Computerized bibliography system, sequential data organization

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COMPUTERIZED BIBLIOGRAPHY SYSTEM, SEQUENTIAL DATA ORGANIZATION

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OTTAWA

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ABSTRACT

This report contains the complete details of a system of computer programs for the storage and retrieval of information contained in a bibliography. The general system is described and each program is considered in detail. Complete program listings and flow charts are also included.

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COMPUTERIZED BIBLIOGRAPHY SYSTEM, SEQUENTIAL DATA ORGANIZATION

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PURPOSE AND SYSTEM CONCEPTS

This system of programs was designed for the storage and retrieval of bibliographic references pertaining to scientific literature. It was required that the data be stored in a condensed form for efficient use of storage, yet retain all the information necessary for setting up bibliographies directly from the computer. Specialized searches concerning subject matter, authors, bibliographic information, accounting information, and source journal were also included in the system.

Several secondary considerations were kept in mind when the programs were written.

(1) Once the references had been added to the main data set, allowances had to be made for correction, modification, and addition without disturbing the data format.

(2) Since several types of searches were required, more than one output tape format was desirable.

(3) Various printer outputs were required and the following are included in the system at present:

a) Master record format – contains all the information in an easily read form.
b) Bibliography format – sets up the references in a form suited to publication.
c) Reference numbers – this routine prints only master reference numbers found under a search heading during a preliminary sort of references.

(4) Allowances had to be made in the system for the possibility of additional requirements under points 2 and 3.

(5) Provision had to be made for carrying and accumulating accounting information as the volume of data increases in size.

DATA SOURCES

Initially, data from two sources were visualized as input to the system.

(1) Manually collected data to be put onto punched cards and then added to the main data set.

(2) References selected from the Chemical Titles' tapes and placed into the main data set directly from these tapes.

At the present time, the data source covered under (2) has not been utilized; however, provision for a subroutine entry has been left for future use.

In the case of manually collected information, a special bibliographic card has been designed for the use of the bibliographer. The necessary information is filled in and the cards are handed to a key punch operator for processing. The punched cards are then verified and added to the system without further handling. This routine also works in a similar manner for modifications and additions.

FORMAT OF BIBLIOGRAPHY CARDS

When the bibliography cards were designed, it was felt that each reference should contain two major divisions according to the type of information (see Figure 1). These divisions were fixed format and variable format data.

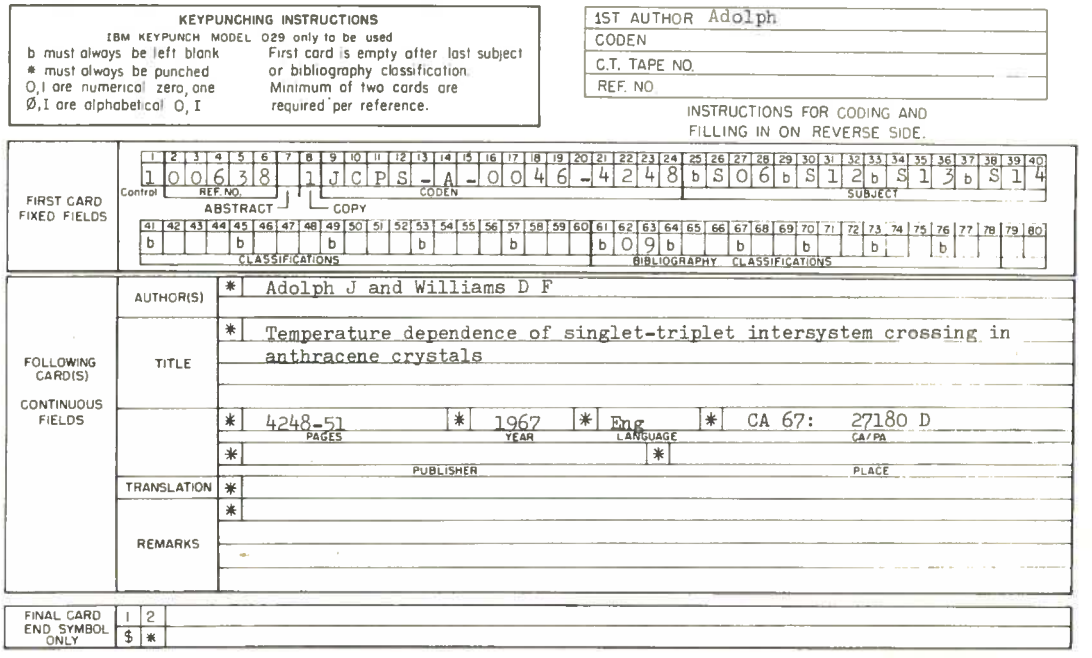

Fig. 1 Bibliography card

1) Fixed Format Data

These data are added by the bibliographer at the time the reference is selected. The total length of the data is limited to one 80-column punched card and contains the fields in Table I. Blanks have been left between each entry in the subject and bibliography

TABLE I

Fixed Format Data

Field Number	Length In Columns	Purpose	Remarks
1	1	Control	If this field is equal to 1, the information is new and will be added to the end of the tape. If the field = 2, the information is a correction or addition
2	5	Master reference number	These numbers must be in numeric sequence for any group
3	1	Abstract indicator	If = 1, abstract is on hand
4	1	Copy on hand	If = 1, a copy is on hand
5	16	CODEN	This field contains the assigned CODEN or the following words BOOK, REPORT, or THESIS
6	36	Subject classifications	Room has been left for nine subject classes each three alphameric digits with a separating blank
7	18	Bibliography classifications	Six numeric codes of two digits and a blank may be entered in this field

areas to make the format easily read by the key punch operator. It should be noted that the CODEN field can contain key words for special formating during the subroutine which sets up the journal reference form.

2) Variable Format Data

The variable format data make up the main body of the reference and contain the following ten fields:

1. Authors

2. Title
3. Pages
4. Year
5. Language
6. CA/PA (Chemical and/or Physics Abstracts)
7. Publisher
8. Place of publication
9. Translation
10. Remarks

Each of the above fields must start with an asterisk and if no entry is to be made in a given field, the asterisk still must appear. The length of the ten individual entries has not been restricted, as long as the over-all reference including the fixed data does not exceed the input/output buffer size assigned on the data definition statement for the data set being used.

When the variable length data are being key punched, the fields are punched continuously with no regard to the punched card boundaries (see Fig. 1). Each card should be completely filled except where a blank separating words falls in column 80. The program reassembles the cards into one continuous field, removes leading and trailing blanks in the individual fields, and puts the reference on the output tape as one variable length unblocked record.

A control card containing a dollar sign and an asterisk in columns 1 and 2 is required after each reference. This signals the end of the reference. After the last reference, a control card containing $EX starting in column 1 is required to signal that the last reference has bee read.

GENERAL SYSTEM OUTLINE

The system of programs, as illustrated in Fig. 2, is made up of four main programs, which presently are as follows:

1. Main editing program
2. Search program
3. Secondary search program
4. Author index

A summary of the main program characteristics is given in Table II. The detailed flow charts associated with each program will be found in the Appendix. The special formating subroutine used by each program follows the description of the program.

OUTPUT PRINTER HEADINGS

At the start of each of the four programs to be described in the following sections, a new page is started before any data are printed. The first line of this page will contain a line

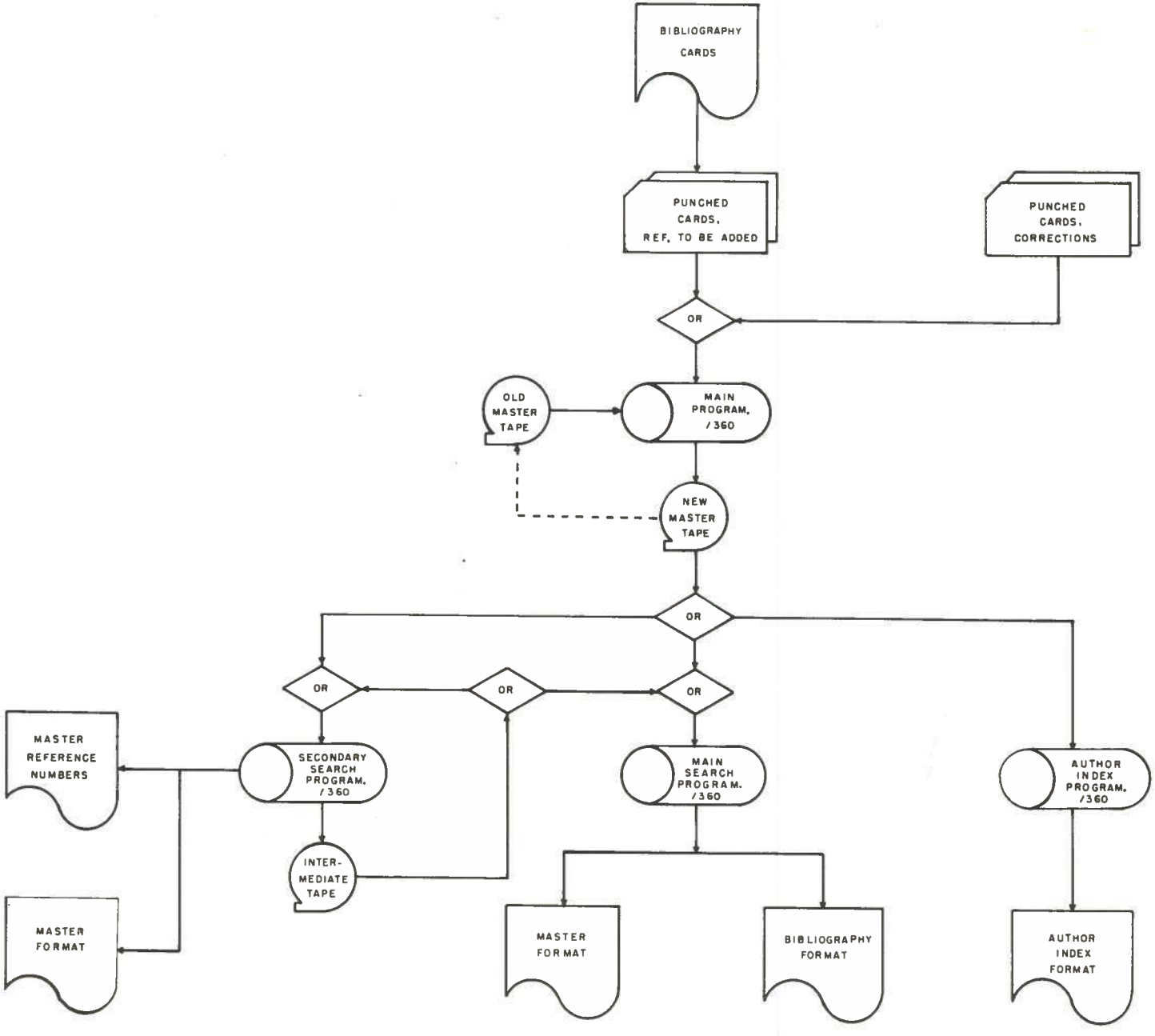

Fig. 2 General system flow chart

TABLE II

SUMMARY OF PROGRAMS

PROGRAM	*FUNCTION*	*PRINTER OUTPUT*	*TAPE OUTPUT*	*REMARKS*
Main program	Sets up original tape. Adds references to tape. Checks data formats. Corrects existing references. Updates accounting information.	Card images. Gives updated accounting information only.	Master tape only.	Card input. Variable length tape records.
Search program	Searches for individual references by number. Scans over a range of reference numbers. Searches for references by a single author. Completes accounting information.	Master list form. Journal form. Accounting information (complete).	None	Will accept either master tape format or special group classification format.
Secondary search program	Searches by subject or bibliography classification, or by Coden.	Master list form. Reference numbers.	Master tape format. Special group classifications.	Allows assembly of references in special groups for resorting.
Author index	Searches for all authors and sorts into alphabetic order. Carries along reference numbers associated with authors.	Authors' names sorted alphabetically by first 20 characters. Printed in groups according to first letter of surname. Reference numbers included for each author.	None	Limits may be placed on the search such that: *a.* Only a given range of reference numbers will be searched. *b.* Only a given range of first letters will be searched. *c.* Combination of *a* and *b*.

of eighty characters to be used as a heading for the user's name or output title. This heading is read into the program as one card of information before the first data card. In the program descriptions, as a general rule, no mention has been made of this card to avoid redundant information, since it must appear in all cases. If this card is not included, the program will indicate that the first data card is missing. When no title is desired, a blank card may be used.

MAIN EDITING PROGRAM

Description of Data Sets

In the present version of the program, the queued sequential access method is used for all data sets.

Master Tape Data Sets

Except during the initialization of the system, two magnetic tapes are required for any given run. The first is the old master tape which contains all references previously added to the system. The second is the new master tape which will contain, at the completion of the run, all of the references from the old master tape as well as any new references or corrections to the existing data.

The dd-names are as follows:

1. old master tape dd-name – FDBDD4
2. new master tape dd-name – FDBDD5.

When the system is being initialized (i.e., first master tape is created), since an old master tape does not exist, the data definition (DD) card of the old master tape should be made a dummy statement to avoid system errors at run time.

The data set names and the tape numbers must be assigned to match the appropriate tapes being used.

Format and Organization of Master Tape Data

The data contained on the master tape are in variable length records with a maximum size of 2004 bytes. No effort has been made to block the records. However, it should be a simple matter to provide this feature when necessary by changing the RECFM field in the DCB operand of the DD card.

In the following section, the block count and record count fields necessary for the variable length records are ignored unless otherwise stated and all references to a given byte number are in relation to the first data byte.

After the last reference record on the tape, a 24-byte control record appears containing AAAA in the first four bytes of the record. This signals the end of the reference

records on the tape and the beginning of the accounting information added by the program. The second four bytes of this record contain a full binary word which gives the total number of references stored on the tape. All other bytes in this record are padding.

The subsequent tape records are made up of main subject classes and a bibliography record. Each of the major subject classifications is an individual tape record beginning with the appropriate alphabetic character designating the subject class in the first byte and followed by three blanks. Each full word (4 bytes) of the record, after the first four bytes, corresponds to the numeric sub-classification of the subject and contains a binary number giving the count of the number of references belonging to the particular subject classification (i.e., T05 would be the fifth full word of the classification record beginning with T and the word contains the number of references recorded under the subject T05).

Following the subject classification records, a record starting with CCCC in the first four bytes will be found. This indicates that the record contains the counts of the bibliography classifications. Each full word (4 bytes) contains a binary number giving the number of references to the particular bibliography number (i.e., bibliography reference 09 will be contained in the ninth field of this record).

The final record on the tape is a 28-byte record with BBBB in the first four bytes. This signals the end of all data and is used to avoid an end-of-file indication.

Card Data Formats

The main body of data cards must conform to the format indicated in the section 'Format of Bibliography Cards'. Data cards not conforming to the described layout in order, number of asterisks, or other format details will result in a serious error condition. Deletion or inclusion of extra control cards (either $* or $EX types), will result in unpredictable errors in the data. If serious errors result during a run, it is suggested that the data be corrected and the run be made again with the same tapes.

One constant card is required before the main reference card deck can be read into the computer. This card contains the identification character A in column 1. If this card is deleted or misplaced, an uncorrectable error condition will result. If the character in column seven of the A card is a zero, then the output tape is an initial tape and the old master DD card should be a dummy. If the seventh column is other than zero, the program expects to find an old master tape.

Special Notes Concerning Card Input

The following points should be noted before setting up the data decks:

1. Each reference must contain ten asterisks (and only ten asterisks) and one of these must be placed before each field even if that field does not contain an entry.

2. If an asterisk other than the required field markers appears in the data, some other symbol should be substituted or the extra asterisk completely dropped.

3. The control field in the fixed data (column 1) must be either 1 or 2 depending upon whether the card includes new data or corrections. This column must be the same for all references in a given run, i.e., corrections to existing data and addition of new data cannot be mixed in the same deck.

4. All master reference numbers in a given run whether a new data run or a correction run, must be in numerical sequence. This is very important to the program.

Printer Output

The printer output consists of card images of the input data and error messages. Since this output is designed as a temporary editing aid rather than a permanent record, the card images are printed without regard to page divisions. The card images are set back from the left hand edge of the paper to allow the error message to stand out from the normal data.

Error Messages

The error messages printed by the program are given on page 8. An indication of what the message means and why it occurred is also given as well as what the program will do when the condition is found. In most cases, the program will continue where possible so that any errors in the remaining data can be found. It is suggested that in most cases, the errors be corrected and the program re-run. In the case of a tape error, the offending tape should be re-made even if it means re-making an old master tape from the original data used to create it.

Subject Field in Error

The above message, which is not included in the error messages, indicates that no subject class has been entered in the subject classification field. This situation will normally occur on a correction or modification run (control = 2). Sometimes it may be necessary to delete the subject classification during a normal processing run. In either case, the above message will be printed and no action need be taken. If the subject classification has been dropped by accident, the necessary classification may be added at a later date when a correction run is being made.

When the errors shown are printed, most of the messages are accompanied by information indicating where the trouble has occurred. In some instances the reference number only is printed, while in others the first card of the reference or the whole reference is given. In the case of tape errors, the status indicators are printed in hexadecimal as a single 32-character word as follows:

Byte	+ 0	
	+ 1	
	+ 2	sense byte 1

Byte	+ 3	sense byte 2	
	+ 4		
	+ 8	beginning of channel status word	
	+ 9	command address	channel status word
	+ 12	status byte 1 (unit)	
	+ 13	status byte 2 (channel)	
	+ 14	count field	

Subroutines

Two subroutines are required by the program:

1. NEWD – This subroutine checks and formats new references which are to be added to the new master tape.
2. MODT – This subroutine handles the corrections or modifications to existing data.

A third subroutine entry has been included but is not in use. This entry is called CEMT and was included when the Chemical Titles tapes were to be used as a possible input to the program.

Error Messages

1. SOMETHING WRONG WITH COUNTS – During update of accounting information an end of data was found before completion.

   Program The program attempts to terminate the output tape normally.

   Correction The old master tape should be dumped and examined for completeness.

2. SUB ERROR IN MODT RECOVERY – This will only occur after an uncorrectable error in the data has been found and the program has tried to correct the accounting information for subject classes but cannot.

   Program Will eventually try to go on with next reference.

   Correction Should correct data and rerun since the accounting information is incorrect.

3. BIB ERROR IN MODT RECOVERY – Same as 2 except that the error concerns the bibliography accounting information.

   Program Program action and correction procedure is the same as 2.

4. CARD FORMAT ERROR – Constant card with A in column 1 has not been found as first card.

Program Reads all input cards until end of card file is found and terminates. Prints all cards after error.

Correction Correct condition and rerun.

5. WRONG INPUT REF – Control character in column 1 of first card of a reference does not agree with previous reference.

Program Clears the rest of the reference in error and continues with the next. Maximum of 3 consecutive errors allowed.

Correction Since the reference is probably missing from the new master tape, the card error should be corrected and the new master tape rerun.

6. DATA GROUP TO LONG REF – Reference exceeds 2000 characters.

Program Program action and corrective procedure the same as 5.

7. COUNT RECORD NOT VALID – Cannot find a subject class during updating of accounting information.

Program Puts subject class onto new master tape without modification.

Correction Dump old master tape, examine program and data. Re-run when trouble is found.

8. ERROR-OUTPUT TAPE NOT IND – Data indicates a correction run but the A card indicates no old tape to be initialized (no previous data for correction).

Program Program reads input cards until an end-of-file card is found and then terminates the program.

Correction Correct A card or correct data and rerun.

9. END OF FILE ON INPUT TAPE – The program did not find the data end message (BBBB) indicating that something is wrong with the old master tape.

Program The program ends the new master tape and then terminates.

Correction Examine old master tape for errors.

10. UNCORRECTABLE ERROR IN MODT – An error in format of a correction, probably the number of asterisks are wrong.

Program Drops the correction.

Correction Correct error and re-submit correction in next correction run.

11. INFORMATION LOST DURING MODT – Subject class or bibliography class is filled when an addition is made to the field during a correction run.

    Program The program deletes some of the original subject or bibliography references to make room for the new. Old entries are dropped from the left hand end and new entries are added to the right hand end of the field.

    Correction Check to see if the classifications dropped were less valuable than the new ones added.

12. IDENT TERMINATE – More than three consecutive references with uncorrectable errors found during card read routine.

    Program The program is terminated.

    Correction Correct errors and rerun.

13. CORRECTION PLACED WRONG – Master reference out of sequence during correction run.

    Program The program drops this correction and goes on to the next.

    Correction Either rerun the entire data deck with the correction made or save until the next correction run.

14. PARITY ERROR INDICATED ON IN TAPE – The old master tape contains an error (probably a parity error). The necessary indicators are printed in hexadecimal.

    Program The program continues if the input is accepted.

    Correction Check reference for incorrect characters on new master tape.

15. UNCORRECTABLE READ ERROR – A serious tape error occurred on the old master tape. This could be a noise record but indicates that a reference will probably be missing on the new master tape.

    Program The program continues with the next reference.

    Correction Should remake old master tape if a reference has been lost on the new tape.

16. END OF CARD FILE – If no other error has occurred check to see if the $EX card follows the last reference in the card input.

    Program The program terminates without completing the new master tape.

    Correction Correct trouble and rerun.

17. FORMAT ERROR ON NEW DATA — A serious error in the data format of new data being added to the new master tape has been found.

Program The program prints the offending reference and goes on to the next reference. (The reference in error is not on the new master tape.)

Correction Correct the data card in error and rerun the data again using the old Master tape as before.

MAIN SEARCH PROGRAM

Types of Searches Supported

1. Search by master reference number:
   a) Single reference search.
   b) Scan between upper and lower limits of master reference numbers.

2. Single author search.

3. Accounting information search.

All of the above search modes are strongly dependent on the card input to the program and as a result, each search will be given with its own card layout.

Main Control Card (A Card)

The selection of the various combinations of search method, printer format, and input tape type is indicated to the program by the first control card read in to the machine.

Column	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Variable	A					K	K		M	M		J	J		P	P	P	P		S		C

Fig. 3 Control card for main search program

where A is the identifier and must always be present

KK Search selection
- KK = 01 Single reference search
- KK = 02 Between limits
- KK = 03 Author search
- KK = 04 Accounting information

MM Printer format
- MM = 01 Master list format
- MM = 02 Journal format

JJ Input tape indicator
- JJ = 01 Master tape format
- JJ = 02 Group classification format

PPPP Starting page number on output

S	Spacing control	S = 1	Single space
		S = 2	Double space
C	Printer chain control	C = 0	Standard printer chain
		C = 1	TN printer chain

NOTE:– The TN printer chain prints colons, semi-colons, and special characters and need only be used when the journal format from the ETB subroutine is used and the output is to be sent directly to the printers.

CODEN to Title Translation Deck

After the main A control card, the CODEN to title translation deck follows immediately. Each card in this deck begins with the control character Q in column one. The last card in the deck signals the end of data and contains an R in column one with the rest of the card blank.

Q b XXXX - X b b T T T ----

where X X X X - X	is the first six characters of the CODEN for the journal title (e.g., ACAC-A).
T T T ----	This is the journal title (or the official abbreviation to be used in the references). Starting in column eleven, the title may extend through the rest of the card. The program removes trailing blanks and places the title into storage.

Search Methods – Card Details

Only one of the following search methods may be used in a given run and the selected card layout must coincide with the search method chosen on the A card.

A. Single Reference Number Search – Master Tape Input (KK = 01, JJ = 01 on the A Card)

Following the CODEN-TITLE deck, the cards containing the individual reference numbers to be found are read into the program. Each input card contains one reference number to be searched for on the master tape.

The various card formats are as follows:

1. C b X X X X X	where X X X X X is the reference to be searched for.
2. Z b b ---	Causes a new page to be started. This need only be used when required.
3. D b b ---	Signals that the last reference card has been read in and terminates the program.

B. Single Reference Number Search – Special Group Classification Tape (KK = 01, JJ = 02 on A Card)

A special case of the single reference search is possible when the special group classification tape is being used as input. This tape is divided into groups of classifications which were selected by the secondary search program (see Input Tape Formats, page 15). Each set of master reference numbers which are to be searched for within a group on the tape must be preceded by a special heading card. The information on this card must agree exactly with the information searched for when the tape was created by the secondary search program since the search information was used as an identification record on the tape. The order in which each group is searched does not matter since each group on the tape is independent of all the others.

Another difference between the present method and the search covered under heading *A* is that in the present method the master reference numbers to be searched for can be packed thirteen to a card while the method under *A* must be one reference number per card.

CARD FORMATS

C b XXXXXX- - - - - - -	
b b RRRRRbRRRRRb- - - - - - -	RRRRR (13 per card)
b b RRRRRk bRRRRRb- - - - - - -	RRRRR
C b XXXXXXX - - - - - -	
b b RRRRR- - - - -	
b b RRRRR- - - - -	
E	

where C — is the control card identification of a new group heading,

XXX- - - - — is the group identification to be searched,

RRRRR — is the reference number to be searched for (two blanks appear at the beginning of the card and one blank appears between each reference number). Up to thirteen reference numbers may appear on a card and as many cards containing reference numbers as necessary may be used. The beginning of the next group (C card) signals the end of the present group. As many C cards followed by a set of reference numbers may be used as required.

E — This signals the end of the data.

C. Scan Between Upper and Lower Limits of the Master Reference Numbers (KK = 02)

This form of search is normally used in building up the master bibliography index and for intermediate searching. One card is required after the coden-title deck.

B b L L L L L b U U U U U

where	B	is the control character
	L L L L L	is the master reference number where the search is to begin
	U U U U U	is the master reference number where the search is to end.

NOTE: L L L L L $\leqslant$ U U U U U.

D. Author Search (KK = 03)

This search method should not be confused with the author index program. This search is designed to scan the whole master tape for a given author's name and to select only the references containing this name. As many complete searches can be done as there are author cards at the input, but only one author's name may appear per input card.

The author's name must be in the same form as it appears in the references, with the surname first followed by the initials (e.g., Smith IP). Periods, commas, etc., are removed from the name for search purposes.

It should be noted that any part of the name starting with the first letter of the last name may be used as the search input. All authors' names that are found to agree up to the number of letters used in the search will be selected. This is convenient for finding all authors with the same last name where the desired author's initials are in doubt.

After the last coden-title card, the following data card (or cards) should appear to initiate an author search:

C b A A A --- A

where	C	is an identifying control character
	A A A A - - - A	is one author's name.

As many C cards as desirable may appear. These cards should be followed by a blank card beginning with D in column one.

E. Accounting Information Search (KK = 04)

No cards are required after the coden-title deck. The program simply scans through the master tape until the accounting information is found and then prints out this information.

INPUT TAPE FORMATS

1. *Master Tape Format* – The format of the master tape is described in the section 'Main Editing Program' and a detailed description is given on page 5.

   The queued sequential access method is used for this data set. All of the search procedures except the single reference number search using the group classification tape require the master tape format.

2. *Special Group Classification Format* – This tape format is produced by the secondary search program (see page 20) and may only be used when KK = 01 (single reference search). Because the NOTE and POINT macros are used with this tape, it is required that the basic sequential access method be employed.

   Each special group on the tape begins with a record starting A A A A. Following the identification in the same logical record is the image of the card used for the original search starting with column three. This is used as the group identification by the present search program. The logical records after the identification record each contain a reference and are in the order found by the secondary search program. All records on this tape are variable length records.

   The end of each group is signaled by a record starting with B B B B. The rest of this record contains the same information as the A A A A record at the beginning of the group. Up to ten group classifications may be contained on a tape. (A group classification is defined as all records between a record starting with A A A A and ending with a record starting with B B B B.)

   After the last group, a record starting with C C C C will appear. This record signals the end of the data.

PRINTER FORMATS

Two subroutines have been provided for the formating of the output data on the printer and a third subroutine has been provided to carry out coden-to-journal abbreviation translation. Either of the two formating subroutines may be selected with any of the search methods previously mentioned. The output is designed to be cut down to an 11 X 8½ inch page in both cases.

1. *Master Format Routine* – This subroutine was designed to assemble the data for a master printer file of all references. The routine may be used to arrange the data from any of the search methods into an easily read format as shown in Appendix A.

2. *ETB Subroutine* – The purpose of this subroutine is to set up the output data in a form suitable for publication directly as a bibliography. The coden is translated into the equivalent journal abbreviation and the appropriate punctuation is added.

   Several special cases can be considered in this subroutine by putting in key words in the coden field of the original reference (e.g., thesis, report, book). These key words will cause the required special format to be printed. An example is included in Appendix A.

3. *CODEN* – This subroutine has been provided for the use of subroutine ETB for the translation of the coden to the approved journal abbreviation. Special formats are also indicated by this routine when the words book, report, or thesis appear in the coden field of the reference.

NOTE ON PRINTER CHAINS

When the standard type chain on the printer is used, none of the special characters including colons and semi-colons will be printed even though they are included in the data. When output from ETB is to be used for publication, it is sometimes desirable to use the TN printer chain. This will be called automatically when column nineteen is made equal to one on the A card. The type face of this printer chain is also somewhat better. However, this has the disadvantage of increasing the time to print out the information compared to the time required using the standard chain.

A summary of the various error messages which may be printed out during a run of the program follows.

ERROR MESSAGES FOR MAIN SEARCH PROGRAM

1. INCORRECT M VALUE – The program has found that the MM value of the A control card is smaller than one or larger than four.

   Program Terminates.

   Correction Check the A card.

2. I = 1, K = 2, CARD ID INCORRECT – The main input card (B card) giving the search limits for the scan between master reference numbers (KK = 02 on the A card) is incorrect or missing.

   Program Terminates.

   Correction Correct the B card.

3. INCORRECT K VALUES — The KK value from the A card is not equal to one, two, three, or four.

   Program Terminates.

   Correction Check the A card.

4. FORMAT ERROR IN X X X X X TYPE C C C C C — An error has occurred during one of the formating subroutines at reference number X X X X X. If C C C C C = 1, the subroutine has found too many asterisks in the reference.

   Program The program goes on to the next reference. A maximum of ten consecutive errors of this type are allowed.

   Correction Dump input tape and look for errors.

5. ERROR TERMINATION — Ten consecutive errors of type 4 have occurred.

   Program Terminates.

   Correction Same as 4 above.

6. MASTER REF LESS THAN LOWEST ON TAPE — This error can occur during a single reference search using a master format tape. This indicates that the reference number being searched for is less than the first reference number on the tape. This can occur in the case of an output tape from the secondary search program.

   Program Goes on to the next reference.

   Correction Examine the input C cards for an error.

7. MASTER REF NOT ON TAPE — This error occurs during single reference search using a master format tape. The reference number sought after is larger than the highest reference number on the tape or the reference number does not exist on the tape.

   Program Goes on the next reference.

   Correction Examine input C cards for an error.

8. SEARCH TAPE INCORRECT CANNOT CONTINUE — This error occurs during single reference search using the group classification format tape. This indicates that the end of data has been found but that no specific group class has been noted.

Program Terminates.

Correction Check to see if the proper tape has been loaded. Check the input data to the secondary search program.

9. TOO MANY SUBJECTS ON TAPE – WILL CONTINUE — This error occurs in the same program section as 8. More than 20 group classes are indicated on the tape.

   Program Continues with the first 20 groups noted. The program can only refer to the first 20 classes on the tape.

   Correction Check the secondary search program input data. Since the secondary search program produced the tape, division of the classes into more than one run will probably be necessary.

10. SUBJECT NOT FOUND ON TAPE — The error occurred during a single reference search using a group classification tape. A group heading called for on an input C card could not be found on the tape.

    Program Goes on to the next group heading.

    Correction Check the input C cards against the original cards used for the secondary search program.

11. TAPE INCORRECT — Same program section as 10. The subject group heading (A A A A) or identification is incorrect after the NOTE macro.

    Program Terminates.

    Correction If this error occurs, it means that a serious undetected program error exists. This error message was added to the program early in the debugging period and has been left as a precaution.

12. END OF CARD FILE — The program has found the end-of-file card during a card operation.

    Program Terminates.

    Correction This error indicates that a card has been dropped and a check should be made of the input data provided no other serious errors have occurred.

13. UNCORRECTABLE ERROR ON TAPE READ, STATUS INDICATORS = — A serious error has occurred during a tape read.

Program Continues to read records until it finds an acceptable record or until five consecutive errors of this type have occurred.

Correction A check should be made of the input tape. If the error has been caused by a noise record, no action need be taken. If the error was caused by a record containing a reference, then the tape should be remade. It should be noted that during a search where the tape is scanned many times, this error could happen every time the record is read.

14. TOO MANY READ ERRORS IN A K 10 — More than five consecutive errors of type 13 have occurred.

Program Terminates.

Correction Remake the input tape.

15. TAPE FILE MARK FOUND — The tape file mark was found on the input tape. This should not happen.

Program Terminates.

Correction The data on the tape are incomplete possibly due to an error condition which took place during the tape's creation. The run creating the old master tape should be checked carefully as well as the data used. The master tape should be remade.

16. TOO MANY CODEN ENTRIES — This error takes place during the input of the coden-title tables and indicates that the storage area allowed for the table has been completely used up.

Program The program reads the rest of the coden-title cards but does not store them. The program goes on as if nothing had happened.

Correction Either edit out some of the coden-title translations if they are not required or assign more storage to the tables and reassemble the program.

17. CODEN ERROR-INPUT — The program has found a card without a Q or R in the first column of a card during the coden-title input routine.

Program Terminates.

Correction Examine the coden-title card deck and correct the error.

18. CARD ERROR – A IDENT — The A control card has not been found as the first card.

Program Terminates.

Correction Examine the card deck and find out what happened to the A card.

19. CARD ERROR I = 1, K = 1, J = 1 — During a single reference search using a master format tape, a card was read which did not contain a character C, D, or Z in column one.

Program Terminates.

Correction Check the input cards for misplaced or mispunched cards. Check A card to be sure that the correct search method has been chosen.

SECONDARY SEARCH PROGRAM

This program has been written to complement the main search program previously described and to increase the depth to which the information can be screened. References may be sorted according to the following methods:

1. Bibliographic classification.
2. Subject classification.
3. Coden reference.

To accomplish further searching of the material obtained by any of the above techniques, two optional tape outputs have been provided.

Tape Input/Output

The two tape formats provided by the program are as follows:

1. Master tape format.
2. Group classification format.

For a description of these tape formats please see page 15.

Only the master tape format is acceptable as input to this program. However, master tapes produced from this program may be re-entered as input to either search program for further processing. The group classification tape has been included to provide feedback to the main search program with the subject data classified under particular headings.

Printer Output

Two printer layouts have been included in this routine:

1. Master reference (see Appendix A).
2. Reference numbers.

The second form of printer output simply lists the master reference numbers as the references are found during the search. This output form is meant as an editing aid when further processing is required.

Main Control Card (A Card)

The first control card, as shown in Fig. 4, controls the selection of search technique, printer layout, and tape output.

1	2	3	4	5	6	7	8	9	10	11	12	13	14							
A		I	I		K	K		J	J											

Fig. 4 Main control card for the secondary search program

where A is a required control character.

II Search control –
- a) II = 01 – Bibliography Search
- b) II = 02 – Subject Search
- c) II = 03 – Coden Search

KK Printer control –
- a) KK = 01 – Master Reference Format
- b) KK = 02 – Reference Numbers

JJ Tape control –
- a) JJ = 01 – No Tape Output
- b) JJ = 02 – Master Tape Format
- c) JJ = 03 – Group Classification Format

Details of Search Methods

On any one scan through the source tape, the number of items to be searched for is limited to one card of search data with the particular format to be described under each search heading. Each item in the list is given an OR condition by the program. In other words, any of the items if found will cause the reference to be selected.

As well as the above limit, the bibliography and coden searches had the following restrictions placed on them:

1. Only the master tape format is allowed.
2. Only one pass through the source tape per run can be made.

It was felt that the above limitations were justified since the coden search was of only limited use and the bibliography search was the starting point for much more extensive processing.

Search Techniques

In each of the following methods, the B control card illustrated must come immediately after the main A control card.

1. Bibliography Search (II = 01)

1	2	3	4	5	6	7	8	9	10	11	12	-	-	-	-	-							
B		C_1	C_1		C_2	C_2		C_3	C_3					etc.									

Fig. 5 Bibliography Search Control Card

In Fig. 5 the characters have the following meaning:

B Identifier which must be present.

C_1C_1 A two digit number giving the bibliography reference to be searched for.

It should be noted that each item is separated by a blank and that as many numbers may be used as will fit on a single card. As noted previously any of the bibliography numbers on the card can cause the reference to be selected.

2. Subject Search (II = 02)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15									
B		S_1	S_1	S_1				S_2	S_2	S_2				S_3			etc.						

Fig. 6 Subject Search Control Card

From Fig. 6:

B Identifier which must be present.

$S_nS_nS_n$ Three character subject identification.

Each subject identification must be followed by three blanks and as many subject identifications can be used as will fit on the card. For each group of subjects for which a search is required, one B card must be included in the input deck. Each B card initiates a search through the input tape.

A card containing C in column 1 must follow the last B card.

3. Coden Search (II = 03)

1	2	3	4	5	6	7	8	9	10	11										80
B		C	C	C	C	C	C													

Fig. 7 Coden search control card

From Fig. 7:

B Identification.

CCCCCC Six character coden representation of the journal title.

Only one journal title per card and only one B search card per run has been allowed.

A summary of possible error messages for the secondary search program as well as the program action and possible corrective procedure follows.

ERROR MESSAGES FOR SECONDARY SEARCH PROGRAM

1. VARIABLE N IS TOO LARGE — Where N is the symbol I, K, or J the indicated variable is larger than the acceptable limit on the A card (see page 21 for limits).

   Program Terminates.

   Correction Check and correct A card and start again.

2. INPUT CARD ERROR IN BIBLIOGRAPHY SEARCH — The B card indicating the search list has not been found during a bibliography search.

   Program Terminates.

   Correction Check order of input cards.

3. NO BIBLIOGRAPHY REF PRESENT — The B card has been found in the bibliography search but no list is present.

   Program Terminates.

   Correction Check the alignment of the items in the list and correct.

4. INPUT CARD ERROR IN SUBJECT SEARCH — Something is wrong with contents of a B card during a subject search, possibly no items in the subject list.

   Program Terminates.

   Correction Examine the B card at the point where the trouble took place.

5. CARD ERROR IN CODEN SEARCH — The B card has not been found during a coden search.

   Program Terminates.

   Correction Examine input cards.

6. END OF CARD FILE —
   a) In the case of a subject search, the C control card is missing after the last B card.
   b) During a bibliography search or coden search, nothing appears after the A control card except the end-of-file card.

   Program Terminates.

   Correction Insert missing card and rerun.

7. END OF TAPE FILE — The end-of-file on the input tape has been found. This should not happen.

   Program Terminates.

   Correction Examine the run which created the input tape for errors which may have caused the tape to be terminated incorrectly. If necessary, dump the input tape and examine against the format description given on page 5 for the master tape format. Remake the input tape if necessary.

8. INPUT CARD ERROR — The A control card has not been found.

   Program Terminates.

   Correction Check input data and rerun.

AUTHOR INDEX PROGRAM

This program searches the master data set for all of the authors' names and then sorts these into alphabetic order. The names are printed along with the numbers of the references where the names were found.

Since the output of this program was meant as a cross reference for everyday use and as an aid to setting up the author index for a bibliography, it was felt that no other output except the printer was required.

The input to the program is limited to the master reference tape described on page 5. A temporary disc (or tape) data set is required by the program as an intermediate storage during the alphabetic sort. The data set name for this data set is FDBAR04.

Acceptable Characters and Data Limits

So that the authors' names appear in the proper order, the following precautions are taken before sorting the data:

1. All leading blanks are eliminated.
2. All periods are removed completely.

3. Apostrophes (hexadecimal '7D') appearing in a name such as O'Connor are dropped from the name.
4. Hyphens appearing in a name have a blank substituted in their place.

In the above text the terms 'dropped from' and 'removed' indicate that no blanks are left in the place of the character.

5. The names, including initials, are limited to twenty characters and if this number is exceeded, the name is truncated on the right hand end.

Printer Output

The authors' names are first sorted into groups according to the first letter of the last name and then each group is sorted into alphabetic order. When each of these groups is completed, the whole group is printed in two columns. Each page begins with a heading giving the page number for the particular first alphabetic character being printed as well as the over-all page number. After each alphabetic group is printed, a count is printed giving the number of authors' names found in this group.

Because of space limitations, each alphabetic group has been limited to five hundred names. If this limit is exceeded, the first five hundred names are sorted and printed and then the program starts a new group beginning with the same alphabetic character. This second group is handled as if it were a separate alphabetic group.

Control Card

Only one control card is required in this program and is illustrated in Fig. 8.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25			80
A		S	S	S	S	S		E	E	E	E	E		M	M	M	M	M		D	D	D	D	D			

Fig. 8 Control card for author index search

In Fig. 8 we have:

A Identification.

SSSSS A number giving the first letter of the alphabet for which the search is to be done.

EEEEE A number giving the last alphabetic character for which the search is to be done.

MMMMM Reference number of first reference to be used.

DDDDD Reference number of last reference to be used.

In normal use, the S field is set to one and the E field is set to twenty-six to allow all alphabetic groups to be sorted.

The program recognizes the following two errors:

ERROR MESSAGES

1. INPUT CARD ERROR – The A card has not been found.

   Program Terminates.

   Correction Check the A card format

2. END-OF-FILE CARD, TAPE, OR DISK – An end of file on any of these devices is considered incorrect except for the card input when an error one has been printed.

   Program Terminates.

   Correction Check the offending data set.

SUBROUTINE DETAILS

Five subroutines have been written for editing the data, and arranging them in desired format. In the following sections, a brief description is given of each subroutine as well as a list of programs which use each routine.

1. MODT

This subroutine is used by the main editing program for the modification of references which are residing on the master tape.

Information is passed to MODT in the following parameter list:

List + 0 Address of the region containing additions or modifications

List + 4 Address of length of the region addressed by List + 0.

List + 8 Address of the region containing reference to be modified.

List + 12 Actual length of region to be modified.

List + 16 Indicator. A value other than zero in this location after a normal exit indicates that some old data in the subject or bibliography fields have been dropped to make room for new entries.

Modification of References

For a description of the following data fields see page 3.

a) Fixed Format Data

If the abstract, copy, or coden fields are non-blank in the modification data, the complete non-blank field is substituted directly into the reference. In the case of the subject and bibliography classification fields, a non-blank entry (or entries) in the modification data is added after the last non-blank entry in the reference to be modified. When the subject or bibliography fields are filled and more data are to be added, the first classification in the old list is deleted, all of the remaining class are moved back one location, and the new classification is added at the end of the list. It should be noted that the scan of the subject or bibliography classifications in the modification data will be terminated when a blank field is encountered.

b) Variable Format Data

If information appears between any of the asterisks in the variable length fields of the modification data, these data will be substituted for the appropriate field in the reference being modified. There is one exception to this rule and that is the remarks field. In this case, the new entry is added after the old remarks.

2. NEWD

This subroutine is used by the main editing program for preparing new references to be added to the system.

The following parameter list is provided to NEWD:

List + 0 Address of reference to be processed.

List + 4 Address of length of reference to be processed.

List + 12 Actual length of the reference after processing.

On returning to the main program, register fifteen will be non-zero if the reference could not be processed.

This subroutine checks for the correct number of asterisks and removes leading and trailing blanks from the variable length data.

3. MASTER

This subroutine is used by both the main search program and the secondary search program. Its main job is to set up the indicated reference in the master printer format, which is then passed back to the main program for printing.

4. ETB

The subroutine, ETB, is used by the main search program to provide the journal or bibliography printer format. When ETB is used, the CODEN subroutine described under heading 5 is required. Special formating is provided for theses, books and reports when indicated by CODEN.

5. CODEN

CODEN converts the coden for a given journal into the accepted abbreviation and returns this to the ETB subroutine. If BOOK, THESIS, or REPORT is found instead of the coden abbreviation, an indicator is set for ETB so that appropriate action can be taken.

DATA DEFINITION STATEMENTS

Each of the programs described in the preceding sections requires a number of data definition statements. These data definition cards will be illustrated under individual headings for each of the programs. The important item to be noted is the dd names in each case. Card continuations have not been shown.

1. *Main Editing Program*

a) Printer Output:

```
//GO · FDBDD1  DD  SYSOUT = A
```

b) Sequential Data Input (Tape in this Case.):

```
//GO · FDBDD4  DD  DSNAME = FDBDN4, UNIT = TAPE9, DISP = (OLD, KEEP),
DCB = (RECFM = V, LRECL = 2000, BLKSIZE = 2004), VOLUME = (PRIVATE,
SER = 9ROO3H)
```

c) Sequential Data Output (Tape in this Case.):

```
//GO · FDBDD3 DD – (This card is the same as FDBDD4 above except that
DISP = (NEW, KEEP) and of course the ds name and the serial number.)
```

d) Card Input:

```
//GO · FDBDD2  DD *
```

2. *Main Search Program*

a) Printer Output:

```
//GO · FDBK01  DD  SYSOUT = A
```

b) Sequential Data Input (Tape):

//GO · FDBK03 DD – (Rest of the card the same as (b) under 'Main Editing Program' except for the ds name and the serial number.)

c) Card Input:

//GO · FDBK02 DD *

3. *Secondary Search Program*

a) Printer Output:

// GO · FDBAQ1 DD SYSOUT = A

b) Sequential Data Input (Tape):

//GO · FDBAQ3 DD – (Rest of the card is the same as (b) under 'Main Editing Program' except for ds name and serial number.)

c) Sequential Data Output (Tape):

//GO · FDBAQ4 DD – (Rest of the card is the same as (b) above, except that the DISP parameter is now NEW, KEEP.)

d) Card Input:

//GO · FDBAQ2 DD *

4. *Author Index*

a) Printer Input

//GO · FDBAR01 DD SYSOUT = A

b) Sequential Data Input (Tape):

//GO · FDBAR03 DD – (The rest of the card is the same as (b) of 'Main Editing Program' except for the ds name and serial number.)

c) Temporary Sequential Data Set (Disk):

//GO · FDBAR04 DD UNIT = DISK, DISP = (NEW, DELETE), SPACE = (TRK, (20,5)), DCB = (RECFM = FD, LRECL = 25, BLKSIZE = 3625)

d) Card Input:

//GO · FDBAR02 DD *

NOTES ON SPECIAL MACRO INSTRUCTIONS

Five macro instructions have been used in this system of programs, which are not part of the standard operating system. These are MAKE, SCAN, PROP, NRCS, and NRCR macro instructions. NRCS and NRCR macro instructions perform linkage functions between the system and the programs and between the programs and the subroutines while PROP propagates a character through a field. If the bibliography programs are not run at the NRC Computing Centre, then the macro definitions shown on page 31 must be added to the macro library of the operating system in use at the particular installation.

The MAKE and SCAN macro instructions perform input/output conversions of numeric data. These two macro instructions and their subroutines are also given on the following pages.

ACKNOWLEDGMENT

The authors wish to thank the staff of the NRC Computing Centre for providing copies of the PROP, MAKE, SCAN, NRCS and NRCR macro instructions which are used in this report.

REFERENCES

1. Lipsett, F.R. and Blair, F.D. Bibliography preparation by computer. J. Chem. Documentation, 8: 26; 1968

Macro Instructions

```
                MACRO                                                          00000001
&NAME           NRCR  &SAVE,&CODE                                              00000002
.*              NRC RETURN MACRO    WRITTEN BY R.A.GREEN                       00000003
.*                    SAVE- SAVE AREA PROGRAM USED. IF OMITTED 13 IS ASSUMED   00000004
.*                          TO POINT TO WHERE THE GPR'S ARE                    00000005
.*                    CODE - RETURN CODE, IF OMITTED, 0 IS ASSUMED             00000006
&NAME           DS    0H                                                       00000007
                AIF   ('&SAVE' EQ '').NOSAVE                                   00000008
                L     13,&SAVE+4                                               00000009
.NOSAVE         LM    14,12,12(13)                                             00000010
                AIF   ('&CODE' EQ '').NOCODE                                   00000011
                LA    15,&CODE                                                 00000012
                BR    14                                                       00000013
                MEXIT                                                          00000014
.NOCODE         SR    15,15                                                    00000015
                BR    14                                                       00000016
                MEND                                                           00000017


                MACRO                                                          00000001
&NAME           NRCS  &SAVE,&BASE                                              00000002
.*              NRC SAVE MACRO.     WRITTEN BY R.A.GREEN                       00000003
.*                    BASE - BASE REGISTER TO BE SET UP, IF OMITTED 15 IS      00000004
.*                           ASSUMED                                           00000005
.*                    SAVE - PROGRAM SAVE AREA, IF OMMITTED GPR 13 UNCHANGED   00000006
                AIF   ('&SAVE' EQ '').NOSAVE                                   00000007
                USING *,15                                                     00000008
&NAME           STM   14,12,12(13)                                             00000009
                LA    2,&SAVE                                                  00000010
                ST    2,8(13)                                                  00000011
                ST    13,4(2)                                                  00000012
                LR    13,2                                                     00000013
                AIF   ('&BASE' EQ '').EXIT                                     00000014
                LR    &BASE,15                                                 00000015
                USING *-20,&BASE                                               00000016
                DROP  15                                                       00000017
.EXIT           MEXIT                                                          00000018
.NOSAVE         AIF   ('&BASE' EQ '').NOBASE                                   00000019
                USING *,&BASE                                                  00000020
&NAME           STM   14,12,12(13)                                             00000021
                LR    &BASE,15                                                 00000022
                MEXIT                                                          00000023
.NOBASE         ANOP                                                           00000024
                USING *,15                                                     00000025
&NAME           STM   14,12,12(13)                                             00000026
                MEND                                                           00000027


                MACRO                                                          PROP 000
&NAME           PROP  &FIELD,&LNGT,&HEX                                        PROP 001
                LCLA  &AL1,&AL2,&AL3                                           PROP 002
.*      WRITTEN BY R.A.GREEN                                                   PROP 003
                AIF   ('&HEX' NE '').A                                         PROP 004
&NAME           MVI   &FIELD,X'40'                                             PROP 005
                AGO   .B                                                       PROP 006
.A              ANOP                                                           PROP 007
&NAME           MVI   &FIELD,&HEX                                              PROP 008
.B              ANOP                                                           PROP 009
&AL1            SETA  &LNGT                                                    PROP 010
&AL2            SETA  0                                                        PROP 011
&AL3            SETA  1                                                        PROP 012
.C              AIF   (&AL1 LE 257).LSTMOV                                     PROP 013
                MVC   &FIELD+&AL3.(256),&FIELD+&AL2                            PROP 014
&AL1            SETA  &AL1-256                                                 PROP 015
&AL2            SETA  &AL2+256                                                 PROP 016
&AL3            SETA  &AL3+256                                                 PROP 017
                AGOB  .C                                                       PROP 018
.LSTMOV         ANOP                                                           PROP 019
&AL1            SETA  &AL1-1                                                   PROP 020
                MVC   &FIELD+&AL3.(&AL1),&FIELD+&AL2                           PROP 021
                MEND                                                           PROP 022
```

