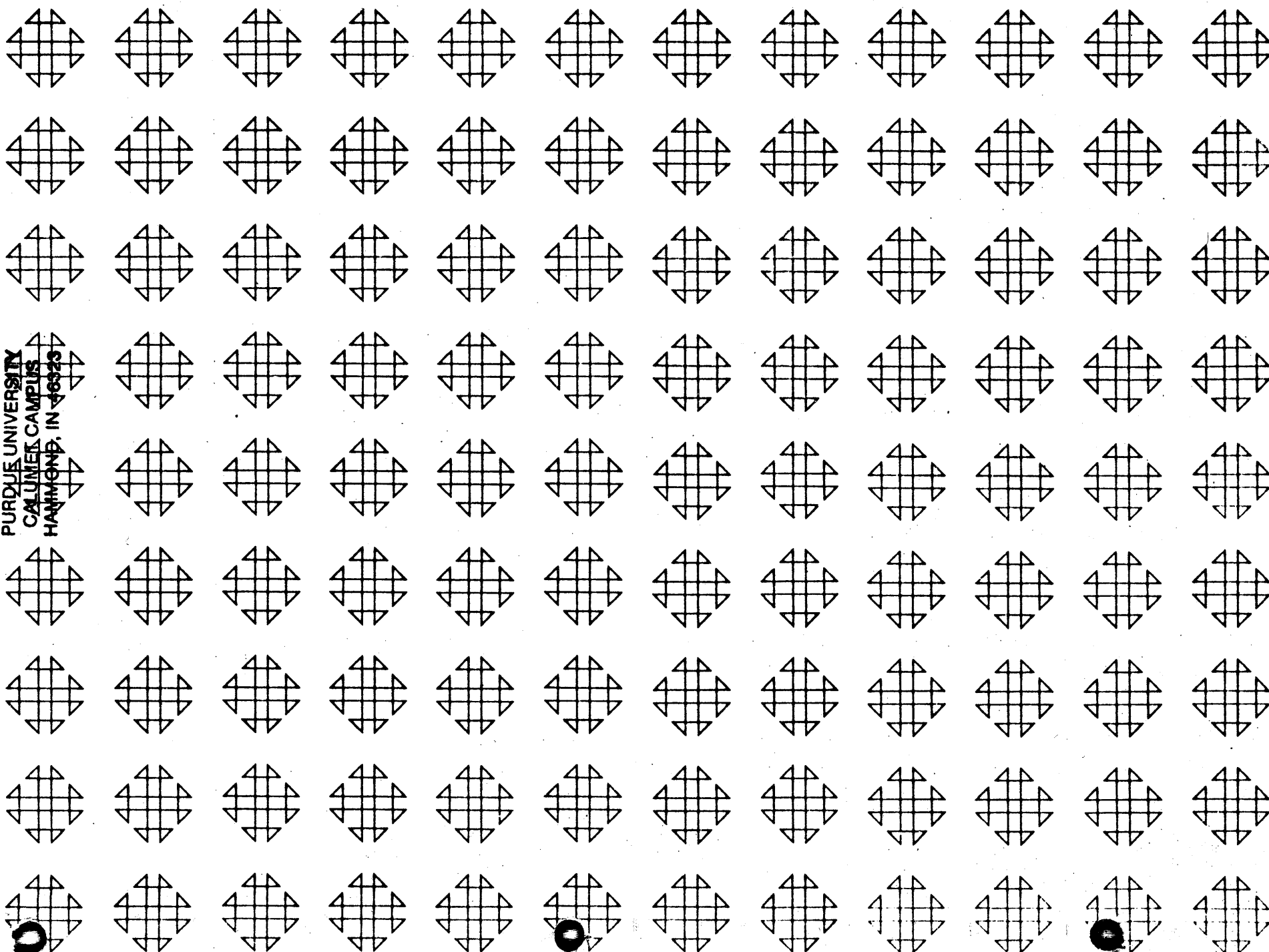


DR. JOAN MANIOTES
COMPUTER TECHNOLOGY DEPT.

PURDUE UNIVERSITY
CALUMET CAMPUS
HAMMOND, IN 46323



THE JOINT CHIEFS OF STAFF
COMBATANT COMMANDS
YOUTH AND SECURITY
SUPPORT GROUPS
EXERCISES IN PROGRESS

DISCLAIMER

Although each program has been tested by its contributor, no warranty, express or implied, is made by the contributor or any User's Group, as to the accuracy and functioning of the program and related program material, nor shall the fact of distribution constitute any such warranty, and no responsibility is assumed by the contributor or any User's Group, in connection therewith.

1620
2. O. 059

Correction
July 20, 1967

Attached are corrected pages 2 and 169 for the subject program.
These pages have been prepared to allow you to replace these sheets
in your writeup affected by this correction.

Replacement of the program card decks have also been made.

COMMON USERS GROUP PROGRAM REVIEW AND EVALUATION
(fill out in typewriter, ink or pencil)

Program No. _____

Date _____

Program Name: _____

1. Does the abstract adequately describe what the program is and what it does? Yes____ No____
Comment _____
2. Does the program do what the abstract says? Yes____ No____
Comment _____
3. Is the description clear, understandable, and adequate? Yes____ No____
Comment _____
4. Are the Operating Instructions understandable and in sufficient detail? Yes____ No____
Comment _____
Are the Sense Switch options adequately described (if applicable)? Yes____ No____
Are the mnemonic labels identified or sufficiently understandable? Yes____ No____
Comment _____
5. Does the source program compile satisfactorily (if applicable)? Yes____ No____
Comment _____
6. Does the object program run satisfactorily? Yes____ No____
Comment _____
7. Number of test cases run _____. Are any restrictions as to data, size, range, etc. covered adequately in description? Yes____ No____
Comment _____
8. Does the Program meet the minimal standards of COMMON? Yes____ No____
Comment _____
9. Were all necessary parts of the program received? Yes____ No____
Comment _____
10. Please list on the back any suggestions to improve the usefulness of the program.
These will be passed onto the author for his consideration.

Please return to:

IBM Corporation
Program Information Department
40 Saw Mill River Road
Hawthorne, New York 10532
Attn: PREP FORM COORDINATOR

Your Name _____
Company _____
Address _____
Users Group Code _____

THIS REVIEW FORM IS PART OF THE COMMON ORGANIZATION'S PROGRAM REVIEW AND EVALUATION PROCEDURE. NONMEMBERS ARE CORDIALLY INVITED TO PARTICIPATE IN THIS EVALUATION.

2/2/67

11

1620 USERS GROUP LIBRARY
PROGRAM ABSTRACT

1. TITLE (If subroutine, state in Title): C4D (An Operating System for PDQ Fortran)
Subject Classification: 2.0 Operating System
2. Author; Organisation: Grant, Lilly, McAteer - J & L Steel Corporation,
Maskiell, Powell - Pennsylvania Transformer Division.
Date: 1 - 20 - 67 Users Group Membership Code: 3081
3. Direct Inquiries to Name: Frank H. Maskiell, Pennsylvania Transformer Division,
Box 330, Canonsburg, Pa. Phone: 412-745-9100 (205)
4. Description/Purpose: (5. Method; 6. Restriction/Range; When Applicable)
C4D is a PDQ Fortran operating system providing batch processing, a mixed group of
Fortran compilation and execution runs. It permits storage of programs and data
on one or more 1311 disk drives. Segmentation of programs is possible. The system
contains very comprehensive error checking. The operating system resides on the
disk and occupies less than 5% of a single disk. A 1443 Printer may be used for
output if available but is not required for the use of the system.
7. Specifications (Check or fill in appropriate spaces):
a. Storage used by program: The system occupies the last 5 cylinders of the disk.
b. Equipment required by program: Object Fortran programs commence at 07650.
Card System X ; Magnetic Tape System ; No. of Tapes ;
Paper Tape System ; Disk File System X ; No. of Packs 1 ;
TNS, TNF, MF X ; Auto divide X ; Indirect addressing X ; Floating point hardware ;
Other (specify) System will adjust for any memory size. Additional disk drives may be
used if available.
Can program be used on lesser Machine? NO . Specify which requirements can be
easily removed
c. Programming type (Check appropriate spaces):
Fortran without Format ; Fortran with Format ;
Fortran II ; Mainline, Complete ; Subroutine or function subprogram(S or F) ;
Is the program a library (ie, SPS) function to the Fortran system checked? ;
SPS ; SPS - 1620/1710 ;
Mainline, Complete ; Macro ; Subroutine ;
Other programming language: ; Give details
d. Language used in the writeup: The entire system has been written in APT SPS 1.1.023
8. Additional Remarks:

C4D

An Operating System Built Around PDQ

by

Jean Grant,¹ Gordon Lilly,² Frank Maskiell,³
Mary Lynn McAteer,⁴ Lawrence Powell⁵

ABSTRACT

C4D is a PDQ operating system for the IBM 1620. It provides for batch processing a mixed group of compilation and execution runs. It permits storage of program and data on one or more 1311 disk drives. Segmentation of programs is possible under C4D. The system contains very comprehensive error checking.

ACKNOWLEDGMENTS

The authors gratefully acknowledge the contributions of many friends and colleagues:

John Burgeson of IBM whose FORTRAN II DIAGNOSTICIAN provided the original basis for the C4D diagnostic routine; James Taylor for a faster routine for the compiler symbol table scan; Dick Pratt for his preliminary version of DATA SPS which was used exclusively in assembling the system; Manfred Fliess and Joseph Smith for contributions to the sample procedures; John Holmes, Stewart Lee and James Field, and Donald Jardine for their suggestions built into the original PDQ; Jack O'Keefe for the REREAD feature; Jim Deck, Jack Imbertson, and Bob Humbrecht for testing the early version of the system and suggesting improvements.

1. Junior Research Mathematician, Jones & Laughlin Steel Corporation
2. Research Supervisor, Jones & Laughlin Steel Corporation
3. Computer Supervisor, Pennsylvania Transformer Division of the McGraw Edison Company
4. Research Physicist, Jones & Laughlin Steel Corporation
5. Scientific Programmer, Pennsylvania Transformer Division of the McGraw Edison Company.

TABLE OF CONTENTS

DECK LABELS	PAGE 2
USERS MANUAL	3
LANGUAGE SPECIFICATIONS	4
STATEMENT FORMAT	6
PERMISSABLE STATEMENTS	6
I/O LISTS	8
FORMAT	9
SYSTEM CONTROL CARDS	11
DEBUGGING	12
CHECK STOPS	13
OPERATING INSTRUCTIONS	14
PROCEDURES	15
NEW SUBROUTINES	16
ERROR MESSAGES	18
USERS MANUAL INDEX	20
SYSTEMS MANUAL	
INTRODUCTION	21
SYSTEM DECK AND LOADER	26
EXECUTIVE AND CONTROL CARDS	27
SCAN	30
DIAGNOSTICIAN	31
INTERFACE LABELS AND DISK ADDRESSES	36
SYSTEM SOURCE LISTINGS	
LOADER	37
EXECUTIVE	39
SCAN	54
DIAGNOSTICIAN	62
COMPILER	89
CLASS A SUBROUTINES	127
RELOCATABLE SUBROUTINES	137
FORTRAN LABEL INDEXER	144
FLOW CHARTS	161
SYSTEM DECK LISTING	169
TEST DECK LISTING	182
RESULTS OF RUNNING TEST DECK	187

DISCLAIMER

ALTHOUGH EACH PROGRAM HAS BEEN TESTED BY ITS CONTRIBUTOR, NO WARRANTY, EXPRESS OR IMPLIED, IS MADE BY THE CONTRIBUTOR OR COMMON, AS TO THE ACCURACY AND FUNCTIONING OF THE PROGRAM AND RELATED PROGRAM MATERIAL, NOR SHALL THE FACT OF DISTRIBUTION CONSTITUTE ANY SUCH WARRANTY, AND NO RESPONSIBILITY IS ASSUMED BY THE CONTRIBUTOR OR COMMON, IN CONNECTION THEREWITH.

DECK LABELS

DECK 1 SYSTEM DECK CARDS NUMBERED IN COLUMNS 1-5

IDENTIFIER - CARD CONTENTS

1ST 3 CARDS - (NOT SEQUENTIALLY NUMBERED)

(A) TURN OFF INDEX REGISTERS

(B) TURN ON INDIRECT ADDRESSING

(D) READ NEXT CARD

00000-..... - LOADS LOADER INITIALIZATION

00001-00026 - LOADER INITIALIZATION

00997-..... - CAUSES BRANCH INTO LOADER INITIALIZATION

00998-..... - C4D COLD START CARD

00999-..... - LOADS EXECUTIVE TO CORE

01001-01155 - EXECUTIVE ROUTINE

01999-..... - CAUSES BRANCH TO EXECUTIVE INITIALIZATION,
CONTAINS EXEC MINUS DISK TABLE DISK CONTROL FIELD

02001-02109 - CLASS-A SUBROUTINES

02999-..... - CAUSES BRANCH TO CLASS A INITIALIZATION,
CONTAINS CLASS A SUBS DISK CONTROL FIELD

03001-03064 - SCAN ROUTINE

03999-..... - CAUSES BRANCH TO SCAN INITIALIZATION,
CONTAINS SCAN DISK CONTROL FIELD

04001-04244 - DIAGNOSTICIAN I

04999-..... - CONTAINS DIAG. I DISK CONTROL FIELD

05001-05029 - DIAGNOSTICIAN II

05999-..... - CONTAINS DIAG. II DISK CONTROL FIELD

06001-06096 - LABEL INDEX ROUTINE

06999-..... - CONTAINS LABEL INDEX DISK CONTROL FIELD

07001-07251 - COMPILER I

07999-..... - CAUSES BRANCH TO COMPILE I INITIALIZATION,
CONTAINS COMPILE I DISK CONTROL FIELD

08001-08029 - COMPILER II

08999-..... - CONTAINS COMPILE II DISK CONTROL FIELD

09001-09019 - ERROR SUBROUTINES

09997-09998 - CAUSES BRANCH INTO ERR SUBS INITIALIZATION,
CONTAINS ERR SUBS DISK CONTROL FIELD

09999-..... - SERVES TO COLD START AFTER SYSTEM LOAD

*DATE SYSTEM LOAD CARD

*DISK CARD

*SRS 16 CARD AND RELOCATABLE SUBROUTINE DECK

DECK 2 TEST DECK

THE C4D OPERATING SYSTEM

Introduction

C4D is an operating system built around an extended version of PDQ FORTRAN. It is written for the IBM 1620 with a 1311 disk file, indirect addressing, and the special instructions TNS, TNF, and MF. C4D will also utilize a second disk drive and the 1443 printer if these are available. It is self-adapting for any core size.

