
02470 131 DO 132 I=1,500
02480 IF (JANS(I) .EQ. IBLNK) GO TO 133
02490 132 CONTINUE
02500 133 KK = I-1
02510 GO TO 134
02520 129 JDIFF = IPNT(K) - IPNT(MTCH)
02530 KK = IPNT(K) - 1
02540C COUNT CHARACTERS IN ALREADY EXISTING ANSWER
02550 134 CALL COUNT
02560 KBOTH = MDCT + KJ
02570 KSTRCH = KBOTH/10 + 1
02580 LSTRCH = (KSTRCH - 1)*10
02590 IF (LSTRCH .EQ. KBOTH) KSTRCH = KSTRCH - 1
02600 LSHFT = KSTRCH - 1
02610 IF (K .GT. IQNDEX) GO TO 153
02620 IF (LSHFT)299,155,135
02630C FIND BLANK IN ANSWER ARRAY
02640 135 DO 140 I=1,500
02650 IF (JANS(I) .EQ. IBLNK) GO TO 145
02660 140 CONTINUE
02670 145 K = (I-1) + LSHFT
02680 I = K - LSHFT
02690 150 JANS(K) = JANS(I)
```

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```
02700 I = I-1
02710 K = K-1
02720 IF (I .GT. IPNT(MTCH)) GO TO 150
02730 JANS(I+1) = IBLNK
02740C ANSWERS HAVE BEEN SHIFTED UP...NOW ENTER DATA TO BE ADDED
02750 155 CONTINUE
02760C ADJUST IPNT ARRAY
02770 K = MTCH+1
02780 DO 152 I=K,160
02790 IF (IPNT(I) .EQ. 0) GO TO 152
02800 IPNT(I) = IPNT(I) + LSHFT
02810 152 CONTINUE
02820C
02830 153 IANDEX = IANDEX + LSHFT
02840 IPUT = 5
02850 MCOUNT = 0
02860 NW = 1
02870 NC = 0
02880 IF (KJ .LT. 10) GO TO 156
02890 KK = KK+1
02900 KJ = 0
02910 156 KSHFT = (NC*6)-54
02920 ICHAR = ISHIFT(MDATA(NW),KSHFT) .AND. KAND
02930 CALL STRCH
02940 KJ = KJ+1
02950 NC = NC+1
02960 MCOUNT = MCOUNT+1
02970 IF (MCOUNT .GT. MDCT) GO TO 110
02980 IF (KJ .GT. 9) GO TO 158
02990 157 IF (NC .LE. 9) GO TO 156
03000 NC = 0
03010 NW = NW+1
03020 GO TO 156
03030 158 KJ = 0
03040 KK = KK+1
03050 JANS(KK) = IBLNK
03060 GO TO 157
03070 159 PRINT, *YOU CAN ONLY CHANGE DATA IN THE FIRST 4 HEADINGS*
03080 STOP
03090 160 IF (JACTION .NE. JCHANGE) GO TO 220
03100C CHANGE DATA
03110 MATCHX = 0
03120 MATCHH = 0
03130 CALL MATCH
03140 IF (IRET .EQ. 2) MATCHH = 1
03150 GO TO (165,110),IRET
03160 165 K = MTCH + 1
03170 PRINT 1167, (ID(2,I),I=1,3)
03180 MTCHH=1
03190 IF (K .GT. IANDEX) GO TO 167
03200 IF (K .LE. 4) GO TO 218
03210 IF (K .EQ. 5) GO TO 240
```

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```
03220 166 JDIFF = IPNT(K) - IPNT(MTCH)
03230 IF (JDIFF .GT. 0) GO TO 167
03240 K = K + 1
03250 GO TO 166
03260 167 KSTRCH = MDCT/10 + 1
03270 LSTRCH = (KSTRCH - 1)*10
03280 IF (LSTRCH .EQ. MDCT) KSTRCH = KSTRCH - 1
03290 IF (K .GT. IQNDEX) GO TO 210
03300 IF (K .LE. 5) GO TO 216
03310 IF (JDIFF - KSTRCH) 170,210,195
03320C MUST SHIFT DATA UP TO ACCOMODATE BIGGER DATA FIELD
03330 170 DO 175 I=1,1000
03340 IF (JANS(I) .EQ. IBLNK) GO TO 180
03350 175 CONTINUE
03360 180 L = ((KSTRCH - JDIFF) - 1) + I
03370 M = I - 1
03380 185 JANS(L) = JANS(M)
03390 L = L - 1
03400 M = M - 1
03410 IF (M .GT. IPNT(MTCH)) GO TO 185
03420C DATA HAS BEEN SHIFTED UP...NOW MAKE CHANGE
03430C CHANGE POINTERS
03440 N = KSTRCH - JDIFF
03450 M = MTCH + 1
03460 DO 192 I=M,160
03470 IF (IPNT(I) .NE. 0) IPNT(I) = IPNT(I) + N
03480 192 CONTINUE
03490 IANDEX = IANDEX + N
03500 187 N = IPNT(MTCH)
03510 DO 190 I=1,KSTRCH
03520 JANS(N) = MDATA(I)
03530 190 N = N + 1
03540 GO TO 110
03550C SHIFT DATA DOWN
03560 195 M = IPNT(MTCH)
03570 N = M + (JDIFF-KSTRCH)
03580 DO 200 I=N,1000
03590 JANS(M) = JANS(I)
03600 200 M = M+1
03610 DO 205 I=K,160
03620 IF (IPNT(I) .EQ. 0) GO TO 205
03630 IPNT(I) = IPNT(I) - (JDIFF - KSTRCH)
03640 205 CONTINUE
03650 IANDEX = IANDEX - (JDIFF - KSTRCH)
03660 GO TO 187
03670C NO SHIFTING REQUIRED
03680 210 M = IPNT(MTCH)
03690 DO 215 I=1,KSTRCH
03700 JANS(M) = MDATA(I)
03710 215 M = M+1
03720 DO 216 I=1,1000
03730 IF (JANS(I) .EQ. IBLNK) GO TO 217
```

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```
03740 216 CONTINUE
03750 217 IANDEX = I - 1
03760 GO TO 110
03770 218 DO 219 I=1,6
03780 J = I+1
03790 IF (IQUT .EQ. 3) GO TO 219
03800 MDATA(I) = ISHIFT(MDATA(I),12)
03810 MDATA(I) = MDATA(I) .AND. ISEVN(8)
03820 LTCHAR = MDATA(J) .AND. ISEVN(2)
03830 LTCHAR = ISHIFT(LTCHAR,-48) .AND. 7777B
03840 MDATA(I) = MDATA(I) .OR. LTCHAR
03850 219 ID(J,MTCH) = MDATA(I)
03860 IQUT = 3
03870 GO TO 110
03880 220 IF (JACTION .NE. JCHNGHD) GO TO 299
03890 CALL MATCH
03900 GO TO (225,110) IRET
03910 225 DO 230 I=1,3
03920 230 LHEAD(I,MTCH) = MHEAD(I)
03930 PRINT 1167, (ID(2,I),I=1,3)
03940 MTCHH=1
03950 GO TO 110
03960 299 PRINT, *PROGRAMMING ERROR*
03970 STOP
03980 240 IF (ISTP .EQ. 1) GO TO 260
03990 IS = 1
04000 DO 250 I=1,2
04010 DO 245 J=1,10
04020 KSHFT = (J*6)-60
04030 IDATE(IS) = ISHIFT(MDATA(I),KSHFT) .AND. KAND
04040 IF (IDATE(IS).NE.55B.AND.IDATE(IS).NE.63B.AND.IDATE(IS).NE.
04050+ 62B) IS = IS+1
04060 245 CONTINUE
04070 250 CONTINUE
04080 ISTP = 1
04090 IPUT = 3
04100 CALL DATEIN
04110 GO TO (255,255,255,260) IRET
04120 255 PRINT, *YOU GAVE ME A SCREWY DATE*
04130 STOP
04140 9214 PRINT 9215,MDAT
04150 9215 FORMAT(/"**,A7,"**, * NOT IN PERMANENT STORAGE.*)
04160 PRINT,*RE-ENTER VALID FILE NAME*,
04170 GO TO 3379
04180 260 DO 265 I=1,3
04190 J=I+1
04200 265 ID(J,4) = MDATA(I)
04210 GO TO 110
04220 END
04230 SUBROUTINE IDMATCH
04240 COMMON IQ(3,7),ISEVN(10),KHEAD(3),MHEAD(3),KDATA(500),MDATA(500),
04250+ ITYPE(500),IA(7,5),ID(7,4),LHEAD(3,160),LCQ(160),IPNT(160),
```