N.R.C. MACRO INSTRUCTIONS.

```
1                MACRO                                                  SCAN 001
2       &NAME    MAKE  &TYPE,&FIELD,&LNGT                               SCAN 002
3       .*  OUTPUT CONVERSION MACRO     R.A.GREEN                      SCAN 003
4                AIF   ('&TYPE' EQ 'I').OK                              SCAN 004
5                AIF   ('&TYPE' EQ 'S').OK                              SCAN 005
6                AIF   ('&TYPE' EQ 'L').OK                              SCAN 006
7                MNOTE 'INVALID TYPE, GENERATION TERMINATED'            SCAN 007
8                MEXIT                                                  SCAN 008
9       .OK      AIF   ('&FIELD' NE '').OK1                             SCAN 009
10               MNOTE 'NO FIELD SPECIFICATION'                         SCAN 010
11               AGO   .STOP                                            SCAN 011
12      .OK1     AIF   ('&LNGT' NE '').OK2                              SCAN 012
13               MNOTE 'NO LENGTH SPECIFICATION'                        SCAN 013
14      .STOP    MNOTE 'GENERATION TERMINATED'                          SCAN 014
15               MEXIT                                                  SCAN 015
16      .OK2     CNOP  2,4                                              SCAN 016
17      &NAME    L     15,*+6                                           SCAN 017
18               BALR  14,15                                            SCAN 018
19               DC    AL1(&LNGT)                                       SCAN 019
20               DC    VL3(MAKE&TYPE)                                   SCAN 020
21               DC    A(&FIELD)                                        SCAN 021
22               MEND                                                   SCAN 022
23
24
25
26               MACRO                                                  MAKE 001
27      &NAME    SCAN  &TYPE,&FIELD,&LNGT                               MAKE 002
28      .*  INPUT CONVERSION MACRO     R.A.GREEN                        MAKE 003
29               AIF   ('&TYPE' EQ 'I').OK                              MAKE 004
30               AIF   ('&TYPE' EQ 'S').CK                              MAKE 005
31               AIF   ('&TYPE' EQ 'L').CK                              MAKE 006
32               MNOTE 'INVALID TYPE, GENERATION TERMINATED'            MAKE 007
33               MEXIT                                                  MAKE 008
34      .OK      AIF   ('&FIELD' NE '').OK1                             MAKE 009
35               MNOTE 'NO FIELD SPECIFICATION'                         MAKE 010
36               AGO   .STOP                                            MAKE 011
37      .OK1     AIF   ('&LNGT' NE '').OK2                              MAKE 012
38               MNOTE 'NO LENGTH SPECIFICATION'                        MAKE 013
39      .STOP    MNOTE 'GENERATION TERMINATED'                          MAKE 014
40               MEXIT                                                  MAKE 015
41      .OK2     CNOP  2,4                                              MAKE 016
42      &NAME    L     15,*+6                                           MAKE 017
43               BALR  14,15                                            MAKE 018
44               DC    AL1(&LNGT)                                       MAKE 019
45               DC    VL3(SCAN&TYPE)                                   MAKE 020
46               DC    A(&FIELD)                                        MAKE 021
47               MEND                                                   MAKE 022
48
49
50
51      BESD       0   ASCANS          I/SCANI   A B     ASCANL   A  F   A              0001
52      BESD       0    MAKEI   A CF   AMAKES   A C4    AMAKEL   A D    A              0002
53      BTXT       8   AKA6'E00)K 65&U60$SC   C  DA3  K02ZK01=KM6-6  TKCOVK 0I%D     0003
```

```
DATA SET UTILITY - GENERATE
SCANS    START 0
         ENTRY SCANI
         ENTRY SCANL
         ENTRY MAKEI
         ENTRY MAKES
         ENTRY MAKEL
*********************************************************************
*********************************************************************
**     FLOATING POINT BINARY
**
**     CALLING SEQUENCE --
**
**                    NAME     SCAN    TYPE,FIELD,WIDTH
**
**                    *        CNOP    2,4
**                    *NAME    L       15,*+6
**                    *        BALR    14,15
**                    *        DC      AL1(WIDTH)
**                    *        DC      VL3(SCAN&TYPE)
**                    *        DC      A(FIELD)
**
**               WHERE--
**                     TYPE -- MAY BE ONE OF 3 LETTERS,
**                              I FOR INTEGER (RESULT WILL BE IN GPR 0)
**                              S FOR SHORT PRECISION (RESULT IN FPR 0)
**                              L FOR LONG PRECISION (RESULT IN FPR 0)
**
**                    FIELD -- THE STARTING ADDRESS OF THE SOURCE FIELD
**
**                    WIDTH -- THE WIDTH OF THE SOURCE FIELD
**
**     AN ERROR CODE WILL BE RETURNED AT SYMBOLIC ADDRESS NAME+10
**     THE CODES ARE --
**                       X'FF' -- NO ERROR
**                       X'01' -- NUMBER TOO LARGE (OVERFLOW) ZERO
**                                RESULT RETURNED
**                       X'02' -- FLOATING EXPONENT TOO SMALL (UNDERFLOW)
**                                ZERO RESULT RETURNED
**                       X'F3' -- NO DIGITS OTHER THAN ZERO IN THE
**                                SOURCE FIELD (ZERO RESULT RETURNED)
**                       X'F4' -- SCAN TERMINATED BY OTHER THAN A BLANK
**                                OR END OF FIELD
**
**     NOTE -- CONDITIONS X'F3' AND X'F4' MAY NOT BE ERRORS (IE. THE
**             USER MAY INTEND THIS TO HAPPEN)
**     NOTE -- THIS ROUTINE DOES NOT ALTER THE SOURCE FIELD
**
**
*********************************************************************
*********************************************************************
         EJECT
*********************************************************************
**
**                  SCAN ROUTINE FOR FLOATING POINT NUMBERS
**
*********************************************************************
         SPACE 5
         USING *,15
         MVI   SCANTYPE,X'C1'
         BAL   15,SCANL+4
         USING *,15
```

```
SCANL    MVI   SCANTYPE,X'C0'
         STM   2,4,SCANSAVE
         SR    SCANEND,SCANEND     ZERO REG
         IC    SCANEND,0(14)       LOAD FIELD WIDTH
         L     SCANADD,4(14)       LOAD ADDR TO SCAN
         LA    SCANADD,0(SCANADD)   KNOCK OFF HIGH ORDER BYTE
         MVI   SCANNEGF,X'F0'      RESET NEG FRACTION SW TO INDICATE +
         MVI   SCANNEGE,X'F0'      RESET NEG EXP SW TO INDICATE +
         MVC   SCANB1(21),SCANB    CLEAR BUCKETS
         AR    SCANEND,SCANADD     ADDR OF END OF FIELD
         MVI   SCANDP,X'F0'        RESET DEC PT SW
         MVI   SCANBFI,X'00'       RESET BUCKET FULLIND
         SR    SCANCTR,SCANCTR     ZERO DIGIT COUNTER
         MVI   4(14),X'FF'         RESET ERROR INDICATOR
SCAN1    CLI   0(SCANADD),C'.'
         BE    SCAN4
         CLI   0(SCANADD),C'-'
         BE    SCAN3
         CLI    0(SCANADD),X'F0'
         BH    SCAN45
SCAN2    LA    SCANADD,1(SCANADD)  HERE IF BL ANK,+,ALPHA,OR ZERO,
         CR    SCANADD,SCANEND     INC ADDR TO SCAN
         BL    SCAN1
         MVI   4(14),X'F3'
SCAN25   SDR   0,0                END OF FIELD,RETURN A ZERO
SCANRET1 LM    2,4,SCANSAVE        RESTORE REGISTERS
         B     8(14)
SCAN3    MVI   SCANNEGF,X'00'      MINUS SIGN FOUND,SET SW
         B     SCAN2
SCAN4    MVI   SCANDP,X'00'        DEC. PT. FOUND,SET SW
         B     SCAN7
SCAN45   CLI   0(SCANADD),X'F9'   IS FIRST DIGIT REALLY A DIGIT
         BH    SCAN2
         B     SCAN55
SCAN5    CLI   0(SCANADD),X'F9'    IS IT REALLY A DIGIT
         BH    SCANDONE
SCAN55   B     SCAN18              DIGIT FOUND,TEST BFI NOP IF BUCKET
*                                  NOT FULL
SCANBFI  EQU   SCAN55+1            BUCKET FULL INDICATOR
         MVC   SCANB1(17),SCANB1+1
         MVC   SCANB1+17(1),0(SCANADD) PUT DIGIT IN BUCKET
         CLI   SCANB1+1,X'F0'      IS BUCKET FULL
         BE    SCAN6
         MVI   SCANBFI,X'F0'
SCAN6    B     SCAN7               DEC PT FOUND SW NOP IF DEC PT FOUND
SCANDP   EQU   SCAN6+1
         BCTR  SCANCTR,0           INCREMENT COUNTER
SCAN7    LA    SCANADD,1(SCANADD)  INC. ADD TO SCAN
         CR    SCANADD,SCANEND
         BNL   SCANDONE            BRANCH IF END OF FIELD
         CLI   0(SCANADD),X'F0'    WHAT IS THE CHARACTER
         BNL   SCAN5
         CLI   0(SCANADD),C'.'     DEC PT
         BE    SCAN4
         CLI   0(SCANADD),C'-'     MINUS SIGN
         BE    SCAN10
         CLI   0(SCANADD),C'E'     E
         BE    SCAN8
         CLI   0(SCANADD),C'D'     D
         BE    SCAN8
         CLI   0(SCANADD),C'+'     PLUS SIGN 029
         BE    SCAN8
         CLI   0(SCANADD),X'5C'    PLUS SIGN 026
         BE    SCAN8
         CLI   0(SCANADD),X'40'    BLANK
         BE    SCAN8
```

```
         MVI   4(14),X'F4'
         B     SCANDONE
SCAN8    LA    SCANADD,1(SCANADD)  NOW SCAN FOR THE EXPONENT - INC ADD
         CR    SCANADD,SCANEND
         BNL   SCANDONE
         CLI   0(SCANADD),X'F0'
         BNL   SCAN9
         CLI   0(SCANADD),C'-'
         BE    SCAN10
         CLI   0(SCANADD),C'E'
         BE    SCAN8
         CLI   0(SCANADD),C'D'
         BE    SCAN8
         CLI   0(SCANADD),C'+'
         BE    SCAN8
         CLI   0(SCANADD),X'50'
         BE    SCAN8
         CLI   0(SCANADD),X'40'
         BNE   SCANDONE
         B     SCAN8
SCAN9    CLI   0(SCANADD),X'F9'    IS IT REALLY A DIGIT
         BH    SCANDONE
         MVC   SCANB2+2(1),0(SCANADD) PUT FIRST EXP DIGIT IN BUCKET
         LA    SCANADD,1(SCANADD)  INC ADD TO SCAN
         CLI   0(SCANADD),X'F0'
         BL    SCANDONE            IS NEXT CHAR A DIGIT
         CLI   0(SCANADD),X'F9'
         BH    SCANDONE
         MVC   SCANB2+1(1),SCANB2+2   YES,PUT IT IN EXP BUCKET
         MVC   SCANB2+2(1),0(SCANADD)
         B     SCANDONE
SCAN10   MVI   SCANNEGE,X'00'      SET EXP SIGN = -
         B     SCAN8
SCANDONE SR    0,0
         CLC   SCANB1+1(17),SCANZT
         BE    SCANRET1
         PACK  SCAND,SCANB1+1(9)  CONVERT NO TO BINERY
         CVB   SCANACC,SCAND
         ST    SCANACC,SCAND1+4
         PACK  SCAND,SCANB1+10(8)
         CVB   SCANACC,SCAND
         ST    SCANACC,SCAND2+4
         LD    SCANFPRO,SCAND1
         MD    SCANFPRO,SCAN108
         AD    SCANFPRO,SCAND2
SCAN11   PACK  SCAND,SCANB2+1(2)   PACK EXP
         CVB   SCANACC,SCAND
SCANNEGE EQU   *+1
         B     SCAN12              SET TO NOP IF EXP IS NEG
         LNR   SCANACC,SCANACC
SCAN12   AR    SCANACC,SCANCTR
         BZ    SCANRET2
         MVI   SCANOP1,X'6C'
         MVI   SCANOP2,X'1A'
         MVI   SCANOP3,X'48'
         BP    SCAN13
         MVI   SCANOP1,X'6D'
         MVI   SCANOP2,X'1B'
         MVI   SCANOP3,X'4A'
SCAN13   CH    SCANACC,SCAN75      IS EXP LT -75
         BNL   SCAN131             BRANCH IF NO
         DD    SCANFPRO,SCAN1075
         SH    SCANACC,SCAN75
SCAN131  LPR   SCANACC,SCANACC     MAKE EXP POS
         CH    SCANACC,SCANH75
         BH    SCAN16
```

```
         SLA   SCANACC,3          MULT EXP BY 8 FOR INDEXING
         STD   SCANFPRO,SCAND
         SR    C,C
         SR    1,1
         IC    0,SCANTAB-8(SCANACC)   PICK UP TABLE EXP
         IC    1,MAKEDIT
         STC   1,SCANTAB-8(SCANACC)   MAKE IT 40
         IC    1,SCAND            PICK UP EXP OF FPRO
         MVI   SCAND,X'4C'         MAKE IT 40
         SDR   SCANFPRO,SCANFPRO
         LE    SCANFPRO,SCAND     LOAD PART OF NUMBER
SCANOP1  MD    SCANFPRO,SCANTAB-8(SCANACC)  MULT BY TABLE VALUE
         MVC   SCAND+1(3),SCANTAB+2         IN 2 PARTS TO PROTECT
         STD   SCANFPRO,MAKED1              LAST DIGIT
         LC    SCANFPRO,SCAND
         EX    C,SCANOP1
         AC    SCANFPRO,MAKED1
         STE   SCANFPRO,SCAND
SCANOP2  AR    1,0                NOW CALC EXP AND SEE IF WE HAVE
SCANOP3  AH    1,SCANH64
         STC   0,SCANTAB-8(SCANACC)       UNDER OR OVER FLOW
         IC    0,SCAND
         AR    1,0
         SH    1,SCANH64
         BL    SCAN17             BRANCH ON UNDERFLOW
         CH    1,SCANH128
         BNL   SCAN16             BRANCH ON OVERFLOW
         STC   1,SCAND
         LE    SCANFPRO,SCAND     LOAD EXP AND HIGH DIGITS
SCANRET2 B     SCAN132
SCANNEGF EQU   SCANRET2+1
         LNDR  SCANFPRO,SCANFPRO
SCAN132  CLI   SCANTYPE,X'01'
         BNE   SCANRET1
         STE   SCANFPRO,SCAND
         MVC   SCANRND(1),SCAND
         AD    SCANFPRO,SCANRND
         STE   SCANFPRO,SCAND
         SDR   SCANFPRO,SCANFPRO
         LE    SCANFPRO,SCAND
         B     SCANRET1
SCAN16   MVI   4(14),X'01'          OVERFLOW
         B     SCAN25             RETURN
SCAN17   MVI   4(14),X'02'          UNDERFLOW
         B     SCAN25
SCAN18   CLI   SCANDP,X'00'
         BE    SCAN7
         A     SCANCTR,SCANONE
         B     SCAN7
         EJECT
*****************************************************************
**
**              SCAN ROUTINE FOR FIXED POINT NUMBERS
**
*****************************************************************
         SPACE 5
         USING *,15
SCANI    STM   2,3,SCANSAVE       SAVE REGISTERS
         MVI   4(14),X'FF'
         L     SCANADD,4(14)      GET ADDR OF FIELD
         SR    SCANEND,SCANEND
         IC    SCANEND,0(14)      GET LNGT OF FIELD
         LA    SCANADD,0(SCANADD) KNOCK HIGH ORDER BYTE OFF
         AR    SCANEND,SCANADD    CALC END OF FIELD
         MVI   SCANISN,X'F0'      SET SIGN +
         B     SCANI2
```

```
SCANI1   LA     SCANADD,1(SCANADD) BUMP ADDR TO SCAN
         CR     SCANADD,SCANEND    IS IT END OF FIELD
         BNL    SCANI3             BRANCH YES
SCANI2   CLI    0(SCANADD),C'0'    WHAT IS CHARACTER
         BNL    SCANI4             BRANCH,MAY BE A DIGIT
         CLI    0(SCANADD),C'-'
         BNE    SCANI1             BRANCH IF NOT - SIGN
         MVI    SCANISN,X'00'      SET NEG SWITCH
         B      SCANI1
SCANI3   MVI    4(14),X'F3'        NOTHING IN FIELD,SET CODE = F3
SCANI35  SR     0,0                ZERO REG 0
SCANIRET LM     2,3,SCANSAVE       RETURN
         B      8(14)
SCANI4   CLI    0(SCANADD),C'9'    IS IT REALLY A DIGIT
         BH     SCANI1             NO, LOOK SOME MORE
         MVC    SCANB1(11),SCANB   FIRST DIGIT FOUND,ZERO BUCKET
SCANI5   CLI    SCANB1,C'0'        IS BUCKET FULL
         BNE    SCANI9             BRANCH TO OVERFLOW
         MVC    SCANB1(9),SCANB1+1 PUT DIGIT IN BUCKET
         MVC    SCANB1+9(1),0(SCANADD)
         LA     SCANADD,1(SCANADD) BUMP ADDR TO SCAN
         CR     SCANADD,SCANEND    IS IT END OF FIELD
         BNL    SCANI7             BRANCH IF YES
         CLI    0(SCANADD),C'0'    NO,WHAT IS CHAR
         BL     SCANI6             BRANCH IF NOT DIGIT
         CLI    0(SCANADD),C'9'
         BNH    SCANI5             BRANCH IF DIGIT
SCANI6   CLI    0(SCANADD),X'40'
         BE     SCANI7
         MVI    4(14),X'F4'        SCAN STOPPED BY OTHER THAN B OR EOF
SCANI7   CLC    SCANB1(10),SCANBIG IS NUMBER TOO BIG
         BL     SCANI8
         BH     SCANI9             BRANCH TO OVERFLOW
         CLI    SCANISN,X'00'      HERE IF EQUAL
         BNE    SCANI9             BRANCH TO OVERFLOW
SCANI8   B      SCANI85            IT IS OK, TEST NG SW
         NI     SCANB1+9,X'DF'     PUT IN -
SCANISN  EQU    SCANI8+1
SCANI85  PACK   SCAND,SCANB1(10)
         CVB    0,SCAND
         B      SCANIRET
SCANI9   MVI    4(14),X'01'        OVERFLOW, SET CODE =01
         B      SCANI35
         EJECT
*********************************************************************
**
**                          EQUIVALENCES
**
*********************************************************************
         SPACE 5
SCANEND  EQU    2
SCANADD  EQU    3
SCANACC  EQU    3
SCANCTR  EQU    4
SCANFPRO EQU    0
         EJECT
*********************************************************************
*********************************************************************
**
**     ROUTINE FOR OUTPUT CONVERSION FROM FIXED OR FLOATING POINT BINARY
**       TO DECIMAL CHARACTERS
**     CALLING SEQUENCE --
**
**                    NAME     MAKE     TYPE,FIELD,WIDTH
**
**                     *         CNCP     2,4
```

```
**                  *NAME    L       15,*+6
**                  *        BALR    14,15
**                  *        DC      AL1(WIDTH)
**                  *        DC      VL3(MAKE&TYPE)
**                  *        DC      A(FIELD)
**
**              WHERE-
**                   TYPE -- MAY BE ONE OF 3 LETTERS, I FOR INTEGER
**                           S FOR SHORT PRECISION FLOATING POINT,
**                           L FOR LONG PRECISION FLOATING POINT,
**                           FOR I TYPE, THE NUMBER IS EXPECTED IN
**                           FOR I TGPR 0, FOR S OR L TYPE THE NUMBER
**                           IS EXPECTED IN FPR 0
**
**                  FIELD -- THE STARTING ADDRESS OF THE RESULT FIELD
**
**                  WIDTH -- THE WIDTH OF THE RESULT FIELD
**
**    AN ERROR CODE WILL BE RETURNED AT SYMBOLIC ADDRESS NAME+10
**    THE CODES ARE --
**                      X'FF' -- NO ERROR
**                      X'01' -- FIELD WIDTH = ZERO
**                      X'02' -- FIELD NOT WIDE ENOUGH
**
**
**    NOTE -- THIS ROUTINE DOES NOT BLANK OUT UNUSED PARTS OF THE
**            RESULT FIELD.
**    NOTE -- IN THE CASE OF AN ERROR THE RESULT FIELD REMAINS
**            UNCHANGED.
**    NOTE -- CONTENTS OF ONLY GPR 1 WILL BE DESTROYED
**    NOTE -- NUMBERS ARE RIGHT JUSTIFIED IN RESULT FIELD
**
**
*********************************************************************
*********************************************************************
         EJECT
*********************************************************************
**
**              MAKE ROUTINE FOR FIXED POINT NUMBERS
**
*********************************************************************
         SPACE 5
         USING *,15
MAKEI    STM   2,4,MAKESAVE        SAVE REGISTERS
         MVI   4(14),X'FF'         SET CODE = FF
         SR    MAKELNG,MAKELNG     GET FIELD LNGT
         IC    MAKELNG,0(14)
         L     MAKEADD,4(14)       GET FIELD ADDR
         LA    MAKEADD,0(MAKEADD)
         LTR   MAKELNG,MAKELNG     IS LNGT GT 0
         BP    MAKEI2
         MVI   4(14),X'01'         NO. CODE = 01
MAKEIRET LM    2,4,MAKESAVE        RETURN
         B     8(14)
MAKEI2   CVD   0,MAKED            CONVERT NO TO DEC
         LA    1,MAKESE+11         LOAD REG 1 WITH SIG START FOR EDMK
         MVC   MAKESE(13),MAKEDIT  MOVE EDIT PATTERN TO RESULT FIELD
         EDMK  MAKESE(13),MAKED+2
         BNL   MAKEI3              BRANCH IF GE 0
         BCTR  1,0
         MVI   0(1),C'-'           PUT MINUS SIGN IN
MAKEI3   LA    MAKEACC,MAKESE+12
         SR    MAKEACC,1           CALC LENGTH OF RESULT
         CR    MAKELNG,MAKEACC
         BL    MAKEI4              BRANCH IF RESULT TOO LONG
         AR    MAKEADD,MAKELNG     RIGHT JUSTIFY IN FIELD
```

```
         SR    MAKEACD,MAKEACC
         BCTR  MAKEACC,0            SUBT 1 FROM RESULT LNGT FOR MVC
         EX    MAKEACC,MAKEIMVC     MOVE RESULT INTO FIELD
         B     MAKEIRET             RETURN
MAKEIMVC MVC   0(0,MAKEACD),0(1)
MAKEI4   MVI   4(14),X'02'          FIELD TOO SHORT
         B     MAKEIRET
         EJECT
*********************************************************************
**
**             MAKE ROUTINE FOR SINGLE PRECISION
**
*********************************************************************
         SPACE 5
         USING *,15
MAKES    STE   MAKEFPR,MAKED
         SDR   MAKEFPR,MAKEFPR
         LE    MAKEFPR,MAKED
         BALR  15,0
         EJECT
*********************************************************************
**
**             MAKE ROUTINE FOR DOUBLE PRECISION
**
*********************************************************************
         SPACE 5
         USING *,15
MAKEL    STM   2,5,MAKESAVE         SAVE REGISTERS
         STD   MAKEFPR,MAKEFRS
         STD   MAKEFR2,MAKEFRS+8
         LA    MAKEEXP,19
         SR    MAKEACC,MAKEACC      ZERO ACC
MAKE1    LTDR  MAKEFPR,MAKEFPR      SET SIGN OF FRACTION
         MVI   MAKESIGN,X'40'
         BZ    MAKE13
         BP    MAKE15
         MVI   MAKESIGN,X'60'
         LPDR  MAKEFPR,MAKEFPR      MAKE NUMBER POSITIVE
MAKE15   STD   MAKEFPR,MAKED
         IC    MAKEACC,MAKED
         C     MAKEACC,MAKE78       IS EXP = 78
         BE    MAKEDONE                BRANCH IF YES
         S     MAKEACC,MAKE78       CHOP OF THE EXCESS 64 +14 FOR INT.
         MH    MAKEACC,MAKELOG      MULT BY(LOG16)*1024
         MVI   MAKESW1,X'6D'        RESET NEG SW1    DD
         MVI   MAKESWA,X'6D'
         MVI   MAKESW2,X'1A'        RESET NEG SW2    AR
         BP    MAKE3
         C     MAKEACC,MAKE75X      COMPARE TO -75
         BH    MAKE2
         MD    MAKEFPR,MAKE1075     LT-75
         S     MAKEEXP,MAKE75
         SR    MAKEACC,MAKEACC
         B     MAKE15
MAKE2    MVI   MAKESW1,X'6C'        NEG,BUT GT -75, SET NEG SW1  MD
         MVI   MAKESWA,X'6C'
         MVI   MAKESW2,X'1B'        SET NEG SW2  SR
         LPR   MAKEACC,MAKEACC      MAKE NUMBER POSITIVE
MAKE3    AH    MAKEACC,MAKE5X       ROUND
         SRA   MAKEACC,10           DIVIDE BY 1024 TO MAKE INTEGER
         SLA   MAKEACC,3            MULT   BY 8 FOR INDEXING
         SDR   MAKEFPR,MAKEFPR
         LE    MAKEFPR,MAKED
         MVC   MAKED+1(3),MAKETEN+2
         LD    MAKEFR2,MAKED
MAKESWA  MD    MAKEFR2,MAKETAB-8(MAKEACC)
```

```
MAKESW1  MD     MAKEFPR,MAKETAB-8(MAKEACC)
         ADR    MAKEFPR,MAKEFR2
         SRA    MAKEACC,3
MAKESW2  AR     MAKEEXP,MAKEACC      UPDATE DEC EXP
MAKE4    STD    MAKEFPR,MAKED
         CLI    MAKED,X'4E'          IS EXP 78
         BE     MAKEDONE
         BL     MAKE5
         DD     MAKEFPR,MAKETEN      HERE IF GT 78   DIVIDE BY TEN
         A      MAKEEXP,MAKEONE      BUMP DEC EXP
         B      MAKE4
MAKE5    MD     MAKEFPR,MAKETEN      HERE IF LT 78  MULT BY 10
         BCTR   MAKEEXP,0            SUB 1 FROM DEC EXP
         B      MAKE4
**
**          NOW CONVERT THE FRACTION TO A DECIMAL INTEGER
**
MAKEDONE L      MAKEACC,MAKED+4
         N      MAKEACC,MAKEMSK      LOAD LOW 7 HEX DIGITS
         CVD    MAKEACC,MAKED1       CONVERT TO DEC
         MVC    MAKED(4),MAKED+1
         L      MAKEACC,MAKED
         SRL    MAKEACC,4            LOAD HIGH 7 HEX DIGITS
         CVD    MAKEACC,MAKED        CONVERT TO DEC
         ZAP    MAKEINT,MAKED        MOVE HIGH PART TO RESULT FIELD
         MP     MAKEINT,MAKECON      MULT BY  2**12
         MP     MAKEINT,MAKECON      AND AGAIN TO SHIFT IT UP 7 HEX
*                                    DIGITS WHERE IT BELONGS
         AP     MAKEINT,MAKED1            ADD IN LOW PART
         NI     MAKEINT+9,X'F0'      TAKE OFF SIGN
MAKE6    CLI    MAKEINT,X'0C'        ARE 2 HIGH DIGITS ZERO
         BNE    MAKE7                BRANCH IF NO
         MVC    MAKEINT(10),MAKEINT+1 YES,KNOCK THEM OFF PUT ZEROS ON
         S      MAKEEXP,MAKETWO
         B      MAKE6                          LOW SIDE
MAKE7    MVC    MAKERES,MAKEZERO     ZERO RESULTFIELD
         TM     MAKEINT,X'F0'         IS HIGH DIGIT ZERO
         BNE    MAKE8                BRANCH IF NO
         MVO    MAKERES+1(9),MAKEINT(9)  KNOCK IT OFF
         S      MAKEEXP,MAKEONE
         B      MAKE9
MAKE8    MVC    MAKERES+1(9),MAKEINT
**
**                                   NOW DO THE ROUNDING
MAKE9    MVC    MAKEINT,MAKEZERO+1    ZERO ROUNDING CONSTANT
         CLI    C(14),X'06'          GET FIELD WIDTH
         BNH    MAKEFR1              BRANCH IF FIELD NOT BIG ENOUGH
         L      MAKEADD,4(14)        GET ADD OF RESULT FIELD
         LA     MAKEADD,0(MAKEADD)
         SR     MAKELNG,MAKELNG
         IC     MAKELNG,0(14)
         CLI    C(14),X'16'          IS FIELD GT 22
         BH     MAKE115
MAKE95   S      MAKELNG,MAKESIX
         STC    MAKELNG,MAKED
         SRA    MAKELNG,1            DIVIDE FRACTION LNGT BY 2
         IC     MAKEACC,MAKEVEN
         TM     MAKED,X'01'          IS IT EVEN OR ODD
         BZ     MAKE10
         IC     MAKEACC,MAKEODD
MAKE10   STC    MAKEACC,MAKEINT(MAKELNG)  STORE THE 5 FOR ROUNDING
         AP     MAKERES,MAKEINT      ROUND
         TM     MAKERES,X'0F'        TEST OFLO
         BZ     MAKE11               BRANCH IF NO OVFLO
         MVO    MAKERES,MAKERES(10) SHIFT DOWN
         A      MAKEEXP,MAKEONE      BUMP EXP
```

```
**                          NOW CONVERT TO CHARACTERS
MAKE11   UNPK   MAKEDEC(7),MAKERES+1(4)
         UNPK   MAKEDEC+6(13),MAKERES+4(7)
         MVC    C(2,MAKEACD),MAKESIGN
         SR     MAKEACC,MAKEACC
         IC     MAKEACC,MAKED
         BCTR   MAKEACC,0
         EX     MAKEACC,MAKEMVC
         MVI    MAKESE,X'40'          SET SIGN OF EXP
         LTR    MAKEEXP,MAKEEXP
         BNL    MAKE12
         MVI    MAKESE,X'60'
MAKE12   CVD    MAKEEXP,MAKED         MAKEEXP DEC.
         UNPK   MAKEEC,MAKED+6(2)     MAKE IT CHARACTERS
         OI     MAKEEC+1,X'F0'        PUT IN LAST ZONE
         AR     MAKEACD,MAKEACC
         LA     MAKEACD,3(MAKEACD)
         MVC    0(4,MAKEACD),MAKEEE
         MVI    4(14),X'FF'           SET RESULT INDICATOR
MAKERET  LM     2,5,MAKESAVE          RETURN
         LD     MAKEFPR,MAKEFRS
         LD     MAKEFR2,MAKEFRS+8
         B      8(14)
MAKEMVC  MVC    2(0,MAKEACD),MAKEEEC
MAKE13   MVC    MAKERES,MAKEZERO
         SR     MAKEEXP,MAKEEXP
         B      MAKE9
MAKEER1  MVI    4(14),X'02'
         B      MAKERET
MAKE115  SH     MAKELNG,MAKE23
         AR     MAKEACD,MAKELNG
         LA     MAKELNG,22
         B      MAKE95
         EJECT
*********************************************************************
**
**                          EQUIVALENCES
**
*********************************************************************
         SPACE 5
MAKEACD  EQU    2
MAKEACC  EQU    3
MAKELNG  EQU    4
MAKEEXP  EQU    5
MAKEFPR  EQU    0
MAKEFR2  EQU    2
         EJECT
*********************************************************************
**
**                    STORAGE ASSIGNMENTS FOR SCAN
**
*********************************************************************
         SPACE 3
SCAND    DS     D
SCANRND  DC     X'0000000008C000C0'
SCAND1   DC     X'4E0C0000'
         DS     F
SCAND2   DC     X'4E0C0000'
         DS     F
SCANSAVE DS     4F
SCAN75   DC     F'-75'
SCANH64  DC     F'64'
SCANBIG  DC     C'2147483648'
SCANZT   DC     17C'0'
SCANB    DC     X'F0'                 CONSTANT TO ZERO BUCKETS
SCANB1   DS     CL18                  BUCKET TO HOLD DIGITS OF FRACTION
```

```
SCANB2    DS    CL3                    BUCKET TO HOLD DIGITS OF EXP
SCANTYPE  DS    CL1
SCANONE   DC    F'1'
SCANH75   DC    H'75'
SCANH128  DC    H'128'
SCANTAB   DS    0D
          DC    X'41ACD0CC0CC000D0'
          DC    X'42640000C000C0C0'
          DC    X'433E800CCCC00C0C'
          DC    X'44271CCC0C000CD0'
          DC    X'4518eA0C0C000CD0'
          DC    X'45F424CC0C000C0C'
          DC    X'469896800CC00C0C'
SCAN108   DC    X'475F5E1C0C000C0C'
          DC    X'483B9ACACCC00000'
          DC    X'49254CBE4CC00C00'
          DC    X'4A174876E8C00C0C'
          DC    X'4AE8D4A51C000C0C'
          DC    X'4B9184E72AC00C00'
          DC    X'4C5AF31C7A400000'
          DC    X'4D38D7EA4C680C0C'
          DC    X'4E2386F26FC10C0C'
          DC    X'4F16345785D8AC00'
          DC    X'4FDE0B6B3A764CCC'
          DC    X'508AC7230489E80C'
          DC    X'5156BC75E2D63100'
          DC    X'523635C9ACC5DEAC'
          DC    X'5321E19E0C9BAB24'
          DC    X'54152D02C7E14AF6'
          DC    X'54D3C218CECCED9C'
          DC    X'558459516140147A'
          DC    X'56528702CCC80CCC'
          DC    X'5732B2E3C9FD07FF'
          DC    X'582C4FCE5E3E24FF'
          DC    X'591431E0FAE6D71F'
          DC    X'59C9F2C9CD046740'
          DC    X'5A7E378E2C22CC88'
          DC    X'5B4EF2D6D415B855'
          DC    X'5C314DC6448D9335'
          DC    X'5D1ED09BEAD87C01'
          DC    X'5E13426172C74D80'
          DC    X'5ECC97CE7BC90700'
          DC    X'5F785EE10D5DA460'
          DC    X'604B3B4CA85A86BC'
          DC    X'612F050FE9389435'
          DC    X'621D6329F1C35CA4'
          DC    X'63125DFA371A19E6'
          DC    X'63B7ABC6270502FC'
          DC    X'6472CB5BD86321D6'
          DC    X'65473F19673DF525'
          DC    X'662CD76FEC86B937'
          DC    X'671C06A5EC5433C2'
          DC    X'68118427B3B4A059'
          DC    X'68AF298C050E4370'
          DC    X'696D79F82328EA26'
          DC    X'6A446C3B15F99261'
          DC    X'6B2AC3A4EDBBF87C'
          DC    X'6C1ABA4714957D2D'
          DC    X'6D10B46C6CDD6E3C'
          DC    X'6DA7DC3C4CA64E50'
          DC    X'6E6867A5A867FCF2'
          DC    X'6F414CC78940F697'
          DC    X'7028C87CB5C89A1E'
          DC    X'7119D7D4DF19D6C52'
          DC    X'71FFE50B7C25C33C'
          DC    X'729F4F2726179A0A'
```

```
          DC     X'7363917E77CECC46'
          DC     X'743E3AEB4AE1382B'
          DC     X'7526F4D30ECCC31A'
          DC     X'76184F03E53FF9FC'
          DC     X'76F316271C7FC360'
          DC     X'7797EDD871CFDA1C'
          DC     X'785EF4A74721E851'
          DC     X'793B58E88C753132'
          DC     X'7A2517915 7C93EBF'
          DC     X'7B172EBAD6DDC73A'
          DC     X'7BE7D34C64A9C840'
          DC     X'7C90E40FBEEA1C28'
          DC     X'7C5A3E89D7525239'
          DC     X'7E38991626937363'
SCAN1075  DC     X'7F235FACD81C281D'
          EJECT
*****************************************************************
**
**                    STORAGE ASSIGNMENTS FOR MAKE
**
*****************************************************************
          SPACE 3
MAKED     EQU    SCAND
MAKED1    DS     D
MAKEFRS   DS     2D
MAKE78    DC     F'78'
MAKE75X   DC     F'-76800'           -75*1024
MAKE75    DC     F'75'
MAKEMSK   DC     X'0FFFFFFF'         MASK
MAKETWO   DC     F'2'
MAKESIX   DC     F'6'
MAKESAVE  EQU    SCANSAVE
MAKELOG   DC     F'1233'             1024 LOG(16)
MAKE5X    DC     F'512'              .5*1024
MAKE23    DC     F'22'
MAKEVEN   DC     X'50'
MAKEODC   DC     X'05'
MAKECON   DC     P'16384'
MAKEDEC   DS     CL19
MAKEDE    DC     X'40'
MAKESE    DS     CL1                 X
MAKEED    DS     CL2                 X
MAKERES   DS     CL11                X
MAKEINT   DS     CL10                X  THESE 5 MUST BE TOGETHER,
MAKEZERO  DC     PL11'0'             X  NEED THE ZERO AFTER MAKEINT
MAKESIGN  DC     C'-.'
MAKEDIT   DC     X'402020202020202020212C6C'
MAKE1075  EQU    SCAN1075
MAKETAB   EQU    SCANTAB
MAKEONE   EQU    SCANONE
MAKETEN   EQU    SCANTAB
          END

PROCESSING ENDED AT EOD
```

Appendix A

Typical Printer Output

MASTER REFERENCE SEARCH-SCAN REF. C1500

C1500 SCHWOERER M AND WOLF HC
EXCITATION EXCHANGE AND OPTICAL SPIN POLARIZATION IN THE TRIPLET STATE OF NAPHTHALENE AS STUDIED BY ESR. IN MAGNETIC RESONANCE AND RELAXATION. PROC. 14TH COLLOQUE AMPERE, LJUBLJANA, 6-11 SEPTEMBER 1966. R. BLINC, ED.
CODEN BOOK0000C0000000 COPY ON HAND
SUBJECT- S12 S20
BIBLIOG.- 10
PAGES 544-552 1967 ENG
NORTH-HOLLAND AMSTERDAM
QC 762 / B 64 , BLINC

C1501 SEN PN AND BASU S
FREE-ELECTRON MODEL AND TRIPLET-STATE LIFETIME OF BENZENE
CODEN IJQC-B-0002-0183 ABST. ON HAND
SUBJECT- SC3 R04
BIBLIOG.- 10
PAGES 183-6 1968 ENG CA 68 100328

C1502 SILBERMAN Z AND PAUNCZ R
APPLICATION OF THE ALTERNANT MOLECULAR ORBITAL METHOD TO THE NAPHTHALENE MOLECULE
CODEN TCHA-A-0010-0254
SUBJECT- T04
BIBLIOG.- 10
PAGES 254-62 1968 ENG

C1503 STEINBERG IZ AND KATCHALSKI E
THEORETICAL ANALYSIS OF THE ROLE OF DIFFUSION IN CHEMICAL REACTIONS, FLUORESCENCE QUENCHING AND NONRADIATIVE ENERGY TRANSFER
CODEN JCPS-A-0048-2404
SUBJECT- E01
BIBLIOG.- 10
PAGES 2404-10 1968 ENG

C1504 STEINBERG IZ
NONRADIATIVE ENERGY TRANSFER IN SYSTEMS IN WHICH ROTATORY BROWNIANMOTION IS FROZEN
CODEN JCPS-A-0048-2411
SUBJECT- E01
BIBLIOG.- 10
PAGES 2411-13 1968 ENG

C1505 STOCKBURGER M
TRANSFER OF VIBRATIONAL ENERGY IN EXCITED ELECTRONIC STATES
CODEN BBPC-A-0072-0151 ABST. ON HAND
SUBJECT- TC2 E06
BIBLIOG.- 10
PAGES 151-3 1968 ENG CA 68 100360

Journal output

MASTER REFERENCE SEARCH-SCAN REF. 01500

SCHWOERER M. AND WOLF H.C., EXCITATION EXCHANGE AND OPTICAL SPIN POLARIZATION IN THE TRIPLET STATE OF NAPHTHALENE AS STUDIED BY ESR. IN MAGNETIC RESONANCE AND RELAXATION. PROC. 14TH COLLOQUE AMPERE, LJUBLJANA, 6-11 SEPTEMBER 1966. R. BLINC, ED. NORTH-HOLLAND AMSTERDAM (1967) (ENG).

SEN P.N. AND BASU S., FREE-ELECTRON MODEL AND TRIPLET-STATE LIFETIME OF BENZENE. INT. J. QUANTUM CHEM. 2, 183-6 (1968) (ENG). (C.A. 68 100328.)

SILBERMAN Z. AND PAUNCZ R., APPLICATION OF THE ALTERNANT MOLECULAR ORBITAL METHOD TO THE NAPHTHALENE MOLECULE. THEOR. CHIM. ACTA 10, 254-62 (1968) (ENG).

STEINBERG I.Z. AND KATCHALSKI E., THEORETICAL ANALYSIS OF THE ROLE OF DIFFUSION IN CHEMICAL REACTIONS, FLUORESCENCE QUENCHING AND NONRADIATIVE ENERGY TRANSFER. J. CHEM. PHYS. 48, 2404-10 (1968) (ENG).

STEINBERG I.Z., NONRADIATIVE ENERGY TRANSFER IN SYSTEMS IN WHICH ROTATORY BROWNIANMOTION IS FROZEN. J. CHEM. PHYS. 48, 2411-13 (1968) (ENG).

STOCKBURGER M., TRANSFER OF VIBRATIONAL ENERGY IN EXCITED ELECTRONIC STATES. BER. BUNSENGES. PHYS. CHEM. 72, 151-3 (1968) (ENG). (C.A. 68 100360.)

TOTAL REFERENCES= 1511

*** SUBJECT TOTALS ***

B 1	42	S11	5	G 1	4
B 2	40	S12	98	G 2	2
B 3	8	S13	1	G 3	25
B 4	25	S14	34	G 4	2
B 5	11	S15	40	G 5	2
B 6	4	S16	18	G 6	3
B 7	23	S17	10	G 7	13
B 8	34	S18	1	G 8	2
B 9	8	S19	5	G 9	1
B10	1	S20	42	G10	0
B11	1	S21	4	G11	1
B12	1	S22	24	G12	0
B13	2	S23	0	G13	0
B14	5	S24	0	G14	0
B15	0	S25	0	G15	0
B16	0	S26	0	G16	0
B17	0	E 1	22	F 1	32
B18	0	E 2	52	F 2	28
T 1	22	E 3	9	F 3	13
T 2	101	E 4	64	F 4	1
T 3	14	E 5	17	F 5	40
T 4	28	E 6	2	F 6	6
T 5	26	E 7	7	F 7	14
T 6	17	E 8	3	F 8	5
T 7	16	E 9	1	F 9	9
T 8	10	E10	0	F10	21
T 9	0	E11	0	F11	1
T10	3	E12	0	F12	76
T11	18	E13	0	F13	7
T12	6	E14	0	F14	14
T13	11	R 1	10	F15	2
T14	7	R 2	45	F16	2
T15	2	R 3	19	F17	0
T16	39	R 4	9	F18	6
T17	13	R 5	91	F19	28
T18	9	R 6	23	F20	6
T19	43	R 7	1	F21	21
T20	29	R 8	10	F22	4
T21	13	R 9	1	F23	20
T22	21	R10	2	F24	8
T23	1	R11	0	F25	36
T24	7	R12	13	F26	39
T25	0	R13	16	F27	7
T26	0	R14	0	F28	6
T27	0	R15	1	F29	12
T28	0	R16	25	F30	50
T29	0	R17	0	F31	3
S 1	3	R18	1	F32	8
S 2	0	R19	0	F33	28
S 3	21	R20	0	F34	17
S 4	20	R21	0	F35	48
S 5	51	R22	0	F36	2
S 6	58	R23	0	F37	3
S 7	35	C 1	4	F38	10
S 8	34	C 2	2	F39	7
S 9	2	C 3	37	F40	18
S10	11	C 4	14	F41	9
		C 5	55	F42	4
		C 6	2	F43	3
		C 7	8	F44	4
		C 8	2	F45	7
		C 9	0	F46	2
		C10	0	F47	2
		C11	0	F48	0
		C12	0	F49	3
		C13	0	F50	2

F51	9
F52	69
F53	5
F54	8
F55	26
F56	12
F57	5
F58	5
F59	3
F60	0
F61	0
F62	0
F63	0
F64	0
A 1	2
A 2	5
A 3	2
A 4	0
A 5	3
A 6	3
A 7	0
A 8	0
A 9	2
A10	11
A11	0
A12	1
A13	2
A14	0
A15	0
A16	0
A17	0
A18	0