C4D consists of the following programs:

1. The statement scan routine
2. The diagnostic routine
3. The compiler routine
4. The class A subroutines
5. The relocatable subroutines
6. The label index routine
7. The executive routine.

The statement scan routine reads each source program statement, removes the blanks, determines the type of statement, and stores this information on the disk for later use by the diagnostic and compiler routines. After it has read the entire source program, it calls the diagnostic routine from the disk.

The diagnostic routine is a modified version of the 40K FORTRAN II Diagnostician. The modifications accommodate the differences in language between FORTRAN II and PDQ FORTRAN, permit the use of the 40K Diagnostician on a 20K machine, and incorporate the Diagnostician as a routine within C4D. If the diagnostic routine finds errors, it punches or prints error messages, lists the entire source program on the 1443 if available, and calls the executive routine from disk. If no errors are found in the program, the diagnostic routine calls the compiler.

The compiler routine is a modified version of the original C2 processor for PDQ. Error messages have been eliminated as these are now handled by the diagnostician. ACCEPT and IF (SENSE SWITCH) statements have been eliminated as they have no place in an operating system designed for open shop programming and closed shop operation. DATA statements now permit initial values of variables to be defined at compile time. Iteration within input/output statements is now permissible. The ability to segment programs has been added to avoid core size limitation on program length. More symbols are permitted since the compiler routine occupies less core storage. The length of integer variables is now ten digits. This allows integer arithmetic in the comparison of alphanumeric fields. Finally, no object decks are produced, since C4D object programs are stored temporarily or permanently on the disk.

-2-

The class A subroutines are little changed from their PDQ ancestors. They now detect undefined symbols at run time and, in this event, provide a symbol table dump before they return control to the executive routine. The relocatable subroutines have real or integer values according to their initial letters. The LOG subroutine is now called ALOG since it is a real function. Eight new subroutines have been added to the original set of PDQ relocatables. They include a disk data routine, a link routine which calls another program from disk without destroying the contents of the COMMON area, and a random integer generator.

The label indexer provides an index of all statement, procedure, and segment labels and of all variable names. The index gives the source card number where the label or name is defined and the source card numbers where they are referenced. If the source cards are not numbered, the scan routine supplies sequential numbers.

The executive routine determines the nature of each job from a control card. It then loads the appropriate system routine or object program from disk. It acts as librarian for users programs on disk, it loads and relocates the relocatable subroutines, and it prints headings and dates for each job. Finally, it permits automatic exit from the system by loading another program not handled under the system.

Speed comparisons with other systems will be possible only after extended experience with C4D and will vary for different jobs and for different machine configurations. Unlike the IBM MONITOR system, C4D has no provision for assembly language programs and does not permit separate compilation of subprograms with local variable names, statement labels, and parameter lists. These limitations, however, must be balanced by important advantages for the installation which runs mainly FORTRAN programs. The system uses only 5% of the disk and the rest of the disk may be divided into program storage and working data storage to suit the needs of each particular installation. The comprehensive diagnostics at compile and run time are invaluable in debugging. Other advantages of C4D are the efficient use of core and the high speed of disk operations for program segmentation and data storage.

Documentation consists of the Users Manual and the Systems Manual. The Users Manual defines C4D as a programming language for users who have a basic knowledge of FORTRAN. It also includes operating instructions and a description of control cards and error messages. The Systems Manual is written for systems programmers who wish to correct or extend C4D or who are just curious about the construction of the system.

USERS MANUAL FOR C4D

Specifications of the C4D Language

Variables

Variable names may contain up to five alphameric characters and must start with a letter. Variables may be either integer-valued or real-valued.

1. Integer variables are ten decimal digits. Any variable whose name starts with the letters I,J,K,L,M, or N is an integer.

Integer addition, subtraction, and multiplication are performed modulo 10,000,000,000. This means that only the ten right-most digits are retained out of a possible twenty digit product. No error message is printed if an overflow occurs. The quotient of an integer division is converted to an integer by truncation.

Examples: $(500,000 * 25,000) \text{ Mod } 10^{10} = 12,500,000,000 \text{ Mod } 10^{10}$
 $= 2,500,000,000$

$5/2 \text{ Truncated} = 2.5 \text{ Truncated}$
 $= 2$

2. Real variables have names with initial letters other than I,J,K,L,M,N. They are stored in the 1620 in excess-50 floating point form, that is with a two digit exponent and an eight digit fraction as follows:

$\overline{e}e\overline{e}ff\overline{e}ff\overline{e}ff$ represents $0.\overline{e}ff\overline{e}ff\overline{e}ff * 10^{(ee-50)}$

Examples: $\overline{5}131415927$ represents 0.31415927×10^1 or pi

$\overline{4}910000000$ represents $0.1 \times 10^{-1} = 0.01$

Zero is a special case and is stored as $\overline{0}000000000$. Thus a real variable V may have the following values:

$0.1 \times 10^{-49} \leq |V| \leq 0.99999999 \times 10^{49}$ or $V = 0$

Arrays

Vectors and matrices may be stored, and their elements are addressed by means of integer subscripts.

Examples: $X(I)$, $Y(I,J)$, $NAME(M)$, $P(2)$

A limited amount of arithmetic is permitted within the subscript parentheses. $X(I-3)$ and $Y(I+1, J+2)$ are permissible but $X(2+I)$, $X(2*I)$, $X(I+J)$, $X(2*I-3)$ are not.

The subscripts may have only strictly-positive values. $X(0)$, $Y(-3)$ will refer to some other variable or some element of another array. The array is stored in core by columns, with the first element in the highest numbered core location. A matrix $B(I,J)$ with two row and two columns might therefore appear in core as follows:

Core Location	Element
18999	$B(1,1)$
18989	$B(2,1)$
18979	$B(1,2)$
18969	$B(2,2)$

Subroutines

Certain commonly used functions are available as subroutines. Other subroutines may be added to the system as described in Appendix 2. These subroutines are loaded relocatably into core only if they are called for by the program to be executed. Real functions have real arguments and integer subroutines have integer arguments. Functions are identified as real or integer by the initial letter of the subroutine name in the same way as variables.

The following table of the subroutines which are supplied with C4D includes their range and associated error messages. The subroutines may be addressed with or without a final F e.g. $SIN(x)$ or $SINF(x)$.

1. SIN/COS - evaluates $\sin(x)$ or $\cosine(x)$ when x is expressed in radians and $x < 10^7$
Error Message - TRIG if $(x) \geq 10^7$
Length - 718 digits
2. EXP - evaluates e^x
Error Message - OFLO if $e^x \geq 10^{50}$
Length - 536 digits
3. $ALOG$ - evaluates $\log_e(x)$ where $x > 0$
Error Message - OFLO if $x = 0$, ERLN if $x < 0$
Length - 582 digits

4. SQRT - evaluates x when $x \geq 0$
Error Message - NSQR if $x < 0$
Length - 366 digits
5. ABS - evaluates x
Length - 38 digits
6. NABS - evaluates n
Length - 38 digits
7. ATAN - evaluates $\arctan(x)$. Result is in the range $-\pi/2$ to $\pi/2$
Length - 846 digits
8. DRH - drops decimal digits of a real variable
Length - 128 digits
9. NPR - generates equiprobable pseudo-random integers in the range 00000 to 99999. Different starting points in the sequence can be defined by different odd integer arguments. After the first execution of NPR the argument is ignored.
Length - 208 digits
10. MOVE - MOVE(-1) reads a group of records from disk
MOVE(0) seeks a group of records on disk
MOVE(1) writes a group of records on disk

Further details are given under the heading Disk Storage of Data.

Error Messages - DISK indicates computer malfunction
- TASK indicates programming error
Length - 994 digits

11. MOD-MOD(N/M) evaluates $N \bmod M$ i.e. $(N - (N/M) * M)$
Note: MOD in fact ignores the argument and picks up the remainder from the last executed division. Since this remainder is only erased by another divide, a multiply, a fix to float operation, or the use of a doubly subscripted variable, it is possible to use a dummy argument under certain circumstances.

Example: NLB = NOZ/16
NOZ = MOD(NOZ/16)

can be replaced by the following more efficient statements:

NLB = NOZ/16
NOZ = MOD(1)

However, this trick would lead to error in the following case:

NLB(I,4) = NOZ/16
NOZ = MOD(NOZ/16)
Length - 14 digits

12. SAVE(C) - permits temporary storage of the contents of the input/output area. SAVE is used in conjunction with the REREAD statement.

SAVE(-1.) saves the contents of the I/O area
SAVE(+1.) restores the contents of the I/O area

Error Message - SAVE if SAVE(+1.) is executed before SAVE (-1.)
Length - 296 digits

13. LINK(N) - permits a program to call another program on the disk without zeroing the symbol table. The program so called is not protected against the use of undefined variables. The COMMON statement may be used to ensure that both programs refer to the same variable in the same location.

The argument N is the numeric representation of the name of the program called. N can be readily defined by the DATA statement.

Example: M = LINK(N)

:
:
:
DATA, N/5HPLOT1/
END

will call the program PLOT1
Length - 80 digits

14. NFIL(N) - converts an integer in the range $0 \leq N \leq 99999$ into its alphanumeric form. Leading zeroes are converted to 00 and not 70.
Example: K = NFIL(987) will set K equal to 0000797877

The major application of NFIL is to permit output of the value zero as a blank.
Error Message - NFIL indicates out-of-range variable
Length - 222 digits

15. NUPL(N) allows for additional printer carriage control by altering the class A subroutines as specified by the subroutine argument, N.

NUPL(1) suppresses skipping at the end of a page
 NUPL(-1) restores skipping at the end of a page
 NUPL(10) suppresses spacing when printing
 NUPL(-10) restores spacing when printing

Error Message - NUPL if N = 0
 Length - 170 digits

Storage of Subroutines

At run time, these routines are stored between the object program and the symbol table only if called for in the program. In this connection, the programmer should know how the ** operation is executed at run time:

$T ** P$ (i.e. T to the power P) is interpreted as

EXP (P * ALOG(T))

Therefore, if T is negative, an error message will result. This is reasonable because P can be fractional and FORTRAN does not handle complex numbers. If the programmer knows that P is an integer, he should define it as an integer, e.g. NP. $T ** NP$ uses successive multiplication rather than the logarithmic procedure. If P is a small constant integer, e.g. 2, the programmer can save computer time and storage by writing $T * T$.

Statement Card Format

Strict FORTRAN rules apply to statement card format.

1. A comment card must have a C in column 1.
2. The statement label, if any, must be right justified in columns 2 through 5 and be a positive integer in the range 1 through 9999. It may not contain leading zeroes and must be distinct from any other statement, procedure, or segment label.
3. Column 6 must contain a non-zero digit on any continuation card. Note, however, that continuation cards are only permissible in FORMAT and I/O statements. Furthermore, the card preceding a continuation card must end with a comma.
4. The statement text may only occupy columns 7 through 72. Record marks may not appear in the statement.
5. The cards may be numbered in columns 77-80. This number will appear in the 1443 listing of the source statements at compile time. If the first card of the source deck is not numbered, then a sequence number will be supplied for the 1443 listing.

Permissible Statements

A. Arithmetic Statements:

$A = B \text{ op } C$ etc.

Note: There is one known error in C4D inherited from FORTRAN (with FORMAT).

The statements

$A = -B ** C$ or $A = -B ** I$

will compile as if they were

$A = (-B) ** C$ or $A = (-B) ** I$

B. Control Statements:

1. GO TO n
2. GO TO ($n_1, n_2, \dots, n_m$), i
3. IF (a) n_1, n_2, n_3 ,
4. DO n i = m_1, m_2 or DO n i = m_1, m_2, m_3
5. CONTINUE
6. PAUSE
7. STOP n
8. END
9. BEGIN TRACE F15.d or BEGIN TRACE E15.d
10. END TRACE

C. Input/Output Statements:

1. READ n, list
2. REREAD n, list
3. PUNCH n, list
4. PRINT n, list

5. TYPE n, list

6. CONTROL n

D. Declarative Statements:

1. COMMON

2. DIMENSION

3. FORMAT

4. DATA, name/value/name/value ... name/value/

5. SEGMENT $n_1, n_2, n_3 \dots, n_k$

E. Segment Statements:

1. BEGIN SEGMENT n

2. END SEGMENT n

3. CALL SEGMENT n

F. Procedure Statements:

1. BEGIN PROCEDURE n

2. RETURN n

3. END PROCEDURE n

4. EXECUTE PROCEDURE n

Differences from FORTRAN (with FORMAT)

IF(a) n_1, n_2, n_3

Statement labels following the arithmetic expression in an IF statement may be replaced by C under the following conditions:

1. The statement referenced immediately follows the IF statement.
2. The statement is not referenced anywhere else in the program.

Example: IF(I) 1,2,1
1 X(I) = I

can be written as follows

IF(I) C,2,C
X(I) = I

By reducing the number of labeled statements this feature of C4D reduces the storage requirements of the symbol table.