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```
04260+ JANS(1000),JALL,IBLNK,JCHANGE,JDELETE,JADD,JACTION,KAND,KOLON,
04270+ JCHNGHD,KBLNK,NRTAPE,NWTAPE,LANS,JSHFT,JCHAR,ICHAR,NANS,IRET,
04280+ IPUT,KHCT,KDCT,MHCT,MDCT,MCOUNT,KK,KJ,IGNDEX,IANDEX,MTCH,JJ,
04290+ KTERM,IDATE(18),JMASK(10),KNEW(20)
04300 COMMON IEND, MACH
04310 DO 10 J=1,3
04320 IF (IA(2,J) .EQ. JALL) GO TO 10
04330 DO 5 I=2,4
04340 IF (IA(I,J) .NE. ID(I,J)) GO TO 50
04350 5 CONTINUE
04360 10 CONTINUE
04370C NOW CHECK DATE RANGE
04380 IF (IA(2,4) .EQ. JALL) GO TO 45
04390 IF (ID(2,4) - IA(2,4))50,20,30
04400 20 IF (ID(3,4) - IA(3,4))50,25,30
04410 25 IF (ID(4,4) - IA(4,4))50,30,30
04420 30 IF (ID(2,4) - IA(2,5))45,35,50
04430 35 IF (ID(3,4) - IA(3,5))45,40,50
04440 40 IF (ID(4,4) - IA(4,5))45,45,50
04450 45 IRET = 1
04460 RETURN
04470 50 IRET = 2
04480 RETURN
04490 END
04500 SUBROUTINE TYPEN
04510 COMMON IQ(3,7),ISEVN(10),KHEAD(3),MHEAD(3),KDATA(500),MDATA(500),
04520+ ITYPE(500),IA(7,5),ID(7,4),LHEAD(3,160),LCQ(160),IPNT(160),
04530+ JANS(1000),JALL,IBLNK,JCHANGE,JDELETE,JADD,JACTION,KAND,KOLON,
04540+ JCHNGHD,KBLNK,NRTAPE,NWTAPE,LANS,JSHFT,JCHAR,ICHAR,NANS,IRET,
04550+ IPUT,KHCT,KDCT,MHCT,MDCT,MCOUNT,KK,KJ,IGNDEX,IANDEX,MTCH,JJ,
04560+ KTERM,IDATE(18),JMASK(10),KNEW(20)
04570 COMMON IEND, MACH
04580 NANS = 0
04590 K = 1
04600 5 M=K+4
04610 READ 10, (ITYPE(N),N=K,M)
04620 10 FORMAT (6A10)
04630 DO 15 I=K,M
04640 IF (ITYPE(I) .EQ. IBLNK) GO TO 35
04650 NANS = NANS + 1
04660 15 CONTINUE
04670 20 CALL ETERM(ITYPE(M),JSWIT,KTERM)
04680 IF (JSWIT .EQ. 1) GO TO 30
04690 K = M+1
04700 PRINT 25
04710 25 FORMAT (27X+)
04720 GO TO 5
04730 30 IF (ITYPE(M) .EQ. IBLNK) NANS=NANS-1
04740 RETURN
04750 35 M=I-1
04760 GO TO 20
04770 END
```


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```
04780 SUBROUTINE STRCH
04790 COMMON IQ(3,7), ISEVN(10), KHEAD(3), MHEAD(3), KDATA(500), MDATA(500),
04800+ ITYPE(500), IA(7,5), ID(7,4), LHEAD(3,160), LCG(160), IPNT(160),
04810+ JANS(1000), JALL, IBLNK, JCHANGE, JDELETE, JADD, JACTION, KAND, KOLON,
04820+ JCHNGHD, KBLNK, NRTAPE, NWTAPE, LANS, JSHFT, JCHAR, ICHAR, NANS, IRET,
04830+ IPUT, KHCT, KDCT, MHCT, MDCT, MCOUNT, KK, KJ, IQNDEX, IANDEX, MTCH, JJ,
04840+ KTERM, IDATE(18), JMASK(10), KNEW(20)
04850 COMMON IEND, MACH
04860 JSHFT = 54 - (KJ*6)
04870 ISUBS = (JSHFT/6) + 1
04880 GO TO (5,10,15,20,25,30) IPUT
04890 5 KHEAD(KK) = (KHEAD(KK).AND.JMASK(ISUBS)).OR.ISHIFT(ICCHAR, JSHFT)
04900 RETURN
04910 10 KDATA(KK) = (KDATA(KK).AND.JMASK(ISUBS)).OR.ISHIFT(ICCHAR, JSHFT)
04920 RETURN
04930 15 MHEAD(KK) = (MHEAD(KK).AND.JMASK(ISUBS)).OR.ISHIFT(ICCHAR, JSHFT)
04940 RETURN
04950 20 MDATA(KK) = (MDATA(KK).AND.JMASK(ISUBS)).OR.ISHIFT(ICCHAR, JSHFT)
04960 RETURN
04970 25 JANS(KK) = (JANS(KK).AND.JMASK(ISUBS)).OR.ISHIFT(ICCHAR, JSHFT)
04980 RETURN
04990 30 KNEW(KK) = (KNEW(KK).AND.JMASK(ISUBS)).OR.ISHIFT(ICCHAR, JSHFT)
05000 RETURN
05010 END
05020 SUBROUTINE COUNT
05030 COMMON IQ(3,7), ISEVN(10), KHEAD(3), MHEAD(3), KDATA(500), MDATA(500),
05040+ ITYPE(500), IA(7,5), ID(7,4), LHEAD(3,160), LCG(160), IPNT(160),
05050+ JANS(1000), JALL, IBLNK, JCHANGE, JDELETE, JADD, JACTION, KAND, KOLON,
05060+ JCHNGHD, KBLNK, NRTAPE, NWTAPE, LANS, JSHFT, JCHAR, ICHAR, NANS, IRET,
05070+ IPUT, KHCT, KDCT, MHCT, MDCT, MCOUNT, KK, KJ, IQNDEX, IANDEX, MTCH, JJ,
05080+ KTERM, IDATE(18), JMASK(10), KNEW(20)
05090 COMMON IEND, MACH
05100 KJ = 10
05110 JSHFT = 6
05120 DO 5 I=1,10
05130 2 JSHFT = JSHFT - 6
05140 ICHAR = ISHIFT(JANS(KK), JSHFT) .AND. KAND
05150 IF (ICCHAR .NE. 55B) RETURN
05160 5 KJ = KJ - 1
05170 GO TO 2
05180 END
05190 SUBROUTINE READREC
05200 COMMON IQ(3,7), ISEVN(10), KHEAD(3), MHEAD(3), KDATA(500), MDATA(500),
05210+ ITYPE(500), IA(7,5), ID(7,4), LHEAD(3,160), LCG(160), IPNT(160),
05220+ JANS(1000), JALL, IBLNK, JCHANGE, JDELETE, JADD, JACTION, KAND, KOLON,
05230+ JCHNGHD, KBLNK, NRTAPE, NWTAPE, LANS, JSHFT, JCHAR, ICHAR, NANS, IRET,
05240+ IPUT, KHCT, KDCT, MHCT, MDCT, MCOUNT, KK, KJ, IQNDEX, IANDEX, MTCH, JJ,
05250+ KTERM, IDATE(18), JMASK(10), KNEW(20)
05260 COMMON IEND, MACH
05270 READ (NRTAPE,100) IQNDEX, IANDEX
05280 IF (EOF, NRTAPE) 140, 5
05290 5 DO 10 J=1,4
```