BIBLIOGRAPHY CLASS TOTALS

CLASS	3	4
CLASS	4	11
CLASS	5	9
CLASS	6	3
CLASS	7	4
CLASS	8	254
CLASS	9	486
CLASS	10	121

AUTHOR INDEX, PAGE 1 OF LETTER T

NUMBER OF REFERENCES FOR LETTER T = 96

Appendix B

Main Editing Program

Program Listing and Flow Charts

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F 01JAN68   7/02/68

                                    1          PRINT NOGEN                                                  AG000000
                                    2 *                                                                     AG000001
                                    3 *MAIN EDITING PROGRAM ,                                               AG000002
                                    4 *     BIBLIOGAPHY SYSTEM ,                                            AG000003
                                    5 *       SEQUENTIAL DATA,                                              AG000004
                                    6 *                                                                     AG000005
                                    7 * WRITEN BY F.C.BLAIR,                                                AG000006
                                    8 *      N.R.C., OTTAWA, ONT.                                           AG000007
                                    9 *                                                                     AG000008
000000                             10 MAIN     START                                                        AG000100
                                   11 AG3      NRCS  AG1                                                    AG000200
000012 0520                        18          BALR  2,0                                                    AG000300
000014                             19          USING AG2,2,3,4                                              AG000400
000014 9834 2F8C          00FA0    20 AG2      LM    3,4,AG4                                                AG000500
000018 057C                        21          BALR  7,0                                                    AG000600
00001A 547C 3984          019C8    22          N     7,AG173                                                AG000900
00001E 047C                        23          SPM   7                                                      AG001000
000020 47F0 219C          001A4    24          B     AG174                                                  AG001100
                                   25 AG6      DCB   DSORG=PS,                                             XAG001200
                                                     MACRF=PM,                                             XAG001300
                                                     DDNAME=FDBDD1,                                        XAG001400
                                                     RECFM=FM,                                             XAG001500
                                                     LRECL=133,                                            XAG001600
                                                     BFTEK=S,                                              XAG001700
                                                     BUFNO=5,                                              XAG001800
                                                     BLKSIZE=133,                                          XAG001900
                                                     BUFL=133                                               AG002000
                                   26                *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
                                   82 AG7      DCB   DSORG=PS,                                             XAG002100
                                                     MACRF=GM,                                             XAG002200
                                                     DDNAME=FDBDD2,                                        XAG002300
                                                     RECFM=F,                                              XAG002400
                                                     LRECL=80,                                             XAG002500
                                                     BFTEK=S,                                              XAG002600
                                                     BUFNO=5,                                              XAG002700
                                                     BLKSIZE=80,                                           XAG002800
                                                     EODAD=AG154,                                          XAG002900
                                                     ERROPT=ACC                                             AG003000
                                   83                *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
                                  139 AG20     DCB   DSORG=PS,                                             XAG003100
                                                     MACRF=PM,                                             XAG003200
                                                     DDNAME=FDBDD3                                          AG003300
                                  140                *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
                                  196 AG41     DCB   DSORG=PS,                                             XAG003400
                                                     MACRF=GM,                                             XAG003500
                                                     DDNAME=FDBDD4,                                        XAG003600
                                                     EODAD=AG141,                                          XAG003700
                                                     SYNAD=AG136,                                          XAG003800
                                                     ERROPT=ACC                                             AG003900
                                  197                *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
                                  253 AG174    OPEN  (AG6,(OUTPUT),AG7,(INPUT))  OPEN PR. AND CB.         AG004000
                                  261          PROP  AG9,133,X'40'                                          AG004100
0001BC 9289 37CB          0171F  264          MVI   AG9,X'89'                                              AG004200
0001C0 4580 2B22          00B36  265          BAL   8,AG10                                                 AG004300
0001C4 458C 2B32          00B46  266          BAL   8,AG11                                                 AG004400
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```
00C1C8 D24F 3790 36BB 017A4 016CF   267          MVC   AG12(80),AG8                                    AG004500
00C1CE 9211 37CB      0171F         268          MVI   AG9,X'11'                                       AG004600
0001D2 D24F 37CC 379C 01720 017A4   269          MVC   AG9+1(80),AG12                                  AG004700
00C1D8 4580 2B22            00B36   270          BAL   8,AG10                                          AG004800
0001DC 1B55                         271          SR    5,5                                             AG004900
00C1DE 1875                         272          LR    7,5                                             AG005000
0001E0 416C 3004            01018   273          LA    6,AG72                                          AG005100
0001E4 5056 C000            00C00   274 AG81     ST    5,0(6)   ZERO SUB. COUNT REG.                   AG005200
0001E8 4166 00C4            00004   275          LA    6,4(6)                                          AG005300
0001EC 4177 00C1            00C01   276          LA    7,1(7)                                          AG005400
0001F0 5970 337C            01390   277          C     7,AG82                                          AG005500
0001F4 4740 21D0            001E4   278          BL    AG81                                            AG005600
0001F8 1B55                         279          SR    5,5                                             AG005700
00C1FA 1875                         280          LR    7,5                                             AG005800
00C1FC 416C 346C            01480   281          LA    6,AG201                                         AG005900
000200 5056 0000            00000   282 AG209    ST    5,0(6)                                          AG006000
000204 4166 00C4            00004   283          LA    6,4(6)                                          AG006100
00C208 4177 00C1            00C01   284          LA    7,1(7)                                          AG006200
00020C 5970 35FC            0161C   285          C     7,AG208                                         AG006300
000210 4740 21EC            00200   286          BL    AG209                                           AG006400
000214 458C 2B32            00B46   287          BAL   8,AG11   READ DATA CARD                        AG006500
00C218 95C1 36BB      016CF         288          CLI   AG8,C'A'                                        AG006600
00021C 4780 2232            00246   289          BE    AG15                                            AG006700
                                    290          PROP  AG9,133,X'4C'    DATA CARD NOT HERE             AG006800
00022A 9211 37CB      0171F         293          MVI   AG9,X'11'                                       AG006900
00022E D210 37CC 37EC 01720 017F4   294          MVC   AG9+1(17),AG13                                  AG007000
000234 D24F 3727 36BB 0173B 016CF   295 AG14     MVC   AG9+28(8C),AG8                                  AG007100
00023A 4580 2B22            00B36   296          BAL   8,AG10                                          AG007200
00023E 41EC 2220            00234   297          LA    8,AG14                                          AG007300
000242 47FC 2B32            00B46   298          B     AG11                                            AG007400
000246 D2CC 37F5 36C1 0180C 016D5   299 AG15     MVC   AG19(1),AG8+6                                   AG007500
                                    300          OPEN  (AG20,(OUTPUT))     OPEN OUT. TAPE              AG007600
000256 940F 28CD      008E1         306          NI    AG21+1,X'CF'                                    AG007700
00025A 458C 287A            0088E   307          BAL   8,AG30                                          AG007800
00025E D2C3 33D8 33F0 013EC 01404   308          MVC   AG95(4),AG116                                   AG007900
000264 95FC 37F5      01809         309          CLI   AG19,C'0'                                       AG008000
000268 4780 226A            0027E   310          BE    AG43                                            AG008100
                                    311          OPEN  (AG41,(INPUT))    OPEN IN TAPE                  AG008200
00C276 940F 22E1      002F5         317          NI    AG42+1,X'0F'                                    AG008300
00027A 47F0 2274            00288   318          B     AG44                                            AG008400
00027E 96F0 22E1      002F5         319 AG43     OI    AG42+1,X'F0'                                    AG008500
000282 D203 33DC 33F0 013FC 01404   320          MVC   AG96(4),AG116                                   AG008600
00C288 418C 39BC            019D0   321 AG44     LA    8,AG23                                          AG008700
00028C 508C 2FA0            00FB4   322          ST    8,AG56                                          AG008800
000290 4180 2FSC            00FB0   323          LA    8,AG40                                          AG008900
00C294 5080 2FA4            00FB8   324          ST    8,AG56+4                                        AG009000
00C298 95F1 36BA      016CE         325          CLI   AG5,C'1'                                        AG009100
00C29C 4740 22A4            00288   326          BL    AG46                                            AG009200
00C2A0 4720 22AC            002C0   327          BH    AG45                                            AG009300
00C2A4 940F 245B      0046F         328          NI    AG50+1,X'0F'                                    AG009400
00C2A8 96FC 2301      00315         329 AG51     OI    AG47+1,X'F0'                                    AG009500
00C2AC 96FC 2435      00449         330          OI    AG48+1,X'F0'                                    AG009600
00C2B0 96F0 2453      00467         331          OI    AG49+1,X'F0'                                    AG009700
00C2B4 47F0 22E0            002F4   332          B     AG42                                            AG009800
00C2B8 96FC 245B      0046F         333 AG46     OI    AG50+1,X'F0'                                    AG009900
```

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0002BC 47F0 2294          002A8   334          B     AG51                          AG010000
0002C0 940F 23C1     00315        335 AG45     NI    AG47+1,X'0F'                  AG010100
0002C4 94CF 2435     00449        336          NI    AG48+1,X'0F'                  AG010200
0002C8 94CF 2453     00467        337          NI    AG49+1,X'0F'                  AG010300
0002CC 4180 41S0          021A4   338          LA    8,AG55                        AG010400
0002D0 5080 2FA8          00FBC   339          ST    8,AG56+8                      AG010500
0002D4 95FC 37F5     01809        340          CLI   AG19,C'0'                     AG010600
0002D8 4770 22EC          002F4   341          BNE   AG42                          AG010700
                                  342          PROP  AG9,133,X'40'                 AG010800
0002E6 9211 37CB     0171F        345          MVI   AG9,X'11'                     AG010900
0002EA D21S 37CC 3895 01720 018A9 346          MVC   AG9+1(26),AG133               AG011000
0002F0 47F0 2220          00234   347          B     AG14                          AG011100
0002F4 47C0 245A          0046E   348 AG42     BC    0,AG50                        AG011200
0002F8 458C 2B86          0089A   349 AG60     BAL   8,AG53                        AG011300
0002FC 50SC 36C0          01614   35C          ST    9,AG243                       AG011400
C00300 D503 41SC 381D 021A4 01831 351          CLC   AG55(4),AG5S                  AG011500
C00306 477C 23C0          00314   352          BNE   AG47                          AG011600
00030A D2C3 33DC 4194 C13FC 021A8 353          MVC   AGS6(4),AG55+4                AGC11700
000310 47FC 2452          00466   354          B     AG49                          AG011800
000314 470C 243C          00444   355 AG47     BC    0,AG54                        AG011900
000318 D5C4 39BD 4191 019D1 021A5 356          CLC   AG23+1(5),AG55+1              AG012000
00031E 478C 235A          0036E   357          BE    AG240                         AG012100
C0C322 474C 231E          00332   358          BL    AG241                         AG012200
C00326 96F0 2435     00449        359          OI    AG48+1,X'F0'                  AG012300
00032A 58SC 36CC          .01614  36C          L     9,AG243                       AGC12400
00032E 47F0 243C          00444   361          B     AG54                          AG012500
00C332 940F 2435     00449        362 AG241    NI    AG48+1,X'0F'                  AG012600
                                  363          PROP  AG9,133,X'40'                 AG012700
000340 9211 37CB     0171F        366          MVI   AG9,X'11'                     AGC12800
000344 D21E 37CC 3999 01720 019AD 367          MVC   AG9+1(23),AG242               AG012900
00034A D205 3729 39BC 0173D 019D0 368          MVC   AG9+30(6),AG23                AG013000
000350 4580 2B22          00B36   369          BAL   8,AG10                        AG013100
000354 458C 287A          0088E   37C          BAL   8,AG30                        AGC13200
000358 D503 2FB4 33FC 00FC8 01404 371          CLC   AG65(4),AG116                 AGC13300
C0035E 478C 23C0          00314   372          BE    AG47                          AG013400
000362 96FC 2301     00315        373          OI    AG47+1,X'F0'                  AG013500
000366 96F0 2435     00449        374          OI    AG48+1,X'F0'                  AGC13600
00036A 47F0 2430          00444   375          B     AG54                          AG013700
00036E D203 2FAC 360C 00FC0 01614 376 AG240    MVC   AG56+12(4),AG243              AG013800
000374 41D0 2F44          00F58   377          LA    13,AG1                        AG013900
000378 940F 2435     00449        378          NI    AG48+1,X'0F'                  AG014000
                                  379          CALL  MODT,(AG56)                   AGC14100
000392 50F0 344C          01460   391          ST    15,AG2C0                      AG014200
000396 59FC 33F0          01404   392          C     15,AG116                      AG014300
C0039A 4780 23E0          003F4   393          BE    AG167                         AG014400
                                  394          PROP  AG9,133,X'40'                 AG014500
0003A8 92C9 37CB     0171F        397          MVI   AG9,X'09'                     AG014600
0003AC D21A 37CC 393D 01720 01951 398          MVC   AG9+1(27),AG164               AGC14700
0003B2 4580 2B22          0CB36   399          BAL   8,AG10                        AG014800
                                  400          PROP  AG9,133,X'40'                 AGC14900
0003C0 9211 37CB     0171F        403          MVI   AG9,X'11'                     AG015000
0003C4 D2CA 37CC 3958 01720 0196C 404          MVC   AG9+1(11),AG165               AG015100
0003CA D204 3717 39BD 0172B 019D1 405          MVC   AG9+12(5),AG23+1              AG015200
0003D0 D209 371F 3963 01733 01977 406          MVC   AG9+20(10),AG166              AG015300
0003D6 58C0 344C          01460   407          L     0,AG200                       AG015400
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                                    408          MAKE  I,AG9+31,8                                  AG015500
000E8 4180 2DDE                 00DF2  415          LA    8,AG222                                  AG015600
0003EC 50SC 2FAC                00FC0  416          ST    9,AG56+12                                AG015700
0003F0 47F0 2B22                00B36  417          B     AG10                                     AG015800
0003F4 D503 2FB0 33F0 00FC4 01404   418 AG167    CLC   AG56+16(4),AG116                           AG015900
0003FA 4780 2424                00438  419          BE    AG169                                    AG016000
                                    420          PROP  AG9,133,X'4C'                            AG016100
000408 92C9 37CB      0171F         423          MVI   AG9,X'09'                                  AG016200
C0040C D218 370C 3S6D C1720 01581   424          MVC   AG9+1(28),AG168                          AG016300
000412 D24F 372S 3SBC 0173D 019D0   425          MVC   AG9+30(80),AG23                          AG016400
C0C418 4580 2B22                00B36  426          BAL   8,AG10                                   AG016500
                                    427          PROP  AG9,133,X'40'                            AG016600
C00426 9211 370B      0171F         430          MVI   AG9,X'11'                                  AG016700
00042A D24F 372S 419C 0173D 021A4   431          MVC   AG9+30(80),AG55                          AG016800
C0C430 4180 2424                00438  432          LA    8,AG16S                                  AG016900
000434 47F0 2B22                00B36  433          B     AG10                                     AG017000
000438 4180 2434                00448  434 AG169    LA    8,AG48                                   AG017100
00043C 58SC 2FAC                00FC0  435          L     9,AG56+12                                AG017200
C0C440 47FC 2BC6                00B1A  436          B     AG58                                     AG017300
000444 4580 2B6A                0087E  437 AG54     BAL   8,AG163                                  AG017400
000448 4700 22E4                002F8  438 AG48     BC    0,AG60                                   AG017500
00044C 458C 287A                0088E  439          BAL   8,AG30                                   AG017600
000450 D503 2FB4 33FC 00FC8 01404   44C          CLC   AG65,AG116                               AG017700
000456 4780 22E4                002F8  441          BE    AG60                                     AG017800
00045A 96FC 2301      00315         442          OI    AG47+1,X'F0'                             AG017900
00045E 96FC 2435      0044S         443          OI    AG48+1,X'F0'                             AG018000
000462 47F0 22E4                002F8  444          B     AG60                                     AG018100
000466 4700 245A                0046E  445 AG49     BC    0,AG50                                   AG018200
00046A 47F0 252C                0054C  446          B     AG193                                    AG018300
00046E 47C0 24F4                00508  447 AG50     BC    0,AG63                                   AG018400
                                    448          CALL  NEWD,(AG56)  ADD NEW DATA                AG018500
C0C48A 59FC 33F0                01404  460          C     15,AG116                                 AG018600
00048E 478C 250A                0051E  461          BE    AG64                                     AG018700
                                    462          PROP  AG9,133,X'4C'  ERROR IN DATA FORMAT      AG018800
C00498 9211 370B      0171F         465          MVI   AG9,X'11'                                  AG018900
0004A0 D217 370C 3S0D 01720 01521   466          MVC   AG9+1(24),AG156                          AG019000
0004A6 906A 3434                01448  467          STM   6,10,AG157                               AG019100
C0C4AA 1B77                         468          SR    7,7                                      AG019200
0004AC 41AC 39BC                019D0  46S          LA    10,AG23                                  AG019300
00C4B0 940F 24A5      004B9         47C          NI    AG158+1,X'0F'                            AG019400
0004B4 4580 2B22                00B36  471 AG160    BAL   8,AG10                                   AG019500
0004B8 47C0 251E                00532  472 AG158    BC    0,AG159                                  AG019600
00C4BC 1B66                         473          SR    6,6                                      AG019700
0004BE 4190 37CC                01720  474          LA    9,AG9+1                                  AG019800
                                    475          PROP  AG9,133,X'40'                            AG019900
00C4CC 92C9 37CB      0171F         478          MVI   AG9,X'09'                                  AG020000
0004D0 D2CC 90CC ACC0 C0C0C 00C00   479 AG162    MVC   0(1,9),0(10)                             AG020100
0004D6 4199 00C1                00001  48C          LA    9,1(9)                                   AG020200
C0C4DA 41AA 0001                00C01  481          LA    10,1(10)                                 AG020300
0C04DE 4166 0001                00001  482          LA    6,1(6)                                   AG020400
C0C4E2 4177 00C1                00C01  483          LA    7,1(7)                                   AG020500
C0C4E6 5970 2F9C                00FBC  484          C     7,AC40                                   AG020600
0004EA 474C 24E6                004FA  485          BL    AG161                                    AG020700
C004EE 96FC 24A5      004B9         486          CI    AG158+1,X'FC'                            AG020800
0004F2 986A 3434                01448  487          LM    6,1C,AG157                               AG020900
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  LOC   OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F01JAN68   7/02/68
00004F6 47FC 24A0                   004B4   488          B     AG160                                        AG021000
00004FA 596C 33C8                   013DC   489 AG161    C     6,AG175                                      AG021100
00004FE 474C 24BC                   004DC   490          BL    AG162                                        AG021200
000502 47FC 24AC                    004B4   491          B     AG160                                        AG021300
                                            492 AG63     CALL  CEMT,(AG56)                                  AG021400
000051E 5890 2FAC                   00FC0   504 AG64     L     9,AG56+12          OUTPUT NEW RECORD       AG021500
000522 458C 2BC6                    00B1A   505          BAL   8,AG58                                       AG021600
000526 588C 33D8                    013EC   506          L     8,AG95                                       AG021700
00052A 4188 00C1                    00001   507          LA    8,1(8)                                       AG021800
00052E 508C 33D8                    013EC   508          ST    8,AG95                                       AG021900
000532 458C 287A                    0088E   509 AG159    BAL   8,AG30                                       AG022000
000536 D503 2FB4 33FC 00FC8 01404   510          CLC   AG65,AG116                                   AG022100
00053C 4780 245A                    0046E   511          BE    AG50                                         AG022200
000540 95F0 37F5       01809        512 AG193    CLI   AG19,C'0'                                     AG022300
000544 477C 253C                    00550   513          BNE   AG104                                       AG022400
000548 96FC 263D       00651        514          OI    AG106+1,X'FC'                                AG022500
00054C 47FC 2540                    00554   515          B     AG105                                        AG022600
000550 940F 263D       00651        516 AG104    NI    AG106+1,X'0F'                                AG022700
                                            517 AG1C5    PROP  AG9,133,X'40'                                AG022800
00055E 9289 37CB       0171F        520          MVI   AG9,X'89'                                    AG022900
000562 4580 2B22                    00B36   521          BAL   8,AG10                                       AG023000
000566 9219 37CB       0171F        522          MVI   AG9,X'19'                                    AG023100
00056A D213 370C 384A 01720 0185E   523          MVC   AG9+1(20),AG98                               AG023200
000570 4580 2B22                    00B36   524          BAL   8,AG10                                       AG023300
000574 418C 0003                    00003   525          LA    8,3                                          AG023400
000578 508C 33E0                    013F4   526          ST    8,AG97                                       AG023500
                                            527          PROP  AG9,133,X'40'                                AG023600
000586 9211 37CB       0171F        530          MVI   AG9,X'11'                                    AG023700
00058A D203 37CC 385E 0172C 01872   531          MVC   AG9+1(4),AG99                                AG023800
000590 D207 3716 3862 0172A 01876   532          MVC   AG9+11(8),AG100                              AG023900
000596 D204 3720 386A 01734 0187E   533          MVC   AG9+21(5),AG101                              AG024000
00059C D205 372A 386F 0173E 01883   534          MVC   AG9+31(6),AG102                              AG024100
0005A2 4580 2B22                    00B36   535          BAL   8,AG10                                       AG024200
                                            536          PROP  AG9,133,X'40'                                AG024300
                                            539          PROP  AG23,2000,X'40'                              AG024400
0005E4 9209 37CB       0171F        549          MVI   AG9,X'09'                                    AG024500
0005E8 D203 398C 381D 019DC 01831   550          MVC   AG23(4),AG59                                 AG024600
0005EE 5880 33DC                    013F0   551          L     8,AG96                                       AG024700
0005F2 5A8C 33D8                    013EC   552          A     8,AG95                                       AG024800
0005F6 5080 39C0                    019D4   553          ST    8,AG23+4                                     AG024900
0005FA 5800 33DC                    013F0   554          L     0,AG96                                       AG025000
                                            555          MAKE  I,AG9+11,5                                   AG025100
000600C 5800 33D8                   013EC   562          L     0,AG95                                       AG025200
                                            563          MAKE  I,AG9+21,5                                   AG025300
000620 58CC 39CC                    019D4   570          L     0,AG23+4                                     AG025400
                                            571          MAKE  I,AG9+31,5                                   AG025500
000634 D2C5 37CC 3874 0172C 01888   578          MVC   AG9+1(6),AG103                               AG025600
00063A 4580 2B22                    00B36   579          BAL   8,AG10                                       AG025700
00063E 419C 001C                    00C1C   58C          LA    9,16                                         AG025800
000642 458C 2BC6                    00B1A   581 AG108    BAL   8,AG58                                       AG025900
000646 1B55                                 582          SR    5,5                                          AG026000
000648 416C 3827                    0183B   583          LA    6,AG70-1                                     AG026100
00064C 417C 2FB4                    00FC8   584          LA    7,AG71-8                                     AG026200
000650 47CC 27A6                    007BA   585 AG106    BC    0,AG107                                      AG026300
                                            586          PROP  AG55,2000,X'00'                              AG026400
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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  AG026500
000688 458C 2B86            00B9A  596           BAL   8,AG53                               AG026600
00068C D503 419C 363C 021A4 0165C  597           CLC   AG55(4),AG211                        AG026700
000692 4780 2D7C            00D90  598           BE    AG215                                AG026800
000696 D503 419C 3821 021A4 01835  599           CLC   AG55(4),AG194                        AG026900
00069C 4770 26CA            006DE  600           BNE   AG121                               AG027000
                                   601           PROP  AG9,133,X'40'                        AG027100
0006AA 9211 37CB      0171F        604           MVI   AG9,X'11'                           AG027200
0006AE D21B 370C 364C 0172C 01E54  605           MVC   AG9+1(28),AG221                      AG027300
0006B4 D24F 372C 419C 0173D 021A4  606           MVC   AG9+30(80),AG55                      AG027400
0006BA 4180 2D7C            00D9C  607           LA    8,AG215                              AG027500
0006BE 47F0 2B22            00836  608           B     AG10                                 AG027600
                                   609 AG177     PROP  AG23,20,X'4C'                        AG027700
0006CC D203 39BC 3821 019DC 01835  612           MVC   AG23(4),AG194                        AG027800
0006D2 4190 0014            00014  613           LA    9,20                                 AG027900
0006D6 418C 2ABC            00AC4  614           LA    8,AG125                              AG028000
0006DA 47FC 2B06            00B1A  615           B     AG58                                 AG028100
0006DE 1BAA                        616 AG121     SR    10,10                                AG028200
0006E0 417C 3828            0183C  617           LA    7,AG70                               AG028300
0006E4 D500 4190 7000 021A4 00000  618 AG109     CLC   AG55(1),0(7)                         AG028400
0006EA 4780 2720            00734  619           BE    AG110                                AG028500
0006EE 4177 0001            00C01  620           LA    7,1(7)                               AG028600
0006F2 41AA 00C1            00001  621           LA    10,1(10)                             AG028700
0006F6 59A0 2FB8            00FCC  622           C     10,AG69                              AG028800
0006FA 4740 26D0            006E4  623           BL    AG109                                AG028900
                                   624           PROP  AG9,133,X'40'                        AG029000
000708 9211 37CB      0171F        627           MVI   AG9,X'11'                           AG029100
00070C D215 37CC 387A 01720 0188F  628           MVC   AG9+1(22),AG122                      AG029200
000712 D207 3724 419C 0173E 021A4  629           MVC   AG9+25(8),AG55                       AG029300
000718 458C 2B22            00836  630           BAL   8,AG10                               AG029400
00071C 1B66                        631           SR    6,6                                  AG029500
00071E 58F6 4190            021A4  632 AG123     L     15,AG55(6)                           AG029600
000722 50F6 39BC            019D0  633           ST    15,AG23(6)                           AG029700
000726 4166 00C4            00C04  634           LA    6,4(6)                               AG029800
00072A 1969                        635           CR    6,9                                  AG029900
00072C 474C 270A            0071E  636           BL    AG123                                AG030000
000730 47FC 279E            007B2  637           B     AG124                                AG030100
000734 D203 39BC 4190 019D0 021A4  638 AG110     MVC   AG23(4),AG55                         AG030200
00073A 89A0 0003            00003  639           SLL   10,3                                 AG030300
00073E 41AA 2F8C            00FD0  640           LA    10,AG71(10)                          AG030400
000742 58BA 0004            00004  641           L     11,4(10)                             AG030500
000746 58AA 0000            00000  642           L     10,0(10)                             AG030600
00074A 41F0 00C1            00C01  643           LA    15,1                                 AG030700
00074E 50F0 2F40            00F54  644           ST    15,AG176                             AG030800
000752 415C 4194            021A8  645           LA    5,AG55+4                             AG030900
000756 416C 39C0            019D4  646           LA    6,AG23+4                             AG031000
00075A 58F5 00C0            00C00  647 AG113     L     15,0(5)                              AG031100
00075E 5AFA 0000            00000  648           A     15,0(10)                             AG031200
000762 50F6 CCCC            00000  649           ST    15,0(6)                              AG031300
000766 58FA 0000            00C00  650           L     15,0(10)                             AG031400
00076A 59F0 33F0            01404  651           C     15,AG116                             AG031500
00076E 4780 2772            00786  652           BE    AG117                                AG031600
000772 5070 2F3C            00F50  653           ST    7,AG178                              AG031700
000776 5870 2F40            00F54  654           L     7,AG176                              AG031800
00077A 5B70 33D0            013E4  655           S     7,AG87                               AG031900
00077E 458C 28CC            0082C  656           BAL   8,AG111
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000782 587C 2F3C              00F50   657          L     7,AG178                                  AG032000
000786 58F0 2F40              00F54   658 AG117    L     15,AG176                                 AG032100
00078A 19FB                           659          CR    15,11                                    AG032200
00078C 47BC 27S4              007A8   660          BNL   AG120                                    AG032300
000790 41FF 0001              00001   661          LA    15,1(15)                                 AG032400
000794 50F0 2F40              00F54   662          ST    15,AG176                                 AG032500
000798 4155 0CC4              00004   663          LA    5,4(5)                                   AG032600
00079C 41AA 0CC4              00004   664          LA    10,4(10)                                 AG032700
0007A0 4166 00C4              00004   665          LA    6,4(6)                                   AG032800
0007A4 47F0 2746              00758   666          B     AG113                                    AG032900
0007A8 189B                           667 AG120    LR    9,11                                     AG033000
0007AA 899C 0002              00002   668          SLL   9,2                                      AG033100
0007AE 419S 0004              00004   669          LA    9,4(9)                                   AG033200
0007B2 418C 263C              00650   670 AG124    LA    8,AG106                                  AG033300
0007B6 47FC 2BC6              0081A   671          B     AG58                                     AG033400
0007BA 4155 0CC1              00001   672 AG107    LA    5,1(5)                                   AG033500
0007BE 5950 2FB8              0CFCC   673          C     5,AG69                                   AG033600
0007C2 4720 2DCA              00D1E   674          BH    AG210                                    AG033700
0007C6 4166 0001              00001   675          LA    6,1(6)                                   AG033800
0007CA 4177 00C8              00008   676          LA    7,8(7)                                   AG033900
0007CE 9057 33E4              013F8   677          STM   5,7,AG115                                AG034000
0007D2 D202 39BD 3831 019D1   01845   678          MVC   AG23+1(3),AG85                           AG034100
0007D8 D200 39BC 6000 019DC   00000   679          MVC   AG23(1),0(6)                             AG034200
0007DE 416C 39C0              019D4   680          LA    6,AG23+4                                 AG034300
0007E2 58A7 0000              00000   681          L     10,0(7)                                  AG034400
0007E6 58B7 0004              00004   682          L     11,4(7)                                  AG034500
0007EA 1B77                           683          SR    7,7                                      AG034600
0007EC 415C 33F0              01404   684          LA    5,AG116                                  AG034700
0007F0 D2C3 60CC A000 00000   00C0C   685 AG119    MVC   0(4,6),0(10)                             AG034800
0007F6 58FA 0000              00000   686          L     15,0(10)                                 AG034900
0007FA 59FC 33F0              01404   687          C     15,AG116                                 AG035000
0007FE 478C 27F2              00806   688          BE    AG118                                    AG035100
000802 458C 28CC              00820   689          BAL   8,AG111                                  AG035200
000806 4177 00C1              00001   690 AG118    LA    7,1(7)                                   AG035300
00080A 4166 00C4              00004   691          LA    6,4(6)                                   AG035400
00080E 41AA 0CC4              00004   692          LA    10,4(10)                                 AG035500
000812 197B                           693          CR    7,11                                     AG035600
000814 474C 27DC              007FC   694          BL    AG119                                    AG035700
000818 9857 33E4              013F8   695          LM    5,7,AG115                                AG035800
00081C 47FC 27S4              007A8   696          B     AG120                                    AG035900
                                      697 AG111    PROP  AG9,133,X'4C'                            AG036000
00082A 9209 37CB      0171F           700          MVI   AG9,X'09'                                AG036100
00082E 41C7 0001              00001   701          LA    0,1(7)                                   AG036200
                                      702          MAKE  I,AG9+2,3                                AG036300
000840 D2CC 37CC 39BC 0172C 019DC     709          MVC   AG9+1(1),AG23                            AG036400
000846 5805 00C0              00000   710          L     0,0(5)                                   AG036500
                                      711          MAKE  I,AG9+11,5                               AG036600
000858 58CA 00C0              00C00   718          L     0,0(10)                                  AG036700
                                      719          MAKE  I,AG9+21,5                               AG036800
00086C 5806 00CC              00C00   726          L     0,0(6)                                   AG036900
                                      727          MAKE  I,AG9+31,5                               AG037000
000880 508C 33F4              01408   734          ST    8,AG126                                  AG037100
000884 4580 2B22              00836   735          BAL   8,AG10                                   AG037200
000888 5880 33F4              01408   736          L     8,AG126                                  AG037300
00088C 07F8                           737          BR    8                                        AG037400
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00C88E 5080 2F94          00FA8   738 AG30     ST    8,AG31                    AG037500
00C892 D203 2F98 33F0 0CFAC 01404 739          MVC   AG36(4),AG116             AG037600
00C898 D203 2FB4 33F0 00FC8 01404 740          MVC   AG65(4),AG116             AG037700
00089E 4150 39BC          019D0   741 AG34     LA    5,AG23                    AG037800
00C8A2 1B66               00D9    742          SR    6,6                       AG037900
0008A4 940F 28C5    008D9         743          NI    AG22+1,X'0F'              AG038000
00C8A8 940F 28C1    008D5         744          NI    AG32+1,X'0F'              AG038100
0008AC 940F 2943    00957         745          NI    AG35+1,X'0F'              AG038200
0008B0 458C 2B32          00B46   746 AG33     BAL   8,AG11                    AG038300
00C8B4 D501 36BB 37F3 016CF 01807 747          CLC   AG8(2),AG24               AG038400
0008BA 478C 2942          00956   748          BE    AG35                      AG038500
00C8BE D502 36BB 3825 016CF 01839 749 AG66     CLC   AG8(3),AG67               AG038600
00C8C4 4770 28C0          008D4   750          BNE   AG32                      AG038700
00C8C8 4180 0001          00001   751          LA    8,1                       AG038800
00C8CC 5080 2FB4          00FC8   752          ST    8,AG65                    AG038900
00C8D0 47F0 295E          00982   753          B     AG195                     AG039000
00C8D4 4700 289C          008B0   754 AG32     BC    0,AG33                    AG039100
00C8D8 4700 29A4          00988   755 AG22     BC    0,AG25                    AG039200
0008DC 96FC 28C5    008D9         756          OI    AG22+1,X'F0'              AG039300
00C8E0 4700 28DE          008F2   757 AG21     BC    0,AG26                    AG039400
00C8E4 D200 36BA 36BB 016CE 016CF 758          MVC   AG5(1),AG8                AG039500
0008EA 96FC 28CD    008E1         759          OI    AG21+1,X'F0'              AG039600
0008EE 47FG 29D4          00EE8   760          B     AG83                      AG039700
00C8F2 D500 36BB 36BA 016CF 016CE 761 AG26     CLC   AG8(1),AG5                AG039800
00C8F8 4780 29D4          00E8    762          BE    AG83                      AG039900
                                  763          PROP  AG9,133,X'4C'             AG040000
00C906 D20F 37CC 37F6 01720 0180A 766          MVC   AG9+1(16),AG37            AG040100
00C90C D24F 371F 36BB 01733 016CF 767          MVC   AG9+20(80),AG8            AG040200
00C912 96FC 28C1    008D5         768 AG38     OI    AG32+1,X'F0'              AG040300
00C916 96FC 2943    00957         769          OI    AG35+1,X'F0'              AG040400
00C91A 588C 2F98          00FAC   770          L     8,AG36                    AG040500
00C91E 4188 00C1          00001   771          LA    8,1(8)                    AG040600
00C922 5080 2F98          00FAC   772          ST    8,AG36                    AG040700
00C926 9211 37CB    0171F         773          MVI   AG9,X'11'                 AG040800
00092A 4580 2B22          00B36   774          BAL   8,AG10                    AG040900
00092E 418C 00C3          00003   775          LA    8,3                       AG041000
00C932 5980 2F98          00FAC   776          C     8,AG36                    AG041100
00C936 47B0 289C          008B0   777          BNL   AG33                      AG041200
                                  778          PROP  AG9,133,X'40'             AG041300
000944 9211 370B    0171F         781          MVI   AG9,X'11'                 AG041400
000948 D20F 37CC 3989 01720 0199D 782          MVC   AG9+1(16),AG179           AG041500
00094E 4180 2220          00234   783          LA    8,AG14                    AG041600
00C952 47FC 2B22          00B36   784          B     AG10                      AG041700
00C956 4700 288A          0089E   785 AG35     BC    0,AG34                    AG041800
00C95A 50C0 2F9C          00FB0   786 AG68     ST    6,AG40                    AG041900
00C95E 1B66               00D9    787          SR    6,6                       AG042000
00C960 4170 39BC          019D0   788          LA    7,AG23                    AG042100
                                  789 AG127    PROP  AG9,133,X'4C'             AG042200
00C96E 9209 370B    0171F         792          MVI   AG9,X'09'                 AG042300
000972 D24F 3715 7000 01729 00C00 793          MVC   AG9+10(80),0(7)           AG042400
00C978 4177 00S0          0005C   794          LA    7,80(7)                   AG042500
00C97C 4166 00S0          00050   795          LA    6,80(6)                   AG042600
00C980 4580 2B22          00B36   796          BAL   8,AG10                    AG042700
00C984 5960 2F9C          00FB0   797          C     6,AG40                    AG042800
00C988 4740 2950          00964   798          BL    AG127                     AG042900
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                                      799          PROP  AG9,133,X'40'                                  AG043000
000996 9211 37C8       0171F          802          MVI   AG9,X'11'                                       AG043100
COC99A 4580 2B22              00B36   803          BAL   8,AG10                                          AG043200
00C99E 5860 2F9C              00FBC   804          L     6,AG40                                          AG043300
0009A2 4186 39BC              015DC   805          LA    8,AG23(6)                                       AG043400
00C9A6 925C 800C       0C00C          806          MVI   0(8),C'*'                                       AG043500
0009AA 4166 0001              00001   807          LA    6,1(6)                                          AG043600
0009AE 506C 2F9C              00FB0   808          ST    6,AG40                                          AG043700
COC9B2 5880 2F94              00FAE   809 AG195     L     8,AG31                                          AG043800
COC9B6 07F8                           810          BR    8                                               AG043900
COC9B8 D24F 500C 36BB 0C00C 016CF     811 AG25     MVC   0(80,5),AG8                                     AG044000
0009BE 4155 005C              00050   812          LA    5,80(5)                                         AG044100
00C9C2 4166 C05C              00050   813          LA    6,80(6)                                         AG044200
00C9C6 596C 3448              0145C   814          C     6,AG180                                         AG044300
COC9CA 474C 289C              008BC   815          BL    AG33                                            AG044400
                                      816          PROP  AG9,133,X'40'                                   AG044500
0009D8 D216 370C 3806 0172C 0181A     819          MVC   AG9+1(23),AG39                                  AG044600
0009DE D205 3724 39BC 015D0 820       MVC   AG9+25(6),AG23                                  AG044700
00C9E4 47FC 28FE              00912   821          B     AG38                                            AG044800
00C9E8 417C 36D4              016E8   822 AG83     LA    7,AG8+25                                        AG044900
0009EC 1B99                           823          SR    9,9                                             AG045000
0009EE D237 36D4 36D3 01618 016E7     824          MVC   AG207(56),AG8+24                                AG045100
0009F4 599C 338C              01394   825 AG88     C     9,AG84                                          AG045200
00C9F8 47BC 2CCC              00CD4   826          BNL   AG203                                           AG045300
00C9FC D502 7000 3831 00000 01845     827          CLC   0(3,7),AG85                                     AG045400
COCA02 477C 2AC0              00A14   828          BNE   AG9C                                            AG045500
COCAC6 1299                           829          LTR   9,9                                             AG045600
COCA08 472C 2CC0              00CD4   83C          BH    AG203                                           AG045700
00CA0C 4180 2CC0              00CD4   831          LA    8,AG203                                         AG045800
000A10 47FC 2A92              00AA6   832          B     AG91                                            AG045900
000A14 1BAA                           833 AG90     SR    10,10                                           AG046000
000A16 41BC 3828              0183C   834          LA    11,AG7C                                         AG046100
000A1A 59AC 2FB8              00FCC   835 AG86     C     10,AG69                                         AG046200
00CA1E 474C 2A16              00A2A   836          BL    AG181                                           AG046300
00CA22 4177 0004              00004   837          LA    7,4(7)                                          AG046400
C00A26 47FC 2A8A              00A9E   838          B     AG182                                           AG046500
000A2A D50C 70C0 B000 00C0C 00C0C     839 AG181    CLC   0(1,7),C(11)                                   AG046600
C00A30 4780 2A2C              00A40   84C          BE    AG89                                            AG046700
000A34 41BB 0001              00001   841          LA    11,1(11)                                        AG046800
000A38 41AA 0001              00001   842          LA    10,1(10)                                        AG046900
00CA3C 47FC 2A06              00A1A   843          B     AG86                                            AG047000
000A40 4177 0001              00001   844 AG89     LA    7,1(7)                                          AG047100
COCA44 D201 36B8 700C 016CC 00000     845          MVC   AG196(2),0(7)                                   AG047200
                                      846          SCAN  I,AG196,2                                       AG047300
00CA58 18FC                           853          LR    15,0                                            AG047400
COCA5A 89AC 0003              00C03   854          SLL   10,3                                            AG047500
000A5E 41AA 2FBC              00FD0   855          LA    10,AG71(10)                                     AG047600
COCA62 41BA 0C04              00004   856          LA    11,4(10)                                        AG047700
COCA66 59FC 33D0              013E4   857          C     15,AG87                                         AG047800
00CA6A 474C 2A8E              00A9A   858          BL    AG93                                            AG047900
00CA6E 59FB 0CC0              00C0C   859          C     15,C(11)                                        AG048000
C00A72 472C 2A8E              00A9A   860          BH    AG93                                            AG048100
00CA76 588A 0000              00C0C   861          L     11,0(10)                                        AG048200
C0CA7A 5BFC 33D0              013E4   862          S     15,AG87                                         AG048300
COCA7E 89F0 0002              00002   863          SLL   15,2                                            AG048400
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  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                              F01JAN68   7/02/68

000A82 58EF B000              00000   864             L     14,0(15,11)                                        AG048500
000A86 41EE 0001              00001   865             LA    14,1(14)                                           AG048600
000A8A 50EF B000              00000   866             ST    14,0(15,11)                                        AG048700
000A8E 4177 0003              00003   867             LA    7,3(7)                                             AG048800
000A92 4199 0001              00001   868             LA    9,1(9)                                             AG048900
000A96 47F0 29E0              009F4   869             B     AG88                                               AG049000
000A9A 4177 0003              00003   870 AG93        LA    7,3(7)                                             AG049100
000A9E 4199 0001              00001   871 AG182       LA    9,1(9)                                             AG049200
000AA2 4180 29E0              009F4   872             LA    8,AG88                                             AG049300
                                      873 AG91        PROP  AG9,133,X'4C'                                      AG049400
000AB0 D215 37CC 3834 01720 01848     876             MVC   AG9+1(22),AG92                                     AG049500
000AB6 D24F 3724 36BB 01738 016CF     877             MVC   AG9+25(80),AG8                                     AG049600
000ABC 9211 37CB        0171F         878             MVI   AG9,X'11'                                          AG049700
000AC0 47F0 2B22              00B36   879             B     AG10                                               AG049800
000AC4 95F0 37F5        01809         880 AG125       CLI   AG19,C'0'                                          AG049900
000AC8 4780 2AC2              00AD6   881             BE    AG140                                              AG050000
                                      882             CLOSE AG41                                               AG050100
000AD6 95F0 36BA        016CE         888 AG140       CLI   AG5,C'0'                                           AG050200
000ADA 477C 2AE0              00AF4   889             BNE   AG152                                              AG050300
000ADE D203 2FAC 33F0 00FB4 01404     890             MVC   AG56(4),AG116                                      AG050400
                                      891             CALL  CEMT                                               AG050500
                                      897 AG152       CLOSE (AG7,,AG20)                                        AG050600
                                      905             CLOSE AG6                                                AG051700
                                      911             NRCR  AG1                                                AG051800
000B1A 4199 0004              00004   917 AG58        LA    9,4(9)                                             AG051900
000B1E 4090 39B8              019CC   918             STH   9,AG170                                            AG052000
                                      919             PUT   AG20,AG170                                         AG052100
000B30 5B90 33C4              013D8   924             S     9,AG183                                            AG052200
000B34 07F8                           925             BR    8                                                  AG052300
                                      926 AG10        PUT   AG6,AG9                                            AG052400
000B44 07F8                           931             BR    8                                                  AG052500
                                      932 AG11        GET   AG7,AG8                                            AG052600
000B54 07F8                           937             BR    8                                                  AG052700
                                      938 AG154       CLOSE AG7                                                AG052800
                                      944             PROP  AG9,133,X'40'                                      AG052900
000B6C 9211 37CB        0171F         947             MVI   AG9,X'11'                                          AG053000
000B70 D20F 37CC 38FD 0172C 01911     948             MVC   AG9+1(16),AG155                                    AG053100
000B76 4180 2AB0              00AC4   949             LA    8,AG125                                            AG053200
000B7A 47F0 2B22              00B36   950             B     AG10                                               AG053300
000B7E 4199 0004              00004   951 AG163       LA    9,4(9)                                             AG053400
000B82 409C 418C              021A0   952             STH   9,AG171                                            AG053500
                                      953             PUT   AG20,AG171                                         AG053600
000B94 5B90 33C4              013D8   958             S     9,AG183                                            AG053700
000B98 07F8                           959             BR    8                                                  AG053800
000B9A D203 3404 33F0 01418 01404     960 AG53        MVC   AG135(4),AG116                                     AG053900
000BA0 D203 34C8 33F0 0141C 01404     961             MVC   AG137(4),AG116                                     AG054000
                                      962             GET   AG41,AG171                                         AG054100
000BB4 489C 418C              021AC   967             LH    9,AG171                                            AG054200
000BB8 5B90 33C4              013D8   968             S     9,AG183                                            AG054300
000BBC 58FC 34C4              01418   969             L     15,AG135                                           AG054400
000BC0 59F0 33D0              013E4   970             C     15,AG87                                            AG054500
000BC4 472C 2BE0              00BF4   971             BH    AG172                                              AG054600
000BC8 474C 2BDE              00BF2   972             BL    AG144                                              AG054700
                                      973             PROP  AG9,133,X'40'                                      AG054800
000BD6 9211 37CB        0171F         976             MVI   AG9,X'11'                                          AG054900
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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F01JAN68  7/02/68

000BDA D220 370C 38C8 0172C 018DC   977          MVC   AG9+1(33),AG142                              AG055000
000BE0 508C 34CC            0142C   978          ST    8,AG143                                      AG055100
000BE4 D21F 3723 3414 01747 0142E   979          MVC   AG9+40(32),AG15C                             AG055200
000BEA 458C 2B22            00B36   980          BAL   8,AG10                                       AG055300
000BEE 588C 34CC            0142C   981          L     8,AG143                                      AG055400
000BF2 07F8                         982 AG144    BR    8                                            AG055500
                                    983 AG172    PROP  AG9,133,X'4C'                                AG055600
000BFE 9211 370B      0171F         986          MVI   AG9,X'11'                                    AG055700
000C02 D217 37CC 3925 0172C 01939   987          MVC   AG9+1(24),AG145                              AG055800
000C08 D21F 3724 3414 01738 01428   988          MVC   AG9+25(32),AG150                             AG055900
000C0E 5080 34CC            01420   989          ST    8,AG143                                      AG056000
000C12 458C 2B22            00836   990          BAL   8,AG10                                       AG056100
000C16 5880 34CC            01420   991          L     8,AG143                                      AG056200
000C1A 47F0 2B8E            0CB9A   992          B     AG53                                         AG056300
                                    993 AG141    CLOSE AG41              END OF FILE IN TAPE        AG056400
                                    999          PROP  AG9,133,X'4C'                                AG056500
000C34 9211 370B      0171F         1002         MVI   AG9,X'11'                                    AG056600
000C38 D216 37CC 38AF 0172C 018C3   1003         MVC   AG9+1(23),AG139                              AG056700
000C3E 4180 2AC2            00AD6   1004         LA    8,AG140                                      AG056800
000C42 47F0 2B22            00B36   1005         B     AG10                                         AG056900
000C46 900F 3384            01398   1006 AG136   STM   0,15,AG184    IN TAPE ERROR ROUTINE        AG057000
                                    1007         PROP  AG150,32,X'40'                               AG057100
000C54 4160 3414            01428   1010         LA    6,AG150                                      AG057200
000C58 1870                         1011         LR    7,0                                          AG057300
000C5A 4177 00C2            00C02   1012         LA    7,2(7)                                       AG057400
000C5E 1B55                         1013         SR    5,5                                          AG057500
000C60 5950 39BC            019C4   1014 AG187   C     5,AG185                                      AG057600
000C64 47B0 2C8E            00CA2   1015         BNL   AG188                                        AG057700
000C68 1B88                         1016         SR    8,8                                          AG057800
000C6A 1898                         1017         LR    9,8                                          AG057900
000C6C 4387 00C0            00000   1018         IC    8,0(7)                                       AG058000
000C70 8C80 0004            00004   1019         SRDL  8,4                                          AG058100
000C74 4286 0000            00000   1020         STC   8,0(6)                                       AG058200
000C78 DC00 6000 36A8 00000 016BC   1021         TR    0(1,6),AG186                                 AG058300
000C7E 4166 00C1            00001   1022         LA    6,1(6)                                       AG058400
000C82 1B88                         1023         SR    8,8                                          AG058500
000C84 8D80 0004            00004   1024         SLDL  8,4                                          AG058600
000C88 4286 C000            00000   1025         STC   8,0(6)                                       AG058700
000C8C DC0C 60CC 36A8 00C0C 016BC   1026         TR    0(1,6),AG186                                 AG058800
000C92 4166 0001            00001   1027         LA    6,1(6)                                       AG058900
000C96 4155 00C1            00C01   1028         LA    5,1(5)                                       AG059000
000C9A 4177 0001            00C01   1029         LA    7,1(7)                                       AG059100
000C9E 47FC 2C4C            00C6C   103C         B     AG187                                        AG059200
000CA2 5010 33CC            013EC   1031 AG188   ST    1,AG189                                      AG059300
000CA6 4190 00C1            00001   1032         LA    9,1                                          AG059400
000CAA 5090 3404            01418   1033         ST    9,AG135                                      AG059500
000CAE 9180 33CC      013EC         1034         TM    AG189,X'80'                                  AG059600
000CB2 478C 2CB0            0CCC4   1035         BC    8,AG190                                      AG059700
000CB6 9110 33CC      013EC         1036         TM    AG189,X'10'                                  AG059800
000CBA 478C 2CB0            00CC4   1037         BC    8,AG190                                      AG059900
000CBE 980F 3384            01398   1038 AG192   LM    0,15,AG184                                   AG060000
                                    1039         RETURN                                             AG060100
000CC4 589C 3404            01418   1041 AG190   L     9,AG135                                      AG060200
000CC8 4199 00C1            00001   1042         LA    9,1(9)                                       AG060300
000CCC 509C 3404            01418   1043         ST    9,AG135                                      AG060400
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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  AG060500
00CCD0 47F0 2CAA            00CBE  1044           B      AG192                              AG060600
00CCD4 4170 36F8            0170C  1045 AG2C3     LA     7,AG8+61                           AG060700
00CCD8 1B99                        1046           SR     9,9                                AG060800
00CCDA 599C 346E            0147C  1047 AG2C4     C      9,AG2C5                            AG060900
00CCDE 4720 29A4            009B8  1048           BH     AG25                               AG061000
00CCE2 D501 7000 3831 C0J0C 01845  1049           CLC    0(2,7),AG85                        AG061100
00CCE8 4780 29A4            009B8  1050           BE     AG25                               AG061200
00CCEC D201 36B8 7C0C 016CC 0CC0C  1051           MVC    AG196(2),0(7)                      AG061300
                                   1052           SCAN   I,AG196,2                          AG061400
00CD00 18FC                        1059           LR     15,C                               AG061500
00CD02 89F0 00C2            00002  1060           SLL    15,2                               AG061600
00CDC6 58AF 346C            0148C  1061           L      10,AG201(15)                       AG061700
00CD0A 41AA 0001            00001  1062           LA     10,1(10)                           AG061800
00CD0E 50AF 346C            0148C  1063           ST     10,AG201(15)                       AG061900
00CD12 4177 00C3            00003  1064           LA     7,3(7)                             AG062000
00CD16 4199 0CC1            00C01  1065           LA     9,1(9)                             AG062100
00CD1A 47F0 2CC6            00CDA  1066           B      AG204                              AG062200
00CD1E 940F 2D31      0CD45        1067 AG210     NI     AG216+1,X'0F'                      AG062300
00CD22 D203 39BC 363C 019D0 01650  1068 AG217     MVC    AG23(4),AG211                      AG062400
                                   1069           PROP   AG9,133,X'40'                      AG062500
00CD32 9211 37CB      C171F        1072           MVI    AG9,X'11'                          AG062600
00CD36 4580 2B22            00B36  1073           BAL    8,AG10                             AG062700
00CD3A D214 37CC 365C 0172C 0167C  1074           MVC    AG9+1(21),AG212                    AG062800
00CD40 458C 2B22            00B36  1075           BAL    8,AG10                             AG062900
00CD44 47CC 2D84            00D98  1076 AG216     BC     0,AG218                            AG063000
00CD48 1B77                        1077           SR     7,7                                AG063100
00CD4A 5B7C 33DC            013E4  1078           S      7,AG87                             AG063200
00CD4E 4150 33FC            01404  1079           LA     5,AG116                            AG063300
00CD52 416C 39CC            019D4  1080           LA     6,AG23+4                           AG063400
00CD56 41AC 346C            0148C  1081           LA     10,AG201                           AG063500
00CD5A 41BC 0063            00063  1082           LA     11,99                              AG063600
00CD5E 58FA 0C00            00C00  1083 AG213     L      15,C(10)                           AG063700
00CD62 50F6 00C0            00C0C  1084           ST     15,C(6)                            AG063800
00CD66 59FC 33FC            01404  1085           C      15,AG116                           AG063900
00CD6A 4780 2D5E            00D72  1086           BE     AG214                              AG064000
00CD6E 458C 28CC            0082C  1087           BAL    8,AG111                            AG064100
00CD72 4177 00C1            00001  1088 AG214     LA     7,1(7)                             AG064200
00CD76 4166 00C4            00004  1089           LA     6,4(6)                             AG064300
00CD7A 41AA 0004            00004  1090           LA     10,4(10)                           AG064400
00CD7E 197B                        1091           CR     7,11                               AG064500
00CD80 474C 2D4A            00D5E  1092           BL     AG213                              AG064600
00CD84 4190 0194            00194  1093           LA     9,404                              AG064700
00CD88 418C 26AE            006C2  1094           LA     8,AG177                            AG064800
00CD8C 47FC 2BC6            00B1A  1095           B      AG58                               AG064900
00CD90 96FC 2D31      0CD45        1096 AG215     OI     AG216+1,X'FC'                      AG065000
00CD94 47FC 2DCE            00D22  1097           B      AG217                              AG065100
00CD98 1B77                        1098 AG218     SR     7,7                                AG065200
00CD9A 5B7C 33D0            013E4  1099           S      7,AG87                             AG065300
00CD9E 416C 39C0            019D4  1100           LA     6,AG23+4                           AG065400
00CDA2 41AC 346C            0148C  1101           LA     10,AG201                           AG065500
00CDA6 4150 4194            021A8  1102           LA     5,AG55+4                           AG065600
00CDAA 41BC C063            00C63  1103           LA     11,99                              AG065700
00CDAE D203 39BC 363C 019DC 0165C  1104           MVC    AG23(4),AG211                      AG065800
00CDB4 58F5 00C0            00C0C  1105 AG219     L      15,C(5)                            AG065900
00CDB8 5AFA 00CC            00C00  1106           A      15,C(10)
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LOC   OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    AG066000
00DBC 50F6 0000             0C0C0  1107           ST    15,0(6)              AG066000
00DC0 58FA 00C0             00C00  1108           L     15,0(10)             AG066100
00DC4 59FC 33F0             01404  1109           C     15,AG116             AG066200
00DC8 478C 2D8C             00DD0  1110           BE    AG220                AG066300
00DCC 458C 28CC             00820  1111           BAL   8,AG111              AG066400
00DD0 4177 00C1             00001  1112 AG220     LA    7,1(7)               AG066500
00DD4 4166 00C4             00004  1113           LA    6,4(6)               AG066600
00DD8 4155 00C4             00004  1114           LA    5,4(5)               AG066700
00DDC 41AA 00C4             00004  1115           LA    10,4(10)             AG066800
00DE0 197B                         1116           CR    7,11                 AG066900
00DE2 474C 2DAC             00DB4  1117           BL    AG219                AG067000
00DE6 4190 C194             00194  1118           LA    9,404                AG067100
00DEA 4180 26AE             006C2  1119           LA    8,AG177              AG067200
00DEE 47F0 2B06             00B1A  1120           B     AG58                 AG067300
00DF2 906B 345C             01464  1121 AG222     STM   6,11,AG223           AG067400
00DF6 4160 36C5             01619  1122           LA    6,AG207+1            AG067500
00DFA 4170 0001             00C01  1123           LA    7,1                  AG067600
00DFE 5970 3468             0147C  1124 AG225     C     7,AG205              AG067700
00E02 472C 2EAE             00EC2  1125           BH    AG227                AG067800
00E06 D502 60CC 3831 00C0C  01845  1126           CLC   0(3,6),AG85          AG067900
00E0C 4780 2EAE             00EC2  1127           BE    AG227                AG068000
00E10 4180 3828             0183C  1128           LA    8,AG70               AG068100
00E14 1BAA                         1129           SR    10,10                AG068200
00E16 59AC 2FB8             00FCC  1130 AG224     C     10,AG69              AG068300
00E1A 474C 2E16             00E2A  1131           BL    AG232                AG068400
00E1E 4166 0001             00001  1132           LA    6,1(6)               AG068500
00E22 4177 00C1             00001  1133           LA    7,1(7)               AG068600
00E26 47F0 2E88             00E9C  1134           B     AG233                AG068700
00E2A D50C 60CC 800C 00C0C  00000  1135 AG232     CLC   0(1,6),0(8)          AG068800
00E30 478C 2E28             00E3C  1136           BE    AG234                AG068900
00E34 41AA 00C1             00001  1137           LA    10,1(10)             AG069000
00E38 4188 00C1             00001  1138           LA    8,1(8)               AG069100
00E3C 4166 0001             00C01  1139 AG234     LA    6,1(6)               AG069200
00E40 D201 36B8 6C0C 016CC  00000  1140           MVC   AG196(2),0(6)        AG069300
                                   1141           SCAN  I,AG196,2            AG069400
00E54 18F0                         1148           LR    15,0                 AG069500
00E56 188A                         1149           LR    8,10                 AG069600
00E58 8980 0003             00003  1150           SLL   8,3                  AG069700
00E5C 41A0 2FBC             00FD0  1151           LA    10,AG71              AG069800
00E60 1A8A                         1152           AR    8,10                 AG069900
00E62 18A8                         1153           LR    10,8                 AG070000
00E64 41AA 00C4             00004  1154           LA    10,4(10)             AG070100
00E68 59F0 33D0             013E4  1155           C     15,AG87              AG070200
00E6C 4740 2E88             00E9C  1156           BL    AG233                AG070300
00E70 59FA 0000             00000  1157           C     15,0(10)             AG070400
00E74 4720 2E88             00E9C  1158           BH    AG233                AG070500
00E78 58A8 0000             00C00  1159           L     10,0(8)              AG070600
00E7C 5BF0 33D0             013E4  1160           S     15,AG87              AG070700
00E80 89F0 0002             00002  1161           SLL   15,2                 AG070800
00E84 58EF A000             00000  1162           L     14,0(15,10)          AG070900
00E88 5BEC 33D0             013E4  1163           S     14,AG87              AG071000
00E8C 50EF A0CC             00000  1164           ST    14,0(15,10)          AG071100
00E90 4166 0003             00003  1165           LA    6,3(6)               AG071200
00E94 4177 00C1             00001  1166           LA    7,1(7)               AG071300
00E98 47FC 2DEA             00DFE  1167           B     AG225                AG071400
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                                1168 AG233    PROP  AG9,133,X'4C'                    AG071500
00CEA6 9211 37CB       0171F    1171          MVI   AG9,X'11'                       AG071600
00CEAA D21B 37CC 367C  0172C 01684 1172       MVC   AG9+1(28),AG226                AG071700
00CE80 D204 372S 39BD  0173D 019D1 1173       MVC   AG9+30(5),AG23+1               AG071800
00CEB6 4166 C0C3             00C03 1174       LA    6,3(6)                         AG071900
00CEBA 4180 2DEA             00DFE 1175       LA    8,AG225                        AG072000
00CEBE 47F0 2B22             00B36 1176       B     AG10                           AG072100
00CEC2 416C 362S             0163D 1177 AG227 LA    6,AG207+37                     AG072200
00CEC6 4170 00C1             00001 1178       LA    7,1                            AG072300
00CECA 5970 3468             0147C 1179 AG228 C     7,AG205                        AG072400
00CECE 472C 2F28             00F3C 1180       BH    AG235                          AG072500
00CED2 D501 60C0 3831  00C0C 01845 1181       CLC   0(2,6),AG85                    AG072600
00CED8 4780 2F28             00F3C 1182       BE    AG235                          AG072700
00CEDC D201 36B8 6C0C  016CC 00000 1183       MVC   AG196(2),C(6)                  AG072800
                                1184          SCAN  I,AG196,2                      AG072900
00CEF0 1890                     1191          LR    9,0                            AG073000
00CEF2 5990 35FC             0161C 1192       C     9,AG208                        AG073100
00CEF6 47DC 2F08             00F1C 1193       BNH   AG229                          AG073200
                                1194          PROP  AG9,133,X'4C'                  AG073300
00CF04 9211 37CB       0171F    1197          MVI   AG9,X'11'                      AG073400
00CF08 D218 37CC 368C  0172C 016A0 1198       MVC   AG9+1(28),AG230                AG073500
00CF0E D204 372S 39BD  0173D 019D1 1199       MVC   AG9+30(5),AG23+1               AG073600
00CF14 4180 2F1C             00F30 1200       LA    8,AG231                        AG073700
00CF18 47F0 2B22             00B36 1201       B     AG10                           AG073800
00CF1C 4180 346C             01480 1202 AG229 LA    8,AG201                        AG073900
00CF20 899C 00C2             00002 1203       SLL   9,2                            AG074000
00CF24 58AS 80C0             00C0C 1204       L     10,C(9,8)                      AG074100
00CF28 5BAC 33DC             013E4 1205       S     10,AG87                        AG074200
00CF2C 50AS 80C0             00C0C 1206       ST    10,C(9,8)                      AG074300
00CF30 4177 C0C1             00001 1207 AG231 LA    7,1(7)                         AG074400
00CF34 4166 0003             00003 1208       LA    6,3(6)                         AG074500
00CF38 47FC 2EB6             00ECA 1209       B     AG228                          AG074600
00CF3C 9868 3450             01464 1210 AG235 LM    6,11,AG223                     AG074700
00CF40 47F0 243C             00444 1211       B     AG54                           AG074800
00CF48                          1212 AG16     DS    D                              AG074900
00CF50                          1213 AG178    DS    F                              AG075000
00CF54                          1214 AG176    DS    F                              AG075100
00CF58                          1215 AG1      DS    18F                            AG075200
00CFA0 00001014                 1216 AG4      DC    A(AG2+4096)                    AG075300
00CFA4 00002014                 1217          DC    A(AG2+8192)                    AG075400
00CFA8                          1218 AG31     DS    F                              AG075500
00CFAC                          1219 AG36     DS    F                              AG075600
00CFB0                          1220 AG40     DS    F                              AG075700
00CFB4                          1221 AG56     DS    5F                             AG075800
00CFC8                          1222 AG65     DS    F                              AG075900
00CFCC C0000009                 1223 AG69     DC    F'9'                           AG076000
00CFD0 00001018                 1224 AG71     DC    A(AG72)                        AG076100
00CFD4 00CCC012                 1225          DC    F'18'                          AG076200
00CFD8 00C106C                  1226          DC    A(AG73)                        AG076300
00CFDC 00C001D                  1227          DC    F'29'                          AG076400
00CFE0 000010D4                 1228          DC    A(AG74)                        AG076500
00CFE4 00C0001A                 1229          DC    F'26'                          AG076600
00CFE8 0000113C                 1230          DC    A(AG75)                        AG076700
00CFEC 0000000E                 1231          DC    F'14'                          AG076800
00CFF0 00001174                 1232          DC    A(AG76)                        AG076900
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00CFF4 00000017                    1233          DC    F'23'                                    AG077000
00CFF8 000C1100                    1234          DC    A(AG77)                                  AG077100
00CFFC 00C00000                    1235          DC    F'13'                                    AG077200
C01000 00001204                    1236          DC    A(AG78)                                  AG077300
C01004 0000001C                    1237          DC    F'16'                                    AG077400
C01008 00001244                    1238          DC    A(AG79)                                  AG077500
C0100C 000CC040                    1239          DC    F'64'                                    AG077600
001010 00001344                    1240          DC    A(AG80)                                  AG077700
C01014 00000012                    1241          DC    F'18'                                    AG077800
001018                             1242 AG72     DS    18F                                      AG077900
001060                             1243 AG73     DS    29F                                      AG078000
0010D4                             1244 AG74     DS    26F                                      AG078100
00113C                             1245 AG75     DS    14F                                      AG078200
001174                             1246 AG76     DS    23F                                      AG078300
0011D0                             1247 AG77     DS    13F                                      AG078400
C01204                             1248 AG78     DS    16F                                      AG078500
001244                             1249 AG79     DS    64F                                      AG078600
001344                             1250 AG80     DS    18F                                      AG078700
00138C                             1251          DS    F                                        AG078800
001390 00C00CDD                    1252 AG82     DC    F'221'                                   AG078900
C01394 00000009                    1253 AGE4     DC    F'9'                                     AG079000
C01398                             1254 AG184    DS    16F                                      AG079100
0013D8 00000004                    1255 AG183    DC    F'4'                                     AG079200
0013DC 00000084                    1256 AG175    DC    F'132'                                   AG079300
0013E0                             1257 AG189    DS    F                                        AG079400
0013E4 00000C01                    1258 AG87     DC    F'1'                                     AG079500
0013E8 00CCCC09                    1259 AG94     DC    F'9'                                     AG079600
0013EC                             126C AG95     DS    F                                        AG079700
0013F0                             1261 AG96     DS    F                                        AG079800
0013F4                             1262 AG97     DS    F                                        AG079900
0013F8                             1263 AG115    DS    3F                                       AG080000
001404 000C0000                    1264 AG116    DC    F'0'                                     AG080100
001408                             1265 AG126    DS    F                                        AG080200
C0140C                             1266 AG129    DS    F                                        AG080300
C01410 0000000D                    1267 AG130    DC    F'13'                                    AG080400
001414 000F424C                    1268 AG131    DC    F'1000000'                               AG080500
001418                             1269 AG135    DS    F                                        AG080600
00141C                             127C AG137    DS    F                                        AG080700
001420                             1271 AG143    DS    F                                        AG080800
001428                             1272 AG150    DS    4D                                       AG080900
C01448                             1273 AG157    DS    5F                                       AG081000
C0145C 000C07D0                    1274 AG180    DC    F'2000'                                  AG081100
C01460                             1275 AG2C0    DS    F                                        AG081200
001464                             1276 AG223    DS    6F                                       AG081300
00147C 00000006                    1277 AG205    DC    F'6'                                     AG081400
C01480                             1278 AG201    DS    100F                                     AG081500
001610 00000C64                    1279 AG208    DC    F'1CC'                                   AG081600
C01614                             1280 AG243    DS    F                                        AG081700
001618                             1281 AG207    DS    CL56                                     AG081800
001650 C3C3C3C3                    1282 AG211    DC    C'CCCC'                                  AG081900
001654 E2D6D4C54CE3C8C9            1283 AG221    DC    C'SOME THING WRONG WITH COUNTS'          AG082000
001670 C2C9C24B40D9C5C6            1284 AG212    DC    C'BIB. REFERENCE COUNT'                  AG082100
001684 E2E4C24B4CC5D9D9            1285 AG226    DC    C'SUB. ERROR IN MODT. RECOVERY'          AG082200
0016A0 C2C9C24B40C5D9D9            1286 AG230    DC    C'BIB. ERROR IN MODT. RECOVERY'          AG082300
0016BC F0F1F2F3F4F5F6F7            1287 AG186    DC    C'0123456789ABCDEF'                      AG082400
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0016CC                          1288 AG196    DS    CL2                                  AG082500
C016CE                          1289 AG5      DS    CL1                                  AG082600
0016CF                          1290 AG8      DS    CL80                                 AG082700
00171F                          1291 AG9      DS    CL133                                AG082800
C017A4                          1292 AG12     DS    CL80                                 AG082900
0017F4 C3C1D9C44CC6D6D9         1293 AG13     DC    C'CARD FORMAT ERROR'                 AG083000
C01805                          1294 AG17     DS    CL1                                  AG083100
C01806                          1295 AG18     DS    CL1                                  AG083200
C01807 5B5C                     1296 AG24     DC    C'$*'                                AG083300
001809                          1297 AG19     DS    CL1                                  AG083400
00180A E6D9D6D5C74CC9D5         1298 AG37     DC    C'WRONG INPUT REF.'                  AG083500
00181A C4C1E3C140C7D9D6         1299 AG39     DC    C'DATA GRCUP TO LONG REF.'           AG083600
001831 C1C1C1C1                 1300 AG59     DC    C'AAAA'                              AG083700
C01835 C2C2C2C2                 1301 AG194    DC    C'BBBB'                              AG083800
C01839 5BC5E7                   1302 AG67     DC    C'$EX'                               AG083900
C0183C C2                       1303 AG70     DC    C'B'                                 AG084000
00183D E3                       1304          DC    C'T'                                 AG084100
00183E E2                       1305          DC    C'S'                                 AG084200
C0183F C5                       1306          DC    C'E'                                 AG084300
001840 D9                       1307          DC    C'R'                                 AG084400
001841 C3                       1308          DC    C'C'                                 AG084500
C01842 C7                       1309          DC    C'G'                                 AG084600
C01843 C6                       1310          DC    C'F'                                 AG084700
001844 C1                       1311          DC    C'A'                                 AG084800
001845 404040                   1312 AG85     DC    X'404040'                            AG084900
001848 E2E4C2D1C5C3E340         1313 AG92     DC    C'SUBJECT FIELD IN ERROR'            AG085000
00185E 5C5C5CE2E4C2D1C5         1314 AG98     DC    C'***SUBJECT TOTALS***'              AG085100
C01872 E3E8D7C5                 1315 AG99     DC    C'TYPE'                              AG085200
001876 D7D9C5E5C9D6E4E2         1316 AG1C0    DC    C'PREVIOUS'                          AG085300
00187E C1C4C4C5C4               1317 AG101    DC    C'ADDED'                             AG085400
001883 E3D6E3C1D3               1318 AG102    DC    C'TOTAL'                             AG085500
001888 E348D9C5C64B             1319 AG1C3    DC    C'T.REF.'                            AG085600
00188E C3D6E4D5E34CD9C5         1320 AG122    DC    C'COUNT RECORD NOT VALID'            AG085700
C018A4 E3C9D4C57E               1321 AG132    DC    C'TIME='                             AG085800
C018A9 C5D9D9D6D960D6E4         1322 AG133    DC    C'ERROR-OUTPUT TAPE NOT IND.'        AG085900
0018C3 C5D5C44CD6CE40C6         1323 AG139    DC    C'END OF FILE ON INPUT TAPE'         AG086000
C018DC D7C1D9C9E3E84CC5         1324 AG142    DC    C'PARITY ERROR INDICATED ON IN.TAPE' AG086100
C018FD C9D540E3C1D7C54C         1325 AG149    DC    C'IN TAPE UNREC. ERROR'              AG086200
001911 C5D5C44CD6C64CC3         1326 AG155    DC    C'END OF CARD FILE'                  AG086400
001921 C6D6D9C4C1E340C5         1327 AG156    DC    C'FORMAT ERROR ON NEW DATA'          AG086500
001939 E4D5C3D6D9D9C5C3         1328 AG145    DC    C'UNCORRECTABLE READ ERROR'          AG086600
001951 E4D5C3D6D9D9C5C3         1329 AG164    DC    C'UNCORRECTABLE ERROR IN MODT'       AG086700
C0196C D4C1E2E3C5D94CD9         1330 AG165    DC    C'MASTER REF.'                       AG086800
C01977 C5D9D9D6D94CE3E8         1331 AG166    DC    C'ERROR TYPE'                        AG086900
001981 C9D5C6D6D9D4C1E3         1332 AG168    DC    C'INFORMATION LOST DURING MODT'      AG087000
00199D C9C4C5D5E3D34CE3         1333 AG179    DC    C'IDENT. TERMINATE'                  AG087100
C019AD C3D6D9D9C5C3E3C9         1334 AG242    DC    C'CORRECTION PLACED WRONG'           AG087200
0019C4 C0000010                 1335 AG185    DC    F'16'                                AG087300
C019C8                          1336 AG173    DS    0F                                   AG087400
C019C8 FCFFFFFF                 1337          DC    X'FCFFFFFF'                          AG087500
0019CC                          1338 AG17C    DS    0F                                   AG087600
0019CC 404C4040                 1339          DC    X'4C404040'                          AG087700
0019D0                          1340 AG23     DS    500F                                 AG087800
0021A0                          1341 AG171    DS    0F                                   AG087900
0021A0 404C4040                 1342          DC    X'4C404040'                          AG088000
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  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    F01JAN68   7/02/68
C021A4                            1343 AG55      DS    50CF                                              AG088100
C0C000                            1344           END   AG3                                               AG088200
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SYMBOL	LEN	VALUE	DEFN	REFERENCES														
AG1	0C0C4	000F5E	1215	C014	0377	C913												
AG10	000C4	0C0B36	0927	0265	0270	0296	0369	0399	0417	0426	0433	0471	0521	0524	0535	0579	0608	0630
				0735	0774	0784	0796	0803	0879	0950	0980	0990	1005	1073	1075	1176	1201	
AG100	0CCC8	C0187E	1316	C532														
AG101	00005	C0187E	1317	C533														
AG102	0C005	001883	1318	C534														
AG103	00006	001888	1319	C578														
AG104	0CC04	CC055C	0516	C513														
AG105	0CCC4	000554	0518	C515														
AG106	CCCC4	C0065C	0585	C514	C516	C670												
AG107	00004	0C07BA	0672	C585														
AG108	0C0C4	000642	0581															
AG109	0CCC6	CC06E4	0618	C623														
AG11	000C4	CC0B4E	0933	C266	0287	0298	0746											
AG110	0CCC6	C00734	0638	0619														
AG111	C0004	C00820	C698	C656	0689	1087	1111											
AG113	000C4	0C075A	0647	C666														
AG115	0CCC4	0013F8	1263	0677	0655													
AG116	000C4	C01404	1264	C3C8	0320	0371	0392	C418	0440	0460	0510	0651	C684	C687	0739	0740	C890	0960
				C961	1079	1C85	1109											
AG117	0C0C4	CC0786	0658	C652														
AG118	C00C4	CC080E	0690	C688														
AG119	000C6	CC07FC	0685	C694														
AG12	CCC80	C017A4	1292	0267	0269													
AG120	0CCC2	CC07A8	0667	0660	0696													
AG121	00C02	C006DE	0616	C600														
AG122	0CC22	C0188E	1320	062B														
AG123	0CCC4	CC071E	0632	C636														
AG124	C0CC4	000782	0670	C637														
AG125	0CCC4	000AC4	0880	0614	0949													
AG126	0C0C4	CC140E	1265	C734	0736													
AG127	00CC4	000964	0790	C798														
AG129	0CCC4	C0140C	1266															
AG13	0CC17	C017F4	1293	C294														
AG130	00004	CC141C	1267															
AG131	CCCC4	C01414	1268															
AG132	0CCC5	C018A4	1321															
AG133	CC026	C018A8	1322	0346														
AG135	0CCC4	C01418	1269	0960	0969	1033	1041	1043										
AG136	0C0C4	C00C46	10C6	C236														
AG137	00004	C0141C	127C	C961														
AG139	0CC25	0018C3	1323	10C3														
AG14	0CCC6	C00234	C295	C297	0347	C783												
AG140	0C0C4	CC0AD6	0888	C881	10C4													
AG141	0C0C4	C00C2C	0995	C221														
AG142	0CC33	0018DC	1324	C977														
AG143	0C0C4	CC142C	1271	C978	0981	C989	C991											
AG144	0C0C2	C00BF2	0982	C972														
AG145	CC024	CC193S	1328	C987														
AG149	C0020	CC18FD	1325															
AG15	0CCC6	C00246	0295	C289														
AG150	00CC8	C01428	1272	C979	0988	1CC8	100S	100S	1010									
AG152	0C004	000AF4	0899	C889														
AG154	0C0C4	CC0B5E	0940	C107														
AG155	CCC16	CC1911	1326	C948														

SYMBOL	LEN	VALUE	DEFN	REFERENCES								7/02/68
AG156	00024	001921	1327	0466								
AG157	00004	001448	1273	0467	0487							
AG158	00004	0004B8	0472	0470	0486							
AG159	00004	000532	05C9	0472								
AG16	00008	000F48	1212									
AG160	00004	000484	0471	0488	0491							
AG161	00004	0004FA	0489	0485								
AG162	00006	000400	0479	0490								
AG163	00004	000B7E	0951	0437								
AG164	00027	001951	1329	0398								
AG165	00011	001960	1330	04C4								
AG166	00010	001977	1331	04C6								
AG167	00006	0003F4	0418	0393								
AG168	00028	001981	1332	0424								
AG169	00004	00043E	0434	0419	0432							
AG17	00001	001805	1294									
AG170	00004	001900	1338	0918	0921							
AG171	00004	0021A0	1341	0952	0955	0964	0967					
AG172	00004	000BF4	0984	0971								
AG173	00004	0019C8	1336	0022								
AG174	00004	0001A4	0255	0024								
AG175	00004	001300	1256	0489								
AG176	00004	000F54	1214	0644	0654	0658	0662					
AG177	00004	0006C2	0610	1094	1119							
AG178	00004	000F50	1213	0653	0657							
AG179	00016	001990	1333	0782								
AG18	00001	001806	1295									
AG180	00004	001450	1274	0814								
AG181	00006	000A2A	0839	0836								
AG182	00004	000A9E	0871	0838								
AG183	00004	001308	1255	0924	0958	0968						
AG184	00004	001398	1254	1006	1038							
AG185	00004	0019C4	1335	1014								
AG186	00016	001680	1287	1021	1026							
AG187	00004	000C6C	1014	1030								
AG188	00004	000CA2	1031	1015								
AG189	00004	001320	1257	1031	1034	1036						
AG19	00001	001809	1297	0299	0309	0340	0512	0880				
AG190	00004	000CC4	1041	1035	1037							
AG192	00004	000CBE	1038	1044								
AG193	00004	00054C	0512	0446								
AG194	00004	001835	1301	0599	0612							
AG195	00004	000982	0809	0753								
AG196	00002	0016CC	1288	0845	0852	1051	1058	1140	1147	1183	1190	
AG2	00004	000014	0020	0019	1216	1217						
AG20	00004	000E44	0145	0304	0903	0920	0954					
AG200	00004	00146C	1275	0391	0407							
AG201	00004	001480	1278	0281	1061	1063	1081	1101	1202			
AG203	00004	000D04	1045	0826	0830	0831						
AG204	00004	000DDA	1047	1066								
AG205	00004	001470	1277	1047	1124	1179						
AG207	00056	001618	1281	0824	1122	1177						
AG208	00004	001610	1279	0285	1192							
AG209	00004	000200	0282	0286								
AG21	00004	000EEC	0757	0306	0759							

SYMBOL	LEN	VALUE	DEFN	REFERENCES
AG210	0C0C4	0C0D1E	1067	0674
AG211	0CCC4	0C165C	1282	0597 1068 1104
AG212	00020	CC1670	1284	1074
AG213	CC0C4	0C0D5E	1083	1092
AG214	0CCC4	C00D72	1088	1086
AG215	CCCC4	CC0D9C	1096	0598 06C7
AG216	0C0C4	CC0D44	1076	1067 1096
AG217	0CCC6	0C0D22	1068	1097
AG218	0C002	CC0D9E	1098	1076
AG219	0C0C4	C00DB4	1105	1117
AG22	0CCC4	CC08D8	0755	0743 0756
AG220	0CC04	000DDC	1112	1110
AG221	0CC28	0C1654	1283	06C5
AG222	0CCC4	C00DF2	1121	0415
AG223	0CCC4	C01464	1276	1121 1210
AG224	0CCC4	C00E16	1130	
AG225	CCCC4	0C0DFE	1124	1167 1175
AG226	0CC28	C01684	1285	1172
AG227	CCCC4	C00EC2	1177	1125 1127
AG228	0CCC4	000ECA	1179	12C9
AG229	0CCC4	C00F1C	12C2	1193
AG23	0CC04	CC19D0	1340	0321 0356 0368 0405 0425 0469 0540 0541 0541 0542 0542 0543 0543 0544 0544 0545 0545 0546 0546 0547 0547 0548 0548 0550 0553 0570 0610 0611 0611 0612 0633 0638 0646 0678 0679 0680 0709 0741 0788 0805 0820 1068 1080 1100 1104 1173 1199
AG230	0C028	CC16AC	1266	1198
AG231	0C004	C00F3C	12C7	1200
AG232	0CCC6	C00E2A	1135	1131
AG233	0C0C4	C00E9C	1169	1134 1156 1158
AG234	0CCC4	C00E3C	1139	1136
AG235	CCC04	CC0F3C	1210	1180 1182
AG24	CC002	CC1807	1296	0747
AG240	CC0C6	00036E	0376	0357
AG241	CCCC4	CC0332	0362	0358
AG242	0CC23	0019AD	1334	0367
AG243	0C004	C01614	1280	0350 036C 0376
AG25	0CCC6	CC09B8	0811	0755 1048 1050
AG26	0CCC6	C008F2	0761	0757
AG3	0C004	CC0C0C	0013	1344
AG30	00004	0C088E	0738	03C7 037C 0439 0509
AG31	0C0C4	C00FA8	1218	0738 08C9
AG32	CCCC4	C008D4	0754	0744 075C 0768
AG33	CCCC4	CC08BC	0746	0754 0777 0815
AG34	CCCC4	CC089E	0741	0785
AG35	00004	C00956	0785	0745 0748 0769
AG36	00C04	C00FAC	1219	0739 077C 0772 0776
AG37	00016	C0180A	1298	0766
AG38	CC0C4	CC0912	0768	0821
AG39	CCC23	CC181A	1299	0819
AG4	C00C4	CC0FAC	1216	0020
AG40	00004	C00F8C	1220	0323 0484 0786 0797 0804 08C8
AG41	00004	C00144	02C2	0315 0886 0963 0997
AG42	CCCC4	CC02F4	0348	0317 0319 0332 0341
AG43	CCCC4	CC027E	0319	0310
AG44	CC004	C00286	0321	0318

SYMBOL	LEN	VALUE	DEFN	REFERENCES
AG45	00004	0002CC	0335	0327
AG46	00004	0002B8	0333	0326
AG47	00004	000314	0355	0329 0335 0352 0372 0373 0442
AG48	00004	000448	0438	0330 0336 0359 0362 0374 0378 0434 0443
AG49	00004	000466	0445	0331 0337 0354
AG5	00001	0016CE	1289	0325 0758 0761 0888
AG50	00004	00046E	0447	0328 0333 0348 0445 0511
AG51	00004	0002A8	0329	0334
AG53	00006	000B9A	0960	0349 0596 0992
AG54	00004	000444	0437	0355 0361 0375 1211
AG55	00004	0021A4	1343	0338 0351 0353 0356 0431 0587 0588 0588 0589 0589 0590 0590 0591 0591 0592 0592 0593 0593 0594 0594 0595 0595 0597 0599 0606 0618 0629 0632 0638 0645 1102
AG56	00004	000FB4	1221	0322 0324 0339 0376 0387 0416 0418 0435 0456 0500 0504 0890
AG58	00004	000B1A	0917	0436 0505 0581 0615 0671 1095 1120
AG59	00004	001831	1300	0351 0550
AG6	00004	000C24	0031	0257 0909 0927
AG60	00004	0002F8	0349	0438 0441 0444
AG63	00004	000508	0494	0447
AG64	00004	00051E	0504	0461
AG65	00004	000FC8	1222	0371 0440 0510 0740 0752
AG66	00006	0008BE	0749	
AG67	00003	001835	1302	0749
AG68	00004	000958	0786	
AG69	00004	000FCC	1223	0622 0673 0835 1130
AG7	00004	000084	0088	0259 0901 0933 0942
AG70	00001	00183C	1303	0583 0617 0834 1128
AG71	00004	000FDC	1224	0584 0640 0855 1151
AG72	00004	001018	1242	0273 1224
AG73	00004	001060	1243	1226
AG74	00004	0010D4	1244	1228
AG75	00004	00113C	1245	1230
AG76	00004	001174	1246	1232
AG77	00004	0011DC	1247	1234
AG78	00004	001204	1248	1236
AG79	00004	001244	1249	1238
AG8	00080	0016CF	1290	0267 0288 0295 0299 0747 0749 0758 0761 0767 0811 0822 0824 0877 0934 1045
AG80	00004	001344	1250	1240
AG81	00004	001E4	0274	0278
AG82	00004	001390	1252	0277
AG83	00004	0009E8	0922	0760 0762
AG84	00004	001394	1253	0825
AG85	00003	001845	1312	0678 0827 1049 1126 1181
AG86	00004	000A1A	0835	0843
AG87	00004	0013E4	1258	0655 0857 0862 0970 1078 1099 1155 1160 1163 1205
AG88	00004	0009F4	0825	0869 0872
AG89	00004	000A4C	0844	0840
AG9	00133	00171F	1291	0262 0263 0263 0264 0268 0269 0291 0292 0292 0293 0294 0295 0343 0344 0344 0345 0346 0364 0365 0365 0366 0367 0368 0395 0396 0396 0397 0398 0401 0402 0402 0403 0404 0405 0406 0414 0421 0422 0422 0423 0424 0425 0428 0429 0429 0430 0431 0463 0464 0464 0465 0466 0474 0476 0477 0477 0478 0518 0519 0519 0520 0522 0523 0528 0529 0529 0530 0531 0532 0533 0534 0537 0538 0538 0549 0561 0569 0577 0578 0602 0603 0603 0604 0605 0606 0625 0626 0626 0627 0628 0629 0698 0699 0699 0700 0708 0709 0717 0725 0733 0764 0765 0765 0766 0767 0773 0779 0780 0780 0781 0782 0790 0791 0791 0792 0793 0800 0801 0801 0802

CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES														
				0817	0818	0818	0819	0820	0874	0875	0875	0876	0877	0878	0928	0945	0946	0946
				0947	0948	0974	0975	0975	0976	0977	0979	0984	0985	0985	0986	0987	0988	1000
				1001	1001	1002	1003	1070	1071	1071	1072	1074	1169	1170	1170	1171	1172	1173
				1195	1196	1196	1197	1198	1199									
AG90	00002	000A14	0833	C828														
AG91	00004	000AA6	0874	0832														
AG92	00022	001848	1313	C876														
AG93	00004	000A9A	0870	C858	0860													
AG94	00004	001 3E8	1259															
AG95	00004	001 3EC	1260	03C8	05C6	0508	C552	C562										
AG96	00004	001 3F0	1261	0320	0353	C551	C554											
AG97	00004	001 3F4	1262	C526														
AG98	00020	001 85E	1314	0523														
AG99	00004	001872	1315	C531														
IHB0021B	00004	000380	0382	0389														
IHB0022	00001	000388	0365															
IHB0022A	00001	000380	0388	C384														
IHB0028B	00004	000478	0451	0458														
IHB0029	00001	000480	0454															
IHB0029A	00001	000484	0457	0453														
IHB0032B	00004	000500	0495	0502														
IHB0033	00001	000514	0498															
IHB0033A	00001	000518	0501	0497														
IHB0058B	00004	000AE8	0894	C895														
MAIN	00001	000000	0010															

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
1241 PRINTED LINES

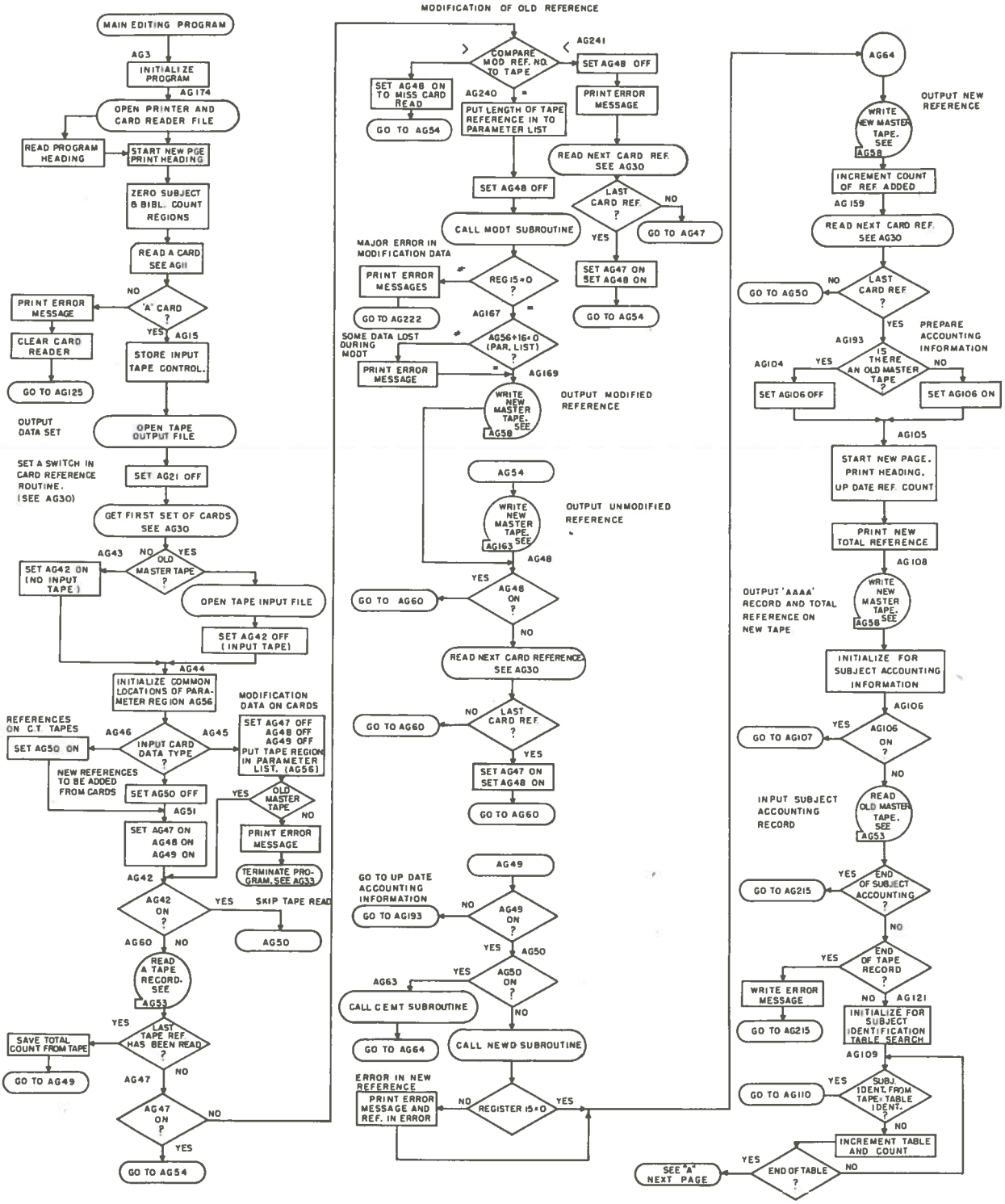

Fig. 9 Detail flow chart, main editing program (continued on next page)

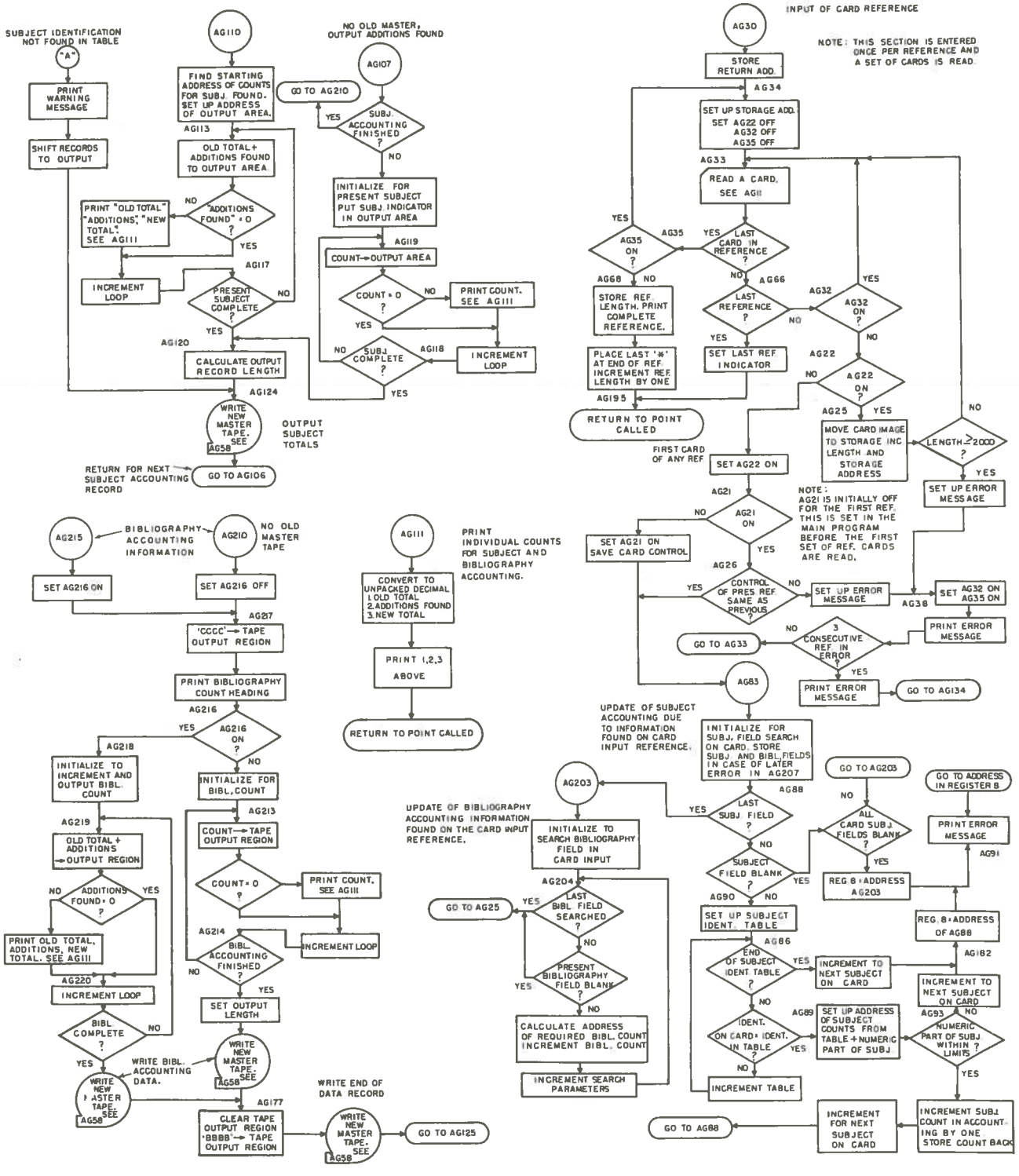
SUBJECT IDENTIFICATION NOT FOUND IN TABLE
"A"
PRINT WARNING MESSAGE
SHIFT RECORDS TO OUTPUT
AG110
FIND STARTING ADDRESS OF COUNTS FOR SUBJ. FOUND. SET UP ADDRESS OF OUTPUT AREA.
AG113
OLD TOTAL + ADDITIONS FOUND TO OUTPUT AREA
"ADDITIONS FOUND" > 0 ?
NO
YES
PRINT "OLD TOTAL", "ADDITIONS", "NEW TOTAL". SEE AG111
INCREMENT LOOP
AG117
PRESENT SUBJECT COMPLETE ?
NO
YES
AG120
CALCULATE OUTPUT RECORD LENGTH
AG124
WRITE NEW MASTER TAPE. SEE AG58
OUTPUT SUBJECT TOTALS
RETURN FOR NEXT SUBJECT ACCOUNTING RECORD
GO TO AG106
NO OLD MASTER, OUTPUT ADDITIONS FOUND
AG107
GO TO AG210
YES
SUBJ. ACCOUNTING FINISHED ?
NO
INITIALIZE FOR PRESENT SUBJECT PUT SUBJ. INDICATOR IN OUTPUT AREA
AG119
COUNT → OUTPUT AREA
COUNT > 0 ?
NO
PRINT COUNT. SEE AG111
YES
NO
SUBJ. COMPLETE ?
AG118
YES
INCREMENT LOOP
INPUT OF CARD REFERENCE
AG30
NOTE: THIS SECTION IS ENTERED ONCE PER REFERENCE AND A SET OF CARDS IS READ.
STORE RETURN ADD.
AG34
SET UP STORAGE ADD. SET AG22 OFF AG32 OFF AG35 OFF
AG33
READ A CARD, SEE AG11
YES
AG35 ON ?
AG35
YES
LAST CARD IN REFERENCE ?
NO
AG68
NO
STORE REF. LENGTH. PRINT COMPLETE REFERENCE.
AG66
LAST REFERENCE ?
NO
YES
AG32
AG32 ON ?
YES
NO
SET LAST REF. INDICATOR
PLACE LAST '*' AT END OF REF. INCREMENT REF. LENGTH BY ONE
AG22
AG22 ON ?
NO
YES
AG195
RETURN TO POINT CALLED
AG25
MOVE CARD IMAGE TO STORAGE INC. LENGTH AND STORAGE ADDRESS
LENGTH ≥ 2000 ?
NO
YES
SET UP ERROR MESSAGE
FIRST CARD OF ANY REF.
SET AG22 ON
AG21
AG21 ON
NO
YES
SET AG21 ON SAVE CARD CONTROL
NOTE: AG21 IS INITIALLY OFF FOR THE FIRST REF. THIS IS SET IN THE MAIN PROGRAM BEFORE THE FIRST SET OF REF. CARDS ARE READ.
AG26
CONTROL OF PRES. REF. SAME AS PREVIOUS ?
YES
NO
SET UP ERROR MESSAGE
AG38
SET AG32 ON AG35 ON
PRINT ERROR MESSAGE
GO TO AG33
NO
3 CONSECUTIVE REF. IN ERROR ?
YES
PRINT ERROR MESSAGE
GO TO AG134
AG83
UPDATE OF SUBJECT ACCOUNTING DUE TO INFORMATION FOUND ON CARD INPUT REFERENCE.
INITIALIZE FOR SUBJ. FIELD SEARCH ON CARD. STORE SUBJ. AND BIBL. FIELDS IN CASE OF LATER ERROR IN AG207
AG88
LAST SUBJ. FIELD ?
YES
NO
SUBJECT FIELD BLANK ?
YES
NO
SET UP SUBJECT IDENT. TABLE
AG86
END OF SUBJECT IDENT. TABLE ?
YES
NO
IDENT. ON CARD = IDENT. IN TABLE ?
YES
NO
INCREMENT TABLE
INCREMENT TO NEXT SUBJECT ON CARD
AG89
SET UP ADDRESS OF SUBJECT COUNTS FROM TABLE + NUMERIC PART OF SUBJ.
AG93
NUMERIC PART OF SUBJ. WITHIN ? LIMITS
NO
YES
INCREMENT SUBJ. COUNT IN ACCOUNTING BY ONE STORE COUNT BACK
INCREMENT FOR NEXT SUBJECT ON CARD
GO TO AG88
GO TO AG203
ALL CARD SUBJ. FIELDS BLANK ?
YES
NO
REG. 8 = ADDRESS AG203
GO TO ADDRESS IN REGISTER 8
PRINT ERROR MESSAGE
AG91
REG. 8 = ADDRESS OF AG88
AG182
INCREMENT TO NEXT SUBJECT ON CARD
UPDATE OF BIBLIOGRAPHY ACCOUNTING INFORMATION FOUND ON THE CARD INPUT REFERENCE.
AG203
INITIALIZE TO SEARCH BIBLIOGRAPHY FIELD IN CARD INPUT
AG204
LAST BIBL. FIELD SEARCHED ?
YES
NO
GO TO AG25
PRESENT BIBLIOGRAPHY FIELD BLANK ?
YES
NO
CALCULATE ADDRESS OF REQUIRED BIBL. COUNT INCREMENT BIBL. COUNT
INCREMENT SEARCH PARAMETERS
AG215
BIBLIOGRAPHY ACCOUNTING INFORMATION
AG210
NO OLD MASTER TAPE
SET AG216 ON
SET AG216 OFF
AG217
'CCCC' → TAPE OUTPUT REGION
PRINT BIBLIOGRAPHY COUNT HEADING
AG216
AG216 ON ?
YES
NO
AG218
INITIALIZE TO INCREMENT AND OUTPUT BIBL. COUNT
INITIALIZE FOR BIBL. COUNT
AG219
OLD TOTAL + ADDITIONS → OUTPUT REGION
AG213
COUNT → TAPE OUTPUT REGION
ADDITIONS FOUND > 0 ?
NO
YES
COUNT > 0 ?
PRINT COUNT. SEE AG111
PRINT OLD TOTAL, ADDITIONS, NEW TOTAL. SEE AG111
AG214
BIBL. ACCOUNTING FINISHED ?
NO
YES
INCREMENT LOOP
AG220
INCREMENT LOOP
SET OUTPUT LENGTH
BIBL. COMPLETE ?
NO
YES
WRITE NEW MASTER TAPE. SEE AG58
WRITE BIBL. ACCOUNTING DATA.
WRITE NEW MASTER TAPE. SEE AG58
AG177
CLEAR TAPE OUTPUT REGION 'BBBB' → TAPE OUTPUT REGION
WRITE END OF DATA RECORD
WRITE NEW MASTER TAPE. SEE AG58
GO TO AG125
AG111
PRINT INDIVIDUAL COUNTS FOR SUBJECT AND BIBLIOGRAPHY ACCOUNTING.
CONVERT TO UNPACKED DECIMAL 1.OLD TOTAL 2.ADDITIONS FOUND 3.NEW TOTAL
PRINT 1,2,3 ABOVE
RETURN TO POINT CALLED

Fig. 9 (cont'd.)

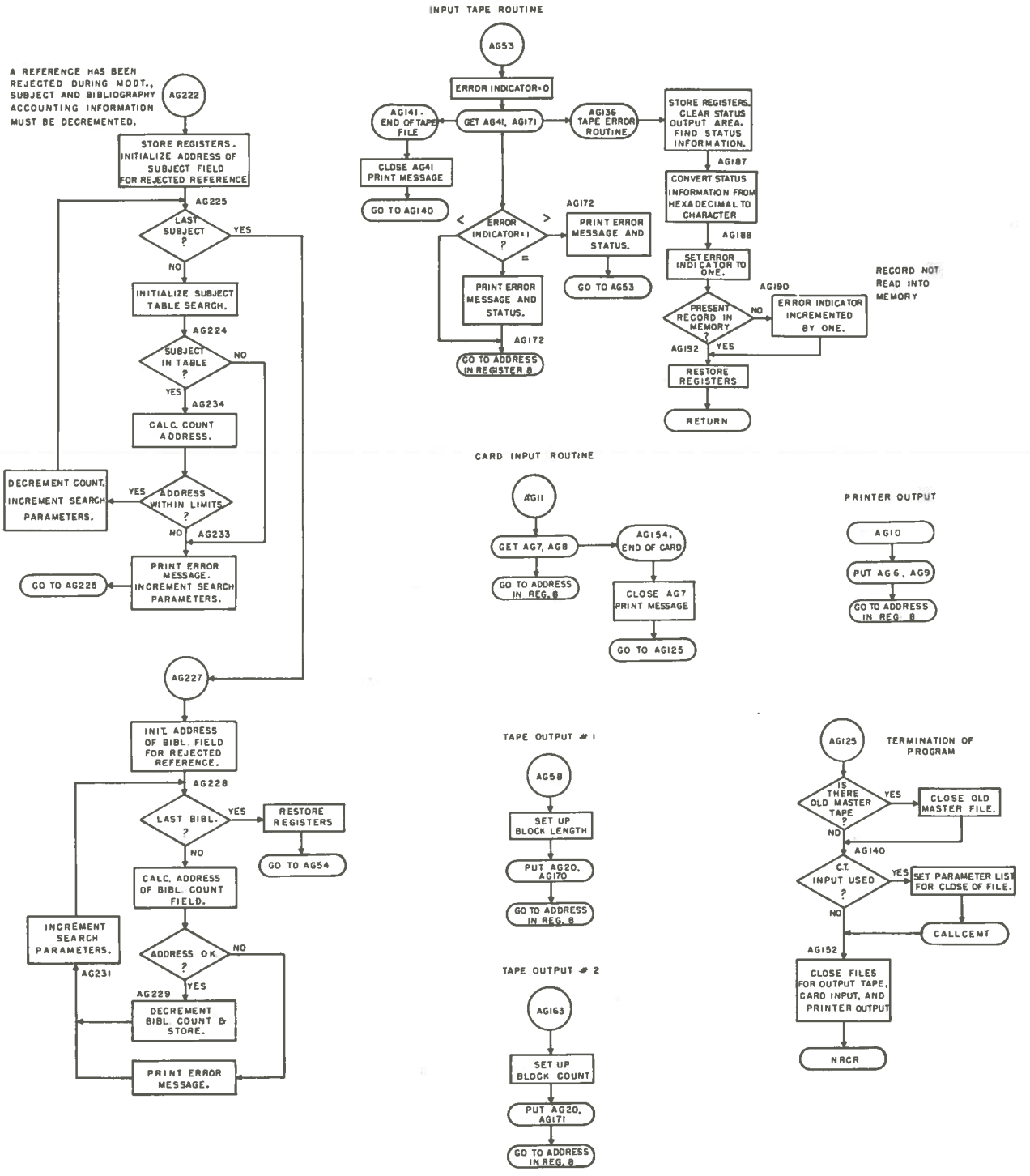
A REFERENCE HAS BEEN REJECTED DURING MODT., SUBJECT AND BIBLIOGRAPHY ACCOUNTING INFORMATION MUST BE DECREMENTED.
AG222
STORE REGISTERS. INITIALIZE ADDRESS OF SUBJECT FIELD FOR REJECTED REFERENCE
AG225
LAST SUBJECT ?
YES
NO
INITIALIZE SUBJECT TABLE SEARCH.
AG224
SUBJECT IN TABLE ?
NO
YES
AG234
CALC. COUNT ADDRESS.
DECREMENT COUNT, INCREMENT SEARCH PARAMETERS.
YES
ADDRESS WITHIN LIMITS ?
NO
AG233
PRINT ERROR MESSAGE. INCREMENT SEARCH PARAMETERS.
GO TO AG225
AG227
INIT. ADDRESS OF BIBL. FIELD FOR REJECTED REFERENCE.
AG228
LAST BIBL. ?
YES
RESTORE REGISTERS
GO TO AG54
NO
CALC. ADDRESS OF BIBL. COUNT FIELD.
INCREMENT SEARCH PARAMETERS.
AG231
ADDRESS OK ?
NO
YES
AG229
DECREMENT BIBL. COUNT & STORE.
PRINT ERROR MESSAGE.
INPUT TAPE ROUTINE
AG53
ERROR INDICATOR=0
AG141, END OF TAPE FILE
GET AG41, AG171
AG136 TAPE ERROR ROUTINE
STORE REGISTERS. CLEAR STATUS OUTPUT AREA. FIND STATUS INFORMATION.
AG187
CONVERT STATUS INFORMATION FROM HEXADECIMAL TO CHARACTER
AG188
SET ERROR INDICATOR TO ONE.
AG190
PRESENT RECORD IN MEMORY ?
NO
ERROR INDICATOR INCREMENTED BY ONE.
RECORD NOT READ INTO MEMORY
AG192
YES
RESTORE REGISTERS
RETURN
CLOSE AG41 PRINT MESSAGE
GO TO AG140
AG172
ERROR INDICATOR=1 ?
PRINT ERROR MESSAGE AND STATUS.
GO TO AG53
PRINT ERROR MESSAGE AND STATUS.
AG172
GO TO ADDRESS IN REGISTER 8
CARD INPUT ROUTINE
AG11
GET AG7, AG8
AG154, END OF CARD
GO TO ADDRESS IN REG. 8
CLOSE AG7 PRINT MESSAGE
GO TO AG125
PRINTER OUTPUT
AG10
PUT AG6, AG9
GO TO ADDRESS IN REG. 8
TAPE OUTPUT # 1
AG58
SET UP BLOCK LENGTH
PUT AG20, AG170
GO TO ADDRESS IN REG. 8
TAPE OUTPUT # 2
AG163
SET UP BLOCK COUNT
PUT AG20, AG171
GO TO ADDRESS IN REG. 8
AG125
TERMINATION OF PROGRAM
IS THERE OLD MASTER TAPE ?
YES
CLOSE OLD MASTER FILE.
NO
AG140
C.T. INPUT USED ?
YES
SET PARAMETER LIST FOR CLOSE OF FILE.
NO
CALLCEMT
AG152
CLOSE FILES FOR OUTPUT TAPE, CARD INPUT, AND PRINTER OUTPUT
NRCR

Fig. 9 (cont'd.)

Appendix C

Main Search Program

Program Listing and Flow Charts