PAUSE

With sense switch 3 on, PAUSE halts the computer. Execution of the program continues when START is pressed. With sense switch 3 off, PAUSE calls the executive without halting the computer. PAUSE should be used only following a TYPE statement which instructs the operator on machine set up.

STOP n

Prints STOP n and calls the executive routine which proceeds with the job specified by the next control card that it finds in the card read hopper.

END

Calls the executive.

TRACE

The results of arithmetic statements may be traced without the generation of any additional instructions. Replacement type statements, that is: A = B; C = D(K); I = J; will not be traced since no arithmetic operation is required. If the replacement statement includes a subscripted variable on each side of the equality, the statement may be traced. This option is under the control of the operator (sense switch 4 for trace) and causes the output of traced statements to be punched four per card in I15 or E15.8 format, followed by the first four digits of the address of the variables traced. The trace is printed on the 1443 if available. An E or F type format may be specified instead of the more general E15.8 in the BEGIN TRACE statement. The field width specified must be 15 columns e.g.

BEGIN TRACE F15.5
BEGIN TRACE E15.6

BEGIN TRACE will turn on the trace feature during compilation. Each arithmetic statement thereafter will be compiled to include tracing. Tracing will be terminated when an END TRACE card is encountered. Succeeding statements will not be traced until another BEGIN TRACE is read.

INPUT/OUTPUT LISTS

If the length of an input/output statement requires more characters than are available before column 73, the list may be continued on the next card. Terminate the partial list preceding a continuation with a comma. The next card must have a digit punched in column 6 followed by the continuation of the list.

Single indexing is permitted within a list but not multiple indexing.

Examples: READ 1, (A(I), I=1,7), (B(J),J=1,7) is permitted

READ 1, ((A(I,J),I=1,2), J=1,3) is not permitted

READ

All 80 columns of each data card may be read.

REREAD

The programmer will first call for a normal read operation, specifying a format which will define the identifying data in the card. After programming the necessary logical operations on the identifying data, he will call for a reread operation, specifying the desired format for the particular card.

Example: READ 1,J
GO TO (17, 18, 19), J
17 REREAD 2, D, E, F
GO TO nnn
18 REREAD 3, A, B, C
GO TO nnn
19 REREAD 4, X, Y, Z

FORMAT 1 defines the field for the control digit J. If J is 1, control transfers to statement 17 and the card contents are reread in FORMAT 2, etc.

Note that any input/output statement interposed between the READ statement and its corresponding REREAD statement destroys the contents of the I/O area. The SAVE subroutine was written to overcome this difficulty.

Example: 1 READ 100, I
TEMP = SAVE(-1.)
PRINT 101, L,M
TEMP = SAVE(+1.)
2 REREAD 102, J,K

Statement 2 stores in J and K the contents of the card read by statement 1. Without the use of SAVE it would have picked up the information stored in the I/O area by the PRINT statement.

PUNCH

All 80 columns may be used for card output.

PRINT

Up to 80 columns may be printed in each line on the typewriter following a carriage return. With a 1443 up to 144 characters may be printed on the 1443 printer. However, in most installations the 1443 printer will permit only 120 characters per line.

TYPE

Up to 80 columns are printed on the typewriter with carriage return.

CONTROL n

This statement controls the typewriter carriage in C4D.

n = 101 spaces typewriter
n = 102 returns typewriter carriage
n = 108 tabulates

CONTROL can also be used for control of the 1443 printer if available.

n = 951 spaces one line before printing
n = 952 spaces two lines before printing
n = 953 spaces three lines before printing
n = 962 spaces one line after printing
n = 963 spaces two lines after printing
n = 971 skips to new page before printing

For a Mod II 1620 two other control options are available

n = 103 backspaces the typewriter
n = 104 gives a line index, that is advances the carriage one line without carriage return.

COMMON

The COMMON statement is followed by a list of variables whose object-time addresses will begin in the first symbol location

after the function symbols. COMMON is used in conjunction with multiple argument subroutines, particularly with regard to the use of the disk for data storage under MOVE. COMMON is also used to ensure that each of several programs which are run in sequence with the LINK subroutine, uses the same core locations for the same variables.

Array variables which are listed in a COMMON statement will have the necessary space reserved and must not be listed again in a DIMENSION statement. CAUTION: The COMMON statement(s) must be the first compiled statement(s) in the program. That is, COMMON statements may be preceded only by COMMENT cards.

Example: COMMON A,B,C,D(2,4),E

FORMAT

Should a desired set of specifications require more characters than are available on the format card, the specifications may be continued on the next card beginning in column 7. A non-zero digit must be punched in column 6. A single format specification may not be split between cards. Any format card to be followed by a continuation card should terminate with a comma in anticipation of another format specification. The duplication of the format statement number on continuation cards in columns 2 through 5 is optional.

Permissible format specifications include I type (Iw), F type (Fw.d), E type (Ew.d), A type (Aw), X type (wX), and H type (wH). All numerical field specifications and the A specification may have fields repeated by preceding the specification by the number of required repetitions such as (3F10.2), which is the equivalent of (F10.2,F10.2,F10.2). Multiple format groups, such as (3(3F5.2,I3), 2(3I4,5X)), are also permissible. Field and group multipliers must be less than or equal to 99.

I Type: The I specification defines a field of w characters from which, or into which, integer data will be transferred. The data must be in integer form with a maximum of 10 digits; however, the field width, w, is not so limited. On input, leading or trailing blanks are interpreted as zeros. On output, the sign of the variable will precede the digits so that a minimum field width of 11 is required to ensure complete output of an integer. Should the field width be less than one plus the number of digits to be output, the width of the field will be automatically increased to accommodate the output. This will thereby alter the columns for subsequent data in that output statement.

F Type: The F specification defines a field of w characters from which, or into which, real data will be transferred. If a decimal point is not included in input data, the last d characters of the field will be recognized as decimal digits. On output, if the numerical value of the variable requires a field width greater than w to permit all non-decimal digits to be output, the specification will be automatically changed to an E type specification so that the output data will be complete.

Example: +1728. is the output under the specification (F6.0) of a variable. Had the specification been (F5.0), the output would have been +.17280000E+04

Variables in E type notation may be input under the F type specification.

E Type: The E specification permits the input or output of a real variable in the exponential form; that is, +.XXXE+XX. E Type input data must be right justified within the field. On output, 6 characters of the field are required for the sign, the decimal point, and the exponential notation. Variables in F type notation may be input under the E type specification.

A Type: The A type specification permits the input or output of up to five alphanumeric characters. The alphanumeric characters are converted to their two digit forms and stored in the symbol table as a 10 digit integer or real variable. The integer form permits arithmetic operations on alphanumeric data. The width of the A field must not exceed 5. The number of alphanumeric characters output will be determined by this field width designation.

X TYPE (Blank Field Specification): Blank characters may be provided in an output record by means of specification wX where w is the width of the field to contain blanks. When the X specification is used with an input record, w characters are ignored.

H Type: The specification wH permits the w alphanumeric characters immediately following H in the specification to be input or output. CAUTION: The characters of an H specification may not be split on two cards. Should more characters than are available on a given format card be required in an H specification, the H specification on the first card must include the count of characters on the first card only, the first card must terminate with a comma, and a new H specification must be stated on the format continuation card for the remaining desired characters. The H type format may be used for programs to reproduce card input or to list the contents of an input deck.

DATA

Variables may be given initial values at run time by the DATA statement(s) rather than by arithmetic statements. The DATA statement saves core storage by eliminating both instructions and constants. It also permits definition of alphanumeric constants

Example: DATA, A/1.0/I/2/K/3HABC/X(10)/-3.1416/

This statement is equivalent to the following four statements, if and only if they are only used for initializing, i.e. are only executed once at the beginning of the program.

```
A = 1.0
I = 2
K = 4142430000
X(10) = -3.1416
```

The DATA statement(s) must immediately precede the END statement.

Segmentation

To run a long program in a computer of small memory the programmer may break up his program into segments. C4D permits these segments to be brought into the core memory from disk storage one at a time as needed during program execution. In a segmented source program there is an initial unsegmented portion of the program. This unsegmented portion may include COMMON, DIMENSION and FORMAT statements. It must include at least one CALL SEGMENT statement and must end with one or more SEGMENT declaration statements. The segments of the program follow immediately after the SEGMENT declaration.

SEGMENT $n_1, n_2, n_3, \dots, n_k$ The n_i are the integer labels for the segments included in the program. These labels must be distinct from all statement labels and procedure labels. Execution of SEGMENT is not meaningful and will be identical to execution of END.

BEGIN SEGMENT n and END SEGMENT n These statements are used to enclose the segment with the label n . CALL SEGMENT n may appear in the part of the program prior to SEGMENT or within any of the segments other than segment n . At run time the statement CALL SEGMENT n transfers the segment n from the disk to the core and branches to the first statement in segment n . If multiple entry points within a segment are desired, an index should be defined prior to the CALL SEGMENT statement and this index used in a computed GO TO statement which appears as the first statement in the segment. Exit from the segment may be by a GO TO statement or an IF statement which transfers control to the initial part of the program before the SEGMENT statement. Alternatively, exit may be achieved by calling another segment. The END SEGMENT is not to be used as an exit. Execution of END SEGMENT is identical to execution of END.

Procedures

A procedure is defined as a group of C4D statements which are to be executed as a unit more than once in a larger program. Such a group of statements is enclosed by the statements BEGIN PROCEDURE n and END PROCEDURE n where n is the procedure label. This label must not appear anywhere in the program as a statement label; it may not be used in more than one procedure, nor may it be used as a segment label.

The procedure n may be executed at any time by the statement EXECUTE PROCEDURE n which transfers control to the statement immediately following the BEGIN PROCEDURE n statement and obeys the statements of procedure n until either of the two following situations is encountered.

- (a) the END PROCEDURE n statement is executed, which transfers control to the statement immediately following the EXECUTE PROCEDURE n statement which initiated entry into the procedure.
- (b) a RETURN n statement is executed. This returns control to the statement immediately following the EXECUTE PROCEDURE n statement which initiated entry to the procedure. A RETURN statement is valid only within the procedure from which it returns control.

A procedure may include EXECUTE PROCEDURE statements referring to other procedures but may not include BEGIN PROCEDURE, RETURN, or END PROCEDURE statements referring to other procedures or EXECUTE PROCEDURE referring to the procedure within which it is placed.

Appendix 1 gives examples of procedures that may be of general utility. Note that the use of large procedure labels and statement labels in the examples reduces the likelihood of duplicating the statement labels of the main program.

Data Storage on the Disk

The subroutine MOVE is written to enable bulk storage of data during the execution of a program or a group of consecutive programs. It is a multiple argument subroutine with four arguments stored in the COMMON area. The use of MOVE is subject to the following restrictions.

1. Data may be read from or written on the disk as a group of records, where a record is a positive multiple of ten words up to 2000 words maximum. The group may consist of one record or a number of records, the total number of words within the group not exceeding 2000.

2. The first statement of the program must be a COMMON statement which names in the following order:
 - a. number of words per record (must be a multiple of 10) - INTEGER VARIABLE
 - b. maximum number of records - INTEGER VARIABLE
 - c. number of the first record to be written or read - INTEGER VARIABLE
 - d. number of the last record to be written or read - INTEGER VARIABLE
 - e. buffer area (core storage area for data involved in the transfer) - INTEGER or REAL VARIABLE named array, or combination of both. e.g. COMMON NWR, MNR, NFR, NLR, BUF(80) or COMMON NWR, MNR, NFR, NLR, A,I,J,B,C,D(4),K
In the second example A,I,J,B,C,D(4),K constitute the buffer area. Values for items (a) through (d) must be specified in the program before the subroutine is entered.
In C4D, variables dimensioned in a COMMON statement must not appear in a DIMENSION statement also.
3. The MOVE routine is called through an arithmetic statement, e.g. N=MOVE(I), where I may be given the values +1, 0, -1

I = +1 causes a core-to-disk transfer or write.

I = 0 causes the disk read/write arm to be positioned over the correct cylinder.

I = -1 causes a disk-to-core transfer or read.

e.g. COMMON NWORD, MAXNR, N1ST, NLAST, BUFFA(200)

```

MAXNR = 2000
NWORD = 20
...
...
N1ST = 1997
NLAST = 2000
K = MOVE (-1)
...

```

These statements will transfer the four two-sector records 1997, 1998, 1999, 2000 from the disk into BUFFA(1) through BUFFA(80). K is a dummy variable and is set to zero.

4. $0 < \text{first record number} \leq \text{last record number} \leq \text{maximum number of records}$.
5. Each transfer of data (and therefore the size of the buffer area) is limited to 2000 words.
6. The space limitation on the disk must not be exceeded.

Error Messages: The error message TASK indicates that one of the above limitations has been violated or that the wrong disk pack is mounted on the 1311. The error message DISK indicates a computer malfunction during a MOVE attempt. After the error message is printed the executive is called from the disk.

Output: All the output from MOVE is in the buffer area defined by COMMON. The statement K = MOVE(I) sets K to zero.

Disk Storage Map: Data is stored on the disk at sectors 60000 through 59999 + (maximum number of records) * (number of words per record)/10. The first record is stored in the highest numbered sector. In the above example the first record is stored in sectors 63998 and 63999. Note that if the system had been loaded to store program starting below 64000, the statements in the example would result in a TASK error because rule 6 would have been violated.

Control Cards

The format for control cards is as follows:

Column 1	*
Columns 2-5	Four characters, left justified, specifying the control function required by the executive.
Column 6	Blank
Columns 7-11	Up to five characters, left justified, specifying the name of the program for CODE, HOLD, RUN, or CUT. The number of subroutines in two left justified digits for SRS.
Column 12	Blank

Columns 13-80

Comments, for example, project number, programmer's name, etc. followed by a record mark.