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```
05300 10 READ (NRTAPE,110) (ID(I,J),I=1,7)
05310 ID(3,4) = ID(3,4) .AND. 77B
05320 DO 20 M=1,IQINDEX
05330 20 READ (NRTAPE,110) (LHEAD(L,M),L=1,3)
05340 IF (IQINDEX .LE. 65) GO TO 30
05350 READ (NRTAPE,120) (LCQ(K),K=1,65)
05360 READ (NRTAPE,120) (LCQ(K),K=66,IQINDEX)
05370 GO TO 40
05380 30 READ (NRTAPE,120) (LCQ(K),K=1,IQINDEX)
05390 40 MPT = 22
05400 M = 1
05410 50 N = M+21
05420 IF (IQINDEX - MPT)70,70,60
05430 60 READ (NRTAPE,130) (IPNT(K),K=M,N)
05440 M = N+1
05450 MPT = MPT+22
05460 GO TO 50
05470 70 READ (NRTAPE,130) (IPNT(K),K=M,IQINDEX)
05480C COMPUTE HOW MANY LINES IT TAKES TO READ DATA
05490 J = 1
05500 IZAN = (IANDEX/6) + 1
05510 IPAN = (IZAN - 1)*6
05520 IF (IPAN .EQ. IANDEX) IZAN = IZAN - 1
05530 DO 90 M=1,IZAN
05540 K = J+5
05550 READ (NRTAPE,110) (JANS(I),I=J,K)
05560 90 J = J+6
05570 IRET = 1
05580 RETURN
05590 100 FORMAT (1X,2I5)
05600 110 FORMAT (1X,7A10)
05610 120 FORMAT (1X,65I1)
05620 130 FORMAT (1X,22I3)
05630 140 IEND = 2
05640 RETURN
05650 END
05660 SUBROUTINE INIT
05670 COMMON IQ(3,7),ISEVN(10),KHEAD(3),MHEAD(3),KDATA(500),MDATA(500),
05680+ ITYPE(500),IA(7,5),ID(7,4),LHEAD(3,160),LCQ(160),IPNT(160),
05690+ JANS(1000),JALL,IBLNK,JCHANGE,JDELETE,JADD,JACTION,KAND,KOLON,
05700+ JCHNGHD,KBLNK,NRTAPE,NWTAPE,LANS,JSHFT,JCHAR,ICHAR,NANS,IRET,
05710+ IPUT,KHCT,KDCT,MHCT,MDCT,MCOUNT,KK,KJ,IQINDEX,IANDEX,MTCH,JJ,
05720+ KTERM,IDATE(18),JMASK(10),KNEW(20)
05730 COMMON IEND, MACH
05740 IQ(2,5) = 6HACTION
05750 IQ(2,6) = 4HWHAT
05760 IQ(2,7) = 2HTO
05770 JALL = 3HALL
05780 IBLNK = 10H
05790 JCHANGE = 6HCHANGE
05800 JDELETE = 6HDELETE
05810 JADD = 3HADD
```

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05820 JACTION = IBLNK
05830 KAND = 77B
05840 KOLON = 63B
05850 JCHNGHD = 10HCHANGEHEAD
05860 KBLNK = 55B
05870 ISEVN(1) = 07700000000000000000
05880 ISEVN(2) = 07777000000000000000
05890 ISEVN(3) = 07777770000000000000
05900 ISEVN(4) = 07777777700000000000
05910 ISEVN(5) = 07777777777000000000
05920 ISEVN(6) = 07777777777770000000
05930 ISEVN(7) = 07777777777777700000
05940 ISEVN(8) = 07777777777777777000
05950 ISEVN(9) = 07777777777777777770
05960 ISEVN(10) = 07777777777777777777
05970 JMASK(1) = 07777777777777777770
05980 JMASK(2) = 07777777777777777707
05990 JMASK(3) = 07777777777777777077
06000 JMASK(4) = 07777777777770077777
06010 JMASK(5) = 07777777777007777777
06020 JMASK(6) = 07777777007777777777
06030 JMASK(7) = 07777770077777777777
06040 JMASK(8) = 07777007777777777777
06050 JMASK(9) = 07700777777777777777
06060 JMASK(10) = 00077777777777777777
06070 NRTAPE = 4
06080 NWTAPE = 5
06090 DO 30 I = 1,1000
06100 30 JANS(I) = IBLNK
06110 DO 35 J=1,7
06120 DO 35 I=1,5
06130 35 IA(J,I) = IBLNK
06140 RETURN
06150 END
06160 SUBROUTINE MATCH
06170 COMMON IQ(3,7), ISEVN(10), KHEAD(3), MHEAD(3), KDATA(500), MDATA(500),
06180+ ITYPE(500), IA(7,5), ID(7,4), LHEAD(3,160), LCQ(160), IPNT(160),
06190+ JANS(1000), JALL, IBLNK, JCHANGE, JDELETE, JADD, JACTION, KAND, KOLON,
06200+ JCHNGHD, KBLNK, NRTAPE, NWTAPE, LANS, JSHFT, JCHAR, ICHAR, NANS, IRET,
06210+ IPUT, KHCT, KDCT, MHCT, MDCT, MCOUNT, KK, KJ, IQINDEX, IANDEX, MTCH, JJ,
06220+ KTERM, IDATE(18), JMASK(10), KNEW(20)
06230 COMMON IEND, MACH
06240 IPUT=6
06250 J=1
06260C DO HEADINGS MATCH?
06270 5 DO 10 K=1,3
06280 IF (LHEAD(K,J)-KHEAD(K))90,10,90
06290 10 CONTINUE
06300C HEADING MATCHES...DOES DATA?
06310 IF (JACTION.EQ.JCHNGHD) GO TO 95
06320 IF (KDATA(1).EQ.IBLNK) GO TO 95
06330 IF (J-4) 105,120,15

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```
06340 15 LPOINT=IPNT(J)
06350 K=J
06360 20 K=K+1
06370 IF (K.GT.IQNDEX) GO TO 30
06380 IF (IPNT(K).EQ.0) GO TO 20
06390 LIMIT=IPNT(K)
06400 GO TO 35
06410 30 LIMIT=IANDEX
06420 35 IFIRST=0
06430 JOUNT=0
06440 IGET=IFIRST
06450 40 KK=1
06460 KJ=0
06470 45 IF (IGET.LE.9) GO TO 50
06480 IGET=0
06490 LPOINT=LPOINT+1
06500 IF (LPOINT.GT.LIMIT) GO TO 90
06510 50 JSHFT=(IGET*6)-54
06520 ICHAR=ISHIFT(JANS(LPOINT),JSHFT).AND.77B
06530 CALL STRCH
06540 JOUNT=JOUNT+1
06550 IF (JOUNT.EQ.KDCT) GO TO 65
06560 KJ=KJ+1
06570 IF (KJ.LE.9) GO TO 60
06580 KJ=0
06590 KK=KK+1
06600 60 IGET=IGET + 1
06610 GO TO 45
06620C SEE IF DATA MATCHES
06630 65 DO 75 M=1,20
06640 IF (KNEW(M)-IBLNK) 70,95,70
06650 70 IF (KDATA(M)-KNEW(M)) 80,75,80
06660 75 CONTINUE
06670 GO TO 95
06680C DOESN'T MATCH...TRY AGAIN
06690 80 IFIRST=IFIRST+1
06700 LPOINT=IPNT(J) + IFIRST/10
06710 JOUNT=0
06720 DO 85 M=1,20
06730 85 KNEW(M)=IBLNK
06740 GO TO 40
06750 90 J=J+1
06760 IF (J-IQNDEX) 5,5,100
06770 95 IRET=1
06780 MTCH=J
06790 RETURN
06800 100 IRET=2
06810 RETURN
06820C SEE IF THE LEADER MATCHES
06830 105 DO 110 K=1,6
06840 L = K+1
06850 IF (KDATA(K)-ID(L,J)) 115,110,115
```

