AUSTRALIAN ATOMIC ENERGY COMMISSION
RESEARCH ESTABLISHMENT
LUCAS HEIGHTS

AECOPY - A MAGNETIC TAPE ANALYSIS AND UTILITY PROGRAM FOR THE IBM SYSTEM/360

by

D.A. PAYNE *

*Attached, from IBM Australia Pty. Ltd.

January 1969

AUSTRALIAN ATOMIC ENERGY COMMISSION

RESEARCH ESTABLISHMENT

LUCAS HEIGHTS

AECOPY – A MAGNETIC TAPE ANALYSIS AND UTILITY PROGRAM FOR THE IBM SYSTEM/360

by

D. A. PAYNE*

*Attached, from IBM Australia Pty. Ltd.

ABSTRACT

The program AECOPY can be used to inspect and to copy IBM System/360 magnetic tapes. The number and length of physical records on the tape and the actual records may be printed, and a number of other typical magnetic tape operations may be performed. The type of error handling required may also be specified by the user. Instructions to the program are specified in free format English and 'DD' cards for the tape units are not required. The program runs under the Operating System, but requires a special Input/Output subroutine.

CONTENTS

	Page
1. INTRODUCTION	1
2. PRIMARY OPERATIONS	1
2.1 Method	1
2.1.1 Record size	1
2.1.2 Error handling	2
2.1.3 Number of records	2
2.2 Listing	2
2.3 Operations	3
3. SECONDARY OPERATIONS	4
4. INPUT TO THE PROGRAM	4
5. USE OF AECOPY	5
5.1 Restrictions	5
5.2 Operator Instructions	6
6. CONCLUSIONS	6
7. ACKNOWLEDGEMENTS	6
8. REFERENCES	7

Appendix 1 Use of SVC 255, the Particular Supervisor Call Needed by AECOPY

Appendix 2 Error Messages Given by the AECOPY Program

Appendix 3 Allowable Words for Input to AECOPY

Appendix 4 Example of the Use of AECOPY

Appendix 5 Source Listing of the AECOPY Program

1. INTRODUCTION

AECOPY was originally a widely used program for the IBM 7040 computer at the Australian Atomic Energy Commission Research Establishment, Lucas Heights (Richardson 1966). It was written to overcome difficulties with tapes from widely different sources, many of which had unknown record formats and persistent errors.

The present version of the program has been completely rewritten and expanded. It is designed to be a comprehensive and simple method of using 2400 series Magnetic Tape Units attached to an IBM System/360 computer.

Three basic differences between AECOPY and conventional tape utilisation programs are:

(a) The user can specify the error handling, both in the number of times that errors are retried, and in the number of permanent errors allowed.

(b) The record characteristics and format of the input tape being processed need not be known by the user. Any number of files and records and any number of operations can be processed with a single statement from the user.

(c) Input to the program is in free form English with very few linguistic restrictions, with keywords tested for, and others ignored. The user need not have any knowledge of the Operating System Job Control Language.

AECOPY treats magnetic tape operations in two slightly different ways. Read, Tape Copy and Tape Print are known as primary operations, and control functions such as Rewind and Backspace are known as secondary operations.

With primary operations, a listing can be given which states the number and the sizes of the records, the occurrence of tape marks and the placement and sizes of permanent errors found. This listing can be suppressed if desired. The number of errors on both input and output tapes is given at the completion of the particular operation, and these messages cannot be suppressed.

AECOPY is written in the assembler language of the IBM/360, and the program runs as a normal job under the Operating System. All Input/Output operations use the IOCP subroutine (Richardson 1968) which needs a particular use for the Supervisor Call SVC 255. The method of incorporating this SVC 255 into the Operating System of a particular installation is detailed in Appendix 1. Error messages, allowable words for input to AECOPY, an example of its use and the source listing are given in Appendices 2–5.

2. PRIMARY OPERATIONS

Three magnetic tape operations are basic to AECOPY, and are known as primary operations. They are READ, COPY FROM TAPE TO TAPE and COPY FROM TAPE TO PRINTER. These operations are specified to AECOPY by the keywords READ, COPY and PRINT.

2.1 Method

From an analysis of the keywords in the English language input, AECOPY decides on an operation.

A control block for the particular unit and a channel program are constructed and this information is given to the IOCP subroutine. IOCP carries out the channel program and returns the Channel Status Word to AECOPY in the control block.

2.1.1 Record size

For primary operations, it is unnecessary for the record format or record sizes of the input tape to be known.

Each read operation of the input tape is initiated with the maximum tape blocksize of 65535 bytes set in the Channel Command Word. After the successful completion of a read operation which has not read a tapemark, the residual byte count of the Channel Status Word is examined to determine the actual size of the record read.

For copy operations, the input data is then written to the output tape with the correct blocksize inserted in the Channel Command Word.

For print operations, the input data is written out in 80 byte or 40 byte units, depending on the type of printing chosen.

2.1.2 Error handling

The user can specify the number of times that errors are retried and the number of permanent errors allowed during a particular operation (permanent errors are those tape records which are still found to be in error after the number of tries specified).

Keywords tested for are TIMES and ERRORS.

A statement such as:

30 ERRORS ALLOWED; TRY 12 TIMES EACH

instructs AECOPY that any error found is to be backspaced and reread for a total of 12 times. If one of these attempts finds that the record is not in error, processing continues. If the record is still found to be in error, it is noted as a permanent error and both the output list and the count of errors are adjusted. The number of permanent errors allowed (in this case 30) is checked, and processing either continues or is terminated depending on the number of errors allowed.

At the conclusion of the particular operation, a message is written on the printer giving the number of permanent input and output errors found. If no errors are found, no message will be given.

The default values for error handling are that errors are not retried, and that only one permanent error is allowed.

2.1.3 Number of records

The number of records to be processed is specified through the keywords FILES and RECORDS.

A file is taken to be the information on a tape which is concluded by a tapemark, and a record is taken to be one physical record, which may be a tapemark.

The input information:

READ 5 FILES AND SEVEN RECORDS FROM UNIT 184

instructs AECOPY to read all the information up to and including the fifth tapemark, and then a further seven records past the fifth tapemark.

Either RECORDS or FILES may be specified. If neither RECORDS nor FILES is specified, the default value for primary operations is one file.

2.2 Listing

With primary operations, a summary listing of the input tape is given unless this listing is suppressed.

Suppression of the listing is through the keywords NOT, NO, NOR, NEITHER, WITHOUT combined with LIST and TALLY. Thus, instructions such as NO LIST or WITHOUT TALLYING will cause the summary to be suppressed.

The listing takes the form:

a b * S1, C * S2, ES3, T

where a is the cumulative total of records read during this primary operation up to the end of the line on which it occurs,

b is the number of records of size S1 bytes read consecutively,

C is the number of records of size S2 bytes read consecutively,

E signifies an error record of size S3 bytes,

T means that a tapemark has been read, and

S1, S2, S3 are record sizes in bytes.

One line of the listing is printed when a tapemark is read, or when the space given to the line for output is full.

An example of the listing is:

104 3 * 80, 100 * 800, T

137 6 * 50, E50, 25 * 50, T

138 T

Here, three files have been read. The first consists of three eighty byte records followed by one hundred eight hundred byte records followed by a tapemark.

The second file consists of six fifty byte records followed by one fifty byte record which was still found to be in error after the number of tries specified, followed by twenty five fifty byte records and a tapemark. The third file consists of a single tapemark.

The cumulative total signifies that there have been one hundred and four records read up to the end of the first file, one hundred and thirty seven records up to the end of the second file, and one hundred and thirty eight records read altogether during this particular operation.

2.3 Operations

The primary operations are Read, Copy and Print. When a magnetic tape record is read, the whole physical record is read into an area of core storage, and the Channel Status Word is checked to find if the record is in error, or if the record is a tapemark. The record size is calculated for use in listing, copying or printing.

Tape copying is carried out if the key verb COPY is used, but for a successful copy it is essential for the keyword TO or ONTO to appear following the COPY verb for assignment of the tape unit to be used for output. If the input list does not specify a unit for copying to, no copy operation will be carried out.

When tapes are copied, all the correct information on the tapes is copied exactly. Thus labels are copied intact, and the output tape is given the same label as the input tape.

If magnetic tape errors occur on the input tape, the actual record which is read into core is not found to be in error; for example, a parity error on the input tape is not carried over to core storage. When this record is copied to another tape unit, the record will no longer be recognised as an error when this output tape is subsequently read.

If a permanent input error is found during a copy operation, the message:

'INPUT ERRORS COPIED TO OUTPUT TAPE'

is written on the printer immediately. This is to ensure that the user is informed that the output tape is suspect if later error counts are lost because of the operator cancelling the program.

Tape printing can be done on EBCDIC (extended binary-coded-decimal interchange code) or in hexadecimal code. Printing is in EBCDIC by default. If hexadecimal printing is required, the keyword HEX must be used after the PRINT verb.

EBCDIC printing is done in eighty byte segments of the physical record, and hexadecimal printing uses forty byte segments of the physical record expanded to eighty bytes for printing.

3. SECONDARY OPERATIONS

The secondary operations allowed by AECOPY are:

REWIND

UNLOAD

ERASE GAP

END FILE (WRITE TAPE MARK)

BACK SPACE RECORDS

BACK SPACE FILES

FORWARD SPACE RECORDS

FORWARD SPACE FILES

SENSE

The keyword TIMES used with secondary operations specifies the number of times that the operation is to be carried out.

For example:

ENDFILE 180 20 TIMES

means that twenty tapemarks are to be written on unit 180.

Backspace files and Backspace records operations can be combined by use of the keywords FILES and RECORDS.

For example:

BACKSPACE 2 FILES AND 3 RECORDS ON 181

tells AECOPY to backspace 2 files on unit 181, and then to backspace 3 records on the same unit.

In the same way, forward space files and forward space records can be combined.

The default values for REWIND, UNLOAD, ERASE GAP, ENDFILE and SENSE are to carry out the operation once.

The default values for BACKSPACE and FORWARD SPACE are to move the tape one record.

4. INPUT TO THE PROGRAM

Instructions to AECOPY are given in English through the SYSIN data set. Any number of cards are allowed with any number of sentences or parts of sentences on each card, with the restric-

tions that words may not be continued from one card to another, and that numerals are restricted to four digits. The list is ended by any card with a slash (/) in Column 1.

AECOPY analyses the input list into four types of word (a word is any collection of symbols separated by blanks). These four types of word are verbs, key nouns, numerals and any other words.

Each operation attempted by AECOPY consists of the information given from one verb up to the last word before the following verb. This collection of information including a verb is referred to as a sentence. Once a verb, except the first, is found during the scanning of the input list, the information taken from the preceding sentence is used in an operation. For example: ENDFILE 180 5 TIMES READ 181. The 5 TIMES would refer to the preceding verb ENDFILE, with ENDFILE 180 5 TIMES being a sentence.

Once a numeral is found in the input list, a check is made of the word immediately following. If this next word is one of the key nouns (FILES, RECORDS, ERRORS and TIMES), the numeral is taken to refer to the key noun. If the numeral is not immediately followed by a key noun, the numeral is taken to be a magnetic tape unit. A hexadecimal number can also be taken as a magnetic tape unit, and OOE is taken as a special word.

For example:

READ 181 RECORDS 180

would mean to read 181 records from unit 180, while

READ 181 180 RECORDS

would mean to read 180 records from unit 181.

If the word found in the input list is not numeric, the first three letters of the word are tested against dictionaries held in AECOPY. If a word is immediately preceded by NOT, NO, NOR, NEITHER or WITHOUT, it is tested against the dictionary of negatives. Words without an immediately preceding negative are tested against the normal dictionary.

If a word is found in the dictionaries, appropriate action is taken, with the finding of a verb precipitating the operation designated by the previous sentence, and the letters FOR, WIT and PRI causing further letter checks. If a word is not found in the dictionaries, it is ignored. This leads to free form English, with the restriction that there must be no words interposed between a numeral and the key noun it refers to.

The concept of double units has been introduced for secondary operations. If a sentence specifies two magnetic tape units, the operation will be carried out on both units.

The instruction: REWIND 180 and 181

will result in a rewind of tape unit 180 followed by a rewind of tape unit 181.

At the conclusion of AECOPY, all tape units used during the program will be unloaded, unless the user wishes to keep the tapes at the last point reached. Automatic unloading is prevented by specifying NOREWIND in the parameter field of the EXEC statement.

This statement would then take the form:

```
// EXEC PGM =AECOPY, PARM = 'NOREWIND'
```

The default for this parameter is that all tape units used during AECOPY are unloaded at the end of the job.

5. USE OF AECOPY

5.1 Restrictions

The following restrictions apply:

(a) AECOPY is written in the Assembler language of IBM System/360 to run under the Operating System. All Input/Output is carried out through the IOCP subroutine (Richardson 1968) which requires a special Supervisor Call (see Appendix 1).

(b) Unit assignments for an installation using AECOPY must be:

009 Console Typewriter

5.2 Operator Instructions

Operator instructions are as follows:

(a) If the tape units referred to are not ready when the AECOPY Program starts, the message:

READY x x x

will be printed on the console, where xxx is the tape unit referred to.

(b) In the event of AECOPY being cancelled by the operator, the RESET button should be pressed on tape units being used before the program is cancelled. This will ensure that the Operating System will cope with subsequent use of these tape units.

6. CONCLUSIONS

AECOPY should be a useful program for any IBM System/360 installation which uses magnetic tapes extensively.

Its main advantages result from the differences between AECOPY and conventional magnetic tape programs – error handling, record format and English input.

Because of the flexible error handling, some persistent tape errors can be overcome if they are retried a sufficient number of times. If a tape contains readable information or information where individual errors may not be vital, a large number of permanent errors can be allowed so that all the information on the tape can be processed.

If a tape whose record format is not known is to be read, an instruction such as:

READ 184 100 FILES

will cause the tape on unit 184 to be read until one error is found, or until the occurrence of one hundred tapemarks.

The English input to the program allows a wide range of operations to be specified with no intervention necessary at the end of each file or at the start of each new operation. There is no limit to the number of operations which can be specified, the number of words per card in the input or the number of cards. There is no fixed format for words within the cards, except that words cannot be continued from one card to another.

With this simple input combined with the wide range of operations and error treatment possible, AECOPY should be more useful than many existing magnetic tape programs.

7. ACKNOWLEDGEMENTS

AECOPY is a modified version of the 7040 AECOPY program (Richardson 1966).

Development of this program would not have been possible without the unstinted assistance of Mr. D. J. Richardson, Head of the Applied Mathematics and Computing Section of the Australian Atomic Energy Commission, Research Establishment, Lucas Heights, N.S.W.

8. REFERENCES

Richardson, D.J. (1966). – AECOPY – A tape utilisation program for the IBM 7040 computer. Unpublished.

Richardson, D.J. (1968). – IOCP – An Input/Output control program for IBM 360 system computers. AAEC/TM483

APPENDIX 1

USE OF SVC 255, THE PARTICULAR SUPERVISOR CALL NEEDED BY AECOPY

The IOCP Subroutine needs a particular use for SVC 255. This supervisor call must set the Program Status Word to the Supervisor State.

One simple way to incorporate this use of SVC 255 into the Operating System is to add four extra statements to the module IEAAIH in SYS1.NUCLEUS.

The modified coding is:

```
***     FIRST LEVEL SVC HANDLER  ***
IEAASCOO DS    OH                                  07620000
         CLI   SVCOPSW+3,255     IS IT SVC 255?
         BNE   *+12              CONTINUE IF NOT
         NI    SVCOPSW+1,X'FE' SET PSW TO SUPV
         LPSW  SVCOPSW  LOAD PSW and RETURN
         STM   0,15,SVCSAV                         07640000
```

Note: The four additional statements are to be inserted after Source Statement Number 07620000 in the Operating System Release 14 Source.

APPENDIX 2

ERROR MESSAGES GIVEN BY THE AECOPY PROGRAM

The following error messages are given by AECOPY:

UNITS ARE NOT KNOWN TO AECOPY PROGRAM

An input sentence specifying a primary operation does not have tape units specified.

INPUT ERRORS COPIED TO OUTPUT TAPE

Errors were found on the input tape during a copy operation.

FOUND TAPE ERRORS WHEN WRITING ON OUTPUT TAPE

Errors were found on the output tape during a copy operation.

TAPE ON UNIT x x x SHOULD NOT BE FILE PROTECTED

This message to the operator means that a copy operation has been specified to a tape which is file protected. The operator must mount a tape which is not file protected or else cancel AECOPY.

NUMBER OF ERRORS ON INPUT TAPE WAS x x x

A count of the permanent errors found on the tape read.

NUMBER OF ERRORS ON OUTPUT TAPE WAS x x x

A count of the permanent errors found on the tape which was copied onto.

AN INVALID OPERATION HAS BEEN SPECIFIED

The verb in a secondary operation is incorrect.

UNIT IS NOT KNOWN TO PROGRAM

A sentence specifying a secondary operation does not have a tape unit specified.

NUMBER OF CHANNEL ERRORS WAS x x x

This message gives the number of incorrect Channel Status Words found during execution. These errors are always retried. This message should only appear if there are hardware errors.

WARNING: SHORT RECORDS: UNPREDICTABLE RESULTS

AECOPY will cope with the smallest possible records (one byte) for all normal operations. However, if a very small record is found to be in error, and this error record is extremely close to the preceding record without sufficient interblock gap, unpredictable results may occur if a retry of errors is specified. This message will only occur if very short error records are found during an operation in which errors are retried.

APPENDIX 3

ALLOWABLE WORDS FOR INPUT TO AECOPY

(a) Normal Dictionary

Verbs

READ

COPY

PRINT

BACK SPACE

FORWARD SPACE

ERASE GAP

SENSE

REWIND

ENDFILE

UNLOAD

Key Nouns

FILES

RECORDS

ERRORS

TIMES

Other Words

LIST	SIX	NO
TALLY	SEVEN	NEITHER
ONE	EIGHT	WITHOUT
TWO	NINE	PRINTER
THREE	TEN	HEXADECIMAL
FOUR	NOT	TO
FIVE	NOR	ONTO

(continued)

(b) Dictionary of Negatives

(action is taken if one of these words immediately follows a negative)

Verbs

READ

COPY

REWIND

END FILE

BACK SPACE

UNLOAD

ERASE GAP

FORWARD SPACE

SENSE

Other Words

LIST

TALLY

HEXADECIMAL

APPENDIX 4

EXAMPLE OF THE USE OF AECOPY

```
//MMM       JOB '          ,0107',D.A.PAYNE,MSGLEVEL=1
**JST  69.006  10.51.43 50268
//  EXEC PGM=AECOPY
//SYSPRINT  DD  SYSOUT=A
//SYSIN  DD  *
IEF236I ALLOC. FOR MMM
IEF237I SYSIN     ON 00C
```

```
READ 2 FILES AND THREE RECORDS 180 REWIND UNIT 180


    19      17*800,1*400,T
    20      T
    21      E418,
                      **********    NUMBER OF ERRORS ON  INPUT TAPE WAS      1  **********
  COPY 2 FILES 1 REC FROM 180 TO 181


ENDFILE 181 SEVEN TIMES, REWIND 181.


    19      17*800,1*400,T
    20      T
 INPUT ERRORS COPIED TO OUTPUT TAPE
    21      E418,
                      **********    NUMBER OF ERRORS ON  INPUT TAPE WAS      1  **********
READ 9 FIL 181. BACKSPACE 2 FIL 23 RECORDS 181


    19      17*800,1*400,T
    20      T
    22      1*413,T
    23      T
    24      T
    25      T
    26      T
    27      T
    29      T
PRINT 4 RECORDS 181  BACKSPACE 4 REC 181


 TXT              ) =     F  OF     /  F      O =       O =      /  F   F% O     0031
 TXT             F      OF%    -  F             O =      O =     F            0032
 TXT   H          /  F          C =        O =     F  OF    /  G      O =      0033
 TXT                 ) =     /  F    F4 OF      OF4K I I    I  O =    I  O     0034
 TXT              =   ))          OB       O       OB       OB REA  OBUCOP     0035
 TXT              OC LIS  OC TAL  OC FIL  OC REC  OC ERR  OC TIM  OC ONE     0036
 TXT              OC TWO  OC THR  OC FOL  OC FIV  OC SIX  OC SEV  OC ETG     0037
 TXT              OC NIN  OCOTEN  OC NOT  OCMNCR  OCMNC   OCMNEI  OCMWIT     0038
 TXT              OC BAC  OD ERA  OD FOR  OD SEA  OD TO   OC CNT  OC REW     0039
 TXT   &          OD .$.  O  END  OC2PRT  OD UNL  OD HEX  OG REA  OC COP     0040


 TXT              OD REW  OD LIS  OG TAL  OG END  OD BAC  OD UNL  OD ERA     0041
 TXT              OD FORW OD SEN  OD .$.  OG HEX  OG                          0042
 TXT   Y                                                                      0043
 TXT                              -                 &               &   &     0044
 TXT             -  *                             -         &   &-            0045
 TXT                                                                          0046
 TXT   H                          AN INVALID OPERATION HAS BEEN SPECIFIED     0047
 TXT               UNIT IS NOT KNOWN TO PROGRAM          -                    0048
 TXT                                                                          0049
 TXT                                                              .$.         0050
```

```
TXT                                                                              0051
TXT                                                                              0052
TXT                                                                              0053
TXT         0000                                                                 0054
TXT            CRL0000                                                           0055
TXT                                                         ********             0056
TXT                           FIL REC ERR TIM          FORW    WITHOUPR          0057
TXT         INTE                                                                 0058
RLD                                                                              0059
RLD                                                                              0060


ESD                                                                              0061
ESD         READTAPE    ,    YAECOPY        IOCP                                 0001
TXT             &        &    LK    <K      FK  B FK  6 FK     F    K            0002
TXT           K     K    FK     K     K ; K     FK     K  S  K|                  0003
TXT             K  F F&&  &   &   N   F   +N    F   8N    0    K                 0004
TXT              K     K     K               &. K S &                            0005
TXT            &     &-- &                   0          0                        0006
TXT                                       -- &     K        F     0              0007
TXT    &        N    F   -    ^  N   0   K        0          0                   0008
TXT                  K    K    K    K     0          &&   &    &  &&             0009


     4        4*800,
PRINT 4 REC 131 IN HEXADECIMAL,  READ 5 FILES 181 WITHOUT LISTING


02E3E7E340000658404000384040C0C158F0CB7E05EF4680C64847F0C60091FFCB614710C6904110
CA2A58F0CB7E05EF5810CA2658F0CB7E05EF91FFCB6147C0C6004680C66C47F040404040F0F0F3F1
02E3E7E3400006934040003940400CC1C6005880CB2247F0C66C91FFCB6047C0C6EC923FCA465870
CB1E4110CA2A58F0CB7E05EF5810CA2658F0CB7E05EF4670C6A89237CA4691FF40404040F0F0F3F2
02E3E7E340000C840400038404C0001CB6147C0C6005880CB224110CA2A58F0CB7E05EF5810CA26
58F0CB7E05EF4680C6D047F0C60C91FFCB614710C7184110CA2A58F0CB7E05EF40404040F0F0F3F3
02E3E7E3400007004040003840400C01581 0CA2658F0CB7E05EF91FFCB6147C0C6004680C6F447F0
C6005880CB2247F0C6F40227C9AEC9FF4110C98A58F0CB7E05EF5810C9865 8F040404040F0F0F3F4
02E3E7E34000073840400039404C0C01CB7E05EF47F0C4CE92FFCB6992FFCB6747F0C26892FFCB62
47F0C01297 00CB6947F0C26892FFCB6F47F0C268D9C5C14047F0C2E4C3D6D740404040F0F0F3F5
02E3E7E3400007704040003840400C0147F0C31003C9E24047F0C3205 3C1D34047F0C320C6C9C340
47F0C324D9C5C34047F0C33CC5D5D94047F0C354E3C9D44047F0C36 8D6C5C540404040F0F0F3F6
02E3E7E34000074840400038404C0CC147F0C380E3E6D64047F0C38CE3C8D94047F0C394C6D6E440
47F0C39CC6C9E54047F0C3A4E2C5E74047F0C3ACE2C5E54047F0C3B4C5C9C740404040F0F0F3F7
02E3E7E34000007E0404000384040CCC147F0C3BCD5C9D54047F0C3C4E3C5D54047F0C3CCD5D6E340
47F0C3D4D5D6D94047F0C3D4D5D64C4047F0C3D4D5C5C94047F0C3D4E6C9E340404040F0F0F3F8
02E3E7E3400081840400038404C0CC147F0C3DCC2C1C34047F0C45AC5D9C14047F0C462C6D6C940
47F0C46AE2C5D54047F0C490E3D64C4047F0C3EAD6D5E34047F0C3EAD9C5E640404040F0F0F3F9
02E3E7E3400008504040003840400C0147F0C44A4B5B4B4047F0C012C5D5C44047F0C3F2D7D9C940
47F0C418E4D5D34047F0C4F2C8C5E74047F0C73E09C5C14047F0C480C3D6D740404040F0F0F4F0


02E3E7E3400008834040003F4040CCC147F0C480D9C5E64047F0C480D3C9E24047F0C75AE3C1C340
47F0C75AC5D5C44047F0C480C2C1C34047FCC480E4D5D34047F0C480C5D9C140404040F0F0F4F1
02E3E7E34000008C0404000244040C0C147F0C480C6D6D9E647F0C480E2C5D54047F0C4804B5B4B40
47F0C74AC8C5E74047F0C7524040404040404040404040404040404040404040404040F0F0F4F2
02E3E7E3400085840400038404C0CC1C0C0C0CC00000000000000000000000000000000000000000
00000000000000C00CC000000CC0C00C0CC0C00000000000000000000000000040404040F0F0F4F3
02E3E7E34000092140400038404C0CC1000000000000000000000000000000006000093400000000
0000000000000000000009500C000CCCCC0CCCCC000000000002000A50200000504040404F0F0F4F4
02E3E7E340000958404000384040C0C16000C95C0000000000000000000000E000009780000000
C000000000000000000983CC00C0600C000C119000A5020000050600009 8C0000000040404040F0F0F4F5
02E3E7E34000099 3434003840400CC1C000C0C000000000E000019A8 000000000000000000000
```

```
4*800,
READ 2 FILES 11 RECORDS 181 FIVE ERRORS ALLOWED  REW 181
```

```
    4       T
   13       9*23.
READ 11 FILES 131 2 ERRORS ALLOWED TRY 3 TIMES       REW 181


   19       17*300,1*400,T
   20       T
   22       1*413,T
   23       T
   24       T
   25       T
   26       T
   27       T
   28       T
   45       12*23,3*33,1*50,T
   46       T
FORWARD SPACE 2 FILES AND 3 RECORDS 181 TWO TIMES  PRINT HEX 1 REC 181


       REWIND 131 AND 181


000000000018404040C2C2C2C2C2C2C2C2C2C2C2C2C2C2C2C2C2C24040F8F9404040404040404040404040
4040404040404040404040404040404040404040404040404040404040404040404040404040404040404040


    1       1*23,
```

```
IEF285I   SYSOUT                                        SYSOUT
IEF285I   VOL SER NOS=
**EOS          10.54.25 00162 SECS 0000
**EOJ MMM      11.54.27 0.05 HOURS
```