The system permits the use of the following control cards:

- ```

*CODE - causes the subsequent C4D source program to be
checked for errors and compiled if no errors are
found. The source program is normally followed
immediately by either *RUN or *HOLD.

*HOLD - assigns permanent disk storage to the specified
program if it has just been compiled. Also causes
the index routine to provide an index.

*RUN - causes execution of the specified object program.
*RUN is usually followed by data cards.

*CUT - deletes the specified object program from disk
storage.

*DISK - provides a listing on the typewriter or on the
printer. The listing contains

 1. the number of programs currently assigned
 permanent disk storage
 2. the number of the next available sector for
 program storage
 3. the names of all the programs currently on
 disk

*DATE - stores the contents of Columns 7-80 of the *DATE
card to be stored. This area is intended for a
date, shift, AM, PM, or other message. The mes-
sage is then printed or punched after the control
card message for each subsequent job.

*SRS - causes loading of the relocatable subroutine set
(see Appendix 2)

*OUT - reads the next card (which should be the first
card of a card program) and branches to 00000.

```

## Debugging Under C4D

We will now study the output of a program called ERROR that was written to illustrate the use of program output in debugging.

```

#CODE ERROR
DECEMBER 16, 1965 AM
07500 READ3,I,X,Y
07560 GOTO(1,2),I
07648 1 CALLSEGMENT10
07660 2 CALLSEGMENT20
07672 3 FORMAT(I5,2F10.5)
07704 SEGMENT10,20
 BEGINSEGMENT10
07716 11 X=SQRT(X)
07742 ENDSEGMENT10
 BEGINSEGMENT20
07718 21 X=SQRT(Y)
07742 ENDSEGMENT20
 END

39959 COS 39989 COSF 39979 SIN 39969 SINF
39959 EXP 39949 EXPF 39939 ALOG 39929 ALOGF
39919 SQRT 39909 SQRTF 39899 ABS 39889 ABSF
39879 NABS 39869 NABSF 39859 ATAN 39849 ATANF
39839 DRH 39829 DRHF 39819 NPR 39809 NPRF
39799 MOVE 39789 MOVF 39779 MOD 39769 MODF
39759 SAVE 39749 SAVEF 39739 LINK 39729 LINKF
39719 NFIL 39709 NFILF 39699 FM 0003 39689 I
39679 X 39669 Y 39659 SN 0001 39649 SN 0002
39629 SG 0010 39609 SG 0020 39599 SN 0011 39589 000

ARUN ERROR
DECEMBER 16, 1965 AM
SEGMENT SYMTAB ADDR 3960 NSQR,NEXT INSTR-0773
39930 M1535647-#M5675746-#M5675700-#Q2495546-#Q2495500-#M3566246-#M3566200-#
39860 M5414262-#N5414262-#M1426246-#M1426200-#N11000000-M9-7770-#M1535647-#
39780 N4566545-#N5575946-#N5575900-#M4594846-#M4594800-#M1634155-#M1634155-#
39720 N3495552-#N3495552-#Q2410545-#Q2410545-#N4566446-#N4566400-#N4566545-#
39650 M907648000N11000000--000000000-000000002---7678000N5464953-#N5464953-#
39580 -000000--M907718000---0005000---7718000---00C4000---7718000M90766000
39510 -00000000##-00000000##-00000000##-00000000##-000000C##-000000R99M907718000

```

The output consists of the following items:

1. A referenced source statement listing
2. A referenced symbol table
3. An error message indicating an attempt to take the square root of a negative number
4. A symbol table dump

In addition, the operator has recorded the address 07730 from the IR<sub>2</sub> register. This address contains the next instruction in the users program that would have been executed following the error.

-21-

# Check Stops

The referenced source statements show that both statement 11 and statement 21 have been translated into instructions which include the instruction at 7730. Furthermore, both these statements involve the square root routine. Isolation of the offending statement is accomplished in this way. The error message draws attention to a symbol table address of 3960. This is the first four digits of the symbol table address 39609. The referenced source statement listing shows that this address corresponds to segment 20. Since statement 21 is in segment 20, it is the offending statement. Also, we notice that the argument of the square root in statement 21 is Y. The symbol table shows that Y is stored at 39669 (actually 39660 through 39669). The symbol table dump shows that this storage area contains N11000000-. The N represents a flagged 5 and the - a flagged zero. The flag at the leftmost digit of this field is normal but the flag at the rightmost digit indicates that Y is negative. In fact, 5110000000 represents  $-0.1 \times 10^1$  or -1.0. The same number in locations 39900 through 39909 is the actual argument conveyed to the subroutine. The number 4907770 immediately following is an instruction to branch to location 07770 where the square root subroutine has been stored for this program. Note also that fields in the symbol table dump that end in a record mark have not been given a numerical value. That is, if they are variables, they were still undefined when the error was detected.

Alphabetic characters in dumped output may be interpreted as follows:

|   |               |
|---|---------------|
| J | T             |
| K | U             |
| L | V             |
| M | W             |
| N | X             |
| O | Y             |
| P | Z             |
| Q | [RECORD MARK] |
| R | [RECORD MARK] |
| - | [RECORD MARK] |

There are certain programming errors which are not detected by C4D and which cause the computer to stop functioning with a CHECK STOP light on. The error responsible is probably one of the following:

1. An array element computed when the subscript is out of the dimensioned range.
2. The subscript of an array element is undefined.
3. A GO TO or IF statement in one segment references a statement in another segment, or an EXECUTE PROCEDURE references a procedure in another segment.
4. Branch to a FORMAT statement.
5. An integer variable is raised to a power by the use of the \*\*operator. This operator may only be used to raise a real variable to a power.
6. An error in the argument of a subroutine.

To help debugging after a check stop the operator should recover the contents of IR<sub>2</sub> if possible and then manually branch to 06576. This will provide a symbol table dump as if an undefined variable had been detected.

7. An invalid transfer of data from disk to core. Nearly all transfers from disk to core are verified and, if incorrect will be automatically corrected by the system when the PARITY and I/O switches are set to program. In a few cases, a CHECK STOP will result from an invalid disk to core transfer. Should the RD CHK light be ON on the occurrence of a CHECK STOP, RESET, RELEASE, and START will permit the continuing of the program.

### OPERATING INSTRUCTIONS FOR C4D

#### Loading the System onto Disk

1. Number the C4D disk pack(s) 60000 through 79999.
2. Place system deck in read hopper.
3. Set PARITY and I/O switches to STOP, DISK, and ARITHMETIC switches to PROGRAM. \*\*
4. Press RESET and LOAD keys.
5. You will be requested to enter the following information through the typewriter:
  - a. The disk drive numbers for the system drive and the data drive. For a single drive system, enter the same number twice.
  - b. A digit specifying that this is an initial or subsequent load. CAUTION -- an initial load erases the table that indexes the user's programs which are stored on the disk file.
  - c. The starting sector number for disk program storage.\*
6. The loader punches out a C4D COLD START card.
7. When all cards have been read, the system is loaded and ready to accept jobs headed by control cards.

\* 64000 might be a reasonable starting sector number. This would allow for a maximum of 2000 source cards per program and a maximum of 40000 stored variables when using the MOVE subroutine. Such designation would allocate 15125 sectors for permanent program storage. For compilation of larger programs or for more disk data storage area, the starting sector number must be increased by two per source card or by one per ten additional variables to be stored. The sectors allocated for permanent program storage will be correspondingly reduced. This is only requested upon initial load of a single drive system.

\*\* PARITY and I/O switches may be set to PROGRAM for the automatic correction of any transfer between disk and core which initially proves to be invalid.

#### Cold Start

The executive may be called from the disk at any time by the following procedure:

1. Place C4D COLD START CARD in read hopper
2. Press RESET & LOAD

The same effect may be achieved as follows:

1. Press RESET & INSERT
2. Enter by typewriter the following

3400044007013200000000036000440070249129820n7980012900100R-S

where n is the system disk drive code (0,1,3,5,7)

#### Switch Settings

SS1 ON halts the computer after the header card is punched for each new job. This permits removal of the cards punched during the previous job. Alternatively a different colored card placed behind the cards in the 1622 punched card stacker at halt time can be used to separate output decks at some subsequent time.

SS2 should be ON for the use of the 1443 printer. If the 1443 printer fails, SS2 OFF will enable C4D to operate while the 1443 is repaired. For an installation without a 1443, SS2 should always be OFF.

SS3 should be left ON when the operator is in the computer room. It should be left OFF when the 1620 is running unattended. SS3 ON causes a halt after an error message at run time. This permits recovery of the address in IR2 to direct the programmer's attention to the FORTRAN statement being executed. START then causes a symbol table dump on cards or printer. After this dump, the executive is automatically called. SS3 ON also causes halt after a PAUSE statement. START then allows the program execution to continue. SS3 OFF inhibits the halts and the symbol table dump and causes the executive to be called immediately following a run-time error or a PAUSE statement.

SS4 ON causes tracing to be executed on cards or printer depending on the setting of SS2. SS4 OFF inhibits the trace.

APPENDIX 1

```

C BEGIN PROCEDURE 5000
C USES JORDAN TECHNIQUE WITH MAXIMUM PIVOTAL ELEMENTS TO SOLVE
C -NSO- EQUATIONS WITH AUGMENTED COEFFICIENT MATRIX -CSO-
C IF THE EQUATIONS HAVE NO UNIQUE SOLUTION THE ERROR MESSAGE
C SOLVE IS PRINTED AND -NOSOL- IS SET TO ZERO OTHERWISE
C -NOSOL- IS ONE AND THE SOLUTION VECTOR IS STORED IN THE
C FIRST COLUMN OF -CSO- MAIN PROGRAM MUST DIMENSION
C CSO(NSO,NSO+1) AND NAME(NSO)
C
C NSOP = NSO + 1
C NOSOL = 1
C DO 5001 JSO = 1,NSO
C 5001 NAME(JSO) = 0
C DO 5015 KSO = 1,NSO
C CMAX = 0.
C DO 5004 JSO = 1,NSO
C IF(NAME(JSO))5004, C,5004
C TSO = CSO(KSO,JSO)
C IF(ABSF(TSO)-ABSF(CMAX))5004,5004,C
C CMAX = TSO
C JMAX = JSO
C 5004 CONTINUE
C IF(CMAX)5007, C,5007
C NOSOL = 0
C PRINT 5006
C RETURN 5000
C 5006 FORMAT(5HSOLVE)
C 5007 NAME(JMAX) = KSO
C DO 5010 JSO = 1,NSOP
C IF(JSO-NSOP) C,5009, C
C IF(NAME(JSO))5010,5009,5010
C 5009 CSO(KSO,JSO) = CSO(KSO,JSO)/CMAX
C 5010 CONTINUE
C DO 5015 ISO = 1,NSO
C IF(ISO-KSO) C,5015,C
C TSO = CSO(ISO,JMAX)
C IF(TSO) C,5015,C
C DO 5015 JSO = 1,NSOP
C IF(JSO-NSOP) C,5014,C
C IF(NAME(JSO))5015,5014,5015
C 5014 CSO(ISO,JSO) = CSO(ISO,JSO)-TSO*CSO(KSO,JSO)
C 5015 CONTINUE
C DO 5016 KSO = 1,NSO
C LSO = NAME(KSO)
C 5016 CSO(KSO,1)=CSO(LSO,NSOP)
C END PROCEDURE 5000

```

```

BEGIN PROCEDURE 5100
C INVERTS MATRIX -YINV- OF ORDER -NNV- IF -YINV- IS SINGULAR THE
C ERROR MESSAGE INVERT IS PRINTED AND THE VARIABLE -NOSOL- IS
C SET TO ZERO OTHERWISE -NOSOL- IS SET TO ONE AND THE INVERSE
C IS STORED IN -YINV- MAIN PROGRAM MUST DIMENSION CNV(NNV)
C YINV(NNV,NNV) AND NAME(NNV)
C
C NOSOL=1
C DO 5101 INV=1,NNV
C 5101 NAME(INV)=INV
C DO 5113 JNV=1,NNV
C CMAX=0.
C JNV=INV
C DO 5103 KNV=INV,NNV
C IF (ABSF(CMAX)-ABSF(YINV(INV,KNV))) C,5103,5103
C JNV=KNV
C CMAX=YINV(INV,KNV)
C 5103 CONTINUE
C IF (CMAX) 5106, C,5106
C PRINT 5105
C NOSOL=0
C RETURN 5100
C 5105 FORMAT (6HINVERT)
C 5106 IF (INV-JNV) C,5109,C
C KNV=NAME(INV)
C NAME(INV)=NAME(JNV)
C NAME(JNV)=KNV
C DO 5108 LNV=1,NNV
C TNV=YINV(LNV,INV)
C YNV(LNV,INV)=YINV(LNV,JNV)
C 5108 YNV(LNV,JNV)=TNV
C 5109 YNV(INV,INV)=1.
C DO 5110 JNV=1,NNV
C 5110 YNV(INV,JNV)=YNV(INV,JNV)/CMAX
C DO 5113 JNV=1,NNV
C IF (INV-JNV) C,5113,C
C TNV=YNV(JNV,INV)
C YNV(JNV,INV)=0.
C DO 5112 KNV=1,NNV
C 5112 YNV(JNV,KNV)=YNV(JNV,KNV)-TNV*YNV(INV,KNV)
C 5113 CONTINUE
C DO 5119 MNV=1,NNV
C IF (NAME(MNV)-MNV) C,5119,C
C 5114 DO 5115 JNV=1,NNV
C 5115 CNV(JNV)=YNV(MNV,JNV)
C JJNV=MNV+1
C DO 5116 JNV=JJNV,NNV
C IF (NAME(JNV)-MNV) 5116,5117,5116
C 5116 CONTINUE
C 5117 NAME(JNV)=NAME(MNV)
C DO 5118 KNV=1,NNV
C YNV(MNV,KNV)=YNV(JNV,KNV)
C 5118 YNV(JNV,KNV)=CNV(KNV)
C 5119 NAME(MNV)=MNV
C END PROCEDURE 5100