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08/05/71. 11.31.33.

```
06860 110 CONTINUE
06870 111 IRET=1
06880 MTCH = J
06890 RETURN
06900 115 J=J+1
06910 GO TO 5
06920C SEE IF DATE MATCHES
06930 120 I=1
06940 DO 130 K=1,2
06950 DO 125 L=1,10
06960 KSHFT = (6*L) - 60
06970 IDATE(I)=ISHIFT(KDATA(K),KSHFT).AND.77B
06980 IF (IDATE(I).NE.55B.AND.IDATE(I).NE.63B.AND.IDATE(I).NE.62B)I=I+1
06990 125 CONTINUE
07000 130 CONTINUE
07010 IPUT=2
07020 CALL DATEIN
07030 GO TO (135,135,135,105),IRET
07040 135 PRINT, *YOU GAVE ME A SCREWY DATE*
07050 STOP
07060 END
07070 SUBROUTINE BUILD
07080 COMMON IQ(3,7),ISEVN(10),KHEAD(3),MHEAD(3),KDATA(500),MDATA(500),
07090+ ITYPE(500),IA(7,5),ID(7,4),LHEAD(3,160),LCQ(160),IPNT(160),
07100+ JANS(1000),JALL,I BLNK,JCHANGE,JDELETE,JADD,JACTION,KAND,KOLON,
07110+ JCHNGHD,KBLNK,NRTAPE,NWTAPE,LANS,JSHFT,JCHAR,I CHAR,NANS,IRET,
07120+ IPUT,KHCT,KDCT,MHCT,MDCT,MCOUNT,KK,KJ,IQINDEX,IANDEX,MTCH,JJ,
07130+ KTERM,IDATE(18),JMASK(10),KNEW(20)
07140 COMMON IEND, MACH
07150 LCNT=0 $ IRET=1 $ LANS=1 $ IRET=1
07160 JCHAR = 0
07170 KK=1
07180 KJ=0
07190 10 JSHFT=(JCHAR*6)-54
07200 ICHAR=ISHIFT(ITYPE(LANS),JSHFT).AND.77B
07210 IF (ICHAR.EQ.47B) GO TO 25
07220 IF (ICHAR.EQ.63B) GO TO 35
07230 12 IF (ICHAR .EQ. 51B) ICHAR = 62B
07240 IF (ICHAR .EQ. 52B) ICHAR = 63B
07250 CALL STRCH
07260 LCNT=LCNT+1
07270 15 JCHAR=JCHAR+1
07280 KJ=KJ+1
07290 IF (KJ.GT.9) GO TO 30
07300 20 IF (JCHAR.LE.9) GO TO 10
07310 LANS=LANS+1
07320 JCHAR=0
07330 IF (LANS.LE.(NANS+1)) GO TO 10
07340 22 IRET=3
07350 25 GO TO (26,27,28,29),IPUT
07360 26 KHCT=LCNT
07370 RETURN
```

** "UPDATE" -- ALTERS DATA RECORDS AND POINTERS
08/05/71. 11.31.33.

```
07380 27 KDCT=LCNT
07390 RETURN
07400 28 MHCT=LCNT
07410 RETURN
07420 29 MDCT=LCNT
07430 IF (JACTION .EQ. JCHNGHD) GO TO 37
07440 IF (JACTION .EQ. JADD) RETURN
07450 IF (MDATA(1) .EQ. IBLNK) RETURN
07460 K = ISHIFT(MDATA(1),-54) .AND. 77B
07470 IF (K .EQ. 62B) RETURN
07480 K = MDCT/10 + 2
07490 ISAVE1=636200000000000000000000B
07500 DO 291 L=1,K
07510 ISAVE2= MDATA(L) .AND. 7777B
07520 MDATA(L) = ISHIFT(MDATA(L),-12) .AND. 77777777777777777B
07530 MDATA(L) = MDATA(L) .OR. ISAVE1
07540 291 ISAVE1 = ISHIFT(ISAVE2,48)
07550 LCNT = LCNT+2
07560 RETURN
07570 30 KJ=0
07580 KK=KK+1
07590 GO TO 20
07600 35 GO TO (36,50,37,37), IPUT
07610 36 KHCT=LCNT
07620 IPUT = IPUT+1
07630 GO TO 38
07640 37 MHCT=LCNT
07650 DO 371 L=1,3
07660 MHEAD(L) = MDATA(L)
07670 371 MDATA(L) = IBLNK
07680 IF (JACTION .EQ. JCHNGHD) RETURN
07690 38 LCNT=0
07700 KK=1
07710 KJ=0
07720 39 JCHAR=JCHAR+1
07730 IF (JCHAR.LE.9) GO TO 40
07740 LANS=LANS+1
07750 JCHAR=0
07760 IF (LANS.GT.(NANS+1)) GO TO 22
07770 40 JSHFT=(JCHAR*6)-54
07780 ICHAR=ISHIFT(ITYPE(LANS),JSHFT).AND.77B
07790 IF (ICHR-55B) 12,39,12
07800 50 PRINT, *PROGRAMMING ERROR, SEE PROGRAMMER*
07810 STOP
07820 END
07830 SUBROUTINE WRITREC
07840 COMMON IQ(3,7), ISEVN(10), KHEAD(3), MHEAD(3), KDATA(500), MDATA(500),
07850+ ITYPE(500), IA(7,5), ID(7,4), LHEAD(3,160), LCQ(160), IPNT(160),
07860+ JANS(1000), JALL, IBLNK, JCHANGE, JDELETE, JADD, JACTION, KAND, KOLON,
07870+ JCHNGHD, KBLNK, NRTAPE, NWTAPE, LANS, JSHFT, JCHAR, ICHAR, NANS, IRET,
07880+ IPUT, KHCT, KDCT, MHCT, MDCT, MCOUNT, KK, KJ, IQNDEX, IANDEX, MTCH, JJ,
07890+ KTERM, IDATE(18), JMASK(10), KNEW(20)
```

** "UPDATE" -- ALTERS DATA RECORDS AND POINTERS
08/05/71. 11.31.33.

```
07900 COMMON IEND, MACH
07910 WRITE (NWTAPE,100) IQNDEX, IANDEX
07920 DO 10 J = 1,4
07930 10 WRITE (NWTAPE,110) (ID(I,J),I=1,7)
07940 DO 20 M = 1,IQNDEX
07950 20 WRITE (NWTAPE,110) (LHEAD(L,M),L=1,3)
07960 IF (IQNDEX.LE.65) GO TO 30
07970 WRITE (NWTAPE,120) (LCQ(K), K=1,65)
07980 WRITE (NWTAPE,120) (LCQ(K), K = 66,IQNDEX)
07990 GO TO 40
08000 30 WRITE (NWTAPE,120) (LCQ(K), K = 1,IQNDEX)
08010 40 MPT = 22
08020 M = 1
08030 50 N = M + 21
08040 IF (IQNDEX - MPT) 70,70,60
08050 60 WRITE (NWTAPE,130) (IPNT(K), K= M,N)
08060 M = N + 1
08070 MPT = MPT + 22
08080 GO TO 50
08090 70 WRITE (NWTAPE,130) (IPNT(K), K=M,IQNDEX)
081000 COMPUTE HOW MANY LINES IT TAKES TO WRITE DATA
08110 J = 1
08120 IZAN = (IANDEX/6) + 1
08130 IPAN = (IZAN-1) * 6
08140 IF (IPAN.EQ.IANDEX) IZAN = IZAN - 1
08150 DO 80 M = 1,IZAN
08160 K = J + 5
08170 WRITE (NWTAPE,110) (JANS(I), I = J,K)
08180 80 J = J + 6
08190 RETURN
08200 100 FORMAT (1X,2I5)
08210 110 FORMAT (1X,7A10)
08220 120 FORMAT (1X,65I1)
08230 130 FORMAT (1X,22I3)
08240 END
08250 SUBROUTINE ETERM(NTERM,MSWIT,JTERM)
08260 MSWIT = 0
08270 IAND = 07700000000000000000
08280 IOR = .NOT. IAND
08290 JASTK = 04700000000000000000
08300 IBK = 05500000000000000000
08310 IBLNK = 10H
08320 NNEW = NTERM.AND.IAND
08330 IF (NNEW.EQ.JASTK) GO TO 20
08340 DO 10 K = 1,10
08350 NTERM = ISHIFT(NTERM,6)
08360 NNEW = NTERM.AND.IAND
08370 IF (NNEW.NE.JASTK) GO TO 10
08380 NTERM = NTERM.AND.IOR
08390 MSWIT = 1
08400 IF (JTERM.EQ.0) GO TO 5
08410 NTERM = NTERM.OR.IBK
```