APPENDIX 5

SOURCE LISTING OF THE AECOPY PROGRAM

```
//NNN      JOB '          ,CICT',D.A.PAYNE,MSGLEVEL=1
**JST  69.029  11.29.52 51SCC
//  EXEC ASMFC
//ASM     EXEC  PGM=IEUASM                                              00000010
//SYSLIB DD    DSNAME=SYS1.MACLIB,DISP=OLD                             00000020
//SYSUT1 DD DSNAME=SYSUT1,DISP=OLD                                     00000030
//SYSUT2 DD DSNAME=SYSUT2,DISP=OLD                                     00000040
//SYSUT3 DD DSNAME=SYSUT3,DISP=OLD                                     00000050
//SYSPRINT DD  SYSOUT=A                                                00000060
//SYSPUNCH DD  UNIT=SYSCP                                              00000070
//ASM.SYSIN  DD  *
IEF236I ALLOC. FOR NNN      ASM
IEF237I SYSLIB   ON 190
IEF237I SYSUT1   ON 190
IEF237I SYSUT2   ON 290
IEF237I SYSUT3   ON 191
IEF237I SYSPUNCH ON 00D
IEF237I SYSIN    ON 00C
```

SYMBOL	TYPE	ID	ADDR	LENGTH	LD ID
INPUT1	SD	01	000000	000D91	
IOCP	ER	02			
AECOPY	ER	03			

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                     FC1JAN68   1/29/69

000000                                1 INPUT1   START
000000 05C0                           2 A1       BALR  12,0                          COUNTER INFORMATION INTO R12
000002                                3          USING *,12                          TELL ASSEMBLER TO USE R12
000002 90EC D00C            0000C     4          STM   14,12,12(13)                  SAVE REGISTERS
000006 5000 C9BA            00CBC     5          ST    13,SAVEA+4                    GET ADDRESS OF CALLING SAVEAREA
00000A 4130 C9B6            00CB8     6          LA    3,SAVEA                       NEW SAVEAREA ADDRESS INTO R3
00000E 5030 D008            0000C     7          ST    3,8(0,13)                     NEW ADDRESS INTO OLD SAVEAREA
000012 1803                           8          LR    13,3                          NEW ADDRESS INTO R 13
000014 4150 0001            00001     9          LA    5,1                           COUNTER
000018 5860 1000            00000    10          L     6,0(0,1)                      A(PARMLIST) INTO R6
00001C D501 6000 CC5E 00000 00C60    11          CLC   0(2,6),ZERO                   BYTE COUNT ZERO?
000022 4770 C0E8            000EA    12          BNE   SKIPAUTO                      NO-CHECK FOR NOREW
                                     13 A3       OPEN  (CARDIN,,MINEOUT,(OUTPUT))
000026 0700                          14+         CNOP  0,4
000028 4510 C032            00034    15+A3       BAL   1,*+12 LOAD REG1 W/LIST ADDR.
00002C 00                            16+         DC    AL1(0) OPTION BYTE
00002D 000B7C                        17+         DC    AL3(CARDIN) DCB ADDRESS
000030 8F                            18+         DC    AL1(143) OPTION BYTE
000031 000BCC                        19+         DC    AL3(MINEOUT) DCB ADDRESS
000034 0A13                          20+         SVC   19 ISSUE OPEN SVC
                                     21          CNTRL MINEOUT,SK,1                ***MACRO
000036 4110 CBCA            00BCC    22+         LA    1,MINEOUT LOAD PARAMETER REG 1
00003A 4100 0001            00001    23+         LA    0,1(0,0) LOAD PARAMETER REG 0
00003E 1300                          24+         LCR   0,0 INDICATE SK ACTION
000040 58F1 0054            00054    25+         L     15,84(1,0) LOAD CONTROL ROUT.ADDR
000044 05EF                          26+         BALR  14,15 LINK TO CONTROL ROUT.
000046 D24F CAD6 C82B 00AD8 0082D    27 READ     MVC   INPUT(80),CLEAR             CLEAR INPUT AREA
                                     28          GET   CARDIN,INPUT                ***MACRO
00004C 4110 CB7A            00B7C    29+         LA    1,CARDIN LOAD PARAMETER REG 1
000050 4100 CAD6            00AD8    30+         LA    0,INPUT LOAD PARAMETER REG 0
000054 58F0 1030            00030    31+         L     15,48(0,1) LOAD GET ROUTINE ADDR.
000058 05EF                          32+         BALR  14,15 LINK TO GET ROUTINE
00005A 9561 CAD6      00AD8          33          CLI   INPUT,X'61'                 / IN FIRST COLUMN ?
00005E 4780 C310            00312    34          BE    FINISHED                    BRANCH FOR A CONTROL CARD
                                     35          PUT   MINEOUT,INPUT               ***MACRO
000062 4110 CBCA            00BCC    36+         LA    1,MINEOUT LOAD PARAMETER REG 1
000066 4100 CAD6            00AD8    37+         LA    0,INPUT LOAD PARAMETER REG 0
00006A 58F0 1030            00030    38+         L     15,48(0,1) LOAD PUT ROUTINE ADDR.
00006E 05EF                          39+         BALR  14,15 LINK TO PUT ROUTINE
                                     40          CNTRL MINEOUT,SP,3                ***MACRO
000070 4110 CBCA            00BCC    41+         LA    1,MINEOUT LOAD PARAMETER REG 1
000074 4100 0003            00003    42+         LA    0,3(0,0) LOAD PARAMETER REG 0
000078 58F1 0054            00054    43+         L     15,84(1,0) LOAD CONTROL ROUT.ADDR
00007C 05EF                          44+         BALR  14,15 LINK TO CONTROL ROUT.
00007E 4160 0003            00003    45          LA    6,3                         3 INTO R6
000082 4150 0001            00001    46          LA    5,1                         1 INTO R5 AS A COUNTER
000086 4130 CAD6            00AD8    47          LA    3,INPUT                     R3 CONTAINS ADDRESS OF INPUT
00008A 1B35                          48          SR    3,5                         BACKSPACE ONE TEMPORARILY
00008C 1A35                          49 COMPR    AR    3,5                         ONE PLACE FURTHER ALONG INPUT
00008E 9540 3000      00000          50          CLI   0(3),X'40'                  IGNORE
000092 4780 C08A            0008C    51          BE    COMPR                       *       BLANKS
000096 1B44                          52          SR    4,4                         CLEAR R4
000098 4120 CC2E            00C30    53          LA    2,HOLDNO                    R2 CONTAINS ADDRESS OF HOLDNO
00009C D202 CB86 3000 00B88 00000    54          MVC   HOLDWORD(3),0(3)            THREE CHARACTERS INTO HOLDWORD
0000A2 91FF CCF1      00CF3          55          TM    COUNTSW,X'FF'               IS THERE A NUMBER WAITING ?
```

```
0000A6 4710 C178          CC17A    56           BC    TESTNUM          YES - GO TO TESTNUM
0000AA 91F0 C886    (0888          57 CONTINUE  TM    HOLDWORD,X'F0'   IS THIS CHARACTER NUMERIC ?
0000AE 47C0 C2C2          CC2C2    58           BC    12,ALPHA         NO  - GO TO ALPHA
0000B2 5030 CC52          CCC54    59           ST    3,SAVE3          YES - SAVE THE PLACE IN INPUT
000086 D203 CC5A C886 CCC5C CC888  60           MVC   SAVEHOLD(4),HOLDWORD  SAVE HOLDWORD
0000BC 91F0 3000    00000         61 NUMTEST   TM    0(3),X'F0'       IS THIS CHARACTER NUMERIC ?
0000C0 47C0 C204          CC206    62           BC    12,HEXTEST       NO - GO AND TEST FOR HEX
0000C4 D200 2000 3000 CCCCC CCCCC  63           MVC   0(1,2),0(3)      YES- MOVE ONE DIGIT TO HOLDNO
0000CA 1A45                        64           AR    4,5              ADD 1 TO DIGIT COUNT
0000CC 1A25                        65           AR    2,5              ADD 1 TO PLACE IN HOLDNO
0000CE 1A35                        66           AR    3,5              ADD 1 TO PLACE IN INPUT
0000D0 9540 3000          00000    67           CLI   0(3),X'40'       IS THIS CHARACTER BLANK ?
0000D4 4770 C1D4          CC1C6    68           BNE   COMTEST          NO - TEST FOR COMMA
0000D8 5940 CCD6          CCDC8    69 CK        C     4,=X'00000001'   SINGLE DIGIT ?
0000DC 4770 C118          CC11A    70           BNE   TWO1             NO - TRY TWO
0000E0 D200 CC3D CC2E CCC3F CCC3C  71           MVC   HOLDNO2+3(1),HOLDNO  YES -MOVE DIGIT TO HOLDNO2
0000E6 47F0 C142          CC144    72           B     CORRECT          ACCEPT THIS NUMBER
0000EA 1A65                        73 SKIPAUTO  AR    6,5              1 TO COUNTER
0000EC 9540 6001          00001    74           CLI   1(6),X'40'       BLANK?
0000F0 4780 CCE8          CCCEA    75           BE    SKIPAUTO         YES-NEXT CHARACTER
0000F4 D504 6001 CD4A CCCC1 CCD4C  76           CLC   1(5,6),=C'NOREW'  NO REWIND?
0000FA 4770 C026          CCC28    77           BNE   A3               NO - SKIP LIST
0000FE 92FF CCFC          CCCFE    78           MVI   AUTOREW,X'FF'    YES-TURN ON SKIP SWITCH
000102 47F0 C026          CCC28    79           B     A3               BACK TO PROCESSING
000106 9568 3000          00000    80 COMTEST   CLI   0(3),X'6B'       COMMA ?
00010A 4780 CCD6          CCCD8    81           BE    CK               YES - NUMBER ENDS CORRECTLY
00010E 9548 3000          00000    82           CLI   0(3),X'4B'       FULL STOP ?
000112 4780 CCD6          CCCD8    83           BE    CK               YES-NUMBER ENDS CORRECTLY
000116 47F0 CCBA          CCBBC    84           B     NUMTEST          NO - GO AND TEST NEXT DIGIT
00011A 5940 CCDA          CCDCC    85 TWO1      C     4,=X'00000002'   TWO DIGIT NUMBER ?
00011E 4770 C12A          CC12C    86           BNE   THREE           NO - TRY THREE
000122 D201 CC3C CC2E CCC3E CCC3C  87           MVC   HOLDNO2+2(2),HOLDNO  YES- MOVE 2 DIGITS TO HOLDNO2
000128 47F0 C142          CC144    88           B     CORRECT          ACCEPT THIS NUMBER
00012C 5940 CCDE          CCD1C    89 THREE     C     4,=X'00000003'   THREE DIGIT NUMBER ?
000130 4770 C13C          CC13E    90           BNE   FOUR             NO - TRY FOUR
000134 D202 CC3B CC2F CCC3D CCC3C  91           MVC   HOLDNO2+1(3),HOLDNO  YES - MOVE 3 DIGITS TO HOLDNO2
00013A 47F0 C142          CC144    92           B     CORRECT          ACCEPT THIS NUMBER
00013E D203 CC3A CC2F CCC3C CCC3C  93 FOUR      MVC   HOLDNO2(4),HOLDNO  MOVE 4 DIGITS TO HOLDNO2
000144 D303 CC3A CC3E CCC3C CCC40  94 CORRECT   MVZ   HOLDNO2(4),HOLDNO3  FIX UP ZONES IN HOLDNO2
00014A F233 CC3A CC3A CCC3C CCC3C  95           PACK  HOLDNO2(4),HOLDNO2(4)  PACK THE COUNTS NUMBER
000150 4F90 CC36          CCC38    96           CVB   9,HOLDNO1        R9 CONTAINS COUNTS IN BINARY
000154 D203 CC3A CC3E CCC3C CCC40  97           MVC   HOLDNO2(4),HOLDNO3  RESTORE HOLDNO2
00015A 4120 CC2E          CCC3C    98           LA    2,HOLDNO         RESTORE POINTER TO HOLDNO2
00015E 1B44                        99           SR    4,4              CLEAR  R4
000160 1299                       100           LTR   9,9              DOES R 9 CONTAIN ZERO ?
000162 47C0 C16C          CC16E   101           BC    12,ZEROTEST      BRANCH IF NEGATIVE OR ZERO
000166 92FF CCF1    (0CF3         102 CORRCVER MVI    COUNTSW,X'FF'    TURN ON COUNT SWITCH
00016A 47F0 C08A          CCCPC   103           B     COMER            SKIP INPUT LIST UNTIL A BLANK
00016E 91FF CCEA    00CEC         104 ZEROTEST TM     AECOPYSW,X'FF'   AECOPY OPERATION ?
000172 4710 C164          CC166   105           BC    CORRCVER         BRANCH IF AECOPY
000176 47F0 C08A          CCC8C   106           B     COMER            IGNORE THIS COUNT REQUEST
00017A 9200 CCF1    (0CF3         107 TESTNUM  MVI    COUNTSW,X'00'    TURN COUNT-SWITCH OFF
00017E D503 C886 CD12 (0888 CCD14 108           CLC   HOLDWORD(4),=C'FIL '  FILES ?
000184 4780 C286          CC288   109           BE    FREEZFIL         YES - BRANCH
000188 D503 C886 CD16 (0888 CCD18 110           CLC   HOLDWORD(4),=C'REC '  RECORDS ?
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                 FCIJAN68    1/29/69
00018E 4780 C292            CC294   111            BE    FREEZREC                 YES - BRANCH
000192 D503 CB86 CD1A 00B88 C0D1C   112            CLC   HOLDWORD(4),=C'ERR '     ERRORS ?
000198 4780 C29E            0C2A0   113            BE    FREEZERR                 YES - BRANCH
00019C D503 CB86 CD1E 00B88 CCD20   114            CLC   HOLDWORD(4),=C'TIM '     TIMES ?
0001A2 4780 C2A6            002A8   115            BE    FREEZTIM                 YES - BRANCH
0001A6 5830 CC52            00C54   116            L     3,SAVE3                  RESTORE POINTER-START OF WORD
0001AA D203 CB86 CC5A 00B88 00C5C   117            MVC   HOLDWORD(4),SAVEHOLD     RESTORE HOLDWORD
0001B0 4E90 CB7E            00B80   118            CVD   9,DECWORK                *  ASSUME COUNTS REFERS TO A
0001B4 5890 CB82            00B84   119            L     9,DECWORK+4              *  UNIT, AND CONVERT BINARY TO
0001B8 8890 0004            00004   120            SRL   9,4(0)                   *  CORRECT FORM FOR ICCP
0001BC 91FF CCEA      00CEC         121 AECOPT     TM    AECOPYSW,X'FF'           AECOPY REQUESTED ?
0001C0 4710 C1E8            001EA   122            BO    TESTTC                   YES - BRANCH
0001C4 5090 CC72            00C74   123            ST    9,NEWUNIT                NUMBER TO NEWUNIT
0001C8 D503 CC76 CC5E 00C78 00C60   124            CLC   WAITUNIT(4),ZERO         WAIT UNIT EMPTY ?
0001CE 4780 C1D8            001DA   125            BE    CLEARNEW                 YES - BRANCH
0001D2 92FF CCEB      00CED         126            MVI   ANDSW,X'FF'              TURN  AND-SWITCH ON
0001D6 47F0 C528            0052A   127            B     EXEC                     GO AND EXECUTE SECONDARY CP
0001DA D203 CC76 CC72 00C78 00C74   128 CLEARNEW   MVC   WAITUNIT(4),NEWUNIT      MOVE NEWUNIT INTO WAIT
0001E0 D203 CC72 CC5E 00C74 00C60   129            MVC   NEWUNIT(4),ZERO          CLEAR NEWUNIT
0001E6 47F0 C2B2            002B4   130            B     ACTNUM                   GET ANOTHER WORD
0001EA 91FF CCF6      00CF8         131 TESTTC     TM    TCSW,X'FF'               TO-SWITCH ON ?
0001EE 47C0 C1FC            001FE   132            BC    12,PUTFROM               NO - BRANCH
0001F2 92FF CCF2      00CF4         133            MVI   COPYSW,X'FF'             YES - TURN COPY-SWITCH ON
0001F6 5090 CCBA            00CBC   134            ST    9,TCUNIT                 ACCEPT UNIT AS TCUNIT
0001FA 47F0 C2B2            002B4   135            B     ACTNUM                   GET ANOTHER WORD
0001FE 5090 CC8E            00C90   136 PUTFROM    ST    9,FROMUNIT               ACCEPT AS FROMUNIT
000202 47F0 C2B2            002B4   137            B     ACTNUM                   GET ANOTHER WORD
000206 9130 3000      00000         138 HEXTEST    TM    0(3),X'30'               TEST FOR 'C' IN ZONE
00020A 4750 C2B2            002B4   139            BC    5,ACTNUM                 DISCARD WORD IF NOT HEX
00020E 1B99                         140 HEXOVER    SR    9,9                      CLEAR COUNT REGISTER
000210 4393 0000            00000   141            IC    9,0(3)                   INSERT ONE HEX CHARACTER IN R9
000214 5A90 CD22            00D24   142            A     9,=X'00000039'           CONVERT TO DECIMAL
000218 4293 0000            00000   143            STC   9,0(3)                   REPLACE THIS DIGIT IN INPUT
00021C 5080 CC56            00C58   144            ST    8,SAVER8                 SAVE R 8
000220 1883                         145            LR    8,3                      USE R8 TO TEST PLACE OF HEX
000222 5B80 CC52            00C54   146            S     8,SAVE3                  TEST PLACE OF HEX DIGIT
000226 5580 CD0A            00D0C   147            CL    8,=X'00000002'           THIRD DIGIT HEX ?
00022A 4780 C254            00256   148            BE    HEXOK                    YES - ACCEPT HEX WORD AS UNIT
00022E 5580 CD06            00D08   149            CL    8,=X'00000001'           SECOND DIGIT HEX ?
000232 4770 C2B2            002B4   150            BNE   ACTNUM                   NO - DISCARD THIS WORD
000236 1A35                         151            AR    3,5                      NEXT PLACE IN INPUT
000238 91F0 3000      00000         152            TM    0(3),X'F0'               NUMERIC ?
00023C 4710 C254            00256   153            BO    HEXOK                    YES - ACCEPT HEX WORD
000240 9130 3000      00000         154            TM    0(3),X'30'               HEX ?
000244 4750 C2B2            002B4   155            BC    5,ACTNUM                 NO - DISCARD THIS WORD
000248 1B99                         156            SR    9,9                      YES - CLEAR R9
00024A 4393 0000            00000   157            IC    9,0(3)                   INSERT HEX CHARACTER INTO R9
00024E 5A90 CD22            00D24   158            A     9,=X'00000039'           CONVERT ZONE TO DECIMAL
000252 4293 0000            00000   159            STC   9,0(3)                   REPLACE CHARACTER IN INPUT
000256 5830 CC52            00C54   160 HEXOK      L     3,SAVE3                  POINTER BACK TO START OF WORD
00025A 5880 CC56            00C58   161            L     8,SAVER8                 RESTORE R 8
00025E D202 CC3B 3000 00C3D 00000   162            MVC   HOLDNO2+1(3),0(3)        PUT HEX NUMBER IN HOLDNO2
000264 D303 CC3A CC3E 00C3C 00C40   163            MVZ   HOLDNO2(4),HOLDNO3       FIX UP ZONES IN HOLDNO2
00026A F233 CC3A CC3A 00C3C 00C3C   164            PACK  HOLDNO2(4),HOLDNO2(4)    PACK HOLDNO2
000270 5890 CC3A            00C3C   165            L     9,HOLDNO2                PACKED NUMBER INTO R9
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
000274 8890 0004              CCCC4  166           SRL   9,4(0)          GET RID OF 4-BIT SIGN
000278 D203 CC3A CC3E CC3C CCC4C 167           MVC   HCLDNC2(4),HCLDNC3 RESTORE HOLDNO2
00027E 4120 CC2E              CCC30 168           LA    2,HCLDNC        RESTORE POINTER TO HOLDNC START
000282 1B44                         169           SR    4,4             CLEAR R4
000284 47F0 C1BA              CC1BC 170           B     AECCPT          GO TO UNIT TEST
000288 5090 CC46              CCC48 171 FREEZFIL  ST    9,SAVE7         ACCEPT COUNTS AS FILES
00028C 92FF CCEC        CCCEE       172           MVI   FILSW,X'FF'     TURN FILE SWITCH ON
000290 47F0 C2B2              CC2B4 173           B     NCTNUM          GET ANOTHER WORD
000294 5090 CC4A              CCC4C 174 FREEZREC  ST    9,SAVE8         ACCEPT COUNTS AS RECORDS
000298 92FF CCE9        CCCEF       175           MVI   RECSW,X'FF'     TURN REC SWITCH ON
00029C 47F0 C2B2              CC2B4 176           B     NCTNUM          GO AND GET ANOTHER WORD
0002A0 5090 CC4E              CCC50 177 FREEZERR  ST    9,SAVE11        ACCEPT COUNTS AS ERRORS
0002A4 47F0 C2B2              CC2B4 178           B     NCTNUM          GET ANOTHER WORD
0002A8 5090 CC42              CCC44 179 FREEZTIM  ST    9,SAVE6         ACCEPT COUNTS AS TIMES
0002AC 92FF CCEF        CCCF1       180           MVI   TIMSW,X'FF'     TURN TIMES SWITCH ON
0002B0 47F0 C2B2              CC2B4 181           B     NCTNUM          GET ANOTHER WORD
0002B4 1A35                         182 NCTNUM    AR    3,5             NEXT PLACE IN INPUT
0002B6 9540 3000        CCCCC       183           CLI   0(3),X'40'       BLANK ?
0002BA 4770 C2B2              CC2P4 184           BNE   NCTNUM          NO-KEEP LOOKING FOR A BLANK
0002BE 47F0 C09A              CCC8C 185           B     CONFR           YES- GET READY FOR NEXT WORD
0002C2 91FF CCEE        CCCF0       186 ALPHA     TM    NCTSW,X'FF'     NCT SWITCH ON ?
0002C6 4710 C2CC              CC2CE 187           BO    NCTLCCK         YES - LOOK UP NCT LIBRARY
0002CA 47F0 C2F2              CC2F2 188           B     LCOKUP          NO  - LOOK UP NORMAL LIBRARY
0002CE 9200 CCEE        CCCFC       189 NCTLCCK   MVI   NCTSW,X'00'     TURN NCT SWITCH OFF
0002D2 4170 C94A              CC94C 190           LA    7,NCTLIB        R7 POINTS TO NCT LIBRARY
0002D6 41A0 0008              CCCC8 191           LA    10,8            R10 HAS WIDTH OF DOUBLE ENTRY
0002DA 41B0 0068              CCC68 192           LA    11,104          WIDTH OF NCT LIBRARY
0002DE 1A87                         193           AR    11,7            R11 POINTS TO END OF NCTLIB
0002E0 D503 7000 C886 C0000 CCB88 194 NLOOK     CLC   0(4,7),HCLDWORD IS WORD = LIBRARY WORD ?
0002E6 4780 7004              CCCC4 195           BE    4(0,7)          YES - BRANCH
0002EA 877A C2DE              CC2EC 196           BXLE  7,10,NLCCK      NO - KEEP LOOKING IN LIBRARY
0002EE 47F0 C2B2              CC2B4 197           B     NCTNUM          WORD NOT FOUND - GET ANOTHER
0002F2 4170 C832              CC834 198 LCCKUP    LA    7,LIB           R7 POINTS TC NORMAL LIBRARY
0002F6 41A0 0008              CCCC8 199           LA    10,8            R10 HAS WIDTH OF DOUBLE ENTRY
0002FA 58B0 CC26              CCC2E 200           L     11,=X'00000118' WIDTH OF NORMAL LIBRARY
0002FE 1A87                         201           AR    11,7            R11 POINTS TC END OF LIBRARY
000300 D503 7000 C896 C0000 CCB88 202 LOOK      CLC   0(4,7),HCLDWORD IS WORD = LIBRARY WORD
000306 4780 7004              CCCC4 203           BE    4(0,7)          YES - BRANCH
00030A 877A C2FE              CC3C0 204           BXLE  7,10,LCCK       NO - KEEP LOOKING IN LIBRARY
00030E 47F0 C2B2              CC2B4 205           B     NCTNUM          WORD NOT FOUND - GET ANOTHER
000312 91FF CCF0        CCCF2       206 FINISHED  TM    CPSW,X'FF'      IS THERE A WAITING CPERATION ?
000316 4710 C378              CC37A 207           BO    LASTEX          YES - GO TO LAST EXECUTION
00031A 91FF CCFC        CCCFE       208 FINISH    TM    AUTCREW,X'FF'   AUTOMATIC REWIND WANTED ?
00031E 4710 C35E              CC360 209           BO    FINISHX         NO- SKIP
000322 D203 CCD2 CC5E CCCD4 CCC60 210           MVC   TABLE+64(4),ZERO ENSURE WIND-UP
000328 4150 0004              CCCC4 211           LA    5,4             *  PREPARE REGISTERS
00032C 4170 CC92              CCC94 212           LA    7,TABLE         *
000330 D207 CABE CACE CCACC CCADC 213           MVC   CCZ(8),CCY      PREPARE CCW FOR UNLOAD
000336 D501 7000 CC5E CCCCC CCC60 214 TABLES    CLC   0(2,7),ZERO     ANY MORE UNITS ?
00033C 4780 C35E              CC360 215           BE    FINISHX         NO- FINISH
000340 95FF 7002        CCCC2       216           CLI   2(7),X'FF'      ALREADY UNLOADED ?
000344 4780 C356              CC358 217           BE    NEQAL           YES-SKIP UNLOAD
000348 D201 CAAC 7000 CAAE CCCCC 218           MVC   PLCCKZ+10(2),0(7) NO-USE THIS UNIT
00034F 4110 CAA2              CCAA4 219           LA    1,BLCCKZ        *
000352 58F0 CC24              CCC2C 220           L     15,=V(IECCP)    *     UNLOAD
```