```

```

C BEGIN PROCEDURE 5200
C MULTIPLIES MATRIX -BMULT- BY MATRIX -CMULT- AND STORES PRODUCT
C IN -AMULT-. SIZE OF BMULT IS -MMULT-* -KMULT- AND SIZE OF
C CMULT IS -KMULT-* -NMULT-. MAIN PROGRAM MUST DEFINE VALUES
C OF -MMULT-, -KMULT-, -NMULT-, AND DIMENSION -AMULT-,
C -BMULT-, -CMULT-
C DO5202 IMULT=1,MMULT
C DO5202 JMULT=1,NMULT
C SMULT=0.
C DO5201 MULT=1,KMULT
5201 SMULT=SMULT+BMULT(IMULT,MULT)*CMULT(MULT,JMULT)
5202 AMULT(IMULT,JMULT)=SMULT
END PROCEDURE 5200

C BEGIN PROCEDURE 6000
C GENERATES A STANDARD NORMAL DEVIATE -SND-
C SUSND=0
C DO 6001 J=1,12
C SNDX=NPRF(1BEG)
6001 SUSND=SUSND+SNDX
C SND = 0.00001*SUSND - 5.99994
C END PROCEDURE 6000

C BEGIN PROCEDURE 6100
C GENERATES A VALUE -NERL- FROM AN ERLANG DISTRIBUTION
C OF ORDER -KERL- AND MEAN VALUE -TBAR-
C XKERL=KERL
C PROD =1.
C DO 6101 JERL=1,KERL
C XR=NPR(NRI)
C XR = 0.00001*(XR+0.5)
6101 PROD=PROD*XR
C NERL= -(TBAR/XKERL)*ALOG(PROD)
C END PROCEDURE 6100

C BEGIN PROCEDURE 6200
C CONVERTS A TIME IN SECONDS -NSEC- TO DAYS,HOURS, AND MINUTES
C NDAY = NSEC/86400
C NHR = MOD(1)/3600
C NMIN = MOD(1)/60
C IF(MOD(1)-30)6201,6201,C
C NMIN = NMIN+1
6201 CONTINUE
C END PROCEDURE 6200

```

## APPENDIX 2

### Adding New Subroutines to C4D

Up to 37 subroutines may be included in C4D if they are short enough to fit in 150 disk sectors (average length less than 406 digits). No individual subroutine may be longer than 4998 digits. Additional subroutines may be added to the system if certain rules are followed. CAUTION: Do not remove subroutines after the initial load as this will alter the transfer points for all subsequent subroutines. The rules for adding a new subroutine are as follows:

1. Define the origin of the subroutine at 5000.
2. All instructions, except for the last instruction, must occupy a full twelve digits, i.e. DORG \*-n, B7, BB2 instructions are not permitted before the last instruction. Symbol and constant definition must follow the instructions to ensure that instructions start in 5000, 5012, 5024, etc. The spare digits in branch, clear flag and similar instructions are, of course, available for data storage.
3. Flag the first or second operation code digits corresponding to those P or Q addresses which must be modified by the relocater.
4. Do not use the halt instruction. Upon error detection the subroutine should transmit the address of the leftmost digit of its error message to ERMA and branch to ERR. These addresses are in the Class A subroutines which will print the error message, dump the symbol table, and call the executive.
5. Only define group marks within a subroutine as the last digit.
6. The field address of the argument may be found by subtracting 20 from the field address of the argument of the last subroutine already in the system. The system, as provided, has the following subroutines:

| Name | Address of Argument |
|------|---------------------|
| COS  | 19989               |
| SIN  | 19969               |
| EXP  | 19949               |
| ALOG | 19929               |
| SQRT | 19909               |
| ABS  | 19889               |
| NABS | 19869               |
| ATAN | 19849               |
| DRH  | 19829               |
| NPR  | 19809               |
| MOVE | 19789               |

| <u>Name</u> | <u>Address of Argument</u> |
|-------------|----------------------------|
| MOD         | 19769                      |
| SAVE        | 19749                      |
| LINK        | 19729                      |
| NFIL        | 19709                      |
| NUPL        | 19689                      |

These addresses are adjusted at load time for core size greater than 20K.

7. Test the subroutine argument for a record mark in the rightmost digit. If there is a record mark, the argument is undefined. A branch to UDV in the Class A subroutines will provide the error message.

8. The output value of the function should be stored as a ten digit integer or as a real value in excess-fifty floating point form in the floating point accumulator. This occupies core positions 00051 through 00060.

9. Use Data SPS, AFIT SPS, SPS III, or 1620/1710 SPS to assemble into a condensed object deck. Discard the first two and the last seven cards of this deck.

10. Add a header card with the following format:

|               |                                                                                                                                                                                                                |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Column 1      | \$                                                                                                                                                                                                             |
| Columns 2-5   | The name of the subroutine, left justified. The initial letter determines a real or integer value for the function and its argument. The name must be from two to four digits in length and must not end in F. |
| Column 6      | Blank                                                                                                                                                                                                          |
| Columns 7-10  | The total number of digits in the instructions                                                                                                                                                                 |
| Columns 11-14 | The total number of digits for instructions and data. If this is an odd number add one to make it even.                                                                                                        |
| Columns 15-18 | The number of cards in the subroutine object deck excluding header and trailer cards.                                                                                                                          |
| Columns 19-22 | The number of cards in the object deck excluding header but including trailer cards.                                                                                                                           |

11. Add a trailer card that contains, in successive five digit fields, the unrelocated addresses of any digit that must be modified for core size. Follow the last of these fields with a record mark. Use additional trailer cards if more than 14 such modifications are needed.

12. A subroutine may have two entry points (e.g. sine-cosine. Refer to section on "Subroutines With Two Entry Points")

13. Add the new subroutine to the back of the subroutine deck. Do not disturb the order of the previous subroutines.

14. Place the control card \*SRSnn as a header card for the new subroutine deck (discard the old \*SRS card). The value of nn is the number of subroutines in the new deck.

15. Load the deck under the control of the executive. Error messages that may occur at subroutine load time (\*SRS) are as follows:

- (a) WRONG ENTRY - second entry point of subroutine with two entry points specified to be outside the range of subroutine.
- (b) 1ST SUB WRONG - first subroutine \$ card contains blanks or zeroes in columns 11-14.
- (c) TOO MANY SUBS - SRSnn has nn greater than 40.
- (d) SUB TOO BIG - number in columns 11-14 of \$ card greater than 4998.
- (e) SUB CYLINDER EXCEEDED - total length of all subroutines exceeds 15,000 digits.
- (f) SUB ODD LENGTH - number in columns 11-14 of \$ card is not an even number.
- (g) HDWR ERR EXEC - hardware error encountered with core-disk transfer while loading subroutines.
- (h) \$ CARD NOT IN PLACE - nn of SRSnn card or columns 15-18 or 19-22 of a \$ card incorrectly specified.
- (i) SUB NAME ERR - less than two-digit subroutine name.

A check stop will result if the number of subroutine cards specified on the \$ card is incorrect.

# Subroutines With Two Entry Points

Two functions with different names can be generated by a subroutine with two entry points. The first function results from entering the subroutine at 05000. Assemble the subroutine deck under the name of the first function and follow this deck with a dummy \$ card containing the name of the other function. Columns 7-10 of this \$ card contain the address of the abnormal entry relative to 5000. Columns 11-14 must be blank or zero signifying a special type of subroutine. No cards need follow the dummy card.

Example: COS has entry at 05000, SIN has entry at 05036 and the joint subroutine generating these functions is set up as follows:

```
$ COS 0644071800140015
 14 object program cards
 1 trailer card
$ SIN 0036
```

TABLE I

## C4D ERROR MESSAGES AT CODE TIME

```
ERR 01 OPEN SEGMENT OR PROCEDURE
ERR 02 CONTINUATION ERROR OR PREVIOUS STATEMENT ENDS IN A COMMA
ERR 03 DUPLICATE STATEMENT, SEGMENT OR PROCEDURE LABEL
ERR 04 SEGMENT NOT DECLARED OR NOT CALLED
ERR 05 PARENTHESIS ERROR
ERR 06 GO TO WRITTEN INCORRECTLY
ERR 07 IMPROPERLY NESTED DO LOOPS
ERR 08 DO LOOP ENDS WITH A TRANSFER STATEMENT
ERR 09 END OF A DO LOOP IS A PREVIOUS STATEMENT LABEL
ERR 10 INVALID DO STATEMENT
ERR 11 ERROR IN A NUMERIC CONSTANT
ERR 12 ERROR IN A VARIABLE NAME
ERR 13 SUBSCRIPTING ERROR
ERR 14 NON-NUMERIC SUBSCRIPT OR MORE THAN 2 SUBSCRIPTS
 IN A DIMENSION OR COMMON
ERR 15 ERROR IN SEGMENT OR PROCEDURE LABEL
ERR 16 TRANSFER STATEMENT TRANSFERS TO ITSELF
ERR 17 INVALID STATEMENT LABEL
ERR 18 MODIFICATION OF A DO INDEX OR PARAMETER WITHIN A DO LOOP
ERR 19 FORMAT OF TRACE, IF SPECIFIED, NOT E OR F.
ERR 20 STATEMENT IS UNRECOGNIZABLE
ERR 21 I/O LIST MISSING OR INCORRECTLY WRITTEN
ERR 22 COMMON STATEMENT(S) NOT FIRST STATEMENT(S) IN PROGRAM
ERR 23 INVALID FORMAT STATEMENT LABEL IN AN I/O STATEMENT
ERR 24 NON-NUMERIC SUBSCRIPT IN A DATA STATEMENT
ERR 25 LABELED STATEMENT FOLLOWS END SEGMENT STATEMENT
ERR 26 COMMA MISSING IN AN I/O STATEMENT
ERR 27 SUBSCRIPTED VARIABLE NOT DIMENSIONED
ERR 28 INDEXING ERROR IN I/O STATEMENT, OR IMPLIED DO WITHIN MORE THAN
 ONE LEVEL OF PARENTHESIS
ERR 29 INVALID FORMAT STATEMENT
ERR 30 INCORRECTLY WRITTEN ARITHMETIC STATEMENT
ERR 31 DIMENSIONED VARIABLE NOT SUBSCRIPTED
ERR 32 SYMBOL TABLE EXCEEDED OR MORE THAN 15 NESTED DO LOOPS
ERR 33 MIXED MODE EXPRESSION
ERR 34 HOLLERITH FIELD IN A DATA STATEMENT MORE THAN 5 CHARACTERS
ERR 35 ERROR IN DATA STATEMENT OR DATA STATEMENT(S) NOT PLACED
 IMMEDIATELY BEFORE END STATEMENT
ERR 36 ERROR IN STATEMENT LABEL(S) IN AN IF STATEMENT OR
 INVALID EXPRESSION WITHIN THE PARENTHESIS
ERR 37 INVALID DIMENSION OR COMMON STATEMENT
ERR 38 VARIABLE APPEARS MORE THAN ONCE IN COMMON AND/OR DIMENSION STATEMENT
ERR 39 UNLABELED STATEMENT FOLLOWING A TRANSFER STATEMENT
ERR 40 SUBROUTINE NAME USED AS A VARIABLE NAME
ERR 41 FORMAT MULTIPLIER GREATER THAN 99
```

TABLE II

SYSTEM MESSAGES AT RUN TIME

STOP NNNN -- EXECUTION OF STOP NNNN  
 END -- EXECUTION OF END, END SEGMENT, OR SEGMENT

SEGMENT SYMTAB ADDR AAAA UNDV -- UNDEFINED VARIABLE

SEGMENT SYMTAB ADDR AAAA OFLO -- RESULT OF ARITHMETIC OPERATION GREATER IN  
 MAGNITUDE THAN 10 TO THE POWER +50  
 THIS INCLUDES TAKING THE LOGARITHM OF ZERO  
 ALSO RESULTS FROM ATTEMPT TO FIX A NUMBER  
 GREATER THAN 99999999.0 IN MAGNITUDE

SEGMENT SYMTAB ADDR AAAA UFLO -- RESULT OF ARITHMETIC OPERATION LESS IN  
 MAGNITUDE THAN 10 TO THE POWER -50

SEGMENT SYMTAB ADDR AAAA ERI0 -- INPUT DATA ERROR

SEGMENT SYMTAB ADDR AAAA IXER -- INDEX OUT OF RANGE IN COMPUTED GO TO

SEGMENT SYMTAB ADDR AAAA TRIG -- ARGUMENT OF SIN OR COS IS 10000000 OR GREATER

SEGMENT SYMTAB ADDR AAAA NSQR -- NEGATIVE ARGUMENT FOR SQRT SUBROUTINE

SEGMENT SYMTAB ADDR AAAA ERLN -- NEGATIVE ARGUMENT FOR ALOG SUBROUTINE

SEGMENT SYMTAB ADDR AAAA TASK -- VIOLATION OF RESTRICTIONS ON USE OF MOVE

SEGMENT SYMTAB ADDR AAAA DISK -- 1311 HARDWARE MALFUNCTION IN MOVE SUBROUTINE

SEGMENT SYMTAB ADDR AAAA SAVE -- ATTEMPT TO RECOVER DATA BEFORE ANY HAS  
 BEEN SAVED

SEGMENT SYMTAB ADDR AAAA NFIL -- ARGUMENT FOR NFIL IS OUT OF RANGE

NOTE -- AAAA REFERS TO FIRST FOUR DIGITS OF THE SYMBOL TABLE ADDRESS

TABLE III

MISCELLANEOUS SYSTEM MESSAGES

EXECUTIVE ROUTINE MESSAGES

HDWR ERR EXEC -- EXECUTIVE ROUTINE READ INCORRECTLY FROM DISK FILE  
 OR INFORMATION WRITTEN INCORRECTLY ON THE FILE  
 BY THE EXECUTIVE (THIS IS A COMPUTER MALFUNCTION)