** "UPDATE" -- ALTERS DATA RECORDS AND POINTERS
08/05/71. 11.31.33.

```
08420 GO TO 10
08430 5 NTERM = NTERM.OR.JASTK
08440 10 CONTINUE
08450 RETURN
08460 20 IF (JTERM.EQ.1) NTERM = IBLNK
08470 MSWIT = 1
08480 RETURN
08490 END
08500 SUBROUTINE DATEIN
08510 COMMON IQ(3,7), ISEVN(10), KHEAD(3), MHEAD(3), KDATA(500), MDATA(500),
08520+ ITYPE(500), IA(7,5), ID(7,4), LHEAD(3,160), LCQ(160), IPNT(160),
08530+ JANS(1000), JALL, IBLNK, JCHANGE, JDELETE, JADD, JACTION, KAND, KOLON,
08540+ JCHNGHD, KBLNK, NRTAPE, NWTAPE, LANS, JSHFT, JCHAR, ICHAR, NANS, IRET,
08550+ IPUT, KHCT, KDCT, MHCT, MDCT, MCOUNT, KK, KJ, IQINDEX, IANDEX, MTCH, JJ,
08560+ KTERM, IDATE(18), JMASK(10), KNEW(20)
08570 DIMENSION IMONTH(22)
08580 DATA IMONTH/0120116, 0060502, 0150122, 0012022, 0150131, 0122516,
08590+ 0122514, 0012507, 0230520, 0170324, 0161726, 0040503, 0251613/
08600 KZERO = 27
08610 KNINE = 36
08620 ITERM = 39
08630 IFILLO = 033333333333333333330000
08640 ISHFL1 = 2**6
08650 KHYPHN = 38
08660 I = 0
08670 MM = 1
08680 IDAY1 = KZERO
08690 IDAY2 = KZERO
08700 GO TO 145
08710 110 I = I + 1
08720 IF (IDATE(I)-ITERM) 135,115,135
08730 115 IA(2,5) = IA(2,4)
08740 IA(3,5) = IA(3,4)
08750 IF (IFLAG) 125,120,125
08760 120 IA(4,5) = (KZERO+3)*ISHFL1+(KZERO+1)+IFILLO
08770 GO TO 130
08780 125 IA(4,5) = IA(4,4)
08790 130 IRET = 4
08800 RETURN
08810 135 IF (IDATE(I)-KHYPHN) 190,140,190
08820 140 MM = 2
08830 IDAY1 = KZERO + 3
08840 IDAY2 = KZERO + 1
08850 145 IFLAG = 0
08860 150 I = I+1
08870 ICHAR = IDATE(I)
08880 IF (ICHAR-KNINE) 155,155,175
08890 155 IF (ICHAR-KZERO) 175,160,160
08900 160 IFLAG = IFLAG + 1
08910 GO TO (165,170), IFLAG
08920 165 IDAY1 = KZERO
08930 IDAY2 = ICHAR
```


** "UPDATE" -- ALTERS DATA RECORDS AND POINTERS
08/05/71. 11.31.33.

```
08940 GO TO 150
08950 170 IDAY1 = IDAY2
08960 IDAY2 = ICHAR
08970 I = I + 1
08980 ICHAR = IDATE(I)
08990 175 K = ICHAR
09000 I = I + 1
09010 L = IDATE(I)
09020 I = I + 1
09030 IDATE1 = ISHFL1*ISHFL1*K+ISHFL1*L+IDATE(I)
09040 DO 180 M = 1,22
09050 MO = M
09060 IF (IDATE1-IMONTH(M)) 180,185,180
09070 180 CONTINUE
09080 IRET = 2
09090 RETURN
09100 185 I = I + 1
09110 K = IDATE(I)
09120 I = I + 1
09130 GO TO (187,205,210) IPUT
09140 187 IF (MM .EQ. 2) GO TO 200
09150 IA (2,4) = IABS(ISHFL1*K)+IDATE(I)+IFILLO
09160 IA(3,4) = MO
09170 IA(4,4) = IABS(IDAY1*ISHFL1)+IDAY2+IFILLO
09180 GO TO (110,130), MM
09190 200 IA(2,5) = IABS(ISHFL1*K)+IDATE(I)+IFILLO
09200 IA(3,5) = MO
09210 IA(4,5) = IABS(IDAY1*ISHFL1)+IDAY2+IFILLO
09220 GO TO (110,130), MM
09230 190 IRET = 3
09240 RETURN
09250 205 KDATA(1) = IABS(ISHFL1*K)+IDATE(I)+IFILLO
09260 KDATA(2) = MO
09270 KDATA(3) = IABS(IDAY1*ISHFL1)+IDAY2+IFILLO
09280 GO TO 130
09290 210 MDATA(1) = IABS(ISHFL1*K)+IDATE(I)+IFILLO
09300 MDATA(2) = MO
09310 MDATA(3) = IABS(IDAY1*ISHFL1)+IDAY2+IFILLO
09320 GO TO 130
09330 END
```

- - - T H E E N D - - -

** "SORTER" -- SORTS DATA RECORDS BY ID ITEMS
07/30/71. 08.58.24.

00100C THIS PROGRAM WAS RE-DESIGNED AND DEVELOPED BY PAUL SIMMONS,
00110C UNITED COMPUTING SYSTEMS, INC., AND RONALD SCHWARZ, GODDARD
00120C SPACE FLIGHT CENTER, JULY, 1971.
00130C
00140C CURRENT 7/29/71
00150 PROGRAM SORT(INPUT, OUTPUT, TAPE4, TAPES)
00160 COMMON I, J, K, NTAPE, KTAPE, IREAD, IRET, IWRITE, JID(7,4), KID(7,4),
00170+ JQINDEX, JANDEX, JHEAD(3,160), JCODE(160), MPT, M, N,
00180+ JPNT(160), KPNT(160), KQINDEX, KANDEX, KHEAD(3,160), KCODE(160),
00190+ IZAN, IANDEX, IPAN, JANS(800), KANS(700), IDCNT, INUM
00200 DIMENSION ID(4)
00210 INUM=-1
00220 IDCNT=0
00230 CALL CLOCK(IX)
00240 CALL DATER(IS)
00250 PRINT 16, IS, IX
00260 16 FORMAT(*PROGRAM: SORTER*, 4X, *DATE:*, A9, 4X, *TIME:*, A9, ///)
00270 PRINT, *DO YOU NEED OPERATING INSTRUCTIONS*,
00280 READ 17, LANS
00290 17 FORMAT(A1)
00300 IF (LANS .EQ. 1HN) GO TO 6
00310 PRINT, /, *THIS PROGRAM SORTS ON THE FIRST FOUR DATA ITEMS IN*,
00320+ * EACH RECORD*, /, *(ID ITEMS). SPECIFY THE ORDER OF*,
00330+ * IMPORTANCE OF THESE ITEMS WITH*, /, *A 1, 2, 3, OR*,
00340+ * 4 WHEN REQUESTED.*
00350 6 PRINT, /, *ENTER NAME OF THE DATA FILE TO BE SORTED*,
00360 21 READ 2, NAME
00370 2 FORMAT(A7)
00380 CALL PFUR(3HRET, NTAPE, NAME, 0, ISTA)
00390 IF (ISTA .EQ. 5) GO TO 61
00400 PRINT, /, *WILL THE DATA FILE BE SORTED INTO ASCENDING (A) OR*,
00410+ /, *DESCENDING (D) SEQUENCE*,
00420 5 READ 10, ISEQ
00430 10 FORMAT(A1)
00440 IF (ISEQ .NE. 1HA .AND. ISEQ .NE. 1HD) GO TO 63
00450 PRINT, /, *ENTER SORTING SEQUENCE HERE*
00460 DO 12 I=1, 4
00470 12 READ 15, ID(I)
00480 15 FORMAT (I1)
00490 NTAPE=4
00500 KTAPE=5
00510 20 ISWIT=0
00520 ICHANGE=0
00530 CALL PFUR(3HRET, NTAPE, NAME, 0, ISTA)
00540 IREAD=1
00550 CALL RED
00560 IREAD=2
00570 25 CALL RED
00580 GO TO (30, 40), IRET
00590 30 DO 100 I=1, 4
00600 DO 100 J=2, 7
00610 K=ID(I)