```
000356 05EF                            221          BALR  14,15                    *
000358 1A75                            222 NCUNL    AR    7,5                      NEXT UNIT
00035A 47F0 C334            000336     223          B     TABLES                   GO AND TEST AGAIN
                                       224 FINISHX  CLOSE (CARDIN,,MINECUT)        ***MACRO
00035E 0700                            225+         CNOP  0,4
000360 4510 C36A            00036C     226+FINISHX  BAL   1,*+12 BRANCH AROUND LIST
000364 00                              227+         DC    AL1(0) OPTION BYTE
000365 000B7C                          228+         DC    AL3(CARDIN) DCB ADDRESS
000368 80                              229+         DC    AL1(128) OPTION BYTE
000369 000BCC                          230+         DC    AL3(MINECUT) DCB ADDRESS
00036C 0A14                            231+         SVC   20 ISSUE CLOSE SVC
00036E 5800 C98A            000980     232          L     13,SAVE8+4               RESTORE R13
000372 98EC D00C            000000     233          LM    14,12,12(13)             RESTORE REGISTERS
000376 18FF                            234          SR    15,15                    SET CONDITION CODE
000378 07FE                            235          BR    14                       GO BACK TO CALLING PROGRAM
00037A 92FF CCF8            000CF0     236 LASTEX   MVI   LASTEXSW,X'FF'           TURN LASTEX SWITCH ON
00037E 9200 CCF0            000CF2     237          MVI   OPSW,X'00'               TURN OP SWITCH OFF
000382 47F0 C528            00052A     238          B     EXEC                     GO AND CARRY OUT INSTRUCTION
000386 91FF CCF0            000CF2     239 REA      TM    OPSW,X'FF'               OP SWITCH ON ?
00038A 47C0 C394            000396     240          BC    12,REAF                  NO - BRANCH TO FIX SWITCHES
00038E 92FF CCF8            000CFA     241          MVI   REASW,X'FF'              YES - TURN REA SWITCH ON
000392 47F0 C528            00052A     242          B     EXEC                     GO AND CARRY OUT INSTRUCTION
000396 92FF CCF0            000CF2     243 REAP     MVI   OPSW,X'FF'               TURN OP SWITCH ON
00039A 9200 CCF8            000CFA     244          MVI   REASW,X'00'              TURN REA SWITCH OFF
00039E 92FF CCEA            000CEC     245          MVI   AECOPYSW,X'FF'           TURN AECOPY SWITCH ON
0003A2 47F0 C282            000284     246          B     NCTNUM                   GET ANOTHER WORD
0003A6 9200 CCF9            000CFB     247 COPP     MVI   COPSW,X'00'              TURN COP SWITCH OFF
0003AA 92FF CCF2            000CF4     248          MVI   COPYSW,X'FF'             TURN COPY SWITCH ON
0003AE 47F0 C394            000396     249          B     REAP                     BRANCH TO FIX MORE SWITCHES
0003B2 91FF CCF0            000CF2     250 COP      TM    OPSW,X'FF'               OP SWITCH ON ?
0003B6 47C0 C3A4            0003A6     251          BC    12,COPP                  NO - BRANCH TO FIX SWITCHES
0003BA 92FF CCF9            000CFB     252          MVI   COPSW,X'FF'              TURN COP SWITCH ON
0003BE 47F0 C528            00052A     253          B     EXEC                     GO AND CARRY OUT INSTRUCTION
0003C2 47F0 C282            000284     254 LIS      B     NCTNUM                   GET ANOTHER WORD
0003C6 91FF CCF1            000CF3     255 FIL      TM    COUNTSW,X'FF'            COUNT SWITCH ON ?
0003CA 47C0 C282            000284     256          BC    12,NCTNUM                NO - GET ANOTHER WORD
0003CE 5090 CC46            000C48     257          ST    9,SAVE7                  ACCEPT COUNTS AS FILES
0003D2 9200 CCF1            000CF3     258          MVI   COUNTSW,X'00'            TURN COUNT SWITCH OFF
0003D6 92FF CCEC            000CEE     259          MVI   FILSW,X'FF'              TURN FIL SWITCH ON
0003DA 47F0 C282            000284     260          B     NCTNUM                   GET ANOTHER WORD
0003DE 91FF CCF1            000CF3     261 REC      TM    COUNTSW,X'FF'            COUNT SWITCH ON ?
0003E2 47C0 C282            000284     262          BC    12,NCTNUM                NO - GET ANOTHER WORD
0003E6 5090 CC4A            000C4C     263          ST    9,SAVE8                  ACCEPT COUNTS AS RECORDS
0003EA 9200 CCF1            000CF3     264          MVI   COUNTSW,X'00'            TURN COUNT SWITCH OFF
0003EE 92FF CCED            000CEF     265          MVI   RECSW,X'FF'              TURN REC SWITCH ON
0003F2 47F0 C282            000284     266          B     NCTNUM                   GET ANOTHER WORD
0003F6 91FF CCF1            000CF3     267 ERR      TM    COUNTSW,X'FF'            COUNT SWITCH ON ?
0003FA 47C0 C282            000284     268          BC    12,NCTNUM                NO - GET ANOTHER WORD
0003FE 5090 CC4E            000C50     269          ST    9,SAVE11                 ACCEPT COUNTS AS ERRORS
000402 9200 CCF1            000CF3     270          MVI   COUNTSW,X'00'            TURN COUNTSWITCH OFF
000406 47F0 C282            000284     271          B     NCTNUM                   GET ANOTHER WORD
00040A 91FF CCF1            000CF3     272 TIM      TM    COUNTSW,X'FF'            COUNT SWITCH ON ?
00040E 47C0 C282            000284     273          BC    12,NCTNUM                NO - GET ANOTHER WORD
000412 5090 CC42            000C44     274          ST    9,SAVE6                  ACCEPT COUNTS AS TRIES
000416 9200 CCF1            000CF3     275          MVI   COUNTSW,X'00'            TURN COUNT SWITCH OFF
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
000418 92FF CCEF      00CF1          276          MVI   TIMSW,X'FF'       TURN TIMES SWITCH ON
00041C 47F0 C282            C0284  277          B     ACTNUM            GET ANOTHER WORD
000420 4190 0001            CCCC1  278 ONE      LA    9,1               *
000424 92FF CCF1      00CF3        279 COUNTCN  MVI   COUNTSW,X'FF'      *
000428 47F0 C282            C02B4  280          B     ACTNUM            *
00042C 4190 0002            CCCC2  281 TWO      LA    9,2               *
000430 47F0 C424            C0426  282          B     COUNTCN           *
000434 4190 0003            CCCC3  283 THR      LA    9,3               *
000438 47F0 C424            C0426  284          B     COUNTCN           *
00043C 4190 0004            CCCC4  285 FOU      LA    9,4               *
000440 47F0 C424            C0426  286          B     COUNTCN           *
000444 4190 0005            CCCC5  287 FIV      LA    9,5               *   ACCEPT ENGLISH WORDS 'ONE -
000448 47F0 C424            C0426  288          B     COUNTCN           *
00044C 4190 0006            CCCC6  289 SIX      LA    9,6               *   - TEN' AS  NUMERICS
000450 47F0 C424            C0426  290          B     COUNTCN           *
000454 4190 0007            CCCC7  291 SEV      LA    9,7               *
000458 47F0 C424            C0426  292          B     COUNTCN           *
00045C 4190 0008            CCCC8  293 EIG      LA    9,8               *
000460 47F0 C424            C0426  294          B     COUNTCN           *
000464 4190 0009            CCCC9  295 NIN      LA    9,9               *
000468 47F0 C424            C0426  296          B     COUNTCN           *
00046C 4190 000A            CCCCA  297 TEN      LA    9,10              *
000470 47F0 C424            C0426  298          B     COUNTCN           *
000474 92FF CCEE      00CF0        299 NOT      MVI   NOTSW,X'FF'       TURN NOT SWITCH ON
000478 47F0 C282            C02B4  300          B     ACTNUM            GET ANOTHER WORD
00047C D505 3000 CD3E 00000 CCD40  301 WIT      CLC   0(6,3),=C'WITHOU' WITHOUT ?
000482 4780 C474            CC476  302          BE    NOT               YES - TURN NOTSWITCH ON
000486 47F0 C282            C02B4  303          B     ACTNUM            GET ANOTHER WORD
00048A 92FF CCF6      00CF8        304 TC       MVI   TCSW,X'FF'        TURN TO SWITCH ON
00048E 47F0 C282            C02B4  305          B     ACTNUM            GET ANOTHER WORD
000492 921F CC89            CC88A  306 END      MVI   NEWCF,X'1F'       WRITE TAPEMARK
000496 91FF CCF0      00CF2        307 ENDOVER  TM    OPSW,X'FF'        OP SWITCH ON ?
00049A 47C0 C4A6            CC4A8  308          BC    12,FIRSTCTR       NO - GO TO FIRST CONTROL
00049E 92FF CCFA      00CFC        309 SECCTR   MVI   SECSW,X'FF'        YES - TURN SEC SWITCH ON
0004A2 47F0 C528            CC52A  310          B     EXEC              GO AND CARRY OUT INSTRUCTION
0004A6 D200 CC89 CC88 00C8B CCC8A  311 FIRSTCTR MVC   WAITCP(1),NEWOP   USE NEW OPERATION
0004AC 9200 CC89            00C8A  312          MVI   NEWCF,X'00'       CLEAR NEWOP
0004B0 92FF CCF0      00CF2        313          MVI   OPSW,X'FF'        TURN OP SWITCH ON
0004B4 47F0 C282            C02B4  314          B     ACTNUM            GET ANOTHER WORD
0004B8 D505 3000 CD44 00000 CCD46  315 PRI      CLC   0(6,3),=C'PRINTE' PRINTER ?
0004BE 4780 C4D2            CC4D4  316          BE    PRIP              YES - BRANCH
0004C2 91FF CCF0      00CF2        317          TM    OPSW,X'FF'        NO - OP SWITCH ON ?
0004C6 47C0 C4D2            CC4D4  318          BC    12,PRIP           NO - BRANCH
0004CA 92FF CCF7      00CF9        319          MVI   PRISW,X'FF'       YES - TURN PRI SWITCH ON
0004CE 47F0 C528            CC52A  320          B     EXEC              GO AND CARRY OUT INSTRUCTION
0004D2 92FF CCF0      00CF2        321 PRIP     MVI   OPSW,X'FF'        TURN OP SWITCH ON
0004D6 9200 CCF7      00CF9        322          MVI   PRISW,X'00'       TURN PRI SWITCH OFF
0004DA 92FF CCF3      00CF5        323          MVI   PRINTSW,X'FF'     TURN PRINT SWITCH ON
0004DE 9200 CCF2      00CF4        324          MVI   COPYSW,X'00'      TURN COPY SWITCH OFF
0004E2 92FF CCEA      00CEC        325          MVI   AECOPYSW,X'FF'    TURN AECOPY SWITCH ON
0004E6 47F0 C282            C02B4  326          B     ACTNUM            GET ANOTHER WORD
0004EA 9207 CC89            00C8A  327 REW      MVI   NEWCF,X'07'       *
0004EE 47F0 C496            CC498  328          B     ENDOVER           *
0004F2 920F CC89            00C8A  329 UNL      MVI   NEWCF,X'0F'       *
0004F6 47F0 C496            CC498  330          B     ENDOVER           *
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                      FO1JAN68   1/29/69

0004FC 9227 CC88          00C8A          331 BAC       MVI   NEWCF,X'27'                *
000500 47F0 C496                CC498    332           B     ENDCVER                    *   FIX CCW , THEN SEE WHETHER
000504 9217 CC83          00C8A          333 ERA       MVI   NEWCF,X'17'                *   THERE IS ANOTHER SECONDARY
000508 47F0 C496                CC498    334           B     ENDCVER                    *   OPERATION WAITING
00050C D503 3000 CD2E 00000 00D30        335 FOR       CLC   0(4,3),=C'FORW'            TO SEPARATE FROM FOR
000512 4780 C518                CC51A    336           BE    FCRW                       BRANCH IF FORWARD
000516 47F0 C282                CC284    337           B     ACTNUM                     IGNORE FOR
00051A 9237 CC88          00C8A          338 FCRW      MVI   NEWCF,X'37'                *
00051E 47F0 C496                CC498    339           B     ENDCVER                    *
000522 9204 CC88          00C8A          340 SEN       MVI   NEWCF,X'04'                *
000526 47F0 C496                CC498    341           B     ENDCVER                    *
00052A 9200 CCF0          00CF2          342 EXEC      MVI   CPSW,X'00'                 TURN OP SWITCH OFF
00052E 91FF CCEA          00CEC          343           TM    AECCPYSW,X'FF'             AECOPY SWITCH ON ?
000532 47C0 C684                CC686    344           BC    12,TESTUN2                 NO - BRANCH
000536 91FF CCEC          00CEE          345           TM    FILSW,X'FF'                YES - FIL SWITCH ON ?
00053A 47C0 C606                CC608    346           BC    12,TESTREC2                NO - BRANCH
00053E 5890 CCF2                CCCF4    347 AECOPY1   L     9,CCPYSW                   YES - FIX INFORMATION TO SEND
000542 D503 CC9E CC5E 00C90 CCC60        348           CLC   FRCMUNIT(4),ZERO           FROMUNIT EMPTY ?
000548 4780 C556                CC558    349           BE    CVERA                      YES-SKIP TABLE LOOK UP
00054C D203 CCD6 CC8E 00CD8 CCC90        350           MVC   LUNIT(4),FRCMUNIT          *
000552 58F0 CD32                CCD34    351           L     15,=A(TABLE2)              *  LOOK UP TOUNIT IN TABLE
000556 05EF                              352           BALR  14,15                      *
000558 D503 CC8A CC5E 00C8C CCC60        353 CVERA     CLC   TCUNIT(4),ZERO             TOUNIT EMPTY ?
00055E 4780 C56C                CC56E    354           BE    CVERB                      YES-BRANCH
000562 D203 CCD6 CC8A 00CD8 CCC8C        355           MVC   LUNIT(4),TCUNIT            *
000568 58F0 CD32                CCD34    356           L     15,=A(TABLE2)              *  LOOK UP FROMUNIT IN TABLE
00056C 05EF                              357           BALR  14,15                      *
00056E 5840 CC8E                CCC90    358 CVERB     L     4,FRCMUNIT                 PUT SWITCHES IN R5 & R4
000572 5850 CC8A                CCC8C    359           L     5,TCUNIT                   UNITS IN R5
000576 5870 CC46                CCC48    360           L     7,SAVE7                    FILES IN R7
00057A 5880 CC4A                0CC4C    361           L     8,SAVE8                    RECORDS IN R8
00057E 5860 CC42                CCC44    362           L     6,SAVE6                    TIMES IN R6
000582 58B0 CC4E                CCC50    363           L     11,SAVE11                  ERRORS IN R11
000586 58F0 CD36                CCD38    364           L     15,=V(AECCPY)              POINT TO AECOPY
00058A 05FF                              365           BALR  14,15                      CALL AECOPY
00058C D203 CC8E CC5E 00C90 CCC60        366           MVC   FRCMUNIT(4),ZERC           CLEAR FROMUNIT
000592 D203 CC8A CC5E 00C8C CCC60        367           MVC   TCUNIT(4),ZERO             CLEAR TOUNIT
000598 4150 0001                CCC01    368           LA    5,1                        COUNTER IN R5
00059C D20C CCEA CC5E 00CEC CCC60        369 CLEAR2    MVC   AECCPYSW(13),ZERO          ZERO SWITCHES
0005A2 D203 CC46 CD06 00C48 C0D08        370           MVC   SAVE7(4),=X'00000001'      DEFAULT FILES
0005A8 D203 CC4A CC5E 00C4C C0C60        371           MVC   SAVE8(4),ZERC              DEFAULT RECORDS
0005AE D203 CC42 CC5E 00C44 CCC60        372           MVC   SAVE6(4),ZERC              DEFAULT TIMES
0005B4 D203 CC4E CC5E 00C50 CCC60        373           MVC   SAVE11(4),ZERO             DEFAULT ERRORS
0005BA 91FF CCF8          00CFA          374           TM    READSW,X'FF'               READ WAITING ?
0005BE 4710 C394                CC396    375           BC    READ                       YES - BRANCH
0005C2 91FF CCF9          00CFB          376           TM    CCPSW,X'FF'                COPY WAITING ?
0005C6 4710 C3A4                CC3A6    377           BC    CCPF                       YES - BRANCH
0005CA 91FF CCF7          00CF9          378           TM    PRTSW,X'FF'                PRINT WAITING ?
0005CE 4710 C4D2                CC4D4    379           BC PRIF                          YES - BRANCH
0005D2 91FF CCFA          00CFC          380           TM    SECSW,X'FF'                SECONDARY OPERATION WAITING ?
0005D6 4710 C5E4                CC5E6    381           BC    SECF                       YES - BRANCH
0005DA 91FF CCFB          00CFD          382           TM    LASTEXSW,X'FF'             WAS THIS THE LAST EXECUTION ?
0005DE 4710 C318                CC31A    383           BC    FINISH                     YES - GO AND WIND UP
0005E2 47F0 C282                CC284    384           B     ACTNUM                     NO - GET ANOTHER WORD
0005E6 92FF CCF0          00CF2          385 SECP      MVI   CPSW,X'FF'                 TURN OP SWITCH ON
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
0005EA D203 CC76 CC72 CC78 CCC74   386          MVC   WAITUNIT(4),NEWUNIT  USE NEW UNIT
0005F0 D200 CC89 CC88 CC8B CCCBA   387          MVC   WAITOP(1),NEWOP     USE NEW OPERATION
0005F6 D203 CC72 CC5F CCC74 CCC6C  388          MVC   NEWUNIT(4),ZERO     CLEAR NEWUNIT
0005FC 9200 CC88      CC8A         389          MVI   NEWOP,X'00'         CLEAR NEWOP
000600 9200 CCFA      CCFC         390          MVI   SECSW,X'00'         TURN SEC SWITCH OFF
000604 47F0 C282            CC2B4  391          B     NETNUM              GET ANOTHER WORD
000608 91FF CCED      CCEF         392 TESTREC2 TM    RECSW,X'FF'         REC SWITCH ON ?
00060C 47C0 C53C            CC53E  393          BC    12,AECCPY1          NO - GET READY TO CALL AECCPY
000610 D203 CC46 CC5F CCC48 CCC6C  394          MVC   SAVET(4),ZERO       YES - CHANGE DEFAULT FILES TO 0
000616 47F0 C53C            CC53E  395          B     AECCPY1             GET READY TO CALL AECCPY
00061A 50D0 CCDA            CCCDC  396 TABLE2   ST    7,SAVUN7            *
00061E 50A0 CCDE            CCCEC  397          ST    10,SAVUN10          *  SAVE REGISTERS
000622 50B0 CCE2            CCCE4  398          ST    11,SAVUN11          *
000626 4170 CC92            CCC94  399          LA    7,TABLE             A
00062A 41A0 0004            CCCC4  400          LA    10,4                A
00062E 58B0 CCE4            CCCE8  401          L     11,NUMB             A  PREPARE FOR BXLE
000632 1AB7                        402          AR    11,7                A
000634 D501 7003 CCD8 CCCCC CCCDA  403 TABLE1   CLC   0(2,7),LUNIT+2       UNIT IN TABLE?
00063A 4780 C674            CC676  404          BE    FOUND               YES-BRANCH
00063E 877A C632            CC634  405          BXLE  7,10,TABLE1         NO-TEST NEXT ENTRY
000642 D201 7003 CCD8 CCCCC CCCDA  406          MVC   0(2,7),LUNIT+2      NOT IN TABLE-ADD THIS UNIT
000648 58B0 CCE6            CCCE8  407          L     11,NUMB             *
00064C 5AB0 CD3A            CCD3C  408          A     11,=X'00000004'     *  UPDATE NUMB
000650 50B0 CCE6            CCCE8  409          ST    11,NUMB             *
000654 91FF CCFD      CCFF         410          TM    UNLSW,X'FF'         UNIT BEING UNLOADED
000658 4710 C668            CC66A  411          BC    TABLE3              YES-BRANCH
00065C 58A0 CCDA            CCCDC  412 TABLE4   L     7,SAVUN7            *
000660 58A0 CCDE            CCCEC  413          L     10,SAVUN10          *  NO-RESTORE REGISTERS
000664 58B0 CCE2            CCCE4  414          L     11,SAVUN11          *
000668 07FE                        415          BR    14                  FINISHED TABLE LOOKUP
00066A 92FF 7002      CC002        416 TABLE3   MVI   2(7),X'FF'          UNLOAD MARKER
00066E 9200 CCFD      CCFF         417          MVI   UNLSW,X'00'         TURN OFF SWITCH
000672 47F0 C65A            CC65C  418          B     TABLE4              GO BACK
000676 91FF CCFD      CCFF         419 FOUND    TM    UNLSW,X'FF'         UNLOADING ?
00067A 4710 C668            CC66A  420          BC    TABLE3              YES-PUT MARKER IN TABLE
00067E 9200 7002      CC002        421          MVI   2(7),X'00'          NO-CLEAR MARKER
000682 47F0 C65A            CC65C  422          B     TABLE4              GO BACK
000686 D503 CC76 CC5E CCC78 CCC6C  423 TESTUN2  CLC   WAITUNIT(4),ZERO     WAITUNIT EMPTY ?
00068C 4780 C7F6            CC7F8  424          BE    MESSAGE1            YES - WRITE ERROR MESSAGE
000690 D203 CAAA CC76 CCAAC CCC78  425          MVC   BLOCKZ+8(4),WAITUNIT NO - USE WAITUNIT
000696 D200 CA8E CC89 CCAC0 CCC8B  426          MVC   CCZ(1),WAITOP       USE WAITOP
00069C 950F CA8E      CCACC        427          CLI   CCZ,X'0F'           UNLOAD ?
0006A0 4780 C742            CC744  428          BE    UNL1                YES-FIX UP TABLE ENTRY
0006A4 D203 CCD6 CC76 CCCD8 CCC78  429 CALL1    MVC   LUNIT(4),WAITUNIT   *
0006AA 58F0 CD32            CCD34  430          L     15,=A(TABLE2)       *  LOOK UP WAITUNIT IN TABLE
0006AE 05EF                        431          BALR  14,15               *
0006B0 5860 CC42            CCC44  432          L     6,SAVE6             USE TIMES FOR SECONDARY OPER
0006B4 9527 CA8E      CCACC        433 BACK     CLI   CCZ,X'27'           BACKSPACE?
0006B8 4780 C72A            CC72C  434          BE    BFILCN1             YES-BRANCH
0006BC 9537 CA8E      CCACC        435          CLI   CCZ,X'37'           FORWARD SPACE ?
0006C0 4780 C736            CC73E  436          BE    FFILCN              YES - BRANCH
0006C4 9507 CA8E      CCACC        437          CLI   CCZ,X'07'           REWIND ?
0006C8 4780 C74A            CC74C  438          BE    OPER                YES - GO AND EXECUTE OPERATION
0006CC 950F CA8E      CCACC        439          CLI   CCZ,X'0F'           UNLOAD ?
0006D0 4780 C74A            CC74C  440          BE    OPER                YES - GO AND EXECUTE OPERATION
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
0006D4 9517 CA8E       C0ACC          441          CLI   CCZ,X'17'               ERASE GAP ?
0006D8 4780 C74A              CC74C   442          BE    CPER                    YES - GO AND EXECUTE CPERATICN
0006DC 951F CA8E       00ACC          443          CLI   CCZ,X'1F'               WRITE TAPE MARK ?
0006F0 4780 C74A              0074C   444          BE    CPER                    YES - GO AND EXECUTE CPERATICN
0006E4 9504 CA8E       C0ACC          445          CLI   CCZ,X'04'               SENSE ?
0006E8 4780 C74A              CC74C   446          BE    CPER                    YES - GO AND EXECUTE CPERATICN
0006EC D227 C9FE CA4E C0A00 00A5C     447          MVC   MESSAGE(40),MESSAGEA    'INVALID OPERATION'
                                      448          PUT   MINECUT,MESSAGE         ***MACRO
0006F2 4110 C8CA              008CC   449+         LA    1,MINECUT LCAD PARAMETER REG 1
0006F6 4100 C9FE              C0ACC   450+         LA    0,MESSAGE LCAD PARAMETER REG 0
0006FA 58F0 1030              CCC3C   451+         L     15,48(0,1) LCAD PUT ROUTINE ADDR.
0006FE 05EF                           452+         BALR  14,15 LINK TC PUT ROUTINE
000700 91FF CCE8       00CE0          453 ANDCA    TM    ANDSW,X'FF'             AND SWITCH ON ?
000704 47C0 C59A              CC59C   454          BC    12,CLEAR2               NO - GO AND CLEAR SWITCHES ESAV
000708 92FF CCF0       00CF2          455          MVI   CPSW,X'FF'              YES - TURN OP SWITCH ON
00070C 9200 CCE8       C0CE0          456          MVI   ANDSW,X'00'             TURN SWITCH OFF
000710 D203 CC76 CC72 C0C78 0CC74     457          MVC   WAITUNIT(4),NEWUNIT     USE NEWUNIT
000716 D203 CC72 CC5E C0C74 C0C60     458          MVC   NEWUNIT(4),ZERO         CLEAR NEWUNIT
00071C 9200 CCE0       00CEF          459          MVI   RECSW,X'00'             *
000720 9200 CCEC       C0CEE          460          MVI   FILSW,X'00'             *  TURN SWITCHES OFF
000724 9200 CCEF       00CF1          461          MVI   TIMSW,X'00'             *
000728 47F0 C2B2              CC284   462          B     NCTNUM                  GET ANOTHER WORD
00072C 922F C777       CC77S          463 BFILCN1  MVI   BFILCN+9,X'2F'          BACKSPACE FILES
000730 9227 C797       CC79S          464          MVI   BFILES+25,X'27'         BACKSPACE RECORDS
000734 47F0 C76F              CC770   465          B     BFILCA                  CARRY OUT INSTRUCTION
000738 923F C777       CC77S          466 FFILCA   MVI   BFILCN+9,X'3F'          FORWARD SPACE FILES
00073C 9237 C797       CC79S          467          MVI   BFILES+25,X'37'         FCRWARC SPACE RECORDS
000740 47F0 C76E              CC77C   468          B     BFILCA                  CARRY OUT INSTRUCTION
000744 92FF CCF0       C0CFF          469 UNLI     MVI   UNLSW,X'FF'             TURN ON SWITCH
000748 47F0 C6A2              CC6A4   47C          B     CALLI                   GO AND LOCK UP TABLE
00074C 4110 CAA2              CCAA4   471 OPER     LA    1,BLCCKZ                *
000750 58F0 C02A              CCC2C   472          L     15,=V(IICCP)            *  CARRY CUT OPERATICN
000754 05EF                           473          BALR  14,15                   *
000756 5810 CA9E              CCAAC   474          L     1,PCINT2                *
00075A 58F0 C02A              CCC2C   475          L     15,=V(IICCP)            * WAIT FOR OPERATION TO END
00075E 05EF                           476          BALR  14,15                   *
000760 91FF CCEF       00CF1          477 REPEAT   TM    TIMSW,X'FF'             TIMES SWITCH ON ?
000764 47C0 C6FE              CC7CC   478          BC    12,ANDCA                NO - BRANCH TO TEST 'AND'
000768 4660 C6B2              CC6B4   479          BCT   6,BACK                  YES -REPEAT THE NUMBER OF TIMES
00076C 47F0 C6FE              CC7CC   48C          B     ANDCA                   GO AND TEST 'AND'
000770 91FF CCEC       CCCEE          481 BFILCA   TM    FILSW,X'FF'             FIL SWITCH ON ?
000774 47C0 C7C2              CC7C4   482          BC    12,BRECCN               NO - BRANCH TO TEST RECORDS
000778 922F CA8E       C0ACC          483          MVI   CCZ,X'2F'               YES - BACKSPACE FILES
00077C 5870 CC46              CCC4E   484          L     7,SAVE7                 FILES INTC R7
000780 4110 CAA2              CCAA4   485 BFILES   LA    1,BLCCKZ                *
000784 58F0 C02A              CCC2C   486          L     15,=V(IICCP)            *
000788 05EF                           487          BALR  14,15                   *
00078A 5810 CA9E              CCAAC   488          L     1,PCINT2                *  BACKSPACE FILES
00078E 58F0 C02A              CCC2C   489          L     15,=V(IICCP)            *
000792 05EF                           490          BALR  14,15                   *
000794 4670 C77E              CC780   491          BCT   7,BFILES                REPEAT DEPENDING ON COUNTS
000798 9227 CA8E       00AC0          492          MVI   CCZ,X'27'               RESTORE BACKSPACE RECORDS
00079C 91FF CCED       00CEF          493          TM    RECSW,X'FF'             REC SWITCH ON ?
0007A0 47C0 C75E              CC76C   494          BC    12,REPEAT               NO - BRANCH TO TEST 'TIMES'
0007A4 5880 CC4A              CCC4C   495          L     8,SAVE8                 RECORDS INTO R8
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  FC1JAN68  1/29/69