INVALID \* CARD -- SELF EXPLANATORY

PROGRAM WAS ON FILE -- TRYING TO CODE OR HOLD PROGRAMS WITH THE SAME NAME

PROGRAM NOT ON FILE -- TRYING TO RUN OR CUT A NON-EXISTENT PROGRAM

DISK TABLE FULL -- NO ROOM TO INDEX ANY NEW PROGRAMS

OVERLAP -- NOT ENOUGH CORE FOR PROGRAM, SYMBOL TABLE,  
 AND SUBROUTINES

RELOAD C40-  
 INITIAL LOAD-- DISK TABLE DESTROYED BY 1311 DISK MALFUNCTION

CUT HDWR ERROR-  
 PROGRAMS ON FILE  
 FOLLOW -- ONLY PART OF DISK TABLE DESTROYED

RENUMBER SYSTEM  
 DRIVE -- DISK SECTOR ADDRESS NOT FOUND IN NINE SEKS

STATEMENT SCAN ROUTINE MESSAGES

HDWR ERR SCAN -- SCAN ROUTINE READ INCORRECTLY FROM THE DISK FILE  
 OR INFORMATION WRITTEN INCORRECTLY ON THE FILE  
 BY THE SCAN ROUTINE-THIS IS A COMPUTER MALFUNCTION

NO END CARD -- SELF EXPLANATORY

DIAGNOSTIC ROUTINE MESSAGES

HDWR ERR DIAG -- DIAGNOSTICS READ INCORRECTLY FROM THE DISK FILE  
 (THIS IS A COMPUTER MALFUNCTION)

UNDEF LABLS -- FOLLOWED BY LIST OF STATEMENT, SEGMENT, AND  
 PROCEDURE LABELS REFERENCED BUT NOT DEFINED IN  
 THE USERS PROGRAM

UNDEF SMBLS -- FOLLOWED BY LIST OF VARIABLES REFERENCED IN THE  
 USERS PROGRAM BUT NEVER GIVEN A NUMERICAL VALUE

COMPILER ROUTINE MESSAGES

HDWR ERR COMP -- COMPILER READ INCORRECTLY FROM THE DISK FILE  
 OR INFORMATION WRITTEN INCORRECTLY ON THE FILE  
 BY THE COMPILER (THIS IS A COMPUTER MALFUNCTION)

SYMTAB FULL -- PROGRAM IN ITS PRESENT FORM TOO LARGE FOR COMPUTER

OVERLAP -- PROGRAM IN ITS PRESENT FORM TOO LARGE FOR COMPUTER

FORMAT TOO LONG -- SELF EXPLANATORY

NO ROOM ON FILE -- SELF EXPLANATORY

TABLE III (CONTINUED)

MISCELLANEOUS SYSTEM MESSAGES

LABEL INDEX ROUTINE MESSAGES

HDWR ERR LAB INDX -- LABEL INDEXER READ INCORRECTLY FROM THE DISK FILE  
(THIS IS A COMPUTER MALFUNCTION)  
NO INDEX-\*HOLD SHOULD  
FOLLOW \*CODE -- HOLD CARD DID NOT IMMEDIATELY FOLLOW SOURCE PROGRAM

SUBJECT INDEX

ARRAYS.....4  
CHECK STOPS.....22  
COLD START.....24  
CONTROL CARDS.....19  
\*CODE.....19  
\*CUT.....19  
\*DATE.....19  
\*DISK.....19  
\*HOLD.....19  
\*OUT.....19  
\*RUN.....19  
\*SRS.....19  
DATA STORAGE ON DISK...16  
DEBUGGING UNDER C4D...20  
ERROR MESSAGES.....32-34  
AT CODE TIME.....32  
AT RUN TIME.....33  
MISCELLANEOUS.....34,35  
EXPONENTIATION(\*\*).....8  
FLOATING POINT  
ARITHMETIC.....3  
FORMAT.....13-14  
A TYPE.....14  
E TYPE.....14  
F TYPE.....14  
H TYPE.....14  
I TYPE.....13  
X TYPE.....14  
INPUT/OUTPUT LISTS.....11  
INTEGER ARITHMETIC.....3  
INTEGERS.....3  
LABELS.....7  
LOADING C4D.....23  
MATRICES.....4  
OPERATING  
INSTRUCTIONS...23,24  
PROCEDURES.....16  
ERLANG SAMPLING.....27  
LINEAR EQUATIONS.....25  
MATRIX INVERSION.....26  
MATRIX MULTIPLY.....27  
NORMAL DEVIATES.....27  
TIME CONVERSION.....27  
REAL VARIABLES.....3  
SEGMENTATION.....14  
STATEMENT CARD FORMAT...7

STATEMENTS.....8  
ARITHMETIC.....8  
BEGIN PROCEDURE .....16  
BEGIN SEGMENT.....16  
BEGIN TRACE.....10  
CALL SEGMENT.....15  
COMMON.....12,13  
CONTROL.....12  
DATA.....15  
END PROCEDURE.....16  
END SEGMENT.....15  
END TRACE.....10  
END.....10  
EXECUTE PROCEDURE...16  
FORMAT.....13-14  
IF.....9  
PAUSE.....10  
PRINT.....12  
PUNCH.....12  
READ.....11  
REREAD.....11  
RETURN.....16  
SEGMENT.....15  
STOP.....10  
TYPE.....11  
SUBROUTINES.....4,28-31  
ABS.....5  
ALOG.....4  
ATAN.....5  
COS.....4  
DRH.....5  
EXP.....4  
LINK.....6  
MOD.....5  
MOVE.....5,16-18  
NABS.....5  
NFIL.....6  
NPR.....5  
SAVE.....6  
SIN.....4  
SQRT.....4  
SWITCH SETTINGS.....24  
SYMBOL TABLE DUMP.....20  
TRACE MODE.....10  
VARIABLES.....3  
VECTORS.....4

## C 4 D S Y S T E M M A N U A L

## INTRODUCTION

C4D CONTAINS NO RESIDENT EXECUTIVE. EACH SYSTEM ROUTINE CALLS INTO CORE THE NEXT APPROPRIATE ROUTINE TO ACCOMPLISH THE GIVEN JOB. SINCE CERTAIN INFORMATION MUST BE TRANSMITTED FROM ONE ROUTINE TO ANOTHER, CERTAIN CORE LOCATIONS ARE SET ASIDE FOR THIS PURPOSE. AT COMPILE TIME, INFORMATION IS ALSO STORED IN THE WORKING STORAGE AREA ON DISK.

## SYSTEM INFORMATION STORED IN CORE

THE MEMORY SIZE (1,3,5), SYSTEM DRIVE CODE (0,1,3,5,7) AND DATA DRIVE CODE (0,1,3,5,7) ARE DETERMINED BY THE LOADER INITIALIZATION AND STORED IN CORE LOCATIONS 400,401,402 RESPECTIVELY WITH FLAGS. FOR A SINGLE DRIVE SYSTEM THE TWO DRIVE CODES ARE THE SAME. CORE LOCATION 403 CONTAINS A GROUP MARK. THESE PARAMETERS REMAIN IN 400-403 AND ARE USED FOR INITIALIZATION BY ALL OTHER ROUTINES.

THE VARIABLE -NEXT- IS IN CORE POSITIONS 566-570 DURING ALL PHASES OF THE \*CODE PROCESS. -NEXT- DEFINES THE NEXT AVAILABLE SECTOR FOR USER PROGRAM STORAGE. IT IS UPDATED BY THE EXECUTIVE ROUTINE DURING \*HOLD AND \*CUT AND IS SUBSEQUENTLY USED BY THE COMPILER.

PARTS OF THE SYSTEM THAT RECEIVE INPUT FROM THE CARD READER SHARE A COMMON INPUT AREA AT LOCATIONS 404-563. IF A CONTROL CARD (\* IF COLUMN 1) IS READ BY A ROUTINE OTHER THAN THE EXECUTIVE, THE EXECUTIVE IS CALLED LEAVING THE INPUT AREA INTACT, AND THE CARD IS PROCESSED.

PERMANENTLY ASSIGNED AREAS IN CORE, THEN, ARE AS FOLLOWS

|               |                                                              |
|---------------|--------------------------------------------------------------|
| 00100 - 00299 | ADD TABLES                                                   |
| 00300 - 00399 | MULTIPLICATION TABLES                                        |
| 00400         | MEMORY SIZE DIGIT                                            |
| 00401         | SYSTEM DRIVE CODE                                            |
| 00402         | DATA DRIVE CODE                                              |
| 00403         | GROUP MARK                                                   |
| 00404 - 00563 | CARD INPUT AREA                                              |
| 00566 - 00570 | -NEXT- -- NEXT AVAILABLE SECTOR<br>FOR USER PROGRAM STORAGE. |

## SYSTEM INFORMATION STORED ON DISK

THREE ROUTINES IN C4D - DIAGNOSTICIAN, LABEL INDEX, AND COMPILER - PROCESS SOURCE STATEMENTS. IN ORDER THAT THE CARDS NEED ONLY BE READ ONCE, A STATEMENT SCAN ROUTINE HAS BEEN ADDED. THE SCAN READS SOURCE CARDS,

COMPRESSES BLANKS, SETS UP BRANCH ADDRESSES FOR THE DIAGNOSTICIAN AND COMPILER, AND STORES THIS INFORMATION, TWO SECTORS PER CARD, IN THE WORKING STORAGE AREA ON DISK (SEE ALLOCATION OF DISK STORAGE). WHEN THIS INFORMATION IS LATER BROUGHT INTO THE INPUT AREA IT APPEARS AS FOLLOWS

|               |                                                             |
|---------------|-------------------------------------------------------------|
| 00404 - 00547 | SOURCE STATEMENT                                            |
| 00548 - 00552 | ADDRESS OF LAST NON-BLANK CHARACTER IN THE SOURCE STATEMENT |
| 00549         | CONTAINS A FLAG IF THIS STATEMENT ENDS IN A COMMA           |
| 00561         | CONTAINS A FLAG IF SCAN FOUND A PARENTHESIS ERROR           |
| 00553 - 00557 | BRANCH ADDRESS FOR DIAGNOSTICIAN                            |
| 00558 - 00562 | BRANCH ADDRESS FOR COMPILER                                 |
| 00563         | CONTAINS A FLAGGED DIGIT IF THIS STATEMENT HAS A LABEL      |
| 00573 - 00576 | CARD NUMBER                                                 |

THE DISK TABLE (SECTORS 79804-79843) IS USED AND UPDATED BY BOTH THE COMPILER AND EXECUTIVE ROUTINES. (SEE EXECUTIVE ROUTINE).

A TABLE OF SUBROUTINE NAMES CURRENTLY IN THE SYSTEM IS STORED ON SECTORS 79852-79856. THE FIRST TWO DIGITS OF THIS TABLE IS THE NUMBER OF SUBROUTINES. THE TABLE IS UPDATED BY THE EXECUTIVE WHEN AN \*SRS CARD IS ENCOUNTERED, AND IS SUBSEQUENTLY USED BY THE DIAGNOSTICIAN AND COMPILER.

#### READ-BACK CHECK

THE READ-BACK CHECK IS USED AT ALL POSSIBLE TIMES AFTER A TRANSFER TO OR FROM THE DISK. IT CANNOT BE USED WHEN FETCHING THE UNSEGMENTED PORTION OF A PROGRAM OR WHEN FETCHING RELOCATABLE SUBROUTINES SINCE THESE ARE READ WITH THE WRONG LENGTH RECORD CHECK WHICH USES THE SAME INDICATOR AS THE READ-BACK CHECK. A HARDWARE ERROR RESULTS IN THE MESSAGE -PDWR ERR RRRR- WHERE RRRR INDICATES THE ROUTINE IN WHICH THE ERROR OCCURRED.