** "SORTER" -- SORTS DATA RECORDS BY ID ITEMS
07/30/71. 08.58.24.

```
00620C COMPARE FIRST TO NEXT
00630 IF (JID(J,K)-KID(J,K))135,100,140
00640 100 CONTINUE
00650 105 IRET=1
00660 GO TO 00115
00670 110 IRET=2
00680 115 ISWIT=ISWIT+1
00690 IF (ISWIT .GT. 2) ISWIT=1
00700 IF (IRET .NE. ISWIT) ICHANGE=1
00710 IWRITE=IRET
00720 CALL WRIT
00730 IREAD=IWRITE
00740 GO TO 00025
00750C ASCENDING SEQUENCE?
00760 135 IF (ISEQ-1HA) 110,105,110
00770 140 IF (ISEQ-1HA) 105,110,105
00780C DID INTERCHANGE OCCUR?
00790 40 IF (ICHANGE .EQ. 0) GO TO 80
00800 GO TO (50,45), IREAD
00810 45 IWRITE=1
00820 GO TO 00060
00830 50 IWRITE=2
00840 60 CALL WRIT
00850 CALL PFUR(3HREP,KTAPE,NAME,0,1STA)
00860 IDCNT=1
00870 GO TO 00020
00880 80 CONTINUE
00890 PRINT,*SORT COMPLETED.*
00900 PRINT 90, INUM
00910 90 FORMAT(*YOU HAVE SORTED *,I4,* DATA RECORDS.*)
00920 STOP
00930 61 PRINT 44,NAME
00940 PRINT,*RE-ENTER VALID DATA FILE NAME:*,
00950 GO TO 00021
00960 44 FORMAT(*DATA FILE *,A7,* NOT IN PERMANENT STORAGE.*)
00970 63 PRINT,*ENTER A OR D*,
00980 GO TO 00005
00990 STOP
01000 END
01010 SUBROUTINE RED
01020 COMMON I,J,K,NTAPE,KTAPE,IREAD,IRET,IWRITE,JID(7,4),KID(7,4),
01030+ JQINDEX,JANDEX,JHEAD(3,160),JCODE(160),MPT,M,N,
01040+ JPNT(160),KPNT(160),KQINDEX,KANDEX,KHEAD(3,160),KCODE(160),
01050+ IZAN,IANDEX,IPAN,JANS(800),KANS(700),IDCNT,INUM
01060 IF (IDCNT .EQ. 1) GO TO 2
01070 INUM=INUM+1
01080 2 GO TO (5,120), IREAD
01090 5 READ (NTAPE,175) JQINDEX,JANDEX
01100 IF (EOF,NTAPE) 170,10
01110 10 DO 15 I=1,4
01120 15 READ (NTAPE,180) (JID(J,I),J=1,7)
01130 DO 20 I=1,JQINDEX
```

** "SORTER" -- SORTS DATA RECORDS BY ID ITEMS
07/30/71. 08.58.24.

```
01140 20 READ (NTAPE,180) (JHEAD(J,I),J=1,3)
01150 IF (JQINDEX .LE. 65) GO TO 25
01160 READ (NTAPE,185) (JCODE(I),I=1,65)
01170 READ (NTAPE,185) (JCODE(I),I=66,JQINDEX)
01180 GO TO 00030
01190 25 READ (NTAPE,185) (JCODE(I),I=1,JQINDEX)
01200 30 MPT=22
01210 M=1
01220 35 N=M+21
01230 GO TO (40,55), IREAD
01240 40 IF (JQINDEX .LE. MPT) GO TO 50
01250 READ (NTAPE,190) (JPNT(I),I=M,N)
01260 45 M=N+1
01270 MPT=MPT+22
01280 GO TO 00035
01290 50 READ (NTAPE,190) (JPNT(I),I=M,JQINDEX)
01300 GO TO 00075
01310 55 IF (KQINDEX .LE. MPT) GO TO 60
01320 READ (NTAPE,190) (KPNT(I),I=M,N)
01330 GO TO 00045
01340 60 READ (NTAPE,190) (KPNT(I),I=M,KQINDEX)
01350 GO TO 00075
01360 75 GO TO (80,85), IREAD
01370 80 IANDEX=JANDEX
01380 GO TO 00095
01390 85 IANDEX=KANDEX
01400 95 J=1
01410 IZAN=(IANDEX/6)+1
01420 IPAN=(IZAN-1)*6
01430 IF (IPAN .EQ. IANDEX) IZAN=IZAN-1
01440 DO 115 M=1,IZAN
01450 K=J+5
01460 GO TO (100,105), IREAD
01470 100 READ (NTAPE,180) (JANS(I),I=J,K)
01480 GO TO 00115
01490 105 READ (NTAPE,180) (KANS(I),I=J,K)
01500 115 J=J+6
01510 IRET=1
01520 RETURN
01530 120 READ (NTAPE,175) KQINDEX,KANDEX
01540 IF (EOF,NTAPE)170,125
01550 125 DO 130 I=1,4
01560 130 READ (NTAPE,180) (KID(J,I),J=1,7)
01570 DO 135 I=1,KQINDEX
01580 135 READ (NTAPE,180) (KHEAD(J,I),J=1,3)
01590 IF (KQINDEX .LE. 65) GO TO 140
01600 READ (NTAPE,185) (KCODE(I),I=1,65)
01610 READ (NTAPE,185) (KCODE(I),I=66,KQINDEX)
01620 GO TO 00030
01630 140 READ (NTAPE,185) (KCODE(I),I=1,KQINDEX)
01640 GO TO 00030
01650 170 IRET=2
```