```
  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F01JAN68   7/05/68

                                       1          PRINT NOGEN                                        AK000100
                                       2 *                                                           AK000200
                                       3 * MAIN SEARCH PROGRAM,                                      AK000300
                                       4 *    BIBLIOGRAPHY SYSTEM,                                   AK000400
                                       5 *     SEQUENTIAL DATA,                                      AK000500
                                       6 *                                                           AK000600
                                       7 * WRITTEN BY F.D.BLAIR,                                     AK000700
                                       8 *    N.R.C., OTTAWA, ONT.                                   AK000800
                                       9 *                                                           AK000900
000000                                10          START                                              AK001000
                                      11 AK5       NRCS  AK1                                          AK001100
000012 0520                           18          BALR  2,0                                          AK001200
000014                                19          USING *,2,3,4,5                                    AK001300
000014 9835 20C0        000D4         20 AK4      LM    3,5,AK3                                      AK001400
000018 0570                           21          BALR  7,0                                          AK001500
00001A 5470 3074        01088         22          N     7,AK6                                        AK001600
00001E 0470                           23          SPM   7                                            AK001700
                                      24 AK7       OPEN  (AK8,(OUTPUT),AK9,(INPUT))                  AK001800
00002E D203 3098 3280 010AC 01294     32          MVC   AK42(4),AK228                                AK001900
                                      33          PROP  AK13,133,X'40'                               AK002000
00003E 9289 3299        012AD         36          MVI   AK13,X'89'                                   AK002100
000042 4580 2ABE        00AD2         37          BAL   8,AK14                                       AK002200
000046 4580 2ACE        00AE2         38          BAL   8,AK16                                       AK002300
00004A D24F 331E 3376 01332 0138A     39          MVC   AK15(80),AK21                                AK002400
000050 9219 3299        012AD         40          MVI   AK13,X'19'                                   AK002500
000054 D24F 329A 331E 012AE 01332     41          MVC   AK13+1(80),AK15                              AK002600
00005A 4580 2ABE        00AD2         42          BAL   8,AK14                                       AK002700
00005E 4580 2ACE        00AE2         43          BAL   8,AK16                                       AK002800
000062 95C1 3376        0138A         44          CLI   AK21,C'A'                                    AK002900
000066 4780 2CCC        000E0         45          BE    AK22                                         AK003000
                                      46          PROP  AK13,133,X'40'                               AK003100
000074 9211 3299        012AD         49          MVI   AK13,X'11'                                   AK003200
000078 D212 329A 4206 012AE 0221A     50          MVC   AK13+1(19),AK212                             AK003300
00007E D24F 32B2 3376 012C6 0138A     51          MVC   AK13+25(80),AK21                             AK003400
000084 4180 2AFC        00B10         52          LA    8,AK69                                       AK003500
000088 47F0 2ABE        00AD2         53          B     AK14                                         AK003600
00008C                                54 AK1       DS    18F                                        AK003700
0000D4 00001014                       55 AK3       DC    A(AK4+4096)                                AK003800
0000D8 00002014                       56          DC    A(AK4+8192)                                AK003900
0000DC 00003014                       57          DC    A(AK4+12288)                               AK004000
0000E0 D201 336E 3378 01382 0138C     58 AK22      MVC   AK17(2),AK21+2                             AK004100
0000E6 D201 3370 3378 01384 0138F     59          MVC   AK18(2),AK21+5                             AK004200
0000EC D201 3372 337E 01386 01392     60          MVC   AK19(2),AK21+8                             AK004300
0000F2 D201 3374 3381 01388 01395     61          MVC   AK20(2),AK21+11                            AK004400
                                      62          SCAN  I,AK21+14,4                                  AK004500
000108 50C0 309C        010B0         69          ST    0,AK43                                       AK004600
                                      70          SCAN  I,AK21+19,1                                  AK004700
00011C 5000 323C        01250         77          ST    0,AK199                                      AK004800
000120 D200 3298 338B 012AC 0139F     78          MVC   AK302(1),AK21+21                           AK004900
000126 95F1 338B        0139F         79          CLI   AK21+21,C'1'                               AK005000
00012A 4770 212A        0013E         80          BNE   AK301                                      AK005100
                                      81          CALL  TTRAIN                                     AK005200
00013E D501 3372 4219 01386 0222D     87 AK301     CLC   AK19(2),AK213                              AK005300
000144 4780 2156        0016A         88          BNL   AK27                                       AK005400
                                      89 AK25      PROP  AK13,133,X'40'                             AK005500
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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    AK005600
000152 9211 3299       012AD        92           MVI   AK13,X'11'            AK005700
000156 D210 329A 33C6 012AE 013DA   93           MVC   AK13+1(17),AK26       AK005800
00015C D201 32AD 3372 012C1 01386   94           MVC   AK13+20(2),AK19       AK005900
000162 4180 2AFC              00B10 95           LA    8,AK69                AK006000
000166 47F0 2ABE              00AD2 96           B     AK14                  AK006100
00016A D501 3372 421B 01386 0222F   97 AK27      CLC   AK19(2),AK214         AK006200
000170 4720 2134              00148 98           BH    AK25                  AK006300
                                    99           SCAN  I,AK19,2              AK006400
000184 1860                        106           LR    6,0                   AK006500
000186 5B60 3078              01C8C 107           S     6,AK23                AK006600
00018A 8960 00C2              00002 108           SLL   6,2                   AK006700
00018E 5876 30E0              01094 109           L     7,AK28(6)             AK006800
000192 5070 3090              010A4 110           ST    7,AK29                AK006900
000196 D203 3254 30BC 01268 01CDC  111           MVC   AK200+20(4),AK62      AK007000
                                   112           CALL  CODEN,(AK200)         AK007100
0001B2 4580 2D6C              00074 124           BAL   8,AK201               AK007200
0001B6 D203 3254 3078 01268 01C8C  125           MVC   AK200+20(4),AK23      AK007300
                                   126           SCAN  I,AK18,2              AK007400
0001CC 1860                        133           LR    6,0                   AK007500
0001CE 5960 3094              01CA8 134           C     6,AK30                AK007600
0001D2 4770 2216              0022A 135           BNE   AK38                  AK007700
0001D6 4580 2ACE              00AE2 136           BAL   8,AK16                AK007800
0001DA 95C2 3376       0138A       137           CLI   AK21,C'B'             AK007900
0001DE 4780 21FC              00204 138           BE    AK34                  AK008000
                                   139 AK215     PROP  AK13,133,X'40'        AK008100
0001EC 9211 3299       012AD       142           MVI   AK13,X'11'            AK008200
0001F0 D219 329A 33E8 012AE 013FC  143           MVC   AK13+1(26),AK33       AK008300
0001F6 D24F 32B7 3376 012CB 0138A  144           MVC   AK13+30(80),AK21      AK008400
0001FC 4180 2AFC              00B10 145           LA    8,AK69                AK008500
000200 47F0 2ABE              00AD2 146           B     AK14                  AK008600
000204 D204 3402 3378 01416 0138C  147 AK34      MVC   AK35(5),AK21+2        AK008700
00020A D204 3407 337E 0141B 01392  148           MVC   AK36(5),AK21+8        AK008800
000210 D504 3407 3402 01418 01416  149           CLC   AK36(5),AK35          AK008900
000216 47D0 21CE              001E2 150           BNH   AK215                 AK009000
                                   151           OPEN  (AK10,(INPUT))        AK009100
000226 47F0 2250              00264 157           B     AK41                  AK009200
00022A 5960 3078              01C8C 158 AK38      C     6,AK23                AK009300
00022E 4780 2522              00536 159           BE    AK40                  AK009400
000232 5960 313C              01150 160           C     6,AK132               AK009500
000236 478C 29C8              0091C 161           BE    AK133                 AK009600
00023A 5960 3238              0124C 162           C     6,AK191               AK009700
00023E 4780 2CF4              00DC8 163           BE    AK192                 AK009800
                                   164           PROP  AK13,133,X'40'        AK009900
00024C 9211 3299       012AD       167           MVI   AK13,X'11'            AK010000
000250 D210 329A 340C 012AE 01420  168           MVC   AK13+1(17),AK39       AK010100
000256 D201 32AD 337C 012C1 01384  169           MVC   AK13+20(2),AK18       AK010200
00025C 4180 2AFC              00B10 170           LA    8,AK69                AK010300
000260 47F0 2ABE              00AD2 171           B     AK14                  AK010400
000264 4180 40B3              020C7 172 AK41      LA    8,AK157               AK010500
000268 5080 3184              01198 173           ST    8,AK151               AK010600
00026C 4180 001C              0001C 174           LA    8,28                  AK010700
000270 5080 3188              0119C 175           ST    8,AK152               AK010800
000274 940F 2279       0028D       176           NI    AK56+1,X'0F'          AK010900
000278 D203 30C0 30BC 010D4 010D0  177           MVC   AK71(4),AK62          AK011000
00027E 4580 2B3E              00852 178 AK54      BAL   8,AK46


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000282 D503 4270 388E 02284 018A2   179           CLC   AK48(4),AK55                    AK011100
000288 4780 23DC             003F0  180           BE    AK58                           AK011200
00028C 4760 226A             0027E  181 AK56      BC    6,AK54                         AK011300
000290 D5C4 4271 3402 02285 01416   182           CLC   AK48+1(5),AK35                 AK011400
000296 4740 226A             0027E  183           BL    AK54                           AK011500
00029A D5C4 4271 3407 02285 0141B   184           CLC   AK48+1(5),AK36                 AK011600
0002A0 47D0 2298             002AC  185           BNH   AK57                          AK011700
0002A4 96F6 227F       0028D       186           OI    AK56+1,X'F0'                   AK011800
0002A8 47F0 226A             0027E  187           B     AK54                           AK011900
0002AC 5090 30A4             016B8  188 AK57      ST    9,AK50+4                       AK012000
0002B0 4190 4270             02284  189           LA    9,AK48                         AK012100
0002B4 5090 30A0             016B4  190           ST    9,AK50                         AK012200
0002B8 5890 3090             016A4  191           L     9,AK29                         AK012300
0002BC 0589                         192           BALR  8,9                            AK012400
0002BE 4180 226A             0027E  193           LA    8,AK54                         AK012500
0002C2 5080 30D0             016E4  194           ST    8,AK94                         AK012600
0002C6 5880 30B4             016C8  195           L     8,AK50+20                      AK012700
0002CA 5080 3130             01144  196           ST    8,AK119                        AK012800
0002CE 900F 3144             01158  197 AK95      STM   0,15,AK149                     AK012900
0002D2 5880 30B0             016C4  198           L     8,AK50+16                      AK013000
0002D6 5980 30BC             016D0  199           C     8,AK62                         AK013100
0002DA 4780 2354             00368  200           BE    AK96                           AK013200
                                    201           PROP  AK13,133,X'40'                 AK013300
0002E8 9211 3299       012AD       204           MVI   AK13,X'11'                     AK013400
0002EC 5880 30C0             016D4  205           L     8,AK71                         AK013500
0002F0 4188 0001             00001  206           LA    8,1(8)                         AK013600
0002F4 5080 30C0             016D4  207           ST    8,AK71                         AK013700
0002F8 4580 2ABE             00AD2  208           BAL   8,AK14                        AK013800
0002FC 5880 3098             016AC  209           L     8,AK42                         AK013900
000300 4188 0004             00004  210           LA    8,4(8)                         AK014000
000304 5080 3098             016AC  211           ST    8,AK42                         AK014100
000308 D21C 329A 38DB 012AE 018EF   212           MVC   AK13+1(29),AK70                AK014200
00030E D204 32AA 4271 012BE 02285   213           MVC   AK13+17(5),AK48+1              AK014300
000314 58C0 30B0             016C4  214           L     0,AK50+16                      AK014400
                                    215           MAKE  I,AK13+31,5                    AK014500
000328 4580 2A8E             00AD2  222           BAL   8,AK14                        AK014600
00032C 5880 30C0             016D4  223           L     8,AK71                         AK014700
000330 5980 326C             01274  224           C     8,AK217                        AK014800
000334 4740 234A             0035E  225           BL    AK218                          AK014900
                                    226           PROP  AK13,133,X'40'                 AK015000
000342 9211 3299       012AD       229           MVI   AK13,X'11'                     AK015100
000346 D210 329A 38F8 012AE 019DC   230           MVC   AK13+1(17),AK72                AK015200
00034C 4180 2AFC             00B10  231           LA    8,AK69                         AK015300
                                    232           CLOSE (AK10)                         AK015400
00035A 47FC 2A8E             00AD2  238           B     AK14                           AK015500
00035E 980F 3144             01158  239 AK218     LM    0,15,AK149                     AK015600
000362 5880 30D0             016E4  240           L     8,AK94                         AK015700
000366 07F8                         241           BR    8                              AK015800
000368 5860 30A8             016BC  242 AK96      L     6,AK50+8                       AK015900
00036C 5870 30AC             016C0  243           L     7,AK50+12                      AK016000
000370 D203 3284 3078 01298 0108C   244           MVC   AK305(4),AK23                  AK016100
000376 1B88                         245           SR    8,8                            AK016200
000378 5080 30C0             016D4  246           ST    8,AK71                         AK016300
00037C 5880 3098             016AC  247           L     8,AK42                         AK016400
000380 1A87                         248           AR    8,7                            AK016500
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  LOC   OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    AK016600
000382 4188 0002              00002   249            LA    8,2(8)               AK016600
000386 5980 3130              01144   250            C     8,AK119              AK016700
00038A 47D0 237E              00392   251            BNH   AK52                AK016800
00038E 4580 2A40              00A54   252            BAL   8,AK45                AK016900
000392 5970 30BC              010D0   253 AK52       C     7,AK62               AK017000
000396 47D0 23B6              003CA   254            BNH   AK53                AK017100
                                      255            PROP  AK13,133,X'40'       AK017200
00C3A4 92C9 3299      012AD           258            MVI   AK13,X'09'           AK017300
0003A8 D246 329A 6000 012AE 00000     259            MVC   AK13+1(71),C(6)      AK017400
00C3AE 5B70 3078              01C8C   260            S     7,AK23               AK017500
00C3B2 4166 0047              00047   261            LA    6,71(6)              AK017600
000386 5880 3098              010AC   262            L     8,AK42               AK017700
0003BA 4188 0001              00001   263            LA    8,1(8)               AK017800
000386 5080 3098              010AC   264            ST    8,AK42               AK017900
00C3C2 4180 237E              00392   265            LA    8,AK52               AK018000
000306 47F0 2ABE              00AD2   266            B     AK14                 AK018100
                                      267 AK53       PROP  AK13,133,X'40'       AK018200
0003D4 9209 3299      012AD           270            MVI   AK13,X'C9'           AK018300
0003D8 5880 3098              010AC   271            L     8,AK42               AK018400
0003DC 4188 0001              00001   272            LA    8,1(8)               AK018500
0003E0 5080 3098              010AC   273            ST    8,AK42               AK018600
0003E4 98CF 3144              01158   274            LM    0,15,AK149           AK018700
0003E8 5880 30D0              010E4   275            L     8,AK94               AK018800
0003EC 47F0 2ABE              00AD2   276            B     AK14                 AK018900
                                      277 AK58       PROP  AK13,133,X'40'       AK019000
0003FA 9289 3299      012AD           280            MVI   AK13,X'89'           AK019100
0003FE 4580 2ABE              00AD2   281            BAL   8,AK14                AK019200
000402 9219 3299      012AD           282            MVI   AK13,X'19'           AK019300
000406 D210 329A 3892 012AE 018A6     283            MVC   AK13+1(17),AK59      AK019400
00040C 58C0 4274              02268   284            L     0,AK48+4             AK019500
                                      285            MAKE  I,AK13+18,5          AK019600
000420 4580 2ABE              00AD2   292            BAL   8,AK14                AK019700
                                      293            PROP  AK13,133,X'40'       AK019800
00042E 9211 3299      012AD           296            MVI   AK13,X'11'           AK019900
000432 D215 329A 38A3 012AE 018B7     297            MVC   AK13+1(22),AK60      AK020000
000438 4580 2ABE              00AD2   298            BAL   8,AK14                AK020100
00043C 4580 2B3E              00B52   299 AK63       BAL   8,AK46                AK020200
000440 D503 4270 38B9 02284 018CD     300            CLC   AK48(4),AK61         AK020300
000446 4780 2494              004A8   301            BE    AK65                 AK020400
00044A 4160 0001              00001   302            LA    6,1                  AK020500
00044E 4170 4274              02288   303            LA    7,AK48+4             AK020600
000452 5B90 3238              0124C   304 AK64       S     9,AK191              AK020700
000456 5990 30BC              010D0   305            C     9,AK62               AK020800
00045A 47D0 2428              0043C   306            BNH   AK63                 AK020900
                                      307            PROP  AK13,133,X'40'       AK021000
000468 92C9 3299      012AD           310            MVI   AK13,X'C9'           AK021100
00046C D200 329E 4270 012B2 02284     311            MVC   AK13+5(1),AK48       AK021200
000472 18C6                           312            LR    0,6                  AK021300
                                      313            MAKE  I,AK13+6,2           AK021400
000484 58C7 0000              00000   320            L     0,0(7)               AK021500
                                      321            MAKE  I,AK13+10,5          AK021600
000498 4166 0001              00001   328            LA    6,1(6)               AK021700
00049C 4177 0004              00004   329            LA    7,4(7)               AK021800
0004A0 4180 243E              00452   330            LA    8,AK64               AK021900
0004A4 47F0 2ABE              00AD2   331            B     AK14                 AK022000
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                                      332 AK65     PROP  AK13,133,X'40'                    AK022100
000482 9289 3299       012AD          335          MVI   AK13,X'89'                      AK022200
000486 458C 2A8E              00AD2   336          BAL   8,AK14                          AK022300
00048A 9211 3299       012AD          337          MVI   AK13,X'11'                      AK022400
00048E D218 329A 38BD 012AE 018D1     338          MVC   AK13+1(25),AK66                 AK022500
000494 458C 2A8E              00AD2   339          BAL   8,AK14                          AK022600
000498 1B66                           340          SR    6,6                             AK022700
00049A 586C 3078              0108C   341          S     6,AK23                          AK022800
00049E 4170 4270              02284   342          LA    7,AK48                          AK022900
0004A2 4166 0001              00001   343 AK67     LA    6,1(6)                          AK023000
0004A6 4177 0004              00004   344          LA    7,4(7)                          AK023100
0004AA 5B90 3238              0124C   345          S     9,AK191                         AK023200
0004AE 5990 30BC              010D0   346          C     9,AK62                          AK023300
0004B2 47D0 2AFC              00B10   347          BNH   AK69                            AK023400
0004B6 5887 00C0              00000   348          L     8,0(7)                          AK023500
0004BA 598C 30BC              010D0   349          C     8,AK62                          AK023600
0004BE 478C 248E              004D2   350          BE    AK67                            AK023700
                                      351          PROP  AK13,133,X'40'                  AK023800
0004FC 9209 3299       012AD          354          MVI   AK13,X'09'                      AK023900
000500 D204 329E 38D6 012B2 018EA     355          MVC   AK13+5(5),AK68                  AK024000
000506 1806                           356          LR    0,6                             AK024100
                                      357          MAKE  I,AK13+11,3                     AK024200
000518 5807 0000              00000   364          L     0,0(7)                          AK024300
                                      365          MAKE  I,AK13+19,3                     AK024400
00052C 418C 24BE              004D2   372          LA    8,AK67                          AK024500
000530 47FC 2ABE              00AD2   373          B     AK14                            AK024600
                                      374 AK40     SCAN  I,AK20,2                        AK024700
000544 5900 3078              0108C   381          C     0,AK23                          AK024800
000548 477C 26C2              006D6   382          BNE   AK97                            AK024900
00054C 418C 4CCF              020E3   383          LA    8,AK158                         AK025000
000550 508C 3184              01198   384          ST    8,AK151                         AK025100
000554 418C 0022              00022   385          LA    8,34                            AK025200
000558 508C 3188              0119C   386          ST    8,AK152                         AK025300
00055C 940F 2583       00597          387          NI    AK76+1,X'0F'                    AK025400
000560 D203 30C8 3078 010DC 0108C     388          MVC   AK81(4),AK23                    AK025500
000566 1B88                           389          SR    8,8                             AK025600
000568 508C 30C0              010D4   390          ST    8,AK71                          AK025700
00056C D203 3284 30BC 01298 010DC     391          MVC   AK305(4),AK62                   AK025800
                                      392 AK84     OPEN  (AK10,(INPUT))                  AK025900
00057E D203 30C4 3078 010D8 0108C     398          MVC   AK80(4),AK23                    AK026000
000584 458C 283E              00B52   399 AK82     BAL   8,AK46                          AK026100
000588 5090 30CC              010E0   400          ST    9,AK83                          AK026200
00058C D503 4270 388E 02284 018A2     401          CLC   AK48(4),AK55                    AK026300
000592 478C 2632              00646   402          BE    AK91                            AK026400
000596 4700 25DE              005F2   403 AK76     BC    0,AK78                          AK026500
00059A 458C 2ACE              00AE2   404 AK88     BAL   8,AK16                          AK026600
00059E 95C3 3376       0138A          405          CLI   AK21,C'C'                       AK026700
0005A2 4780 25D8              005EC   406          BE    AK220                           AK026800
0005A6 95C4 3376       0138A          407          CLI   AK21,C'D'                       AK026900
0005AA 4780 2AFC              00B10   408          BE    AK69                            AK027000
0005AE 95E9 3376       0138A          409          CLI   AK21,C'Z'                       AK027100
0005B2 477C 25B6              005CA   410          BNE   AK306                           AK027200
0005B6 588C 3284              01298   411          L     8,AK305                         AK027300
0005BA 598C 30BC              010D0   412          C     8,AK62                          AK027400
0005BE 4780 2586              0059A   413          BE    AK88                            AK027500
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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    AK027600
                                    414            BAL   8,AK45                               AK027700
0005C6 47F0 2586                    0059A  415            B     AK88                           AK027800
                                           416 AK306      PROP  AK13,133,X'40'                 AK027900
0005D4 9211 329S       012AD        415            MVI   AK13,X'11'                           AK028000
0005D8 D215 329A 423A  012AE 0224E  420            MVC   AK13+1(22),AK219                     AK028100
0005DE D24F 32B7 3376  012CB 0138A  421            MVC   AK13+30(80),AK21                     AK028200
0005E4 4180 2AFC                    00810  422            LA    8,AK69                         AK028300
0005E8 47F0 2ABE                    00AD2  423            B     AK14                           AK028400
0005EC D204 391A 3378  0192E 0138C  424 AK220      MVC   AK79(5),AK21+2                       AK028500
0005F2 D504 391A 4271  0192E 02285  425 AK78       CLC   AK79(5),AK48+1                       AK028600
0005F8 474C 260C                    00614  426            BL    AK85                           AK028700
0005FC 4780 2682                    00696  427            BE    AK92                           AK028800
000600 96FC 2583       00597        428            OI    AK76+1,X'F0'                         AK028900
0006C4 5880 30C4                    010D8  429            L     8,AK80                         AK029000
0006C8 4188 0001                    00001  430            LA    8,1(8)                         AK029100
0006CC 5080 30C4                    010D8  431            ST    8,AK80                         AK029200
0006D0 47F0 2570                    00584  432            B     AK82                           AK029300
0006D4 5880 30C4                    010D8  433 AK85       L     8,AK80                         AK029400
0006D8 5980 3078                    0108C  434            C     8,AK23                         AK029500
0006DC 4720 2632                    00646  435            BH    AK91                           AK029600
                                           436 AK86       PROP  AK13,133,X'40'                 AK029700
0006EA 9211 329S       012AD        439            MVI   AK13,X'11'                           AK029800
0006EE D223 329A 391F  012AE 01933  440            MVC   AK13+1(36),AK87                      AK029900
0006F4 D204 32D1 391A  012D5 0192E  441            MVC   AK13+40(5),AK79                      AK030000
0006FA 96F0 2583       00597        442 AK90       OI    AK76+1,X'F0'                         AK030100
0006FE 4180 2586                    0059A  443            LA    8,AK88                         AK030200
000702 47F0 2ABE                    00AD2  444            B     AK14                           AK030300
000706 588C 30C8                    010DC  445 AK91       L     8,AK81                         AK030400
00070A 598C 3078                    0108C  446            C     8,AK23                         AK030500
00070E 4780 2666                    0067A  447            BE    AK221                          AK030600
                                           448            PROP  AK13,133,X'40'                 AK030700
00071C 9211 329S       012AD        451            MVI   AK13,X'11'                           AK030800
000720 D216 329A 3943  012AE 01957  452            MVC   AK13+1(23),AK89                      AK030900
000726 D203 30C8 3078  010DC 0108C  453            MVC   AK81(4),AK23                         AK031000
                                    454            CLOSE (AK10,REREAD)                        AK031100
000736 47FC 2626                    0063A  460            B     AK90                           AK031200
00073A 4188 0001                    00001  461 AK221      LA    8,1(8)                         AK031300
00073E 5080 30C8                    010DC  462            ST    8,AK81                         AK031400
000742 96FC 2583       00597        463            OI    AK76+1,X'F0'                         AK031500
                                    464            CLOSE (AK10,REREAD)                        AK031600
000752 47F0 2560                    00574  470            B     AK84                           AK031700
000756 4190 4270                    02284  471 AK92       LA    9,AK48                         AK031800
00075A 5090 30AC                    010B4  472            ST    9,AK50                         AK031900
00075E D203 30A4 30CC  010B8 010E0  473            MVC   AK50+4(4),AK83                       AK032000
000764 5890 3090                    010A4  474            L     9,AK29                         AK032100
000768 0589                         475            BALR  8,9                                  AK032200
00076A 4190 26A8                    006BC  476            LA    9,AK93                         AK032300
00076E 5090 30D0                    010E4  477            ST    9,AK94                         AK032400
000772 D203 313C 30B4  01144 010C8  478            MVC   AK119(4),AK50+20                     AK032500
000778 47F0 22BA                    002CE  479            B     AK95                           AK032600
00077C 940F 2583       00597        480 AK93       NI    AK76+1,X'0F'                         AK032700
000780 D203 30C8 3078  010DC 0108C  481            MVC   AK81(4),AK23                         AK032800
000786 5880 30C4                    010D8  482            L     8,AK80                         AK032900
00078A 4188 0001                    00001  483            LA    8,1(8)                         AK033000
00078E 5080 30C4                    010D8  484            ST    8,AK80
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F01JAN68   7/05/68
0006D2 47F0 2586             0059A  485           B      AK88                                        AK033100
0006D6 4180 40F1             02105  486 AK97      LA     8,AK159                                     AK033200
0006DA 5080 3184             01198  487           ST     8,AK151                                     AK033300
0006DE 4180 0005             00005  488           LA     8,5                                         AK033400
0006E2 5080 3188             0119C  489           ST     8,AK152                                     AK033500
                                    490           OPEN   (AK101,(INPUT))                             AK033600
0006F2 4160 395A             0196E  496 AK104     LA     6,AK99                                      AK033700
0006F6 4170 30D4             010E8  497           LA     7,AK100                                     AK033800
0006FA 1BAA                         498           SR     10,10                                       AK033900
0006FC 4580 2BFA             00C0E  499 AK232     BAL    8,AK102                                     AK034000
000700 D503 4270 388E 02284  018A2  500           CLC    AK48(4),AK55                                AK034100
000706 4780 2724             00738  501           BE     AK103                                       AK034200
00070A D503 427C 38B9 02284  018CD  502           CLC    AK48(4),AK61                                AK034300
000710 477C 26E8             006FC  503           BNE    AK232                                       AK034400
000714 59A0 30BC             01CDC  504           C      10,AK62                                     AK034500
000718 4720 27E4             00778  505           BH     AK107                                       AK034600
                                    506           PROP   AK13,133,X'40'                              AK034700
00072A 9211 3299       012AC       509           MVI    AK13,X'11'                                  AK034800
00072A D225 329A 3F72 012AE 01F86  510           MVC    AK13+1(38),AK105                            AK034900
000730 418C 2AFC             00810  511           LA     8,AK69                                      AK035000
000734 47F0 2ABE             00AD2  512           B      AK14                                        AK035100
                                    513 AK103     NOTE   AK101                                       AK035200
000742 5017 00C0             00000  517           ST     1,0(7)                                      AK035300
000746 D24D 60CC 4274 00000  02288  518           MVC    0(78,6),AK48+4                              AK035400
00074C 4177 0004             00004  519           LA     7,4(7)                                      AK035500
000750 4166 004E             00C4E  520           LA     6,78(6)                                     AK035600
000754 41AA 0001             00001  521           LA     10,1(10)                                    AK035700
000758 59A0 3264             01278  522           C      10,AK222                                    AK035800
00075C 4740 26E8             006FC  523           BL     AK232                                       AK035900
                                    524           PROP   AK13,133,X'40'                              AK036000
00076A 9211 3299       012AC       527           MVI    AK13,X'11'                                  AK036100
00076E D225 329A 3F98 012AE 01FAC  528           MVC    AK13+1(38),AK106                            AK036200
000774 4580 2ABE             00AD2  529           BAL    8,AK14                                      AK036300
000778 50A0 3124             01138  530 AK107     ST     10,AK108                                    AK036400
00077C 96F0 2851       00865       531           OI     AK109+1,X'F0'                               AK036500
000780 458C 2ACE             00AE2  532 AK110     BAL    8,AK16                                      AK036600
000784 41A0 3378             0138C  533           LA     10,AK21+2                                   AK036700
000788 1BBB                         534           SR     11,11                                       AK036800
00078A 95C3 3376       0138A       535           CLI    AK21,C'C'                                   AK036900
00078E 4770 2644             00858  536           BNE    AK111                                       AK037000
000792 588C 3284             01298  537           L      8,AK305                                     AK037100
000796 5980 30BC             010D0  538           C      8,AK62                                      AK037200
00079A 478C 278E             007A2  539           BE     AK307                                       AK037300
00079E 458C 2A4C             00A54  540           BAL    8,AK45                                      AK037400
0007A2 1866                         541 AK307     SR     6,6                                         AK037500
0007A4 4170 395A             0196E  542           LA     7,AK99                                      AK037600
0007A8 94CF 2851       00865       543           NI     AK109+1,X'0F'                               AK037700
0007AC D202 3FD7 3378 01FEB 0138C  544           MVC    AK115(3),AK21+2                             AK037800
0007B2 D54D 7000 3378 00000 0138C  545 AK112     CLC    0(78,7),AK21+2                              AK037900
0007B8 4780 27DE             007F2  546           BE     AK223                                       AK038000
0007BC 4166 0001             00C01  547           LA     6,1(6)                                      AK038100
0007C0 4177 004E             0004E  548           LA     7,78(7)                                     AK038200
0007C4 5960 3124             01138  549           C      6,AK108                                     AK038300
0007C8 4740 279E             007B2  550           BL     AK112                                       AK038400
                                    551           PROP   AK13,133,X'40'                              AK038500
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    AK038600
0007D6 9211 329S       012AD         554           MVI   AK13,X'11'           AK038600
0007DA D218 329A 3FBE 012AE 01FD2    555           MVC   AK13+1(25),AK113     AK038700
0007E0 D202 32B7 3378 012C8 0138C    556           MVC   AK13+30(3),AK21+2     AK038800
0007E6 96FC 2851       00865         557           OI    AK109+1,X'FC'        AK038900
0007EA 4180 276C              0078C  558           LA    8,AK110              AK039000
0007EE 47FC 2ABE              00AD2  559           B     AK14                 AK039100
0007F2 8960 0002              00002  560 AK223     SLL   6,2                  AK039200
0007F6 4186 30D4              010E8  561           LA    8,AK100(6)           AK039300
0007FA D203 3128 8000 0113C 00000    562           MVC   AK114(4),0(8)        AK039400
000800 4180 276C              00780  563           LA    8,AK110              AK039500
000804 5080 312C              01140  564           ST    8,AK116              AK039600
                                     565 AK124     POINT AK101,AK114          AK039700
000818 4580 2BFA              00C0E  570           BAL   8,AK102              AK039800
00081C D503 4270 388E 02284 018A2    571           CLC   AK48,AK55            AK039900
000822 4770 2822              00836  572           BNE   AK118                AK040000
000826 D502 4274 3FD7 02288 01FE8    573           CLC   AK48+4(3),AK115      AK040100
00082C 4770 2822              00836  574           BNE   AK118                AK040200
000830 5880 312C              01140  575           L     8,AK116              AK040300
000834 07F8                          576           BR    8                    AK040400
                                     577 AK118     PROP  AK13,133,X'40'       AK040500
000840 9211 329S       012AD         580           MVI   AK13,X'11'           AK040600
000844 D20D 329A 3FDA 012AE 01FEE    581           MVC   AK13+1(14),AK117     AK040700
00084A D207 32AD 4270 012C1 02284    582           MVC   AK13+20(8),AK48      AK040800
000850 4180 2AFC              00810  583           LA    8,AK69               AK040900
000854 47FC 2ABE              00AD2  584           B     AK14                 AK041000
000858 95C5 3376       0138A         585 AK111     CLI   AK21,C'E'            AK041100
00085C 4770 2850              00864  586           BNE   AK109                AK041200
000860 47FC 2AFC              00810  587           B     AK69                 AK041300
000864 4700 276C              00780  588 AK109     BC    0,AK110              AK041400
000868 1B88                          589 AK123     SR    8,8                  AK041500
00086A 5080 3134              01148  590           ST    8,AK120              AK041600
00086E 5980 31D8              011EC  591           C     11,AK164             AK041700
000872 47B0 276C              00780  592           BNL   AK110                AK041800
000876 D503 A000 3FE8 00000 01FFC    593           CLC   0(4,10),AK122        AK041900
00087C 4780 28B6              008CA  594           BE    AK130                AK042000
000880 D204 3FEC A000 02000 00000    595           MVC   AK125(5),0(10)       AK042100
000886 4580 2BFA              00C0E  596 AK126     BAL   8,AK102              AK042200
00088A 509C 3138              0114C  597           ST    9,AK127              AK042300
00088E D503 4270 3FF1 02284 02005    598           CLC   AK48(4),AK128        AK042400
000894 4780 28C2              008D6  599           BE    AK225                AK042500
000898 D504 3FEC 4271 02000 02285    600           CLC   AK125(5),AK48+1      AK042600
00089E 4770 2872              00886  601           BNE   AK126                AK042700
0008A2 4180 4270              02284  602           LA    8,AK48               AK042800
0008A6 5080 30A0              01CB4  603           ST    8,AK50               AK042900
0008AA 5880 3138              0114C  604           L     8,AK127              AK043000
0008AE 5080 30A4              01CB8  605           ST    8,AK50+4             AK043100
0008B2 5890 3C90              010A4  606           L     9,AK29               AK043200
0008B6 0589                          607           BALR  8,9                  AK043300
0008B8 4180 28B6              008CA  608           LA    8,AK130              AK043400
0008BC 5080 30D0              01CE4  609           ST    8,AK94               AK043500
0008C0 D203 3130 30B4 01144 01DC8    610           MVC   AK119(4),AK50+20     AK043600
0008C6 47FC 228A              002CE  611           B     AK95                 AK043700
0008CA 41AA 0006              00006  612 AK130     LA    10,6(10)             AK043800
0008CE 4188 0001              00001  613           LA    11,1(11)             AK043900
0008D2 47F0 2854              00868  614           B     AK123                AK044000
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0008D6 5880 3134          01148   615 AK225    L     8,AK120                    AK044100
0008DA 5980 308C          010D0   616          C     8,AK62                     AK044200
0008DE 4780 28F6          0090A   617          BE    AK226                      AK044300
                                  618          PROP  AK13,133,X'40'             AK044400
0008EC 9211 3299    012AD         621          MVI   AK13,X'11'                 AK044500
0008F0 D21A 329A 3FF5 012AE 02009 622          MVC   AK13+1(27),AK131           AK044600
0008F6 D204 32B7 3FEC 012C8 020DC 623          MVC   AK13+30(5),AK125           AK044700
0008FC D202 32C1 3FD7 012D5 01FEB 624          MVC   AK13+40(3),AK115           AK044800
000902 418C 28B6          008CA   625          LA    8,AK130                    AK044900
000906 47F0 2ABE          00AD2   626          B     AK14                       AK045000
00090A D203 3134 3078 01148 0108C 627 AK226    MVC   AK120(4),AK23              AK045100
000910 4180 2872          00886   628          LA    8,AK126                    AK045200
000914 5080 312C          01140   629          ST    8,AK116                    AK045300
000918 47F0 27F4          00808   630          B     AK124                      AK045400
00091C 4180 40F6          0210A   631 AK133    LA    8,AK160                    AK045500
000920 5080 3184          01198   632          ST    8,AK151                    AK045600
000924 4180 005F          0005F   633          LA    8,95                       AK045700
000928 5080 3188          0119C   634          ST    8,AK152                    AK045800
00092C 4580 2ACE          00AE2   635 AK227    BAL   8,AK16                     AK045900
000930 95C3 3376    0138A         636          CLI   AK21,C'C'                  AK046000
000934 4770 2AFC          00B10   637          BNE   AK69                       AK046100
000938 D24D 41C8 3378 0211C 0138C 638 AK135    MVC   AK160+18(78),AK21+2        AK046200
                                  639          PROP  AK48,10,X'40'              AK046300
000948 4160 3378          0138C   642          LA    6,AK21+2                   AK046400
00094C 4170 33C5          013D9   643          LA    7,AK21+79                  AK046500
000950 18AA                       644          SR    10,10                      AK046600
000952 41B0 400F          02023   645          LA    11,AK134                   AK046700
                                  646          PROP  AK134,80,X'40'             AK046800
000960 954C 600C    00000         649 AK136    CLI   0(6),X'40'                 AK046900
000964 4780 296A          0097E   650          BE    AK137                      AK047000
000968 9548 600C    00000         651          CLI   0(6),C'.'                  AK047100
00096C 4780 296A          0097E   652          BE    AK137                      AK047200
000970 D200 80CC 6000 00000 00C0C 653          MVC   0(1,11),0(6)               AK047300
000976 41BB 0001          00001   654          LA    11,1(11)                   AK047400
00097A 41AA 0001          00001   655          LA    10,1(10)                   AK047500
00097E 4166 0001          00001   656 AK137    LA    6,1(6)                     AK047600
000982 1967                       657          CR    6,7                        AK047700
000984 47D0 294C          0096C   658          BNH   AK136                      AK047800
000988 50A0 3140          01154   659          ST    10,AK138                   AK047900
                                  660          OPEN  (AK10,(INPUT))             AK048000
000996 4580 283E          00852   666 AK142    BAL   8,AK46                     AK048100
00099A D503 4270 388E 02284 018A2 667          CLC   AK48(4),AK55               AK048200
0009A0 4770 299E          009B2   668          BNE   AK150                      AK048300
                                  669          CLOSE (AK10,REREAD)              AK048400
0009AE 47F0 2918          00920   675          B     AK227                      AK048500
0009B2 5090 30A4          01CB8   676 AK150    ST    9,AK50+4                   AK048600
0009B6 4170 42C1          022D5   677          LA    7,AK48+81                  AK048700
0009BA 940F 2A27    00A38         678          NI    AK140+1,X'0F'              AK048800
                                  679 AK143    PROP  AK139,80,X'40'             AK048900
0009C8 4160 405F          02073   682          LA    6,AK139                    AK049000
0009CC 9540 7000    00000         683 AK144    CLI   0(7),X'40'                 AK049100
0009D0 4770 29D2          009E6   684          BNE   AK234                      AK049200
0009D4 D504 7000 4235 00C00 02249 685          CLC   0(5,7),AK233               AK049300
0009DA 4770 2A38          00A4C   686          BNE   AK145                      AK049400
0009DE 4177 0005          00005   687          LA    7,5(7)                     AK049500
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  AK049600
000C9E2 47FC 29F6           00A0A   688          B      AK147                                 AK049600
000C9E6 954B 7000     00000         689 AK234    CLI    0(7),C'.'                             AK049700
000C9EA 4780 2A38           00A4C   690          BE     AK145                                 AK049800
000C9EE 956B 7000     00000         691          CLI    0(7),C','                             AK049900
000C9F2 4780 29F2           00A06   692          BE     AK148                                 AK050000
000C9F6 955C 7000     00000         693          CLI    0(7),C'*'                             AK050100
000C9FA 4770 2A2E           00A42   694          BNE    AK146                                 AK050200
000C9FE 96FC 2A27     00A3B         695          OI     AK140+1,X'FC'                         AK050300
000CA02 47FC 29F6           00A0A   696          B      AK147                                 AK050400
000CA06 4177 0001           00001   697 AK148    LA     7,1(7)                                AK050500
000CA0A 5880 3140           01154   698 AK147    L      8,AK138                               AK050600
000CA0E 5B80 3078           0108C   699          S      8,AK23                                AK050700
000CA12 4480 4250           02264   700          EX     8,AK141                               AK050800
000CA16 4770 2A26           00A3A   701          BNE    AK140                                 AK050900
000CA1A 4180 4270           02284   702          LA     8,AK48                                AK051000
000CA1E 5080 30A0           010B4   703          ST     8,AK50                                AK051100
000CA22 5890 309C           010A4   704          L      9,AK29                                AK051200
000CA26 058S                        705          BALR   8,9                                   AK051300
000CA28 4180 2982           00996   706          LA     8,AK142                               AK051400
000CA2C 5080 30D0           01CE4   707          ST     8,AK94                                AK051500
000CA30 D203 313C 30B4 01144 010C8   708          MVC    AK119(4),AK50+20                      AK051600
000CA36 47FC 228A           002CE   709          B      AK95                                  AK051700
000CA3A 4700 2982           00996   710 AK140    BC     0,AK142                               AK051800
000CA3E 47F0 29AA           009BE   711          B      AK143                                 AK051900
000CA42 D2CC 600C 7000 000DC 00000   712 AK146    MVC    0(1,6),0(7)                           AK052000
000CA48 416C 0001           00001   713          LA     6,1(6)                                AK052100
000CA4C 4177 0001           00001   714 AK145    LA     7,1(7)                                AK052200
000CA50 47FC 29B8           009CC   715          B      AK144                                 AK052300
000CA54 90CF 318C           011A0   716 AK45     STM    0,15,AK156                            AK052400
000CA58 5860 3184           01198   717          L      6,AK151                               AK052500
000CA5C 5870 3188           0119C   718          L      7,AK152                               AK052600
000CA60 5970 328C           012A0   719          C      7,AK235                               AK052700
000CA64 47D0 2A58           00A6C   720          BNH    AK153                                 AK052800
000CA68 5870 328C           012A0   721          L      7,AK235                               AK052900
                                    722 AK153    PROP   AK13,133,X'40'                        AK053000
000CA76 9289 3299     012AD         725          MVI    AK13,X'89'                            AK053100
000CA7A 458C 2ABE           00AD2   726          BAL    8,AK14                                AK053200
000CA7E 9211 3299     012AD         727          MVI    AK13,X'11'                            AK053300
000CA82 5B70 3078           0108C   728          S      7,AK23                                AK053400
000CA86 4470 425E           0226C   729          EX     7,AK154                               AK053500
000CA8A D203 32BF 40AF 012D3 020C3   730          MVC    AK13+38(4),AK155                      AK053600
000CA90 5800 309C           010B0   731          L      0,AK43                                AK053700
                                    732          MAKE   I,AK13+42,3                           AK053800
000CAA4 D203 32CB 3290 012DF 012A4   739          MVC    AK13+50(4),AK300                      AK053900
000CAAA D204 32D0 4271 012E4 02285   740          MVC    AK13+55(5),AK48+1                     AK054000
000CAB0 18A0                        741          LR     10,0                                  AK054100
000CAB2 41AA 0001           00001   742          LA     10,1(10)                              AK054200
000CAB6 50A0 309C           010B0   743          ST     10,AK43                               AK054300
000CABA 4580 2ABE           00AD2   744          BAL    8,AK14                                AK054400
000CABE 41A0 0002           00002   745          LA     10,2                                  AK054500
000CAC2 50A0 3098           010AC   746          ST     10,AK42                               AK054600
000CAC6 D203 3284 30BC 01298 010D0   747          MVC    AK305(4),AK62                         AK054700
000CACC 980F 318C           011A0   748          LM     0,15,AK156                            AK054800
000CAD0 07F8                        749          BR     8                                     AK054900
                                    750 *                                                    AK055000
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    AK055100
                                    751 * PRINTER  ROUTINE USING QSAM          AK055200
                                    752 *                                      AK055300
                                    753 AK14      PUT   AK8,AK13               AK055400
00CAE0 07F8                         758           BR    8                      AK055500
                                    759 *                                      AK055600
                                    760 *  CARD READER ROUTINE USING QSAM      AK055700
                                    761 *                                      AK055800
                                    762 AK16      GET   AK9,AK21               AK055900
00CAF0 07F8                         767           BR    8                      AK056000
                                    768 AK161     PROP  AK13,133,X'40'         AK056100
00CAFC 9211 3299       012AD        771           MVI   AK13,X'11'             AK056200
00CB00 D20F 329A 4157 012AE 02168   772           MVC   AK13+1(16),AK162       AK056300
00CB06 4180 2AFC            00B10   773           LA    8,AK69                 AK056400
00CB0A 47F0 2ABE            00AD2   774           B     AK14                   AK056500
                                    775 AK69      CLOSE (AK10,,AK101,,AK9)     AK056600
00CB22 95F1 3298       012AC        785           CLI   AK302,C'1'             AK056700
00CB26 4770 2B28            00B3C   786           BNE   AK304                  AK056800
                                    787           CALL  HTRAIN                 AK056900
                                    793 AK304     CLOSE (AK8)                  AK057000
                                    799           NRCR  AK1                    AK057100
                                    805 *                                      AK057200
                                    806 * INPUT TAPE ROUTINE USING QSAM        AK057300
                                    807 *                                      AK057400
00CB52 D203 31E4 30BC 011F8 010D0   808 AK46      MVC   AK170(4),AK62          AK057500
00CB58 5080 31E8            011FC   809           ST    8,AK174                AK057600
00CB5C 4180 2850            00864   810           LA    8,AK171                AK057700
00CB60 5080 3230            01244   811           ST    8,AK186                AK057800
00CB64 D203 31EC 30BC 011F4 010DC   812 AK171     MVC   AK167(4),AK62          AK057900
                                    813           GET   AK10,AK47              AK058000
00CB78 5880 31E0            011F4   818 AK187     L     8,AK167                AK058100
00CB7C 5980 30BC            010D0   819           C     8,AK62                 AK058200
00CB80 4780 2C52            00C66   820           BE    AK175                  AK058300
                                    821           PROP  AK13,133,X'40'         AK058400
00C88E 9211 3299       012AD        824           MVI   AK13,X'11'             AK058500
00CB92 D21F 32D5 3054 012E5 01068   825           MVC   AK13+60(32),AK169      AK058600
00CB98 5980 3078            0108C   826           C     8,AK23                 AK058700
00CB9C 4780 2C48            00C5C   827           BE    AK173                  AK058800
00CBA0 D233 329A 2ACE 012AE 00AE2   828           MVC   AK13+1(52),AK16        AK058900
00CBA6 4580 2ABE            00AD2   829           BAL   8,AK14                 AK059000
00CBAA 5880 31E4            011F8   830           L     8,AK170                AK059100
00CBAE 4188 0001            00001   831           LA    8,1(8)                 AK059200
00CBB2 5080 31E4            011F8   832           ST    8,AK170                AK059300
00CBB6 5980 3288            0129C   833           C     8,AK229                AK059400
00CBBA 4740 28C6            008DA   834           BL    AK230                  AK059500
                                    835           PROP  AK13,133,X'40'         AK059600
00CBC8 9211 3299       012AD        838           MVI   AK13,X'11'             AK059700
00CBCC D21A 329A 41AC 012AE 021B4   839           MVC   AK13+1(27),AK172       AK059800
00CBD2 4180 2AFC            00B10   840           LA    8,AK69                 AK059900
00CBD6 47F0 2ABE            00AD2   841           B     AK14                   AK060000
00CBDA 5880 3230            01244   842 AK230     L     8,AK186                AK060100
00C8DE 07F8                         843           BR    8                      AK060200
                                    844 *                                      AK060300
                                    845 * SYNAD FOR QSAM TAPE                  AK060400
                                    846 *                                      AK060500
00CBE0 900F 31EC            01200   847 AK176     STM   0,15,AK177
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    AK060600
000BE4 D203 31E0 3078 011F4 0108C   848           MVC   AK167(4),AK23                          AK060700
000BEA 1890                         849           LR    9,0                                   AK060800
000BEC 4580 2CAC              00CC0 850           BAL   8,AK178                               AK060900
000BF0 5010 322C              0124C 851           ST    1,AK179                               AK061000
000BF4 9110 322C       0124C        852           TM    AK179,X'10'                           AK061100
000BF8 4710 2BF4              00C08 853           BC    1,AK180                               AK061200
000BFC 5880 31EC              011F4 854           L     8,AK167                               AK061300
000C00 4188 0001              00001 855           LA    8,1(8)                                AK061400
000C04 5080 31EC              011F4 856           ST    8,AK167                               AK061500
000C08 980F 31EC              01200 857 AK180     LM    0,15,AK177                            AK061600
                                    858           RETURN                                      AK061700
                                    860 *                                                     AK061800
                                    861 *  INPUT TAPE ROUTINE USING BSAM                      AK061900
                                    862 *                                                     AK062000
000C0E D203 31E4 30BC 011F8 010D0   863 AK102     MVC   AK170(4),AK62                         AK062100
000C14 5080 31E8              011FC 864           ST    8,AK174                               AK062200
000C18 4180 2CCC              00C20 865           LA    8,AK185                               AK062300
000C1C 5080 3230              01244 866           ST    8,AK186                               AK062400
000C20 D203 31EC 30BC 011F4 010D0   867 AK185     MVC   AK167(4),AK62                         AK062500
                                    868           READ  FDEB1,SF,AK101,AK98                   AK062600
                                    881           CHECK FDEB1                                 AK062700
000C58 47F0 2B64              00B78 886           B     AK187                                 AK062800
000C5C D231 329A 416E 012AE 02182   887 AK173     MVC   AK13+1(50),AK168+2                    AK062900
000C62 4580 2ABE              00AD2 888           BAL   8,AK14                                AK063000
000C66 4890 426C              02280 889 AK175     LH    9,AK47                                AK063100
000C6A 5B90 3238              0124C 890           S     9,AK191                               AK063200
000C6E 588C 31E8              011FC 891           L     8,AK174                               AK063300
000C72 07F8                         892           BR    8                                     AK063400
                                    893 *                                                     AK063500
                                    894 * SYNAD FOR  TAPE - BSAM                              AK063600
                                    895 *                                                     AK063700
000C74 900F 31EC              01200 896 AK182     STM   0,15,AK177                            AK063800
000C78 D203 31E0 3078 011F4 0108C   897           MVC   AK167(4),AK23                         AK063900
000C7E 5890 2C28              00C3C 898           L     9,FDEB1+16                            AK064000
000C82 4580 2CAC              00CC0 899           BAL   8,AK178                               AK064100
000C86 5010 322C              01240 900           ST    1,AK179                               AK064200
000C8A 9110 322C       01240        901           TM    AK179,X'10'                           AK064300
000C8E 4710 2C8A              00C9E 902           BC    1,AK183                               AK064400
000C92 5880 31E0              011F4 903           L     8,AK167                               AK064500
000C96 4188 0001              00001 904           LA    8,1(8)                                AK064600
000C9A 5080 31E0              011F4 905           ST    8,AK167                               AK064700
000C9E 980F 31EC              01200 906 AK183     LM    0,15,AK177                            AK064800
                                    907           RETURN                                      AK064900
                                    909 *                                                     AK065000
                                    910 * END OF TAPE FILE ROUTINE                            AK065100
                                    911 *                                                     AK065200
                                    912 AK184     PROP  AK13,133,X'40'                        AK065300
000CAE 9211 3299       012AD        915           MVI   AK13,X'11'                            AK065400
000CB2 D213 329A 4188 012AE 021CF   916           MVC   AK13+1(20),AK181                      AK065500
000CB8 4180 2AFC              00B10 917           LA    8,AK69                                AK065600
000CBC 47F0 2ABE              00AD2 918           B     AK14                                  AK065700
                                    919 *                                                     AK065800
                                    920 * CONVERT STANDARD STATUS INFORMATION TO HEX          AK065900
                                    921 *                                                     AK066000
000CC0 41A0 3054              01068 922 AK178     LA    10,AK169
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    AK066100
000CC4 1BBB                          923           SR    11,11                 AK066100
000CC6 1B66                          924 AK190     SR    6,6                   AK066200
000CC8 1B76                          925           LR    7,6                   AK066300
000CCA 4369 0000             00000   926           IC    6,0(9)                AK066400
000CCE 8C60 0004             00004   927           SRDL  6,4                   AK066500
000CD2 426A 0000             00000   928           STC   6,0(10)               AK066600
000CD6 DC00 A000 41CF 00000  021E3   929           TR    0(1,10),AK188         AK066700
000CDC 41AA 0001             00001   930           LA    10,1(10)              AK066800
000CE0 1B66                          931           SR    6,6                   AK066900
000CE2 8D60 0004             00004   932           SLDL  6,4                   AK067000
000CE6 426A 0000             00000   933           STC   6,0(10)               AK067100
000CEA DC00 A000 41CF 00000  021E3   934           TR    0(1,10),AK188         AK067200
000CF0 41AA 0001             00001   935           LA    10,1(10)              AK067300
000CF4 41BB 0001             00001   936           LA    11,1(11)              AK067400
000CF8 4199 0001             00001   937           LA    9,1(9)                AK067500
000CFC 59B0 3234             01248   938           C     11,AK189              AK067600
000D00 474C 2CB2             00CC6   939           BL    AK190                 AK067700
000D04 07F8                          940           BR    8                     AK067800
                                     941 *                                     AK067900
                                     942 * ACCOUNTING INFORMATION ONLY         AK068000
                                     943 *                                     AK068100
                                     944 AK192     OPEN  (AK10,(INPUT))        AK068200
000D12 458C 2B3E             00B52   950 AK193     BAL   8,AK46                AK068300
000D16 D503 4270 388E 02284  018A2   951           CLC   AK48(4),AK55          AK068400
000D1C 477C 2CFE             00D12   952           BNE   AK193                 AK068500
000D20 47F0 23DC             003F0   953           B     AK58                  AK068600
                                     954 *                                     AK068700
                                     955 * MASTER REFERENCE LISTING            AK068800
                                     956 *                                     AK068900
                                     957 AK195     CALL  MASTER,(AK50)         AK069000
000D3A 07F8                          969           BR    8                     AK069100
000D3C D203 30B8 323C 010CC 01250    970 AK196     MVC   AK50+24(4),AK199      AK069200
                                     971           CALL  ETB,(AK50)            AK069300
000D5A 07F8                          983           BR    8                     AK069400
                                     984 AK197     CALL  ETB,(AK50)            AK069500
000D72 07F8                          996           BR    8                     AK069600
000D74 5080 3258             0126C   997 AK201     ST    8,AK202               AK069700
000D78 940F 2DB5       00DC9         998           NI    AK206+1,X'0F'         AK069800
000D7C 4580 2E8C             0CEA0   999           BAL   8,AK310               AK069900
000D80 D203 325C 30BC 01270 010DC   1000           MVC   AK203(4),AK62         AK070000
000D86 4580 2ACE             00AE2   1001 AK207    BAL   8,AK16                AK070100
000D8A 95D6 3376       0138A         1002           CLI   AK21,C'Q'             AK070200
000D8E 4780 2DB4             00DC8   1003           BE    AK206                 AK070300
000D92 95D9 3376       0138A         1004           CLI   AK21,C'R'             AK070400
000D96 4780 2DA2             00DB6   1005           BE    AK231                 AK070500
                                     1006           PROP  AK13,133,X'40'        AK070600
000DA4 9211 3299       012AD         1009           MVI   AK13,X'11'            AK070700
000DA8 D210 329A 41F5 012AE 02209   1010           MVC   AK13+1(17),AK211      AK070800
000DAE 4180 2AFC             00B1C   1011           LA    8,AK69                AK070900
000DB2 47F0 2ABE             00AD2   1012           B     AK14                  AK071000
000DB6 5880 3254             01268   1013 AK231     L     8,AK200+20            AK071100
000DBA 5890 325C             0127C   1014           L     9,AK203               AK071200
000DBE 5098 0000             00000   1015           ST    9,0(8)                AK071300
000DC2 5880 3258             0126C   1016           L     8,AK202               AK071400
000DC6 07F8                          1017           BR    8                     AK071500
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT
000DC8 4700 2D72            00D86  1018 AK206     BC     0,AK207                  AK071600
000DCC 5860 3240            01254  1019           L      6,AK200                  AK071700
000DD0 D205 60CC 3378 00000 0138C  1020           MVC    0(6,6),AK21+2            AK071800
000DD6 4166 0006            00006  1021           LA     6,6(6)                   AK071900
000DDA 5060 3240            01254  1022           ST     6,AK200                  AK072000
000DDE 4160 0046            00046  1023           LA     6,70                     AK072100
000DE2 4170 33C5            013D9  1024           LA     7,AK21+79                AK072200
000DE6 9540 7000      00000        1025 AK204     CLI    0(7),X'40'               AK072300
000DEA 4770 2EC6            00E1A  1026           BNE    AK209                    AK072400
000DEE 5B70 3078            0108C  1027           S      7,AK23                   AK072500
000DF2 5B60 3078            0108C  1028           S      6,AK23                   AK072600
000DF6 5960 30BC            010DC  1029           C      6,AK62                   AK072700
000DFA 4720 2DD2            00DE6  1030           BH     AK204                    AK072800
000DFE 5860 3240            01254  1031 AK210     L      6,AK200                  AK072900
000E02 5B60 3268            0127C  1032           S      6,AK224                  AK073000
000E06 5060 3240            01254  1033           ST     6,AK200                  AK073100
000E0A 5870 3244            01258  1034           L      7,AK200+4                AK073200
000E0E 5B70 3238            0124C  1035           S      7,AK191                  AK073300
000E12 5070 3244            01258  1036           ST     7,AK200+4                AK073400
000E16 47F0 2D72            00D86  1037           B      AK207                    AK073500
000E1A 5890 3278            0128C  1038 AK209     L      9,AK312                  AK073600
000E1E 1996                        1039           CR     9,6                      AK073700
000E20 47B0 2E14            00E28  1040           BNL    AK321                    AK073800
000E24 4580 2EBC            00EAC  1041           BAL    8,AK310                  AK073900
000E28 5870 3244            01258  1042 AK321     L      7,AK200+4                AK074000
000E2C 58A0 324C            01260  1043           L      10,AK200+12              AK074100
000E30 50A7 C0C0            00000  1044           ST     10,0(7)                  AK074200
000E34 4177 C0C4            00004  1045           LA     7,4(7)                   AK074300
000E38 5070 3244            01258  1046           ST     7,AK200+4                AK074400
000E3C 1B96                        1047           SR     9,6                      AK074500
000E3E 5090 3278            0128C  1048           ST     9,AK312                  AK074600
000E42 47F0 2E32            00E46  1049           B      AK322                    AK074700
000E46 5890 3248            0125C  1050 AK322     L      9,AK200+8                AK074800
000E4A 5069 0000            0000C  1051           ST     6,0(9)                   AK074900
000E4E 4199 0004            00004  1052           LA     9,4(9)                   AK075000
000E52 5090 3248            0125C  1053           ST     9,AK200+8                AK075100
000E56 5B60 3078            0108C  1054           S      6,AK23                   AK075200
000E5A 4460 4260            02274  1055           EX     6,AK205                  AK075300
000E5E 4166 0001            00001  1056           LA     6,1(6)                   AK075400
000E62 1AA6                        1057           AR     10,6                     AK075500
000E64 50A0 324C            01260  1058           ST     10,AK200+12              AK075600
000E68 58A0 325C            01270  1059           L      10,AK203                 AK075700
000E6C 41AA 0001            00001  1060           LA     10,1(10)                 AK075800
000E70 50A0 325C            01270  1061           ST     10,AK203                 AK075900
000E74 58B0 3250            01264  1062           L      11,AK200+16              AK076000
000E78 59AB 0000            00000  1063           C      10,0(11)                 AK076100
000E7C 4740 2D72            00D86  1064           BL     AK207                    AK076200
                                   1065 AK319     PROP   AK13,133,X'40'           AK076300
000E8A 9211 3299      012AD        1068           MVI    AK13,X'11'               AK076400
000E8E D215 329A 41DF 012AE 021F3  1069           MVC    AK13+1(22),AK208         AK076500
000E94 96F0 2DB5      00DC9        1070           OI     AK206+1,X'F0'            AK076600
000E98 4180 2D72            00D86  1071           LA     8,AK207                  AK076700
000E9C 47F0 2ABE            00AD2  1072           B      AK14                     AK076800
000EA0 9089 326C            0128C  1073 AK310     STM    8,9,AK313                AK076900
000EA4 5880 3274            01288  1074           L      8,AK314                  AK077000
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F01JAN68   7/05/68

00CEA8 1B99                        1075           SR     9,9                                                          AK077100
                                   1076 AK318     GETMAIN EC,LV=(8),A=AK311                                   AK077200
00CEC0 4199 0001             00001 1085           LA     9,1(9)                                               AK077300
00CEC4 59F0 30BC             01CDC 1086           C      15,AK62                                              AK077400
00CEC8 4780 2EC8             00EDC 1087           BE     AK320                                                AK077500
00CECC 5990 3238             0124C 1088           C      9,AK191                                              AK077600
00CED0 4780 2E6C             00E8C 1089           BNL    AK319                                                AK077700
00CED4 8A80 0001             00001 1090           SRA    8,1                                                  AK077800
00CED8 47F0 2E98             00EAC 1091           B      AK318                                                AK077900
00CEDC 5080 3278             0128C 1092 AK320     ST     8,AK312                                              AK078000
00CEE0 D203 324C 327C 01260 0129C 1093           MVC    AK200+12(4),AK311                                    AK078100
00CEE6 9889 326C             01280 1094           LM     8,9,AK313                                            AK078200
00CEEA 07F8                        1095           BR     8                                                    AK078300
                                   1096 *                                                                      AK078400
                                   1097 * PRINTER DCB USING QSAM                                               AK078500
                                   1098 *                                                                      AK078600
                                   1099 AK8       DCB    DSORG=PS,                                           XAK078700
                                                         MACRF=PM,                                           XAK078800
                                                         DDNAME=FDBK01,                                      XAK078900
                                                         RECFM=FM,                                           XAK079000
                                                         LRECL=133,                                          XAK079100
                                                         BFTEK=S,                                            XAK079200
                                                         BLKSIZE=133,                                        XAK079300
                                                         BUFNO=5                                              AK079400
                                   1100                  *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
                                   1156 *                                                                      AK079500
                                   1157 * CARD READER DCB USING QSAM                                           AK079600
                                   1158 *                                                                      AK079700
                                   1159 AK9       DCB    DSORG=PS,                                           XAK079800
                                                         MACRF=GM,                                           XAK079900
                                                         DDNAME=FDBK02,                                      XAK080000
                                                         RECFM=F,                                            XAK080100
                                                         LRECL=80,                                           XAK080200
                                                         BLKSIZE=80,                                         XAK080300
                                                         BFTEK=S,                                            XAK080400
                                                         BUFNO=5,                                            XAK080500
                                                         EROPT=ACC                                            AK080600
                                   1160                  *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
                                   1216 *                                                                      AK080700
                                   1217 * TAPE INPUT DCB USING QSAM                                            AK080800
                                   1218 *                                                                      AK080900
                                   1219 AK10      DCB    DSORG=PS,                                           XAK081000
                                                         MACRF=GM,                                           XAK081100
                                                         DDNAME=FDBK03,                                      XAK081200
                                                         BFTEK=S,                                            XAK081300
                                                         EODAD=AK184,                                        XAK081400
                                                         SYNAD=AK176                                          AK081500
                                   1220                  *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
                                   1276 *                                                                      AK081600
                                   1277 * TAPE INPUT DCB USING BSAM                                            AK081700
                                   1278 *                                                                      AK081800
                                   1279 AK101     DCB    DSORG=PS,                                           XAK081900
                                                         MACRF=RP,                                           XAK082000
                                                         DDNAME=FDBK03,                                      XAK082100
                                                         EODAD=AK184,                                        XAK082200
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  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                             F01JAN68   7/05/68

                                                       SYNAD=AK182                                             AK082300
                                   1280                *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
001068                             1333 AK169    DS    4D                                                      AK082400
001088                             1334 AK6      DS    0F                                                      AK082500
001088 FCFFFFFF                    1335          DC    X'FCFFFFFF'                                             AK082600
00108C 00000001                    1336 AK23     DC    F'1'                                                    AK082700
001090 00000005                    1337 AK24     DC    F'5'                                                    AK082800
001094 00000D24                    1338 AK28     DC    A(AK195)                                                AK082900
001098 00000D3C                    1339          DC    A(AK196)                                                AK083000
00109C 00000D5C                    1340          DC    A(AK197)                                                AK083100
0010A0                             1341          DS    F                                                       AK083200
0010A4                             1342 AK29     DS    F                                                       AK083300
0010A8 00000002                    1343 AK30     DC    F'2'                                                    AK083400
0010AC                             1344 AK42     DS    F                                                       AK083500
0010B0                             1345 AK43     DS    F                                                       AK083600
0010B4                             1346 AK50     DS    7F                                                      AK083700
0010D0 00000000                    1347 AK62     DC    F'0'                                                    AK083800
0010D4                             1348 AK71     DS    F                                                       AK083900
0010D8                             1349 AK80     DS    F                                                       AK084000
0010DC                             1350 AK81     DS    F                                                       AK084100
0010E0                             1351 AK83     DS    F                                                       AK084200
0010E4                             1352 AK94     DS    F                                                       AK084300
0010E8                             1353 AK100    DS    20F                                                     AK084400
001138                             1354 AK108    DS    F                                                       AK084500
00113C                             1355 AK114    DS    F                                                       AK084600
001140                             1356 AK116    DS    F                                                       AK084700
001144                             1357 AK119    DS    F                                                       AK084800
001148                             1358 AK120    DS    F                                                       AK084900
00114C                             1359 AK127    DS    F                                                       AK085000
001150 00000003                    1360 AK132    DC    F'3'                                                    AK085100
001154                             1361 AK138    DS    F                                                       AK085200
001158                             1362 AK149    DS    16F                                                     AK085300
001198                             1363 AK151    DS    F                                                       AK085400
00119C                             1364 AK152    DS    F                                                       AK085500
0011A0                             1365 AK156    DS    18F                                                     AK085600
0011E8                             1366 AK163    DS    F                                                       AK085700
0011EC 0000000D                    1367 AK164    DC    F'13'                                                   AK085800
0011F0 000F4240                    1368 AK165    DC    F'1000000'                                              AK085900
0011F4                             1369 AK167    DS    F                                                       AK086000
0011F8                             1370 AK170    DS    F                                                       AK086100
0011FC                             1371 AK174    DS    F                                                       AK086200
001200                             1372 AK177    DS    16F                                                     AK086300
001240                             1373 AK179    DS    F                                                       AK086400
001244                             1374 AK186    DS    F                                                       AK086500
001248 00000010                    1375 AK189    DC    F'16'                                                   AK086600
00124C 00000004                    1376 AK191    DC    F'4'                                                    AK086700
001250                             1377 AK199    DS    F                                                       AK086800
001254                             1378 AK200    DS    6F                                                      AK086900
00126C                             1379 AK202    DS    F                                                       AK087000
001270                             1380 AK203    DS    F                                                       AK087100
001274 0000000A                    1381 AK217    DC    F'10'                                                   AK087200
001278 00000014                    1382 AK222    DC    F'20'                                                   AK087300
00127C 00000006                    1383 AK224    DC    F'6'                                                    AK087400
001280                             1384 AK313    DS    2F                                                      AK087500
001288 00001F40                    1385 AK314    DC    F'8000'                                                 AK087600
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F01JAN68   7/05/68