0007A8 4110 CAA2            CCAA4   496 BRECS    LA    1,BLCCKZ                 *
0007AC 58F0 C02A            CCD2C   497          L     15,=V(IICCP)             *
0007B0 05EF                         498          BALR  14,15                    *  BACKSPACE RECORDS
0007B2 5810 CA9E            CCAAC   499          L     1,PCINTZ                 *
0007B6 58F0 C02A            CCD2C   500          L     15,=V(IICCP)             *
0007BA 05EF                         501          BALR  14,15                    *
0007BC 4680 C7A6            CC7A8   502          BCT   8,BRECS                  REPEAT DEPENDING ON COUNTS
0007C0 47F0 C75E            CC76C   503          B     REPEAT                   GO AND TEST 'TIMES'
0007C4 91FF CCF0      CCCEF         504 BRECCK   TM    RECSW,X'FF'              REC SWITCH ON ?
0007C8 4710 C7EE            CC7FC   505          BC    REPREC                   YES - BRANCH TO FIX REPEATS
0007CC 4110 CAA2            CCAA4   506 BREC1    LA    1,BLCCKZ                 *
0007D0 58F0 C02A            CCD2C   507          L     15,=V(IICCP)             *
0007D4 05EF                         508          BALR  14,15                    *  BACKSPACE RECORDS
0007D6 5810 CA9E            CCAAC   509          L     1,PCINTZ                 *
0007DA 58F0 C02A            CCD2C   510          L     15,=V(IICCP)             *
0007DE 05EF                         511          BALR  14,15                    *
0007E0 91FF CCF0      CCCEF         512          TM    RECSW,X'FF'              REC SWITCH ON ?
0007E4 47C0 C75E            CC76C   513          BC    12,REPEAT                NO - GO AND TEST TIMES
0007E8 4680 C7CA            CC7CC   514          BCT   8,BREC1                  REPEAT DEPENDING ON COUNTS
0007EC 47F0 C75E            CC76C   515          B     REPEAT                   GO AND TEST 'TIMES'
0007F0 5880 CC4A            CCC4C   516 REPREC   L     8,SAVE8                  RECORDS INTO R8
0007F4 47F0 C7CA            CC7CC   517          B     BREC1                    GO AND BACKSPACE AGAIN
0007F8 D227 C9FE CA76 CCA00 CCA78   518 MESSAGE1 MVC   MESSAGE(40),MESSAGEB    *
                                    519          PUT   MINEOUT,MESSAGE          ***MACRO
0007FE 4110 C8CA            CC8CC   520+         LA    1,MINEOUT LOAD PARAMETER REG 1
000802 4100 C9FE            CCA00   521+         LA    0,MESSAGE LOAD PARAMETER REG 0
000806 58F0 1030            CCC30   522+         L     15,48(0,1) LOAD PUT ROUTINE ADDR.
00080A 05EF                         523+         BALR  14,15 LINK TO PUT ROUTINE
00080C 47F0 C59A            CC59C   524          B     CLEAR2                   GO AND CLEAR SWITCHES AND SAVES
000810 92FF CCF5      CCCF7         525 HEX      MVI   HEXSW,X'FF'              TURN HEX SWITCH ON
000814 92FF CCF3      CCCF5         526          MVI   PRINTSW,X'FF'            TURN PRINT SWITCH ON
000818 47F0 C282            CC2B4   527          B     NCTNUM                   GO AND GET ANOTHER WORD
00081C 92FF CCEE      CCCF0         528 NNEXT    MVI   NCTSW,X'FF'              TURN NOT SWITCH ON
000820 47F0 C044            CCC46   529          B     READ                     GO AND READ ANOTHER CARD
000824 9200 CCF5      CCCF7         530 NHEX     MVI   HEXSW,X'00'              TURN HEX SWITCH OFF
000828 47F0 C282            CC2B4   531          B     NCTNUM                   GO AND GET ANOTHER WORD
00082C 92FF CCF4      CCCF6         532 NLIS     MVI   NCLISTSW,X'FF'           TURN NOLIST SWITCH ON
000830 47F0 C282            CC2B4   533          B     NCTNUM                   GO AND GET ANOTHER WORD
000834 D9C5C140                     534 LIB      DC    C'REA '                  **********       **********
000838 47F0 C384            CC3B6   535          B     REA
00083C C3D6D740                     536          DC    C'CCP '                  LIBRARY OF ACCEPTABLE WORDS
000840 47F0 C380            CC3B2   537          B     CCP
000844 D3C9E240                     538          DC    C'LIS '                  **********       **********
000848 47F0 C3C0            CC3C2   539          B     LIS
00084C E3C1D340                     540          DC    C'TAL '
000850 47F0 C3C0            CC3C2   541          B     LIS
000854 C6C9D340                     542          DC    C'FIL '
000858 47F0 C3C4            CC3C6   543          B     FIL
00085C D9C5C340                     544          DC    C'REC '
000860 47F0 C3DC            CC3DE   545          B     REC
000864 C5D9D940                     546          DC    C'ERR '
000868 47F0 C3F4            CC3F6   547          B     ERR
00086C E3C9D440                     548          DC    C'TIM '
000870 47F0 C408            CC4CA   549          B     TIM
000874 D6D5C540                     550          DC    C'ONE '
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
000878 47F0 C420            CC422   551          B     CNE
00087C E3E6D640                     552          DC    C'TWC '
000880 47F0 C42C            CC42E   553          B     TWC
000884 F3C8D940                     554          DC    C'THR '
000888 47F0 C434            CC436   555          B     THR
00088C C6D6E440                     556          DC    C'FCU '
000890 47F0 C43C            CC43E   557          B     FCU
000894 C6C9E540                     558          DC    C'FIV '
000898 47F0 C444            CC446   559          B     FIV
00089C E2C9E740                     560          DC    C'SIX '
0008A0 47F0 C44C            CC44E   561          B     SIX
0008A4 E2C5E540                     562          DC    C'SEV '
0008A8 47F0 C454            CC456   563          B     SEV
0008AC C5C9C740                     564          DC    C'EIG '
0008B0 47F0 C45C            CC45E   565          B     EIG
0008B4 D5C9D540                     566          DC    C'NIN '
0008B8 47F0 C464            CC466   567          B     NIN
0008BC E3C5D540                     568          DC    C'TEN '
0008C0 47F0 C46C            CC46E   569          B     TEN
0008C4 D5D6E340                     570          DC    C'NCT '
0008C8 47F0 C474            CC476   571          B     NCT
0008CC D5D6D940                     572          DC    C'NCR '
0008D0 47F0 C474            CC476   573          B     NCT
0008D4 D5D64040                     574          DC    C'NC  '
0008D8 47F0 C474            CC476   575          B     NCT
0008DC D5C5C940                     576          DC    C'NEI '
0008E0 47F0 C474            CC476   577          B     NCT
0008E4 E6C9E340                     578          DC    C'WIT '
0008E8 47F0 C47C            CC47E   579          B     WIT
0008EC C2C1C340                     580          DC    C'BAC '
0008F0 47F0 C4EA            CC4EC   581          B     BAC
0008F4 C5D9C140                     582          DC    C'ERA '
0008F8 47F0 C5D2            CC5C4   583          B     ERA
0008FC C6D6D940                     584          DC    C'FCR '
000900 47F0 C5DA            CC5CC   585          B     FCR
000904 E2C5D540                     586          DC    C'SEN '
000908 47F0 C522            CC522   587          B     SEN
00090C E3D64040                     588          DC    C'TC  '
000910 47F0 C48A            CC48C   589          B     TC
000914 D6D5E340                     590          DC    C'CNT '
000918 47F0 C48A            CC48C   591          B     TC
00091C D9C5E640                     592          DC    C'REW '
000920 47F0 C4EA            CC4EC   593          B     REW
000924 4858484D                     594          DC    C'*.$. '
000928 47F0 C044            CCC46   595          B     READ
00092C C5D5C440                     596          DC    C'EAD '
000930 47F0 C492            CC494   597          B     EAD
000934 D7D9C940                     598          DC    C'PRI '
000938 47F0 C488            CC48A   599          B     PRI
00093C E4D5D340                     600          DC    C'UNL '
000940 47F0 C4F2            CC4F4   601          B     UNL
000944 C8C5E740                     602          DC    C'HEX '
000948 47F0 C80E            CC81C   603          B     HEX
00094C D9C5C140                     604 NOTLIB   DC    C'PEA '          **********      ****
000950 47F0 C522            CC522   605          B     SEN
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                    FC1JAN68  1/29/69

000954 C3D6D740                     606          DC    C'CCP '                 LIBRARY OF NEGATIVES
000958 47F0 C520            CC522   607          B     SEN
00095C D9C5E640                     608          DC    C'REW '                 **********      ****
000960 47F0 C520            CC522   609          B     SEN
000964 D3C9E240                     610          DC    C'LIS '
000968 47F0 C82A            CC82C   611          B     NLIS
00096C E3C1D340                     612          DC    C'TAL '
000970 47F0 C82A            CC82C   613          B     NLIS
000974 C5D5C440                     614          DC    C'END '
000978 47F0 C520            CC522   615          B     SEN
00097C C2C1C340                     616          DC    C'BAC '
000980 47F0 C520            CC522   617          B     SEN
000984 E405D340                     618          DC    C'UNL '
000988 47F0 C520            CC522   619          B     SEN
00098C C5D9C140                     620          DC    C'ERA '
000990 47F0 C520            CC522   621          B     SEN
000994 C6D6D9E6                     622          DC    C'FORM'
000998 47F0 C520            CC522   623          B     SEN
00099C E2C5D540                     624          DC    C'SEN '
0009A0 47F0 C520            CC522   625          B     SEN
0009A4 4B584840                     626          DC    C'.$. '
0009A8 47F0 C81A            CC81C   627          B     NNEXT
0009AC C8C5E740                     628          DC    C'HEX '
0009B0 47F0 C822            CC824   629          B     NHEX
0009B8                              630 A2       DS    0D                      MARKER
0009B8 0000000000000000             631 SAVEA    DC    18A(0)                  SAVE REGISTERS
0009D0 4040404040404040             632 MESSAGE  DC    40C' '                  SPACE FOR OUTPUT MESSAGES
0009F8 4040404040404040             633          DC    40C' '                  FILLER
000A50 40C1D540C9D5E5C1             634 MESSAGEA DC    CL40' AN INVALID OPERATION HAS BEEN SPECIFIED'
000A78 4040E405C9E340C9             635 MESSAGEB DC    CL40'  UNIT IS NOT KNOWN TO PROGRAM          '
000AA0 60000A44                     636 PCINTZ   DC    XL1'60',AL3(BLOCKZ)     *
000AA4 00000000                     637 BLOCKZ   DC    A(0)                    *
000AA8 00000000                     638          DC    A(0)                    *   DUMMY IOCP BLOCK
000AAC 00000180                     639          DC    X'00000180'             *
000AB0 00000AC0                     640          DC    A(CCZ)                  *   TO BE FILLED IN
000AB4 00000000                     641          DC    A(0)                    *
000AB8 00000000                     642 STATUSZ  DC    A(0)                    *   FOR SECONDARY OPERATIONS
000ABC 00000000
000AC0 0400000020000001             643 CCZ      CCW   X'04',0,X'20',1         *
000AC8 0700000020000001             644 CCX      CCW   X'07',0,X'20',1         REWIND
000AD0 0F0000002000001              645 CCY      CCW   X'0F',0,X'20',1         UNLOAD
000AD8 4040404040404040             646 INPUT    DC    80C' '                  AREA FOR SYSIN INPUT
000B28 404B584840                   647 MARKER   DC    C' .$. '                MARKER FOR END OF INPUT
000B2D 4040404040404040             648 CLEAR    DC    80C' '                  CLEAR AREA
000B80                              649 DECWORK  DS    D                       WORKAREA FOR HEX CONVERSION
000B88 40404040                     650 HOLDWORD DC    4C' '                   FOR INPUT WORD
                                    651 CARDIN   DCB   BLKSIZE=80,DEVD=RD,DSORG=PS,EODAD=FINISHED,FROPT=ACC,   *
                                                       LRECL=80,MACRF=(GM),RECFM=F,DDNAME=SYSIN
                                    652                *,***  IHB063  DDNAME SHORT-PADDED TO 8 CHAR


                                    654**                    DATA CONTROL BLOCK
                                    655**
000B7C                              656+         ORG   *-16 TO ELIMINATE UNUSED SPACE
000B7C                              657+CARDIN   DS    OF ORIGIN ON WORD BOUNDRY
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  FC1JAN68  1/29/69
000B8C                           658+         ORG   **+16 TO ORIGIN GENERATION

                                 66C+*                     READER/PUNCH DEVICE INTERFACE

000B8C 0000                      662+         DC    BL2'0000000000000000' MODE,STACK,DEVT
000B8E 0000                      663+         DC    F'0'

                                 665+*                     COMMON ACCESS METHOD INTERFACE

000B90 00                        667+         DC    AL1(0) EUFNC
000B91 000001                    668+         DC    AL3(1) EUFCB
000B94 0000                      669+         DC    AL2(0) EUFL
000B96 4000                      67C+         DC    BL2'0100000000000000' DSORG
000B98 00000001                  671+         DC    A(1) ICBAD

                                 673+*                     FOUNDATION EXTENSION

000B9C 00                        675+         DC    BL1'00000000' BFTEK,BFALN
000B9D 000312                    676+         DC    AL3(FINISHED) EODAD
000BA0 80                        677+         DC    BL1'10000000' RECFM
000BA1 000000                    678+         DC    AL3(0) EXLST

                                 68C+*                     FOUNDATION BLOCK

000BA4 E2E8E2C9D5404040          682+         DC    CL8'SYSIN' DDNAME
000BAC 02                        683+         DC    BL1'00000010' OFLGS
000BAD 00                        684+         DC    BL1'00000000' IFLG
000BAE 5000                      685+         DC    BL2'0101000000000000' MACR

                                 687+*                     BSAM-BPAM-QSAM INTERFACE

000BB0 00                        689+         DC    BL1'00000000'
000BB1 000001                    69C+         DC    AL3(1) CHECK, GERR, PERR
000BB4 00000001                  691+         DC    A(1) SYNAD
000BB8 0000                      692+         DC    F'0' CIND1, CIND2
000BBA 0050                      693+         DC    AL2(80) BLKSIZE
000BBC 00000000                  694+         DC    F'0' WCFC, WCPL, OFFSR, OFFSW
000BC0 00000001                  695+         DC    A(1) ICBA
000BC4 00                        696+         DC    AL1(0) ACB
000BC5 000001                    697+         DC    AL3(1) ECBR, EODAD

                                 699+*                     QSAM INTERFACE

000BC8 00000001                  701+         DC    A(1) RECAD
000BCC 0000                      702+         DC    F'0' QSWS
000BCF 0050                      703+         DC    AL2(80) LRECL
000BD0 80                        704+         DC    BL1'10000000' EROPT
000BD1 000001                    705+         DC    AL3(1) CNTRL
000BD4 00000000                  706+         DC    F'0' PRECL
000BD8 00000001                  707+         DC    A(1) ECB
                                 708 MINEOUT  DCB   BLKSIZE=80,DEVD=PR,DSORG=PS,DDNAME=SYSPRINT,LRECL=80,    *
                                                    MACRF=(PMC),RECFM=F

                                 710+*                     DATA CONTROL BLOCK
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT

                                   711+*
000BCC                             712+          CRG   *-16 TO ELIMINATE UNUSED SPACE
000BCC                             713+MINECUT   DS    OF ORIGIN ON WORD BOUNDRY
000BDC                             714+          ORG   *+16 TO ORIGIN GENERATION

                                   716+*                    PRINTER DEVICE INTERFACE
000BDC 0000                        718+          DC    BL2'0000000000000000' PRTSP,DEVT
000BDE 0000                        719+          DC    H'0'

                                   721+*                    COMMON ACCESS METHOD INTERFACE
000BE0 00                          723+          DC    AL1(0) EUFNO
000BE1 000001                      724+          DC    AL3(1) EUFCB
000BE4 0000                        725+          DC    AL2(0) EUFL
000BE6 4000                        726+          DC    BL2'0100000000000000' DSORG
000BE8 00000001                    727+          DC    A(1) ICBAD

                                   729+*                    FOUNDATION EXTENSION
000BEC 00                          731+          DC    BL1'00000000' RETEK,BFALN
000BED 000001                      732+          DC    AL3(1) EOBAD
000BF0 80                          733+          DC    BL1'10000000' RECFM
000BF1 000000                      734+          DC    AL3(0) EXLST

                                   736+*                    FOUNDATION BLOCK
000BF4 E2E8E2D7D340D5E3            738+          DC    CL8'SYSPRINT' DDNAME
000BFC 02                          739+          DC    BL1'00000010' OFLGS
000BFD 00                          740+          DC    BL1'00000000' IFLG
000BFE 0052                        741+          DC    BL2'0000000001010010' MACR

                                   743+*                    BSAM-BPAM-QSAM INTERFACE
000C00 80                          745+          DC    BL1'00000000'
000C01 000001                      746+          DC    AL3(1) CHECK, GERR, PERR
000C04 00000001                    747+          DC    A(1) SYNAD
000C08 0000                        748+          DC    H'0' CIND1, CIND2
000C0A 0050                        749+          DC    AL2(80) BLKSIZE
000C0C 00000001                    750+          DC    F'0' WCFC, WCPL, OFFSR, OFFSW
000C10 00000001                    751+          DC    A(1) ICBA
000C14 00                          752+          DC    AL1(0) ACP
000C15 000001                      753+          DC    AL3(1) ECBR, EOBAD

                                   755+*                    QSAM INTERFACE
000C18 00000001                    757+          DC    A(1) RECAD
000C1C 0000                        758+          DC    H'0' CSWS
000C1E 0050                        759+          DC    AL2(80) LRECL
000C20 00                          760+          DC    BL1'00000000' ERROPT
000C21 000001                      761+          DC    AL3(1) CNTRL
000C24 00000000                    762+          DC    F'0' PRECL
000C28 00000001                    763+          DC    A(1) ECE
000C30                             764           DS    0D                    FORCE ALIGNMENT
000C30 F0F0F0F0                    765 HOLDAC    DC    X'F0F0F0F0'           *
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT

000C38                             766            DS    0D
000C38 00000000                    767 HCLDNC1    DC    X'0GC00000'
000C3C F0F0F0F0                    768 HCLDNC2    DC    X'FCF0FCF0'
000C40 F0F0F0C0                    769 HCLDNC3    DC    X'F0F0F0C0'
000C44 00000000                    770 SAVE6      DC    A(0)
000C48 00000001                    771 SAVE7      DC    X'00000001'
000C4C 00000000                    772 SAVE8      DC    A(0)
000C50 00000000                    773 SAVE11     DC    A(0)
000C54 00000000                    774 SAVE3      DC    A(0)
000C58 00000000                    775 SAVER8     DC    A(0)
000C5C 00000000                    776 SAVEHOLD   DC    A(0)
000C60 0000000000000000            777 ZERO       DC    5A(0)
000C74 00000000                    778 NEWUNIT    DC    A(0)
000C78 00000000                    779 WAITUNIT   DC    A(0)
000C7C 00000000                    780 LASTFROM   DC    A(0)
000C80 00000000                    781 LASTTO     DC    A(0)
000C84 4040404040404040            782 SENSBYTE   DC    8C' '
000C8A 00                          783 NEWOP      DC    X'00'
000C8B 00                          784 WAITOP     DC    X'00'
000C8C 00000000                    785 TOUNIT     DC    A(0)
000C90 00000000                    786 FROMUNIT   DC    A(0)
000C94 AAAAFF00                    787 TABLE      DC    X'AAAAFF00'
000C98 0000000000000000            788            DC    16A(0)
000CD8 00000000                    789 LUNIT      DC    A(0)
000CDC 00000000                    790 SAVUN7     DC    A(0)
000CE0 00000000                    791 SAVUN10    DC    A(0)
000CE4 00000000                    792 SAVUN11    DC    A(0)
000CE8 00000000                    793 NUMB       DC    A(0)
000CEC 00                          794 AECOPYSW   DC    X'00'
000CED 00                          795 ANDSW      DC    X'00'
000CEE 00                          796 FILSW      DC    X'00'
000CEF 00                          797 RECSW      DC    X'00'
000CF0 00                          798 NOTSW      DC    X'00'
000CF1 00                          799 TIMSW      DC    X'00'
000CF2 00                          800 OPSW       DC    X'00'
000CF3 00                          801 COUNTSW    DC    X'00'
000CF4 00                          802 COPYSW     DC    X'00'
000CF5 00                          803 PRINTSW    DC    X'00'
000CF6 00                          804 NOLISTSW   DC    X'00'
000CF7 00                          805 HEXSW      DC    X'00'
000CF8 00                          806 TOSW       DC    X'00'
000CF9 00                          807 PRISW      DC    X'00'
000CFA 00                          808 READSW     DC    X'00'
000CFB 00                          809 COPYSW     DC    X'00'
000CFC 00                          810 SECSW      DC    X'00'
000CFD 00                          811 LASTEXSW   DC    X'00'
000CFE 00                          812 AUTOREW    DC    X'00'
000CFF 00                          813 UNLSW      DC    X'00'
000D00 5C5C5C5C5C5C5C5C            814 FINAL      DC    C'********'
000D00                             815            END   INPUT1
000D08 00000001                    816                  =X'00000001'
000D0C 00000002                    817                  =X'00000002'
000D10 00000003                    818                  =X'00000003'
000D14 C6C9D340                    819                  =C'FIL '
000D18 D9C5C340                    820                  =C'REC '