** "SORTER" -- SORTS DATA RECORDS BY ID ITEMS
07/30/71. 08.58.24.

```
01660 RETURN
01670 175 FORMAT (1X,215)
01680 180 FORMAT (1X,7A10)
01690 185 FORMAT (1X,65I1)
01700 190 FORMAT (1X,22I3)
01710 END
01720 SUBROUTINE WRIT
01730 COMMON I,J,K,NTAPE,KTAPE,IREAD,IWRITE,JID(7,4),KID(7,4),
01740+ JQINDEX,JANDEX,JHEAD(3,160),JCODE(160),MPT,M,N,
01750+ JPNT(160),KPNT(160),KQINDEX,KANDEX,KHEAD(3,160),KCODE(160),
01760+ IZAN,IANDEX,IPAN,JANS(800),KANS(700),IDCNT,INUM
01770 GO TO (5,120), IWRITE
01780 5 WRITE (KTAPE,175) JQINDEX,JANDEX
01790 DO 15 I=1,4
01800 15 WRITE (KTAPE,180) (JID(J,I),J=1,7)
01810 DO 20 I=1,JQINDEX
01820 20 WRITE (KTAPE,180) (JHEAD(J,I),J=1,3)
01830 IF (JQINDEX .LE. 65) GO TO 25
01840 WRITE (KTAPE,185) (JCODE(I),I=1,65)
01850 WRITE (KTAPE,185) (JCODE(I),I=66,JQINDEX)
01860 GO TO 00030
01870 25 WRITE (KTAPE,185) (JCODE(I),I=1,JQINDEX)
01880 30 MPT=22
01890 M=1
01900 35 N=M+21
01910 GO TO (40,55), IWRITE
01920 40 IF (JQINDEX .LE. MPT) GO TO 50
01930 WRITE (KTAPE,190) (JPNT(I),I=M,N)
01940 45 M=N+1
01950 MPT=MPT+22
01960 GO TO 00035
01970 50 WRITE (KTAPE,190) (JPNT(I),I=M,JQINDEX)
01980 GO TO 00075
01990 55 IF (KQINDEX .LE. MPT) GO TO 60
02000 WRITE (KTAPE,190) (KPNT(I),I=M,N)
02010 GO TO 00045
02020 60 WRITE (KTAPE,190) (KPNT(I),I=M,KQINDEX)
02030 75 GO TO (80,85), IWRITE
02040 80 IANDEX=JANDEX
02050 GO TO 00095
02060 85 IANDEX=KANDEX
02070 95 J=1
02080 IZAN=(IANDEX/6)+1
02090 IPAN=(IZAN-1)*6
02100 IF (IPAN .EQ. IANDEX) IZAN=IZAN-1
02110 DO 115 M=1,IZAN
02120 K=J+5
02130 GO TO (100,105), IWRITE
02140 100 WRITE (KTAPE,180) (JANS(I),I=J,K)
02150 GO TO 00115
02160 105 WRITE (KTAPE,180) (KANS(I),I=J,K)
02170 115 J=J+6
```

** "SORTER" -- SORTS DATA RECORDS BY ID ITEMS
07/30/71. 08.58.24.

```
02180 RETURN
02190 120 WRITE (KTAPE,175) KQINDEX,KANDEX
02200 DO 130 I=1,4
02210 130 WRITE (KTAPE,180) (KID(J,I),J=1,7)
02220 DO 135 I=1,KQINDEX
02230 135 WRITE (KTAPE,180) (KHEAD(J,I),J=1,3)
02240 IF (KQINDEX .LE. 65) GO TO 140
02250 WRITE (KTAPE,185) (KCODE(I),I=1,65)
02260 WRITE (KTAPE,185) (KCODE(I),I=66,KQINDEX)
02270 GO TO 00030
02280 140 WRITE (KTAPE,185) (KCODE(I),I=1,KQINDEX)
02290 GO TO 00030
02300 175 FORMAT (1X,2I5)
02310 180 FORMAT (1X,7A10)
02320 185 FORMAT (1X,65I1)
02330 190 FORMAT (1X,22I3)
02340 END
```

- - - T H E E N D - - -

** "MERGE" -- MERGES TWO DATA FILES TO FORM A THIRD
07/30/71. 09.15.18.

```
00100C THIS PROGRAM WAS RE-DESIGNED AND DEVELOPED BY PAUL SIMMONS,  
00110C UNITED COMPUTING SYSTEMS, INC., AND RONALD SCHWARZ, GODDARD  
00120C SPACE FLIGHT CENTER, JULY, 1971.  
00130C  
00140 PROGRAM MERGE (INPUT, OUTPUT, TAPE1, TAPE2, TAPE3)  
00150 COMMON I, J, K, NTAPE, KTAPE, IREAD, IRET, IWRITE, JID(7,4), KID(7,4),  
00160+ JQINDEX, JANDEX, JHEAD(3,160), JCODE(160), MPT, M, N,  
00170+ JPNT(160), KPNT(160), KQINDEX, KANDEX, KHEAD(3,160), KCODE(160),  
00180+ IZAN, IANDEX, IPAN, JANS(600), KANS(600), ICOUNT  
00190 DIMENSION ID(4)  
00200 ICOUNT = 0  
00210 NTAPE=1  
00220 MTAPE=2  
00230 KTAPE=3  
00240 CALL CLOCK(IX)  
00250 CALL DATER(IS)  
00260 PRINT 4, IS, IX  
00270 PRINT, *ENTER NAME OF THE FIRST FILE TO BE MERGED:*,  
00280 2 READ, NAME  
00290 CALL PFUR(3HRET, NTAPE, NAME, 0, ISTA)  
00300 IF (ISTA .EQ. 5) GO TO 3  
00310 IOK = 1  
00320 PRINT, *ENTER NAME OF THE SECOND FILE TO BE MERGED:*,  
00330 7 READ 5, NAME  
00340 CALL PFUR(3HRET, MTAPE, NAME, 0, ISTA)  
00350 IF (ISTA .EQ. 5) GO TO 3  
00360 PRINT, /  
00370 PRINT, *ARE THESE FILES IN ASCENDING (A) OR DESCENDING (D) SEQUENC  
      (CONT'D) E*,  
00380 READ 10, ISEQ  
00390 PRINT, *WHAT IS THE ORDER OF THE MERGE KEYS? ANSWER THE FOUR*  
00400 PRINT, *QUESTION MARKS WITH A 1, 2, 3, OR 4.*  
00410 DO 15 I=1, 4  
00420 15 READ 20, ID(I)  
00430 IREAD=1  
00440 CALL RED  
00450 35 IREAD=2  
00460 40 CALL RED  
00470 GO TO (45, 75), IRET  
00480 45 DO 50 I=1, 4  
00490 50 DO 50 J=2, 7  
00500 K=ID(I)  
00510C COMPARE FIRST TO NEXT  
00520 IF (JID(J, K) - KID(J, K)) 60, 50, 70  
00530 50 CONTINUE  
00540 55 IWRITE=1  
00550 CALL WRIT  
00560 IREAD=1  
00570 GO TO 40  
00580C ASCENDING SEQUENCE?  
00590 60 IF (ISEQ-1HA) 65, 55, 65  
00600 65 IWRITE=2
```