00128C                             1386 AK312    DS    F                                                                AK087700
001290                             1387 AK311    DS    F                                                                AK087800
001294 00000064                    1388 AK228    DC    F'100'                                                           AK087900
001298                             1389 AK305    DS    F                                                                AK088000
00129C 00000005                    1390 AK229    DC    F'5'                                                             AK088100
0012A0 00000023                    1391 AK235    DC    F'35'                                                            AK088200
0012A4 D9C5C64B                    1392 AK300    DC    C'REF.'                                                          AK088300
0012A8 00000000                    1393 AK303    DC    F'0'                                                             AK088400
0012AC                             1394 AK302    DS    CL1                                                              AK088500
0012AD                             1395 AK13     DS    CL133                                                            AK088600
001332                             1396 AK15     DS    CL80                                                             AK088700
001382                             1397 AK17     DS    CL2                                                              AK088800
001384                             1398 AK18     DS    CL2                                                              AK088900
001386                             1399 AK19     DS    CL2                                                              AK089000
001388                             1400 AK20     DS    CL2                                                              AK089100
00138A                             1401 AK21     DS    CL80                                                             AK089200
0013DA C9D5C3D6D9D9C5C3            1402 AK26     DC    C'INCORRECT M VALUE' 17                                          AK089300
0013EB C9D5C3D6D9D9C5C3            1403 AK31     DC    C'INCORRECT I VALUE' 17                                          AK089400
0013FC C97EF16BD27EF26B            1404 AK33     DC    C'I=1,K=2,CARD ID. INCORRECT' 26                                 AK089500
001416                             1405 AK35     DS    CL5                                                              AK089600
00141B                             1406 AK36     DS    CL5                                                              AK089700
001420 C9D5C3D6D9D9C5C3            1407 AK39     DC    C'INCORRECT K VALUE' 17                                          AK089800
001431 D4C1E2E3C5D940C3            1408 AK44     DC    C'MASTER COPY  PAGE' 17                                          AK089900
001442                             1409 AK49     DS    16CL70                                                           AK090000
0018A2 C1C1C1C1                    1410 AK55     DC    C'AAAA'              4                                           AK090100
0018A6 E3D6E3C1D340D9C5            1411 AK59     DC    C'TOTAL REFERENCES='  17                                         AK090200
0018B7 5C5C5C40E2E4C2D1            1412 AK60     DC    C'*** SUBJECT TOTALS ***' 22                                     AK090300
0018CD C3C3C3C3                    1413 AK61     DC    C'CCCC'                                                          AK090400
0018D1 C2C9C2C3C9D6C7D9            1414 AK66     DC    C'BIBLIOGRAPHY CLASS TOTALS'  25                                 AK090500
0018EA C3D3C1E2E2                  1415 AK68     DC    C'CLASS'                                                         AK090600
0018EF C6D6D9D4C1E340CC5           1416 AK70     DC    C'FORMAT ERROR IN          TYPE' 29                              AK090700
00190C C5D9D9D6D940E3C5            1417 AK72     DC    C'ERROR TERMINATION'  17                                         AK090800
00191D C9D5C3D6D9D9C5C3            1418 AK75     DC    C'INCORRECT J VALUE'  17                                         AK090900
00192E                             1419 AK79     DS    CL5                                                              AK091000
001933 D4C1E2E3C5D94CD9            1420 AK87     DC    C'MASTER REF. LESS THAN LOWEST ON TAPE'  36                      AK091100
001957 D4C1E2E3C5D94CD9            1421 AK89     DC    C'MASTER REF. NOT ON TAPE'  23                                   AK091200
00196E                             1422 AK99     DS    20CL78                                                           AK091300
001F86 E2C5C1D9C3C840E3            1423 AK105    DC    C'SEARCH TAPE INCORRECT CAN NOT CONTINUE' 38                     AK091400
001FAC E3D640D4C1D5E840            1424 AK106    DC    C'TO MANY SUBJECTS ON TAPE-WILL CONTINUE' 38                     AK091500
001FD2 E2E4C2D1C5C3E340            1425 AK113    DC    C'SUBJECT NOT FOUND ON TAPE' 25                                  AK091600
001FEB                             1426 AK115    DS    CL3                                                              AK091700
001FEE E3C1D7C54CC9D5C3            1427 AK117    DC    C'TAPE INCORRECT' 14                                             AK091800
001FFC 40404040                    1428 AK122    DC    X'40404040'                                                      AK091900
002000                             1429 AK125    DS    CL5                                                              AK092000
002005 C2C2C2C2                    1430 AK128    DC    C'BBBB'                                                          AK092100
002009 D4C1E2E3C5D94CD9            1431 AK131    DC    C'MASTER REF. NOT IN SUBJECT' 27                                 AK092200
002023                             1432 AK134    DS    CL80                                                             AK092300
002073                             1433 AK139    DS    CL80                                                             AK092400
0020C3 D7C1C7C5                    1434 AK155    DC    C'PAGE'  4                                                       AK092500
0020C7 D4C1E2E3C5D94CD9            1435 AK157    DC    C'MASTER REFERENCE SEARCH-SCAN'  28                              AK092600
0020E3 D4C1E2E3C5D94CD9            1436 AK158    DC    C'MASTER REFERENCE SEARCH-INDIVIDUAL' 34                         AK092700
002105 404040404040                1437 AK159    DC    X'4C40404040'                                                    AK092800
00210A C1E4E3C8D6D94CE2            1438 AK160    DC    C'AUTHOR SEARCH FOR'   17                                        AK092900
00211B                             1439          DS    CL80                                                             AK093000
002168 C5D5C440D6C640C3            1440 AK162    DC    C'END OF CARD FILE'   16                                         AK093100
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                    F01JAN68   7/05/68

00217B E3C9D4C57E                  1441 AK166    DC    C'TIME='    6                                                    AK093200
002180 E4D5C3D6D9D9C5C3            1442 AK168    DC    C'UNCORRECTABLE ERROR ON TAPE READ, STATUS INDICATORS='      AK093300
002184 E3D64CD4C1D5E840            1443 AK172    DC    C'TC MANY READ ERRORS IN AK10'   27                          AK093400
0021CF E3C1D7C540C6C9D3            1444 AK181    DC    C'TAPE FILE MARK FOUND'   20                                 AK093500
0021E3 F0F1F2F3F4F5F6F7            1445 AK188    DC    C'0123456789ABCDEF'                                          AK093600
0021F3 E3D64CD4C1D5E840            1446 AK208    DC    C'TO MANY CODEN ENTERIES'  22                                AK093700
002209 C3D6C4C5D540C5D9            1447 AK211    DC    C'CODEN ERROR-INPUT'  17                                     AK093800
00221A C3C1D9C440C5D9D9            1448 AK212    DC    C'CARD ERROR,-A IDENT'  19                                   AK093900
00222D F0F1                        1449 AK213    DC    C'01'                                                        AK094000
00222F F0F5                        1450 AK214    DC    C'05'                                                        AK094100
002231 C6D6D9D4C1E34CD9            1451 AK216    DC    C'FORMAT ROUTINE.FAILED ON'  26                              AK094200
002249 40C1D5C440                  1452 AK233    DC    C' AND '                                                     AK094300
00224E C3C1D9C44CC5D9D9            1453 AK219    DC    C'CARD ERROR I=1,K=1,J=1'                                    AK094400
002264                             1454 AK141    DS    0F                                                           AK094500
002264 D50C 40CF 4C5F 02C23 02073  1455          CLC   AK134(0),AK139                                               AK094600
00226C                             1456 AK154    DS    0F                                                           AK094700
00226C D200 329A 6000 012AE 0000C  1457          MVC   AK13+1(0),0(6)                                               AK094800
002274                             1458 AK205    DS    0F                                                           AK094900
002274 D20C A000 338C 00C0C 01394  1459          MVC   0(0,10),AK21+10                                              AK095000
00227C                             1460 AK98     DS    F                                                            AK095100
002280                             1461 AK47     DS    F                                                            AK095200
002284                             1462 AK48     DS    500F                                                         AK095300
C00000                             1463          END   AK5                                                          AK095400
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CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES
AK1	00004	C00C8C	0054	0014 0801
AK10	00004	0C0FAC	1225	0155 0236 0396 0458 0468 0664 0673 0779 0814 0948
AK10C	00004	0010E8	1353	0497 0561
AK101	00004	001000	1285	0494 0514 0566 0781 0875
AK102	00006	000C0E	0863	0499 0570 0596
AK103	00004	000738	0514	0501
AK104	00004	0006F2	0496	
AK105	00038	001F8E	1423	0510
AK106	00038	001FAC	1424	0528
AK107	00004	000778	0530	0505
AK108	00004	001138	1354	0530 0549
AK109	00004	000864	0588	0531 0543 0557 0586
AK110	00004	00078C	0532	0558 0563 0588 0592
AK111	00004	000858	0585	0536
AK112	00006	0007B2	0545	0550
AK113	00025	001FD2	1425	0555
AK114	00004	001130	1355	0562 0567
AK115	00003	001FE8	1426	0544 0573 0624
AK116	00004	001140	1356	0564 0575 0629
AK117	00014	001FEE	1427	0581
AK118	00004	000836	0578	0572 0574
AK119	00004	001144	1357	0196 0250 0478 0610 0708
AK120	00004	001148	1358	0590 0615 0627
AK122	00004	001FFC	1428	0593
AK123	00002	000868	0589	0614
AK124	00004	000808	0566	0630
AK125	00005	002000	1429	0595 0600 0623
AK126	00004	000886	0596	0601 0628
AK127	00004	00114C	1359	0597 0604
AK128	00004	002005	1430	0598
AK13	00133	0012AD	1395	0034 0035 0035 0036 0040 0041 0047 0048 0048 0049 0050 0051 0090 0091 0091
				0092 0093 0094 0140 0141 0141 0142 0143 0144 0165 0166 0166 0167 0168 0169
				0202 0203 0203 0204 0212 0213 0221 0227 0228 0228 0229 0230 0256 0257 0257
				0258 0259 0268 0269 0269 0270 0278 0279 0279 0280 0282 0283 0291 0294 0295
				0295 0296 0297 0308 0309 0309 0310 0311 0319 0327 0333 0334 0334 0335 0337
				0338 0352 0353 0353 0354 0355 0363 0371 0417 0418 0418 0419 0420 0421 0437
				0438 0438 0439 0440 0441 0449 0450 0450 0451 0452 0507 0508 0508 0509 0510
				0525 0526 0526 0527 0528 0552 0553 0553 0554 0555 0556 0578 0579 0579 0580
				0581 0582 0619 0620 0620 0621 0622 0623 0624 0723 0724 0724 0725 0727 0730
				0738 0739 0740 0755 0769 0770 0770 0771 0772 0822 0823 0823 0824 0825 0828
				0836 0837 0837 0838 0839 0887 0913 0914 0914 0915 0916 1007 1008 1008 1009
				1010 1066 1067 1067 1068 1069 1457
AK130	00004	000BCA	0612	0594 0608 0625
AK131	00026	002009	1431	0622
AK132	00004	001150	1360	0160
AK133	00004	000910	0631	0161
AK134	00080	002023	1432	0645 0647 0648 0648 1455
AK135	00006	000938	0638	
AK136	00004	000960	0649	0658
AK137	00004	00097E	0656	0650 0652
AK138	00004	001154	1361	0659 0698
AK139	00080	002073	1433	0680 0681 0681 0682 1455
AK14	00004	000AD2	0754	0037 0042 0053 0096 0146 0171 0208 0222 0238 0266 0276 0281 0292 0298 0331
				0336 0339 0373 0423 0444 0512 0529 0559 0584 0626 0726 0744 0774 0829 0841
				0888 0918 1012 1072

SYMBOL	LEN	VALUE	DEFN	REFERENCES							
AK140	00004	000A3A	0710	0678	0695	0701					
AK141	00004	002264	1454	0700							
AK142	00004	000596	0666	0706	0710						
AK143	00004	0009BE	0680	0711							
AK144	00004	000ACC	0683	0715							
AK145	00004	000A4C	0714	0686	0690						
AK146	00006	000A42	0712	0694							
AK147	00004	000A0A	0698	0688	0696						
AK148	00004	000A06	0697	0692							
AK149	00004	001158	1362	0197	0239	0274					
AK15	00080	001332	1396	0039	0041						
AK150	00004	0009B2	0676	0668							
AK151	00004	001198	1363	0173	0384	0487	0632	0717			
AK152	00004	00119C	1364	0175	0386	0489	0634	0718			
AK153	00004	000A6C	0723	0720							
AK154	00004	00226C	1456	0729							
AK155	00004	0020C3	1434	0730							
AK156	00004	0011AC	1365	0716	0748						
AK157	00028	0020C7	1435	0172							
AK158	00034	0020E3	1436	0383							
AK159	00005	002105	1437	0486							
AK16	00004	000AE2	0763	0038	0043	0136	0404	0532	0635	0828	1001
AK160	00017	00210A	1438	0631	0638						
AK161	00004	000AF2	0769								
AK162	00016	00216B	1440	0772							
AK163	00004	0011E8	1366								
AK164	00004	0011EC	1367	0591							
AK165	00004	0011FC	1368								
AK166	00005	00217B	1441								
AK167	00004	0011F4	1369	0812	0818	0848	0854	0856	0867	0897	0903	0905
AK168	00052	002180	1442	0887							
AK169	00008	00106E	1333	0825	0922						
AK17	00002	001382	1397	0058							
AK170	00004	0011F8	1370	0808	0830	0832	0863				
AK171	00006	000B64	0812	0810							
AK172	00027	0021B4	1443	0839							
AK173	00006	000C5C	0887	0827							
AK174	00004	0011FC	1371	0809	0864	0891					
AK175	00004	000C66	0889	0820							
AK176	00004	000BE0	0847	1259							
AK177	00004	001200	1372	0847	0857	0896	0906				
AK178	00004	000CCC	0922	0850	0899						
AK179	00004	001240	1373	0851	0852	0900	0901				
AK18	00002	001384	1398	0059	0132	0169					
AK180	00004	000C08	0857	0853							
AK181	00020	0021CF	1444	0916							
AK182	00004	000C74	0896	1319							
AK183	00004	000C9E	0906	0902							
AK184	00004	000CA4	0913	1244	1304						
AK185	00006	000C20	0867	0865							
AK186	00004	001244	1374	0811	0842	0866					
AK187	00004	000B78	0818	0886							
AK188	00016	0021E3	1445	0929	0934						
AK189	00004	001248	1375	0938							
AK19	00002	001386	1399	0060	0087	0094	0097	0105			

CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES													
AK190	0002	000CC6	0924	0939													
AK191	0004	00124C	1376	0162	0304	0345	0890	1035	1088								
AK192	0004	000D08	0946	0163													
AK193	0004	000D12	0950	0952													
AK195	0004	000D24	0959	1338													
AK196	0006	000D3C	0970	1339													
AK197	0004	000D5C	0986	1340													
AK199	0004	001250	1377	0077	0970												
AK20	0002	001388	1400	0061	0380												
AK200	0004	001254	1378	0111	0120	0125	1013	1019	1022	1031	1033	1034	1036	1042	1043	1046	1050	1053
				1058	1062	1093												
AK201	0004	000D74	0997	0124														
AK202	0004	00126C	1379	0997	1016													
AK203	0004	001270	1380	1000	1014	1059	1061											
AK204	0004	000DE6	1025	1030														
AK205	0004	002274	1458	1055														
AK206	0004	000DC8	1018	0998	1003	1070												
AK207	0004	000D86	1001	1018	1037	1064	1071											
AK208	0022	0021F3	1446	1069														
AK209	0004	000E1A	1038	1026														
AK21	0080	00138A	1401	0039	0044	0051	0058	0059	0060	0061	0068	0076	0078	0079	0137	0144	0147	0148
				0405	0407	0409	0421	0424	0533	0535	0544	0545	0556	0585	0636	0638	0642	0643
				0764	1002	1004	1020	1024	1459									
AK210	0004	000DFE	1031															
AK211	0017	002209	1447	1010														
AK212	0019	00221A	1448	0050														
AK213	0002	00222D	1449	0087														
AK214	0002	00222F	1450	0097														
AK215	0004	0001E2	0140	0150														
AK216	0024	002231	1451															
AK217	0004	001274	1381	0224														
AK218	0004	00035E	0239	0225														
AK219	0022	00224E	1453	0420														
AK22	0006	000DE0	0058	0045														
AK220	0006	0005EC	0424	0406														
AK221	0004	00067A	0461	0447														
AK222	0004	001278	1382	0522														
AK223	0004	0007F2	0560	0546														
AK224	0004	00127C	1383	1032														
AK225	0004	0008D6	0615	0599														
AK226	0006	00090A	0627	0617														
AK227	0004	00092C	0635	0675														
AK228	0004	001294	1388	0032														
AK229	0004	00129C	1390	0833														
AK23	0004	00108C	1336	0107	0125	0158	0244	0260	0341	0381	0388	0398	0434	0446	0453	0481	0627	0699
				0728	0826	0848	0897	1027	1028	1054								
AK230	0004	0008DA	0842	0834														
AK231	0004	000DB6	1013	1005														
AK232	0004	0006FC	0499	0503	0523													
AK233	0005	002249	1452	0685														
AK234	0004	0009E6	0689	0684														
AK235	0004	0012AC	1391	0719	0721													
AK24	0004	001090	1337															
AK25	0004	000148	0090	0098														
AK26	0017	0013DA	1402	0093														

SYMBOL	LEN	VALUE	DEFN	REFERENCES
AK27	00006	000016A	0097	0088
AK28	00004	001094	1338	0109
AK29	00004	0010A4	1342	0110 0191 0474 0606 0704
AK3	00004	0000D4	0055	0020
AK30	00004	0010A8	1343	0134
AK300	00004	0012A4	1392	0739
AK301	00006	00013E	00E7	0080
AK302	00001	0012AC	1394	0078 0785
AK303	00004	0012A8	1393	
AK304	00004	000B3C	0795	0786
AK305	00004	001298	1389	0244 0391 0411 0537 0747
AK306	00004	0005CA	0417	0410
AK307	00002	0007A2	0541	0539
AK31	00017	0013EB	1403	
AK310	00004	000EA0	1073	0999 1041
AK311	00004	001290	1387	1080 1093
AK312	00004	00128C	1386	1038 1048 1092
AK313	00004	001280	1384	1073 1094
AK314	00004	001288	1385	1074
AK318	00004	000EAC	1078	1091
AK319	00004	000E80	1066	1089
AK320	00004	000EDC	1092	1087
AK321	00004	000E28	1042	1040
AK322	00004	000E46	1050	1049
AK33	00026	0013FC	1404	0143
AK34	00006	000204	0147	0138
AK35	00005	001416	14C5	0147 0149 0182
AK36	00005	001418	14C6	0148 0149 0184
AK38	00004	00022A	0158	0135
AK39	00017	00142C	14C7	0168
AK4	00004	000014	0020	0055 0056 0057
AK40	00004	000536	0376	0159
AK41	00004	000264	0172	0157
AK42	00004	0010AC	1344	0032 0209 0211 0247 0262 0264 0271 0273 0746
AK43	00004	0010BC	1345	0069 0731 0743
AK44	00017	001431	1408	
AK45	00004	00A54	0716	0252 0414 0540
AK46	00006	000B52	08C8	0178 0299 0399 0666 0950
AK47	00004	002280	1461	0815 0889
AK48	00004	002284	1462	0179 0182 0184 0189 0213 0284 0300 0303 0311 0342 0401 0425 0471 0500 0502
				0518 0571 0573 0582 0598 0600 0602 0640 0641 0641 0667 0677 0702 0740 0951
AK49	00070	001442	1409	
AK5	00004	000000	0013	1463
AK50	00004	0010B4	1346	0188 0190 0195 0198 0214 0242 0243 0472 0473 0478 0603 0605 0610 0676 0703
				0708 0965 0970 0979 0992
AK52	00004	000392	0253	0251 0265
AK53	00004	0003CA	0268	0254
AK54	00004	00027E	0178	0181 0183 0187 0193
AK55	00004	0018A2	1410	0179 0401 0500 0571 0667 0951
AK56	00004	00028C	0181	0176 0186
AK57	00004	0002AC	0188	0185
AK58	00004	0003F0	0278	0180 0953
AK59	00017	0018A6	1411	0283
AK6	00004	001088	1334	0022
AK60	00022	001887	1412	0297

CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES														
AK61	00004	0018CC	1413	0300	0502													
AK62	00004	0010D0	1347	0111	0177	0199	0253	0305	0346	0349	0391	0412	0504	0538	0616	0747	0808	0812
				0819	0863	0867	1000	1029	1086									
AK63	000C4	00043C	0299	03C6														
AK64	00004	000452	0304	0330														
AK65	00004	0004A8	0333	03C1														
AK66	00025	0018D1	1414	0338														
AK67	00004	0004D2	0343	0350	0372													
AK68	00005	0018EA	1415	0355														
AK69	00004	000B10	0777	0052	0095	0145	0170	0231	0347	0408	0422	0511	0583	0587	0637	0773	0840	0917
				1011														
AK7	00004	000C2C	0026															
AK70	00029	0018EF	1416	0212														
AK71	000C4	0010D4	1348	0177	02C5	0207	0223	0246	0390									
AK72	00017	00190C	1417	0230														
AK75	00017	00191C	1418															
AK76	000C4	000596	0403	0387	0428	0442	0463	0480										
AK78	00006	0005F2	0425	0403														
AK79	00005	00192E	1419	0424	0425	0441												
AK8	00004	000EEC	1105	0028	0754	0797												
AK80	00004	0010D8	1349	0398	0429	0431	0433	0482	0484									
AK81	00004	0010DC	1350	0388	0445	0453	0462	0481										
AK82	000C4	000584	0399	0432														
AK83	00004	0010E0	1351	0400	0473													
AK84	00004	000574	0394	0470														
AK85	000C4	000614	0433	0426														
AK86	00004	000620	0437															
AK87	00036	001933	1420	0440														
AK88	00004	00059A	0404	0413	0415	0443	0485											
AK89	00023	001957	1421	0452														
AK9	00004	000F4C	1165	0030	0763	0783												
AK90	000C4	00063A	0442	0460														
AK91	000C4	000646	0445	0402	0435													
AK92	000C4	000696	0471	0427														
AK93	00004	0006BC	0480	0476														
AK94	00004	0010E4	1352	0194	0240	0275	0477	0609	0707									
AK95	00004	0002CE	0197	0479	0611	0709												
AK96	00004	000368	0242	0200														
AK97	00004	0006D6	0486	0382														
AK98	00004	00227C	1460	0876														
AK99	00078	001966	1422	0496	0542													
FDEB1	00004	000C2C	0871	0882	0898													
IHB0007B	00004	000134	0084	0085														
IHB0010B	000C4	0001A0	0115	0122														
IHB0011	00001	0001A8	0118															
IHB0011A	00001	0001AC	0121	0117														
IHB0062B	00004	000B30	0790	0791														
IHB0077B	00004	000D28	0960	0967														
IHB0078	00001	000D3C	0963															
IHB0078A	00001	000D34	0966	0962														
IHB0079B	00004	000D48	0974	0981														
IHB008C	00001	000D50	0977															
IHB008CA	000C1	000D54	0980	0976														
IHB0081B	00004	000D60	0987	0994														
IHB0082	00001	000D6E	0990															

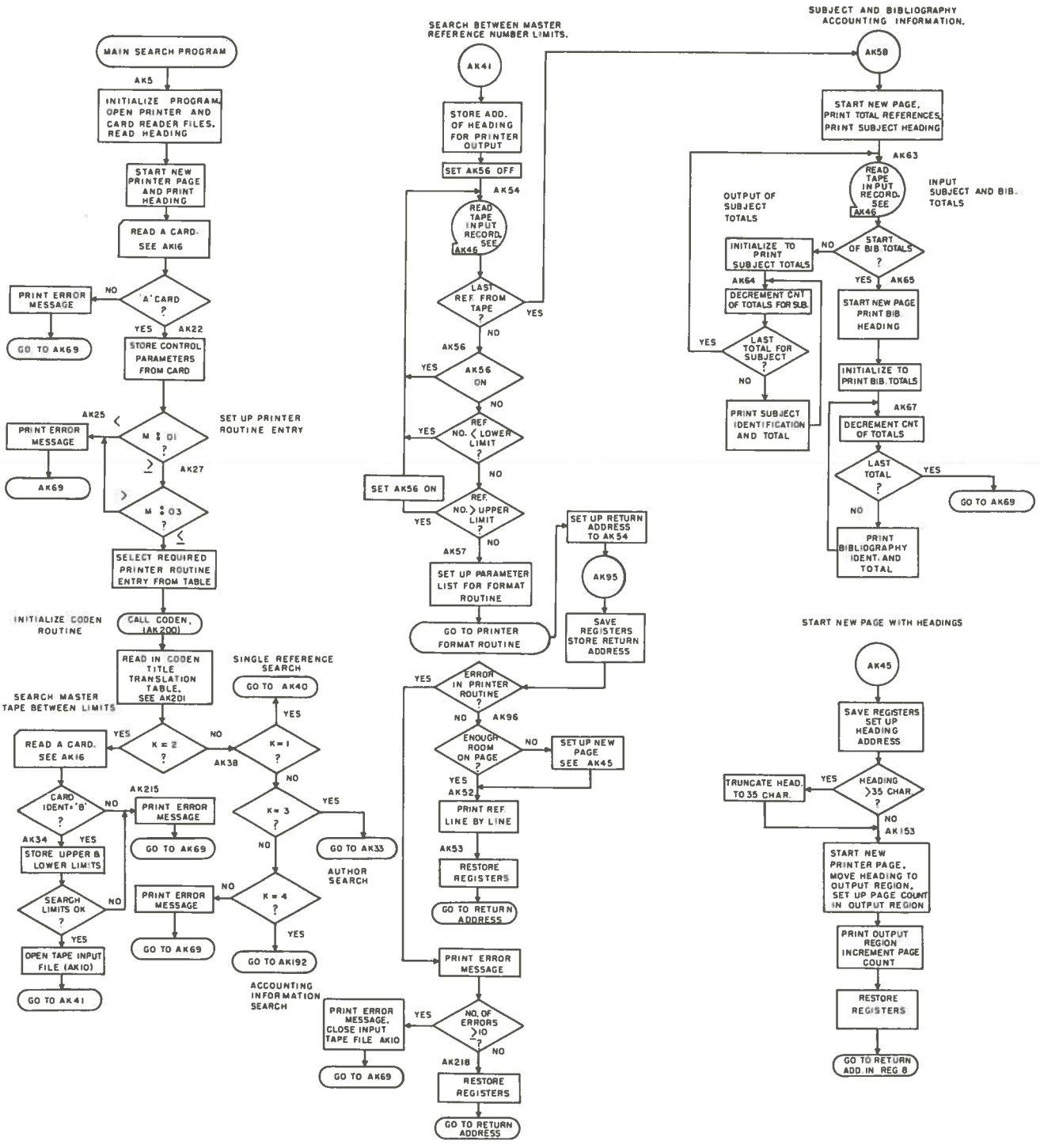

Fig. 10 Detail flow chart, main search program (continued on next page)

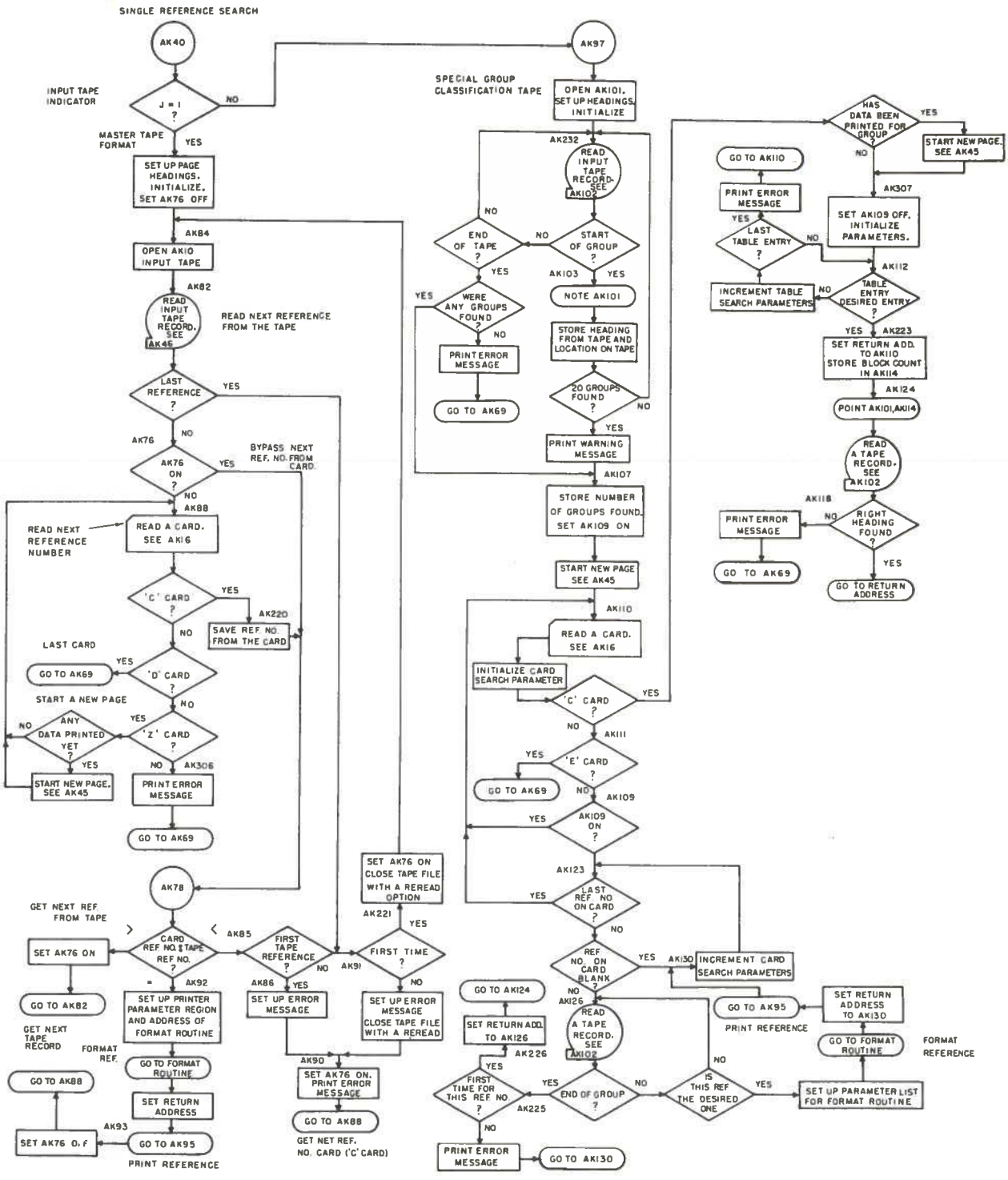
SINGLE REFERENCE SEARCH
AK40
INPUT TAPE INDICATOR
J = 1 ?
NO
MASTER TAPE FORMAT
YES
SET UP PAGE HEADINGS. INITIALIZE. SET AK76 OFF
AK84
OPEN AKIO INPUT TAPE
AK82
READ INPUT TAPE RECORD. SEE AK45
READ NEXT REFERENCE FROM THE TAPE
LAST REFERENCE ?
YES
NO
AK76
AK76 ON ?
YES
BYPASS NEXT REF. NO. FROM CARD.
NO
AK88
READ NEXT REFERENCE NUMBER
READ A CARD. SEE AKI6
'C' CARD ?
YES
AK220
SAVE REF. NO. FROM THE CARD
NO
LAST CARD
'D' CARD ?
YES
GO TO AK69
NO
START A NEW PAGE
ANY DATA PRINTED YET ?
NO
YES
'Z' CARD ?
YES
START NEW PAGE. SEE AK45
NO
AK306
PRINT ERROR MESSAGE
GO TO AK69
AK78
GET NEXT REF FROM TAPE
CARD REF NO. ≷ TAPE REF NO. ?
AK85
SET AK76 ON
GO TO AK82
GET NEXT TAPE RECORD
=
AK92
SET UP PRINTER PARAMETER REGION AND ADDRESS OF FORMAT ROUTINE
FORMAT REF.
GO TO FORMAT ROUTINE
SET RETURN ADDRESS
AK93
GO TO AK95
PRINT REFERENCE
GO TO AK88
SET AK76 OFF
FIRST TAPE REFERENCE ?
AK91
NO
YES
AK86
SET UP ERROR MESSAGE
AK90
SET AK76 ON. PRINT ERROR MESSAGE
GO TO AK88
GET NET REF. NO. CARD ('C' CARD)
FIRST TIME ?
YES
NO
SET AK76 ON CLOSE TAPE FILE WITH A REREAD OPTION
AK221
SET UP ERROR MESSAGE CLOSE TAPE FILE WITH A REREAD
AK97
SPECIAL GROUP CLASSIFICATION TAPE
OPEN AKIOI, SET UP HEADINGS. INITIALIZE
AK232
READ INPUT TAPE RECORD. SEE AKIO2
END OF TAPE ?
NO
YES
START OF GROUP ?
NO
YES
AKIO3
NOTE AKIOI
STORE HEADING FROM TAPE AND LOCATION ON TAPE
20 GROUPS FOUND ?
NO
YES
PRINT WARNING MESSAGE
WERE ANY GROUPS FOUND ?
YES
NO
PRINT ERROR MESSAGE
GO TO AK69
AKIO7
STORE NUMBER OF GROUPS FOUND. SET AKIO9 ON
START NEW PAGE SEE AK45
AKIIO
READ A CARD. SEE AKI6
INITIALIZE CARD SEARCH PARAMETER
'C' CARD ?
YES
NO
AKIII
'E' CARD ?
YES
GO TO AK69
NO
AKIO9
AKIO9 ON ?
YES
AKI23
LAST REF. NO ON CARD ?
YES
NO
REF. NO. ON CARD BLANK ?
YES
AKI30
INCREMENT CARD SEARCH PARAMETERS
NO
AKI26
READ A TAPE RECORD. SEE AKIO2
GO TO AKI24
SET RETURN ADD. TO AKI26
AK226
FIRST TIME FOR THIS REF NO. ?
YES
AK225
NO
PRINT ERROR MESSAGE
GO TO AKI30
END OF GROUP ?
YES
NO
IS THIS REF THE DESIRED ONE
YES
NO
GO TO AK95
PRINT REFERENCE
SET RETURN ADDRESS TO AKI30
GO TO FORMAT ROUTINE
FORMAT REFERENCE
SET UP PARAMETER LIST FOR FORMAT ROUTINE
HAS DATA BEEN PRINTED FOR GROUP ?
YES
START NEW PAGE. SEE AK45
NO
AK307
SET AKIO9 OFF, INITIALIZE PARAMETERS.
AKII2
TABLE ENTRY DESIRED ENTRY ?
NO
YES
AK223
SET RETURN ADD. TO AKIIO STORE BLOCK COUNT IN AKII4
AK124
POINT AKIOI, AKII4
READ A TAPE RECORD. SEE AKIO2
AKII8
RIGHT HEADING FOUND ?
NO
YES
PRINT ERROR MESSAGE
GO TO AK69
GO TO RETURN ADDRESS
INCREMENT TABLE SEARCH PARAMETERS
NO
LAST TABLE ENTRY ?
YES
NO
PRINT ERROR MESSAGE
GO TO AKIIO

Fig. 10 (cont'd.)

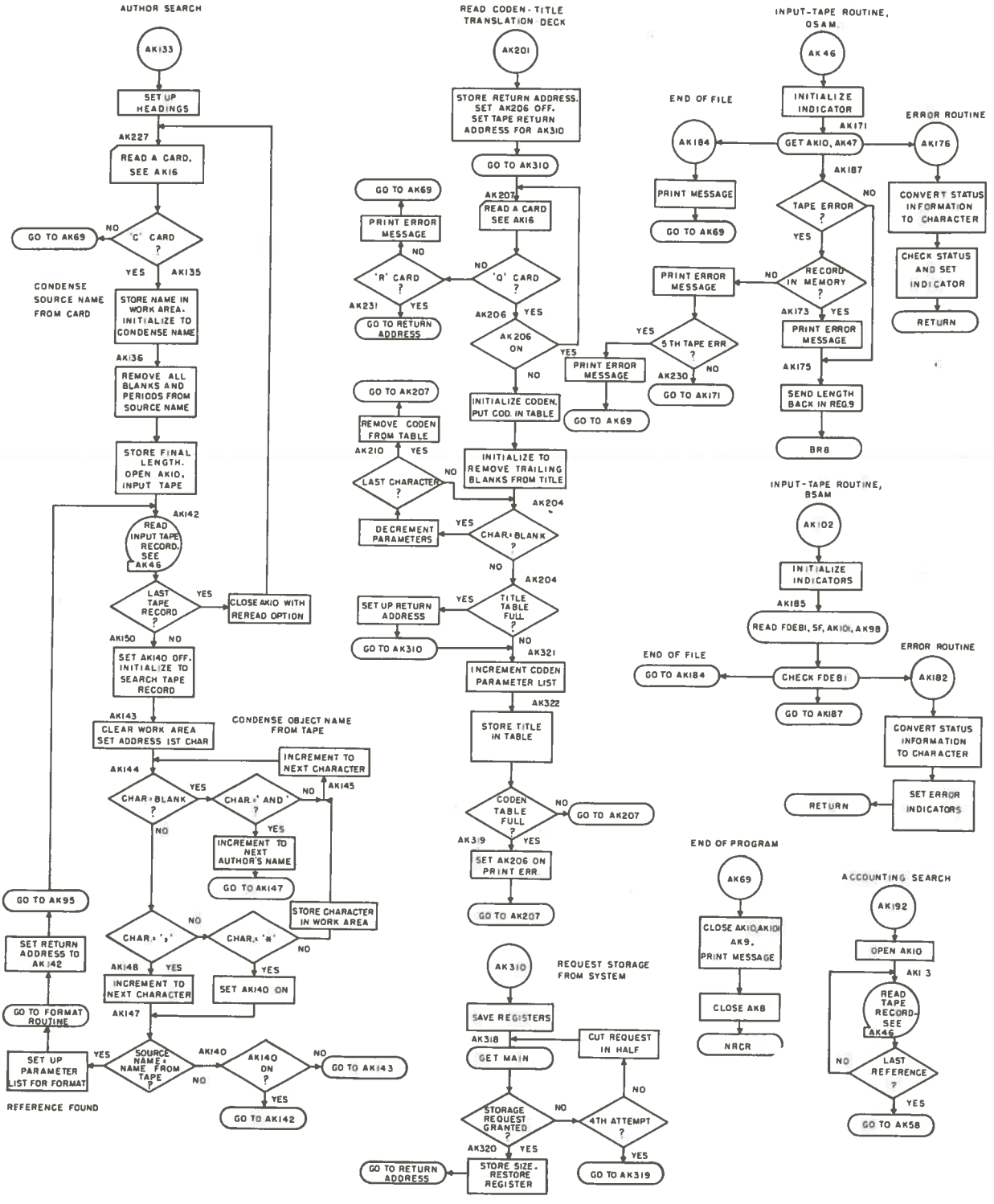
AUTHOR SEARCH
AK133
SET UP HEADINGS
AK227
READ A CARD. SEE AK16
'C' CARD ?
NO
GO TO AK69
YES
AK135
CONDENSE SOURCE NAME FROM CARD
STORE NAME IN WORK AREA. INITIALIZE TO CONDENSE NAME
AK136
REMOVE ALL BLANKS AND PERIODS FROM SOURCE NAME
STORE FINAL LENGTH. OPEN AK10, INPUT TAPE
AK142
READ INPUT TAPE RECORD. SEE AK46
LAST TAPE RECORD ?
YES
CLOSE AK10 WITH REREAD OPTION
AK150
NO
SET AK140 OFF. INITIALIZE TO SEARCH TAPE RECORD
AK143
CLEAR WORK AREA SET ADDRESS 1ST CHAR
CONDENSE OBJECT NAME FROM TAPE
INCREMENT TO NEXT CHARACTER
AK144
CHAR = BLANK ?
YES
CHAR = ' AND ' ?
NO
AK145
YES
INCREMENT TO NEXT AUTHOR'S NAME
GO TO AK147
NO
CHAR = ',' ?
NO
CHAR = '*'
NO
STORE CHARACTER IN WORK AREA
YES
AK148
INCREMENT TO NEXT CHARACTER
SET AK140 ON
AK147
GO TO AK95
SET RETURN ADDRESS TO AK142
GO TO FORMAT ROUTINE
SET UP PARAMETER LIST FOR FORMAT
YES
SOURCE NAME = NAME FROM TAPE ?
NO
AK140
AK140 ON ?
NO
GO TO AK143
YES
GO TO AK142
REFERENCE FOUND
READ CODEN-TITLE TRANSLATION DECK
AK201
STORE RETURN ADDRESS. SET AK206 OFF. SET TAPE RETURN ADDRESS FOR AK310
GO TO AK310
AK207
READ A CARD SEE AK16
'Q' CARD ?
NO
'R' CARD ?
NO
AK231
YES
GO TO RETURN ADDRESS
PRINT ERROR MESSAGE
GO TO AK69
AK206
YES
AK206 ON
YES
PRINT ERROR MESSAGE
GO TO AK69
NO
INITIALIZE CODEN. PUT COD. IN TABLE
GO TO AK207
REMOVE CODEN FROM TABLE
AK210
YES
LAST CHARACTER ?
NO
INITIALIZE TO REMOVE TRAILING BLANKS FROM TITLE
AK204
DECREMENT PARAMETERS
YES
CHAR = BLANK ?
NO
AK204
SET UP RETURN ADDRESS
YES
TITLE TABLE FULL ?
NO
GO TO AK310
AK321
INCREMENT CODEN PARAMETER LIST
AK322
STORE TITLE IN TABLE
CODEN TABLE FULL ?
NO
GO TO AK207
AK319
YES
SET AK206 ON PRINT ERR
GO TO AK207
AK310
REQUEST STORAGE FROM SYSTEM
SAVE REGISTERS
AK318
GET MAIN
CUT REQUEST IN HALF
STORAGE REQUEST GRANTED ?
NO
4TH ATTEMPT ?
NO
YES
AK320
YES
GO TO RETURN ADDRESS
STORE SIZE-RESTORE REGISTER
GO TO AK319
INPUT-TAPE ROUTINE, QSAM
AK46
INITIALIZE INDICATOR
AK171
GET AK10, AK47
END OF FILE
AK184
PRINT MESSAGE
GO TO AK69
ERROR ROUTINE
AK176
CONVERT STATUS INFORMATION TO CHARACTER
CHECK STATUS AND SET INDICATOR
RETURN
AK187
TAPE ERROR ?
NO
YES
PRINT ERROR MESSAGE
NO
RECORD IN MEMORY ?
YES
AK173
PRINT ERROR MESSAGE
AK175
SEND LENGTH BACK IN REG.9
BR8
YES
5TH TAPE ERR ?
NO
AK230
GO TO AK171
INPUT-TAPE ROUTINE, BSAM
AK102
INITIALIZE INDICATORS
AK185
READ FDEB1, SF, AK10, AK98
END OF FILE
GO TO AK184
CHECK FDEB1
ERROR ROUTINE
AK182
GO TO AK187
CONVERT STATUS INFORMATION TO CHARACTER
RETURN
SET ERROR INDICATORS
END OF PROGRAM
AK69
CLOSE AK10,AK101 AK9, PRINT MESSAGE
CLOSE AK8
NRCR
ACCOUNTING SEARCH
AK192
OPEN AK10
AK1 3
READ TAPE RECORD-SEE AK46
NO
LAST REFERENCE ?
YES
GO TO AK58

Fig. 10 (cont'd.)

Appendix D

Secondary Search Program

Program Listing and Flow Charts

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                F01JAN68   7/16/68

                                    1           PRINT NOGEN                                                          AG000100
                                    2 * SECONDARY SEARCH PROGRAM,                                                    AG000200
                                    3 *       BIBLIOGRAPHY SYSTEM,                                                   AG000300
                                    4 *         SEQUENTIAL DATA,                                                     AG000400
                                    5 *                                                                              AG000500
                                    6 * WRITTEN BY F.D.BLAIR,                                                        AG000600
                                    7 *           N.R.C. OTTAWA, ONT.                                                AG000700
                                    8 *                                                                              AG000800
000000                              9           START                                                                AG000900
                                   10 AQ125     NRCS  AQ1                                                          AG001000
000012 0520                        17           BALR  2,0                                                          AG001100
000014                             18           USING AQ2,2,3,4                                                    AG001200
000014 9834 2CB8          00CCC    19 AQ2       LM    3,4,AQ3                                                      AG001300
000018 0570                        20           BALR  7,0                                                          AG001400
00001A 5470 2CC0          00CD4    21           N     7,AQ4                                                        AG001500
000C1E 0470                        22           SPM   7                                                            AG001600
                                   23           OPEN  (AQ6,(OUTPUT),AQ7,(INPUT),AQ8,(INPUT))                       AG001700
000032 D203 2D04 2CE0 00D18 00CF4   33           MVC   AQ41(4),AQ22                                                 AG001800
000038 4580 27A0          007B4    34           BAL   8,AQ9                                                        AG001900
00003C 9289 29CC       009E0       35           MVI   AQ10,X'89'                                                   AG002000
000040 4580 2780          00794    36           BAL   8,AQ11                                                       AG002100
000044 4580 2790          007A4    37           BAL   8,AQ13                                                       AG002200
000048 D24F 2A51 2AA1 00A65 00AB5  38           MVC   AQ12(80),AQ14                                                AG002300
00004E 9211 29CC       009E0       39           MVI   AQ10,X'11'                                                   AG002400
000052 D24F 29CD 2A51 009E1 00A65  40           MVC   AQ10+1(80),AQ12                                              AG002500
000058 4580 2780          00794    41           BAL   8,AQ11                                                       AG002600
00005C 4580 2790          007A4    42           BAL   8,AQ13                                                       AG002700
000060 95C1 2AA1       00AB5       43           CLI   AQ14,C'A'                                                    AG002800
000064 4780 206E          00082    44           BE    AQ127                                                        AG002900
000068 4580 27A0          007B4    45           BAL   8,AQ9                                                        AG003000
00006C D20F 29CD 2DC1 009E1 00DD5  46           MVC   AQ10+1(16),AQ126                                             AG003100
000072 D24F 29E0 2AA1 009F4 00AB5  47           MVC   AQ10+20(80),AQ14                                             AG003200
000078 4180 2814          00828    48           LA    8,AQ33                                                       AG003300
00007C 47F0 2780          00794    49           B     AQ11                                                         AG003400
                                   50 AQ127     SCAN  I,AQ14+2,2                                                   AG003500
000090 5000 2CC8          00CDC    57           ST    0,AQ16                                                       AG003600
                                   58           SCAN  I,AQ14+5,2                                                   AG003700
0000A4 5000 2CCC          00CE0    65           ST    0,AQ17                                                       AG003800
                                   66           SCAN  I,AQ14+8,2                                                   AG003900
0000B8 5000 2CD0          00CE4    73           ST    0,AQ18                                                       AG004000
0000BC 5850 2CCC          00CE0    74           L     5,AQ17                                                       AG004100
0000C0 5950 2CD8          00CEC    75           C     5,AQ20                                                       AG004200
0000C4 47D0 20CA          000DE    76           BNH   AQ29                                                        AG004300
0000C8 92D2 20C1       000D5       77           MVI   AQ32+9,C'K'                                                  AG004400
0000CC 4580 27A0          007B4    78 AQ32      BAL   8,AQ9                                                        AG004500
0000D0 D215 29CD 2AF3 009E1 00B07  79           MVC   AQ10+1(22),AQ31                                              AG004600
0000D6 4180 2814          00828    80           LA    8,AQ33                                                       AG004700
0000DA 47F0 2780          00794    81           B     AQ11                                                         AG004800
0000DE 5850 2CD4          00CE8    82 AQ29      S     5,AQ19                                                       AG004900
0000E2 8950 00D2          00002    83           SLL   5,2                                                          AG005000
0000E6 5865 2CE4          00CF8    84           L     6,AQ25(5)                                                    AG005100
0000EA 5060 2CF8          00D0C    85           ST    6,AQ27                                                       AG005200
0000EE 5850 2CD0          00CE4    86           L     5,AQ18                                                       AG005300
0000F2 5950 2CDC          00CF0    87           C     5,AQ21                                                       AG005400
0000F6 47D0 20EE          00102    88           BNH   AQ30                                                         AG005500
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    AG005600
0000FA 92D1 2AFC       C0B10          89           MVI   AQ31+9,C'J'                          AG005600
0000FE 47F0 2088              000CC   90           B     AQ32                                 AG005700
000102 5950 2CD4              00CE8   91 AQ30      C     5,AQ19                               AG005800
000106 47D0 2102              00116   92           BNH   AQ44                                 AG005900
                                      93           OPEN  (AQ45,(OUTPUT))                      AG006000
000116 5B50 2CD4              00CE8   99 AQ44      S     5,AQ19                               AG006100
00011A 8950 0002              00002  100           SLL   5,2                                  AG006200
00011E 5865 2CEC              00D00  101           L     6,AQ26(5)                            AG006300
000122 5060 2CFC              00D10  102           ST    6,AQ28                               AG006400
000126 5850 2CC8              00CDC  103           L     5,AQ16                               AG006500
00012A 5950 2CD4              00CE8  104           C     5,AQ19                               AG006600
00012E 4780 2136              0014A  105           BE    AQ23                                 AG006700
000132 5950 2CD8              00CEC  106           C     5,AQ20                               AG006800
000136 4780 2292              002A6  107           BE    AQ24                                 AG006900
00013A 5950 2CDC              00CF0  108           C     5,AQ21                               AG007000
00013E 4780 2402              00416  109           BE    AQ34                                 AG007100
000142 92C9 2AFC       00B10          110           MVI   AQ31+9,C'I'                         AG007200
000146 47F0 2088              000CC  111           B     AQ32                                 AG007300
00014A 4580 2790              007A4  112 AQ23      BAL   8,AQ13                              AG007400
00014E 95C2 2AA1       00AB5          113           CLI   AQ14,C'B'                          AG007500
000152 4780 215A              0016E  114           BE    AQ35                                 AG007600
000156 4580 27A0              007B4  115           BAL   8,AQ9                               AG007700
00015A D226 29CD 2B10 009E1   00B24  116           MVC   AQ10+1(39),AQ60                      AG007800
000160 4180 2814              00828  117           LA    8,AQ33                               AG007900
000164 D24F 29F9 2AA1 00A0D   00AB5  118           MVC   AQ10+45(80),AQ14                     AG008000
00016A 47F0 2780              00794  119           B     AQ11                                 AG008100
00016E D203 2D3C 2CE0 00D50   00CF4  120 AQ35      MVC   AQ59(4),AQ22                        AG008200
000174 D203 2D30 2CE0 00D44   00CF4  121           MVC   AQ56(4),AQ22                        AG008300
00017A 4150 2AA3              00AB7  122           LA    5,AQ14+2                             AG008400
00017E 1B66                          123           SR    6,6                                  AG008500
000180 4170 2AEF              00B03  124           LA    7,AQ14+78                            AG008600
000184 D501 5000 2B09 00000   00B1D  125 AQ37      CLC   0(2,5),AQ36                         AG008700
00018A 4780 2188              0019C  126           BE    AQ38                                 AG008800
00018E 4166 0001              00001  127           LA    6,1(6)                               AG008900
000192 4155 0003              00003  128           LA    5,3(5)                               AG009000
000196 1957                          129           CR    5,7                                  AG009100
000198 47D0 2170              00184  130           BNH   AQ37                                 AG009200
00019C 5960 2CE0              00CF4  131 AQ38      C     6,AQ22                               AG009300
0001A0 4720 21A8              001BC  132           BH    AQ39                                 AG009400
0001A4 4580 27A0              007B4  133           BAL   8,AQ9                               AG009500
0001A8 D213 29CD 2B37 009E1   00B4B  134           MVC   AQ10+1(20),AQ61                      AG009600
0001AE D24F 29E5 2AA1 009F9   00AB5  135           MVC   AQ10+25(80),AQ14                     AG009700
0001B4 4180 2814              00828  136           LA    8,AQ33                               AG009800
0001B8 47F0 2780              00794  137           B     AQ11                                 AG009900
0001BC 5060 2DC0              00D14  138 AQ39      ST    6,AQ40                               AG010000
0001C0 D203 2D0C 2CE0 00D20   00CF4  139           MVC   AQ43(4),AQ22                        AG010100
0001C6 D2C3 2D34 2CD8 00D48   00CEC  140           MVC   AQ57(4),AQ20                        AG010200
0001CC 5870 2CF8              00D0C  141           L     7,AQ27                               AG010300
0001D0 05E7                          142           BALR  8,7                                  AG010400
0001D2 D203 2D38 2CD8 00D4C   00CEC  143           MVC   AQ58(4),AQ20                        AG010500
0001D8 4580 26BC              006D0  144           BAL   8,AQ102                              AG010600
0001DC 1B77                          145           SR    7,7                                  AG010700
0001DE 5070 2D34              00D48  146           ST    7,AQ57                               AG010800
0001E2 5070 2D38              00D4C  147           ST    7,AQ58                               AG010900
0001E6 4580 27DC              007F0  148 AQ54      BAL   8,AQ46                              AG011000
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT
0001EA D503 2D08 2B0C 00DEC 00820   149          CLC   AQ48(4),AQ49                AG011100
0001F0 4770 2228             0023C  150          BNE   AQ50                        AG011200
0001F4 D203 2D34 2CD4 00D48 00CF8  151 AQ81      MVC   AQ57(4),AQ19                AG011300
0001FA D203 2D38 2CD4 00D4C 00CE8  152          MVC   AQ58(4),AQ19                AG011400
000200 4170 2DD8             00DEC  153          LA    7,AQ48                      AG011500
000204 5070 2D14             00D28  154          ST    7,AQ55                      AG011600
000208 5090 2D18             00D2C  155          ST    9,AQ55+4                    AG011700
00020C 5870 2CF8             00D0C  156          L     7,AQ27                      AG011800
000210 0587                         157          BALR  8,7                         AG011900
000212 4580 26BC             006D0  158          BAL   8,AQ102                     AG012000
000216 4580 27A0             00784  159          BAL   8,AQ9                       AG012100
00021A D215 29CD 2B4B 009E1 00B5F  160          MVC   AQ10+1(22),AQ62             AG012200
000220 5800 2D3C             00D50  161          L     0,AQ59                      AG012300
                                    162          MAKE  I,AQ10+25,6                 AG012400
000234 4180 2814             00828  169          LA    8,AQ33                      AG012500
000238 47F0 2780             00794  170          B     AQ11                        AG012600
00023C 41B0 2E15             00E29  171 AQ50      LA    11,AQ48+61                  AG012700
000240 1BAA                         172          SR    10,10                       AG012800
000242 D501 B000 2B09 000C0 00B1D  173 AQ51      CLC   0(2,11),AQ36                AG012900
000248 4780 21D2             001E6  174          BE    AQ54                        AG013000
00024C 1B55                         175          SR    5,5                         AG013100
00024E 4160 2AA3             00AB7  176          LA    6,AQ14+2                    AG013200
000252 D501 60C0 B000 00000 00000  177 AQ52      CLC   0(2,6),0(11)                AG013300
000258 4770 226E             00282  178          BNE   AQ63                        AG013400
00025C 4170 2DD8             00DEC  179          LA    7,AQ48                      AG013500
00026C 5070 2D14             00D28  180          ST    7,AQ55                      AG013600
000264 5090 2D18             00D2C  181          ST    9,AQ55+4                    AG013700
000268 5870 2D3C             00D50  182          L     7,AQ59                      AG013800
00026C 4177 0001             00001  183          LA    7,1(7)                      AG013900
000270 5070 2D3C             00D50  184          ST    7,AQ59                      AG014000
000274 5870 2CF8             00D0C  185          L     7,AQ27                      AG014100
000278 0587                         186          BALR  8,7                         AG014200
00027A 4180 21D2             001E6  187          LA    8,AQ54                      AG014300
00027E 47F0 26BC             006D0  188          B     AQ102                       AG014400
000282 4155 0C01             00001  189 AQ63      LA    5,1(5)                      AG014500
000286 4166 0003             00003  190          LA    6,3(6)                      AG014600
00028A 5950 2D00             00D14  191          C     5,AQ40                      AG014700
00028E 4740 223E             00252  192          BL    AQ52                        AG014800
000292 41BB 0003             00003  193          LA    11,3(11)                    AG014900
000296 41AA 0001             00001  194          LA    10,1(10)                    AG015000
00029A 59A0 2D10             00D24  195          C     10,AQ53                     AG015100
00029E 4740 222E             00242  196          BL    AQ51                        AG015200
0002A2 47F0 21D2             001E6  197          B     AQ54                        AG015300
0002A6 D203 2D30 2CE0 00D44 00CF4  198 AQ24      MVC   AQ56(4),AQ22                AG015400
0002AC 4580 2790             007A4  199 AQ64      BAL   8,AQ13                     AG015500
0002B0 95C2 2AA1       00AB5        200          CLI   AQ14,C'B'                   AG015600
0002B4 4780 22B4             002C8  201          BE    AQ128                       AG015700
0002B8 41A0 2814             00828  202          LA    10,AQ33                     AG015800
0002BC 41B0 0001             00001  203          LA    11,1                        AG015900
0002C0 940F 2353       00367        204          NI    AQ132+1,X'0F'               AG016000
0002C4 47F0 233C             00350  205          B     AQ114                       AG016100
0002C8 4150 2AA3             00AB7  206 AQ128     LA    5,AQ14+2                    AG016200
0002CC 1B66                         207          SR    6,6                         AG016300
0002CE D502 5000 2B09 00000 00B1D  208 AQ66      CLC   0(3,5),AQ36                 AG016400
0002D4 4780 22D4             002E8  209          BE    AQ67                        AG016500
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    AG016600
0002D8 4155 0C06             00006   210          LA    5,6(5)                                 AG016700
0002DC 4166 0001             00001   211          LA    6,1(6)                                 AG016800
0002E0 5960 2D40             00D54   212          C     6,AQ65                                 AG016900
0002E4 4740 22BA             002CE   213          BL    AQ66                                   AG017000
0002E8 5960 2CE0             00CF4   214 AQ67     C     6,AQ22                                 AG017100
0002EC 4720 22F4             00308   215          BH    AQ68                                   AG017200
0002F0 4580 27A0             007B4   216          BAL   8,AQ9                                  AG017300
0002F4 D221 29CD 2B75 009E1  00B89   217          MVC   AQ10+1(34),AQ78                        AG017400
0002FA D24F 29F4 2AA1 00AC8  00AB5   218          MVC   AQ10+40(80),AQ14                       AG017500
000300 4180 2814             00828   219          LA    8,AQ33                                 AG017600
000304 47F0 2780             0C794   220          B     AQ11                                   AG017700
000308 5060 2D00             00D14   221 AQ68     ST    6,AQ40                                 AG017800
00030C D2C3 2D3C 2CE0 00D5C  00CF4   222          MVC   AQ59(4),AQ22                           AG017900
000312 D203 2D34 2CD8 00D48  00CEC   223          MVC   AQ57(4),AQ20                           AG018000
000318 D203 2D38 2CD8 00D4C  00CEC   224          MVC   AQ58(4),AQ20                           AG018100
00031E 5870 2CF8             00D0C   225          L     7,AQ27                                 AG018200
000322 0587                          226          BALR  8,7                                    AG018300
000324 5870 2CFC             00D10   227          L     7,AQ28                                 AG018400
000328 0587                          228          BALR  8,7                                    AG018500
00032A D203 2D38 2CE0 00D4C  00CF4   229          MVC   AQ58(4),AQ22                           AG018600
000330 D203 2D34 2CE0 00D48  00CF4   230          MVC   AQ57(4),AQ22                           AG018700
000336 4580 27DC             007F0   231 AQ76     BAL   8,AQ46                                 AG018800
00033A D5C3 2DD8 2B0C 00DEC  00B20   232          CLC   AQ48(4),AQ49                           AG018900
000340 4770 2396             003AA   233          BNE   AQ69                                   AG019000
000344 41A0 2298             002AC   234          LA    10,AQ64                                AG019100
000348 41B0 0003             00003   235          LA    11,3                                   AG019200
00034C 96F0 2353      00367  236          OI    AQ132+1,X'F0'                                AG019300
000350 D2C3 2D34 2CD4 00D48  00CE8   237 AQ114    MVC   AQ57(4),AQ19                          AG019400
000356 5870 2CF8             00D0C   238          L     7,AQ27                                 AG019500
00035A 0587                          239          BALR  8,7                                    AG019600
00035C 50B0 2D38             00D4C   240          ST    11,AQ58                                AG019700
000360 5870 2CFC             00D10   241          L     7,AQ28                                 AG019800
000364 0587                          242          BALR  8,7                                    AG019900
000366 4700 2358             0036C   243 AQ132    BC    0,AQ133                                AG020000
00036A 07FA                          244          BR    10                                     AG020100
                                     245 AQ133    CLOSE (AQ8,REREAD)                           AG020200
                                     251          OPEN  (AQ8,(INPUT))                          AG020300
000382 4580 27A0             007B4   257          BAL   8,AQ9                                  AG020400
000386 9211 29CC      009E0  258          MVI   AQ10,X'11'                                     AG020500
00038A D214 29CD 2B60 009E1  00B74   259          MVC   AQ10+1(21),AQ77                        AG020600
000390 5800 2D3C             00D50   260          L     0,AQ59                                 AG020700
                                     261          MAKE  I,AQ10+25,6                            AG020800
0003A4 188A                          268          LR    8,10                                   AG020900
0003A6 47F0 2780             00794   269          B     AQ11                                   AG021000
0003AA 4150 2AA3             00AB7   270 AQ69     LA    5,AQ14+2                               AG021100
0003AE 1866                          271          SR    6,6                                    AG021200
0003B0 41B0 2DF1             00E05   272 AQ70     LA    11,AQ48+25                             AG021300
0003B4 1BAA                          273          SR    10,10                                  AG021400
0003B6 D5C2 B000 2B09 000C0  00B1D   274 AQ73     CLC   0(3,11),AQ36                           AG021500
0003BC 4780 23EE             00402   275          BE    AQ75                                   AG021600
0003C0 D5C2 B000 5000 00000  0000C   276 AQ72     CLC   0(3,11),0(5)                           AG021700
0003C6 4770 23DE             003F2   277          BNE   AQ71                                   AG021800
0003CA 4170 2DD8             00DEC   278          LA    7,AQ48                                 AG021900
0003CE 5070 2D14             00D28   279          ST    7,AQ55                                 AG022000
0003D2 5090 2D18             00D2C   280          ST    9,AQ55+4
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    AG022100
0003D6 5870 2D3C            00D50   281          L     7,AQ59                  AG022200
0003DA 4177 0001            00001   282          LA    7,1(7)                  AG022300
0003DE 5070 2D3C            00D50   283          ST    7,AQ59                  AG022400
0003E2 5870 2CF8            00D0C   284          L     7,AQ27                  AG022500
0003E6 0587                         285          BALR  8,7                     AG022600
0003E8 5870 2CFC            00D10   286          L     7,AQ28                  AG022700
0003EC 4180 2322            00336   287          LA    8,AQ76                  AG022800
0003F0 07F7                         288          BR    7                       AG022900
0003F2 41BB 0004            00004   289 AQ71     LA    11,4(11)                AG023000
0003F6 41AA 0001            00001   290          LA    10,1(10)                AG023100
0003FA 59A0 2D44            00D58   291          C     10,AQ74                 AG023200
0003FE 4740 23A2            003B6   292          BL    AQ73                    AG023300
000402 4155 0006            00006   293 AQ75     LA    5,6(5)                  AG023400
000406 4166 0001            00001   294          LA    6,1(6)                  AG023500
00040A 5960 2D00            00D14   295          C     6,AQ40                  AG023600
00040E 4740 239C            003B0   296          BL    AQ70                    AG023700
000412 47F0 2322            00336   297          B     AQ76                    AG023800
000416 D2C3 2D30 2CE0 00D44 00CF4   298 AQ34     MVC   AQ56(4),AQ22            AG023900
00041C 4580 2790            007A4   299          BAL   8,AQ13                  AG024000
000420 95C2 2AA1      00AB5         300          CLI   AQ14,C'B'               AG024100
000424 4780 2442            00456   301          BE    AQ118                   AG024200
000428 D2C3 2D34 2CD4 00D48 00CE8   302          MVC   AQ57(4),AQ19            AG024300
00042E 5870 2CF8            00D0C   303          L     7,AQ27                  AG024400
000432 0587                         304          BALR  8,7                     AG024500
000434 D203 2D38 2CDC 00D4C 00CF0   305          MVC   AQ58(4),AQ21            AG024600
00043A 4580 26BC            006D0   306          BAL   8,AQ102                 AG024700
00043E 4580 27A0            007B4   307          BAL   8,AQ9                   AG024800
000442 D219 29CD 2B97 C09F1 00BAB   308          MVC   AQ10+1(26),AQ82         AG024900
000448 D24F 29EA 2AA1 009FE 00AB5   309          MVC   AQ10+30(80),AQ14        AG025000
00044E 4180 2814            00828   310          LA    8,AQ33                  AG025100
000452 47F0 2780            00794   311          B     AQ11                    AG025200
000456 D203 2D34 2CD8 00D48 00CEC   312 AQ118    MVC   AQ57(4),AQ20            AG025300
00045C D203 2D3C 2CE0 00D50 00CF4   313          MVC   AQ59(4),AQ22            AG025400
000462 5870 2CF8            00D0C   314          L     7,AQ27                  AG025500
000466 0587                         315          BALR  8,7                     AG025600
000468 D203 2D38 2CD8 00D4C 00CEC   316          MVC   AQ58(4),AQ20            AG025700
00046F 4580 26BC            006D0   317          BAL   8,AQ102                 AG025800
000472 4580 27DC            007F0   318 AQ79     BAL   8,AQ46                  AG025900
000476 D503 2DD8 28CC 00DFC 00B20   319          CLC   AQ48(4),AQ49            AG026000
00047C 4770 24A8            004BC   320          BNE   AQ80                    AG026100
000480 D203 2D34 2CD4 00D48 00CE8   321          MVC   AQ57(4),AQ19            AG026200
000486 5870 2CF8            00D0C   322          L     7,AQ27                  AG026300
00048A 0587                         323          BALR  8,7                     AG026400
00048C D203 2D38 2CD4 00D4C 00CE8   324          MVC   AQ58(4),AQ19            AG026500
000492 4580 26BC            006D0   325          BAL   8,AQ102                 AG026600
000496 4580 27A0            007B4   326          BAL   8,AQ9                   AG026700
00049A D214 29CD 2B60 009E1 00B74   327          MVC   AQ10+1(21),AQ77         AG026800
0004A0 5800 2D3C            00D50   328          L     0,AQ59                  AG026900
                                    329          MAKE  I,AQ10+25,6             AG027000
0004A4 4180 2814            00828   336          LA    8,AQ33                  AG027100
0004A8 47F0 2780            00794   337          B     AQ11                    AG027200
0004AC D505 2AA3 2DE0 00AB7 00DF4   338 AQ80     CLC   AQ14+2(6),AQ48+8        AG027300
0004C2 4770 245E            00472   339          BNE   AQ79                    AG027400
0004C6 D203 2D34 2CE0 00D48 00CF4   340          MVC   AQ57(4),AQ22            AG027500
0004CC D203 2D38 2CE0 00D4C 00CF4   341          MVC   AQ58(4),AQ22
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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    AG027600
0004D2 5870 2D3C           00D50   342           L     7,AQ59                                  AG027700
0004D6 4177 0001           00001   343           LA    7,1(7)                                  AG027800
0004DA 5070 2D3C           00D50   344           ST    7,AQ59                                  AG027900
0004DE 4170 2DD8           00DEC   345           LA    7,AQ48                                  AG028000
0004E2 5070 2D14           00D28   346           ST    7,AQ55                                  AG028100
0004E6 5090 2D18           00D2C   347           ST    9,AQ55+4                                AG028200
0004EA 5870 2CF8           00D0C   348           L     7,AQ27                                  AG028300
0004EE 0587                        349           BALR  8,7                                     AG028400
0004F0 5870 2CFC           00D10   350           L     7,AQ28                                  AG028500
0004F4 4180 245E           00472   351           LA    8,AQ79                                  AG028600
0004F8 07F7                        352           BR    7                                       AG028700
0004FA 900F 2D4C           00D60   353 AQ83       STM   0,15,AQ87                               AG028800
0004FE 5870 2D34           00D48   354           L     7,AQ57                                  AG028900
000502 5970 2CE0           00CF4   355           C     7,AQ22                                  AG029000
000506 4720 258A           0059E   356           BH    AQ200                                   AG029100
                                   357           CALL  MASTER,(AQ55)                           AG029200
000522 5880 2D04           00D18   369           L     8,AQ41                                  AG029300
000526 5A80 2D20           00D34   370           A     8,AQ55+12                               AG029400
00052A 4188 0001           00001   371           LA    8,1(8)                                  AG029500
00052E 5980 2D28           00D3C   372           C     8,AQ55+20                               AG029600
000532 47D0 2538           0054C   373           BNH   AQ85                                    AG029700
000536 D203 2D04 2CE0 00D18 00CF4   374           MVC   AQ41(4),AQ22                            AG029800
00053C 4580 27A0           007B4   375           BAL   8,AQ9                                   AG029900
00054C 9289 29CC      009E0        376           MVI   AQ10,X'89'                              AG030000
000544 4180 2538           0054C   377           LA    8,AQ85                                  AG030100
000548 47F0 2780           00794   378           B     AQ11                                    AG030200
00054C 1B55                        379 AQ85       SR    5,5                                     AG030300
00054E 5860 2D1C           00D30   380           L     6,AQ55+8                                AG030400
000552 4580 27A0           007B4   381 AQ86       BAL   8,AQ9                                   AG030500
000556 9209 29CC      009E0        382           MVI   AQ10,X'09'                              AG030600
00055A D246 29CD 6000 009E1 00000   383           MVC   AQ10+1(71),0(6)                         AG030700
00056C 4155 0001           00001   384           LA    5,1(5)                                  AG030800
000564 4166 0047           00047   385           LA    6,71(6)                                 AG030900
000568 5870 2D04           00D18   386           L     7,AQ41                                  AG031000
00056C 4177 0001           00001   387           LA    7,1(7)                                  AG031100
000570 507C 2D04           00D18   388           ST    7,AQ41                                  AG031200
000574 4580 2780           00794   389           BAL   8,AQ11                                  AG031300
000578 5950 2D20           00D34   390           C     5,AQ55+12                               AG031400
00057C 4740 253E           00552   391           BL    AQ86                                    AG031500
000580 4580 27A0           007B4   392           BAL   8,AQ9                                   AG031600
000584 9209 29CC      009E0        393           MVI   AQ10,X'09'                              AG031700
000588 5870 2D04           00D18   394           L     7,AQ41                                  AG031800
00058C 4177 0C01           00001   395           LA    7,1(7)                                  AG031900
00059C 507C 2D04           00D18   396           ST    7,AQ41                                  AG032000
000594 4580 2780           00794   397           BAL   8,AQ11                                  AG032100
000598 98CF 2D4C           00D60   398 AQ89       LM    0,15,AQ87                               AG032200
00059C 07F8                        399           BR    8                                       AG032300
00059E 5880 2D34           00D48   400 AQ200      L     8,AQ57                                  AG032400
0005A2 5980 2CD4           00CE8   401           C     8,AQ19                                  AG032500
0005A6 47D0 2584           00598   402           BNH   AQ89                                    AG032600
0005AA 1B88                        403           SR    8,8                                     AG032700
0005AC 5080 2D04           00D18   404           ST    8,AQ41                                  AG032800
0005B0 4580 27A0           007B4   405           BAL   8,AQ9                                   AG032900
0005B4 9289 29CC      C09E0        406           MVI   AQ10,X'89'                              AG033000
0005B8 4580 2780           00794   407           BAL   8,AQ11
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  AG033100
0005BC 9211 29CC       009E0         408          MVI   AQ10,X'11'                          AG033200
0005C0 D24D 29CD 2AA3 009F1 00AB7    409          MVC   AQ10+1(78),AQ14+2                   AG033300
0005C6 5880 2D04              00D18  410          L     8,AQ41                              AG033400
0005CA 4188 0005              00005  411          LA    8,5(8)                              AG033500
0005CE 5080 2D04              00D18  412          ST    8,AQ41                              AG033600
0005D2 4580 2780              00794  413          BAL   8,AQ11                              AG033700
0005D6 47F0 2584              00598  414          B     AQ99                                AG033800
0005DA 900F 2D4C              00D60  415 AQ88      STM   0,15,AQ87                          AG033900
0005DE 5870 2D34              00D48  416          L     7,AQ57                              AG034000
0005E2 5970 2CE0              00CF4  417          C     7,AQ22                              AG034100
0005E6 47D0 2626              0063A  418          BNH   AQ97                                AG034200
0005EA 5970 2CD4              00CE8  419          C     7,AQ19                              AG034300
0005EE 4720 25F2              00606  420          BH    AQ99                                AG034400
0005F2 5870 2D30              00D44  421          L     7,AQ56                              AG034500
0005F6 5970 2CE0              00CF4  422          C     7,AQ22                              AG034600
0005FA 4780 26B6              006CA  423          BE    AQ98                                AG034700
0005FE 41A0 26B6              006CA  424          LA    10,AQ98                             AG034800
000602 47F0 2636              0064A  425          B     AQ93                                AG034900
000606 4580 27A0              007B4  426 AQ99      BAL   8,AQ9                               AG035000
00060A D203 2D04 2C0C 00D18 00CF0    427          MVC   AQ41(4),AQ21                        AG035100
000610 9289 29CC       009E0         428          MVI   AQ10,X'89'                          AG035200
000614 4580 2780              00794  429          BAL   8,AQ11                              AG035300
000618 9211 29CC       009E0         430          MVI   AQ10,X'11'                          AG035400
00061C D209 29CD 2C2F 009E1 00C43    431          MVC   AQ10+1(10),AQ100                    AG035500
000622 D24D 29E0 2AA3 009F4 00AB7    432          MVC   AQ10+20(78),AQ14+2                  AG035600
                                     433          PROP  AQ90,126,X'40'                      AG035700
000632 4180 26B6              006CA  436          LA    8,AQ98                              AG035800
000636 47F0 2780              00794  437          B     AQ11                                AG035900
00063A 5870 2D30              00D44  438 AQ97      L     7,AQ56                              AG036000
00063E 5970 2D8C              00DA0  439          C     7,AQ91                              AG036100
000642 4740 2698              006AC  440          BL    AQ96                                AG036200
000646 41A0 2698              006AC  441          LA    10,AQ96                             AG036300
00064A 5880 2D04              00D18  442 AQ93      L     8,AQ41                              AG036400
00064E 4188 0001              00001  443          LA    8,1(8)                              AG036500
000652 5980 2D90              00DA4  444          C     8,AQ94                              AG036600
000656 47D0 266C              00680  445          BNH   AQ95                                AG036700
00065A 4580 27A0              007B4  446          BAL   8,AQ9                               AG036800
00065E 9289 29CC       009E0         447          MVI   AQ10,X'89'                          AG036900
000662 D203 2D04 2CE0 00D18 00CF4    448          MVC   AQ41(4),AQ22                        AG037000
000668 4580 2780              00794  449          BAL   8,AQ11                              AG037100
00066C 9211 29CC       009E0         450          MVI   AQ10,X'11'                          AG037200
00067C D209 29CD 2C2F 009E1 00C43    451          MVC   AQ10+1(10),AQ100                    AG037300
000676 D24D 29E0 2AA3 009F4 00AB7    452          MVC   AQ10+20(78),AQ14+2                  AG037400
00067C 4580 2780              00794  453          BAL   8,AQ11                              AG037500
000680 4580 27A0              007B4  454 AQ95      BAL   8,AQ9                               AG037600
000684 D27D 29CD 2B81 009E1 00BC5    455          MVC   AQ10+1(126),AQ90                    AG037700
00068A D203 2D30 2CE0 00D44 00CF4    456          MVC   AQ56(4),AQ22                        AG037800
00069C 4580 2780              00794  457          BAL   8,AQ11                              AG037900
000694 5880 2D04              00D18  458          L     8,AQ41                              AG038000
000698 4188 0001              00001  459          LA    8,1(8)                              AG038100
00069C 5080 2D04              00D18  460          ST    8,AQ41                              AG038200
                                     461          PROP  AQ90,126,X'40'                      AG038300
0006AA 07FA                          464          BR    10                                  AG038400
0006AC 58B0 2D30              00D44  465 AQ96      L     11,AQ56                             AG038500
0006B0 5CA0 2D10              00D24  466          M     10,AQ53
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    AG038600
0006B4 419B 2BB1            00BC5   467          LA    9,AQ90(11)                             AG038700
0006B8 D2C4 9000 2DD9 00CC0 00DED   468          MVC   0(5,9),AQ48+1                          AG038800
0006BE 587C 2D30            00D44   469          L     7,AQ56                                 AG038900
0006C2 4177 0CC1            00001   470          LA    7,1(7)                                 AG039000
0006C6 507C 2D30            00D44   471          ST    7,AQ56                                 AG039100
0006CA 980F 2D4C            00D60   472 AQ98      LM    0,15,AQB7                              AG039200
0006CE 07F8                         473 AQ101     BR    8                                      AG039300
0C06DC 900F 2D4C            00D60   474 AQ102     STM   0,15,AQ87                              AG039400
0006D4 58A0 2CD0            00CE4   475          L     10,AQ18                                AG039500
0006D8 59A0 2CD4            00CF8   476          C     10,AQ19                                AG039600
0006DC 47D0 270E            CC722   477          BNH   AQ103                                  AG039700
0006E0 5870 2D38            00D4C   478          L     7,AQ58                                 AG039800
0006E4 5970 2CE0            00CF4   479          C     7,AQ22                                 AG039900
0006E8 47D0 26EF            00702   480          BNH   AQ106                                  AG040000
0006EC 5970 2CD4            00CF8   481          C     7,AQ19                                 AG040100
C006FC 4770 270E            00722   482          BNE   AQ103                                  AG040200
0006F4 4170 26F8            0070C   483          LA    7,AQ107                                AG040300
0006F8 D203 2DDC 2D3C 00DF0 00D50   484          MVC   AQ48+4(4),AQ59                         AG040400
0006FE 47F0 26F2            0C706   485          B     AQ105                                  AG040500
000702 4170 270E            0C722   486 AQ106     LA    7,AQ103                                AG040600
000706 4580 27CC            007E0   487 AQ105     BAL   8,AQ104                                AG040700
00070A C7F7                         488          BR    7                                      AG040800
00070C 4580 27DC            007F0   489 AQ107     BAL   8,AQ46                                 AG040900
000710 D503 2DD8 2C39 00DEC 00C4D   490          CLC   AQ48(4),AQ108                          AG041000
000716 4770 26F2            00706   491          BNE   AQ105                                  AG041100
00071A 4170 270E            00722   492          LA    7,AQ103                                AG041200
00071E 47F0 26F2            0C706   493          B     AQ105                                  AG041300
000722 980F 2D4C            00D60   494 AQ103     LM    0,15,AQ87                              AG041400
000726 C7F8                         495          BR    8                                      AG041500
000728 58A0 2CD0            00CE4   496          L     10,AQ18                                AG041600
00072C 59A0 2CD4            00CE8   497          C     10,AQ19                                AG041700
000730 47D0 277A            0078E   498          BNH   AQ117                                  AG041800
000734 900F 2D4C            00D6C   499 AQ109     STM   0,15,AQ87                              AG041900
000738 5870 2D38            00D4C   500          L     7,AQ58                                 AG042000
00073C 5970 2CD8            00CEC   501          C     7,AQ20                                 AG042100
000740 4770 2752            00766   502          BNE   AQ111                                  AG042200
000744 D203 2DD8 2C3D 00DEC 00C51   503          MVC   AQ48(4),AQ110                          AG042300
00074A D24D 2DDC 2AA3 00DF0 00AB7   504 AQ112     MVC   AQ48+4(78),AQ14+2                      AG042400
000750 4180 277A            0078E   505          LA    8,AQ117                                AG042500
000754 4190 0C58            00058   506          LA    9,88                                   AG042600
000758 4090 2DD4            00DE8   507          STH   9,AQ47                                 AG042700
00075C D201 2DD6 2B09 00DEA 00B1D   508          MVC   AQ47+2(2),AQ36                         AG042800
000762 47F0 27CC            007E0   509          B     AQ104                                  AG042900
000766 5970 2CDC            00CF0   510 AQ111     C     7,AQ21                                 AG043000
00076A 4770 2764            00778   511          BNE   AQ113                                  AG043100
00076E D203 2DD8 2C39 00DEC 00C4D   512          MVC   AQ48(4),AQ108                          AG043200
000774 47F0 2736            0074A   513          B     AQ112                                  AG043300
000778 5970 2CD4            00CE8   514 AQ113     C     7,AQ19                                 AG043400
00077C 4770 2776            0078A   515          BNE   AQ116                                  AG043500
000780 D203 2DD8 2C41 00DFC 00C55   516          MVC   AQ48(4),AQ115                          AG043600
000786 47F0 2736            0074A   517          8     AQ112                                  AG043700
00078A 4580 27CC            007E0   518 AQ116     BAL   8,AQ104                                AG043800
00078E 980F 2D4C            00D60   519 AQ117     LM    0,15,AQ87                              AG043900
000792 07F8                         520          BR    8                                      AG044000
                                    521 AQ11      PUT   AQ6,AQ10
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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F01JAN68   7/16/68