                                                        *
                                                        * FOR CONVERSIONS TO BINARY
                                                        *
                                                        *
                                                        ERROR TRIES
                                                        DEFAULT FILES
                                                        RECORDS
                                                        STOP AFTER THIS MANY ERRORS
                                                        SAVE INPUT POINTER
                                                        ANOTHER SAVE FOR R 8
                                                        SAVE AREA FOR HOLDWORD
                                                        FOR CLEARING WORKAREAS
                                                        UNIT JUST FOUND
                                                        UNIT WAITING FOR OPERATION
                                                        SAVER FOR FROMUNIT
                                                        SAVER FOR TOUNIT
                                                        FOR SENSE INFORMATION
                                                        OPERATION JUST FOUND
                                                        OPERATION WAITING
                                                        TO THIS UNIT
                                                        FROM THIS UNIT
                                                        FIRST ENTRY
                                                        TABLE OF UNITS
                                                        ENTRY TO TABLE
                                                        *
                                                        *     SAVE REGISTERS
                                                        *
                                                        NUMBER OF ENTRIES IN TABLE *4
                                                        AECOPY ?
                                                        AND ?
                                                        FILES ?
                                                        RECORDS ?
                                                        NOT ?
                                                        TIMES ?
                                                        OPERATION WAITING ?
                                                        COUNTS WAITING ?
                                                        COPYING TAPES ?
                                                        PRINTING ?
                                                        BYPASSING LIST ?
                                                        HEXADECIMAL ?
                                                        COPYING TO ?
                                                        PRINTING NEXT ?
                                                        READING NEXT ?
                                                        COPYING NEXT ?
                                                        SECONDARY OPERATION NEXT ?
                                                        LAST EXECUTION ?
                                                        SWITCH TO SKIP AUTO REWIND
                                                        UNLOAD ENTRY IN TABLE
                                                        MARKER FOR END OF PROGRAM
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
000D1C C5D9D943                    821                =C'ERR '
000D20 E3C9D440                    822                =C'TIM '
000D24 00000039                    823                =X'00000039'
000D28 00000118                    824                =X'00000118'
000D2C 00000000                    825                =V(ICCF)
000D30 C6D6D9E6                    826                =C'FCRW'
000D34 0000061A                    827                =A(TABLE2)
000D38 00000000                    828                =V(AECCFY)
000D3C 0C000004                    829                =X'0C000004'
000D40 E6C9E3C8D6E4                830                =C'WITHDU'
000D46 D7D9C9D5E3C5                831                =C'PRINTE'
000D4C D5D6D9C5E5                  832                =C'NCREW'
```

1/29/69

POS. ID	REL.ID	FLAGS	ADDRESS
01	01	08	000020
01	01	08	000031
01	01	08	000365
01	01	08	000369
01	01	08	000A81
01	01	0C	000A80
01	01	08	000A90
01	01	0C	000D34
01	02	1C	000D20
01	03	1C	000D38

SYMBOL	LEN	VALUE	DEFN	REFERENCES											
AECOPT	00004	000188	0121	C170											
AECOPYSW	00001	000CEC	0794	C1C4	C121	0245	0325	0343	0369						
AECOPY1	00004	000538	0347	C393	C395										
ALPHA	00004	0002C2	0186	CC58											
ANDON	00004	000700	0453	C478	C480										
ANDSW	00001	000CED	0795	C126	0453	0456									
AUTOREW	00001	000CFE	0812	CC78	C2CA										
A1	00002	000C00	0002												
A2	00003	000988	0630												
A3	00004	000028	0015	CC77	C079										
BAC	00004	0004EC	0331	C581											
BACK	00004	000684	0433	C479											
BFILES	00004	000780	0485	C464	0467	0491									
BFILON	00004	000770	0481	C463	C465	0466	0468								
BFILON1	00004	000720	0463	C434											
BLOCKZ	00004	000AA4	0637	C218	C219	0425	0471	0485	0496	0506	0636				
BRECON	00004	000704	0504	C482											
BSPECS	00004	000748	0496	C5C2											
BSPEC1	00004	000700	0506	C514	C517										
CALL1	00006	0006A4	0429	C47C											
CARDIN	00004	000870	0657	CC17	C029	0228									
CCX	00008	000AC8	0644												
CCY	00008	000AD0	0645	0213											
CCZ	00008	000AC0	0643	C213	C426	0427	0433	0435	0437	0439	0441	0443	0445	0483	C492	064C
CLEAR	00001	000820	0648	CC27											
CLEARNEW	00006	000100	0128	C125											
CLEAR2	00006	00059C	0369	C454	C524										
COMPR	00002	000080	0049	CC51	C103	0106	0185								
COMTEST	00004	000106	0080	CC68											
CONTINUE	00004	0000AA	0057												
COP	00004	000382	0250	C537											
COPP	00004	0003A6	0247	C251	C377										
COPSW	00001	000CFB	0809	C247	C252	0376									
COPYSW	00001	000CF4	0802	C133	C248	0324	0347								
CORRECT	00006	000144	0094	CC72	CC88	0092									
CORRVER	00004	000166	0102	C105											
COUNTON	00004	000426	0279	C282	C284	0286	0288	0290	0292	0294	0296	0298			
COUNTSW	00001	000CF3	0801	0055	C1C2	0107	0255	0258	0261	0264	0267	0270	0272	0275	C279
DECWORK	00008	000380	0649	C119	C119										
EIG	00004	00045E	0293	C565											
END	00004	000494	0306	C597											
ENDOVER	00004	000498	0307	C328	C33C	0332	0334	0339	0341						
ERA	00004	000504	0333	C583											
ERP	00004	000FE6	0267	C547											
EXEC	00004	00052A	0342	C127	0238	0242	0253	0310	0320						
FFILON	00004	000738	0466	C436											
FIL	00004	000306	0255	C543											
FILSW	00001	000CEE	0796	C172	0259	0345	0460	0481							
FINAL	00008	000900	0814												
FINISH	00004	00031A	0208	C383											
FINISHED	00004	000312	0206	CC34	C676										
FINISHX	00004	000360	0226	C2C9	C215										
FIRSTCTR	00006	0004A8	0311	C2C8											
FIV	00004	000446	0287	C559											
FOR	00006	000530	0336	C585											

SYMBOL	LEN	VALUE	DEFN	REFERENCES													
FORW	00004	00051A	0338	C336													
FOU	00004	00043E	0285	C557													
FOUND	00004	000676	0419	C4C4													
FOUR	00006	00013E	0093	CC90													
FREEZERR	00004	0002A0	0177	C113													
FREEZFIL	00004	000288	0171	C109													
FREEZREC	00004	000294	0174	C111													
FREEZTIM	00004	0002A8	0179	C115													
FROMINIT	00004	000C90	0786	C136	C348	0350	0358	0366									
HEX	00004	000810	0525	C6C3													
HEXOK	00004	000256	0160	C148	C153												
HEXOVER	00002	00020E	0140														
HEXSW	00001	000CF7	0905	C525	C530												
HEXTEST	00004	000206	0138	CC62													
HOLDNO	00004	000C30	C765	CC53	CC71	0087	0091	0093	0098	0168							
HOLDNO1	00004	000C38	0767	CC96													
HOLDNO2	00004	000C3C	C768	CC71	C087	0091	0093	0094	0095	0095	0097	0162	0163	0164	C164	0165	0167
HOLDNO3	00004	000C40	0769	CC94	C097	0163	0167										
HOLDWORD	00001	000888	065C	CC54	C057	006C	0108	0110	0112	0114	0117	0194	0202				
INPUT	00001	000A98	0646	CC27	C030	0033	0037	0047									
INPUT1	00001	000CC0	0001	0815													
LASTEX	00004	00037A	0236	C2C7													
LASTEXSW	00001	000CFD	0811	C236	C382												
LASTFROM	00004	000C7C	078C														
LASTTO	00004	000C80	0781														
LIB	00004	000834	0534	C198													
LIS	00004	0003C2	0254	C539	0541												
LOOK	00006	00030C	02C2	C2C4													
LOOKUP	00004	0002F2	0198	C188													
LUNIT	00004	000CD8	0789	C350	C355	0403	0406	0429									
MARKER	00005	000828	0647														
MESSAGE	00001	000A00	0632	C447	C450	0518	0521										
MESSAGEA	00040	000A50	0634	C447													
MESSAGEB	00040	000A78	0635	C518													
MESSAGE1	00006	000CF8	0518	C424													
MINFOUT	00004	000BCC	0713	CC19	0022	C036	0041	0230	0449	0520							
NEWOP	00001	000C8A	0783	0306	C311	0312	0327	0329	0331	0333	0338	0340	0387	0389			
NEWUNIT	00004	000C74	0778	C123	C128	0129	0386	0388	0457	0458							
NHEX	00004	000824	0530	C629													
NIN	00004	000466	0295	C567													
NLIS	00004	000820	0532	C611	C613												
NLOOK	00006	0002E0	0194	C196													
NNEXT	00004	000810	0528	C627													
NOLISTSW	00001	000CF6	0804	C532													
NOT	00004	000476	0298	C3C2	C571	0573	0575	0577									
NOTLIB	00004	000940	0604	C190													
NOTLOOK	00004	0002CE	0189	C187													
NOTNUM	00002	000284	0182	C130	C135	0137	0139	0150	0155	0173	0176	0178	0181	0184	C197	0205	C246	0254
				0256	C260	0262	0266	0268	0271	0273	0277	0280	0300	0303	C305	0314	C326	0337
				0384	C391	0462	0527	0531	0533									
NOTSW	00001	000CF0	0798	C186	C189	0299	0528											
NOUNL	00002	000358	0222	C217														
NUMB	00004	000CF8	0793	0401	0407	0409												
NUMTEST	00004	0008BC	C061	CC84														
OK	00004	000008	C069	CC81	CC83													

SYMBOL	LEN	VALUE	DEFN	REFERENCES											
ONE	00004	000422	0278	C551											
OPER	00004	00074C	0471	C438	C440	0442	0444	0446							
OPSW	00001	000CF2	0800	C206	C237	0239	0243	0250	0307	0313	0317	0321	0342	0385	C455
OVERA	00006	000558	0353	C349											
OVERB	00004	00056E	0358	C354											
POINTZ	00001	000AA0	0636	C474	C488	0499	0509								
PRT	00006	0004BA	0315	C599											
PRINTSW	00001	000CF5	0803	C323	0526										
PRTP	00004	000404	0321	C316	C318	0379									
PRTSW	00001	000CF9	0807	C319	0322	0378									
PUTFROM	00004	0001FE	0136	C132											
REA	00004	000386	0239	C535											
READ	00006	000046	0027	C529	C595										
READP	00004	000396	0243	C240	0249	0375									
READSW	00001	000CFA	0808	C241	C244	0374									
REC	00004	0003DE	0261	C545											
RECSW	00001	000CEF	0797	C175	C265	0392	0459	0493	0504	0512					
REPEAT	00004	000760	0477	C494	C503	0513	0515								
REPREC	00004	000FE0	0516	C505											
REW	00004	0004EC	0327	C593											
SAVEA	00004	000988	0631	C005	C006	0232									
SAVEHOLD	00004	000C5C	0776	C060	C117										
SAVER8	00004	000C58	0775	C144	C161										
SAVE11	00004	000C50	0773	C177	0269	0383	0373								
SAVE3	00004	000C54	0774	C059	C116	0146	0160								
SAVE6	00004	000C44	0770	C179	0274	0362	0372	0432							
SAVE7	00004	000C48	0771	C171	C257	0360	0370	0394	0484						
SAVE8	00004	000C4C	0772	C174	C263	0361	0371	0495	0516						
SAVUN10	00004	000CE0	0791	C397	C413										
SAVUN11	00004	000CE4	0792	C398	C414										
SAVUN7	00004	000CDC	0790	C396	C412										
SECCTR	00004	000440	0305												
SECP	00004	000586	0385	C381											
SECSW	00001	000CFC	0810	C309	C380	0390									
SEN	00004	000522	0340	C587	0605	0607	0609	0615	0617	0619	0621	0623	0625		
SENSBYTE	00001	000C84	0782												
SEV	00004	000456	0291	C563											
SIX	00004	00044E	0289	C561											
SKIPAUTO	00002	000CFA	0873	C012	C075										
STATUSZ	00004	000A88	0542												
TABLE	00004	000C94	0787	0210	C212	0399									
TABLE1	00006	000634	0403	C405											
TABLE2	00004	00051A	0396	C351	C356	0430	0827								
TABLE3	00004	000C6A	0416	C411	C420										
TABLE4	00004	000650	0412	C418	C422										
TABLE5	00006	000336	0214	C223											
TEN	00004	00046E	0297	C569											
TESTNUM	00004	00017A	0107	C056											
TESTREC2	00004	000608	0392	C346											
TESTTO	00004	0001EA	0131	C122											
TESTUN2	00006	000696	0423	C344											
THR	00004	000436	0283	C555											
THREE	00004	00012C	0089	C086											
TIM	00004	000A0A	0272	C549											
TIMSW	00001	000CF1	0799	C180	C276	0461	0477								

SYMBOL	LEN	VALUE	DEFN	REFERENCES														
TD	00004	00043C	0304	C589	C591													
TOSW	00001	000CF9	0806	C131	C3C4													
TOUNIT	00004	000C9C	0785	C134	C353	0355	0359	0367										
TWO	00004	00042E	0281	C553														
TWO1	00004	000114	0085	C07C														
UNI	00004	0004F4	0329	C6C1														
UNI SW	00001	000CFF	0913	C41C	0417	0419	0469											
UNI1	00004	000744	0469	C428														
WAITSB	00001	000C98	0784	C311	0387	0426												
WAITUNIT	00004	000C78	0779	C124	C128	0386	0423	0425	0429	0457								
WIT	00006	00047E	0301	C575														
ZERO	00004	000C60	0777	C011	C124	0125	0210	0214	0348	0353	0366	0367	0369	0371	0372	0373	0388	0394
				C423	C458													
ZEROTEST	00004	00016E	0104	C1C1														

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
1048 PRINTED LINES