WHENEVER FEASIBLE, THE AREA 00000-00057 IS USED TO READ FROM THE DISK. THIS IS DONE WITH SEEK, SET FLAG, READ AND BRANCH INSTRUCTIONS. THE DISK CONTROL FIELD IS IN LOCATION 44. THE BRANCH ADDRESS REFERS TO THE READ-BACK CHECK IN THE ROUTINE BROUGHT IN. FOR DEBUGGING THE SYSTEM IT IS OFTEN HELPFUL TO DUMP LOCATION 44 TO DETERMINE WHICH ROUTINE WAS IN CORE WHEN THE ERROR OCCURRED. FOR EXAMPLE, WHEN FETCHING THE EXECUTIVE, CORE POSITIONS 00000-00057 MIGHT READ AS FOLLOWS,

3400044007013200000000003600044007024912982017980012900100

## SENSE SWITCHES

| SWITCH | ON                                                                      | OFF                                  | ROUTINES EFFECTED                |
|--------|-------------------------------------------------------------------------|--------------------------------------|----------------------------------|
| 1      | HALTS COMPUTER<br>AFTER HEADER<br>CARD IS PUNCHED                       | NO HALT                              | EXECUTIVE                        |
| 2      | OUTPUT ON 1443<br>PRINTER                                               | OUTPUT ON<br>CARDS AND<br>TYPEWRITER | ALL ROUTINES                     |
| 3      | HALTS COMPUTER AT<br>RUN TIME AFTER A<br>PAUSE STATEMENT OR<br>AN ERROR | NO HALT                              | OBJECT<br>PROGRAM<br>AT RUN TIME |
| 4      | TRACE GENERATED                                                         | NO TRACE                             | OBJECT<br>PROGRAM<br>AT RUN TIME |

## \* ALLOCATION OF DISK STORAGE FOR A SINGLE DRIVE SYSTEM

THE C4D DISK PACK SECTOR NUMBERS RUN FROM 60000 THROUGH 75999,  
DIVIDED INTO THE THREE AREAS LISTED BELOW--

1. DATA AND WORKING STORAGE AREA
2. USERS PROGRAM AREA
3. SYSTEM ROUTINES

SYSTEM ROUTINES ALWAYS OCCUPY CYLINDERS 96 THROUGH 99 AND PART OF CYLINDER 95. THE ALLOCATION OF THE REMAINING 95+ CYLINDERS IS DETERMINED FOR EACH INSTALLATION AT SYSTEM LOAD TIME. NOTE THAT THE STATEMENT SCANNING ROUTINE STORES SOURCE PROGRAM STATEMENTS IN THE WORKING STORAGE AREA FOR RECOVERY BY THE DIAGNOSTIC, COMPILER AND LABEL INDEX ROUTINES. EACH SOURCE CARD REQUIRES TWO SECTORS OF STORAGE. SINCE 100 SOURCE CARDS REQUIRE ONE CYLINDER OF DISK STORAGE, WE SUGGEST A MINIMUM OF 20 CYLINDERS FOR WORKING STORAGE. DATA STORAGE DEPENDS ON THE APPLICATION EXPECTED AT THE INSTALLATION. IF, FOR EXAMPLE, YOU DECIDE TO USE FORTY CYLINDERS FOR DATA YOUR DISK WILL BE PARTITIONED AS FOLLOWS--

|                    |                                              |
|--------------------|----------------------------------------------|
| CYLINDERS 00 - 39  | DATA AND WORKING STORAGE                     |
| CYLINDERS 40 - 95+ | PROGRAM STORAGE                              |
| CYLINDER 95        | FORTRAN LABEL INDEXER                        |
| CYLINDER 96        | DIAGNOSTIC ROUTINE                           |
| CYLINDER 97        | COMPILER ROUTINE                             |
| CYLINDER 98        | SCAN ROUTINE AND RELOCATABLE<br>SUBROUTINES  |
| CYLINDER 99        | EXECUTIVE ROUTINE AND CLASS A<br>SUBROUTINES |

THE ALLOCATION OF DISK STORAGE CANNOT BE CHANGED AFTER THE INITIAL LOAD EXCEPT BY ANOTHER INITIAL LOAD AND RECOMPILATION OF ALL PROGRAMS PREVIOUSLY HELD ON THE DISK.

#### ALLOCATION OF DISK STORAGE FOR A TWO DRIVE SYSTEM

THE SYSTEM AUTOMATICALLY ALLOCATES ONE COMPLETE DRIVE TO DATA AND WORKING STORAGE AND THE OTHER TO PROGRAMS AND SYSTEMS ROUTINES. BOTH DISKS MUST BE NUMBERED 60000 THROUGH 79999. THE SYSTEM ROUTINES OCCUPY THE SAME CYLINDERS ON THE SYSTEM DISK PACK AS IN A SINGLE DRIVE SYSTEM.

#### SYSTEMS WITH THREE OR FOUR DRIVES

SUPPOSE YOU HAVE FOUR DRIVES AND YOU HAVE RESERVED DRIVE 1 FOR SYSTEM AND DRIVE 3 FOR DATA. NOW YOU WISH TO USE 5 AND 7 FOR DATA ALSO. WITHIN YOUR PROGRAM YOU MAY USE THE FOLLOWING STATEMENT, N= NODDF(5), WHICH WILL CAUSE DRIVE 5 TO BE TREATED BY THE MOVE ROUTINE AS THE DATA DRIVE. N= NODD(1) WILL CAUSE AN ERROR MESSAGE AND YOUR JOB WILL BE ABORTED. THIS IS TO PROTECT THE PROGRAMS AND SYSTEM ON DRIVE 1.

THE NODD SUBROUTINE IS SHOWN BELOW.

```

30210* NODD
30230 DORG5000
30240 BNR NODD,KTAB,0, IS ARGUMENT UNDEFINED
30250 B UDV,,, YES
30260NODD TD NODD-1,401,0, 401 IS NUMBER OF SYSTEM DRIVE
30270 MF NODD-2,NODD-1,01, MAKE A FIELD OUT OF SYSTEM DRIVE NUMBER
30290 C KTAB,NODD-1,1, ARE YOU TRYING TO CLOBBER PROGRAMS
30300 BE NODDA,,0 , NO
30310 TD 402,KTAB,, 402 IS NUMBER OF DATA DRIVE
30315 SF 402

```

```

30320 BB
30330NODDA TFM ERMA,NODDM-1,1, YOU ARE DEFINING THE SYSTEMS DISK FOR DATA
30340 B7 ERR
30350NODDM DAC 5,NODD',NODDA-9
30400NFTAB DS ,19709
30360KTAB DS ,NFTAB-20
30370ERR DS ,06356
30380ERMA DS ,03301
30390UDV DS ,06344
30410 DEND

```

## DATA STORAGE BY THE MOVE SUBROUTINE

ASSUME THAT 40 CYLINDERS HAVE BEEN ALLOCATED FOR DATA. NOW CONSIDER A PROGRAM USING MOVE WHICH HAS SPECIFIED HUNDRED-WORD RECORDS AND A MAXIMUM NUMBER OF RECORDS EQUAL TO 800. IF THE PROGRAM STORES ALL THE RECORDS THAT IT SPECIFIED, IT WOULD EXACTLY FILL THE DATA STORAGE AREA. THE FIRST RECORD WOULD OCCUPY SECTORS 67990 THROUGH 67999 AND THE LAST RECORD WOULD OCCUPY SECTORS 60000 THROUGH 60009. SUPPOSE, INSTEAD, THAT THE PROGRAM ONLY STORES TEN RECORDS BUT STILL SPECIFIES 800. THEN THE FIRST RECORD WILL BE STORED IN 67999 THROUGH 67990 AS BEFORE BUT THE LAST (TENTH) RECORD IS IN 67909 THROUGH 67900. THESE RECORDS WILL NOW BE RELATIVELY SAFE SINCE THEY CAN ONLY BE ERASED BY A PROGRAM THAT STORES DATA ON ALL FORTY CYLINDERS. WHERE AN INSTALLATION HAS ONLY ONE OR TWO PROGRAMMERS IT WOULD THEREFORE BE POSSIBLE TO MAINTAIN PERMANENT DATA STORAGE ON DISK BY MEANS OF A DISK MEMORY MAP AND A DISCREET USE OF THE MOVE SUBROUTINE. FOR AN OPEN SHOP INSTALLATION USED BY MANY PROGRAMMERS THIS TYPE OF PERMANENT STORAGE ON DISK IS NOT PRACTICAL. THE BEST SOLUTION FOR AN OPEN SHOP IS TO ACQUIRE ADDITIONAL DISK PACKS FOR SPECIAL JOBS WHICH REQUIRE EITHER PERMANENT DATA STORAGE OR MORE DATA STORAGE THAN IS ALLOCATED ON THE MAIN C4D SYSTEM PACK.

## CORE STORAGE AT EXECUTION TIME

|                 |                                                                                                         |
|-----------------|---------------------------------------------------------------------------------------------------------|
| 00000 - 00399   | LOAD AREA AND ARITHMETIC TABLES                                                                         |
| 00400 - 07649   | CLASS A SUBROUTINES                                                                                     |
| 07650 - SSSSS   | UNSEGMENTED PORTION OF PROGRAM                                                                          |
| SSSSS+2 - RRRRR | THE LAST SEGMENT WHICH HAS BEEN CALLED INTO CORE. THE LONGEST OF THE PROGRAM SEGMENTS DETERMINES RRRRR. |
| RRRRR+1 - UP    | THE RELOCATABLE SUBROUTINES CALLED BY THE PROGRAM                                                       |
| TTTTT - N9999   | THE SYMBOL TABLE                                                                                        |

## SYSTEM DECK AND LOADER INITIALIZATION

ALL ROUTINES OF C4D ARE COMPRESSED INTO A SPECIAL FORMAT THAT DIFFERS FROM THE OUTPUT OF ANY PRESENTLY AVAILABLE SPS ASSEMBLER. THIS FORMAT IS AS FOLLOWS--

COLUMNS 1-5 SEQUENCE NO. OF THE CARD  
 6-10 CORE LOCATION THAT THE INFORMATION IN COLUMN 11  
 WILL BE READ INTO (DIGIT IN COLUMN 6 IS FLAGGED)  
 11-80 PROGRAM INFORMATION

IF A RECORD MARK APPEARS ON A CARD, ALL PROGRAM INFORMATION TO THE RIGHT OF IT MUST APPEAR ON THE FOLLOWING CARD AND THE ADDRESS IN COLUMNS 6-10 ADJUSTED ACCORDINGLY.

THE FIRST THREE CARDS OF THE SYSTEM DECK TURN OFF INDEX REGISTERS, TURN ON INDIRECT ADDRESSING AND ZERO CORE. THE FOURTH CARD LOADS THE LOADER INITIALIZATION USING CORE POSITION 09900-09979 AS AN INPUT AREA. THE FIRST CARD FOLLOWING THE LOADER INITIALIZATION DECK CAUSES A BRANCH TO THE FIRST INSTRUCTION OF THE INITIALIZATION.

THE INITIALIZATION DOES THE FOLLOWING--

1. DETERMINES CORE SIZE
2. CHECKS FOR INDIRECT ADDRESSING
3. REQUESTS VIA THE TYPEWRITER THE SYSTEM DRIVE NUMBER, DATA DRIVE NUMBER, AND A NUMBER INDICATING EITHER AN INITIAL OR SUBSEQUENT LOAD
4. READS AND PUNCHES A C4D COLD START CARD
5. STORES ADD AND MULTIPLY TABLES AND SYSTEM DIGITS ON DISK (SECTORS 79800-79803)
6. READS A LOAD CARD WHICH SUBSEQUENTLY LOADS THE EXECUTIVE INTO CORE.

THE EXECUTIVE ROUTINE THEN REQUESTS THAT THE PROGRAM STORAGE BEGINNING SECTOR ADDRESS BE ENTERED ON THE TYPEWRITER IF THIS IS AN INITIAL LOAD ON A SINGLE DRIVE SYSTEM (ON A MULTIPLE DRIVE SYSTEM IT IS AUTOMATICALLY SET TO 60000). THIS ADDRESS IS STORED IN CORE AT 00181-00185 TO BE LATER RETRIEVED AND LOADED ONTO DISK AS PART OF THE CLASS A SUBROUTINES. THE EXECUTIVE IS THEN INITIALIZED AND LOADED ONTO DISK (THE DISK TABLE IS ALSO LOADED IF THIS IS AN INITIAL LOAD).

THE PORTION OF THE EXECUTIVE LOCATED IN CORE POSITIONS 18000-18223 SERVES TO LOAD THE ENTIRE REST OF THE SYSTEM AND CHECK FOR HARDWARE ERRORS DURING LOADING.

## EXECUTIVE ROUTINE

THE EXECUTIVE ROUTINE IDENTIFIES THE TYPE OF JOB SPECIFIED BY A CONTROL CARD. IT THEN PERFORMS THE FOLLOWING TASKS AS REQUIRED--

1. UPDATES TABLES,
2. LOADS CORE WITH PROGRAMS AND DATA,
3. RELOCATES RELOCATABLE SUBROUTINES,
4. COMPRESSES THE DISK TABLE AND PROGRAM STORAGE AREA FOLLOWING A PROGRAM DELETION,
5. PRINTS OR PUNCHES APPROPRIATE MESSAGES.

## DISK TABLE

THE EXECUTIVE CONTAINS THE DISK TABLE WHICH IS A CATALOG OF THE PROGRAMS STORED ON THE DISK FILE. EACH PROGRAM REFERENCE IS A TWENTY DIGIT RECORD CONSISTING OF THREE FIELDS. A FIVE DIGIT FIELD CONTAINS THE BEGINNING SECTOR NUMBER OF THE PROGRAM. THE NEXT THREE DIGIT FIELD CONTAINS THE NUMBER OF SECTORS FOR SYMBOL TABLE STORAGE. THE LAST TWELVE DIGITS CONTAIN THE FIVE ALPHAMERIC CHARACTER PROGRAM NAME AND AN ALPHAMERIC RECORD MARK (O\*). FOR THE BENEFIT OF THE EXECUTIVE ROUTINE AND THE COMPILER THESE RECORDS ARE PRECEDED BY TWENTY DIGITS CONTAINING INFORMATION ON THE NEXT AVAILABLE SECTOR NUMBER (NEXT AND NRP2LO), THE NUMBER OF USERS PROGRAMS PERMANENTLY HELD (MAX), AND THE DISK TABLE CORE LOCATION FOR THE MAX+1 PROGRAM NAME (EPINLU). THE DISK TABLE IS STORED IN CORE WITH THE EXECUTIVE IN LOCATION 00566 THROUGH 04499. THE SIZE OF THE TABLE ALLOWS PERMANENT STORAGE OF 195 PROGRAMS. AN ATTEMPT TO CODE A 196TH ENTRY RESULTS IN THE ERROR MESSAGE -DISK TABLE FULL-. CKDT IS THE ROUTINE WITHIN THE EXECUTIVE THAT SCANS THE DISK TABLE FOR A SPECIFIC ENTRY. BASE, AS FOUND BY THE CKDT ROUTINE, CONTAINS THE ADDRESS WITHIN THE DISK TABLE OF THE STARTING SECTOR NUMBER OF THE PROGRAM DESIRED. WHENEVER THE DISK TABLE IS ALTERED, IT IS RERECORDED ON THE DISK.