0007A2 07F8                        526           BR    8                                              AG044100
                                   527 AQ13      GET   AQ7,AQ14                                       AG044200
0007B2 07F8                        532           BR    8                                              AG044300
                                   533 AQ9       PROP  AQ10,133,X'40'                                 AG044400
0007BE 9211 29CC       009E0       536           MVI   AQ10,X'11'                                     AG044500
0007C2 07F8                        537           BR    8                                              AG044600
                                   538 AQ119     CLOSE (AQ7)                                          AG044700
0007CE 4580 27A0             007B4 544           BAL   8,AQ9                                         AG044800
0007D2 D20F 29CD 2C45 009E1  00C59 545           MVC   AQ10+1(16),AQ120                               AG044900
0007D8 4180 2814             00828 546           LA    8,AQ33                                         AG045000
0007DC 47F0 2780             00794 547           B     AQ11                                           AG045100
                                   548 AQ104     PUT   AQ45,AQ47                                      AG045200
0007EE 07F8                        553           BR    8                                              AG045300
                                   554 AQ46      GET   AQ8,AQ47                                       AG045400
0007FE 1899                        559           SR    9,9                                            AG045500
000800 4890 2DD4             00DE8 560           LH    9,AQ47                                         AG045600
000804 5B90 2D94             00DA8 561           S     9,AQ129                                        AG045700
000808 07F8                        562           BR    8                                              AG045800
                                   563 AQ121     CLOSE (AQ8)                                          AG045900
000816 4580 27A0             007B4 569           BAL   8,AQ9                                         AG046000
00081A D20F 29CD 2DA0 009E1  00DB4 570           MVC   AQ10+1(16),AQ122                               AG046100
000820 4180 2814             00828 571           LA    8,AQ33                                         AG046200
000824 47F0 2780             00794 572           B     AQ11                                           AG046300
                                   573 AQ33      CLOSE (AQ7,,AQ8,,AQ45)                               AG046400
00083A 4580 27A0             007B4 583           BAL   8,AQ9                                         AG046500
00083E D20B 29CD 2DB0 009E1  00DC4 584           MVC   AQ10+1(12),AQ123                               AG046600
000844 4580 2780             00794 585           BAL   8,AQ11                                         AG046700
                                   586           CLOSE (AQ6)                                          AG046800
                                   592           NRCR  AQ1                                            AG046900
                                   598 *                                                              AG047000
                                   599 * PRINTER DCB QSAM                                             AG047100
                                   600 *                                                              AG047200
                                   601 AQ6       DCB   DSORG=PS,                                     XAG047300
                                                       MACRF=PM,                                      XAG047400
                                                       DDNAME=FDBAQ1,                                 XAG047500
                                                       RECFM=FM,                                      XAG047600
                                                       LRECL=133,                                     XAG047700
                                                       BLKSIZE=133,                                   XAG047800
                                                       BFTEK=S,                                       XAG047900
                                                       BFALN=D,                                       XAG048000
                                                       BUFNO=10                                        AG048100
                                   602                 *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
                                   658 *                                                              AG048200
                                   659 * CARD READER DCB  QSAM                                        AG048300
                                   660 *                                                              AG048400
                                   661 AQ7       DCB   DSORG=PS,                                     XAG048500
                                                       MACRF=GM,                                      XAG048600
                                                       DDNAME=FDBAQ2,                                 XAG048700
                                                       RECFM=F,                                       XAG048800
                                                       LRECL=80,                                      XAG048900
                                                       BLKSIZE=80,                                    XAG049000
                                                       BFTEK=S,                                       XAG049100
                                                       EODAD=AQ119,                                   XAG049200
                                                       EROPT=ACC                                       AG049300
                                   662                 *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
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LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  F01JAN68   7/16/68

                                  718 *                                                                AG049400
                                  719 *  INPUT TAPE DCB  QSAM                                          AG049500
                                  720 *                                                                AG049600
                                  721 AQ8       DCB   DSORG=PS,                                      XAG049700
                                                      MACRF=GM,                                        XAG049800
                                                      DDNAME=FDBAQ3,                                   XAG049900
                                                      BFTEK=S,                                         XAG050000
                                                      EODAD=AQ121,                                     XAG050100
                                                      EROPT=ACC                                        AG050200
                                  722                 *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
                                  778 *                                                                AG050300
                                  779 *  OUTPUT TAPE DCB  QSAM                                         AG050400
                                  780 *                                                                AG050500
                                  781 AQ45      DCB   DSORG=PS,                                      XAG050600
                                                      MACRF=PM,                                        XAG050700
                                                      DDNAME=FDBAQ4,                                   XAG050800
                                                      BFTEK=S                                          AG050900
                                  782                 *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
0009E0                            838 AQ10      DS    CL133                                          AG051000
000A65                            839 AQ12      DS    CL80                                           AG051100
000AB5                            840 AQ14      DS    CL80                                           AG051200
000B05                            841 AQ15      DS    CL2                                            AG051300
000B07 E5C1D9C9C1C2D3C5           842 AQ31      DC    C'VARIABLE   IS TO LARGE'                     AG051400
000B1D 404040                     843 AQ36      DC    X'404040'                                      AG051500
000B20 C1C1C1C1                   844 AQ49      DC    C'AAAA'                                        AG051600
000B24 C9D5D7E4E340C3C1           845 AQ60      DC    C'INPUT CARD ERROR IN BIBLIOGRAPHY SEARCH'     AG051700
000B48 D5D64CC2C9C24B40           846 AQ61      DC    C'NO BIB. REF. PRESENT'                        AG051800
000B5F F3D6E3C1D340D9C5           847 AQ62      DC    C'TOTAL REFERENCE FOUND'                       AG051900
000B74 D5E4D4C2C5D940D6           848 AQ77      DC    C'NUMBER OF REF. FOUND='                       AG052000
000B89 C9D5D7E4E340C3C1           849 AQ78      DC    C'INPUT CARD ERROR IN SUBJECT SEARCH'          AG052100
000BAB C3C1D9C440C5D9D9           850 AQ82      DC    C'CARD ERROR IN CODEN SEARCH'                  AG052200
000BC5                            851 AQ90      DS    CL126                                          AG052300
000C43 E2C5C1D9C3C840C6           852 AQ100     DC    C'SEARCH FOR'                                  AG052400
000C4D C2C2C2C2                   853 AQ108     DC    C'BBBB'                                        AG052500
000C51 C1C1C1C1                   854 AQ110     DC    C'AAAA'                                        AG052600
000C55 C3C3C3C3                   855 AQ115     DC    C'CCCC'                                        AG052700
000C59 C5D5C440D6C640C3           856 AQ120     DC    C'END OF CARD FILE'                            AG052800
000C69 D5E4D4C2C5D940D6           857 AQ204     DC    C'NUMBER OF REFERENCES FOUND='                 AG052900
000C84                            858 AQ1       DS    18F                                            AG053000
000CCC 0CC01014                   859 AQ3       DC    A(AQ2+4096)                                    AG053100
000CD0 00002014                   860           DC    A(AQ2+8192)                                    AG053200
000CD4                            861 AQ4       DS    0F                                             AG053300
000CD4 FCFFFFFF                   862           DC    X'FCFFFFFF'                                    AG053400
000CD8                            863 AQ5       DS    F                                              AG053500
000CDC                            864 AQ16      DS    F                                              AG053600
000CE0                            865 AQ17      DS    F                                              AG053700
000CE4                            866 AQ18      DS    F                                              AG053800
000CE8 00C00001                   867 AQ19      DC    F'1'                                           AG053900
000CEC 00000002                   868 AQ20      DC    F'2'                                           AG054000
000CF0 00000003                   869 AQ21      DC    F'3'                                           AG054100
000CF4 00000000                   870 AQ22      DC    F'0'                                           AG054200
000CF8 000004FA                   871 AQ25      DC    A(AQ83)                                        AG054300
000CFC CC0005DA                   872           DC    A(AQ88)                                        AG054400
000D00 000006CE                   873 AQ26      DC    A(AQ101)                                       AG054500
000D04 000006D0                   874           DC    A(AQ102)                                       AG054600
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    AG054700
000D08 00000734                      875           DC    A(AQ109)                              AG054800
000D0C                               876  AQ27     DS    F                                     AG054900
000D10                               877  AQ28     DS    F                                     AG055000
000D14                               878  AQ40     DS    F                                     AG055100
000D18                               879  AQ41     DS    F                                     AG055200
000D1C                               880  AQ42     DS    F                                     AG055300
000D20                               881  AQ43     DS    F                                     AG055400
000D24 00000006                      882  AQ53     DC    F'6'                                  AG055500
000D28                               883  AQ55     DS    7F                                    AG055600
000D44                               884  AQ56     DS    F                                     AG055700
000D48                               885  AQ57     DS    F                                     AG055800
000D4C                               886  AQ58     DS    F                                     AG055900
000D50                               887  AQ59     DS    F                                     AG056000
000D54 0C000C0D                      888  AQ65     DC    F'13'                                 AG056100
000D58 00C00009                      889  AQ74     DC    F'9'                                  AG056200
000D5C                               890  AQ84     DS    F                                     AG056300
000D60                               891  AQ87     DS    16F                                   AG056400
000DA0 00000015                      892  AQ91     DC    F'21'                                 AG056500
000DA4 0000001B                      893  AQ94     DC    F'27'                                 AG056600
000DA8 00000004                      894  AQ129    DC    F'4'                                  AG056700
000DAC 0000000D                      895  AQ130    DC    F'13'                                 AG056800
000DB0 00CF4240                      896  AQ131    DC    F'1000000'                            AG056900
000DB4 C5D5C440D6C640E3              897  AQ122    DC    C'END OF TAPE FILE'                   AG057000
000DC4 C5D5C440D6C640D7              898  AQ123    DC    C'END OF PROG.'                       AG057100
000DD0 E3C9D4C57E                    899  AQ124    DC    C'TIME='                              AG057200
000DD5 C9D5D7E4E340C3C1              900  AQ126    DC    C'INPUT CARD ERROR'                   AG057300
000DE8                               901  AQ47     DS    2001F                                 AG057400
000DEC                               902  AQ48     EQU   AQ47+4                                AG057500
C00000                               903           END   AQ125
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CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES														7/16/68
AQ1	00004	000C84	0858	0013	0594													
AQ10	00133	0009E0	0838	0035	0039	0040	0046	0047	0079	0116	0118	0134	0135	0160	0168	0217	0218	0259
				0259	0267	0308	0309	0327	0335	0376	0382	0383	0393	0406	0408	0409	0428	0430
				0431	0432	0447	0450	0451	0452	0455	0523	0534	0535	0535	0536	0545	0570	0584
AQ100	00010	000C43	0852	0431	0451													
AQ101	00002	0006CE	0473	0873														
AQ102	00004	0006D0	0474	0144	0158	0188	0306	0317	0325	0874								
AQ103	00004	000722	0494	0477	0482	0486	0492											
AQ104	00004	0007E0	0549	0487	0509	0518												
AQ105	00004	000706	0487	0485	0491	0493												
AQ106	00004	000702	0486	0480														
AQ107	00004	00070C	0489	0483														
AQ108	00004	000C40	0353	0490	0512													
AQ109	00004	000734	0499	0875														
AQ11	00004	000794	0522	0036	0041	0049	0081	0119	0137	0170	0220	0269	0311	0337	0378	0389	0397	0407
				0413	0429	0437	0449	0453	0457	0547	0572	0585						
AQ110	00004	000C51	0854	0503														
AQ111	00004	000766	0510	0502														
AQ112	00006	00074A	0504	0513	0517													
AQ113	00004	000778	0514	0511														
AQ114	00006	000350	0237	0205														
AQ115	00004	000C55	0855	0516														
AQ116	00004	00078A	0518	0515														
AQ117	00004	00078E	0519	0498	0505													
AQ118	00006	000456	0312	0301														
AQ119	00004	0007C4	0540	0686														
AQ12	00080	000A65	0839	0038	0040													
AQ120	00016	000C59	0856	0545														
AQ121	00004	00080C	0565	0746														
AQ122	00016	000DB4	0897	0570														
AQ123	00012	000DC4	0898	0584														
AQ124	00005	000DD0	0899															
AQ125	00004	000C00	0012	0903														
AQ126	00016	000DD5	0900	0046														
AQ127	00004	000082	0052	0044														
AQ128	00004	0002C8	0206	0201														
AQ129	00004	000DA8	0894	0561														
AQ13	00004	0007A4	0528	0037	0042	0112	0199	0299										
AQ130	00004	000DAC	0895															
AQ131	00004	000DB0	0896															
AQ132	00004	000366	0243	0204	0236													
AQ133	00004	00036C	0247	0243														
AQ14	00080	000AB5	0840	0038	0043	0047	0056	0064	0072	0113	0118	0122	0124	0135	0176	0200	0206	0218
				0270	0300	0309	0338	0409	0432	0452	0504	0529						
AQ15	00002	000B05	0841															
AQ16	00004	000CDC	0864	0057	0103													
AQ17	00004	000CE0	0865	0065	0074													
AQ18	00004	000CE4	0866	0073	0086	0475	0496											
AQ19	00004	000CE8	0867	0082	0091	0099	0104	0151	0152	0237	0302	0321	0324	0401	0419	0476	0481	0497
				0514														
AQ2	00004	000014	0019	0018	0859	0860												
AQ20	00004	000CEC	0868	0075	0106	0140	0143	0223	0224	0312	0316	0501						
AQ200	00004	00059E	0400	0356														
AQ204	00027	000C69	0857															
AQ21	00004	000CF0	0869	0087	0108	0305	0427	0510										

SYMBOL	LEN	VALUE	DEFN	REFERENCES														7/16/68
AQ22	00004	000CF4	0870	0033	0120	0121	0131	0139	0198	0214	0222	0229	0230	0298	0313	0340	0341	0355
				0374	0417	0422	0448	0456	0479									
AQ23	00004	00014A	0112	0105														
AQ24	00006	0002A6	0198	0107														
AQ25	00004	000CF8	0871	0084														
AQ26	00004	000D00	0873	0101														
AQ27	00004	000D0C	0876	0085	0141	0156	0185	0225	0238	0284	0303	0314	0322	0348				
AQ28	00004	000D10	0877	0102	0227	0241	0286	0350										
AQ29	00004	0000DE	0082	0076														
AQ3	00004	000CCC	0859	0019														
AQ30	00004	000102	0091	0088														
AQ31	00022	000B07	0842	0079	0089	0110												
AQ32	00004	0000CC	0078	0077	0090	0111												
AQ33	00004	000828	0575	0048	0080	0117	0136	0169	0202	0219	0310	0336	0546	0571				
AQ34	00006	000416	0298	0109														
AQ35	00006	00016E	0120	0114														
AQ36	00003	000B1D	0843	0125	0173	0208	0274	0508										
AQ37	00006	000184	0125	0130														
AQ38	00004	00019C	0131	0126														
AQ39	00004	00018C	0138	0132														
AQ4	00004	000CD4	0861	0021														
AQ40	00004	000D14	0878	0139	0191	0221	0295											
AQ41	00004	000018	0879	0033	0369	0374	0386	0388	0394	0396	0404	0410	0412	0427	0442	0448	0458	0460
AQ42	00004	000D1C	0880															
AQ43	00004	000D2D	0881	0139														
AQ44	00004	000116	0099	0092														
AQ45	00004	000980	0787	0097	0549	0581												
AQ46	00004	0007F0	0555	0148	0231	0318	0489											
AQ47	00004	000DE8	0901	0507	0508	0550	0556	0560	0902									
AQ48	00004	000DEC	0902	0149	0153	0171	0179	0232	0272	0278	0319	0338	0345	0468	0484	0490	0503	0504
				0512	0516													
AQ49	00004	000B20	0844	0149	0232	0319												
AQ5	00004	000CD8	0863															
AQ50	00004	00023C	0171	0150														
AQ51	00006	000242	0173	0196														
AQ52	00006	000252	0177	0192														
AQ53	00004	000D24	0882	0195	0466													
AQ54	00004	0001E6	0148	0174	0187	0197												
AQ55	00004	000D28	0883	0154	0155	0180	0181	0279	0280	0346	0347	0365	0370	0372	0380	0390		
AQ56	00004	000D44	0884	0121	0198	0298	0421	0438	0456	0465	0469	0471						
AQ57	00004	000D48	0885	0140	0146	0151	0223	0230	0237	0302	0312	0321	0340	0354	0400	0416		
AQ58	00004	000D4C	0886	0143	0147	0152	0224	0229	0240	0305	0316	0324	0341	0478	0500			
AQ59	00004	000D50	0887	0120	0161	0182	0184	0222	0260	0281	0283	0313	0328	0342	0344	0484		
AQ6	00004	000860	0607	0027	0522	0590												
AQ60	00039	000B24	0845	0116														
AQ61	00020	000B4B	0846	0134														
AQ62	00021	000B5F	0847	0160														
AQ63	00004	000282	0189	0178														
AQ64	00004	0002AC	0199	0234														
AQ65	00004	000D54	0888	0212														
AQ66	00006	0002CE	0208	0213														
AQ67	00004	0002E8	0214	0209														
AQ68	00004	000308	0221	0215														
AQ69	00004	0003AA	0270	0233														
AQ7	00004	0008C0	0667	0029	0528	0542	0577											

CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES														
AQ70	00004	0003B0	0272	0296														
AQ71	00004	0003F2	0289	0277														
AQ72	00006	0003C0	0276															
AQ73	00006	0003B6	0274	0292														
AQ74	00004	000D58	0889	0291														
AQ75	00004	000402	0293	0275														
AQ76	00004	000336	0231	0287	0297													
AQ77	00021	000874	0848	0259	0327													
AQ78	00034	000889	0849	0217														
AQ79	00004	000472	0318	0339	0351													
AQ8	00004	000920	0727	0031	0249	0255	0555	0567	0579									
AQ80	00006	0004BC	0338	0320														
AQ81	00006	0001F4	0151															
AQ82	00026	0008AB	085C	0308														
AQ83	00004	0004FA	0353	0871														
AQ84	00004	000D5C	0890															
AQ85	00002	00054C	0379	0373	0377													
AQ86	00004	000552	0381	0391														
AQ87	00004	000D60	0891	0353	0398	0415	0472	0474	0494	0499	0519							
AQ88	00004	0005DA	0415	0872														
AQ89	00004	000598	0398	0402	0414													
AQ9	00004	0007B4	0534	0034	0045	0078	0115	0133	0159	0216	0257	0307	0326	0375	0381	0392	0405	0426
				0446	0454	0544	0569	0583										
AQ90	00126	000BC5	0851	0434	0435	0435	0455	0462	0463	0463	0467							
AQ91	00004	000DA0	0892	0439														
AQ93	00004	00064A	0442	0425														
AQ94	00004	000DA4	0893	0444														
AQ95	00004	000680	0454	0445														
AQ96	00004	0006AC	0465	0440	0441													
AQ97	00004	00063A	0438	0418														
AQ98	00004	0006CA	0472	0423	0424	0436												
AQ99	00004	000606	0426	0420														
IHB0012B	00004	000510	0360	0367														
IHB0013	00001	000518	0363															
IHB0013A	00001	00051C	0366	0362														

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
798 PRINTED LINES

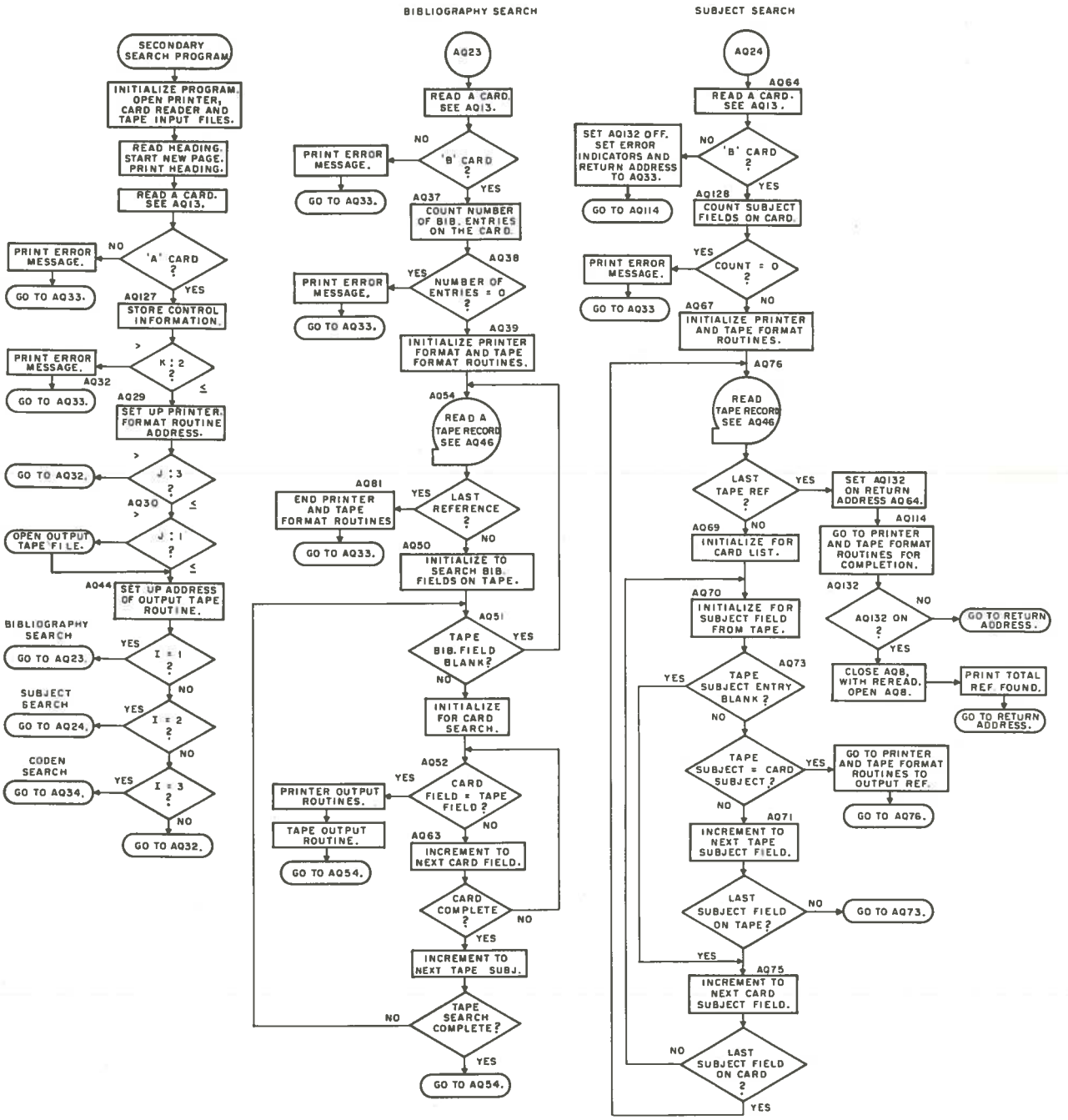

Fig. 11 Detail flow chart, secondary search program (continued on next page)

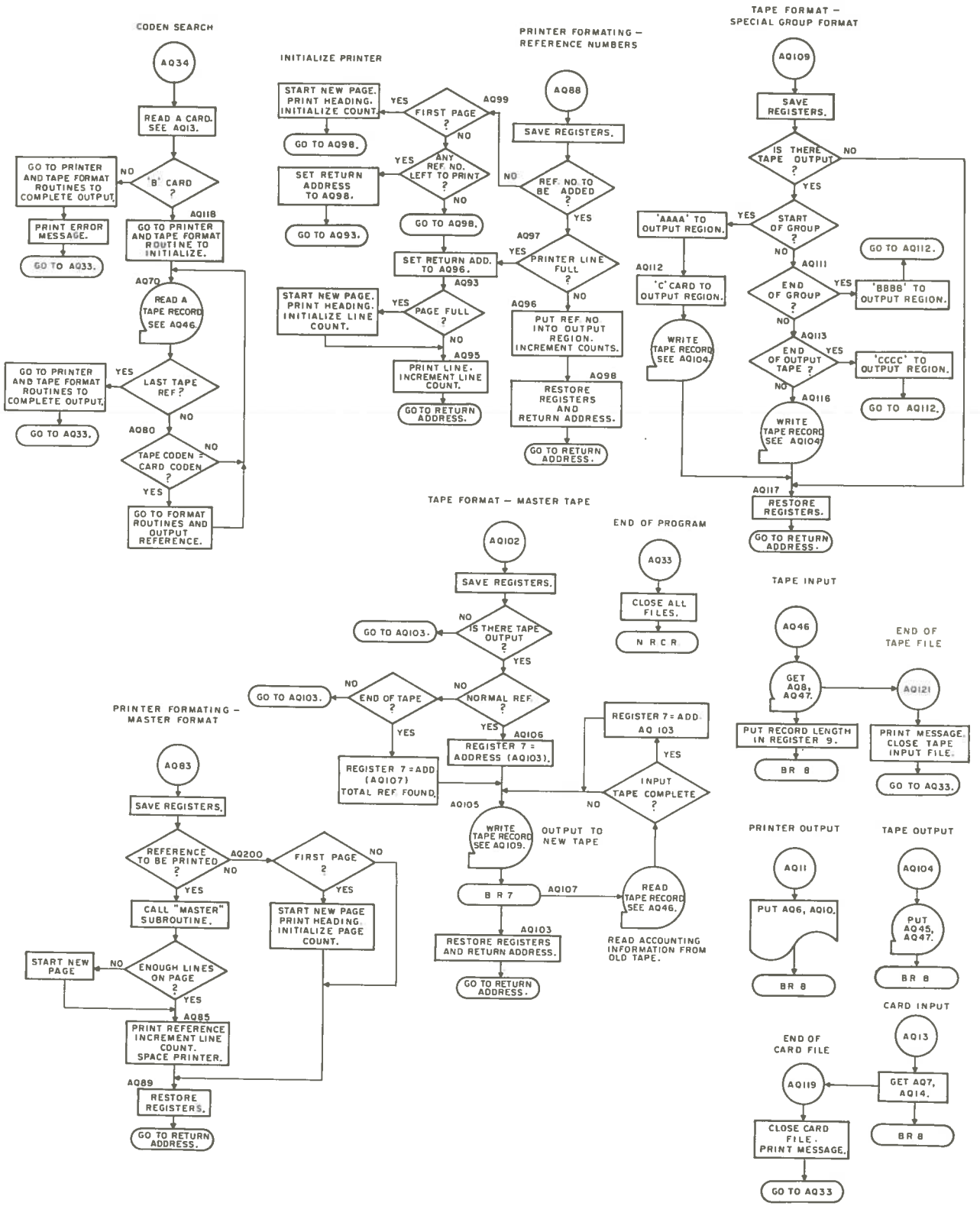
CODEN SEARCH
AQ34
READ A CARD. SEE AQ13.
'B' CARD ?
NO
GO TO PRINTER AND TAPE FORMAT ROUTINES TO COMPLETE OUTPUT.
PRINT ERROR MESSAGE.
GO TO AQ33.
YES
AQ118
GO TO PRINTER AND TAPE FORMAT ROUTINE TO INITIALIZE.
AQ70
READ A TAPE RECORD SEE AQ46.
LAST TAPE REF ?
YES
GO TO PRINTER AND TAPE FORMAT ROUTINES TO COMPLETE OUTPUT.
GO TO AQ33.
NO
AQ80
TAPE CODEN = CARD CODEN ?
NO
YES
GO TO FORMAT ROUTINES AND OUTPUT REFERENCE.
INITIALIZE PRINTER
START NEW PAGE. PRINT HEADING. INITIALIZE COUNT.
GO TO AQ98.
GO TO AQ93.
FIRST PAGE ?
YES
AQ99
NO
ANY REF. NO. LEFT TO PRINT ?
YES
SET RETURN ADDRESS TO AQ98.
NO
GO TO AQ98.
AQ93
SET RETURN ADD. TO AQ96.
START NEW PAGE. PRINT HEADING. INITIALIZE LINE COUNT.
PAGE FULL ?
YES
NO
AQ95
PRINT LINE. INCREMENT LINE COUNT.
GO TO RETURN ADDRESS.
PRINTER FORMATING — REFERENCE NUMBERS
AQ88
SAVE REGISTERS.
REF. NO. TO BE ADDED ?
NO
YES
AQ97
PRINTER LINE FULL ?
YES
NO
AQ96
PUT REF. NO INTO OUTPUT REGION. INCREMENT COUNTS.
AQ98
RESTORE REGISTERS AND RETURN ADDRESS.
GO TO RETURN ADDRESS.
TAPE FORMAT — SPECIAL GROUP FORMAT
AQ109
SAVE REGISTERS.
IS THERE TAPE OUTPUT ?
NO
YES
'AAAA' TO OUTPUT REGION.
YES
START OF GROUP ?
NO
AQ112
'C' CARD TO OUTPUT REGION.
WRITE TAPE RECORD SEE AQ104.
AQ111
END OF GROUP ?
YES
'BBBB' TO OUTPUT REGION.
GO TO AQ112.
NO
AQ113
END OF OUTPUT TAPE ?
YES
'CCCC' TO OUTPUT REGION.
GO TO AQ112.
NO
AQ116
WRITE TAPE RECORD SEE AQ104.
AQ117
RESTORE REGISTERS.
GO TO RETURN ADDRESS.
TAPE FORMAT — MASTER TAPE
AQ102
SAVE REGISTERS.
IS THERE TAPE OUTPUT ?
NO
GO TO AQ103.
YES
NORMAL REF ?
NO
YES
END OF TAPE ?
NO
GO TO AQ103.
YES
REGISTER 7 = ADD (AQ107) TOTAL REF. FOUND.
AQ106
REGISTER 7 = ADDRESS (AQ103).
REGISTER 7 = ADD AQ 103
INPUT TAPE COMPLETE ?
YES
NO
AQ105
WRITE TAPE RECORD SEE AQ109.
OUTPUT TO NEW TAPE
B R 7
AQ107
READ TAPE RECORD SEE AQ46.
READ ACCOUNTING INFORMATION FROM OLD TAPE.
AQ103
RESTORE REGISTERS AND RETURN ADDRESS.
GO TO RETURN ADDRESS.
END OF PROGRAM
AQ33
CLOSE ALL FILES.
N R C R
TAPE INPUT
AQ46
GET AQ8, AQ47.
PUT RECORD LENGTH IN REGISTER 9.
BR 8
END OF TAPE FILE
AQ121
PRINT MESSAGE. CLOSE TAPE INPUT FILE.
GO TO AQ33.
PRINTER FORMATING — MASTER FORMAT
AQ83
SAVE REGISTERS.
REFERENCE TO BE PRINTED ?
AQ200
NO
YES
CALL "MASTER" SUBROUTINE.
ENOUGH LINES ON PAGE ?
NO
START NEW PAGE
YES
AQ85
PRINT REFERENCE INCREMENT LINE COUNT. SPACE PRINTER.
AQ89
RESTORE REGISTERS.
GO TO RETURN ADDRESS.
FIRST PAGE ?
NO
YES
START NEW PAGE PRINT HEADING. INITIALIZE PAGE COUNT.
PRINTER OUTPUT
AQ11
PUT AQ6, AQ10.
BR 8
TAPE OUTPUT
AQ104
PUT AQ45, AQ47.
BR 8
CARD INPUT
AQ13
GET AQ7, AQ14.
BR 8
END OF CARD FILE
AQ119
CLOSE CARD FILE. PRINT MESSAGE.
GO TO AQ33

Fig. 11 (cont'd.)

Appendix E

Author Index Program

Program Listing and Flow Charts

```
   LCC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F01JAN68   7/16/68

                                       1          PRINT NOGEN                                          AR000100
                                       2 *                                                             AR000200
                                       3 * AUTHOR INDEX PROGRAM,                                       AR000300
                                       4 *        BIBLIOGRAPHY SYSTEM,                                 AR000301
                                       5 *          SEQUENTIAL DATA,                                   AR000400
                                       6 *                                                             AR000500
                                       7 * WRITTEN BY F.D.BLAIR,                                       AR000600
                                       8 *           N.R.C. OTTAWA, ONT.                               AR000700
                                       9 *                                                             AR000800
   CC0000                             10          START                                                AR000900
                                      11 AR3       NRCS  AR1                                          AR001000
   000012 0520                        18          BALR  2,0                                          AR001100
   000014                             19          USING AR2,2,3,4,5                                  AR001200
   0C0014 9835 27D4          007E8    20 AR2       LM    3,5,AR4                                      AR001300
   0C0C18 057C                        21          BALR  7,0                                          AR001400
   0C001A 547C 27E0          007F4    22          N     7,AR5                                        AR001500
   0C001E 047C                        23          SPM   7                                            AR001600
   00002C D2C3 2814 2808 C0828 C081C  24          MVC   AR62(4),AR55                                 AR001700
                                      25          OPEN  (AR6,(OUTPUT),AR7,(INPUT))                   AR001800
   000036 4580 253C          C0550    33          BAL   8,AR13                                       AR001900
   0C003A 9289 282E     00842         34          MVI   AR12,X'89'                                   AR002000
   00003E 4580 2548          0055C    35          BAL   8,AR14                                       AR002100
                                      36          GET   AR7,AR15                                     AR002200
   00005C 9211 282E     00842         41          MVI   AR12,X'11'                                   AR002300
   000054 D24F 282F 2883 C0843 C08C7  42          MVC   AR12+1(80),AR15                              AR002400
   00005A 4580 2548          0055C    43          BAL   8,AR14                                       AR002500
                                      44          GET   AR7,AR16                                     AR002600
   0C006C 95C1 2903     00917         49          CLI   AR16,C'A'                                    AR002700
   0C0070 478C 2C76          0008A    50          BE    AR75                                         AR002800
   000074 4580 253C          00550    51          BAL   8,AR13                                       AR002900
   0C0078 9211 282E     00842         52          MVI   AR12,X'11'                                   AR003000
   00007C D2CF 282F 31D0 00843 011E4  53          MVC   AR12+1(16),AR74                              AR003100
   0C0082 4180 2376          0038A    54          LA    8,AR73                                       AR003200
   0C0086 47F0 2548          0055C    55          B     AR14                                         AR003300
                                      56 AR75      SCAN  I,AR16+2,5                                   AR003400
   0C0098 50C0 27E4          0C7F8    63          ST    0,AR17                                       AR003500
                                      64          SCAN  I,AR16+8,5                                   AR003600
   0000AC 5CC0 27E8          0C7FC    71          ST    0,AR18                                       AR003700
   0C00B0 D2C4 2824 2911 00838 00925  72          MVC   AR90(5),AR16+14                              AR003800
   0C00B6 D204 2829 2917 0083D 0092B  73          MVC   AR91(5),AR16+20                              AR003900
   0C00BC 1BAA                        74          SR    10,10                                        AR004000
                                      75          OPEN  (AR8,(INPUT),AR10,(OUTPUT))                  AR004100
                                      83 AR35      GET   AR8,AR19                                     AR004200
   0000DC D5C3 2957 3127 0096B 0113B  88          CLC   AR20(4),AR21                                 AR004300
   0000E2 477C 2CEA          00CFE    89          BNE   AR92                                         AR004400
                                      90          CLOSE (AR8,,AR10,REREAD)                           AR004500
   0000F6 50AC 27F0          C0804    98          ST    10,AR38                                      AR004600
   0000FA 47F0 218C          0C1D0    99          B     AR39                                         AR004700
   0C00FE D5C4 2958 2824 0096C 00838 100 AR92      CLC   AR20+1(5),AR90                             AR004800
   0C01C4 4740 2C8A          00CCE   101          BL    AR35                                         AR004900
   0C01C8 D5C4 2958 2829 0096C 0083D 102          CLC   AR20+1(5),AR91                             AR005000
   00010E 4720 208A          00CCE   103          BH    AR35                                         AR005100
   000112 D2C4 312B 2958 C113F 0096C 104          MVC   AR22(5),AR20+1                             AR005200
   000118 4160 29A8          0098C   105          LA    6,AR20+81                                    AR005300
   0C011C 940F 2173     00187        106          NI    AR23+1,X'0F'                                 AR005400
```

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   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                F01JAN68   7/16/68

000120 1B77                          107 AR36     SR    7,7                                          AR005500
000122 4180 3135             01149   108          LA    8,AR26                                       AR005600
                                     109          PROP  AR26,25,X'40'                                AR005701
000130 9540 600C       C0000         112 AR24     CLI   0(6),X'40'                                   AR005800
000134 4770 212C             00140   113          BNE   AR27                                         AR005900
000138 4166 C001             00001   114          LA    6,1(6)                                       AR006000
00013C 47FC 211C             00130   115          B     AR24                                         AR006100
00014C 955C 60C0       C0000         116 AR27     CLI   0(6),C'*'                                  AR006200
000144 4770 213C             CC150   117          BNE   AR28                                         AR006300
000148 96FC 2173       0C187         118          OI    AR23+1,X'F0'                                 AR006400
C0014C 47F0 215A             0016E   119          B     AR34                                         AR006500
0C015C D5C4 6CC0 3130 C0CCC  01144   120 AR28     CLC   0(5,6),AR25                                AR006600
000156 4770 214E             00162   121          BNE   AR29                                         AR006700
00015A 4166 00C5             00C05   122          LA    6,5(6)                                       AR006800
00015E 47FC 215A             CC16E   123          B     AR34                                         AR006900
000162 956B 6000       00000         124 AR29     CLI   0(6),C','                                  AR007000
CCC166 4770 217A             0018E   125          BNE   AR30                                         AR007100
00016A 4166 CC01             00C01   126          LA    6,1(6)                                       AR007200
00016E D2C4 3149 312B 0115D  0113F   127 AR34     MVC   AR26+20(5),AR22                            AR007300
000174 41AA 0C01             00001   128          LA    10,1(10)                                     AR007400
                                     129          PUT   AR10,AR26                                    AR007500
00C186 47C0 20BA             000CE   134 AR23     BC    0,AR35                                       AR007600
0C018A 47FC 210C             CC120   135          B     AR36                                         AR007700
0C018E 954B 6C0C       00000         136 AR30     CLI   0(6),C'.'                                  AR007800
00C192 4770 218A             0019E   137          BNE   AR100                                        AR007900
000196 4166 CC01             00001   138 AR101    LA    6,1(6)                                       AR008000
0C019A 47F0 212C             CC140   139          B     AR27                                         AR008100
0C019E 957D 6000       00000         140 AR100    CLI   0(6),X'7D'                                 AR008201
00C1A2 4780 2182             00196   141          BE    AR101                                        AR008302
0001A6 9560 6CC0       00000         142          CLI   0(6),C'-'                                  AR008403
0C01AA 4770 219E             001B2   143          BNE   AR31                                         AR008504
0001AE 9240 6CC0       C0000         144          MVI   0(6),X'40'                                 AR008605
0001B2 4177 0CC1             0C001   145 AR31     LA    7,1(7)                                       AR008700
0001B6 5970 27EC             00800   146          C     7,AR33                                       AR008800
0C01BA 4720 21B4             0C1C8   147          BH    AR93                                         AR008900
00018E D200 8CC0 6000 00000  000CC   148          MVC   0(1,8),0(6)                                AR009000
0001C4 4188 0C01             00001   149          LA    8,1(8)                                       AR009100
0C01C8 4166 CC01             C0001   150 AR93     LA    6,1(6)                                       AR009200
0001CC 47F0 212C             0C140   151          B     AR27                                         AR009300
0C01D0 5B60 27E4             0C7F8   152 AR39     L     6,AR17                                       AR009400
0001D4 5960 27E8             C07FC   153          C     6,AR18                                       AR009500
0001D8 472C 2376             0038A   154          BH    AR73                                         AR009600
                                     155          OPEN  (AR11,(INPUT))                               AR009700
0001E6 5B6C 28C8             0081C   161          S     6,AR55                                       AR009800
0001EA 4176 314E             C1162   162          LA    7,AR37(6)                                    AR009900
0001EE D200 3168 7000 0117C  0C0C0   163          MVC   AR40(1),0(7)                               AR010000
0001F4 1B99                          164          SR    9,9                                          AR010100
0001F6 4170 31F8             0120C   165 AR84     LA    7,AR41                                       AR010200
0C01FA 1B66                          166          SR    6,6                                          AR010300
                                     167          PROP  AR41,11250,X'40'                             AR010400
                                     213 AR42     GET   AR11,AR26                                    AR010500
000316 D500 3135 3168 C1149  0117C   218          CLC   AR26(1),AR40                               AR010600
00031C 4770 2336             0C34A   219          BNE   AR43                                         AR010700
0C0320 D218 7000 3135 C0CC0  01149   220          MVC   0(25,7),AR26                               AR010800
000326 4177 0C19             00019   221          LA    7,25(7)                                      AR010900
```

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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    AR011000
00032A 4166 C001           00001   222           LA    6,1(6)                                 AR011000
00032E 596C 27F4           00BC8   223           C     6,AR44                                 AR011100
000332 4740 2336           0034A   224           BL    AR43                                   AR011200
000336 4199 CC01           00C01   225           LA    9,1(9)                                 AR011300
00033A 509C 27F8           0080C   226           ST    9,AR45                                 AR011400
00033E 41F0 2352           00366   227           LA    15,AR49                                AR011500
000342 50FC 27FC           CC810   228           ST    15,AR48                                AR011600
000346 47FC 234A           0035E   229           B     AR51                                   AR011700
00034A 4199 0C01           00001   230 AR43      LA    9,1(9)                                 AR011800
00034E 599C 27F0           00BC4   231           C     9,AR38                                 AR011900
000352 4740 22F4           00308   232           BL    AR42                                   AR012000
000356 41F0 235C           0C370   233           LA    15,AR50                                AR012100
00035A 50FC 27FC           CC810   234           ST    15,AR48                                AR012200
00035E 5C60 2800           00814   235 AR51      ST    6,AR52                                 AR012300
000362 47F0 23AE           003C2   236           B     AR53                                   AR012400
000366 589C 27F8           0080C   237 AR49      L     9,AR45                                 AR012500
00036A 47F0 21E2           001F6   238           B     AR84                                   AR012600
                                   239 AR50      CLOSE (AR11,REREAD)                          AR012700
00037A 5860 27E4           CC7F8   245           L     6,AR17                                 AR012800
00037E 4166 0001           CCC01   246           LA    6,1(6)                                 AR012900
000382 5C60 27E4           C07F8   247           ST    6,AR17                                 AR013000
000386 47F0 21BC           001D0   248           B     AR39                                   AR013100
00038A 4580 253C           00550   249 AR73      BAL   8,AR13                                 AR013200
00038E 9211 282E     CC842         250           MVI   AR12,X'11'                             AR013300
000392 D2CF 282F 31C0 00843 011D4  251           MVC   AR12+1(16),AR72                        AR013400
CCC398 4580 2548           0055C   252           BAL   8,AR14                                 AR013500
                                   253           CLOSE (AR6,,AR7,,AR8,,AR10,,AR11)            AR013600
                                   267           NRCR  AR1                                    AR013700
CC03C2 5960 2804           00818   273 AR53      C     6,AR54                                 AR013800
0003C6 47B0 23C2           CC3D6   274           BNL   AR56                                   AR013900
0003CA 5960 2808           CC81C   275           C     6,AR55                                 AR014000
CC03CE 47B0 242A           CC43E   276           BNL   AR64                                   AR014100
0003D2 47F0 2504           CC518   277           B     AR70                                   AR014200
0003D6 586C 2808           0081C   278 AR56      S     6,AR55                                 AR014300
CC03DA 5060 280C           CC820   279           ST    6,AR57                                 AR014400
0003DE 5060 2810           00824   280           ST    6,AR58                                 AR014500
0003E2 1866                        281           SR    6,6                                    AR014600
0003E4 1B77                        282 AR60      SR    7,7                                    AR014700
0003E6 4180 31F8           0120C   283           LA    8,AR41                                 AR014800
0003EA 4190 3211           01225   284           LA    9,AR41+25                              AR014900
0003EE D513 800C 9000 00000 00000  285 AR59      CLC   0(20,8),0(9)                           AR015000
0003F4 47D0 23FA           0040F   286           BNH   AR61                                   AR015100
0003F8 D218 3135 8CCC C1149 000C0  287           MVC   AR26(25),0(8)                          AR015200
0003FE D218 80C0 9000 CCCC0 00000  288           MVC   0(25,8),0(9)                           AR015300
000404 D218 9000 3135 0CCCC 01149  289           MVC   0(25,9),AR26                           AR015400
C0040A 47F0 23DA           003EF   290           B     AR59                                   AR015500
CC04CE 4188 CC19           0CC19   291 AR61      LA    8,25(8)                                AR015600
000412 4199 CC19           00019   292           LA    9,25(9)                                AR015700
000416 4177 CCC1           00001   293           LA    7,1(7)                                 AR015800
00041A 5970 2810           0C824   294           C     7,AR58                                 AR015900
0C041E 4740 23DA           003FE   295           BL    AR59                                   AR016000
000422 4166 C001           00001   296           LA    6,1(6)                                 AR016100
000426 5960 280C           00820   297           C     6,AR57                                 AR016200
0C042A 47B0 242A           0043E   298           BNL   AR64                                   AR016300
00042E 58B0 2810           0C824   299           L     11,AR58                                AR016400
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   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  AR016500
000432 58BC 28C8            0081C   300          S     11,AR55                                 AR016500
000436 50BC 2810            00824   3C1          ST    11,AR58                                 ARC1660C
00043A 47F0 23D0            0C3E4   302          B     AR60                                    AR016700
00043E D2C3 2818 2808 0082C 0C81C   303 AR64     MVC   AR63(4),AR55                            AR016800
000444 4160 31F8            0120C   304          LA    6,AR41                                  AR016900
000448 417C 36DA            016FE   305          LA    7,AR41+1250                             AR017000
00044C 58SC 28C0            0C814   3C6          L     9,AR52                                  AR017100
000450 41B0 5DD1            03DE5   307          LA    11,AR41+11225                           AR017200
000454 4580 253C            00550   3C8 AR69     BAL   8,AR13                                  AR017300
000458 9289 282E      00842         309          MVI   AR12,X'89'                              AR017400
00045C 4580 2548            0C55C   310          BAL   8,AR14                                  AR017500
0C046C 9211 282E      0C842         311          MVI   AR12,X'11'                              AR017600
000464 D233 282F 3169 00843 0117D   312          MVC   AR12+1(52),AR65                         AR017700
0C046A 58C0 2818            0082C   313          L     0,AR63                                  ARC17800
                                    314          MAKE  I,AR12+19,5                             AR017900
00047C D2C0 2852 3168 0C866 C117C   321          MVC   AR12+36(1),AR40                         AR018000
000482 5800 2814            0082B   322          L     0,AR62                                  AR018100
                                    323          MAKE  I,AR12+53,5                             AR018200
0C0494 598C 2818            0082C   330          L     8,AR63                                  ARC18300
000498 4188 0001            00001   331          LA    8,1(8)                                  AR018400
0C049C 5C80 2818            0082C   332          ST    8,AR63                                  ARC18500
0004A0 5880 2814            0C828   333          L     8,AR62                                  AR018600
0004A4 4188 0001            00001   334          LA    8,1(8)                                  AR018700
0004A8 5080 2814            00828   335          ST    8,AR62                                  ARC18800
0004AC 4580 2548            0055C   336          BAL   8,AR14                                  AR018900
0CC4BC 1BAA                         337          SR    10,10                                   AR019000
0004B2 4580 253C            00550   338          BAL   8,AR13                                  AR019100
0004B6 92C9 282E      C0842         339          MVI   AR12,X'09'                              AR019200
00048A 196B                         340 AR67     CR    6,11                                    AR019300
0C04BC 472C 2504            0C518   341          BH    AR70                                    AR019400
0CC4C0 D213 2834 6CCC C0848 C0000   342          MVC   AR12+6(20),0(6)                         ARC19500
0004C6 D2C4 284A 6014 0085E 0C014   343          MVC   AR12+28(5),20(6)                        ARC19602
0004CC 197B                         344          CR    7,11                                    AR019700
0004CE 4720 24CA            C04DE   345          BH    AR85                                    AR019800
0004D2 D213 2856 7000 C086A 00000   346          MVC   AR12+40(20),0(7)                        ARC19900
0004D8 D2C4 286B 7C14 0087F 00014   347          MVC   AR12+61(5),20(7)                        AR020002
0004DE 4580 2548            0055C   348 AR85     BAL   8,AR14                                  AR020100
0CC4E2 4166 CC19            0CC19   349          LA    6,25(6)                                 AR020200
0004E6 4177 0C19            0CC19   350          LA    7,25(7)                                 ARC20300
0004EA 41AA 0C01            00C01   351          LA    10,1(10)                                AR020400
0004EE 5B90 2808            0081C   352          S     9,AR55                                  AR020500
0004F2 5990 2820            00834   353          C     9,AR68                                  AR020600
0004F6 47D0 2504            00518   354          BNH   AR70                                    ARC20700
0004FA 59A0 281C            00830   355          C     10,AR66                                 AR020800
0C04FE 4740 24A6            004BA   356          BL    AR67                                    AR020900
0CC5C2 5B90 281C            0C830   357          S     9,AR66                                  ARC21000
000506 5990 2820            0C834   358          C     9,AR68                                  AR021100
00050A 47D0 2504            CC518   359          BNH   AR70                                    AR021200
C005CE 1867                         360          LR    6,7                                     AR021300
0C051C 4177 04E2            004E2   361          LA    7,1250(7)                               AR021400
000514 47F0 2440            00454   362          B     AR69                                    AR021500
000518 4580 253C            00550   363 AR70     BAL   8,AR13                                  AR021600
00051C 9211 282E      00842         364          MVI   AR12,X'11'                              ARC21700
000520 4580 2548            0055C   365          BAL   8,AR14                                  AR021800
000524 9209 282E      00842         366          MVI   AR12,X'09'                              AR021900
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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                    AR022000
000528 D222 282F 3190 CC843 011B1   367          MVC   AR12+1(35),AR71                                        AR022000
00052E D200 284F 3168 00863 C117C   368          MVC   AR12+33(1),AR40                                       AR022100
000534 58C0 2800              00814 369          L     0,AR52                                                AR022200
                                    370          MAKE  I,AR12+36,5                                           AR022300
000548 588C 27FC              00810 377          L     8,AR48                                                AR022400
00054C 47FC 2548              0055C 378          B     AR14                                                  AR022500
                                    379 AR13     PROP  AR12,133,X'40'                                        AR022600
00055A C7F8                         382          BR    8                                                     AR022700
                                    383 AR14     PUT   AR6,AR12                                              AR022800
00056A C7F8                         388          BR    8                                                     AR022900
                                    389 AR78     CLOSE (AR8)                                                 AR023000
000576 4190 31F0              01204 395          LA    9,AR80                                                AR023100
00057A 4580 253C              00550 396 AR87     BAL   8,AR13                                                AR023200
00057E 9211 282E        00842       397          MVI   AR12,X'11'                                            AR023300
000582 D2CB 282F 31E0 CC843 011F4   398          MVC   AR12+1(12),AR77                                       AR023400
000588 D203 283C 9000 0085C 0CC00   399          MVC   AR12+14(4),0(9)                                       AR023500
000C58E 4180 2376             0038A 400          LA    8,AR73                                                AR023600
000C592 47F0 2548             0C55C 401          B     AR14                                                  AR023700
                                    402 AR76     CLOSE (AR7)                                                 AR023800
0005A2 4190 31EC              01200 408          LA    9,AR79                                                AR023900
0005A6 47F0 2566              0C57A 409          B     AR87                                                  AR024000
                                    410 AR82     CLOSE (AR11)                                                AR024100
000C5B6 4190 31F4             C12C8 416          LA    9,AR81                                                AR024200
0005BA 47FC 2566              0C57A 417          B     AR87                                                  AR024300
                                    418 AR6      DCB   DSORG=PS,                                            XAR024400
                                                       MACRF=PM,                                           XAR024500
                                                       DDNAME=FDBAR01,                                     XAR024600
                                                       RECFM=FM,                                           XAR024700
                                                       LRECL=133,                                          XAR024800
                                                       BLKSIZE=133,                                        XAR024900
                                                       BFTEK=S,                                            XAR025000
                                                       BUFNO=10                                             AR025100
                                    419                *,***  IH8063  DDNAME SHORT-PADDED TO 8 CHAR
                                    475 AR7      DCB   DSORG=PS,                                            XAR025200
                                                       MACRF=GM,                                           XAR025300
                                                       DDNAME=FDBAR02,                                     XAR025400
                                                       RECFM=F,                                            XAR025500
                                                       LRECL=80,                                           XAR025600
                                                       BLKSIZE=80,                                         XAR025700
                                                       BFTEK=S,                                            XAR025800
                                                       EODAD=AR76                                           AR025900
                                    476                *,***  IH8063  DDNAME SHORT-PADDED TO 8 CHAR
                                    532 AR8      DCB   DSORG=PS,                                            XAR026000
                                                       MACRF=GM,                                           XAR026100
                                                       DDNAME=FDBAR03,                                     XAR026200
                                                       EODAD=AR78,                                         XAR026300
                                                       EROPT=ACC                                            AR026400
                                    533                *,***  IH8063  DDNAME SHORT-PADDED TO 8 CHAR
                                    589 AR10     DCB   DSORG=PS,                                            XAR026500
                                                       MACRF=PM,                                           XAR026600
                                                       DDNAME=FDBAR04,                                     XAR026700
                                                       BFTEK=S                                              AR026800
                                    590                *,***  IH8063  DDNAME SHORT-PADDED TO 8 CHAR
                                    646 AR11     DCB   DSORG=PS,                                            XAR026900
                                                       MACRF=GM,                                           XAR027000
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   LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                  FOIJAN68   7/16/68

                                           DDNAME=FDBAR04,                                                          XAR027100
                                           BFTEK=S,                                                                 XAR027200
                                           EODAD=AR82,                                                              XAR027300
                                           EROPT=ACC                                                                AR027400
                                647        *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR
0007A0                          703 AR1    DS     18F                                                               AR027500
0007E8 COC01014                 704 AR4    DC     A(AR2+4096)                                                       AR027600
0007EC C0C02014                 705        DC     A(AR2+8192)                                                       AR027700
0007FC 00003014                 706        DC     A(AR2+12288)                                                      AR027800
0007F4                          707 AR5    DS     0F                                                                AR027900
0007F4 FCFFFFFF                 708        DC     X'FCFFFFFF'                                                       AR028000
0007F8                          709 AR17   DS     F                                                                 AR028100
0007FC                          710 AR18   DS     F                                                                 AR028200
000BCC C0C0CC14                 711 AR33   DC     F'20'                                                             AR028300
000804                          712 AR38   DS     F                                                                 AR028400
CCC8C8 000001C2                 713 AR44   DC     F'450'                                                            AR028500
CCC80C                          714 AR45   DS     F                                                                 AR028600
000810                          715 AR48   DS     F                                                                 AR028700
CC0814                          716 AR52   DS     F                                                                 AR028800
000818 C0C00002                 717 AR54   DC     F'2'                                                              AR028900
00081C C0CC0001                 718 AR55   DC     F'1'                                                              AR029000
CC0820                          719 AR57   DS     F                                                                 AR029100
CC0824                          720 AR58   DS     F                                                                 AR029200
CC0828                          721 AR62   DS     F                                                                 AR029300
CC082C                          722 AR63   DS     F                                                                 AR029400
CC0830 CCC0CC32                 723 AR66   DC     F'50'                                                             AR029500
000834 C0CCCCC0                 724 AR68   DC     F'0'                                                              AR029600
000838                          725 AR90   DS     CL5                                                               AR029701
00083D                          726 AR91   DS     CL5                                                               AR029802
CC0842                          727 AR12   DS     CL133                                                             AR029900
0008C7                          728 AR15   DS     CL80                                                              AR030000
000917                          729 AR16   DS     CL80                                                              AR030100
CC0967                          730 AR19   DS     CL2004                                                            AR030200
CC096B                          731 AR20   EQU    AR19+4                                                            AR030300
00113B C1C1C1C1                 732 AR21   DC     C'AAAA'                                                           AR030400
00113F                          733 AR22   DS     CL5                                                               AR030500
001144 40C1D5C44C               734 AR25   DC     C' AND '                                                          AR030600
001149                          735 AR26   DS     CL25                                                              AR030700
001162 C1C2C3C4C5C6C7C8         736 AR37   DC     C'ABCDEFGHIJKLMNOPQRSTUVWXYZ'                                     AR030800
00117C                          737 AR40   DS     CL1                                                               AR030900
00117C C1E4E3C8D6D940C9         738 AR65   DC     C'AUTHOR INDEX, PAGE       OF LETTER   , OVER ALL PAGE'          AR031000
0011B1 D5E4D4C2C5D940D6         739 AR71   DC     C'NUMBER OF REFERENCES FOR LETTER   ='                        AR031100
0011D4 C5D5C440D6C640D7         740 AR72   DC     C'END OF PROGRAMME'                                               AR031200
0011E4 C9D5D7E4E340C3C1         741 AR74   DC     C'INPUT CARD ERROR'                                               AR031300
0011F4 C5D5C440D6C640C6         742 AR77   DC     C'END OF FILE-'                                                   AR031400
CC1200 C3C1D9C4                 743 AR79   DC     C'CARD'                                                           AR031500
001204 E3C1D7C5                 744 AR80   DC     C'TAPE'                                                           AR031600
CC1208 C4C9E2D2                 745 AR81   DC     C'DISK'                                                           AR031700
CC12CC                          746 AR41   DS     450CL25                                                           AR031800
CC0000                          747        END    AR3                                                               AR031900
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RELOCATION DICTIONARY

7/16/68

POS.ID	REL.ID	FLAGS	ADDRESS
01	01	08	000020
01	01	08	000031
01	01	0C	000094
01	01	0C	0000A8
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01	01	08	0000C9
01	01	08	0000ED
01	01	08	0000F1
01	01	08	0001E1
01	01	08	000375
01	01	08	0003A1
01	01	08	0003A5
01	01	08	0003A9
01	01	08	0003AD
01	01	08	0003B1
01	01	0C	000478
01	01	0C	000490
01	01	0C	000544
01	01	08	000571
01	01	08	00059D
01	01	08	0005B1
01	01	08	000641
01	01	08	0006A1
01	01	08	000761
01	01	0C	0007E8
01	01	0C	0007EC
01	01	0C	0007F0
01	02	18	000C91
01	02	18	000CA5
01	03	18	000475
01	03	18	00048D
01	03	18	000541

SYMBOL	LEN	VALUE	DEFN	REFERENCES														
AR1	00004	0007A0	0703	0014	0269													
AR10	00004	0006E0	0595	0081	0096	0130	0263											
AR100	00004	00019E	0140	0137														
AR101	00004	000196	0138	0141														
AR11	00004	000740	0652	0159	0214	0243	0265	0414										
AR12	00133	000842	0727	0034	0041	0042	0052	0053	0250	0251	0309	0311	0312	0320	0321	0329	0339	0342
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AR13	00004	000550	0380	0033	0051	0249	0308	0338	0363	0396								
AR14	00004	00055C	0384	0035	0043	0055	0252	0310	0336	0348	0365	0378	0401					
AR15	00080	0008C7	0728	0038	0042													
AR16	00080	000917	0729	0046	0049	0062	0070	0072	0073									
AR17	00004	0007F8	0709	0063	0152	0245	0247											
AR18	00004	0007FC	0710	0071	0153													
AR19	02004	000967	0730	0085	0731													
AR2	00004	000014	0020	0019	0704	0705	0706											
AR20	02004	000968	0731	0088	0100	0102	0104	0105										
AR21	00004	00113B	0732	0088														
AR22	00005	00113F	0733	0104	0127													
AR23	00004	000186	0134	0106	0118													
AR24	00004	000130	0112	0115														
AR25	00005	001144	0734	0120														
AR26	00025	001149	0735	0108	0110	0111	0111	0127	0131	0215	0218	0220	0287	0289				
AR27	00004	000140	0116	0113	0139	0151												
AR28	00006	000150	0120	0117														
AR29	00004	000162	0124	0121														
AR3	00004	000C00	0013	0747														
AR30	00004	00018E	0136	0125														
AR31	00004	000182	0145	0143														
AR33	00004	000800	0711	0146														
AR34	00006	00016E	0127	0119	0123													
AR35	00004	0000CE	0084	0101	0103	0134												
AR36	00002	000120	0107	0135														
AR37	00026	001162	0736	0162														
AR38	00004	000804	0712	0098	0231													
AR39	00004	0001D0	0152	0099	0248													
AR4	00004	0007E8	0704	0020														
AR40	00001	00117C	0737	0163	0218	0321	0368											
AR41	00025	00120C	0746	0165	0168	0169	0169	0170	0170	0171	0171	0172	0172	0173	0173	0174	0174	0175
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				0205	0206	0206	0207	0207	0208	0208	0209	0209	0210	0210	0211	0211	0212	0212
				0283	0284	0304	0305	0307										
AR42	00004	000308	0214	0232														
AR43	00004	00034A	0230	0219	0224													
AR44	00004	000808	0713	0223														
AR45	00004	000800	0714	0226	0237													
AR48	00004	000810	0715	0228	0234	0377												
AR49	00004	000366	0237	0227														
AR5	00004	0007F4	0707	0022														
AR50	00004	000370	0241	0233														
AR51	00004	00035E	0235	0229														
AR52	00004	000814	0716	0235	0306	0369												
AR53	00004	0003C2	0273	0236														

SYMBOL	LEN	VALUE	DEFN	REFERENCES						
AR54	0004	000818	0717	0273						
AR55	0004	00081C	0718	0024	0161	0275	0278	0300	0303	0352
AR56	0004	0003D6	0273	0274						
AR57	0004	000820	0719	0279	0297					
AR58	0004	000824	0720	0280	0294	0299	0301			
AR59	0006	0003EE	0285	0290	0295					
AR6	0004	0005C0	0424	0029	0257	0384				
AR60	0002	0003E4	0282	0302						
AR61	0004	0004CE	0291	0286						
AR62	0004	000828	0721	0024	0322	0333	0335			
AR63	0004	00082C	0722	0303	0313	0330	0332			
AR64	0006	00043E	0303	0276	0298					
AR65	0052	00117D	0738	0312						
AR66	0004	000830	0723	0355	0357					
AR67	0002	0004BA	0340	0356						
AR68	0004	000834	0724	0353	0358					
AR69	0004	000454	0308	0362						
AR7	0004	000620	0481	0031	0037	0045	0259	0406		
AR70	0004	000518	0363	0277	0341	0354	0359			
AR71	0035	0011B1	0739	0367						
AR72	0016	0011D4	0740	0251						
AR73	0004	00038A	0249	0054	0154	0400				
AR74	0016	0011E4	0741	0053						
AR75	0004	000C8A	0058	0050						
AR76	0004	000598	04C4	0500						
AR77	0012	0011F4	0742	0398						
AR78	0004	00056C	0391	0557						
AR79	0004	001200	0743	0408						
AR8	0004	000680	0538	0079	0084	0094	0261	0393		
AR80	0004	001204	0744	0395						
AR81	0004	0012C8	0745	0416						
AR82	0004	0005AC	0412	0671						
AR84	0004	0001F6	0165	0238						
AR85	0004	0004DE	0348	0345						
AR87	0004	00057A	0396	0409	0417					
AR90	0005	000838	0725	0072	0100					
AR91	0005	00083C	0726	0073	0102					
AR92	0006	000CFE	010C	0089						
AR93	0004	0001C8	0150	0147						

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
477 PRINTED LINES

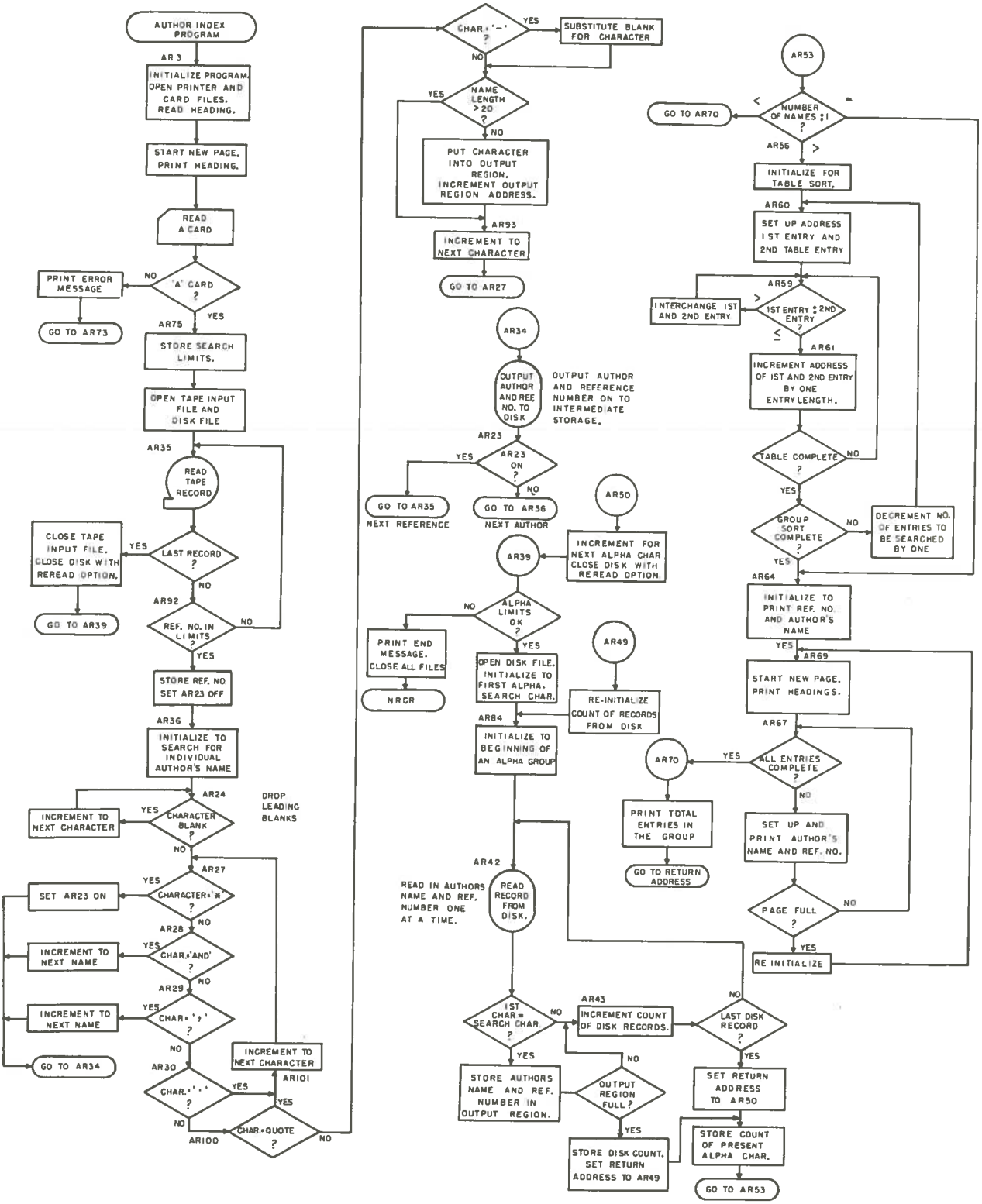

Fig. 12 Detail flow chart, author index

Appendix F

Subroutine Details

Program Listings and Flow Charts