```
IEF285I   SYS1.MACLIB                                    KEPT
IEF285I   VOL SER NOS= AAECC1.
IEF285I   SYSUT1                                         KEPT
IEF285I   VOL SER NOS= AAECC1.
IEF285I   SYSUT2                                         KEPT
IEF285I   VOL SER NOS= AAECC3.
IEF285I   SYSUT3                                         KEPT
IEF285I   VOL SER NOS= AAECC2.
IEF285I   SYSOUT                                         SYSOUT
IEF285I   VOL SER NOS=      .
IEF285I   SYS69029.T112946.RPCC2.NNN.RCC00002            DELETED
IEF285I   VOL SER NOS=      .
**END ASM      11.23.06 CC194 SECS CCCC
//  EXEC ASMEC
//ASM    EXEC  PGM=IEUASM                                                  CCCCC010
//SYSLIB DD    DSNAME=SYS1.MACLIB,DISP=OLD                                 00000020
//SYSUT1 DD DSNAME=SYSUT1,DISP=OLD                                         00000030
//SYSUT2 DD DSNAME=SYSUT2,DISP=OLD                                         00000040
//SYSUT3 DD DSNAME=SYSUT3,DISP=OLD                                         00000050
//SYSPRINT DD  SYSOUT=A                                                    00000060
//SYSPUNCH DD  UNIT=SYSCP                                                  CC000070
//ASM.SYSIN DD *
IEF236I ALLOC. FOR NNN      ASM
IEF237I SYSLIB   ON 190
IEF237I SYSUT1   ON 190
IEF237I SYSUT2   ON 290
IEF237I SYSUT3   ON 191
IEF237I SYSPUNCH ON 00D
IEF237I SYSIN    ON 00C
```

SYMBOL	TYPE	ID	ADDR	LENGTH	LD ID
READTAPE	SD	01	[illegible]	011CC8	
AECOPY	LD		[illegible]		01
IOCP	ER	02			

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  FC1JAN68  1/29/69
000000                                    1 READTAPE CSECT
                                          2          ENTRY AECOPY
000000 05A0                               3 AECOPY   BALR  10,0                 COUNTER INFORMATION INTO R10
000002                                    4          USING *,10                 TELL ASSEMBLER TO USE R10
000002 90EC D00C              CCCCC       5          STM   14,12,12(13)         SAVE REGISTERS
000006 5000 A86A              CC86C       6          ST    13,SAVEA+4           GET ADDRESS OF CALLING SAVEAREA
00000A 4130 A866              CC868       7          LA    3,SAVEA              NEW SAVEAREA ADDRESS INTO R3
00000E 5030 D008              CCCC8       8          ST    3,8(0,13)            NEW ADDRESS INTO OLD SAVEAREA
000012 1803                               9          LR    13,3                 NEW SAVEAREA ADDRESS INTO R13
                                         10          OPEN  (LINECUT,(OUTPUT))   ***MACRO
000014                                   11+         CNOP  0,4
000014 4510 A01A              CCC1C      12+         BAL   1,*+8 LOAD REG1 W/LIST ADDR.
000018 8E                                13+         DC    AL1(143) OPTION BYTE
000019 000F80                            14+         DC    AL3(LINECUT) DCB ADDRESS
00001C 0A13                              15+         SVC   19 ISSUE OPEN SVC
00001E D205 A8C4 A8CC (0)BC8 CCBCE       16          MVC   ECRUN(6),ECRUN2      *
000024 D200 AEC6 AC42 (0)EC8 CCC44       17          MVC   SAVERUN(14),ZERO     *
00002A D208 AC56 AC42 (0)C58 CCC44       18          MVC   LASTREC(12),ZERO     *
000030 9200 AC1E      (0)C20             19          MVI   FRETSW,X'00'         *
000034 D203 AC62 AC6F (0)C64 CCC7C       20          MVC   HOLDNO(4),HOLDNO3    *
00003A D203 AC6A AC6F (0)C6C CCC7C       21          MVC   HOLDNO2(4),HOLDNO3   *   RESTORE AREAS WHICH WERE
000040 D283 A02A A98A (0)02C CC98C       22          MVC   OUTBLOCK(132),BLANKS *   ORIGINALLY SET UP WITH
000046 D283 A0BE A98A (0)0C0 CC98C       23          MVC   HEXBLOCK(132),BLANKS *   OC  INSTRUCTIONS
00004C D283 ACA6 A98A (0)CA8 CC98C       24          MVC   OUTPUT(132),BLANKS   *
000052 D202 AE0F AE5E (0)E11 CCF6C       25          MVC   INLINE+53(3),INNER   *
000058 D274 A542 A98A (0)E44 CC98C       26          MVC   HEXBLOCK+132(117),BLANKS *
00005E D208 AFFE AC42 (0)FFC CCC44       27          MVC   CHECKN(12),ZERO      *
000064 9200 AF5C      (0)FFE             28          MVI   BCOUS,X'00'          *
000068 D200 AF0E AC42 (0)F0C CCC44       29          MVC   FIRSTIME(14),ZERO    *
00006E 5050 AF7E      (0)F8C CCF8C       30          ST    5,TOUNIT             A
000072 5040 AF82      (0)F84 CCF84       31          ST    4,FROMUNIT           A   ACCEPT INFORMATION SENT IN
000076 5090 AF65      (0)F0F CCF8F       32          ST    9,COPYSW             A
00007A D503 AF82 AC42 (0)F84 CCC44       33          CLC   FROMUNIT(4),ZERO     IS THERE A FROM UNIT ?
000080 4770 A154              00156      34          BNE   FROMCK               YES - ACCEPT THIS UNIT
000084 D503 AF7E AC42 (0)F8C CCC44       35          CLC   TOUNIT(4),ZERO       NO - IS THERE A TO UNIT ?
00008A 4780 A24A              CC24C      36          BE    FINISHA              NO - GO AND WRITE ERROR MESSAGE
00008E D503 AF7E A816 (0)F80 CC818       37          CLC   TOUNIT(4),=X'0000000E' YES - IS TOUNIT A PRINTER ?
000094 4780 A24A              CC24C      38          BE    FINISHA              YES-GO AND WRITE ERROR MESSAGE
000098 D203 AF82 AF7E (0)F84 CCF8C       39          MVC   FROMUNIT(4),TOUNIT   NO - ACCEPT TOUNIT AS FROMUNIT
00009E 9200 AF65      (0)F8F             40          MVI   COPYSW,X'00'         TURN COPYSWITCH OFF
0000A2 D203 A84A AF82 (0)84C CCF84       41 SETFROM MVC   BLOCKA+8(4),FROMUNIT  *
0000A8 D203 AAD2 AF82 (0)AD4 CCF84       42          MVC   BLOCKE+8(4),FROMUNIT  *  MOVE FROMUNIT INTO PLACE
0000AE D203 A84A AF82 (0)84C CCF84       43          MVC   BLOCKH+8(4),FROMUNIT  *
0000B4 D201 A84A AFFA (0)84C CCFFC       44          MVC   BLOCKA+8(2),MASK     INSERT MASK
0000BA D201 A84A AFFA (0)84C CCFFC       45          MVC   BLOCKH+8(2),MASK     INSERT MASK
0000C0 9240 AFFE      01000              46          MVI   INPUT,X'40'          *
0000C4 4140 0100              CC10C      47          LA    4,256                *
0000C8 4150 AFFE              C1CCC      48          LA    5,INPUT              *   CLEAR INPUT TO AVOID
0000CC D2FF 5001 5000 (0)001 CCCCC       49 CLEAR1  MVC   1(256,5),0(5)        *   GARBAGE IF PRINTING
0000D2 4155 0100              CC10C      50          LA    5,256(5)             *
0000D6 4640 A0CA              CCCCC      51          BCT   4,CLEAR1             *
0000DA 4120 AC82              CCC84      52 OUT2    LA    2,OUTPUT+12          R2 CONTAINS POINTER TO OUTPUT
0000DE 1833                              53          SR    3,3                  R3 CONTAINS NO. OF THIS SIZE
0000E0 1844                              54          SR    4,4                  R4 CONTAINS TOTAL RECORD COUNT
0000E2 4150 0001              CCCC1      55          LA    5,1                  R5 CONTAINS 1 FOR A COUNTER
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT
0000E6 4190 0364            CCC64   56          LA    9,100          R9 NO. OF PRINT PLACES LEFT
0000EA 5060 AC22            CCC24   57          ST    6,SAVE6        SAVE NUMBER OF TRIES
0000EE 5080 AC26            CCC2E   58          ST    11,SAVE11      SAVE NUMBER ALLOWED
0000F2 1277                         59          LTR   7,7            ANY FILES?
0000F4 4720 A0FA            CCCFC   60          BP    GC             CONTINUE IF SO
0000F8 92FF AFE3      C3FE5         61          MVI   RECSW,X'FF'    TURN ON RECSW
0000FC 4110 A842            CC844   62 GC       LA    1,BLOCKA       *
000100 58F0 A81A            CC81C   63          L     15,=V(IOCP)    * READ A PHYSICAL RECORD
000104 05EF                         64          BALR  14,15          *
000106 5810 A83E            CC84C   65 WAIT     L     1,PRINTA       *
00010A 58F0 A81A            CC81C   66          L     15,=V(IOCP)    * WAIT FOR READ TO FINISH
00010E 05EF                         67          BALR  14,15          *
000110 1A45                         68 LIST     AR    4,5            R4 CONTAINS TOTAL OF RECORDS
000112 91FF AFFC      C0FFE         69          TM    BOGUS,X'FF'    BOGUS CSW?
000116 4710 A18E            CC19C   70          BO    BADCSW         YES-BRANCH
00011A 9101 AFEE      C0FFC         71 MARKTEST TM    CHECKN,X'01'   TEST FOR TAPEMARK
00011E 4710 A6F8            CC6FA   72          BO    TAPEMARK       BRANCH IF TAPEMARK
000122 9102 AFEE      C0FF0         73          TM    CHECKN,X'02'   TEST FOR UNIT CHECK-TAPE ERROR
000126 4710 A3EA            CC3FC   74          BO    ERRCR1         BRANCH IF ERROR
00012A 91FF AFE6      C0FE8         75 LISTCVER TM    COPYSW,X'FF'   IS COPY REQUESTED?
00012E 4710 A360            CC362   76          BO    COPY           BRANCH IF SO
000132 91FF AFE7      C0FE9         77          TM    PRINTSW,X'FF'  PRINT REQUESTED ?
000136 4710 A262            CC264   78          BO    PRINTER        BRANCH IF PRINT
00013A 5860 AC22            CCC24   79 TEST4    L     6,SAVE6        RESTORE NO. OF ERROR TRIES
00013E 4150 0001            CCCC1   80          LA    5,1            RESTORE R5
000142 91FF AFEA      C0FEC         81          TM    EDITSW,X'FF'   EDIT SWITCH ON?
000146 4710 A6B2            CC6B4   82          BO    TEST2          BRANCH IF SO
00014A 91FF AFDE      C0FEC         83          TM    FIRSTIME,X'FF' IS THERE A PREVICUS RECORD?
00014E 4780 A756            CC75E   84          BZ    FIRST          BRANCH IF NOT
000152 47F0 A4AA            CC4AC   85          B     MORE           BRANCH AROUND ERROR
000156 D503 AF7E AC42 C0F80 CCC44   86 FROMCK   CLC   TCUNIT(4),ZERC  IS THERE A TO UNIT ?
00015C 4770 A1B2            CC1B4   87          BNE   TCOK           YES - ACCEPT THIS UNIT
000160 9200 AFE6      C0FE8         88          MVI   COPYSW,X'00'     NO - TURN COPY SWITCH OFF
000164 47F0 A0A0            CC0A2   89          B     SETERROM       ACCEPT ONLY FROM UNIT
000168                              90          USING *,15           TELL ASSEMBLER TO USE R 15
000168 D203 FE88 F6F0 C0FF0 CC858   91 NORMALEX MVC   CHECKN(4),STATUSA A 'NORMAL' CSW
00016E 07FE                         92          BR    14             BACK TO IOCP
000170                              93          USING *,15           TELL ASSEMBLER TO USE R 15
000170 D203 FE84 F6E8 C0FF4 CC858   94 ERROREX  MVC   CHECKE(4),STATUSA AN 'EXCEPTION CSW'
000176 92FF FE8E      C0FFE         95          MVI   BOGUS,X'FF'    TURN ON SWITCH
00017A 07FE                         96          BR    14             BACK TO IOCP
00017C                              97          USING *,15           TELL ASSEMBLER TO USE R 15
00017C D203 FE74 F90C C0FF0 CC858   98 NORMAL2  MVC   CHECKN(4),STATUSH A 'NORMAL' CSW
000182 07FE                         99          BR    14             BACK TO IOCP
000184                             100          USING *,15           TELL ASSEMBLER TO USE R 15
000184 D203 FE70 F904 C0FF4 CC858  101 ERROR2   MVC   CHECKE(4),STATUSH AN 'EXCEPTION' CSW
00018A 92FF FE7A      C0FFE        102          MVI   BOGUS,X'FF'    TURN ON SWITCH
00018E 07FE                        103          BR    14             BACK TO IOCP
                                   104          ORGP  15             GO BACK TO BASE R 1C
000190 9200 AFFC      C0FFE        105 BADCSW    MVI   BOGUS,X'00'    TURN OFF SWITCH
000194 9102 AFF2      C0FF4        106          TM    CHECKE,X'02'   TAPE ERROR?
000198 4710 A3E4            CC3F6  107          BO    ERRCR3         YES-USE BOGUS CSW AS TAPE ERROR
00019C 5030 AED6            CCED8  108 PROTERR  ST    3,SAVER3       SAVE R 3
0001A0 5830 AFF6            CCFF8  109          L     3,COUNTER      COUNT OF BAD CSW'S INTO R3
0001A4 5A30 A81E            CC82C  110          A     3,=X'00000001' ADD 1 TO COUNT
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  FORTJAN68  1/29/69

0001A8 5030 AFF6            CCFF8   111          ST    3,COUNTER                 SAVE COUNT
0001AC 5830 AFD6            CCED8   112          L     3,SAVER3                  RESTORE R3
0001B0 47F0 A3FE            CC4C0   113          B     ERROR                     TRY THIS OPERATION AGAIN
0001B4 D503 AF7E A816 C0F8C CC818   114 TCOK     CLC   TCUNIT(4),=X'0000000E'    IS TO UNIT A PRINTER ?
0001BA 4780 A23E            CC24C   115          BE    PRINTING                  YES - GO AND PREPARE FOR PRINT
0001BE D203 AA02 AF7E C0A04 CCF8C   116          MVC   BLOCKE+8(4),TOUNIT        MOVE TOUNIT TO SENSE
0001C4 4110 AACA            CCACC   117 SENSING  LA    1,BLOCKE                  *
0001C8 58F0 A81A            CC81C   118          L     15,=V(IICCP)              *
0001CC 05EF                 CCACC   119          BALR  14,15                     *  SENSE TO UNIT
0001CE 5810 AAC6            CCAC8   120          L     1,POINTE                  *
0001D2 58F0 A81A            CC81C   121          L     15,=V(IICCP)              *
0001D6 05EF                 CCACC   122          BALR  14,15                     *
0001D8 9102 AF87      C0F89 CCF89   123          TM    SENSBYTE+1,X'02'          IS THIS FILE-PROTECTED ?
0001DC 4710 A1FA            CC1FC   124          BO    FILPROT                   YES-INFORM OPERATOR
0001E0 D203 AA02 AF82 C0A04 CCF84   125          MVC   BLOCKE+8(4),FROMUNIT      RESTORE FROMUNIT TO SENSE
0001E6 D203 AAFA AF7E C0AFC CCF8C   126          MVC   BLOCKF+8(4),TOUNIT        *
0001EC D203 AB22 AF7E C0B24 CCF8C   127          MVC   BLOCKG+8(4),TOUNIT        * NO - MOVE TOUNIT INTO PLACE
0001F2 D203 AB7A AF7E C0B7C CCF8C   128          MVC   BLOCKJ+8(4),TOUNIT        *
0001F8 47F0 A0A2            CCCA2   129          B     SETFROM                   GO AND ACCEPT FROM UNIT
0001FC 91FF AC1E      C0C2C         130 FILPROT  TM    PROTSW,X'FF'              MESSAGE ALREADY SENT ?
000200 4710 A1C2            CC1C4   131          BO    SENSING                   YES-LOOP
000204 5050 AC0E            CCC1C   132          ST    5,SAVER5                  SAVE R 5
000208 5850 AF7E            CCF8C   133          L     5,TCUNIT                  TOUNIT INTO R 5
00020C 8950 0003            CCCC8   134          SLL   5,8(0)                    ALLOW FOR SIGN
000210 5050 AC12            CCC14   135          ST    5,PKUN                    PREPARE TO UNPACK
000214 F373 AC16 AC12 C0C18 CCC14   136          UNPK  UNPKUN(8),PKUN(4)         UNPACK TO UNIT
00021A D202 AB5A AC1A C0BEC CCC1C   137          MVC   TYPNUM(3),UNPKUN+4        MOVE UNIT TO TYPE LINE
000220 5850 AC0E            CCC1C   138          L     5,SAVER5                  RESTORE R 5
000224 4110 ABA2            CCBA4   139          LA    1,BLOCKM                  *
000228 58F0 A81A            CC81C   140          L     15,=V(IICCP)              *
00022C 05EF                 CCACC   141          BALR  14,15                     *
00022E 5810 AB9E            CCBAC   142          L     1,POINTM                  *    WRITE TO OPERATOR
000232 58F0 A81A            CC81C   143          L     15,=V(IICCP)              *
000236 05EF                 CCACC   144          BALR  14,15                     *
000238 92FF AC1E      C0C2C         145          MVI   PROTSW,X'FF'              TURN ON PROTSW
00023C 47F0 A1C2            CC1C4   146          B     SENSING                   GO AND SENSE AGAIN
000240 92FF AFF7      C0FF9         147 PRINTING MVI   PRINTSW,X'FF'             TURN PRINT SWITCH ON
000244 9200 AFF6      C0FF8         148          MVI   COPYSW,X'00'              TURN COPY SWITCH OFF
000248 47F0 A0A2            CCCA2   149          B     SETFROM                   GO AND ACCEPT FROM UNIT
00024C D22C A80B A84F C08DD CC88C   150 FINISHA  MVC   MESSAGE(45),MESSAGEA       MOVE ERROR MESSAGE INTO PLACE
                                    151          PUT   LINECUT,MESSAGE           ***MACRO
000252 4110 AF7E            CCF8C   152+         LA    1,LINECUT LOAD PARAMETER REG 1
000256 4100 A808            CC8DD   153+         LA    0,MESSAGE LOAD PARAMETER REG 0
00025A 58F0 1030            CCC3C   154+         L     15,48(0,1) LOAD PUT ROUTINE ADDR.
00025E 05EF                 CCACC   155+         BALR  14,15 LINK TO PUT ROUTINE
000260 47F0 A73C            CC7BE   156          B     FINISHED                  GO AND WIND UP AECOPY
000264 5030 AC2A            CCC2C   157 PRINTER  ST    3,PSAVE3                  SAVE REGISTER 3
000268 5040 AC2E            CCC30   158          ST    4,PSAVE4                  SAVE REGISTER 4
00026C 5050 AC32            CCC34   159          ST    5,PSAVE5                  SAVE REGISTER 5
000270 4130 AFFE            C1CCC   160          LA    3,INPUT                   ADDRESS OF INPUT INTO R3
000274 4140 0050            CCC50   161          LA    4,80                      BLOCK SIZE INTO R4
000278 5350 A822            CC824   162          L     5,=X'00C0FFFF'            MAXIMUM RECORD SIZE
00027C D201 AC5C AFF0 C0C5E CCFF2   163          MVC   SIZEREC+2(2),CHECKN+2     PUT REMAINDER IN SIZEREC
000282 5B50 AC5A            CCC5C   164          S     5,SIZEREC                 SIZEREC CONTAINS RECORD SIZE
000286 1A53                         165          AR    5,3                       R5 CONTAINS SIZE + A(INPUT)
```

```
LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT
000288 D24F A02A 3[illegible] 002C CCCC0   166 PUTBLOCK MVC   CUTBLOCK(80),0(3)        MOVE BLOCK INTO OUTPUT
00028E 91FF AFE9      02FE8        167         TM    HEXSW,X'FF'              HEX SWITCH ON?
000292 4710 A28A            02FEC  168         BO    TRANSLAT                 BRANCH IF SO
                                    169 PUTPLUS PUT   LINECUT,CUTBLOCK         ***MACRO
000296 4110 AE7E            02F8C  170+PUTPLUS LA    1,LINECUT LOAD PARAMETER REG 1
00029A 4100 A02A            02D2C  171+        LA    0,CUTBLOCK LOAD PARAMETER REG 0
00029E 58F0 1031            02C3C  172+        L     15,48(0,1) LOAD PUT ROUTINE ADDR.
0002A2 05EF                        173+        BALR  14,15 LINK TO PUT ROUTINE
0002A4 91FF AFE5      02FE7        174         TM    SECSW,X'FF'              SECOND-LINE SWITCH ON?
0002A8 4710 A33A            02C3C  175         BO     SEC                     BRANCH IF SO
0002AC 1A34                        176         AR    3,4                      B     PRINT TAPE
0002AE 1935                        177         CR    3,5                      B     IN  BC  BYTE
0002B0 4740 A2B6            02C88  178         BL    PUTBLOCK                 B      SEGMENTS
                                    179         CNTRL LINECUT,SP,3             ***MACRO
0002B4 4111 AE7E            02F8C  180+        LA    1,LINECUT LOAD PARAMETER REG 1
0002B8 4100 0303            02C03  181+        LA    0,3(0,0) LOAD PARAMETER REG 0
0002BC 58E1 0054            02C54  182+        L     15,84(1,0) LOAD CONTROL ROUT.ADDR
0002C0 05EF                        183+        BALR  14,15 LINK TO CONTROL ROUT.
0002C2 9240 AFFF      01CCC        184         MVI   INPUT,X'40'              * CLEAR
0002C6 4140 0100            01CCC  185         LA    4,256                    *  INPUT
0002CA 4150 AFFF            01CCC  186         LA    5,INPUT                  *  TO  AVOID
0002CE D2FF 5001 5030 [illegible] CCCC0  187 CLEAR   MVC   1(256,5),0(5)          *  EXTRA  FIELDS
0002D4 4155 0100            01C00  188         LA    5,256(5)                 *  IN  NEXT
0002D8 4640 A2CC            02CFE  189         BCT   4,CLEAR                  *  PRINT
0002DC 5830 AC2A            02C2C  190         L     3,PSAVE3                 *
0002E0 5840 AC2E            02C3C  191         L     4,PSAVE4                 *  RESTORE
0002E4 5850 AC32            02C34  192         L     5,PSAVE5                 *
0002E8 47F0 A133            02C3A  193         B     TEST4                    GO BACK TO MAINSTREAM
0002EC D24F AF66 A02A [illegible] 02D2C  194 TRANSLAT MVC   INTER(80),CUTBLOCK      PREPARE FOR TRANSLATE
0002F2 5180 AC36            02C38  195         ST    8,PSAVE8                 *
0002F6 5090 AC3A            02C3C  196         ST    9,PSAVE9                 * REGISTERS ARE SAVED,AS THEY
0002FA 5020 AC3E            02C40  197         ST    2,PSAVE2                 * ARE NEEDED FOR HEX CONVERSION
0002FE 4180 A0AE            02D0C  198         LA    8,HEXBLOCK               POINTER TO START OF HEXBLOCK
000302 4190 AF66            02F68  199         LA    9,INTER                  POINTER TO START OF WORKAREA
000306 4120 000C            02CCC  200         LA    2,12                     12 BCT INSTRUCTIONS NEEDED
00030A F3E7 8000 9000 [illegible] CCCCC  201 UNPACK  UNPK  0(15,8),0(8,9)          SPLIT BYTES INTO HALVES
000310 5A80 A016            02C18  202         A     8,=X'0000000F'           *   INCREASE INDICES
000314 5A90 A326            02C28  203         A     9,=X'00000007'           *   FOR  WORKAREAS
000318 4620 A308            02C0A  204         BCT   2,UNPACK                 KEEP UNPACKING
00031C 5880 AC36            02C38  205         L     8,PSAVE8                 *
000320 5890 AC3A            02C3C  206         L     9,PSAVE9                 *  RESTORE REGISTERS
000324 5820 AC3E            02C40  207         L     2,PSAVE2                 *
000328 DC0F A0B5 AE7E 02D0C 02EF0  208         TR    HEXBLOCK(160),TRTABLE-240 TRANSLATE 4 BIT TO 8 BIT
00032E D24F A02A A0BE 02D2C 02D0C  209         MVC   CUTBLOCK(80),HEXBLOCK    PUT INTO PLACE FOR PRINTING
000334 92FF AFE5      02FE7        210         MVI   SECSW,X'FF'              TURN ON SECOND-LINE SWITCH
000338 47F0 A294            02C96  211         B     PUTPLUS                  GO BACK TO PROCESSING
00033C D24F A02A AFDE 02D2C 02E1C  212 SEC     MVC   CUTBLOCK(80),HEXBLOCK+80 PUT SECOND LINE INTO PLACE
000342 9200 AFE5      02FE7        213         MVI   SECSW,X'00'              TURN OFF SECOND-LINE SWITCH
000346 47F0 A294            02C96  214         B     PUTPLUS                  GO BACK TO PROCESSING
00034A D220 A808 AA0E 00800 02A1C  215 PRINTAPE MVC   MESSAGE(45),MESSAGEY     'TAPEMARK'
                                    216         PUT   LINECUT,MESSAGE          ***MACRO
000350 4111 AE7E            02F8C  217+        LA    1,LINECUT LOAD PARAMETER REG 1
000354 4100 A308            02C08  218+        LA    0,MESSAGE LOAD PARAMETER REG 0
000358 58E0 1031            02C3C  219+        L     15,48(0,1) LOAD PUT ROUTINE ADDR.
00035C 05EF                        220+        BALR  14,15 LINK TO PUT ROUTINE
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                        FCIJAN68   1/29/69

00035E 47F0 A70C            CC7CE   221            B     TEST5                      GO BACK TO MAINSTREAM
000362 5860 A822            CC824   222 CCPY       L     6,=X'0000FFFF'             MAXIMUM RECORD SIZE
000366 D201 AC5C AFF0 0C5E 00FF2    223            MVC   SIZEREC+2(2),CHECKN+2      PUT REMAINDER IN SIZEREC
00036C 5860 AC5A            CCC5C   224            S     6,SIZEREC                  R6 CONTAINS SIZE OF RECORD
000370 5060 AC5A            CCC5C   225            ST    6,SIZEREC                  SIZEREC CONTAINS RECORD SIZE
000374 D201 AB14 AC5C 00B16 CCC5E   226            MVC   CCF+6(2),SIZEREC+2         CCF CONTAINS RECORD SIZE
00037A 5860 AC22            CCC24   227            L     6,SAVE6                    R6 CONTAINS NO. OF ERROR TRIES
00037E 4110 AAF2            CCAF4   228 CCPYR      LA    1,BLCCKF                   *
000382 58F0 A81A            CC81C   229            L     15,=V(ICCP)                *
000386 05EF                         230            BALR  14,15                      *  COPY TAPE RECORD
000388 5810 AAEE            COAFC   231            L     1,PCINTF                   *
00038C 58F0 A81A            CC81C   232            L     15,=V(ICCP)                *
000390 05EF                         233            BALR  14,15                      *
000392 9102 AB06      C0B08         234            TM    STATUSF,X'02'              IS THETE A WRITE ERROR?
000396 4780 A138            0013A   235            BZ    TEST4                      NO - BRANCH
00039A 5860 A81E            CC820   236            S     6,=X'00000001'             DECREASE NO. OF ERROR TRIES
00039E 47C0 A388            CC38A   237            BC    12,TESTE                   DON'T BACKSPACE
0003A2 4110 AB72            CCB74   238 BAKSPACE   LA    1,BLCCKJ                   *
0003A6 58F0 A81A            CC81C   239            L     15,=V(ICCP)                *
0003AA 05EF                         240            BALR  14,15                      *  BACKSPACE ONE RECORD
0003AC 5810 AB6E            CCB7C   241            L     1,PCINTJ                   *
0003B0 58F0 A81A            CC81C   242            L     15,=V(ICCP)                *
0003B4 05EF                         243            BALR  14,15                      *
0003B6 47F0 A37C            CC37E   244            B     CCPYR                      TRY TO COPY AGAIN
0003BA D22C A8DB AA68 008DD CCA6A   245 TESTE      MVC   MESSAGE(45),MESSAGEW       MOVE NEW MESSAGE INTO PLACE
0003C0 5030 AED6            CCED8   246            ST    3,SAVER3                   SAVE R 3
0003C4 5830 AED2            CCED4   247            L     3,CUTERR                   NUMBER OF OUTPUT ERRORS TC R3
0003C8 5A30 A81E            CC82C   248            A     3,=X'00000001'             ACD 1 TO NUMBER
0003CC 5030 AED2            CCED4   249            ST    3,CUTERR                   SAVE NUMBER OF CUTPUT ERRORS
0003D0 5830 AED6            CCED8   250            L     3,SAVER3                   RESTORE R3
                                    251            PUT   LINECUT,MESSAGE            ***MACRO
0003D4 4110 AF7E            C0F8C   252+           LA    1,LINECUT LCAD PARAMETER REG 1
0003D8 4100 A8DB            CC8DD   253+           LA    0,MESSAGE LCAD PARAMETER REG 0
0003DC 58F0 1030            CCC30   254+           L     15,48(0,1) LCAD PUT ROUTINE ADDR.
0003E0 05EF                         255+           BALR  14,15 LINK TC PUT ROUTINE
0003E2 47F0 A138            CC13A   256            B     TEST4                      GO BACK AND RESET SWITCHES
0003E6 0203 AFEE AFF2 00FFC CCFF4   257 ERROR3     MVC   CHECKN(4),CHECKE           ACCEPT BAD CSW AS TAPE ERROR
0003EC 5860 AC22            CCC24   258 ERROR1     L     6,SAVE6                    NUMBER OF TRIES INTO R6
0003F0 1266                         259            LTR   6,6                        ANY TRIES IN R6 ?
0003F2 47C0 A42A            CC42C   260            BC    12,SENSE                   NO-ONETRY ONLY
0003F6 D501 AFF0 A83A C0FF2 CC83C   261            CLC   CHECKN+2(2),=X'FFF0'       SHORT RECORD ?
0003FC 4720 A470            C0472   262            BH    MESSAGE7                   YES-WRITE WARNING MESSAGE
000400 4110 A842            CC844   263 ERROR      LA    1,BLCCKH                   *
000404 58F0 A81A            CC81C   264            L     15,=V(ICCP)                *
000408 05EF                         265            BALR  14,15                      * BACKSPACE AND READ AGAIN
00040A 5810 AB3E            CCB4C   266            L     1,PCINTH                   *
00040E 58F0 A81A            CC81C   267            L     15,=V(ICCP)                *
000412 05EF                         268            BALR  14,15                      *
000414 91FF AFFC      C0FFE         269            TM    BOGUS,X'FF'                BOGUS CSW?
000418 4710 A494            C0496   270            BC    BADCSW2                    YES-TEST FOR BOGUS CSW'S
00041C 9102 AFEE      C0FFC         271 ERROR5     TM    CHECKN,X'02'               TEST FOR UNIT CHECK-TAPE ERROR
000420 4780 A488            C048A   272            BZ    FIXED                      BRANCH IF TEMPORARY ERROR
000424 5860 A81E            CC82C   273            S     6,=X'00000001'             DECREASE NO. OF ERROR TRIES
000428 4720 A3FE            CC4CC   274            BC    2,ERROR                    KEEP TRYING TC READ
                                    275 *          ACCEPT LAST ATTEMPT
```

```
00042C 4110 AAC4              00ACC   276 SENSE    LA    1,BLOCKE                  *
000430 58F0 A81A              00E1C   277           L     15,=V(IICCP)              *
000434 05EF                           278           BALR  14,15                     *
000436 5810 AAC6              00ACC   279           L     1,POINTE                  * SENSE ERROR RECORD
00043A 58F0 A81A              00E1C   280           L     15,=V(IICCP)              *
00043E 05EF                           281           BALR  14,15                     *
000440 92FF AFE1      00FE3           282           MVI   ERRORSW,X'FF'             TURN ON ERROR SWITCH
000444 91FF AFE6      00FE8           283           TM    COPYSW,X'FF'              COPYSWITCH ON?
000448 4780 A45E              00460   284           BZ    *OVER                     SKIP MESSAGE IF NOT
00044C D22C A9D8 AA38 TORDD 00A3C     285           MVC   MESSAGE(45),MESSAGEZ      MOVE NEW MESSAGE INTO PLACE
                                      286           PUT   LINEOUT,MESSAGE           ***MACRO
000452 4110 AF7E              00F80   287+          LA    1,LINEOUT LOAD PARAMETER REG 1
000456 4100 A9D8              00DD0   288+          LA    0,MESSAGE LOAD PARAMETER REG 0
00045A 58F0 1030              00030   289+          L     15,48(0,1) LOAD PUT ROUTINE ADDR.
00045E 05EF                           290+          BALR  14,15 LINK TO PUT ROUTINE
000460 91FF AF9E      00F0EC  00EEC   291 MOVER     TM    FIRSTIME,X'FF'            IS THERE A PREVIOUS RECORD?
000464 4710 A484              00486   292           BO    *CREOVER                  SKIP TEST
000468 D201 AC58 AFF0 00C5A   00FF2   293 ECALC     MVC   LASTREC+2(2),CHECKN+2     FIX UP LASTREC
00046E 47F0 A640              00642   294           B     EWRITE                    GO AND WRITE 'E'
000472 D22C A9D8 AA95 00DDD   00A97   295 MESSAGE7 MVC   *ESSAGE(45),MESSAGEV      MOVE MESSAGE INTO PLACE
                                      296           PUT   LINEOUT,MESSAGE           ***MACRO
000478 4110 AF7E              00F8C   297+          LA    1,LINEOUT LOAD PARAMETER REG 1
00047C 4100 A9D8              00DD0   298+          LA    0,MESSAGE LOAD PARAMETER REG 0
000480 58F0 1030              00030   299+          L     15,48(0,1) LOAD PUT ROUTINE ADDR.
000484 05EF                           300+          BALR  14,15 LINK TO PUT ROUTINE
000486 47F0 A3FE              00C0C   301           B     ERROR                     BACK TO RE-TRY ERRORS
00048A 9101 AF8E      00F0C           302 FIXED     TM    CHECKN,X'01'              TEST FOR TAPEMARK
00048E 4710 A6F8              00CFA   303           BO    TAPEMARK                  BRANCH IF SO
000492 47F0 A128              00120   304           B     LISTOVER                  SKIP INCREASE IN RUNNING TOTAL
000496 9200 AFFC      00FFE           305 BADCSW2   MVI   BOGUS,X'00'              TURN OFF SWITCH
00049A 9102 AFF2      00FF4           306           TM    CHECKE,X'02'              TAPE ERROR ?
00049E 4780 A19A              00190   307           BZ    ERCTERR                   NO - REJECT THIS CSW
0004A2 D203 AFEE AFF2 00FFC   00FF4   308 ERROR4    MVC   CHECKN(4),CHECKE          ACCEPT CSW AS TAPE ERROR
0004A8 47F0 A41A              00410   309           B     ERROR5                    BACK TO PROCESSING
0004AC D501 AC58 AFF0 00C5A   00FF2   310 MORE      CLC   LASTREC+2(2),CHECKN+2    IS NEW RECORD SAME AS LAST?
0004B2 4780 A760              00762   311           BE    CONTINUE                  IF SAME, CONTINUE PROCESSING
0004B6 5860 A822              00824   312 MORECOVER L     6,=X'0000FFFF'            MAXIMUM RECORD SIZE
0004BA 5B60 AC56              00C5F   313           S     6,LASTREC                 R6 NOW CONTAINS SIZE OF RECORD
0004BE D201 AC58 AFF0 00C5A   00FF2   314           MVC   LASTREC+2(2),CHECKN+2     PUT NEW SIZE IN LASTREC
0004C4 4E60 AC76              00C7E   315           CVD   6,DECREC                  DECREC CONTAINS PACKED SIZE
0004C8 4E30 AC7E              00C80   316           CVD   3,DECNUM                  DECNUM=PACKED NUMBER OF THESE
0004CC 4130 0001              00001   317           LA    3,1                       THERE IS ONE RECORD OF NEW SIZE
0004D0 F342 AC8E AC78 00C90   00C7D   318           UNPK  UNPKREC(5),DECREC+5(3)    UNPKREC CONTAINS ZONED SIZE
0004D6 F342 AC96 AC83 00C98   00C85   319           UNPK  UNPKNUM(5),DECNUM+5(3)    UNPKNUM=ZONED NUMBER OF THESE
0004DC 4100 0005              00005   320 EDITOR    LA    12,5                      R12 CONTAINS SIZE OF UPKNUM
0004E0 1BBB                           321           SR    11,11                     R11 CONTAINS POINTER TO PLACE
0004E2 910F AC96      00C98           322 TEST1     TM    UNPKNUM,X'0F'             TEST EACH NUMERIC OF UNPKNUM
0004E6 4750 A54A              00540   323           BC    5,NONZERO                 BRANCH IF NOT LEADING ZERO
0004EA 1AB5                           324           AR    11,5                      ADD 1 TO POINTER
0004EC 1BC5                           325           SR    12,5                      ADJUST LENGTH OF UNPKNUM
0004EE 5980 A81E              00E2C   326           C     11,=X'00000001'           FIRST DIGIT?
0004F2 4780 A510              00512   327           BE    ZERO1                     BRANCH IF SO
0004F6 5980 A82A              00E2C   328           C     11,=X'00000002'           SUPPRESS SECOND DIGIT?
0004FA 4780 A520              00522   329           BE ZERO2                        BRANCH IF SO
0004FE 5980 A82E              00E30   330           C     11,=X'00000003'           SUPPRESS THIRD DIGIT?
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                        FC1JAN68   1/29/69

000502 4780 A52A            C052C   331           BE  ZERO3                           BRANCH IF SO
000506 5980 A332            0C834   332           C      11,=X'00000004'              SUPPRESS FOURTH DIGIT?
00050A 4780 A540            C0542   333           BE     ZERO4                        BRANCH IF SO
00050E 47F0 A54A            C054C   334           B      NONZERO                      ERROR IN DIGIT COUNT
000512 D203 AC9E AC97 00CA0 00C99   335 ZERO1     MVC    UNPKNUM2(4),UNPKNUM+1        ZERO SUPPRESS FIRST DIGIT
000518 D203 AC96 AC9E 00C98 00CA0   336           MVC    UNPKNUM(4),UNPKNUM2          REPLACE IN UNPKNUM
00051E 47F0 A4E0            C04E2   337           B      TEST1                        REPEAT ZERO-SUPPRESS TEST
000522 D202 AC96 AC9F 00C98 00CA1   338 ZERO2     MVC    UNPKNUM(3),UNPKNUM2+1        ZERO SUPPRESS SECOND DIGIT
000528 47F0 A4E0            C04E2   339           B      TEST1                        REPEAT ZERO-SUPPRESS TEST
00052C D201 AC9E AC97 00CA0 00C99   340 ZERO3     MVC    UNPKNUM2(2),UNPKNUM+1        ZERO SUPPRESS THIRD DIGIT
000532 D201 AC96 AC9E 00C98 00CA0   341           MVC    UNPKNUM(2),UNPKNUM2          REPLACE IN UNPKNUM
000538 D302 AC9F AC9E 00CA1 00CA0   342           MVZ    UNPKNUM2+1(3),UNPKNUM2       CHANGE SIGN ZONE TO F
00053E 47F0 A4E0            C04E2   343           B      TEST1                        REPEAT ZERO-SUPPRESS TEST
000542 D200 AC96 AC9F 00C98 00CA1   344 ZERO4     MVC    UNPKNUM(1),UNPKNUM2+1        ZERO SUPPRESS FOURTH DIGIT
000548 47F0 A550            C0552   345           B      SKIP                         ZONES HAVE ALREADY BEEN FIXED
00054C D306 AC97 AC96 00C99 00C98   346 NONZERO   MVZ    UNPKNUM+1(7),UNPKNUM         CHANGE SIGN ZONE TO F
000552 1B9C                         347 SKIP      SR     9,12                         ADJUST NUMBER OF PRINT PLACES
000554 D203 2000 AC96 00000 00C98   348 NOTFULL   MVC    0(4,2),UNPKNUM               MOVE UNPKNUM INTO OUTPUT
00055A D500 2000 A83C 00000 0C83E   349           CLC    0(1,2),=X'F0'                ZERO ?
000560 4780 A58E            C0590   350           BE     BLANKER                      YES-BLANK OUT LIST
000564 1A2C                         351           AR     2,12                         UPDATE POINTER
                                    352 *                                             R12 CONTAINS LENGTH OF UNPKNUM
                                    353 *                                             R2 USED AS POINTER IN OUTPUT
000566 55C0 A836            0C838   354           CL     12,=X'00000005'              IS THERE ANOTHER DIGIT?
00056A 4770 A576            C0578   355           BNE    SYMBOL                       IF NOT,GO AND PUT * OR ,
00056E 1B25                         356 FIVEDIG   SR     2,5                          TEMPORARILY ADJUST POINTER
000570 D200 2000 AC9A 00000 00C9C   357           MVC    0(1,2),UNPKNUM+4             MOVE FIFTH DIGIT INTO OUTPUT
000576 1A25                         358           AR     2,5                          RESTORE POINTER
000578 91FF AFEA      00FEC         359 SYMBOL    TM     EDITSW,X'FF'                 EDIT SWITCH ON ?
00057C 4710 A68C            C068E   360           BC     EDVER                        BRANCH IF SO
000580 91FF AFE0      00FE2         361           TM     NUMSWITC,X'FF'               TEST FOR NUMBER
000584 4780 A610            C0612   362           BZ     ASTERISK                     BRANCH IF NUMBER
000588 9200 AFE0      00FE2         363           MVI    NUMSWITC,X'00'               TURN OFF SWITCH