** "MERGE" -- MERGES TWO DATA FILES TO FORM A THIRD
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```
00610 CALL WRIT
00620 GO TO 35
00630 70 IF (ISEQ-1HA)55,65,55
00640C WRITE REMAINDER OF OTHER FILE
00650 75 GO TO (80,90), IREAD
00660 80 IWRITE=2
00670 CALL WRIT
00680 IREAD=2
00690 CALL RED
00700 GO TO (80,95), IRET
00710 90 IWRITE=1
00720 CALL WRIT
00730 IREAD=1
00740 CALL RED
00750 GO TO (90,95), IRET
00760 95 CONTINUE
00770 PRINT 110, ICOUNT
00780 PRINT,*UNDER WHAT NAME SHOULD ALL OF THE MERGED RECORDS*,
00790+      * NOW BE FOUND*,
00800 READ 5,NAME
00810 IOP = 3HSAV
00820 GO TO 96
00830 96 CALL PFUR(IOP,KTAPE,NAME,0,ISTA)
00840 IF (ISTA .EQ. 4) GO TO 44
00850 IF (ISTA .EQ. 0) GO TO 99
00860 44 PRINT,/,*FILE ALREADY PERMANENT. ENTER A NEW FILE NAME OR*
00870 PRINT,*ENTER "REPLACE" TO REPLACE CURRENT PERMANENT FILE:*,
00880 NAMES = NAME
00890 READ 5,NAME
00900 IF (NAME .EQ. 7HREPLACE) IOP = 3HREP
00910 IF (NAME .EQ. 7HREPLACE) NAME = NAMES
00920 GO TO 96
00930 99 IACT = 5HSAVED
00940 IF (IOP .EQ. 3HREP) IACT = 8HREPLACED
00950 PRINT 97,NAME,IACT
00960 STOP
00970 3 PRINT 41,NAME
00980 PRINT,*RE-ENTER VALID FILE NAME:*,
00990 IF (IOK .NE. 1) GO TO 2
01000 GO TO 7
01010 4 FORMAT(/*PROGRAM: MERGE*,4X,*DATE:*,A9,4X,*TIME:*,A9,///)
01020 5 FORMAT (A7)
01030 10 FORMAT (A1)
01040 20 FORMAT (I1)
01050 97 FORMAT(/,A7,* HAS BEEN *,A8,* AS MERGED FILE.*)
01060 41 FORMAT(/*DATA FILE *,A7,* NOT IN PERMANENT STORAGE.*)
01070 110 FORMAT(I4,* DATA RECORDS HAVE BEEN MERGED.*)
01080 END
01090 SUBROUTINE RED
01100 COMMON I,J,K,NTAPE,KTAPE,IREAD,IRET,IWRITE,JID(7,4),KID(7,4),
01110+ JQNDX,JANDEX,JHEAD(3,160),JCODE(160),MPT,M,N,
01120+ JPNT(160),KPNT(160),KQNDX,KANDEX,KHEAD(3,160),KCODE(160),
```


** "MERGE" -- MERGES TWO DATA FILES TO FORM A THIRD
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```
01130+ IZAN, IANDEX, IPAN, JANS(600), KANS(600), ICOUNT
01140 GO TO (5,120), IREAD
01150 5 READ (IREAD,175) JQINDEX, JANDEX
01160 IF (EOF,IREAD) 170,10
01170 10 DO 15 I=1,4
01180 15 READ (IREAD,180) (JID(J,I),J=1,7)
01190 DO 20 I=1,JQINDEX
01200 20 READ (IREAD,180) (JHEAD(J,I),J=1,3)
01210 IF (JQINDEX .LE. 65) GO TO 25
01220 READ (IREAD,185) (JCODE(I),I=1,65)
01230 READ (IREAD,185) (JCODE(I),I=66,JQINDEX)
01240 GO TO 30
01250 25 READ (IREAD,185) (JCODE(I),I=1,JQINDEX)
01260 30 MPT=22
01270 M=1
01280 35 N=M+21
01290 GO TO (40,55), IREAD
01300 40 IF (JQINDEX .LE. MPT) GO TO 50
01310 READ (IREAD,190) (JPNT(I),I=M,N)
01320 45 M=N+1
01330 MPT=MPT+22
01340 GO TO 35
01350 50 READ (IREAD,190) (JPNT(I),I=M,JQINDEX)
01360 GO TO 75
01370 55 IF (KQINDEX .LE. MPT) GO TO 60
01380 READ (IREAD,190) (KPNT(I),I=M,N)
01390 GO TO 45
01400 60 READ (IREAD,190) (KPNT(I),I=M,KQINDEX)
01410 GO TO 75
01420 75 GO TO (80,85), IREAD
01430 80 IANDEX=JANDEX
01440 GO TO 95
01450 85 IANDEX=KANDEX
01460 95 J=1
01470 IZAN=(IANDEX/6)+1
01480 IPAN=(IZAN-1)*6
01490 IF (IPAN .EQ. IANDEX) IZAN=IZAN-1
01500 DO 115 M=1,IZAN
01510 K=J+5
01520 GO TO (100,105), IREAD
01530 100 READ (IREAD,180) (JANS(I),I=J,K)
01540 GO TO 115
01550 105 READ (IREAD,180) (KANS(I),I=J,K)
01560 115 J=J+6
01570 IRET=1
01580 RETURN
01590 120 READ (IREAD,175) KQINDEX, KANDEX
01600 IF (EOF,IREAD) 170,125
01610 125 DO 130 I=1,4
01620 130 READ (IREAD,180) (KID(J,I),J=1,7)
01630 DO 135 I=1,KQINDEX
01640 135 READ (IREAD,180) (KHEAD(J,I),J=1,3)
```

** 'MERGE' -- MERGES TWO DATA FILES TO FORM A THIRD
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```
01650 IF (KQINDEX .LE. 65) GO TO 140
01660 READ (IREAD,185) (KCODE(I),I=1,65)
01670 READ (IREAD,185) (KCODE(I),I=66,KQINDEX)
01680 GO TO 30
01690 140 READ (IREAD,185) (KCODE(I),I=1,KQINDEX)
01700 GO TO 30
01710 170 IRET=2
01720 RETURN
01730 175 FORMAT (1X,215)
01740 180 FORMAT (1X,7A10)
01750 185 FORMAT (1X,65I1)
01760 190 FORMAT (1X,22I3)
01770 END
01780 SUBROUTINE WRIT
01790 COMMON I,J,K,NTAPE,KTAPE,IREAD,IRET,IWRITE,JID(7,4),KID(7,4),
01800+ JQINDEX,JANDEX,JHEAD(3,160),JCODE(160),MPT,M,N,
01810+ JPNT(160),KPNT(160),KQINDEX,KANDEX,KHEAD(3,160),KCODE(160),
01820+ IZAN,IANDEX,IPAN,JANS(600),KANS(600),ICOUNT
01830 ICOUNT = ICOUNT+1
01840 GO TO (5,120), IWRITE
01850 5 WRITE (KTAPE,175) JQINDEX,JANDEX
01860 DO 15 I=1,4
01870 15 WRITE (KTAPE,180) (JID(J,I),J=1,7)
01880 DO 20 I=1,JQINDEX
01890 20 WRITE (KTAPE,180) (JHEAD(J,I),J=1,3)
01900 IF (JQINDEX .LE. 65) GO TO 25
01910 WRITE (KTAPE,185) (JCODE(I),I=1,65)
01920 WRITE (KTAPE,185) (JCODE(I),I=66,JQINDEX)
01930 GO TO 30
01940 25 WRITE (KTAPE,185) (JCODE(I),I=1,JQINDEX)
01950 30 MPT=22
01960 M=1
01970 35 N=M+21
01980 GO TO (40,55), IWRITE
01990 40 IF (JQINDEX .LE. MPT) GO TO 50
02000 WRITE (KTAPE,190) (JPNT(I),I=M,N)
02010 45 M=N+1
02020 MPT=MPT+22
02030 GO TO 35
02040 50 WRITE (KTAPE,190) (JPNT(I),I=M,JQINDEX)
02050 GO TO 75
02060 55 IF (KQINDEX .LE. MPT) GO TO 60
02070 WRITE (KTAPE,190) (KPNT(I),I=M,N)
02080 GO TO 45
02090 60 WRITE (KTAPE,190) (KPNT(I),I=M,KQINDEX)
02100 75 GO TO (80,85), IWRITE
02110 80 IANDEX=JANDEX
02120 GO TO 95
02130 85 IANDEX=KANDEX
02140 95 J=1
02150 IZAN=(IANDEX/6)+1
02160 IPAN=(IZAN-1)*6
```

** "MERGE" -- MERGES TWO DATA FILES TO FORM A THIRD
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```
02170 IF (IPAN .EQ. IANDEX)IZAN=IZAN-1
02180 DO 115 M=1,IZAN
02190 K=J+5
02200 GO TO (100,105), IWRITE
02210 100 WRITE (KTAPE,180) (JANS(I),I=J,K)
02220 GO TO 115
02230 105 WRITE (KTAPE,180) (KANS(I),I=J,K)
02240 115 J=J+6
02250 RETURN
02260 120 WRITE (KTAPE,175) KQINDEX,KANDEX
02270 DO 130 I=1,4
02280 130 WRITE (KTAPE,180) (KID(J,I),J=1,7)
02290 DO 135 I=1,KQINDEX
02300 135 WRITE (KTAPE,180) (KHEAD(J,I),J=1,3)
02310 IF (KQINDEX .LE. 65) GO TO 140
02320 WRITE (KTAPE,185) (KCODE(I),I=1,65)
02330 WRITE (KTAPE,185) (KCODE(I),I=66,KQINDEX)
02340 GO TO 30
02350 140 WRITE (KTAPE,185) (KCODE(I),I=1,KQINDEX)
02360 GO TO 30
02370 175 FORMAT (1X,2I5)
02380 180 FORMAT (1X,7A10)
02390 185 FORMAT (1X,65I1)
02400 190 FORMAT (1X,22I3)
02410 END
```

- - - T H E E N D - - -