```
                                        1          PRINT NOGEN                                          AI000100
                                        2 *                                                             AI000200
                                        3 *      'MODT' SUBROUTINE,                                     AI000300
                                        4 *        BIBLIOGRAPHY SYSTEM                                  AI000400
                                        5 *          SEQUENTIAL DATA,                                   AI000500
                                        6 *                                                             AI000600
                                        7 * WRITTEN BY F.D.BLAIR,                                       AI000700
                                        8 *            N.R.C. OTTAWA,ONT.                               AI000800
                                        9 *                                                             AI000900
000000                                 10 MODT     CSECT                                                AI001000
                                       11          NRCS  AI1,2                                          AI001100
000014 1B55                            21 AI2      SR    5,5                                            AI001200
000016 5811 0000          00000        22          L     1,0(1)                                         AI001300
00001A 5051 0010          00010        23          ST    5,16(1)                                        AI001400
00001E 5831 0000          00000        24          L     3,0(1)                                         AI001500
000022 5841 0004          00004        25          L     4,4(1)                                         AI001600
000026 5844 0000          00000        26          L     4,0(4)                                         AI001700
00002A 5851 0008          00008        27          L     5,8(1)                                         AI001800
00002E 5861 000C          0000C        28          L     6,12(1)                                        AI001900
000032 9036 23A4          003A4        29          STM   3,6,AI3                                        AI002000
000036 9540 3006    00006              30          CLI   6(3),X'40'                                     AI002100
00003A 4780 2044          00044        31          BE    AI4                                            AI002200
00003E D200 5006 3006 00006 00006      32          MVC   6(1,5),6(3)                                    AI002300
000044 9540 3007    00007              33 AI4      CLI   7(3),X'40'                                     AI002400
000048 4780 2052          00052        34          BE    AI5                                            AI002500
00004C D200 5007 3007 00007 00007      35          MVC   7(1,5),7(3)                                    AI002600
000052 D50F 3008 23B4 00008 003B4      36 AI5      CLC   8(16,3),AI6                                    AI002700
000058 4780 2062          00062        37          BE    AI7                                            AI002800
00005C D20F 5008 3008 00008 00008      38          MVC   8(16,5),8(3)                                   AI002900
000062 D502 3019 23B4 00019 003B4      39 AI7      CLC   25(3,3),AI6                                    AI003000
000068 4780 20DC          000DC        40          BE    AI8                                            AI003100
00006C 4173 0019          00019        41          LA    7,25(3)                                        AI003200
000070 41A0 0001          00001        42          LA    10,1                                           AI003300
000074 4185 0019          00019        43 AI10     LA    8,25(5)                                        AI003400
000078 4190 0001          00001        44          LA    9,1                                            AI003500
00007C D502 8000 23B4 00000 003B4      45 AI9      CLC   0(3,8),AI6                                     AI003600
000082 4780 20BC          000BC        46          BE    AI11                                           AI003700
000086 5990 2B98          00B98        47          C     9,AI37                                         AI003800
00008A 47B0 209A          0009A        48          BNL   AI13                                           AI003900
00008E 4188 00C4          00004        49          LA    8,4(8)                                         AI004000
000092 4199 0001          00001        50          LA    9,1(9)                                         AI004100
000096 47F0 207C          0007C        51          B     AI9                                            AI004200
00009A D203 1010 2B9C 00010 00B9C      52 AI13     MVC   16(4,1),AI38                                   AI004300
0000A0 1B99                            53          SR    9,9                                            AI004400
0000A2 4185 0019          00019        54          LA    8,25(5)                                        AI004500
0000A6 D202 8000 8004 00000 00004      55 AI12     MVC   0(3,8),4(8)                                    AI004600
0000AC 4188 0004          00004        56          LA    8,4(8)                                         AI004700
0000B0 4199 0001          00001        57          LA    9,1(9)                                         AI004800
0000B4 5990 2BA0          00BA0        58          C     9,AI39                                         AI004900
0000B8 4740 20A6          000A6        59          BL    AI12                                           AI005000
0000BC D202 8000 7000 00000 00000      60 AI11     MVC   0(3,8),0(7)                                    AI005100
0000C2 59A0 2B98          00B98        61          C     10,AI37                                        AI005200
0000C6 47B0 20DC          000DC        62          BNL   AI8                                            AI005300
0000CA 4177 0004          00004        63          LA    7,4(7)                                         AI005400
0000CE 41AA 0001          00001        64          LA    10,1(10)                                       AI005500
```

```
LOC    OBJECT CODE      ADDR1 ADDR2  STMT   SOURCE STATEMENT
0000D2 D502 7000 23B4 00000 003B4     65          CLC   0(3,7),AI6
0000D8 4770 2074            00074     66          BNE   AI10
0000DC D501 303D 23B4 0003D 003B4     67   AI8    CLC   61(2,3),AI6
0000E2 4760 215C            0015C     68          BE    AI19
0000E6 4173 003D            0003D     69          LA    7,61(3)
0000EA 41A0 0001            00001     70          LA    10,1
0000EE 4185 003D            0003D     71   AI16   LA    8,61(5)
0000F2 4190 0001            00001     72          LA    9,1
0000F6 D501 8000 2384 00000 003B4     73   AI14   CLC   0(2,8),AI6
0000FC 4780 213C            0013C     74          BE    AI15
000100 5990 2BA4            00BA4     75          C     9,AI40
000104 47B0 2114            00114     76          BNL   AI17
000108 4188 0003            00003     77          LA    8,3(8)
00010C 4199 0001            00001     78          LA    9,1(9)
000110 47F0 20F6            000F6     79          B     AI14
000114 58F1 0010            00010     80   AI17   L     15,16(1)
000118 41FF 0002            00002     81          LA    15,2(15)
00011C 50F1 0010            00010     82          ST    15,16(1)
000120 1899                           83          SR    9,9
000122 4185 003D            0003D     84          LA    8,61(5)
000126 D201 8000 8003 00000 00003     85   AI18   MVC   0(2,8),3(8)
00012C 4188 0003            00003     86          LA    8,3(8)
000130 4199 0001            00001     87          LA    9,1(9)
000134 5990 2BA8            00BA8     88          C     9,AI41
000138 4740 2126            00126     89          BL    AI18
00013C D201 8000 7000 00000 00000     90   AI15   MVC   0(2,8),0(7)
000142 59A0 2BA4            00BA4     91          C     10,AI40
000146 47B0 215C            0015C     92          BNL   AI19
00014A 4177 0003            00003     93          LA    7,3(7)
00014E 41AA 0001            00001     94          LA    10,1(10)
000152 D501 7000 23B4 00000 003B4     95          CLC   0(2,7),AI6
000158 4770 20EE            000FE     96          BNE   AI16
00015C 5830 23A4            003A4     97   AI19   L     3,AI3
000160 5840 23AC            003AC     98          L     4,AI3+8
000164 D24F 3000 4000 00000 00000     99          MVC   0(80,3),0(4)
00016A 5860 23A8            003A8    100          L     6,AI3+4
00016E 5960 2BB8            00BB8    101          C     6,AI45
000172 4770 2186            00186    102          BNE   AI29
000176 5860 23B0            003B0    103          L     6,AI3+12
00017A 5B60 2BAC            00BAC    104          S     6,AI42
00017E 5840 23AC            003AC    105          L     4,AI3+8
000182 47F0 2326            00326    106          B     AI28
000186 5850 23A4            003A4    107   AI29   L     5,AI3
00018A 5860 23A8            003A8    108          L     6,AI3+4
00018E 940F 21CD      001CD          109          NI    AI30+1,X'0F'
000192 4155 0050            00050    110   AI31   LA    5,80(5)
000196 4170 0050            00050    111          LA    7,80
00019A 1B88                          112          SR    8,8
00019C 955C 5000      00000          113   AI33   CLI   0(5),C'*'
0001A0 4770 21A8            001A8    114          BNE   AI32
0001A4 4188 0001            00001    115          LA    8,1(8)
0001A8 4177 0001            00001    116   AI32   LA    7,1(7)
0001AC 4155 0001            00001    117          LA    5,1(5)
0001B0 1976                          118          CR    7,6
0001B2 4740 219C            0019C    119          BL    AI33
```

```
LOC  OBJECT CODE      ADDR1 ADDR2  STMT   SOURCE STATEMENT                    FORTRAN 68  7/19/68

000186 5980 2B80            00B80  120            C     8,AI43                          AI011100
00018A 4780 21CC            001CC  121            BNL   AI30                            AI011200
                                   122            NRCR  AI1,8                         AI011300
0001CC 4700 21E0            001E0  128 AI30       BC    C,AI34                          AI011400
0001D0 5850 23AC            003AC  129            L     5,AI3+8                         AI011500
0001D4 5860 23B0            003B0  130            L     6,AI3+12                        AI011600
0001D8 96F0 21CD      001CD        131            OI    AI30+1,X'F0'                    AI011700
0001DC 47F0 2192            00192  132            B     AI31                            AI011800
0001E0 4133 0050            00050  133 AI34       LA    3,80(3)                         AI011900
0001E4 4144 0050            00050  134            LA    4,80(4)                         AI012000
0001E8 1855                        135            SR    5,5                             AI012100
0001EA 1865                        136            LR    6,5                             AI012200
0001EC 4170 23C4            003C4  137            LA    7,AI20                          AI012300
0001F0 955C 3000      00000        138 AI26       CLI   0(3),C'*'                       AI012400
0001F4 4780 2206            00206  139            BE    AI21                            AI012500
                                   140 AI35       NRCR  AI1,4                           AI012600
000206 D200 70C0 3000 00000 00000  146 AI21       MVC   0(1,7),0(3)                     AI012700
00020C 4133 0001            00001  147            LA    3,1(3)                          AI012800
000210 4144 0001            00001  148            LA    4,1(4)                          AI012900
000214 4166 0001            00001  149            LA    6,1(6)                          AI013000
000218 4177 0001            00001  150            LA    7,1(7)                          AI013100
00021C 955C 3000      00000        151            CLI   0(3),C'*'                       AI013200
000220 4770 224E            0024E  152            BNE   AI23                            AI013300
000224 955C 4000      00000        153            CLI   0(4),C'*'                       AI013400
000228 4770 2230            00230  154            BNE   AI22                            AI013500
00022C 47F0 2278            00278  155            B     AI25                            AI013600
000230 D200 7000 4000 00000 00000  156 AI22       MVC   0(1,7),0(4)                     AI013700
000236 4144 0001            00001  157            LA    4,1(4)                          AI013800
00023A 4177 0001            00001  158            LA    7,1(7)                          AI013900
00023E 4166 0001            00001  159            LA    6,1(6)                          AI014000
000242 955C 4000      00000        160            CLI   0(4),C'*'                       AI014100
000246 4770 2230            00230  161            BNE   AI22                            AI014200
00024A 47F0 2278            00278  162            B     AI25                            AI014300
00024E D200 7000 3000 00000 00000  163 AI23       MVC   0(1,7),0(3)                     AI014400
000254 4133 0001            00001  164            LA    3,1(3)                          AI014500
000258 4177 0001            00001  165            LA    7,1(7)                          AI014600
00025C 4166 0001            00001  166            LA    6,1(6)                          AI014700
000260 955C 3000      00000        167            CLI   0(3),C'*'                       AI014800
000264 4770 224E            0024E  168            BNE   AI23                            AI014900
000268 955C 4000      00000        169 AI24       CLI   0(4),C'*'                       AI015000
00026C 4780 2278            00278  170            BE    AI25                            AI015100
000270 4144 0001            00001  171            LA    4,1(4)                          AI015200
000274 47F0 2268            00268  172            B     AI24                            AI015300
000278 4155 0001            00001  173 AI25       LA    5,1(5)                          AI015400
00027C 5950 2B98            00B98  174            C     5,AI37                          AI015500
000280 4740 21F0            001F0  175            BL    AI26                            AI015600
000284 D200 70C0 3000 00000 00000  176            MVC   0(1,7),0(3)                     AI015700
00028A 4133 0001            00001  177            LA    3,1(3)                          AI015800
00028E 4144 0001            00001  178            LA    4,1(4)                          AI015900
000292 4177 0001            00001  179            LA    7,1(7)                          AI016000
000296 4166 0001            00001  180            LA    6,1(6)                          AI016100
00029A 955C 4C00      00000        181 AI46       CLI   0(4),C'*'                       AI016200
00029E 4780 22B8            00288  182            BE    AI47                            AI016300
0002A2 D200 7000 4000 00000 00000  183            MVC   0(1,7),0(4)                     AI016400
0002A8 4144 0001            00001  184            LA    4,1(4)                          AI016500
```

```
  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                              F01JAN68   7/19/68

0002AC 4177 0001             00001   185          LA    7,1(7)                                                    AI016600
0002B0 4166 0001             00001   186          LA    6,1(6)                                                    AI016700
0002B4 47F0 229A             0029A   187          B     AI46                                                      AI016800
0002B8 955C 3000       00000         188 AI47     CLI   0(3),C'*'                                                 AI016900
0002BC 4780 231A             0031A   189          BE    AI48                                                      AI017000
0002C0 5030 2BBC             00BBC   190          ST    3,AI49                                                    AI017100
0002C4 955C 3000       00000         191 AI50     CLI   0(3),C'*'                                                 AI017200
0002C8 4780 22D4             002D4   192          BE    AI52                                                      AI017300
0002CC 4133 0001             00001   193          LA    3,1(3)                                                    AI017400
0002D0 47F0 22C4             002C4   194          B     AI50                                                      AI017500
0002D4 5B30 2B9C             00B9C   195 AI52     S     3,AI38                                                    AI017600
0002D8 5030 2BC4             00BC4   196          ST    3,AI51                                                    AI017700
0002DC 9540 3000       00000         197 AI53     CLI   0(3),X'40'                                                AI017800
0002E0 4770 22F4             002F4   198          BNE   AI54                                                      AI017900
0002E4 5930 2BBC             00BBC   199          C     3,AI49                                                    AI018000
0002E8 47D0 231A             0031A   200          BNH   AI48                                                      AI018100
0002EC 5B30 2B9C             00B9C   201          S     3,AI38                                                    AI018200
0002F0 47F0 22DC             002DC   202          B     AI53                                                      AI018300
0002F4 5030 2BC0             00BC0   203 AI54     ST    3,AI55                                                    AI018400
0002F8 5830 2BBC             00BBC   204          L     3,AI49                                                    AI018500
0002FC D200 7000 3000  00000 00000   205 AI56     MVC   0(1,7),0(3)                                               AI018600
000302 4177 0001             00001   206          LA    7,1(7)                                                    AI018700
000306 4166 0001             00001   207          LA    6,1(6)                                                    AI018800
00030A 5930 2BC0             00BC0   208          C     3,AI55                                                    AI018900
00030E 47B0 231A             0031A   209          BNL   AI48                                                      AI019000
000312 4133 0001             00001   210          LA    3,1(3)                                                    AI019100
000316 47F0 22FC             002FC   211          B     AI56                                                      AI019200
00031A 925C 7000       00000         212 AI48     MVI   0(7),C'*'                                                 AI019300
00031E 4166 0001             00001   213          LA    6,1(6)                                                    AI019400
000322 4140 23C4             003C4   214          LA    4,AI20                                                    AI019500
000326 5830 23A4             003A4   215 AI28     L     3,AI3                                                     AI019600
00032A 4133 0050             00050   216          LA    3,80(3)                                                   AI019700
00032E 1B55                          217          SR    5,5                                                       AI019800
000330 D200 3000 4000  00000 00000   218 AI27     MVC   0(1,3),0(4)                                               AI019900
000336 4144 0001             00001   219          LA    4,1(4)                                                    AI020000
00033A 4133 0001             00001   220          LA    3,1(3)                                                    AI020100
00033E 4155 0001             00001   221          LA    5,1(5)                                                    AI020200
000342 1956                          222          CR    5,6                                                       AI020300
000344 4740 2330             00330   223          BL    AI27                                                      AI020400
000348 4166 0050             00050   224          LA    6,80(6)                                                   AI020500
00034C 5061 000C             0000C   225          ST    6,12(1)                                                   AI020600
                                     226          NRCR  AI1                                                       AI020700
00035C                               232 AI1      DS    18F                                                       AI020800
0003A4                               233 AI3      DS    4F                                                        AI020900
0003B4 4040404040404040              234 AI6      DC    16X'40'                                                   AI021000
0003C4                               235 AI20     DS    500F                                                      AI021100
000B94 00000000                      236 AI36     DC    F'0'                                                      AI021200
000B98 00000009                      237 AI37     DC    F'9'                                                      AI021300
000B9C 00000001                      238 AI38     DC    F'1'                                                      AI021400
000BA0 00000008                      239 AI39     DC    F'8'                                                      AI021500
000BA4 00000006                      240 AI40     DC    F'6'                                                      AI021600
000BA8 00000005                      241 AI41     DC    F'5'                                                      AI021700
000BAC 00000050                      242 AI42     DC    F'80'                                                     AI021800
000BB0 0000000B                      243 AI43     DC    F'11'                                                     AI021900
000BB4 0000000A                      244 AI44     DC    F'10'                                                     AI022000
```

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 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                    F01JAN68  7/19/68
000BB8 00000051                   245 AI45     DC    F'81'                              AIC22100
000BBC                            246 AI49     DS    F                                  AI022200
000BC0                            247 AI55     DS    F                                  AI022300
000BC4                            248 AI51     DS    F                                  AI022400
                                  249          END                                      AI022500
```

SYMBOL	LEN	VALUE	DEFN	REFERENCES										
AI1	00004	00035C	0232	0014	0124	0142	0228							
AI10	00004	000374	0043	0066										
AI11	00006	0000BC	0060	0046										
AI12	00006	0000A6	0055	0059										
AI13	00006	00009A	0052	0048										
AI14	00006	0000F6	0073	0079										
AI15	00006	00013C	0090	0074										
AI16	00004	0000EE	0071	0096										
AI17	00004	000114	0080	0076										
AI18	00006	000126	0085	0089										
AI19	00004	00015C	0097	0068	0092									
AI2	00002	000014	0021											
AI20	00004	0003C4	0235	0137	0214									
AI21	00006	000206	0146	0139										
AI22	00006	000230	0156	0154	0161									
AI23	00006	00024E	0163	0152	0168									
AI24	00004	000268	0169	0172										
AI25	00004	000278	0173	0155	0162	0170								
AI26	00004	0001F0	0138	0175										
AI27	00006	000330	0218	0223										
AI28	00004	000326	0215	0106										
AI29	00004	000186	0107	0102										
AI3	00004	0003A4	0233	0029	0097	0098	0100	0103	0105	0107	0108	0129	0130	0215
AI30	00004	0001CC	0128	0109	0121	0131								
AI31	00004	000192	0110	0132										
AI32	00004	0001A8	0116	0114										
AI33	00004	00019C	0113	0119										
AI34	00004	0001E0	0133	0128										
AI35	00002	0001F8	0141											
AI36	00004	000B94	0236											
AI37	00004	000B98	0237	0047	0061	0174								
AI38	00004	000B9C	0238	0052	0195	0201								
AI39	00004	000BA0	0239	0058										
AI4	00004	000044	0033	0031										
AI40	00004	000BA4	0240	0075	0091									
AI41	00004	000BA8	0241	0088										
AI42	00004	000BAC	0242	0104										
AI43	00004	000BB0	0243	0120										
AI44	00004	000BB4	0244											
AI45	00004	000BB8	0245	0101										
AI46	00004	00029A	0181	0187										
AI47	00004	000288	0188	0182										
AI48	00004	00031A	0212	0189	0200	0209								
AI49	00004	000BBC	0246	0190	0199	0204								
AI5	00006	000052	0036	0034										
AI50	00004	0002C4	0191	0194										
AI51	00004	000BC4	0248	0196										
AI52	00004	0002D4	0195	0192										
AI53	00004	0002DC	0197	0202										
AI54	00004	0002F4	0203	0198										
AI55	00004	000BC0	0247	0203	0208									
AI56	00006	0002FC	0205	0211										
AI6	00001	000384	0234	0036	0039	0045	0065	0067	0073	0095				
AI7	00006	000062	0039	0037										
AI8	00006	0000DC	0067	0040	0062									

CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES
AI9	00006	00007C	0045	0051
MODT	00001	000000	0010	

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
302 PRINTED LINES

```
LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    F01JAN68  7/19/68
                                     1          PRINT NOGEN                                AH0001
                                     2 *                                                   AH0002
                                     3 *     'NEWD' SUBROUTINE,                            AH0003
                                     4 *       BIBLIOGRAPHY SYSTEM,                        AH0004
                                     5 *          SEQUENTIAL DATA,                         AH0005
                                     6 *                                                   AH0006
                                     7 * WRITTEN BY F.D.BLAIR,                             AH0007
                                     8 *          N.R.C. OTTAWA,ONT.                       AH0008
                                     9 *                                                   AH0009
000000                              10 NEWD     CSECT                                      AH0010
                                    11          NRCS  AH1,2                                AH0011
000014 5811 0000           00000    21          L     1,0(1)                               AH0012
000018 4131 0004           00004    22          LA    3,4(1)                               AH0013
00001C 5833 0000           00000    23          L     3,0(3)                               AH0014
000020 5893 0000           00000    24          L     9,0(3)                               AH0015
000024 5841 0000           00000    25          L     4,0(1)                               AH0016
000028 4144 0050           00050    26          LA    4,80(4)                              AH0017
00002C 1B55                         27          SR    5,5                                  AH0018
00002E 4160 0050           00050    28          LA    6,80                                 AH0019
000032 1874                         29          LR    7,4                                  AH0020
000034 D500 7000 297C 00000 0097C   30 AH6      CLC   0(1,7),AH3                           AH0021
00003A 4780 205A           005A     31          BE    AH7                                  AH0022
00003E 4177 0001           00001    32 AH5      LA    7,1(7)                               AH0023
000042 4166 0001           00001    33          LA    6,1(6)                               AH0024
000046 1969                         34          CR    6,9                                  AH0025
000048 4740 2034           00034    35          BL    AH6                                  AH0026
                                    36          NRCR  AH1,4                                AH0027
00005A 1885                         42 AH7      LR    8,5                                  AH0028
00005C 8980 0002           00002    43          SLL   8,2                                  AH0029
000060 5078 2154           00154    44          ST    7,AH4(8)                             AH0030
000064 4155 0001           00001    45          LA    5,1(5)                               AH0031
000068 5950 2150           00150    46          C     5,AH16                               AH0032
00006C 4740 203E           003E     47          BL    AH5                                  AH0033
000070 5070 2974           00974    48          ST    7,AH9                                AH0034
000074 4150 2154           00154    49          LA    5,AH4                                AH0035
000078 5B50 2978           00978    50          S     5,AH14                               AH0036
00007C 4180 21A4           01A4     51          LA    8,AH8                                AH0037
000080 4190 0001           00001    52          LA    9,1                                  AH0038
000084 4155 0004           00004    53 AH12     LA    5,4(5)                               AH0039
000088 5865 0000           00000    54          L     6,0(5)                               AH0040
00008C 5875 0004           00004    55          L     7,4(5)                               AH0041
000090 18A6                         56          LR    10,6                                 AH0042
000092 D200 8000 6000 00000 00000   57 AH10     MVC   0(1,8),0(6)                          AH0043
000098 4166 0001           00001    58          LA    6,1(6)                               AH0044
00009C 4188 0001           00001    59          LA    8,1(8)                               AH0045
0000A0 4199 0001           00001    60          LA    9,1(9)                               AH0046
0000A4 1967                         61          CR    6,7                                  AH0047
0000A6 4740 2092           0092     62          BL    AH10                                 AH0048
0000AA 5B80 2104           00104    63 AH11     S     8,AH15                               AH0049
0000AE 5B90 2104           00104    64          S     9,AH15                               AH0050
0000B2 9540 8000           00000    65          CLI   0(8),X'40'                           AH0051
0000B6 4780 20AA           00AA     66          BE    AH11                                 AH0052
0000BA 4188 0001           00001    67          LA    8,1(8)                               AH0053
0000BE 4199 0001           00001    68          LA    9,1(9)                               AH0054
0000C2 5970 2974           00974    69          C     7,AH9                                AH0055
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  FORTJAN68  7/19/68

0000C6 4740 2084            00084    70           BL    AH12                                        AH0005600
0000CA D200 8000 7000 00000 00000    71           MVC   0(1,8),0(7)                                 AH0005700
0000D0 1854                          72           LR    5,4                                         AH0005800
0000D2 4160 21A4            001A4    73           LA    6,AH8                                       AH0005900
0000D6 1B77                          74           SR    7,7                                         AH0006000
0000D8 D200 5000 6000 00000 00000    75 AH13      MVC   0(1,5),0(6)                                 AH0006100
0000DE 4166 0001            00001    76           LA    6,1(6)                                      AH0006200
0000E2 4155 0001            00001    77           LA    5,1(5)                                      AH0006300
0000E6 4177 0001            00001    78           LA    7,1(7)                                      AH0006400
0000EA 1979                          79           CR    7,9                                         AH0006500
0000EC 4740 20D8            000D8    80           BL    AH13                                        AH0006600
0000F0 4199 0050            00050    81           LA    9,80(9)                                     AH0006700
0000F4 5091 000C            0000C    82           ST    9,12(1)                                     AH0006800
                                     83           NRCR  AH1                                         AH0006900
000104 00000001                      89 AH15      DC    F'1'                                        AH0007000
000108                               90 AH1       DS    18F                                         AH0007100
000150 0000000B                      91 AH16      DC    F'11'                                       AH0007200
000154                               92 AH4       DS    20F                                         AH0007300
0001A4                               93 AH8       DS    500F                                        AH0007400
000974                               94 AH9       DS    F                                           AH0007500
000978 00000004                      95 AH14      DC    F'4'                                        AH0007600
00097C 5C                            96 AH3       DC    C'*'                                        AH0007700
                                     97           END                                               AH0007800
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CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES			7/19/63
AH1	00004	000108	0090	0014	0038	0085	
AH10	00006	000092	0057	0062			
AH11	00004	0000AA	0063	0066			
AH12	00004	000084	0053	0070			
AH13	00006	0000D8	0075	0080			
AH14	00004	000078	0095	0050			
AH15	00004	000104	0089	0063	0064		
AH16	00004	000150	0091	0046			
AH3	00001	00097C	0096	0030			
AH4	00004	000154	0092	0044	0049		
AH5	00004	00003F	0032	0047			
AH6	00006	000034	0030	0035			
AH7	00002	00005A	0042	0031			
AH8	00004	0001A4	0093	0051	0073		
AH9	00004	000974	0094	0048	0069		
NEWD	00001	000000	0010				

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
106 PRINTED LINES

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LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    F01JAN68  7/19/68

                                     1          PRINT NOGEN                                AM0001
                                     2 *                                                   AM0002
                                     3 *     'CODEN' SUBROUTINE,                           AM0003
                                     4 *        BIBLIOGRAPHY SYSTEM,                       AM0004
                                     5 *          SEQUENTIAL DATA,                         AM0005
                                     6 *                                                   AM0006
                                     7 * WRITTEN BY F.D.BLAIR,                             AM0007
                                     8 *          N.R.C. OTTAWA,ONT.                       AM0008
                                     9 *                                                   AM0009
000000                               10 CODEN    CSECT                                     AM0010
                                    11          NRCS  AM1                                  AM0011
000012 0520                         18          BALR  2,0                                  AM0012
000014                              19          USING *,2,3,4                              AM0013
000014 9834 2150           00164    20 AM3      LM    3,4,AM2                              AM0014
000018 5851 0000           00000    21          L     5,0(1)                               AM0015
00001C 5885 0014           00014    22          L     8,20(5)                              AM0016
000020 5980 2930           00944    23          C     8,AM21                               AM0017
000024 4780 20FA           0010E    24          BE    AM19                                 AM0018
000028 5885 0000           00000    25          L     8,0(5)                               AM0019
00002C D203 5010 2930 00010 00944    26          MVC   16(4,5),AM21                         AM0020
000032 D503 8000 294C 00000 00960    27          CLC   0(4,8),AM4                           AM0021
000038 4770 2044           00058    28          BNE   AM7                                  AM0022
00003C 4180 294C           00960    29          LA    8,AM4                                AM0023
000040 5085 0004           00004    30          ST    8,4(5)                               AM0024
000044 4180 0004           00004    31          LA    8,4                                  AM0025
000048 5085 0008           00008    32          ST    8,8(5)                               AM0026
00004C 4180 0002           00002    33          LA    8,2                                  AM0027
000050 5085 000C           0000C    34          ST    8,12(5)                              AM0028
000054 47F0 20EE           00102    35          B     AM18                                 AM0029
000058 D505 8000 2950 00000 00964    36 AM7      CLC   0(6,8),AM5                           AM0030
00005E 4770 206A           0007E    37          BNE   AM8                                  AM0031
000062 4180 2950           00964    38          LA    8,AM5                                AM0032
000066 5085 0004           00004    39          ST    8,4(5)                               AM0033
00006A 4180 0006           00006    40          LA    8,6                                  AM0034
00006E 5085 0008           00008    41          ST    8,8(5)                               AM0035
000072 4180 0003           00003    42          LA    8,3                                  AM0036
000076 5085 000C           0000C    43          ST    8,12(5)                              AM0037
00007A 47F0 20EE           00102    44          B     AM18                                 AM0038
00007E D505 8000 2956 00000 0096A    45 AM8      CLC   0(6,8),AM6                           AM0039
000084 4770 2090           000A4    46          BNE   AM15                                 AM0040
000088 4180 2956           0096A    47          LA    8,AM6                                AM0041
00008C 5085 0004           00004    48          ST    8,4(5)                               AM0042
000090 4180 0006           00006    49          LA    8,6                                  AM0043
000094 5085 0008           00008    50          ST    8,8(5)                               AM0044
000098 4180 0004           00004    51          LA    8,4                                  AM0045
00009C 5085 000C           0000C    52          ST    8,12(5)                              AM0046
0000A0 47F0 20EE           00102    53          B     AM18                                 AM0047
0000A4 4160 295C           00970    54 AM15     LA    6,AM9                                AM0048
0000A8 1B77                         55          SR    7,7                                  AM0049
0000AA D505 6000 8000 00000 00000    56 AM16     CLC   0(6,6),0(8)                          AM0050
0000B0 4780 20D2           000E6    57          BE    AM17                                 AM0051
0000B4 4166 0006           00006    58          LA    6,6(6)                               AM0052
0000B8 4177 0001           00001    59          LA    7,1(7)                               AM0053
0000BC 5970 292C           00940    60          C     7,AM14                               AM0054
0000C0 4740 2096           000AA    61          BL    AM16                                 AM0055
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                      F01JAN68    7/19/68

0000C4 5885 0000             00000    62             L     8,0(5)                                           AM005600
0000C8 5085 0004             00004    63             ST    8,4(5)                                           AM005700
0000CC 4180 0010             00010    64             LA    8,16                                             AM005800
0000D0 5085 0008             00008    65             ST    8,8(5)                                           AM005900
0000D4 1B88                           66             SR    8,8                                              AM006000
0000D6 5085 000C             0000C    67             ST    8,12(5)                                          AM006100
0000DA 4180 0001             00001    68             LA    8,1                                              AM006200
0000DE 5085 0010             00010    69             ST    8,16(5)                                          AM006300
0000E2 47F0 20EE             00102    70             B     AM18                                             AM006400
0000E6 B970 0002             00002    71 AM17        SLL   7,2                                              AM006500
0000EA 5887 2158             0016C    72             L     8,AM10(7)                                        AM006600
0000EE 5085 0004             00004    73             ST    8,4(5)                                           AM006700
0000F2 5887 2540             00554    74             L     8,AM11(7)                                        AM006800
0000F6 5085 0008             00008    75             ST    8,8(5)                                           AM006900
0000FA 4180 0001             00001    76             LA    8,1                                              AM007000
0000FE 5085 000C             0000C    77             ST    8,12(5)                                          AM007100
                                      78 AM18        NRCR  AM1                                              AM007200
00010E 986B 2934             00948    84 AM19        LM    6,11,AM20                                        AM007300
000112 906B 5000             00000    85             STM   6,11,0(5)                                        AM007400
000116 47F0 20EE             00102    86             B     AM18                                             AM007500
00011C                                87 AM1         DS    18F                                              AM007600
000164 00001014                       88 AM2         DC    A(AM3+4096)                                      AM007700
000168 00002014                       89             DC    A(AM3+8192)                                      AM007800
00016C                                90 AM10        DS    250F                                             AM007900
000554                                91 AM11        DS    250F                                             AM008000
00093C 000000CD                       92 AM13        DC    F'205'                                           AM008100
000940                                93 AM14        DS    F                                                AM008200
000944 00000000                       94 AM21        DC    F'0'                                             AM008300
000948 00000970                       95 AM20        DC    A(AM9)                                           AM008400
00094C 0000016C                       96             DC    A(AM10)                                          AM008500
000950 00000554                       97             DC    A(AM11)                                          AM008600
000954 00000E3E                       98             DC    A(AM12)                                          AM008700
000958 0000093C                       99             DC    A(AM13)                                          AM008800
00095C 00000940                      100             DC    A(AM14)                                          AM008900
000960 C2D6D6D2                      101 AM4         DC    C'BOOK'                                          AM009000
000964 D9C5D7D6D9E3                  102 AM5         DC    C'REPORT'                                        AM009100
00096A E3C8C5E2C9E2                  103 AM6         DC    C'THESIS'                                        AM009200
000970                               104 AM9         DS    205CL6                                           AM009300
000E3E                               105 AM12        DS    205CL50                                          AM009400
                                     106             END                                                    AM009500
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CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES					7/19/68
AM1	00004	00011C	0087	0014	0080				
AM10	00004	00016C	0090	0072	0096				
AM11	00004	000554	0091	0074	0097				
AM12	00050	000E3E	0105	0098					
AM13	00004	00093C	0092	0099					
AM14	00004	000940	0093	0060	0100				
AM15	00004	0000A4	0054	0046					
AM16	00006	0000AA	0056	0061					
AM17	00004	0000E6	0071	0057					
AM18	00002	000102	0079	0035	0044	0053	0070	0086	
AM19	00004	00010E	0084	0024					
AM2	00004	000164	0088	0020					
AM20	00004	000948	0095	0084					
AM21	00004	000944	0094	0023	0026				
AM3	00004	000014	0020	0088	0089				
AM4	00004	000960	0101	0027	0029				
AM5	00006	000964	0102	0036	0038				
AM6	00006	00096A	0103	0045	0047				
AM7	00006	000058	0036	0028					
AM8	00006	00007E	0045	0037					
AM9	00006	000970	0104	0054	0095				
CODEN	00001	000000	0010						

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
139 PRINTED LINES

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                                        1          PRINT NOGEN                                    AN000100
                                        2 *                                                       AN000200
                                        3 * 'ETB'    FORMAT SUBROUTINE,                           AN000300
                                        4 *        BIBLIOGRAPHY SYSTEM,                           AN000400
                                        5 *          SEQUENTIAL DATA,                             AN000500
                                        6 *                                                       AN000600
                                        7 * WRITTEN BY F.D.BLAIR,                                 AN000700
                                        8 *            N.R.C. OTTAWA,ONT.                         AN000800
                                        9 *                                                       AN000900
C00000                                 10 ETB      CSECT                                          AN001000
                                       11          NRCS  AN1                                      AN001100
000012 0520                            18          BALR  2,0                                      AN001200
000014                                 19          USING *,2,3                                    AN001300
000014 5830 28C8          008DC        20 AN2      L     3,AN3                                    AN001400
000018 5841 0000          00000        21          L     4,0(1)                                   AN001500
00001C 5854 0000          00000        22          L     5,0(4)                                   AN001600
000020 5864 0004          00004        23          L     6,4(4)                                   AN001700
000024 4155 0C50          00050        24          LA    5,80(5)                                  AN001800
000028 5B60 291C          00930        25          S     6,AN71                                   AN001900
00002C 1B77                            26          SR    7,7                                      AN002000
00002E 4180 28CC          008E0        27          LA    8,AN4                                    AN002100
000032 96F0 275D    00771              28          OI    AN42+1,X'F0'                             AN002200
000036 955C 5000    00000              29 AN6      CLI   0(5),C'*'                                AN002300
00003A 4780 204E          00062        30          BE    AN72                                     AN002400
00003E 5B60 2920          00934        31 AN7      S     6,AN73                                   AN002500
000042 4155 0001          00001        32          LA    5,1(5)                                   AN002600
000046 5960 2930          00944        33          C     6,AN77                                   AN002700
00004A 4720 2022          00036        34          BH    AN6                                      AN002800
00004E D203 4010 2920 00010 00934       35          MVC   16(4,4),AN73                             AN002900
                                       36          NRCR  AN1,1                                    AN003000
000062 5058 0000          00000        42 AN72     ST    5,0(8)                                   AN003100
000066 4188 0004          00004        43          LA    8,4(8)                                   AN003200
00006A 4177 0001          00001        44          LA    7,1(7)                                   AN003300
00006E 5970 2934          00948        45          C     7,AN78                                   AN003400
000072 4740 202A          0003E        46          BL    AN7                                      AN003500
                                       47          PROP  AN8,2840,X'40'                           AN003600
0000C2 4150 294E          00962        61          LA    5,AN8                                    AN003700
0000C6 5054 0008          00008        62          ST    5,8(4)                                   AN003800
0000CA 1B66                            63          SR    6,6                                      AN003900
0000CC 58A4 0018          00018        64          L     10,24(4)                                 AN004000
0000D0 59A0 2920          00934        65          C     10,AN73                                  AN004100
0000D4 4780 20DC          000F0        66          BE    AN79                                     AN004200
0000D8 D203 28FC 2938 00910 0094C       67          MVC   AN12(4),AN80                             AN004300
0000DE D203 2900 2924 00914 00938       68          MVC   AN17(4),AN74                             AN004400
0000E4 41A0 0037          00037        69          LA    10,55                                    AN004500
0000E8 50A4 0014          00014        70          ST    10,20(4)                                 AN004600
0000EC 47F0 20F0          00104        71          B     AN9                                      AN004700
0C00F0 D203 28FC 2940 00910 00954       72 AN79     MVC   AN12(4),AN82                             AN004800
0000F6 D203 2900 2920 00914 00934       73          MVC   AN17(4),AN73                             AN004900
0000FC 41A0 0C37          00037        74          LA    10,55                                    AN005000
C00100 5CA4 0014          00014        75          ST    10,20(4)                                 AN005100
000104 41A0 0047          00047        76 AN9      LA    10,71                                    AN005200
0001C8 1895                            77          LR    9,5                                      AN005300
00010A 5870 28D0          008E4        78          L     7,AN4+4                                  AN005400
00010E 5B70 28CC          008E0        79          S     7,AN4                                    AN005500
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   LCC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                    F01JAN68  7/18/68

000112 5B70 2920           00934    80          S    7,AN73                          AN005600
000116 5880 28CC           008E0    81          L    8,AN4                           AN005700
00011A 5A80 2920           00934    82          A    8,AN73                          AN005800
00011E 9540 8000    00000          83 AN13     CLI  0(8),X'40'                      AN005900
000122 4770 2126           0013A    84          BNE  AN14                            AN006000
000126 4188 0001           00001    85          LA   8,1(8)                          AN006100
00012A 5B70 2920           00934    86          S    7,AN73                          AN006200
00012E 5970 2930           00944    87          C    7,AN77                          AN006300
000132 4720 210A           0011E    88          BH   AN13                            AN006400
000136 47F0 215E           00172    89          B    AN27                            AN006500
00013A 5970 2930           00944    90 AN14     C    7,AN77                          AN006600
00013E 47D0 215E           00172    91          BNH  AN27                            AN006700
000142 47F0 277C           00790    92          B    AN107                           AN006800
000146 197A                         93 AN105    CR   7,10                           AN006900
000148 47D0 2140           00154    94          BNH  AN10                            AN007000
00014C 41F0 2152           00166    95          LA   15,AN15                         AN007100
000150 47F0 26B0           006C4    96          B    AN16                            AN007200
000154 5B70 2920           00934    97 AN10     S    7,AN73                          AN007300
000158 4470 2948           0095C    98          EX   7,AN11                          AN007400
00015C 4177 0001           00001    99          LA   7,1(7)                          AN007500
000160 1BA7                        100          SR   10,7                            AN007600
000162 1A87                        101          AR   8,7                             AN007700
000164 1A97                        102          AR   9,7                             AN007800
000166 926B 9000    00000         103 AN15     MVI  0(9),C','                       AN007900
00016A 5BA0 2924           00938   104          S    10,AN74                         AN008000
00016E 4199 0002           00002   105          LA   9,2(9)                          AN008100
000172 59A0 2930           00944   106 AN27     C    10,AN77                         AN008200
000176 4720 216A           0017E   107          BH   AN26                            AN008300
00017A 45F0 275C           00770   108          BAL  15,AN42                         AN008400
00017E 5870 28D4           008E8   109 AN26     L    7,AN4+8                         AN008500
000182 5B70 28D0           008E4   110          S    7,AN4+4                         AN008600
000186 5B70 2920           00934   111          S    7,AN73                          AN008700
00018A 5880 28D0           008E4   112          L    8,AN4+4                         AN008800
00018E 5A80 2920           00934   113          A    8,AN73                          AN008900
000192 5970 2930           00944   114 AN67     C    7,AN77                          AN009000
000196 47D0 21EA           001FE   115          BNH  AN28                            AN009100
00019A 9540 8000    00000         116          CLI  0(8),X'40'                      AN009200
00019E 4770 219A           001AE   117          BNE  AN68                            AN009300
0001A2 5B70 2920           00934   118          S    7,AN73                          AN009400
0001A6 4188 0001           00001   119          LA   8,1(8)                          AN009500
0001AA 47F0 217E           00192   120          B    AN67                            AN009600
0001AE 197A                        121 AN68     CR   7,10                           AN009700
0001BC 47D0 21A8           001BC   122          BNH  AN29                            AN009800
0001B4 41F0 21BA           001CE   123          LA   15,AN69                         AN009900
0001B8 47F0 2680           006C4   124          B    AN16                            AN010000
0001BC 5B70 2920           00934   125 AN29     S    7,AN73                          AN010100
0001C0 4470 2948           0095C   126          EX   7,AN11                          AN010200
0001C4 4177 0001           00001   127          LA   7,1(7)                          AN010300
0001C8 1A87                        128          AR   8,7                             AN010400
0001CA 1BA7                        129          SR   10,7                            AN010500
0001CC 1A97                        130          AR   9,7                             AN010600
0001CE 1879                        131 AN69     LR   7,9                             AN010700
0001D0 9540 7000    00000         132 AN220    CLI  0(7),X'40'                      AN010800
0001D4 4770 21CC           001E0   133          BNE  AN123                           AN010900
0001D8 5B70 2920           00934   134          S    7,AN73                          AN011000
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0001DC 47F0 21BC              001D0   135          B     AN220                    AN011100
0001E0 954B 7000      00000           136 AN123    CLI   0(7),C'.'                AN011200
0001E4 4770 21DA              001EE   137          BNE   AN121                    AN011300
0001E8 1897                           138          LR    9,7                      AN011400
0001EA 47F0 21DE              001F2   139          B     AN122                    AN011500
0001EE 4197 0001              00001   140 AN121    LA    9,1(7)                   AN011600
0001F2 924B 9000      00000           141 AN122    MVI   0(9),C'.'                AN011700
0001F6 4199 0002              00002   142          LA    9,2(9)                   AN011800
0001FA 5BA0 2924              00938   143          S     10,AN74                  AN011900
0001FE 59A0 2930              00944   144 AN28     C     10,AN77                  AN012000
000202 4720 21F6              0020A   145          BH    AN31                     AN012100
000206 45F0 275C              00770   146          BAL   15,AN42                  AN012200
00020A 58F4 0000              00000   147 AN31     L     15,0(4)                  AN012300
00020E 41FF 0008              00008   148          LA    15,8(15)                 AN012400
000212 50F0 2904              00918   149          ST    15,AN30                  AN012500
000216 D203 2918 2934 0092C   00948   150          MVC   AN30+20(4),AN78          AN012600
                                      151          CALL  CODEN,(AN30)             AN012700
000232 58F0 2910              00924   163          L     15,AN30+12               AN012800
000236 59F0 2920              00934   164          C     15,AN73                  AN012900
00023A 47D0 234E              00362   165          BNH   AN84                     AN013000
00023E 59F0 292C              00940   166          C     15,AN76                  AN013100
000242 4770 22AA              002BE   167          BNE   AN45                     AN013200
000246 5870 290C              00920   168          L     7,AN30+8                 AN013300
00024A 5880 2908              0091C   169          L     8,AN30+4                 AN013400
00024E 197A                           170          CR    7,10                     AN013500
000250 47D0 2244              00258   171          BNH   AN43                     AN013600
000254 45F0 275C              00770   172          BAL   15,AN42                  AN013700
000258 5870 2920              00934   173 AN43     S     7,AN73                   AN013800
00025C 4470 2948              0095C   174          EX    7,AN11                   AN013900
000260 4177 0001              00001   175          LA    7,1(7)                   AN014000
000264 1A97                           176          AR    9,7                      AN014100
000266 5A90 2920              00934   177          A     9,AN73                   AN014200
00026A 1BA7                           178          SR    10,7                     AN014300
00026C 5BA0 2920              00934   179          S     10,AN73                  AN014400
000270 924B 9000      00000           180          MVI   0(9),C'.'                AN014500
000274 4199 0002              00002   181          LA    9,2(9)                   AN014600
000278 58A0 2924              00938   182          S     10,AN74                  AN014700
00027C 5870 28EC              00900   183 AN46     L     7,AN4+32                 AN014800
000280 5B70 28E8              008FC   184          S     7,AN4+28                 AN014900
000284 5870 2920              00934   185          S     7,AN73                   AN015000
000288 5880 28E8              008FC   186          L     8,AN4+28                 AN015100
00028C 4188 0001              00001   187          LA    8,1(8)                   AN015200
000290 5970 2930              00944   188          C     7,AN77                   AN015300
000294 47D0 2446              0045A   189          BNH   AN40                     AN015400
000298 197A                           190          CR    7,10                     AN015500
00029A 47D0 2296              002AA   191          BNH   AN44                     AN015600
00029E 45F0 26B0              006C4   192          BAL   15,AN16                  AN015700
0002A2 4177 0001              00001   193          LA    7,1(7)                   AN015800
0002A6 47F0 2446              0045A   194          B     AN40                     AN015900
0002AA 5B70 2920              00934   195 AN44     S     7,AN73                   AN016000
0002AE 4470 2948              0095C   196          EX    7,AN11                   AN016100
0002B2 4177 0002              00002   197          LA    7,2(7)                   AN016200
0002B6 1BA7                           198          SR    10,7                     AN016300
0002B8 1A97                           199          AR    9,7                      AN016400
0002BA 47F0 2446              0045A   200          B     AN40                     AN016500
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0002BE 59F0 2924          00938   201 AN45     C     15,AN74                  AN016600
0002C2 4770 22FC          00310   202          BNE   AN48                     AN016700
0002C6 5870 28E8          008FC   203          L     7,AN4+28                 AN016800
0002CA 5B7C 28E4          008F8   204          S     7,AN4+24                 AN016900
0002CE 5B70 2920          00934   205          S     7,AN73                   AN017000
0002D2 5880 28E4          008F8   206          L     8,AN4+24                 AN017100
0002D6 4188 0001          000C1   207          LA    8,1(8)                   AN017200
0002DA 5970 2930          00944   208          C     7,AN77                   AN017300
0002DE 47D0 2268          0027C   209          BNH   AN46                     AN017400
0002E2 197A                       210          CR    7,10                     AN017500
0002E4 47D0 22DC          002F0   211          BNH   AN47                     AN017600
0002E8 41F0 22EC          00300   212          LA    15,AN70                  AN017700
0002EC 47F0 26B0          006C4   213          B     AN16                     AN017800
0002F0 5B70 2920          00934   214 AN47     S     7,AN73                   AN017900
0002F4 4470 2948          0095C   215          EX    7,AN11                   AN018000
0002F8 4177 0001          00001   216          LA    7,1(7)                   AN018100
0002FC 1BA7                       217          SR    10,7                     AN018200
0002FE 1A97                       218          AR    9,7                      AN018300
000300 925F 9000    00000         219 AN70     MVI   0(9),C' '                AN018400
000304 4199 0002          00002   220          LA    9,2(9)                   AN018500
000308 5BA0 2924          00938   221          S     10,AN74                  AN018600
00030C 47F0 2268          0027C   222          B     AN46                     AN018700
000310 59F0 2928          0093C   223 AN48     C     15,AN75                  AN018800
000314 4770 2446          0045A   224          BNE   AN40                     AN018900
000318 5870 28F4          00908   225          L     7,AN4+40                 AN019000
00031C 5B70 28F0          00904   226          S     7,AN4+36                 AN019100
000320 5B70 2920          00934   227          S     7,AN73                   AN019200
000324 5880 28F0          00904   228          L     8,AN4+36                 AN019300
000328 4188 0001          00001   229          LA    8,1(8)                   AN019400
00032C 5970 2930          00944   230          C     7,AN77                   AN019500
000330 47D0 2446          0045A   231          BNH   AN40                     AN019600
000334 197A                       232          CR    7,10                     AN019700
000336 47D0 232E          00342   233          BNH   AN50                     AN019800
00033A 41F0 233E          00352   234          LA    15,AN49                  AN019900
00033E 47F0 26B0          006C4   235          B     AN16                     AN020000
000342 5B70 2920          00934   236 AN50     S     7,AN73                   AN020100
000346 4470 2948          0095C   237          EX    7,AN11                   AN020200
00034A 4177 0001          00001   238          LA    7,1(7)                   AN020300
00034E 1BA7                       239          SR    10,7                     AN020400
000350 1A97                       240          AR    9,7                      AN020500
000352 9268 9000    00000         241 AN49     MVI   0(9),C','                AN020600
000356 4199 0002          00002   242          LA    9,2(9)                   AN020700
00035A 5BA0 2924          00938   243          S     10,AN74                  AN020800
00035E 47F0 2446          0045A   244          B     AN40                     AN020900
000362 5870 290C          00920   245 AN84     L     7,AN30+8                 AN021000
000366 5880 2908          0091C   246          L     8,AN30+4                 AN021100
00036A 197A                       247          CR    7,10                     AN021200
00036C 47D0 2364          00378   248          BNH   AN41                     AN021300
000370 41F0 2374          00388   249          LA    15,AN32                  AN021400
000374 47F0 26B0          006C4   250          B     AN16                     AN021500
000378 5B70 2920          00934   251 AN41     S     7,AN73                   AN021600
00037C 4470 2948          0095C   252          EX    7,AN11                   AN021700
000380 4177 0001          00001   253          LA    7,1(7)                   AN021800
000384 1BA7                       254          SR    10,7                     AN021900
000386 1A97                       255          AR    9,7                      AN022000
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 LCC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    AN022100
000388 59A0 2930            00944   256 AN32     C     10,AN77                                 AN022100
00038C 4720 2380            00394   257          BH    AN33                                    AN022200
000390 45F0 275C            00770   258          BAL   15,AN42                                 AN022300
000394 5874 0000            00000   259 AN33     L     7,0(4)                                  AN022400
000398 4177 000F            0000F   260          LA    7,15(7)                                 AN022500
00039C D203 3466 7000 0147A 00000   261          MVC   AN34(4),0(7)                            AN022600
0003A2 926B 346A      0147E         262          MVI   AN34+4,C','                             AN022700
0003A6 4170 0005            00005   263          LA    7,5                                     AN022800
0003AA 4180 3466            0147A   264          LA    8,AN34                                  AN022900
0003AE 4199 0001            00001   265          LA    9,1(9)                                  AN023000
0003B2 5BA0 2920            00934   266          S     10,AN73                                 AN023100
0003B6 95F0 8000      00000         267 AN35     CLI   0(8),C'0'                               AN023200
0003BA 4770 23B6            003CA   268          BNE   AN85                                    AN023300
0003BE 5B70 2920            00934   269          S     7,AN73                                  AN023400
0003C2 4188 0001            00001   270          LA    8,1(8)                                  AN023500
0003C6 47F0 23A2            003B6   271          B     AN35                                    AN023600
0003CA 197A                         272 AN85     CR    7,10                                    AN023700
0003CC 47D0 23C0            003D4   273          BNH   AN37                                    AN023800
0003D0 45F0 275C            00770   274          BAL   15,AN42                                 AN023900
0003D4 5970 2930            00944   275 AN37     C     7,AN77                                  AN024000
0003D8 47D0 23D8            003EC   276          BNH   AN36                                    AN024100
0003DC 5B70 2920            00934   277          S     7,AN73                                  AN024200
0003E0 4470 2948            0095C   278          EX    7,AN11                                  AN024300
0003E4 4177 0001            00001   279          LA    7,1(7)                                  AN024400
0003E8 1A97                         280          AR    9,7                                     AN024500
0003EA 1BA7                         281          SR    10,7                                    AN024600
0003EC 4199 0002            00002   282 AN36     LA    9,2(9)                                  AN024700
0003F0 5BA0 2924            00938   283          S     10,AN74                                 AN024800
0003F4 5870 28D8            008EC   284          L     7,AN4+12                                AN024900
0003F8 5B70 28D4            008E8   285          S     7,AN4+8                                 AN025000
0003FC 5B70 2920            00934   286          S     7,AN73                                  AN025100
000400 5880 28D4            008E8   287          L     8,AN4+8                                 AN025200
000404 4188 0001            00001   288          LA    8,1(8)                                  AN025300
000408 5970 2930            00944   289          C     7,AN77                                  AN025400
00040C 4720 2424            00438   290          BH    AN39                                    AN025500
000410 5884 0000            00000   291          L     8,0(4)                                  AN025600
000414 4188 0014            00014   292          LA    8,20(8)                                 AN025700
000418 4170 0004            00004   293          LA    7,4                                     AN025800
00041C 95F0 8000      00000         294 AN38     CLI   0(8),C'0'                               AN025900
000420 4770 241C            00430   295          BNE   AN86                                    AN026000
000424 5B70 2920            00934   296          S     7,AN73                                  AN026100
000428 4188 0001            00001   297          LA    8,1(8)                                  AN026200
00042C 47F0 240B            0041C   298          B     AN38                                    AN026300
000430 5970 2930            00944   299 AN86     C     7,AN77                                  AN026400
000434 47D0 2446            0045A   300          BNH   AN40                                    AN026500
000438 197A                         301 AN39     CR    7,10                                    AN026600
00043A 47D0 242E            00442   302          BNH   AN120                                   AN026700
00043E 45F0 275C            00770   303          BAL   15,AN42                                 AN026800
000442 5B70 2920            00934   304 AN120    S     7,AN73                                  AN026900
000446 4470 2948            0095C   305          EX    7,AN11                                  AN027000
00044A 4177 0001            00001   306          LA    7,1(7)                                  AN027100
00044E 1BA7                         307          SR    10,7                                    AN027200
000450 1A97                         308          AR    9,7                                     AN027300
000452 5BA0 2920            00934   309          S     10,AN73                                 AN027400
000456 4199 0001            00001   310          LA    9,1(9)                                  AN027500
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00045A 5870 28DC        008F0   311 AN40     L     7,AN4+16                  AN027600
00045E 5870 28D8        008EC   312          S     7,AN4+12                  AN027700
000462 5870 2920        00934   313          S     7,AN73                    AN027800
000466 5880 28D8        008EC   314          L     8,AN4+12                  AN027900
00046A 4188 0001        00001   315          LA    8,1(8)                    AN028000
00046E 5970 2930        00944   316          C     7,AN77                    AN028100
000472 47DC 24B2        004C6   317          BNH   AN54                      AN028200
000476 41F7 0002        00002   318 AN51     LA    15,2(7)                   AN028300
00047A 19FA                     319          CR    15,10                     AN028400
00047C 47D0 248A        0049E   320          BNH   AN52                      AN028500
000480 45F0 275C        00770   321          BAL   15,AN42                   AN028600
000484 924D 9000  00000         322          MVI   0(9),C'('                 AN028700
000488 4199 0001        00001   323          LA    9,1(9)                    AN028800
00048C 5BA0 2920        00934   324          S     10,AN73                   AN028900
000490 41F0 24A6        004BA   325          LA    15,AN53                   AN029000
000494 197A                     326          CR    7,10                      AN029100
000496 47D0 2496        004AA   327          BNH   AN55                      AN029200
00049A 47F0 26B0        006C4   328          B     AN16                      AN029300
00049E 924D 9000  00000         329 AN52     MVI   0(9),C'('                 AN029400
0004A2 4199 0001        00001   330          LA    9,1(9)                    AN029500
0004A6 5BA0 2920        00934   331          S     10,AN73                   AN029600
0004AA 5B70 2920        00934   332 AN55     S     7,AN73                    AN029700
0004AE 4470 2948        0095C   333          EX    7,AN11                    AN029800
0004B2 4177 0001        00001   334          LA    7,1(7)                    AN029900
0004B6 1A97                     335          AR    9,7                       AN030000
0004B8 1BA7                     336          SR    10,7                      AN030100
0004BA 925D 9000  00000         337 AN53     MVI   0(9),C')'                 AN030200
0004BE 4199 0002        00002   338          LA    9,2(9)                    AN030300
0004C2 5BA0 2924        00938   339          S     10,AN74                   AN030400
0004C6 5870 28E0        008F4   340 AN54     L     7,AN4+20                  AN030500
0004CA 5B70 28DC        008F0   341          S     7,AN4+16                  AN030600
0004CE 5B70 2920        00934   342          S     7,AN73                    AN030700
0004D2 5880 28DC        008F0   343          L     8,AN4+16                  AN030800
0004D6 4188 0001        00001   344          LA    8,1(8)                    AN030900
0004DA 5970 2930        00944   345          C     7,AN77                    AN031000
0004DE 47D0 252A        0053E   346          BNH   AN59                      AN031100
0004E2 41F7 0003        00003   347          LA    15,3(7)                   AN031200
0004E6 19FA                     348          CR    15,10                     AN031300
0004E8 47DC 24F6        0050A   349          BNH   AN57                      AN031400
0004EC 45F0 275C        00770   350          BAL   15,AN42                   AN031500
0004FC 924D 9000  00000         351          MVI   0(9),C'('                 AN031600
0004F4 4199 0001        00001   352          LA    9,1(9)                    AN031700
0004F8 5BA0 2920        00934   353          S     10,AN73                   AN031800
0004FC 41F0 2512        00526   354          LA    15,AN56                   AN031900
000500 197A                     355          CR    7,10                      AN032000
000502 47D0 25C2        00516   356          BNH   AN58                      AN032100
000506 47F0 26B0        006C4   357          B     AN16                      AN032200
00050A 924D 9000  00000         358 AN57     MVI   0(9),C'('                 AN032300
00050E 4199 0001        00001   359          LA    9,1(9)                    AN032400
000512 5BA0 2920        00934   360          S     10,AN73                   AN032500
000516 5B70 2920        00934   361 AN58     S     7,AN73                    AN032600
00051A 4470 2948        0095C   362          EX    7,AN11                    AN032700
00051E 4177 0001        00001   363          LA    7,1(7)                    AN032800
000522 1A97                     364          AR    9,7                       AN032900
000524 1BA7                     365          SR    10,7                      AN033000
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000526 9250 9000        00000           366 AN56     MVI   0(9),C')'                    AN033100
00052A 4199 0001                00001   367          LA    9,1(9)                       AN033200
00052E 5BA0 2920                00934   368          S     10,AN73                      AN033300
000532 9248 9000        00000           369          MVI   0(9),C'.'                    AN033400
000536 4199 0001                00001   370          LA    9,1(9)                       AN033500
00053A 5BA0 2924                00938   371          S     10,AN74                      AN033600
00053E 5870 28F0                00904   372 AN59     L     7,AN4+36                     AN033700
000542 5B70 28EC                00900   373          S     7,AN4+32                     AN033800
000546 5B70 2920                00934   374          S     7,AN73                       AN033900
00054A 58B0 28EC                00900   375          L     8,AN4+32                     AN034000
00054E 4188 0001                00001   376          LA    8,1(8)                       AN034100
000552 5970 2930                00944   377          C     7,AN77                       AN034200
000556 47DC 2598                005AC   378          BNH   AN63                         AN034300
00055A 41F7 0003                00003   379          LA    15,3(7)                      AN034400
00055E 19FA                             380          CR    15,10                        AN034500
000560 47D0 256E                00582   381          BNH   AN61                         AN034600
000564 45F0 275C                00770   382          BAL   15,AN42                      AN034700
000568 924D 9000        00000           383          MVI   0(9),C'('                    AN034800
00056C 4199 0001                00001   384          LA    9,1(9)                       AN034900
000570 5BA0 2920                00934   385          S     10,AN73                      AN035000
000574 41F0 258A                0059E   386          LA    15,AN60                      AN035100
000578 197A                             387          CR    7,10                         AN035200
00057A 47D0 257A                0058E   388          BNH   AN62                         AN035300
00057E 47F0 26B0                006C4   389          B     AN16                         AN035400
000582 924D 9000        00000           390 AN61     MVI   0(9),C'('                    AN035500
000586 4199 0001                00001   391          LA    9,1(9)                       AN035600
00058A 5BA0 2920                00934   392          S     10,AN73                      AN035700
00058E 5B70 2920                00934   393 AN62     S     7,AN73                       AN035800
000592 4470 2948                0095C   394          EX    7,AN11                       AN035900
000596 4177 0001                00001   395          LA    7,1(7)                       AN036000
00059A 1A97                             396          AR    9,7                          AN036100
00059C 1BA7                             397          SR    10,7                         AN036200
00059E D201 9000 346C   00000   01480   398 AN60     MVC   0(2,9),AN87                  AN036300
0005A4 4199 0003                00003   399          LA    9,3(9)                       AN036400
0005A8 5BA0 2928                0093C   400          S     10,AN75                      AN036500
0005AC 5870 28E4                00BF8   401 AN63     L     7,AN4+24                     AN036600
0005B0 5B7C 28E0                008F4   402          S     7,AN4+20                     AN036700
0005B4 5B7C 2920                00934   403          S     7,AN73                       AN036800
0005B8 58B0 28E0                008F4   404          L     8,AN4+20                     AN036900
0005BC 4188 0001                00001   405          LA    8,1(8)                       AN037000
0005C0 5970 2930                00944   406          C     7,AN77                       AN037100
0005C4 47D0 2696                006AA   407          BNH   AN66                         AN037200
0005C8 909A 25FC                0061C   408          STM   9,10,AN310                   AN037300
0005CC 41A0 347C                01490   409          LA    10,AN92                      AN037400
0005D0 1B99                             410          SR    9,9                          AN037500
                                        411          PROP  AN92,200,X'40'               AN037600
0005D2 D5C1 8000 2604   00000   00618   414 AN119    CLC   0(2,8),AN311                 AN037700
0005E2 4770 2610                00D24   415          BNE   AN115                        AN037800
0005E6 D203 A000 2606   000C0   0061A   416          MVC   0(4,10),AN112                AN037900
0005EC 41AA 0004                00C04   417 AN116    LA    10,4(10)                     AN038000
0005F0 4199 0004                00004   418          LA    9,4(9)                       AN038100
0005F4 5B70 2924                00938   419          S     7,AN74                       AN038200
0005F8 4188 0002                00002   420          LA    8,2(8)                       AN038300
0005FC 9540 8000        00000           421          CLI   0(8),X'40'                   AN038400
000600 4780 263A                0064E   422          BE    AN118                        AN038500
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000604 41AA 0001              00001   423          LA    10,1(10)                    AN038600
000608 4199 0001              00001   424          LA    9,1(9)                      AN038700
00060C 47F0 263A              0064E   425          B     AN118                       AN038800
000610                                426 AN310    DS    2F                          AN038900
000618 C3C1                           427 AN311    DC    C'CA'                       AN039000
00061A C34BC14B                       428 AN112    DC    C'C.A.'                     AN039100
00061E D7C1                           429 AN113    DC    C'PA'                       AN039200
000620 D74BC14B                       430 AN114    DC    C'P.A.'                     AN039300
000624 D501 8000 260A 00000 0061E     431 AN115    CLC   0(2,8),AN113                AN039400
00062A 4770 2624              00638   432          BNE   AN117                       AN039500
00062E D203 A000 260C 00000 00620     433          MVC   0(4,10),AN114               AN039600
000634 47F0 25D8              005EC   434          B     AN116                       AN039700
000638 D200 A000 8000 00000 00000     435 AN117    MVC   0(1,10),0(8)                AN039800
00063E 41E8 0001              00001   436          LA    8,1(8)                      AN039900
000642 5B70 2920              00934   437          S     7,AN73                      AN040000
000646 41AA 0001              00001   438          LA    10,1(10)                    AN040100
00064A 4199 0001              00001   439          LA    9,1(9)                      AN040200
00064E 5970 2930              00944   440 AN118    C     7,AN77                      AN040300
000652 4720 25C8              005DC   441          BH    AN119                       AN040400
000656 1879                           442          LR    7,9                         AN040500
000658 41E0 347C              01490   443          LA    8,AN92                      AN040600
00065C 989A 25FC              00610   444          LM    9,10,AN310                  AN040700
000660 41F7 0003              00003   445          LA    15,3(7)                     AN040800
000664 19FA                           446          CR    15,10                       AN040900
000666 47D0 2674              00688   447          BNH   AN88                        AN041000
00066A 45F0 275C              00770   448          BAL   15,AN42                     AN041100
00066E 924D 9000       00000          449          MVI   0(9),C'('                   AN041200
000672 4199 0001              00001   450          LA    9,1(9)                      AN041300
000676 5BA0 2920              00934   451          S     10,AN73                     AN041400
00067A 41F0 2690              006A4   452          LA    15,AN64                     AN041500
00067E 197A                           453          CR    7,10                        AN041600
000680 47D0 2680              00694   454          BNH   AN65                        AN041700
000684 47F0 2680              006C4   455          B     AN16                        AN041800
000688 924D 9000       00000          456 AN88     MVI   0(9),C'('                   AN041900
00068C 4199 0001              00001   457          LA    9,1(9)                      AN042000
000690 5BA0 2920              00934   458          S     10,AN73                     AN042100
000694 5B70 2920              00934   459 AN65     S     7,AN73                      AN042200
000698 4470 2948              0095C   460          EX    7,AN11                      AN042300
00069C 4177 0001              00001   461          LA    7,1(7)                      AN042400
0006A0 1A97                           462          AR    9,7                         AN042500
0006A2 1BA7                           463          SR    10,7                        AN042600
0006A4 D201 9000 346C 00000 01480     464 AN64     MVC   0(2,9),AN87                 AN042700
0006AA 4166 0001              00001   465 AN66     LA    6,1(6)                      AN042800
0006AE 5C64 000C              0000C   466          ST    6,12(4)                     AN042900
0006B2 D203 4010 2930 00010 00944     467          MVC   16(4,4),AN77                AN043000
                                      468          NRCR  AN1                         AN043100
0006C4 50F0 28F8              0090C   474 AN16     ST    15,AN20                     AN043200
0006C8 59A0 2930              00944   475          C     10,AN77                     AN043300
0006CC 4720 26C0              006D4   476          BH    AN109                       AN043400
0006D0 45F0 275C              00770   477          BAL   15,AN42                     AN043500
0006D4 197A                           478 AN109    CR    7,10                        AN043600
0006D6 47D0 271C              00730   479          BNH   AN24                        AN043700
0006DA 18F8                           480 AN23     LR    15,8                        AN043800
0006DC 1AFA                           481          AR    15,10                       AN043900
0006DE 5BF0 2920              00934   482          S     15,AN73                     AN044000
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0006E2 18EA                    483          LR    14,10                    AN044100
0006E4 94CF 26FD  00711        484          NI    AN21+1,X'0F'             AN044200
0006E8 9540 F000  00000        485 AN19     CLI   0(15),X'40'               AN044300
0006EC 4780 2734        00748  486          BE    AN89                     AN044400
0006F0 956B F000  00000        487          CLI   0(15),C','               AN044500
0006F4 4780 2734        00748  488          BE    AN89                     AN044600
0006F8 954B F000  00000        489          CLI   0(15),C'.'               AN044700
0006FC 4780 2734        00748  490          BE    AN89                     AN044800
000700 58F0 2920        00934  491          S     15,AN73                  AN044900
000704 58E0 2920        00934  492          S     14,AN73                  AN045000
000708 59E0 2930        00944  493          C     14,AN77                  AN045100
00070C 4720 26D4        006E8  494          BH    AN19                     AN045200
000710 4700 2736        00748  495 AN21     BC    0,AN22                   AN045300
000714 96F0 26FD  00711        496          OI    AN21+1,X'F0'             AN045400
000718 45F0 275C        00770  497          BAL   15,AN42                  AN045500
00071C 197A                    498          CR    7,10                     AN045600
00071E 47DC 271C        00730  499          BNH   AN24                     AN045700
000722 18F8                    500          LR    15,8                     AN045800
000724 1AFA                    501          AR    15,10                    AN045900
000726 58F0 2920        00934  502          S     15,AN73                  AN046000
00072A 18EA                    503          LR    14,10                    AN046100
00072C 47F0 26D4        006E8  504          B     AN19                     AN046200
000730 5870 2920        00934  505 AN24     S     7,AN73                   AN046300
000734 4470 2948        0095C  506          EX    7,AN11                   AN046400
000738 4177 0001        00001  507          LA    7,1(7)                   AN046500
00073C 1BA7                    508          SR    10,7                     AN046600
00073E 1A87                    509          AR    8,7                      AN046700
000740 1A97                    510          AR    9,7                      AN046800
000742 58FC 28F8        00A0C  511 AN25     L     15,AN20                  AN046900
000746 07FF                    512          BR    15                       AN047000
000748 18AE                    513 AN89     LR    10,14                    AN047100
00074A 58A0 2920        00934  514 AN22     S     10,AN73                  AN047200
00074E 44A0 2948        0095C  515          EX    10,AN11                  AN047300
000752 41AA 0001        00001  516          LA    10,1(10)                 AN047400
000756 187A                    517          SR    7,10                     AN047500
000758 1A8A                    518          AR    8,10                     AN047600
00075A 45F0 275C        00770  519          BAL   15,AN42                  AN047700
00075E 197A                    520          CR    7,10                     AN047800
000760 4720 26C6        006DA  521          BH    AN23                     AN047900
000764 5970 2930        00944  522          C     7,AN77                   AN048000
000768 4720 271C        00730  523          BH    AN24                     AN048100
00076C 47F0 272E        00742  524          B     AN25                     AN048200
000770 4700 2770        00784  525 AN42     BC    0,AN110                  AN048300
000774 41A0 0042        00042  526 AN111    LA    10,66                    AN048400
000778 5A60 2900        00914  527          A     6,AN17                   AN048500
00077C 5A50 28FC        00910  528          A     5,AN12                   AN048600
000780 1895                    529          LR    9,5                      AN048700
000782 07FF                    530          BR    15                       AN048800
000784 94CF 275D  00771        531 AN110    NI    AN42+1,X'0F'             AN048900
000788 4155 0005        00005  532          LA    5,5(5)                   AN049000
00078C 47F0 2760        00774  533          B     AN111                    AN049100
000790 909B 3470        01484  534 AN107    STM   9,11,AN90                AN049200
000794 1B99                    535          SR    9,9                      AN049300
000796 18A8                    536          LR    10,8                     AN049400
000798 41B0 347C        01490  537          LA    11,AN92                  AN049500
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   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    F01JAN68   7/18/68

                                      538          PROP  AN92,200,X'40'                    AN049600
000C7A6 96F0 27D7       C07EB         541          OI    AN91+1,X'F0'                      ANC49700
000C7AA 96F0 286D       00881         542          OI    AN94+1,X'F0'                      ANC49800
000C7AE 96F0 285D       00871         543          OI    AN108+1,X'F0'                     AN049900
0007B2 94CF 27DB        007EF         544          NI    AN100+1,X'0F'                     ANC50000
0007B6 9540 A000        00000         545 AN93     CLI   0(10),X'40'                       AN050100
0007BA 4770 27FE              C0812   546          BNE   AN102                             AN050200
0007BE D504 A000 3544 C000C 01558     547          CLC   0(5,10),AN95                      AN050300
000C7C4 4770 27D6             007EA   548          BNE   AN91                              AN050400
000C7C8 D2C4 B0C0 A000 0000C C0000    549          MVC   0(5,11),0(10)                     ANC50500
0007CE 41AA 0C05              00005   550          LA    10,5(10)                          AN050600
0007D2 41BB 0005              00005   551          LA    11,5(11)                          AN050700
0007D6 4199 0005              00005   552          LA    9,5(9)                            AN050800
000C7DA 96F0 27D7       007EB         553          OI    AN91+1,X'F0'                      AN050900
000C7DE 940F 27DB       007EF         554          NI    AN100+1,X'0F'                     ANC51000
000C7E2 96FC 285D       00871         555          OI    AN108+1,X'F0'                     ANC51100
000C7E6 47F0 27A2             007B6   556          B     AN93                              AN051200
000C7EA 47C0 27F6             0080A   557 AN91     BC    0,AN96                            AN051300
0007EE 47C0 27E2              007F6   558 AN100    BC    0,AN101                           ANC51400
000C7F2 47F0 27A2             007B6   559          B     AN93                              AN051500
000C7F6 96F0 27D7       007EB         560 AN101    OI    AN91+1,X'F0'                      AN051600
000C7FA 940F 285D       00871         561          NI    AN108+1,X'0F'                     ANC51700
0007FE 41BB 0001              00001   562          LA    11,1(11)                          AN051800
000802 4199 0001              00001   563          LA    9,1(9)                            AN051900
000806 47F0 27A2              007B6   564          B     AN93                              ANC52000
00080A 41AA 0C01              00001   565 AN96     LA    10,1(10)                          AN052100
00080E 47F0 27A2              007B6   566          B     AN93                              AN052200
000812 956B A0C0        00000         567 AN102    CLI   0(10),C','                        AN052300
000816 4770 281A              0082E   568          BNE   AN104                             AN052400
00081A 96F0 27D7        007EB         569          OI    AN91+1,X'F0'                      AN052500
00081E 940F 286D        00881         570          NI    AN94+1,X'0F'                      AN052600
000822 940F 27DB        007EF         571          NI    AN100+1,X'0F'                     AN052700
000826 96F0 285D        00871         572          OI    AN108+1,X'F0'                     AN052800
00082A 47F0 2940              00854   573          B     AN97                              ANC52900
00082E 955C ACC0        00000         574 AN104    CLI   0(10),C'*'                        ANC53000
000832 4770 2838              0084C   575          BNE   AN106                             AN053100
000836 1879                           576          LR    7,9                               AN053200
000838 4180 347C              01490   577          LA    8,AN92                            AN053300
00083C 9898 3470              01484   578          LM    9,11,AN90                         AN053400
00084C 5970 2930              00944   579          C     7,AN77                            AN053500
000844 47D0 215E              00172   580          BNH   AN27                              AN053600
000848 47F0 2132              00146   581          B     AN105                             AN053700
00084C 96F0 27DB        007EF         582 AN106    OI    AN100+1,X'F0'                     AN053800
000850 940F 27D7        007EB         583          NI    AN91+1,X'0F'                      AN053900
000854 D200 B000 A000 00C00 C0000     584 AN97     MVC   0(1,11),0(10)                     AN054000
00C85A 18FA                           585 AN98     LR    15,10                             AN054100
00085C 41AA 0001              00001   586          LA    10,1(10)                          ANC54200
00086C 41BB 0C01              00001   587          LA    11,1(11)                          ANC54300
000864 4199 0001              00001   588          LA    9,1(9)                            AN054400
000868 954B F000        00000         589          CLI   0(15),C'.'                        AN054500
00086C 4780 286C              C0880   590          BE    AN94                              AN054600
00087C 4700 286C              C0880   591 AN108    BC    0,AN94                            AN054700
000874 924B 8000        00000         592          MVI   0(11),C'.'                        AN054800
000878 41BB 0001              00001   593          LA    11,1(11)                          AN054900
00087C 4199 0C01              00001   594          LA    9,1(9)                            AN055000
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   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    F01JAN68   7/18/68
000880 4700 27A2             007B6   595 AN94     BC     0,AN93                          AN055100
000884 41BB 0001             00001   596          LA     11,1(11)                        AN055200
000888 4199 0001             00001   597          LA     9,1(9)                          AN055300
00088C 96FC 286D       00881         598          OI     AN94+1,X'F0'                    AN055400
000890 47F0 27A2             007B6   599          B      AN93                            AN055500
000894                               600 AN1      DS     18F                             AN055600
0008DC CCC01014                      601 AN3      DC     A(AN2+4096)                     AN055700
0008E0                               602 AN4      DS     11F                             AN055800
00090C                               603 AN20     DS     F                               AN055900
00091C                               604 AN12     DS     F                               AN056000
000914                               605 AN17     DS     F                               AN056100
000918                               606 AN30     DS     6F                              AN056200
000930 C0000050                      607 AN71     DC     F'80'                           AN056300
000934 00000001                      608 AN73     DC     F'1'                            AN056400
000938 00C00002                      609 AN74     DC     F'2'                            AN056500
00093C 00C00003                      610 AN75     DC     F'3'                            AN056600
000940 00000004                      611 AN76     DC     F'4'                            AN056700
000944 00000000                      612 AN77     DC     F'0'                            AN056800
000948 00C0000B                      613 AN78     DC     F'11'                           AN056900
00094C C000008E                      614 AN80     DC     F'142'                          AN057000
000950 00C00019                      615 AN81     DC     F'25'                           AN057100
000954 CC00C047                      616 AN82     DC     F'71'                           AN057200
000958 00C00032                      617 AN83     DC     F'50'                           AN057300
00095C                               618 AN11     DS     0F                              AN057400
00095C D200 9000 8000 00C00 C00C0    619          MVC    0(0,9),0(8)                     AN057500
000962                               620 AN8      DS     40CL71                          AN057600
00147A                               621 AN34     DS     CL5                             AN057700
00147F 5C                            622          DC     C'*'                            AN057800
00148C 485D                          623 AN87     DC     C'.)'                           AN057900
001484                               624 AN90     DS     3F                              AN058000
001490                               625 AN92     DS     CL200                           AN058100
001558 40C1D5C440                    626 AN95     DC     C' AND '                        AN058200
                                     627          END                                    AN058300
```