00058C 47F0 A626            C0628   364           B      COMMA                        GO AND INSERT COMMA
000590 D207 2000 A98A 00000 0C98C   365 BLANKER   MVC    0(8,2),BLANKS                BLANK OUT LIST
000596 47F0 A630            C0632   366           B      COMOVER                      CONTINUE CALCULATIONS
00059A 92FF AFE4      00FE6         367 SWITCHON  MVI    FINALSW,X'FF'                TURN ON FINAL SWITCH
00059E 4E40 AC86            C0C88   368 FULLUP    CVD    4,DECRUN                     CONVERT TOTAL TO PACKED DECIMAL
0005A2 DE05 ABC6 AC8B 00BC8 00C8D   369           ED     EDRUN(6),DECRUN+5            EDIT RUNNING TOTAL
0005A8 D205 ACA6 ABC6 00CA8 00BC8   370           MVC    OUTPUT(6),EDRUN              PUT RUNNING TOTAL IN OUTPUT
0005AE D505 ABC6 AEC6 00BC8 00EC8   371           CLC    EDRUN(6),SAVERUN             SAME TOTAL AS LAST LINE?
0005B4 4780 A5CC            C05CE   372           BE     WAIT1                        YES-DON'T PUT LINE
0005B8 91FF AFE8      00FEA         373           TM     NOLISTSW,X'FF'               SKIP LIST?
0005BC 4710 A5D8            C05DA   374           BO     WAITOVER                     BRANCH IF SO
                                    375           PUT    LINEOUT,OUTPUT               ***MACRO
0005C0 4110 AF7E            C0F80   376+          LA     1,LINEOUT LOAD PARAMETER REG 1
0005C4 4100 ACA6            C0CA8   377+          LA     0,OUTPUT LOAD PARAMETER REG 0
0005C8 58F0 1030            C0C3C   378+          L      15,48(0,1) LOAD PUT ROUTINE ADDR.
0005CC 05EF                         379+          BALR   14,15 LINK TO PUT ROUTINE
0005CE D205 AEC6 ABC6 00EC8 00BC8   380 WAIT1     MVC    SAVERUN(6),EDRUN             SAVE RUNNING TOTAL
0005D4 D205 ABC6 ABCC 00BC8 00BCE   381           MVC    EDRUN(6),EDRUN2              RESTORE MASK
0005DA 95FF AFEB      00FED         382 WAITOVER  CLI    NOMORESW,X'FF'               NOMORE SWITCH ON?
0005DE 4780 A78C            C078E   383           BE     FINISHED                     FINISHED IF SO
0005E2 91FF AFE4      00FE6         384           TM     FINALSW,X'FF'                FINAL SWITCH ON?
0005E6 4710 A78C            C078E   385           BC     FINISHED                     IF SO,FINISHED
```

```
LOC    OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                                               FC1JAN68   1/29/69

0005EA D283 AC46 A93A 0CCA8 0CC9C   386              MVC   OUTPUT(132),BLANKS        CLEAR OUTPUT
0005F0 4120 AC82            0CC84   387              LA    2,OUTPUT+12               RESET OUTPUT POINTER
0005F4 1BBB                         388              SR    11,11                     RESET PLACE POINTER
0005F6 1BCC                         389              SR    12,12                     RESET LENGTH POINTER
0005F8 4190 0064            0CC64   390              LA    9,100                     RESET NO. OF PRINT PLACES LEFT
0005FC 9200 AFDF      0CFE1         391              MVI   SWITCH,X'00'              TURN SWITCH OFF
000600 9200 AFE0      0CFE2         392              MVI   NUMSWITC,X'00'            TURN SWITCH OFF
000604 91FF AFE2      0CFE4         393              TM    TAPESW,X'FF'              IS TAPEMARK SWITCH ON?
000608 4710 A730            0C732   394              BO    ENDFILE                   BRANCH IF TAPEMARK
00060C 1A45                         395              AR    4,5                       RESTORE RUNNING TOTAL
00060E 47F0 A762            0C764   396              B     TEST3                     TEST FOR INDIVIDUAL RECORDS
000612 925C 2000      0CCCC         397 ASTERISK MVI   0(2),X'5C'                * INTO OUTPUT
000616 1A25                         398              AR    2,5                       UPDATE POINTER
000618 1B95                         399              SR    9,5                       REDUCE PRINT PLACES BY 1
00061A 92FF AFE0      0CFE2         400              MVI   NUMSWITC,X'FF'            SET SWITCH TO RECORDS
00061E D204 AC96 AC8E 0CC98 0CC90   401              MVC   UNPKNUM(5),UNPKREC        MOVE UNPKREC INTO PLACE TO EDIT
000624 47F0 A4DA            0C4DC   402              B     EDITOR                    GO AND ZERO SUPPRESS
000628 D203 2000 A932 0CCCC 0C934   403 COMMA    MVC   0(4,2),COMM               COMMA INTO OUTPUT
00062E 1A25                         404              AR    2,5                       UPDATE POINTER
000630 1B95                         405              SR    9,5                       REDUCE NO. OF PRINT PLACES
000632 91FF AFE2      0CFE4         406 COMOVER  TM    TAPESW,X'FF'              IS IT END OF FILE
000636 4710 A6EE            0C6F0   407              BO    TAPEM                     GO TO INSERT T
00063A 91FF AFE1      0CFE3         408              TM    ERRORSW,X'FF'             TEST IF ERROR RECORD
00063E 4780 A682            0C684   409              BZ    TEST2                     GO AND TEST PRINT PLACES
000642 92C5 2000      0CCCC         410 EWRITE   MVI   0(2),X'C5'                E INTO OUTPUT
000646 5030 AED6            0CED8   411              ST    3,SAVER3                  SAVE R 3
00064A 5830 AECE            0CED0   412              L     3,INERR                   NUMBER OF INPUT ERRORS TO R 3
00064E 5A30 A81E            0C820   413              A     3,=X'00000001'            ADD 1 TO NUMBER
000652 5030 AECE            0CED0   414              ST    3,INERR                   SAVE NUMBER OF INPUT ERRORS
000656 5830 AED6            0CED8   415              L     3,SAVER3                  RESTORE R3
00065A 1A25                         416              AR    2,5                       ADJUST OUTPUT POINTER
00065C 5860 A822            0C824   417              L     6,=X'0000FFFF'            MAXIMUM RECORD SIZE
000660 5B60 AC56            0CC58   418              S     6,LASTREC                 R6 NOW CONTAINS SIZE OF RECORD
000664 4E60 AC76            0CC78   419              CVD   6,DECREC                  DECREC CONTAINS PACKED SIZE
000668 F342 AC8E AC7B 0CC90 0CC7D   420              UNPK  UNPKREC(5),DECREC+5(3)    UNPKREC CONTAINS ZONED SIZE
00066E D204 AC96 AC8E 0CC98 0CC90   421              MVC   UNPKNUM(5),UNPKREC        MOVE UNPKREC INTO PLACE TO EDIT
000674 92FF AFEA      0CFEC         422              MVI   EDITSW,X'FF'              TURN ON EDIT SWITCH
000678 5880 AC26            0CC28   423              L     11,SAVE11                 NUMBER ALLOWED INTO R11
00067C 5BB0 A81E            0C820   424              S     11,=X'00000001'           DECREASE NUMBER ALLOWED
000680 12BB                         425              LTR   11,11                     TEST NUMBER LEFT
000682 47C0 A600            0C602   426              BC    12,NOMORE                 BRANCH IF NO MORE ALLOWED
000686 5080 AC26            0CC28   427              ST    11,SAVE11                 SAVE NUMBER ALLOWED
00068A 47F0 A4DA            0C4DC   428              B     EDITOR                    GO AND EDIT
00068E D203 2000 A8D2 0CCCC 0C8D4   429 ECVER    MVC   0(4,2),COMM               COMMA INTO OUTPUT
000694 1A25                         430              AR    2,5                       ADJUST OUTPUT POINTER
000696 5B90 A824            0C820   431              S     9,=X'00000002'            REDUCE NO. OF PRINT PLACES
00069A 1B33                         432              SR    3,3                       ZERO NO. OF THIS SIZE
00069C 9200 AFDE      0CFEC         433              MVI   FIRSTIME,X'00'            RESET FIRST SWITCH
                                    434 *                                            THERE IS NO LASTREC
0006A0 9200 AFE1      0CFE3         435              MVI   ERRORSW,X'00'             TURN SWITCH OFF
0006A4 91FF AFE6      0CFE8         436              TM    COPYSW,X'FF'              COPY SWITCH ON ?
0006A8 4710 A360            0C362   437              BO    COPY                      BRANCH IF COPY
0006AC 91FF AFE7      0CFE9         438              TM    PRINTSW,X'FF'             PRINT REQUESTED ?
0006B0 4710 A262            0C264   439              BO    PRINTER                   BRANCH IF PRINT
0006B4 95FF AFEB      0CFED         440 TEST2    CLI   NOMORESW,X'FF'            NOMORE SWITCH ON ?
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT

000688 4780 A59C            C059E   441          BE     FULLUP          BRANCH IF SO
00068C 9200 AFEA      0OFEC         442          MVI    EDITSW,X'00'    TURN OFF EDIT SWITCH
0006C0 1299                         443          LTR    9,9             ANY PRINT PLACES LEFT ?
0006C2 47C0 A6D8            C06DA   444          BC     12,ADJUST1      BRANCH IF NONE LEFT
0006C6 91FF AFE4      0OFE6         445          TM     FINALSW,X'FF'   FINAL SWITCH ON?
0006CA 4710 A59C            C059E   446          BO     FULLUP          IF SO,GO AND PUT LINE
0006CE 47F0 A762            CC764   447          B      TEST3           TEST FOR INDIVIDUAL RECORDS
0006D2 92FF AFE8      0OFED         448 NOMORE   MVI    NOMORESW,X'FF'  TURN ON NOMORE SWITCH
0006D6 47F0 A4DA            C04DC   449          B      EDITOR          PREPARE TO LIST
0006DA 91FF AFE3      0OFE5         450 ADJUST1  TM     RECSW,X'FF'     RECORD SWITCH ON ?
0006DE 4780 A6E8            C06EA   451          BZ     ADOVER          BRANCH IF NOT
0006E2 5980 A91E            CC82C   452 ADJUST   C      8,=X'00000001'  HAS THE LAST RECORD BEEN READ?
0006E6 47C0 A598            CC59A   453          BC     12,SWITCHON     BRANCH IF FINAL RECORD
0006EA 1845                         454 ADOVER   SR     4,5             TEMPORARILY ADJUST RUN-TOTAL
0006EC 47F0 A59C            C059E   455          B      FULLUP          GO AND PUT LINE
0006F0 D203 2000 AB06 00000 CC808   456 TAPEM    MVC    0(4,2),TTT      T INTO OUTPUT
0006F6 47F0 A59C            C059E   457          B      FULLUP          GO AND PUT LINE
0006FA 92FF AFE2      0OFE4         458 TAPEMARK MVI    TAPESW,X'FF'    TURN ON TAPEMARK SWITCH
0006FE 91FF AFE7      0OFE5         459          TM     PRINTSW,X'FF'   PRINT REQUESTED ?
000702 4710 A348            C034A   460          BC     PRINTAPE        BRANCH IF PRINT
000706 91FF AFE6      0OFE8         461          TM     COPYSW,X'FF'    IS COPY REQUESTED?
00070A 4710 A718            CC71A   462          BC     COPYT           BRANCH IF SO
00070E 91FF AFDF      0OFEC         463 TEST5    TM     FIRSTIME,X'FF'  IS THERE A PREVIOUS RECORD?
000712 4780 A6EF            C06FC   464          BZ     TAPEM           CON'T CALCULATE SIZES
000716 47F0 A4B4            C04B6   465          B      MORECVER        GO AND PUT LINE
00071A 4110 AB1A            CC81C   466 COPYT    LA     1,BLOCKC
00071E 58E0 A91A            CC81C   467          L      15,=V(IICCP)
000722 05EF                         468          BALR   14,15           *
000724 5810 AB16            CC818   469          L      1,POINTC        *
000728 58E0 A91A            CC81C   470          L      15,=V(IICCP)    * WRITE TAPEMARK AND WAIT
00072C 05EF                         471          BALR   14,15           *
00072E 47F0 A70C            CC70E   472          B      TEST5           GO BACK TO PROCESSING
000732 9200 AFE2      0OFE4         473 ENDFILE  MVI    TAPESW,X'00'    TURN OFF TAPEMARK SWITCH
000736 9200 AFDF      0OFEC         474          MVI    FIRSTIME,X'00'  THERE IS NO LASTREC
00073A 1833                         475          SR     3,3             ZERO NO. OF THIS SIZE RECORD
00073C 91FF AFE3      0OFE5         476          TM     RECSW,X'FF'     TEST RECORD SWITCH
000740 4710 A76A            CC76C   477          BC     TESTREC         BYPASS IF READING RECORDS
000744 1875                         478          SR     7,5             DECREASE NO. OF FILES
000746 4720 A0FA            CCOFC   479          BC     2,GC            GO AGAIN IF ANY LEFT
00074A 1288                         480 FINISH   LTR    8,8             TEST IF ANY RECORDS TO BE READ
00074C 4780 A78C            CC78E   481          BZ     FINISHED        FINISHED IF NO MORE RECORDS
000750 92FF AFE3      0OFE5         482          MVI    RECSW,X'FF'     TURN ON RECORD SWITCH
000754 47F0 A0FA            CCOFC   483          B      GC              GO AND READ A PHYSICAL RECORD
000758 D201 AC58 AFF0 00C5A CCFF2   484 FIRST    MVC    LASTREC+2(2),CHECKN+2  PUT NEW SIZE IN LASTREC
00075E 92FF AFDE      0OFE0         485          MVI    FIRSTIME,X'FF'  SET SWITCH ON
                                    486 *
000762 1835                         487 CONTINUE AR     3,5             THERE IS A LAST REC
000764 91FF AFE3      0OFE5         488 TEST3    TM     RECSW,X'FF'     ADD 1 TO NO.OF THIS SIZE RECORD
000768 4780 A0FA            CCOFC   489          BZ     GC              AM I READING INDIVIDUAL RECORDS
00076C 1885                         490 TESTREC  SR     8,5             CONTINUE IF NOT
00076E 4720 A0FA            CCOFC   491          BC     2,GC            DECREASE NO. OF RECORDS
000772 92FF AFE4      0OFE6         492          MVI    FINALSW,X'FF'   GO AGAIN IF ANY LEFT
000776 47F0 A4B4            C04B6   493          B      MORECVER        TURN ON FINAL SWITCH
00077A D203 AED2 AC42 00ED4 CCC44   494 ERROUT   MVC    OUTERR(4),ZERO  GO AND CALCULATE SIZES
000780 D205 ABC6 ABCC 00BC8 00BCF   495 ERRIN    MVC    EORUN(6),EORUN2 BYPASS LINE NEXT TIME
                                                                        RESTORE MASK
```

```
LOC    OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                          FCIJAN68   1/29/69

000786 5840 AECE            C0EDC   496            L     4,INERR                        INPUT ERRORS TO R4
00078A 4E40 AC85            C0CE8   497            CVD   4,DECRUN                       CONVERT TO DECIMAL
00078E DE05 ABC5 AC3B 00BC8 C0C8D   498            ED    EDRUN(6),DECRUN+5              EDIT ERRORS
000794 D205 AF1F ABC6 00F21 C0BC8   499            MVC   INNUM(6),EDRUN                 MOVE NUMBER TO INLINE
                                    500            PUT   LINECUT,INLINE                 ***MACRO
00079A 4110 AF7E            C0FEC   501+           LA    1,LINECUT LOAD PARAMETER REG 1
00079E 4100 AEDA            C0EDC   502+           LA    0,INLINE LOAD PARAMETER REG 0
0007A2 58F0 1030            C0C3C   503+           L     15,48(0,1) LOAD PUT ROUTINE ADDR.
0007A6 05EF                         504+           BALR  14,15 LINK TO PUT ROUTINE
0007A8 D203 AECE AED2 00ED0 C0ED4   505            MVC   INERR(4),CUTERR                INSERT NUMBER OF OUTPUT ERRORS
0007AE D202 AF0F AF61 00F11 C0F63   506            MVC   INLINE+53(3),CUTER             FIX UP LINE FOR 'OUTPUT'
0007B4 D207 AF1F AF64 00F21 C0F66   507            MVC   INNUM(8),CUTNUM                CLEAR NUMBER PART OF LINE
0007BA 47F0 A7C6            C07C8   508            B     FINALY                         GO AND TEST FOR OUTPUT ERRORS
0007BE D503 AECE AC42 00EDC C0C44   509 FINISHED CLC INERR(4),ZERO                  ANY INPUT ERRORS ?
0007C4 4770 A77E            C078C   510            BNE   ERRIN                          YES-GO AND WRITE MESSAGE
0007C8 D503 AED2 AC42 00ED4 C0C44   511 FINALY     CLC   CUTERR(4),ZERO                 ANY OUTPUT ERRORS ?
0007CE 4770 A778            C077A   512            BNE   ERRCUT                         YES-GO AND WRITE MESSAGE
0007D2 D503 AFF6 AC42 00FF8 C0C44   513 FINALZ     CLC   CCUNTER(4),ZERO                ANY BOGUS CSW'S?
0007D8 4780 A802            C08C4   514            BE    FINALZZ                        NO-SKIP WRITING
0007DC D205 ABC6 ABCC 00BC8 C0BCE   515            MVC   EDRUN(6),EDRUN2                RESTORE EDIT MASK
0007E2 5840 AFF6            C0FF8   516            L     4,CCUNTER                      COUNT INTO R4
0007E6 4E40 AC86            C0C88   517            CVD   4,DECRUN                       CONVERT TO DECIMAL
0007FA DE05 ABC6 AC9B 00BC8 C0C8D   518            ED    EDRUN(6),DECRUN+5              EDIT CSW ERRORS
0007F0 D205 A982 ABC6 00984 C0BC8   519            MVC   CUTING(6),EDRUN                COUNT TO OUTLINE
                                    520            PUT   LINECUT,CUTLINE                ***MACRO
0007F6 4110 AF7E            C0F8C   521+           LA    1,LINECUT LOAD PARAMETER REG 1
0007FA 4100 A908            C090A   522+           LA    0,CUTLINE LOAD PARAMETER REG 0
0007FE 58F0 1030            C003C   523+           L     15,48(0,1) LOAD PUT ROUTINE ADDR.
000802 05EF                         524+           BALR  14,15 LINK TO PUT ROUTINE
                                    525 FINALZZ    CLOSE (LINECUT)                      ***MACRO
000804                              526+           CNOP  0,4
000804 4510 A80A            C08CC   527+FINALZZ    BAL   1,*+8 BRANCH AROUND LIST
000808 80                           528+           DC    AL1(128) OPTION BYTE
000809 000F80                       529+           DC    AL3(LINECUT) DCB ADDRESS
00080C 0A14                         530+           SVC   20 ISSUE CLOSE SVC
00080E 58D0 A86A            C0E6C   531            L     13,SAVEA+4
000812 98EC D00C            C000C   532            LM    14,12,12(13)                   RESTORE REGISTERS
000816 07FE                         533            BR    14                             GO BACK TO CALLING PROGRAM
000818                              534            LTORG                                FORCE ALIGNMENT
000818 0000000E                     535                  =X'0000000E'
00081C 00000000                     536                  =V(IECCP)
000820 00000001                     537                  =X'00000001'
000824 0000FFFF                     538                  =X'0000FFFF'
000828 00000007                     539                  =X'00000007'
00082C 00000002                     540                  =X'00000002'
000830 00000003                     541                  =X'00000003'
000834 00000004                     542                  =X'00000004'
000838 00000005                     543                  =X'00000005'
00083C FFF0                         544                  =X'FFF0'
00083E F0                           545                  =X'F0'
000840                              546            DS    0C                             FORCE ALIGNMENT
000840 60000844                     547 PCINTA     DC    XL1'60',AL3(BLOCKA)            POINTER TO BLOCKA
000844 00000163                     548 BLOCKA     DC    XL1'00',AL3(NORMALEX)          NORMAL ADDRESS
000848 00000170                     549            DC    XL1'00',AL3(ERROREX)           EXCEPTION ADDRESS
00084C 00000180                     550            DC    X'00000180'                    UNIT
```

```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                       FC1JAN68   1/29/69

000850 00000860                    551              DC    A(CCA)                    CAW
000854 00000000                    552              DC    A(0)                      FOR RETURNED CSW
000858 00000000                    553 STATUSA      DC    A(0)                      STATUS INFORMATION IN CSW
00085C 00000000
000860 0200100020000FFFF           554 CCA          CCW   2,INPUT,X'20',65535       CCW FOR READING INPUT
000868 0000000000000000            555 SAVEA        DC    18A(0)                    SAVE AREA FOR THIS PROGRAM
0008B0 E4D5C9E3E240C1D9            556 MESSAGEA     DC    CL45'UNITS ARE NOT KNOWN  TO AECOPY PROGRAM          '
0008DD 4040404040404040            557 MESSAGEE     DC    CL45'         FINISHED   AECOPY   PROGRAM            '
00090A 4040404040404040            558 CUTLINE      DC    87C' '                    FILLER
000961 4040D5E4D4C2C5D9            559              DC    C'  NUMBER OF CHANNEL ERRORS  =        '
000984 4040404040404040            560 CUTING       DC    8C' '                     FOR COUNT
00098C 4040404040404040            561 BLANKS       DC    132C' '                   TO CLEAR OUTPUT
000A10 4040404040404040            562 MESSAGEY     DC    CL45'          TAPEMARK*****                        '
000A3D 40C9D5D7E4E340C5            563 MESSAGEZ     DC    CL45' INPUT ERRORS COPIED TO OUTPUT TAPE           '
000A6A C6D6E4D5C440E3C1            564 MESSAGEW     DC    CL45'FOUND TAPE ERRORS WHEN WRITING ON OUTPUT TAPE'
000A97 E6C1D9D5C9D5C77A            565 MESSAGEV     DC    CL45'WARNING: SHORT RECORDS: UNPREDICTABLE RESULTS'
000AC8                             566              DS    0D                        FORCE ALIGNMENT
000AC8 60000ACC                    567 POINTE       DC    XL1'60',AL3(BLOCKE)       POINTER TO BLOCKE
000ACC 00000000                    568 BLOCKE       DC    A(0)                      NORMAL ADDRESS
000AD0 00000000                    569              DC    A(0)                      EXCEPTION ADDRESS
000AD4 00000180                    570              DC    X'00000180'               UNIT
000AD8 00000AE8                    571              DC    A(CCE)                    CAW
000ADC 00000000                    572              DC    A(0)                      FOR RETURNED CSW
000AE0 00000000                    573 STATUSE      DC    A(0)                      STATUS INFORMATION FROM CSW
000AE4 00000000
000AE8 0400E88000000006            574 CCE          CCW   X'04',SENSBYTE,X'00',6    SENSE
000AF0 60000AF4                    575 POINTF       DC    XL1'60',AL3(BLOCKF)       POINTER TO BLOCKF
000AF4 00000000                    576 BLOCKF       DC    A(0)                      NORMAL ADDRESS
000AF8 00000000                    577              DC    A(0)                      EXCEPTION ADDRESS
000AFC 00000181                    578              DC    X'00000181'               UNIT
000B00 00000810                    579              DC    A(CCF)                    CAW
000B04 00000000                    580              DC    A(0)                      FOR RETURNED CSW
000B08 00000000                    581 STATUSF      DC    A(0)                      STATUS INFORMATION FROM CSW
000B0C 00000000
000B10 0100100020000FFFF           582 CCF          CCW   1,INPUT,X'20',65535       CCW FOR COPYING INPUT
000B18 60000B1C                    583 POINTG       DC    XL1'60',AL3(BLOCKG)       POINTER TO BLOCKG
000B1C 00000000                    584 BLOCKG       DC    A(0)                      NORMAL ADDRESS
000B20 00000000                    585              DC    A(0)                      EXCEPTION ADDRESS
000B24 00000181                    586              DC    X'00000181'               UNIT
000B28 00000B38                    587              DC    A(CCG)                    CAW
000B2C 00000000                    588              DC    A(0)                      FOR RETURNED CSW
000B30 00000000                    589 STATUSG      DC    A(0)                      STATUS INFORMATION FROM CSW
000B34 00000000
000B38 1F00000000000001            590 CCG          CCW   X'1F',0,X'00',1           WRITE TAPEMARK
000B40 60000B44                    591 POINTH       DC    XL1'60',AL3(BLOCKH)       POINTER TO BLOCKH
000B44 0000017C                    592 BLOCKH       DC    XL1'00',AL3(NORMAL2)      NORMAL ADDRESS
000B48 00000184                    593              DC    XL1'00',AL3(ERROR2)       EXCEPTION ADDRESS
000B4C 00000180                    594              DC    X'00000180'               UNIT
000B50 00000860                    595              DC    A(CCH)                    CAW
000B54 00000000                    596              DC    A(0)                      FOR RETURNED CSW
000B58 00000000                    597 STATUSH      DC    A(0)                      STATUS INFORMATION FROM CSW
000B5C 00000000
000B60 2700000060000001            598 CCH          CCW   X'27',0,X'60',1           BACKSPACE RECORD
000B68 0200100020000FFFF           599              CCW   2,INPUT,X'20',65535       CHAINED TO READ
000B70 60000B74                    600 POINTJ       DC    XL1'60',AL3(BLOCKJ)       POINTER TO BLOCKJ
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  FCIJAN68  1/29/69

000B74 00000000                    601 BLOCKJ   DC    A(0)                    NORMAL ADDRESS
000B78 00000000                    602          DC    A(0)                    EXCEPTION ADDRESS
000B7C 00000181                    603          DC    X'00000181'             UNIT
000B80 00000B90                    604          DC    A(CCJ)                  CAW
000B84 00000000                    605          DC    A(0)                    FOR RETURNED CSW
000B88 00000000                    606 STATUSJ  DC    A(0)                    STATUS INFORMATION FROM CSW
000B8C 00000000
000B90 270000036000001             607 CCJ      CCW   X'27',0,X'60',1         BACKSPACE RECORD
000B98 1700000020000001            608          CCW   X'17',0,X'20',1         CHAINED TO ERASE GAP
000BA0 60000BA4                    609 PCINTM   DC    X'1160',AL3(BLOCKM)     POINTER TO BLOCKM
000BA4 00000000                    610 BLOCKM   DC    A(0)                    NORMAL ADDRESS
000BA8 00000000                    611          DC    A(0)                    EXCEPTION ADDRESS
000BAC 00000009                    612          DC    X'00000009'             UNIT
000BB0 00000BC0                    613          DC    A(CCM)                  CAW
000BB4 00000000                    614          DC    A(0)                    FOR RETURNED CSW
000BB8 00000000                    615 STATUSM  DC    A(0)                    STATUS INFORMATION FROM CSW
000BBC 00000000
000BC0 09000BDC20000025            616 CCM      CCW   X'09',TYPEM,X'20',46    WRITE TO OPERATOR
000BC8 4020202021200               617 EDRUN    DC    X'4020202021200'        FOR EDITING RUNNING TOTAL
000BCF 4020202021220               618 EDRUN2   DC    X'4020202021220'        TO RESTORE EDRUN MASK
000BD4 6B404040                    619 CCMM     DC    X'6B404040'             SET UP COMMA
000BD8 E3404040                    620 TTT      DC    X'E3404040'             SET UP T
000BDC 40E3C1D7C5400D6E            621 TYPEM    DC    C' TAPE CN UNIT'
000BE9 000000
000BEC 00000000                    622 TYPNUM   DC    A(0)                    FOR TO UNIT
000BF0 40E2C8D6E4D3C443            623          DC    C' SHOULD NOT BE FILE PROTECTED'
000C10                             624 SAVER5   DS    F                       SAVE R 5 FOR 'FILE PRCTECT'
000C14                             625 PKUN     DS    F                       FOR FILE PROTECT MESSAGE
000C18                             626 UNPKUN   DS    D                       FOR FILE PROTECT MESSAGE
000C20 00                          627 PROTSW   DC    X'00'                   USED TO BYPASS MESSAGE
000C24                             628 SAVE6    DS    F                       SAVE NO. OF ERROR TRIES
000C28                             629 SAVE11   DS    F                       SAVE NUMBER ALLOWED
000C2C                             630 PSAVE3   DS    F                       *
000C30                             631 PSAVE4   DS    F                       * SAVE AREAS FOR PRINTING
000C34                             632 PSAVE5   DS    F                       *
000C38                             633 PSAVE8   DS    F                       *
000C3C                             634 PSAVE9   DS    F                       *
000C40                             635 PSAVE2   DS    F                       *
000C44 00000000000000000           636 ZERO     DC    4A(0)                   FOR ZEROING WORKAREAS
000C58                             637          DS    0D                      FORCE ALIGNMENT
000C58 00000000                    638 LASTREC  DC    X'00000000'             FOR PREVIOUS RECORD
000C5C 00000000                    639 SIZEREC  DC    X'00000000'             USED FOR COPYING RECORDS
000C60 00000000                    640 CCMP     DC    X'00000000'             FOR LIST SIZE COMPARISON
000C64 F0F0F0F0                    641 HCLONC   DC    X'F0F0F0F0'             *
000C68                             642          DS    0D                      *
000C68 00000000                    643 HCLONC1  DC    X'00000000'             * USED IN CONVERSION
000C6C F0F0F0F0                    644 HCLONC2  DC    X'F0F0F0F0'             *     OF   PARAMETER LIST
000C70 F0F0F0C0                    645 HCLONC3  DC    X'F0F0F0C0'             *
000C78                             646 DECREC   DS    D                       FOR DECIMAL RECORD SIZE
000C80                             647 DECNUM   DS    D                       FOR DECIMAL NUMBER OF RECORDS
000C88                             648 DECRUN   DS    D                       FOR DECIMAL RUNNING TOTAL
000C90                             649 UNPKREC  DS    D                       FOR UNPACKED RECORD SIZE
000C98                             650 UNPKNUM  DS    D                       FOR UNPACKED NUMBER OF RECORDS
000CA0                             651 UNPKNUM2 DS    D                       FOR WORKING SPACE
000CA8 4040404040404040            652 OUTPUT   DC    132C' '                 FOR WRITTEN LIST
```

```
000D2C 4040404040404040                653 CLTBLOCK DC    132C' '                  FOR COPYING TO PRINTER
000D80                                 654          DS    2D                       BUFFER AREA
000DC0 4040404040404040                655 HEXBLOCK DC    161C' '                  FOR HEX TRANSLATE
000E48                                 656          DS    0D                       FORCE ALIGNMENT
000E68 4040404040404040                657 INTER    DC    80C' '                   WORK-AREA FOR HEX TRANSLATE
000EB8                                 658          DS    2D                       BUFFER AREA
000EC8 000000C000000                   659 SAVERLA  DC    X'000000000000'          FOR BYPASSING A ZERO LINE
000ECE 0000
000ED0 00000000                        660 INERR    DC    A(0)                     NUMBER OF  INPUT ERRORS
000ED4 00000000                        661 OUTERR   DC    A(0)                     NUMBER OF OUTPUT ERRORS
000ED8 00000000                        662 SAVER3   DC    A(0)                     SAVEAREA FOR R 3
000EDC 4040404040404040                663 INLINE   DC    20C' '                   SPACE
000EE0 5C5C5C5C5C5C5C5C                664          DC    C'**********'            PUNCTUATION
000EEA 4040405E4040C2C5                665          DC    C'   NUMBER OF ERRORS ON  INPUT TAPE WAS '
000F21 4040404040404040                666 INNUM    DC    8C' '                    FOR NUMBER OF ERRORS
000F29 5C5C5C5C5C5C5C5C                667          DC    C'**********'            PUNCTUATION
000F33 4040404040404040                668          DC    45C' '                   SPACE
000F60 40C9D5                          669 INNER    DC    C' IN'                   TO CHANGE LINE FOR INPUT
000F63 D6F4E3                          670 OUTER    DC    C'OUT'                   TO CHANGE LINE FOR OUTPUT
000F66 4040404040404040                671 CLRNUM   DC    8C' '                    TO CLEAR NUMBER PART OF LINE
000F70                                 672          DS    0D                       FORCE ALIGNMENT
000F70 F0F1F2F3F4F5F6F7                673 TRTABLE  DC    C'0123456789ABCDEF'      TRANSLATE TO HEX
000F80 00000000                        674 TOUNIT   DC    A(0)                     COPYING TO THIS UNIT
000F84 00000000                        675 FROMUNIT DC    A(0)                     READING FROM THIS UNIT
000F88 4040404040404040                676 SENSBYTE DC    8C' '                    FOR SENSE INFORMATION
                                       677 LINEOUT  DCB   BLKSIZE=132,DEVD=PR,DDNAME=SYSPRINT,DSORG=PS,LRECL=132, *
                                                         MACRF=(PM),RECFM=F

                                       679+*                    DATA CONTROL BLOCK
                                       680+*
000F7E                                 681+         ORG   *-16 TO ELIMINATE UNUSED SPACE
000F80                                 682+LINEOUT  DS    OF ORIGIN ON WORD BOUNDRY
000F90                                 683+         ORG   *+16 TO ORIGIN GENERATION

                                       685+*                    PRINTER DEVICE INTERFACE

000F90 0000                            687+         DC    BL2'0000000000000000' PRTSP,DEVT
000F92 0000                            688+         DC    H'0'

                                       690+*                    COMMON ACCESS METHOD INTERFACE

000F94 00                              692+         DC    AL1(0) RUFNO
000F95 000001                          693+         DC    AL3(1) EUFCB
000F98 0000                            694+         DC    AL2(0) RUFL
000F9A 4000                            695+         DC    BL2'0100000000000000' DSORG
000F9C 00000001                        696+         DC    A(1) IOBAD

                                       698+*                    FOUNDATION EXTENSION

000FA0 00                              700+         DC    BL1'00000000' BFTEK,BFALN
000FA1 000001                          701+         DC    AL3(1) ECBAD
000FA4 80                              702+         DC    BL1'10000000' RECFM
000FA5 000000                          703+         DC    AL3(0) EXLST
```

```
 LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                                  FC1JAN68  1/29/69

                                   705+*                    FOUNDATION BLOCK

000FA8 E2E8E20709C909E3           707+          DC    CL8'SYSPRINT' DDNAME
000FB0 02                         708+          DC    BL1'00000010' OFLGS
000FB1 00                         709+          DC    BL1'00000000' IFLG
000FB2 0052                       710+          DC    BL2'0000000001010010' MACR

                                   712+*                    BSAM-BPAM-QSAM INTERFACE

000FB4 00                         714+          DC    BL1'00000000'
000FB5 000001                     715+          DC    AL3(1) CHECK, GERR, PERR
000FB8 00000001                   716+          DC    A(1) SYNAD
000FBC 0000                       717+          DC    H'0' CIND1, CIND2
000FBE 0084                       718+          DC    AL2(132) BLKSIZE
000FC0 00000000                   719+          DC    F'0' WCFC, WCPL, OFFSR, OFFSW
000FC4 00000001                   720+          DC    A(1) ICEA
000FC8 00                         721+          DC    AL1(0) NCP
000FC9 000001                     722+          DC    AL3(1) EOBR, EOBAD

                                   724+*                    QSAM INTERFACE

000FCC 00000001                   726+          DC    A(1) RECAD
000FD0 0000                       727+          DC    H'0' CSWS
000FD2 0084                       728+          DC    AL2(132) LRECL
000FD4 00                         729+          DC    BL1'00000000' EROPT
000FD5 000001                     730+          DC    AL3(1) CNTRL
000FD8 00000000                   731+          DC    F'0' PRECL
000FDC 00000001                   732+          DC    A(1) ECB
000FE0                            733           DS    0F                        FORCE ALIGNMENT
000FE0 00                         734 FIRSTIME  DC    X'00'                     SWITCH FOR PREVIOUS RECORD TEST
000FE1 00                         735 SWITCH    DC    X'00'                     SWITCH FOR ZERO SUPPRESS TEST
000FE2 00                         736 NUMSWITC  DC    X'00'                     SWITCH FOR NUMBER OR SIZE
000FE3 00                         737 ERRORSW   DC    X'00'                     SWITCH FOR 'E'
000FE4 00                         738 TAPESW    DC    X'00'                     SWITCH FOR 'T'
000FE5 00                         739 RECSW     DC    X'00'                     SWITCH FOR INDIVIDUAL RECORDS
000FE6 00                         740 FINALSW   DC    X'00'                     SWITCH FOR CONCLUSION
000FE7 00                         741 SECSW     DC    X'00'                     SECOND-LINE SWITCH FOR HEX
000FE8 00                         742 COPYSW    DC    X'00'                     SWITCH FOR COPYING RECORDS
000FE9 00                         743 PRINTSW   DC    X'00'                     PRINT SWITCH
000FEA 00                         744 NOLISTSW  DC    X'00'                     SWITCH ON TO SKIP LISTING
000FEB 00                         745 HEXSW     DC    X'00'                     SWITCH FOR HEX
000FEC 00                         746 EDITSW    DC    X'00'                     SWITCH FOR 'E' INSERTION
000FED 00                         747 NOMORESW  DC    X'00'                     SWITCH FOR NO MORE ALLOWED
000FEE 0000
000FF0 00000000                   748 CHECKA    DC    A(0)                      STORE 'NORMAL' CSW
000FF4 00000000                   749 CHECKE    DC    A(0)                      STORE 'EXCEPTION'CSW
000FF8 00000000                   750 COUNTER   DC    A(0)                      FOR COUNT OF BOGUS CSW'S
000FFC 0900                       751 MASK      DC    X'0900'                   CHANNEL END,UNIT EXCEPTION
000FFE 00                         752 BOGUS     DC    X'00'                     SWITCH FOR BAD CSW'S
001000                            753 INPUT     DS    8192D                     INPUT AREA
011000                            754           DS    0                         BUFFER TO PROTECT IOCP
                                  755           END
```