SYMBOL	LEN	VALUE	DEFN	REFERENCES															7/18/68
AN1	C0CC4	000894	0600	0014	0038	0470													
AN10	C0CC4	000154	0097	C094															
AN100	C0CC4	0007FE	0558	0544	0554	0571	0582												
AN101	00004	0007F6	C560	0558															
AN102	C0CC4	000812	0567	0546															
AN104	C0004	00082E	C574	0568															
AN105	000C2	000146	0093	0581															
AN106	C0004	00084C	0582	0575															
AN107	C0CC4	000790	0534	C092															
AN108	C0CC4	000870	0591	0543	0555	0561	0572												
AN109	00C02	0006D4	0478	0476															
AN11	000C4	00095C	0618	0098	0126	0174	0196	0215	0237	0252	0278	0305	0333	0362	0394	0460	0506	0515	
AN110	000C4	000784	0531	0525															
AN111	C0CC4	000774	0526	0533															
AN112	C00C4	00061A	0428	C416															
AN113	C0002	00061E	0429	0431															
AN114	C00C4	000620	0430	0433															
AN115	00006	000624	0431	0415															
AN116	C00C4	0005EC	0417	0434															
AN117	000C6	000638	0435	0432															
AN118	00004	00064E	0440	0422	0425														
AN119	00C06	0005DC	0414	0441															
AN12	00CC4	000910	0604	0067	0072	0528													
AN120	00CC4	000442	03C4	0302															
AN121	00CC4	0001EE	0140	C137															
AN122	C0C04	0001F2	0141	C139															
AN123	C0CC4	0001E0	0136	0133															
AN13	C0CC4	00011E	0083	0088															
AN14	C0004	00013A	0090	0084															
AN15	00CC4	000166	0103	0095															
AN16	00004	0006C4	0474	0096	0124	0192	0213	0235	0250	0328	0357	0389	0455						
AN17	00CC4	000914	0605	0068	0073	0527													
AN19	C0CC4	0006E8	0485	0494	0504														
AN2	C00C4	000014	C020	0601															
AN20	C0004	0009CC	0603	0474	0511														
AN21	C0004	000710	C495	0484	0496														
AN22	00CC4	00074A	0514	0495															
AN220	C0CC4	0001D0	C132	0135															
AN23	C0C02	0006DA	0480	0521															
AN24	C00C4	000730	C505	0479	0499	0523													
AN25	00C04	000742	0511	0524															
AN26	C0CC4	00017E	0109	0107															
AN27	CCCC4	000172	0106	0089	0091	0580													
AN28	00CC4	0001FE	0144	0115															
AN29	C0C04	00018C	C125	0122															
AN3	C0C04	0008DC	06C1	0020															
AN30	00004	000918	0606	0149	0150	0159	0163	0168	0169	0245	0246								
AN31	C0C04	00020A	0147	0145															
AN310	CCC04	000610	0426	0408	0444														
AN311	00002	000618	0427	0414															
AN32	00C04	000388	0256	0249															
AN33	CCCC4	000394	0259	0257															
AN34	C0C05	00147A	0621	0261	0262	0264													
AN35	00004	0003B6	0267	0271															
AN36	CC004	0003EC	0282	0276															

SYMBOL	LEN	VALUE	DEFN	REFERENCES														
AN37	00004	0003D4	0275	0273														
AN38	00004	00041C	0294	0298														
AN39	00002	000438	0301	0290														
AN4	00004	0008F0	0602	0027	0078	0079	0081	0109	0110	0112	0183	0184	0186	0203	0204	0206	0225	0226
				0228	0284	0285	0287	0311	0312	0314	0340	0341	0343	0372	0373	0375	0401	0402
				0404														
AN40	00004	00045A	0311	0189	0194	0200	0224	0231	0244	0300								
AN41	00004	000378	0251	0248														
AN42	00004	000770	0525	0028	0108	0146	0172	0258	0274	0303	0321	0350	0382	0448	0477	0497	0519	0531
AN43	00004	000258	0173	0171														
AN44	00004	0002AA	0195	0191														
AN45	00004	0002BE	0201	0167														
AN46	00004	00027C	0183	0209	0222													
AN47	00004	0002F0	0214	0211														
AN48	00004	000310	0223	0202														
AN49	00004	000352	0241	0234														
AN50	00004	000342	0236	0233														
AN51	00004	000476	0318															
AN52	00004	00049E	0329	0320														
AN53	00004	0004BA	0337	0325														
AN54	00004	0004C6	0340	0317														
AN55	00004	0004AA	0332	0327														
AN56	00004	000526	0366	0354														
AN57	00004	00050A	0358	0349														
AN58	00004	000516	0361	0356														
AN59	00004	00053E	0372	0346														
AN6	00004	000036	0029	0034														
AN60	00006	00059E	0398	0386														
AN61	00004	000582	0390	0381														
AN62	00004	00058E	0393	0388														
AN63	00004	0005AC	0401	0378														
AN64	00006	0006A4	0464	0452														
AN65	00004	000694	0459	0454														
AN66	00004	0006AA	0465	0407														
AN67	00004	000192	0114	0120														
AN68	00002	0001AE	0121	0117														
AN69	00002	0001CE	0131	0123														
AN7	00004	00003F	0031	0046														
AN70	00004	0003C0	0219	0212														
AN71	00004	000930	0607	0025														
AN72	00004	000062	0042	0030														
AN73	00004	000934	0608	0031	0035	0065	0073	0080	0082	0086	0097	0111	0113	0118	0125	0134	0164	0173
				0177	0179	0185	0195	0205	0214	0227	0236	0251	0266	0269	0277	0286	0296	0304
				0309	0313	0324	0331	0332	0342	0353	0360	0361	0368	0374	0385	0392	0393	0403
				0437	0451	0458	0459	0482	0491	0492	0502	0505	0514					
AN74	00004	000938	0609	0068	0104	0143	0182	0201	0221	0243	0283	0339	0371	0419				
AN75	00004	00093C	0610	0223	0400													
AN76	00004	000940	0611	0166														
AN77	00004	000944	0612	0033	0087	0090	0106	0114	0144	0188	0208	0230	0256	0275	0289	0299	0316	0345
				0377	0406	0440	0467	0475	0493	0522	0579							
AN78	00004	000948	0613	0045	0150													
AN79	00006	000CF0	0072	0066														
AN8	00071	000962	0620	0048	0049	0049	0050	0050	0051	0051	0052	0052	0053	0053	0054	0054	0055	0055
				0056	0056	0057	0057	0058	0058	0059	0059	0060	0060	0061				
AN80	00004	000940	0614	0067														

CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES										7/18/68
AN81	00004	000950	0615											
AN82	00004	000954	0616	0072										
AN83	00004	000958	0617											
AN84	00004	000362	0245	0165										
AN85	00002	0003CA	0272	0268										
AN86	00004	000430	0299	0295										
AN87	00002	001480	0623	0398	0464									
AN88	00004	000688	0456	0447										
AN89	00002	000748	0513	0486	0488	0490								
AN9	00004	000104	0076	0071										
AN90	00004	001484	0624	0534	0578									
AN91	00004	0007EA	0557	0541	0548	0553	0560	0569	0583					
AN92	00200	001490	0625	0409	0412	0413	0413	0443	0537	0539	0540	0540	0577	
AN93	00004	0007B6	0545	0556	0559	0564	0566	0595	0599					
AN94	00004	000880	0595	0542	0570	0590	0591	0598						
AN95	00005	001558	0626	0547										
AN96	00004	00080A	0565	0557										
AN97	00006	000854	0584	0573										
AN98	00002	00085A	0585											
ETB	00001	000000	0010											
IHB0004B	00004	000220	0154	0161										
IHB0005	00001	000228	0157											
IHB0005A	00001	00022C	0160	0156										

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
756 PRINTED LINES

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   LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    F01JAN68   7/17/68

                                       1           PRINT NOGEN                                AL000100
                                       2 * 'MASTER' FORMAT SUBROUTINE,                        AL000200
                                       3 *       BIBLIOGRAPHY SYSTEM,                         AL000300
                                       4 *         SEQUENTIAL DATA,                           AL000400
                                       5 *                                                    AL000500
                                       6 * WRITTEN BY F.D.BLAIR,                              AL000600
                                       7 *          N.R.C. OTTAWA,ONT.                        AL000700
                                       8 *                                                    AL000800
000000                                 9 MASTER    CSECT                                      AL000900
                                      10           NRCS  AL1                                  AL001000
000012 0520                           17           BALR  2,0                                  AL001100
000014                                18           USING *,2,3                                AL001200
000014 5830 2568             00057C   19 AL56      L     3,AL57                               AL001300
000018 5841 0000             000000   20           L     4,0(1)                               AL001400
00001C 4150 2588             00059C   21           LA    5,AL2                                AL001500
000020 5054 0008             000008   22           ST    5,8(4)                               AL001600
000024 D203 401C 256C 0001C  00590    23           MVC   16(4,4),AL58                         AL001700
000028 4180 0037             000037   24           LA    8,55                                 AL001800
00002E 5084 0014             000014   25           ST    8,20(4)                              AL001900
000032 5854 0000             000000   26           L     5,0(4)                               AL002000
000036 4155 0050             000050   27           LA    5,80(5)                              AL002100
00003A 5864 0004             000004   28           L     6,4(4)                               AL002200
00003E 586C 2570             000584   29           S     6,AL59                               AL002300
000042 4170 252C             000540   30           LA    7,AL3                                AL002400
000046 1888                           31           SR    8,8                                  AL002500
000048 955C 5000       00000          32 AL4       CLI   0(5),C'*'                            AL002600
00004C 4780 2060             000074   33           BE    AL5                                  AL002700
000050 4155 0001             000001   34 AL6       LA    5,1(5)                               AL002800
000054 5860 2574             000588   35           S     6,AL60                               AL002900
000058 5960 256C             000580   36           C     6,AL58                               AL003000
00005C 4720 2034             000048   37           BH    AL4                                  AL003100
000060 D203 4010 2574 00010  00588    38           MVC   16(4,4),AL60                         AL003200
                                      39           NRCR  AL1,1                                AL003300
000074 5057 0000             000000   45 AL5       ST    5,0(7)                               AL003400
000078 4177 0004             000004   46           LA    7,4(7)                               AL003500
00007C 4188 0001             000001   47           LA    8,1(8)                               AL003600
000080 5980 2578             00058C   48           C     8,AL61                               AL003700
000084 4740 203C             000050   49           BL    AL6                                  AL003800
000088 5854 0000             000000   50           L     5,0(4)                               AL003900
                                      51           PROP  AL2,2840,X'40'                       AL004000
0000D8 4160 2588             00059C   65           LA    6,AL2                                AL004100
0000DC D2C4 6000 5001 0000C  00001    66           MVC   0(5,6),1(5)                          AL004200
0000E2 5870 2530             000544   67           L     7,AL3+4                              AL004300
0000E6 5870 252C             000540   68           S     7,AL3                                AL004400
0000EA 5870 2574             000588   69           S     7,AL60                               AL004500
0000EE 1888                           70           SR    8,8                                  AL004600
0000F0 4166 0006             000006   71           LA    6,6(6)                               AL004700
0000F4 1857                           72           LR    5,7                                  AL004800
0000F6 5890 252C             000540   73           L     9,AL3                                AL004900
0000FA 4199 0001             000001   74           LA    9,1(9)                               AL005000
0000FE 5970 257C             000590   75           C     7,AL62                               AL005100
000102 47D0 2104             000118   76           BNH   AL63                                 AL005200
000106 D203 2558 257C 0056C  00590    77           MVC   AL13(4),AL62                         AL005300
00010C 4550 244C             000460   78           BAL   5,AL14                               AL005400
000110 4166 0004             000004   79           LA    6,4(6)                               AL005500
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000114 47F0 211C          00130    80          B     AL53                    AL005600
000118 5970 256C          00580    81 AL63     C     7,AL58                  AL005700
00011C 47D0 2114          00128    82          BNH   AL8                     AL005800
000120 5B70 2574          00588    83          S     7,AL60                  AL005900
000124 4470 31C4          011D8    84          EX    7,AL7                   AL006000
000128 4166 C04B          0004B    85 AL8      LA    6,75(6)                 AL006100
00012C 4188 CCC1          00001    86          LA    8,1(8)                  AL006200
000130 5870 2534          00548    87 AL53     L     7,AL3+8                 AL006300
000134 5B70 2530          00544    88          S     7,AL3+4                 AL006400
000138 5B7C 2574          00588    89          S     7,AL60                  AL006500
00013C 5890 2530          00544    90          L     9,AL3+4                 AL006600
000140 4199 CC01          00001    91          LA    9,1(9)                  AL006700
000144 5970 2580          00594    92          C     7,AL64                  AL006800
000148 47D0 2146          0015A    93          BNH   AL65                    AL006900
00014C D2C3 2558 2580 0056C C0594  94          MVC   AL13,AL64               AL007000
000152 4150 215E          00172    95          LA    5,AL54                  AL007100
000156 47F0 244C          00460    96          B     AL14                    AL007200
00015A 5970 256C          00580    97 AL65     C     7,AL58                  AL007300
00015E 47D0 2156          0016A    98          BNH   AL19                    AL007400
000162 5B70 2574          00588    99          S     7,AL60                  AL007500
000166 447C 31C4          011D8   100          EX    7,AL7                   AL007600
00016A 4166 0047          00047   101 AL19     LA    6,71(6)                 AL007700
00016E 4188 C0C1          00C01   102          LA    8,1(8)                  AL007800
000172 1856               103 AL54     LR    5,6                     AL007900
000174 D204 500C 30A0 C0000 010B4  104          MVC   0(5,5),AL20             AL008000
00017A 4155 0006          00C06   105          LA    5,6(5)                  AL008100
00017E 5874 0000          C0000   106          L     7,0(4)                  AL008200
000182 D20F 5000 7008 0000C C0008  107          MVC   0(16,5),8(7)            AL008300
000188 4155 C014          00014   108          LA    5,20(5)                 AL008400
00018C 9540 7006       00006      109          CLI   6(7),X'40'              AL008500
000190 4780 2186          0019A   110          BE    AL23                    AL008600
000194 D2CC 5CC0 30A5 0000C C1CB9  111          MVC   0(13,5),AL21            AL008700
000198 4155 000F          0000F   112 AL23     LA    5,15(5)                 AL008800
00019E 9540 7007       C0007      113          CLI   7(7),X'40'              AL008900
0001A2 4780 2198          001AC   114          BE    AL24                    AL009000
0001A6 D20B 5000 30B2 C0000 010C6  115          MVC   0(12,5),AL22            AL009100
0001AC 4166 C047          00047   116 AL24     LA    6,71(6)                 AL009200
0001B0 4188 0001          C0C01   117          LA    8,1(8)                  AL009300
0001B4 D207 60C0 30C7 C0CCC 010DB  118          MVC   0(8,6),AL25             AL009400
0001BA D223 6008 7018 00008 C0C18  119          MVC   8(36,6),24(7)           AL009500
0001C0 4166 CC47          00047   120          LA    6,71(6)                 AL009600
0001C4 4188 0CC1          00001   121          LA    8,1(8)                  AL009700
0001C8 D5C1 703D 30E3 0003D 010F7  122          CLC   61(2,7),AL69            AL009800
0001CE 4780 21D2          C01E6   123          BE    AL68                    AL009900
0001D2 D208 60C0 30BE 0000C 010D2  124          MVC   0(9,6),AL26             AL010000
0001D8 D20E 6CC9 703C C0CC9 C003C  125          MVC   9(15,6),60(7)           AL010100
0001DE 4166 0047          00047   126          LA    6,71(6)                 AL010200
0001E2 4188 0C01          00001   127          LA    8,1(8)                  AL010300
0001E6 1896               128 AL68     LR    9,6                     AL010400
0001E8 18A9               129          LR    10,9                    AL010500
0001EA D204 9000 30CF C0CC0 010E3  130          MVC   0(5,9),AL27             AL010600
0001F0 4199 0006          00C06   131          LA    9,6(9)                  AL010700
0001F4 5870 2538          0054C   132          L     7,AL3+12                AL010800
0001F8 5B70 2534          00548   133          S     7,AL3+8                 AL010900
0001FC 5B70 2574          00588   134          S     7,AL60                  AL011000
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    AL011100
000200 5850 2534            00548   135           L     5,AL3+8               AL011200
000204 4155 0001            00001   136           LA    5,1(5)                AL011300
000208 5970 256C            00580   137           C     7,AL58                AL011400
00020C 47D0 2200            00214   138           BNH   AL29                  AL011500
000210 45F0 24D4            004E8   139           BAL   15,AL55               AL011600
000214 4199 0005            00005   140 AL29      LA    9,5(9)                AL011700
000218 5870 253C            00550   141           L     7,AL3+16              AL011800
00021C 5870 2538            0054C   142           S     7,AL3+12              AL011900
000220 5870 2574            00588   143           S     7,AL60                AL012000
000224 5850 2538            0054C   144           L     5,AL3+12              AL012100
000228 4155 0001            00001   145           LA    5,1(5)                AL012200
00022C 5970 256C            00580   146           C     7,AL58                AL012300
000230 47D0 2224            00238   147           BNH   AL31                  AL012400
000234 45F0 24D4            004E8   148           BAL   15,AL55               AL012500
000238 4199 0002            00002   149 AL31      LA    9,2(9)                AL012600
00023C 5870 2540            00554   150           L     7,AL3+20              AL012700
000240 5870 253C            00550   151           S     7,AL3+16              AL012800
000244 5870 2574            00588   152           S     7,AL60                AL012900
000248 5850 253C            00550   153           L     5,AL3+16              AL013000
00024C 4155 0001            00001   154           LA    5,1(5)                AL013100
000250 5970 256C            00580   155           C     7,AL58                AL013200
000254 47D0 2248            00250   156           BNH   AL33                  AL013300
000258 45F0 24D4            004E8   157           BAL   15,AL55               AL013400
00025C 4199 0003            00003   158 AL33      LA    9,3(9)                AL013500
000260 5870 2544            00558   159           L     7,AL3+24              AL013600
000264 5870 2540            00554   160           S     7,AL3+20              AL013700
000268 5870 2574            00588   161           S     7,AL60                AL013800
00026C 5850 2540            00554   162           L     5,AL3+20              AL013900
000270 4155 0001            00001   163           LA    5,1(5)                AL014000
000274 5970 256C            00580   164           C     7,AL58                AL014100
000278 47D0 228C            002A0   165           BNH   AL37                  AL014200
00027C 18B9                         166           LR    11,9                  AL014300
00027E 18BA                         167           SR    11,10                 AL014400
000280 1AB7                         168           AR    11,7                  AL014500
000282 41BB 0007            00007   169           LA    11,7(11)              AL014600
000286 59B0 2580            00594   170           C     11,AL64               AL014700
00028A 47D0 2284            00298   171           BNH   AL35                  AL014800
00028E 4166 0047            00047   172           LA    6,71(6)               AL014900
000292 4188 0001            00001   173           LA    8,1(8)                AL015000
000296 1896                         174           LR    9,6                   AL015100
000298 5870 2574            00588   175 AL35      S     7,AL60                AL015200
00029C 4470 31CC            011E0   176           EX    7,AL28                AL015300
0002A0 4166 0047            00047   177 AL37      LA    6,71(6)               AL015400
0002A4 4188 0001            00001   178           LA    8,1(8)                AL015500
0002A8 1896                         179           LR    9,6                   AL015600
0002AA 5870 2548            0055C   180           L     7,AL3+28              AL015700
0002AE 5870 2544            00558   181           S     7,AL3+24              AL015800
0002B2 5870 2574            00588   182           S     7,AL60                AL015900
0002B6 5850 2544            00558   183           L     5,AL3+24              AL016000
0002BA 4155 0001            00001   184           LA    5,1(5)                AL016100
0002BE D203 2564 256C C0578 00580   185           MVC   AL46(4),AL58          AL016200
0002C4 5970 256C            00580   186           C     7,AL58                AL016300
0002C8 47D0 22D8            002EC   187           BNH   AL44                  AL016400
0002CC 5970 2580            00594   188           C     7,AL64                AL016500
0002D0 47D0 22EE            00302   189           BNH   AL38                  AL016600
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 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                                    AL016600
0002D4 D203 2558 2580 0056C 00594   190          MVC   AL13(4),AL64                                          AL016600
0002DA 1895                         191          LR    9,5                                                   AL016700
0002DC 4550 244C              0046C 192          BAL   5,AL14                                                AL016800
0002E0 1896                         193          LR    9,6                                                   AL016900
0002E2 D203 2560 2574 0C574 CC588   194          MVC   AL40(4),AL60                                          AL017000
0002E8 47F0 2302              00316 195          B     AL41                                                  AL017100
0002EC D2C3 2560 2574 0C574 CC588   196 AL44     MVC   AL40(4),AL60                                          AL017200
0002F2 58F0 2564              00578 197          L     15,AL46                                               AL017300
0002F6 41FF 0001              00001 198          LA    15,1(15)                                              AL017400
0002FA 50F0 2564              00578 199          ST    15,AL46                                               AL017500
0002FE 47F0 2302              00316 200          B     AL41                                                  AL017600
000302 5870 2574              C0588 201 AL38      S     7,AL60                                                AL017700
0003C6 4470 31CC              011F0 202          EX    7,AL28                                                AL017800
00030A 4177 0C01              00001 203          LA    7,1(7)                                                AL017900
00030E 1A97                         204          AR    9,7                                                   AL018000
0C031C D203 2560 256C C0574 0C580   205          MVC   AL40(4),AL58                                          AL018100
000316 5870 254C              00560 206 AL41      L     7,AL3+32                                              AL018200
00031A 5870 2548              0055C 207          S     7,AL3+28                                              AL018300
00031E 5870 2574              00588 208          S     7,AL60                                                AL018400
000322 5850 2548              0055C 209          L     5,AL3+28                                              AL018500
000326 4155 0C01              00001 210          LA    5,1(5)                                                AL018600
00032A 4199 0C05              00CC5 211          LA    9,5(9)                                                AL018700
00032E 5970 256C              00580 212          C     7,AL58                                                AL018800
000332 4720 2332              00346 213          BH    AL47                                                  AL018900
000336 58F0 2564              0C578 214          L     15,AL46                                               AL019000
00033A 41FF 0001              00001 215          LA    15,1(15)                                              AL019100
00033E 50F0 2564              00578 216          ST    15,AL46                                               AL019200
000342 47FC 238A              0039E 217          B     AL43                                                  AL019300
000346 5970 2580              0C594 218 AL47      C     7,AL64                                                AL019400
00034A 47D0 235E              00372 219          BNH   AL66                                                  AL019500
00034E 58F0 2560              CC574 220          L     15,AL40                                               AL019600
000352 59F0 2574              00588 221          C     15,AL60                                               AL019700
000356 4780 234E              00362 222          BE    AL42                                                  AL019800
00035A 4166 0047              00047 223          LA    6,71(6)                                               AL019900
00035E 4188 0001              00001 224          LA    8,1(8)                                                AL020000
000362 1895                         225 AL42      LR    9,5                                                   AL020100
0C0364 D203 2558 258C 0056C 00594   226          MVC   AL13(4),AL64                                          AL020200
00036A 4150 238A              0039E 227          LA    5,AL43                                                AL020300
C0036E 47F0 244C              00460 228          B     AL14                                                  AL020400
000372 58F0 2560              0C574 229 AL66      L     15,AL40                                               AL020500
000376 59F0 2574              00588 230          C     15,AL60                                               AL020600
00037A 4780 2382              00396 231          BE    AL45                                                  AL020700
00037E 18A9                         232          LR    10,9                                                  AL020800
0CC380 1BA6                         233          SR    10,6                                                  AL020900
000382 1AA7                         234          AR    10,7                                                  AL021000
000384 59A0 2580              00594 235          C     10,AL64                                               AL021100
0C0388 47D0 2382              00396 236          BNH   AL45                                                  AL021200
00038C 4166 0047              00047 237          LA    6,71(6)                                               AL021300
000390 4188 0C01              C0001 238          LA    8,1(8)                                                AL021400
000394 1896                         239          LR    9,6                                                   AL021500
000396 5870 2574              00588 240 AL45      S     7,AL60                                                AL021600
00039A 4470 31CC              011E0 241          EX    7,AL28                                                AL021700
00039E 58F0 2564              CC578 242 AL43      L     15,AL46                                               AL021800
0003A2 59F0 2584              0C598 243          C     15,AL67                                               AL021900
0003A6 4780 239E              00382 244          BNL   AL48                                                  AL022000
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0003AA 4166 0047             00047   245          LA    6,71(6)                    AL022100
0003AE 4188 0001             C00C1   246          LA    8,1(8)                     AL022200
0003B2 5870 2550             00564   247 AL48     L     7,AL3+36                   AL022300
0003B6 5B70 254C             00560   248          S     7,AL3+32                   AL022400
0003BA 5B70 2574             00588   249          S     7,AL60                     AL022500
0003BE 5850 254C             C0560   250          L     5,AL3+32                   AL022600
0003C2 4155 0001             00001   251          LA    5,1(5)                     AL022700
0003C6 1896                          252          LR    9,6                        AL022800
0003C8 5970 256C             00580   253          C     7,AL58                     AL022900
0003CC 47D0 23FA             0040F   254          BNH   AL49                       AL023000
0003DC D2CB 30F1 30E5 01105  010F9   255          MVC   AL71(12),AL70              AL023100
0003D6 5B70 2574             00588   256          S     7,AL60                     AL023200
0003DA 4470 31BC             011D0   257          EX    7,AL72                     AL023300
0003DE 4177 0C0E             0000E   258          LA    7,14(7)                    AL023400
0003E2 4150 3CF1             01105   259          LA    5,AL71                     AL023500
0003E6 5970 2580             00594   260          C     7,AL64                     AL023600
0003EA 47D0 23EA             003FE   261          BNH   AL50                       AL023700
0003EE 1895                          262          LR    9,5                        AL023800
0003F0 D203 2558 2580 0056C  C0594   263          MVC   AL13(4),AL64               AL023900
0003F6 4150 23FA             0040E   264          LA    5,AL49                     AL024000
0003FA 47F0 244C             C046C   265          B     AL14                       AL024100
0003FE 5B70 2574             00588   266 AL50     S     7,AL60                     AL024200
C0C402 4470 31CC             011E0   267          EX    7,AL28                     AL024300
C0C406 4166 C047             00047   268          LA    6,71(6)                    AL024400
00040A 4188 0001             00001   269          LA    8,1(8)                     AL024500
C0040E 5870 2554             00568   270 AL49     L     7,AL3+40                   AL024600
000412 5B70 2550             00564   271          S     7,AL3+36                   AL024700
000416 5B70 2574             00588   272          S     7,AL60                     AL024800
00041A 5850 2550             00564   273          L     5,AL3+36                   AL024900
00041E 4155 0001             00001   274          LA    5,1(5)                     AL025000
000422 1896                          275          LR    9,6                        AL025100
000424 5970 256C             00580   276          C     7,AL58                     AL025200
000428 47D0 243C             00450   277          BNH   AL51                       AL025300
00042C 5970 2580             0C594   278          C     7,AL64                     AL025400
0C0430 47D0 2430             C0444   279          BNH   AL52                       AL025500
000434 1895                          280          LR    9,5                        AL025600
000436 D2C3 2558 2580 0056C  00594   281          MVC   AL13(4),AL64               AL025700
00043C 4150 243C             0C450   282          LA    5,AL51                     AL025800
00044C 47F0 244C             0C460   283          B     AL14                       AL025900
000444 5B7C 2574             00588   284 AL52     S     7,AL60                     AL026000
000448 4470 31CC             011E0   285          EX    7,AL28                     AL026100
00044C 4188 0001             00001   286          LA    8,1(8)                     AL026200
000450 5C84 000C             0000C   287 AL51     ST    8,12(4)                    AL026300
                                     288          NRCR  AL1                        AL026400
00046C 58A0 2558             0056C   294 AL14     L     10,AL13                    AL026500
000464 18B9                          295          LR    11,9                       AL026600
000466 5AB0 2558             0056C   296          A     11,AL13                    AL026700
00046A 5BB0 2574             00588   297          S     11,AL60                    AL026800
00046E 9540 B000       00000         298 AL15     CLI   0(11),X'40'                AL026900
000472 4780 2486             0049A   299          BE    AL16                       AL027000
000476 956B B000       00000         300          CLI   0(11),C','                 AL027100
0C047A 4780 2486             0049A   301          BE    AL16                       AL027200
00047E 5BA0 2574             00588   302          S     10,AL60                    AL027300
000482 5BB0 2574             00588   303          S     11,AL60                    AL027400
000486 59A0 256C             00580   304          C     10,AL58                    AL027500
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  LOC   OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    F01JAN68  7/17/68

00048A 4720 245A              0046E   305          BH    AL15                              AL027600
00048E 58A0 2558              0056C   306          L     10,AL13                           AL027700
000492 5AB0 2558              0056C   307          A     11,AL13                           AL027800
000496 5BB0 2574              00588   308          S     11,AL60                           AL027900
00049A 58A0 2574              00588   309 AL16     S     10,AL60                           AL028000
00049E 44A0 31C4              011D8   310          EX    10,AL7                            AL028100
0004A2 41AA CC01              00CC1   311          LA    10,1(10)                          AL028200
0004A6 1B7A                           312          SR    7,10                              AL028300
0004A8 41BB 0001              00CC1   313          LA    11,1(11)                          AL028400
0004AC 1A9A                           314          AR    9,10                              AL028500
0004AE 5970 2558              0056C   315          C     7,AL13                            AL028600
0004B2 47D0 24B2              004C6   316          BNH   AL18                              AL028700
0004B6 58A0 2558              CC56C   317          L     10,AL13                           AL028800
0004BA 4166 C047              00C47   318          LA    6,71(6)                           AL028900
0004BE 4188 0001              00CC1   319          LA    8,1(8)                            AL029000
0004C2 47F0 245A              0046E   320          B     AL15                              AL029100
0004C6 4166 C047              00047   321 AL18     LA    6,71(6)                           AL029200
0004CA 4188 0001              000C1   322          LA    8,1(8)                            AL029300
0004CE 5970 256C              00580   323          C     7,AL58                            AL029400
0004D2 47D0 24D2              CC4E6   324          BNH   AL17                              AL029500
0004D6 5B70 2574              00588   325          S     7,AL60                            AL029600
0004DA 4470 31C4              011D8   326          EX    7,AL7                             AL029700
0004DE 4166 CC47              00047   327          LA    6,71(6)                           AL029800
0004E2 4188 0CC1              00001   328          LA    8,1(8)                            AL029900
0004E6 C7F5                           329 AL17     BR    5                                 AL030000
0004E8 5B70 2574              00588   330 AL55     S     7,AL60                            AL030100
0004EC 4470 31CC              011F0   331          EX    7,AL28                            AL030200
0004F0 4177 C001              00001   332          LA    7,1(7)                            AL030300
0004F4 1A97                           333          AR    9,7                               AL030400
0004F6 07FF                           334          BR    15                                AL030500
0004F8                                335 AL1      DS    18F                               AL030600
000540                                336 AL3      DS    11F                               AL030700
00056C                                337 AL13     DS    F                                 AL030800
000570                                338 AL39     DS    F                                 AL030900
000574                                339 AL40     DS    F                                 AL031000
000578                                340 AL46     DS    F                                 AL031100
00057C CCCC1014                       341 AL57     DC    A(AL56+4096)                      AL031200
000580 CCCCCCCC                       342 AL58     DC    F'0'                              AL031300
000584 CCCCCC50                       343 AL59     DC    F'80'                             AL031400
000588 CCCCCCC1                       344 AL60     DC    F'1'                              AL031500
00058C CCCCCCCB                       345 AL61     DC    F'11'                             AL031600
000590 CCCCCC41                       346 AL62     DC    F'65'                             AL031700
000594 CCCCC03D                       347 AL64     DC    F'61'                             AL031800
000598 CCCCCCC2                       348 AL67     DC    F'2'                              AL031900
00059C                                349 AL2      DS    40CL71                            AL032000
0010B4 C3D6C4C5D5                     350 AL20     DC    C'CODEN'                          AL032100
0010B9 C1C2E2E34B4CD6D5               351 AL21     DC    C'ABST. ON HAND'                  AL032200
0010C6 C3D6D7E84CD6D540               352 AL22     DC    C'COPY ON HAND'                   AL032300
0010D2 C2C9C2D3C9D6C74B               353 AL26     DC    C'BIBLIOG.-'                      AL032400
0010DB E2E4C2D1C5C3E36C               354 AL25     DC    C'SUBJECT-'                       AL032500
0010E3 D7C1C7C5E2                     355 AL27     DC    C'PAGES'                          AL032600
0010E8 E8C5C1D9                       356 AL30     DC    C'YEAR'                           AL032700
0010EC C3C1D5C74B                     357 AL32     DC    C'LANG.'                          AL032800
0010F1 C3C161D7C17A                   358 AL34     DC    C'CA/PA '                         AL032900
0010F7 4040                           359 AL69     DC    X'4040'                           AL033000
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  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    FORTJAN68  7/17/68

0010F9 E3D9C1D5E2D3C1E3             360 AL70     DC    C'TRANSLATION-'                  AL033100
001105                              361 AL71     DS    CL200                            AL033200
001108                              362 AL72     DS    0F                               AL033300
00110C D200 30FE 5CCC 01112 00000    363          MVC   AL71+13(0),0(5)                  AL033400
0011D8                              364 AL7      DS    0F                               AL033500
0011D8 D200 6000 9000 00000 00000    365          MVC   0(0,6),0(9)                      AL033600
0011E0                              366 AL28     DS    0F                               AL033700
0011E0 D200 9000 5000 00000 00000    367          MVC   0(0,9),0(5)                      AL033800
                                    368          END                                    AL033900
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SYMBOL	LEN	VALUE	DEFN	REFERENCES														
AL1	00004	0004F8	0335	0013	0041	0290												
AL13	00004	00056C	0337	0077	0094	0190	0226	0263	0281	0294	0296	0306	0307	0315	0317			
AL14	00004	000460	0294	0078	0096	0192	0228	0265	0283									
AL15	00004	00046E	0298	0305	0320													
AL16	00004	00049A	0309	0299	0301													
AL17	00002	0004E6	0329	0324														
AL18	00004	0004C6	0321	0316														
AL19	00004	00016A	0101	0098														
AL2	00071	00059C	0349	0021	0052	0053	0053	0054	0054	0055	0055	0056	0056	0057	0057	0058	0058	0059
				0059	0060	0060	0061	0061	0062	0062	0063	0063	0064	0064	0065			
AL20	00005	001CB4	0350	0104														
AL21	00013	001CB9	0351	0111														
AL22	00012	001CC6	0352	0115														
AL23	00004	00019A	0112	0110														
AL24	00004	0001AC	0116	0114														
AL25	00008	0010DB	0354	0118														
AL26	00009	001CD2	0353	0124														
AL27	00005	001CE3	0355	0130														
AL28	00004	0011E0	0366	0176	0202	0241	0267	0285	0331									
AL29	00004	000214	0140	0138														
AL3	00004	000540	0336	0030	0067	0068	0073	0087	0088	0090	0132	0133	0135	0141	0142	0144	0150	0151
				0153	0159	0160	0162	0180	0181	0183	0206	0207	0209	0247	0248	0250	0270	0271
				0273														
AL30	00008	001CE8	0356															
AL31	00004	000238	0149	0147														
AL32	00005	001CEC	0357															
AL33	00004	00025C	0158	0156														
AL34	00006	001CF1	0358															
AL35	00004	000298	0175	0171														
AL37	00004	0002A0	0177	0165														
AL38	00004	000302	0201	0189														
AL39	00004	000570	0338															
AL4	00004	000048	0032	0037														
AL40	00004	000574	0339	0194	0196	0205	0220	0229										
AL41	00004	000316	0206	0195	0200													
AL42	00002	000362	0225	0222														
AL43	00004	00039E	0242	0217	0227													
AL44	00006	0002EC	0196	0187														
AL45	00004	000396	0240	0231	0236													
AL46	00004	000578	0340	0185	0197	0199	0214	0216	0242									
AL47	00004	000346	0218	0213														
AL48	00004	000382	0247	0244														
AL49	00004	00040E	0270	0254	0264													
AL5	00004	000074	0045	0033														
AL50	00004	0003FF	0266	0261														
AL51	00004	000450	0287	0277	0282													
AL52	00004	000444	0284	0279														
AL53	00004	000130	0087	0080														
AL54	00002	000172	0103	0095														
AL55	00004	0004E8	0330	0139	0148	0157												
AL56	00004	000014	0019	0341														
AL57	00004	00057C	0341	0019														
AL58	00004	000580	0342	0023	0036	0081	0097	0137	0146	0155	0164	0185	0186	0205	0212	0253	0276	0304
				0323														
AL59	00004	000584	0343	0029														

CROSS-REFERENCE

SYMBOL	LEN	VALUE	DEFN	REFERENCES															7/17/68
AL6	000C4	000C50	0034	0049															
AL60	00004	000588	0344	0035	0038	0069	0083	0089	0099	0134	0143	0152	0161	0175	0182	0194	0196	0201	
				0208	0221	0230	0240	0249	0256	0266	0272	0284	0297	0302	0303	0308	0309	0325	
				0330															
AL61	C0CC4	00058C	0345	CC48															
AL62	00CC4	000590	0346	0075	0077														
AL63	C0CC4	0C0118	0081	0076															
AL64	00C04	000594	C347	CC92	0094	0170	C188	0190	0218	0226	0235	0260	0263	0278	0281				
AL65	00004	00015A	0097	0093															
AL66	00CC4	000372	0229	0219															
AL67	00004	000598	0348	0243															
AL68	00002	0001E6	0128	0123															
AL69	00C02	0010F7	0359	0122															
AL7	00004	0011D8	0364	0084	0100	0310	0326												
AL7C	00C12	001CF9	0360	C255															
AL71	C0200	001105	0361	0255	0259	0363													
AL72	C0C04	0011D0	0362	0257															
AL8	C0CC4	000128	0085	0082															
MASTER	00001	000000	C009																

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
440 PRINTED LINES

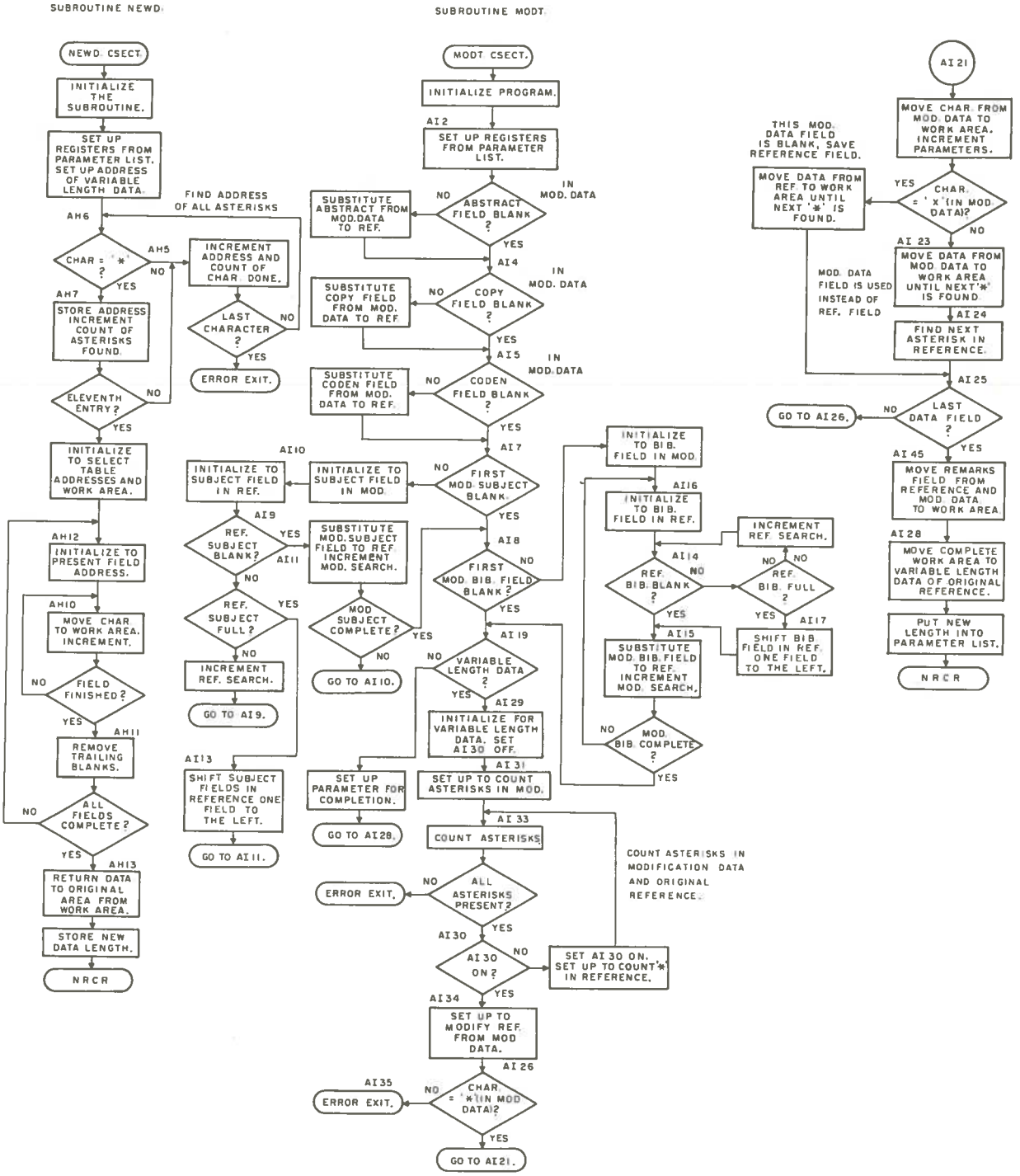

Fig. 13 Detail flow chart, subroutines (continued on next page)

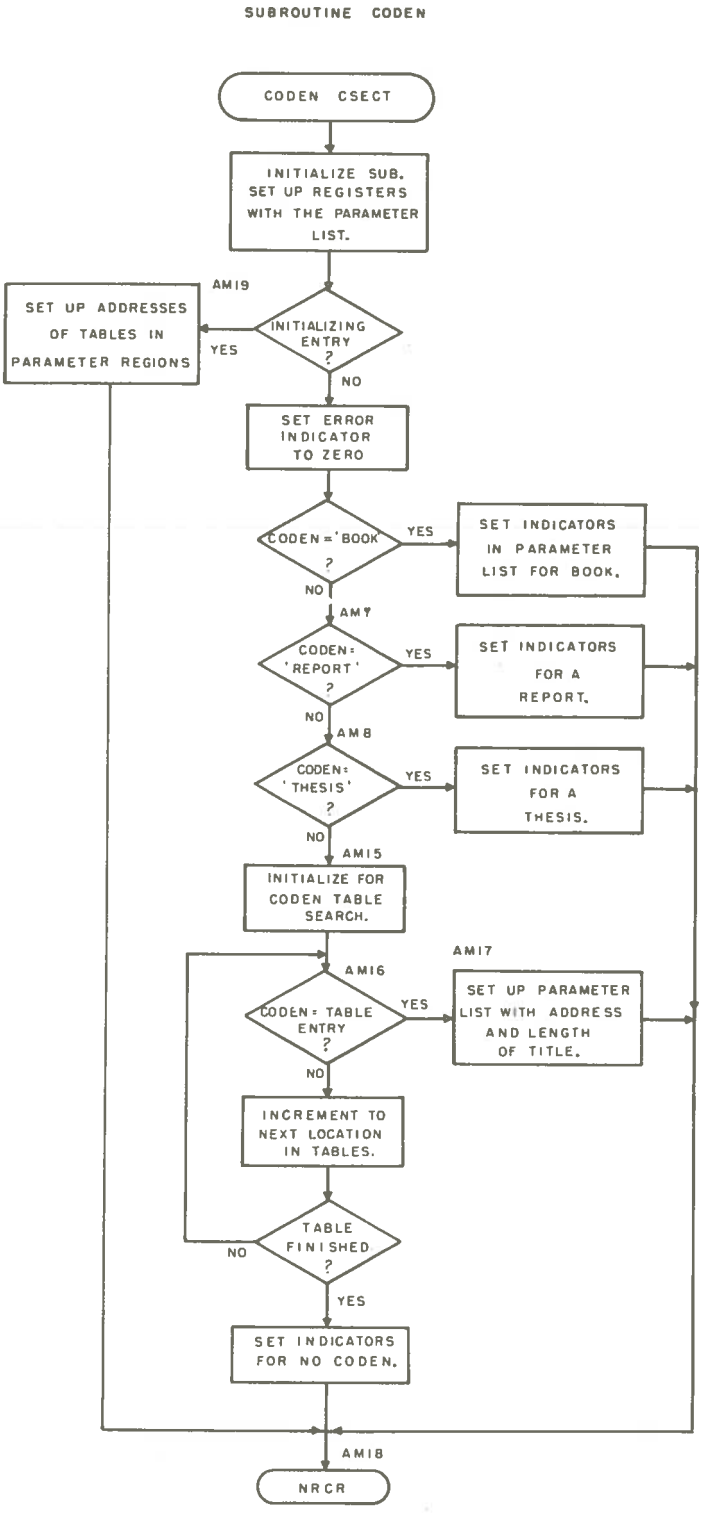
SUBROUTINE CODEN
CODEN CSECT
INITIALIZE SUB. SET UP REGISTERS WITH THE PARAMETER LIST.
AMI9
INITIALIZING ENTRY ?
YES
SET UP ADDRESSES OF TABLES IN PARAMETER REGIONS
NO
SET ERROR INDICATOR TO ZERO
CODEN = 'BOOK' ?
YES
SET INDICATORS IN PARAMETER LIST FOR BOOK.
NO
AMI9
CODEN = 'REPORT' ?
YES
SET INDICATORS FOR A REPORT.
NO
AMI8
CODEN = 'THESIS' ?
YES
SET INDICATORS FOR A THESIS.
NO
AMI5
INITIALIZE FOR CODEN TABLE SEARCH.
AMI7
AMI6
CODEN = TABLE ENTRY ?
YES
SET UP PARAMETER LIST WITH ADDRESS AND LENGTH OF TITLE.
NO
INCREMENT TO NEXT LOCATION IN TABLES.
TABLE FINISHED ?
NO
YES
SET INDICATORS FOR NO CODEN.
AMI8
NRCR

Fig. 13 (cont'd)