POS.ID	REL.ID	FLAGS	ADDRESS
01	01	08	0000C1C
01	01	08	0000C0C
01	01	08	0000E41
01	01	08	0000E45
01	01	08	0000E49
01	01	0C	0000E5C
01	01	08	0000E61
01	01	08	0000AD9
01	01	0C	0000ADC
01	01	08	0000AF9
01	01	08	0000AF1
01	01	0C	0000B00
01	01	08	0000B11
01	01	08	0000B19
01	01	0C	0000B28
01	01	08	0000B41
01	01	08	0000B45
01	01	08	0000B49
01	01	0C	0000B5C
01	01	08	0000B69
01	01	08	0000B71
01	01	0C	0000B8C
01	01	08	0000BA1
01	01	0C	0000BB0
01	01	08	0000BC1
01	02	1C	0000B1C

SYMBOL	LEN	VALUE	DEFN	REFERENCES
ADJUST	00004	000E62	0452	
ADJUST1	00004	000E9A	0450	C444
ADOVER	00002	000E6A	0454	C451
AECOPY	00002	000000	0003	C002
ASTERISK	00004	000612	0357	C362
BADCSW	00004	000190	0105	C070
BADCSW2	00004	000496	0305	C270
BAKSPACE	00004	0003A2	0238	
BLANKER	00006	000590	0365	C350
BLANKS	00001	000580	0561	C022 C023 0024 0026 0365 0386
BLOCKA	00001	003844	0548	C041 C044 0062 0547
BLOCKE	00004	000ACC	0569	C042 C116 0117 0125 0276 0567
BLOCKF	00004	000AE4	0576	C126 C228 0575
BLOCKG	00004	000B1C	0584	C127 C466 0583
BLOCKH	00001	000B44	0592	C043 C045 0263 0591
BLOCKJ	00004	000B74	0601	C129 0238 0600
BLOCKM	00004	000BA4	0610	C139 C609
BOGUS	00001	000FFE	0752	C028 C069 0095 0102 0105 0269 0305
CCA	00008	000860	0554	C551
CCE	00008	000AE8	0574	C571
CCF	00008	000B10	0582	C226 C579
CCG	00008	000338	0590	C587
CCH	00008	000B60	0598	C595
CCJ	00008	000B90	0607	C604
CCM	00008	000BC0	0616	C613
CHECKF	00004	000FE4	0749	C094 C101 0106 0257 0306 0308
CHECKN	00004	000FF0	0748	C027 C071 0073 0091 0098 0163 0223 0257 0261 0271 C293 C302 0308 031C 0314 C484
CLEAR	00006	0002CE	0187	C189
CLEAR1	00006	0000CC	0045	C051
COMM	00004	000304	0319	C403 C429
COMMA	00006	000628	0403	C364
COMOVER	00004	000632	0406	C366
COMP	00004	000C60	0440	
CONTINUE	00002	000762	0487	C311
COPY	00004	001362	0222	C076 0437
COPYR	00004	00037E	0228	C244
COPYSW	00001	000FE8	0742	C032 C040 0075 0088 0148 0283 0436 0461
COPYT	00004	00071A	0466	C462
COUNTER	00004	000FE8	0750	C109 C111 0513 0516
DECNUM	00008	000C80	0647	C316 C319
DECREC	00008	000C78	0646	C315 C318 0419 0420
DECRUN	00008	000C88	0648	C368 C369 0497 0498 0517 0518
ECALC	00006	000468	0293	
EDITOR	00004	000400	0320	C402 C428 0449
EDITSW	00001	000FEC	0746	C091 0359 0422 0442
EDRUN	00006	000BC8	0617	C016 0369 0370 0371 0380 0381 0495 0498 0499 0515 0518 0519
EDRUN2	00006	000BCE	0618	C016 0381 0495 0515
ENDFILE	00004	000732	0473	C394
EOVER	00006	000B8E	0629	C360
ERRIN	00006	000780	0495	C510
ERROR	00004	000400	0263	C113 C274 0301
ERROREX	00006	000170	0094	0549
ERRORSW	00001	000FE3	0737	C282 C408 0435
ERROR1	00004	000350	0258	C074

SYMBOL	LEN	VALUE	DEFN	REFERENCES
ERROR2	00006	000184	0101	C593
ERROR3	00006	0003E6	C257	C107
ERROR4	00006	0004A2	0308	
ERROR5	00004	00041C	C271	C309
ERROUT	00006	000778	0494	C512
EWRITE	00004	000642	0410	C294
FILERDT	00004	0001EC	0130	C124
FINALSW	00001	000FE6	0740	C367 0384 0445 0492
FINALY	00006	000708	0511	C508
FINALZ	00006	000702	0513	
FINALZZ	00004	000804	0527	C514
FINISH	00002	000748	0480	
FINISHA	00006	00024C	0150	C036 C038
FINISHED	00006	00078E	0509	C156 0383 0385 0481
FIRST	00006	000758	C484	C084
FIRSTIME	00001	000FEC	0734	C029 C083 0291 0433 0463 0474 0485
FIVEDIG	00002	000568	0356	
FIXED	00004	00048A	0302	C272
FROMOK	00006	000156	C086	C034
FROMUNIT	00004	000F84	0675	C031 C033 0039 0041 0042 0043 0125
FULLUP	00004	00059E	0368	C441 C446 0455 0457
GO	00004	0000FC	0062	C060 C479 0483 0489 0491
HEXBLOCK	00001	0000C0	0665	C023 C026 0198 0208 0209 0212
HEXSW	00001	000FE8	0745	C167
HOLDNO	00004	000C64	C641	C020
HOLDNO1	00004	000C68	0643	
HOLDNO2	00004	000C6C	0644	C021
HOLDNO3	00004	000C70	0645	C020 C021
INERR	00004	000ED0	0660	C412 C414 0496 0505 0509
INLINE	00001	000EDC	C663	C025 C502 0506
INNER	00003	000E60	C669	0025
INNUM	00001	000F21	C666	C499 C507
INPUT	00003	0001D0	C753	C046 0048 0160 0184 0186 0554 0582 0599
INTER	00001	000568	0657	C194 C199
LASTREC	00004	000C58	0638	C018 0293 0310 0313 0314 0418 0484
LINEOUT	00004	000E80	0682	C014 C152 0170 0180 0217 0252 0287 0297 0376 0501 0521 0529
LIST	00002	000110	C068	
LISTOVER	00004	00012A	C075	C304
MARKTEST	00004	000114	C071	
MASK	00002	000FFC	0751	C044 C045
MESSAGE	00045	000B0D	0557	C150 C153 0215 0218 0245 0253 0285 0288 0295 0298
MESSAGEA	00045	000B3D	0556	C150
MESSAGEV	00045	000A97	0565	C295
MESSAGEW	00045	000A6A	0564	C245
MESSAGEY	00045	000A10	0562	C215
MESSAGEZ	00045	000A3D	0563	C285
MESSAGE7	00006	000472	0295	C262
MORE	00006	0004AC	0310	C085
MOREOVER	00004	000486	0312	C292 0465 0493
MOVER	00004	000460	0291	C284
NBLISTSW	00001	000FEA	0744	C373
NOMORE	00004	000602	0448	C426
NOMORESW	00001	000FED	0747	C382 0440 0448
NONZERO	00006	000540	0346	C323 C334
NORMALEX	00006	000168	C091	C548

SYMBOL	LEN	VALUE	DEFN	REFERENCES					
NORMAL2	00004	000170	0098	C592					
NOTFULL	00006	000554	0348						
NUMSWITC	00001	000FE2	0736	C361	0363	0392	0400		
OUTBLOCK	00001	000020	0653	C022	C166	0171	0194	0209	0212
OUTER	00003	000F63	0670	C5C6					
OUTERR	00004	000ED4	0661	C247	C249	0494	0505	0511	
OUTING	00001	000984	0560	C519					
OUTLINE	00001	000990	0558	C522					
OUTNUM	00001	000F66	0671	C5C7					
OUTPUT	00001	000CA8	0652	C024	0052	0370	0377	0386	0387
OUT2	00004	000D0A	0052						
PKUN	00004	000C14	0625	C135	0136				
POINTA	00001	000940	0547	C0E5					
POINTE	00001	000AC8	0567	C12C	0279				
POINTF	00001	000AF0	0575	C231					
POINTG	00001	000818	0583	C469					
POINTH	00001	000840	0591	C266					
POINTJ	00001	000870	0600	C241					
POINTM	00001	000BA0	0609	C142					
PRINTAPE	00006	000344	0215	C460					
PRINTER	00004	000264	0157	C078	C439				
PRINTING	00004	000240	0147	C115					
PRINTSW	00001	000FE9	0743	C077	C147	0438	0459		
PROTERR	00004	000190	0108	C3C7					
PROTSW	00001	000C20	0627	C019	C130	0145			
PSAVE2	00004	000C40	0635	C197	C2C7				
PSAVE3	00004	000C2C	0630	C157	C190				
PSAVE4	00004	000C30	0631	C158	C191				
PSAVE5	00004	000C34	0632	C159	C192				
PSAVE8	00004	000C38	0633	C155	C2C5				
PSAVE9	00004	000C3C	0634	C196	C2C6				
PUTBLOCK	00006	000288	0166	C178					
PUTPLUS	00004	000296	0170	C211	0214				
READTAPE	00001	000000	0001						
RECSW	00001	000FE5	0739	C0E1	0450	0476	0482	0488	
SAVEA	00004	000868	0555	C0C6	C0C7	0531			
SAVERUN	00004	000EC8	0659	C017	C371	0380			
SAVER3	00004	000ED8	0662	C1C8	C112	0246	0250	0411	0415
SAVER5	00004	000C10	0624	C132	C138				
SAVE11	00004	000C28	0629	C058	C423	0427			
SAVE6	00004	000C24	0628	C057	C079	0227	0258		
SEC	00006	000230	0212	C175					
SECSW	00001	000FE7	0741	C174	C210	0213			
SENSBYTE	00001	000F88	0676	C123	C574				
SENSE	00004	000420	0276	C260					
SENSING	00004	0001C4	0117	C131	C146				
SETFROM	00006	0000A2	0041	C0B9	C129	0149			
SIZEREC	00004	000C5C	0639	C163	C164	0223	0224	0225	0226
SKIP	00002	000552	0347	C345					
STATUSA	00004	000858	0553	C091	C094				
STATUSE	00004	000AE0	0573						
STATUSF	00004	000808	0581	0234					
STATUSG	00004	000830	0589						
STATUSH	00004	000858	0597	C098	C101				
STATUSJ	00004	000888	0606						

1/29/69

```
SYMBOL    LEN  VALUE  DEFN     REFERENCES
STATUSM   00004 000638 0615
SWITCH    00001 000FE1 0735     C351
SWITCHON  00004 00059A 0367     C453
SYMBOL    00004 000578 0359     C355
TAPEM     00004 0005F0 0456     C407  C464
TAPEMARK  00004 0005EA 0458     C077  C303
TAPESW    00001 000FE4 0738     C353  C406  0458  0473
TESTE     00006 C003BA 0245     C237
TESTREC   00002 000760 0490     C477
TEST1     00004 C004E2 0322     C337  C339  0343
TEST2     00004 000684 0440     C082  C409
TEST3     00004 000764 0488     C356  C447
TEST4     00004 000138 0079     C193  0235  0256
TEST5     00004 000700 0463     C221  C472
TOOK      00006 000184 0114     C087
TOUNIT    00004 000F30 0674     C030  C035  0037  0039  0086  0114  0116  0126  0127  0128  0133
TRANSLAT  00006 0002E0 0194     C168
TRTABLE   00016 000570 0678     C208
TTT       00004 C00300 0620     C456
TYPEM     00013 C00300 0621     0616
TYPNUM    00004 0003E0 0622     C187
UNPACK    00004 000390 0201     C204
UNPKNUM   00008 000C98 0650     C319  C322  0335  0336  0338  0340  0341  0344  0346  0346  C348  C357  C401  C421
UNPKNUM2  00008 000CA0 0651     C335  C336  0338  0340  0341  0342  0342  0344
UNPKREC   00008 000C90 0649     C318  C401  C420  0421
UNPKUN    00008 000C18 0626     C186  C187
WAIT      00004 000106 0065
WAITOVER  00004 C005DA 0382     C374
WAIT1     00006 0005CE 0380     C372
ZERO      00004 000C44 0636     C017  C018  0027  0029  0033  0035  0086  0494  0509  0511  0513
ZERO1     00004 000512 0335     C327
ZERO2     00006 000522 0338     C329
ZERO3     00006 000520 0340     C331
ZERO4     00006 000542 0344     C333
```

NO STATEMENTS FLAGGED IN THIS ASSEMBLY
1024 PRINTED LINES

```
IEF285I   SYS1.MACLIB                                    KEPT
IEF285I   VOL SER NOS= AAECC1.
IEF285I   SYSUT1                                         KEPT
IEF285I   VOL SER NOS= AAECC1.
IEF285I   SYSUT2                                         KEPT
IEF285I   VOL SER NOS= AAEC03.
IEF285I   SYSUT3                                         KEPT
IEF285I   VOL SER NOS= AAEC02.
IEF285I   SYSOUT                                         SYSOUT
IEF285I   VOL SER NOS=       .
IEF294I   SYS69029.T112946.RP002.NAN.R0000005            DELETED
IEF285I   VOL SER NOS=       .
**EOS ASM       11.36.13 00186 SECS 0000
**EOJ NNN       11.36.14 0.11 HOURS
```