WHENEVER A CORE TO DISK OR DISK TO CORE TRANSFER IS ATTEMPTED, A MAXIMUM OF NINE SEEKS ARE EXECUTED TO FIND THE SECTOR ADDRESS. IF AFTER SEEKING NINE TIMES THE WRONG ADDRESS INDICATOR IS ON, THE MESSAGE-RENUMBER SYSTEM DRIVE- IS OUTPUT. IT IS SUGGESTED THAT THE POSITION OF THE SEEK MECHANISM BE CHECKED BEFORE RENUMBERING THE PACK.

## CONTROL CARDS

THE EXECUTIVE RESPONDS TO CONTROL CARDS AS FOLLOWS--

## \* DATE

THE CONTENTS OF COLUMNS 7-80 ARE STORED IN THE DAYID AREA IN CORE AND ON DISK FOR SUBSEQUENT OUTPUT WITH EACH JOB.

## \* SRS NNN

THE EXECUTIVE RELOCATES ALL SUBROUTINES RELATIVE TO ZERO, ENTERS THE NUMBER OF SUBS -NNN- AND EACH SUBROUTINE NAME IN THE SUB NAME TABLE (SUBNMS), ENTERS FOR EACH SUBROUTINE THE NUMBER OF SUBROUTINE INSTRUCTION DIGITS, SUBROUTINE INSTRUCTION PLUS DATA DIGITS, AND THE SIZE OF THE SUBROUTINE IN SECTORS INTO THE SUBROUTINE TABLE (SUBTAB). AFTER RELOCATING A SUBROUTINE AND MAKING THE APPROPRIATE TABLE ENTRIES, THE SUBROUTINE IS STORED ON DISK. AFTER ALL SUBS HAVE BEEN PROCESSED, THE TABLES ARE STORED ON THE DISK.

## \* DISK

THE EXECUTIVE OUTPUTS THE NUMBER EQUAL TO MAX, THE NUMBER EQUAL TO NEXT, AND THE NAMES OF ALL PROGRAMS PERMANENTLY STORED ON DISK.

## \* CODE NAME

THE EXECUTIVE CHECKS THAT THE PROGRAM -NAME- IS NOT ALREADY ON FILE, ENTERS THE NAME OF THE PROGRAM AS THE MAX + 1 ENTRY IN THE DISK TABLE, AND FLAGS N(MAX+2) ON THE RIGHT TO INDICATE THAT COMPILATION HAS NOT YET TAKEN PLACE. THE SCAN ROUTINE IS THEN FETCHED TO CORE AND CONTROL IS TRANSFERRED TO SCAN.

IF THE PROGRAM IS ON FILE, THE MESSAGE -NAME WAS ON FILE- IS OUTPUT.

## \* HOLD NAME

THE EXECUTIVE CHECKS THAT NAME WAS THE LAST PROGRAM COMPILED AND UPDATES THE DISK TABLE BY INCREMENTING MAX BY ONE AND NEXT BY THE SIZE OF THE PROGRAM. ALSO, MPINLO (MAX PLUS ONE NAME LOCATION) AND MP2LO (NAME-MAX PLUS TWO-LOCATION) ARE INCREMENTED BY TWENTY. NAME(MAX+1) IS ZEROED OUT AND N(MAX+2) IS FLAGGED ON ITS RIGHTMOST DIGIT. THE FORTRAN LABEL INDEXER IS THEN FETCHED TO CORE AND CONTROL IS TRANSFERRED TO THE INDEXER.

IF THE PROGRAM WAS NOT THE LAST COMPILED, A CHECK IS MADE TO SEE IF THE PROGRAM IS ALREADY ON FILE. IF IT IS, THE MESSAGE -NAME WAS ON FILE- IS OUTPUT. OTHERWISE THE MESSAGE -NAME NOT ON FILE- IS OUTPUT.

## \* RUN NAME

THE EXECUTIVE CHECKS THAT NAME HAS BEEN SUCCESSFULLY COMPILED AND EXISTS ON DISK AND THEN FETCHES THE UNSEGMENTED PORTION OF THE PROGRAM INTO CORE LOCATION 7550. THE FIRST ONE HUNDRED DIGITS OF THE UNSEGMENTED PORTION CONTAIN THE FOLLOWING INFORMATION--

1. THE SECTOR ADDRESS OF THE SYMBOL TABLE CONSTANTS ON DISK RELATIVE TO BASE, THE SECTOR ADDRESS OF THE BEGINNING OF THE PROGRAM. (SYMSEC)
2. THE STARTING CORE ADDRESS FOR THE RELOCATABLE SUBROUTINES (RELBEG)
3. THE LOW CORE ADDRESS OF THE SYMBOL TABLE (STBEG)
4. THE HIGH CORE ADDRESS OF THE COMMON AREA (FCTEND)

5. THE LAST (LOW CORE) ADDRESS OF VARIABLES IN COMMON (ENDCOM)
6. DESIGNATION OF WHICH RELOCATABLE SUBROUTINES ARE CALLED BY THE PROGRAM (ISUSED THROUGH ISUSED-72)

(THIS INFORMATION WAS SUPPLIED BY THE COMPILER AT COMPILE TIME).

THE SYMBOL TABLE AREA IS FILLED WITH 0\* AT THE RIGHT OF EACH SYMBOL TABLE SLOT, AND DISK SECTORS CONTAINING SYMBOL TABLE ENTRIES (SIX PER SECTOR) ARE READ ONE AT A TIME AND THE CONTENTS OF EACH STORED IN THE CORE SYMBOL TABLE AREA. THE RELOCATABLE SUBROUTINES THAT ARE REFERENCED ARE FETCHED ONE AT A TIME, ENTRY POINTS ARE RECORDED IN THE SYMBOL TABLE, AND EACH IS PROPERLY RELOCATED. THE FIRST FIVE SECTORS OF THE CLASS A SUBROUTINES ARE BROUGHT INTO CORE AND STBEG AND FCTEND (3 AND 4 ABOVE) ARE STORED WITHIN THESE FIVE HUNDRED DIGITS AT PRBS AND COMBEG RESPECTIVELY. THE REMAINDER OF THE CLASS A SUBROUTINES ARE CALLED TO CORE AND CONTROL IS TRANSFERRED TO THE PROGRAM NAME.

\*CUT NAME (WHERE NAME IS ENTRY K)

THE EXECUTIVE CHECKS THAT THE PROGRAM EXISTS ON FILE AND FOLLOWS ONE OF TWO PATHS ACCORDING TO WHETHER NAME WAS OR WAS NOT THE LAST PROGRAM PERMANENTLY STORED. IN EITHER CASE, MPINLO AND MNP2LO ARE BOTH DECREMENTED BY TWENTY AND MAX IS DECREMENTED BY ONE. THE NONEXISTENCE OF NAME ON FILE RESULTS IN THE MESSAGE -NAME NOT ON FILE-.

IF NAME WAS THE LAST PERMANENTLY RECORDED PROGRAM, NEXT IS DECREMENTED BY THE SIZE OF THE PROGRAM BEING DELETED, THE NAME OF THE PROGRAM IS ZEROED OUT, AND N(MAX+2) IS FLAGGED ON THE RIGHTMOST DIGIT. THE ALTERED DISK TABLE IS RECORDED ON DISK.

IF NAME WAS NOT THE LAST PERMANENTLY RECORDED PROGRAM, THE FOLLOWING OCCURS. NEXT IS SET EQUAL TO BASE + THE NUMBER OF STORED PROGRAM SECTORS FOLLOWING PROGRAM K. THE DISK PROGRAM STORAGE AREA IS COMPRESSED BY READING THOSE PROGRAMS FOLLOWING NAME FROM THE DISK INTO A CORE BUFFER AREA (BUFBEQ) AND THEN REPLACING THE PROGRAMS ONTO THE DISK STARTING IN THE AREA WHERE NAME EXISTED. AFTER THIS PROCESS IS COMPLETE, THE DISK TABLE IS UPDATED BY SUBTRACTING THE SIZE OF NAME FROM N(K+1), MOVING ENTRY K+1 BACK ONE TO THE POSITION FORMERLY CONTAINING THE K ENTRY AND EXECUTING THIS SUBTRACTION AND SHIFT FOR THE REMAINING ENTRIES K+2 THROUGH MAX+1. FINALLY NAME(MAX+1) IS ZEROED OUT AND N(MAX+2) IS FLAGGED ON ITS RIGHTMOST DIGIT, THE ALTERED DISK TABLE IS RECORDED ON DISK, AND THE EXECUTIVE IS RECALLED IN ITS ENTIRETY TO CORE WHEREIN IT LOOKS FOR A NEW \* CONTROL CARD.

A-HDWR ERR EXEC-MESSAGE DURING \*CUT JOB INDICATES THAT A DISK CHECK HAS OCCURRED TWICE WHEN ATTEMPTING TO RECORD THE UPDATED DISK TABLE. IF A HARDWARE ERROR (INCORRECT DISK-CORE READ/WRITE OR MISSING SECTOR ADDRESS) OCCURS DURING THE COMPRESSING OF THE PROGRAM STORAGE AREA THE NAMES OF PROGRAMS K THROUGH MAX+1 ARE ZEROED IN THE DISK TABLE. MAX IS SET EQUAL TO K-1, NEXT IS SET EQUAL TO N(K), AND THE NEW N(MAX+2) IS FLAGGED ON ITS RIGHTMOST DIGIT. THE EXECUTIVE LESS THE DISK TABLE IS FETCHED TO CORE, THE NEW DISK TABLE IS RECORDED, THE MESSAGE -CUT HDWR ERR- PROGRAMS

ON FILE FOLLOW- IS OUTPUT, AND THE NAMES OF THE PROGRAMS REMAINING ARE OUTPUT. IF A HARDWARE ERROR OCCURS DURING THIS ATTEMPT TO SAVE PROGRAMS NUMBERED ONE THROUGH K-1 (E.G. WHEN RECORDING NEW DISK TABLE), THE MESSAGE -RELOAD C4D, INITIAL LOAD- IS OUTPUT, AND THE MACHINE HALTS WITH A CHECK STOP.

#### EXECUTIVE CALLED BY LINK SUBROUTINE

WHEN THE EXECUTIVE IS CALLED BY THE LINK SUBROUTINE, THE PROGRAM TO BE RUN IS TREATED AS EXPLAINED UNDER \*RUN NAME WITH ONE EXCEPTION -THE COMMON AREA OF THE SYMBOL TABLE IS NOT INITIALIZED WITH RECORD MARKS BEFORE INSERTING THE DEFINED SYMBOLS OF THE PROGRAM IN THEIR PROPER CORE LOCATIONS.

#### C4D SCAN

SCAN WAS ADDED TO THE C4D SYSTEM TO SAVE TIME. SINCE THE COMPILER AND DIAGNOSTICIAN BOTH NEED SIMILAR INFORMATION ABOUT THE SOURCE STATEMENTS, SCAN ASSEMBLES THIS INFORMATION AND STORES IT ON DISK. IT DOES THE FOLLOWING--

1. READS SOURCE CARDS
2. COMPRESSES BLANKS (EXCEPT IN FORMAT STATEMENTS)
3. DOES SOME MINOR ERROR CHECKING (E.G. UNBALANCED PARENTHESIS)
4. DETERMINES THE STATEMENT TYPE
5. SEQUENTIALLY NUMBERS EACH CARD IMAGE ON THE RIGHT IF THE FIRST CARD IS NOT NUMBERED IN COLUMNS 77-80.
6. SETS UP BRANCH ADDRESSES FOR THE DIAGNOSTICIAN AND COMPILER
7. STORES THIS INFORMATION ALONG WITH THE SOURCE STATEMENT IN THE WORKING STORAGE AREA ON DISK
8. CHECKS FOR AN END CARD. IF NONE IS FOUND THE MESSAGE -NO END CARD- IS PRINTED AND THE EXECUTIVE IS CALLED.

## C4D DIAGNOSTICIAN

THE DIAGNOSTIC ROUTINE CONSISTS OF 2 PARTS, THE FIRST OF WHICH CONTAINS CHECKING ROUTINES FOR EVERY ALLOWABLE TYPE OF STATEMENT EXCEPT DATA AND END. WHENEVER EITHER A DATA OR END STATEMENT IS ENCOUNTERED THE SECOND PART IS CALLED SO THAT IT OVERLAYS ONLY THE ARITHMETIC STATEMENT CHECKING ROUTINE. ALL THE SUBROUTINES, SUCH AS THE LABEL PROCESSOR, NEEDED BY PART TWO ARE LEFT IN FROM PART ONE. AFTER THE END STATEMENT IS FOUND, THE TABLES OF UNDEFINED LABELS, UNDEFINED VARIABLES, AND OPEN DO LOOPS, IF ANY, ARE OUTPUT. THE COMPILER IS THEN CALLED AND EITHER COMPILES THE PROGRAM IF NO ERRORS HAVE BEEN FOUND OR MERELY LISTS IT IF IT CONTAINS ERRORS.

## ERRORS

WHEN AN ERROR IS ENCOUNTERED, THE CONTENTS OF THE INPUT AREA ARE SHIFTED TO THE RIGHT, ERRXX (WHERE XX IS THE ERROR NO.) IS INSERTED ON THE LEFT AND THE AREA IS PRINTED OR PUNCHED DEPENDING ON THE SETTING OF SENSE SWITCH 2. THE CONTENTS ARE THEN SHIFTED BACK TO THE ORIGINAL POSITION AND A FLAG IS SET TO INDICATE THAT THE PROGRAM CONTAINS ERRORS.

WHENEVER POSSIBLE, ERROR CHECKING CONTINUES ON A PARTICULAR STATEMENT AFTER AN ERROR IS FOUND. SOMETIMES, HOWEVER, THE ERROR IS SUCH THAT IT WOULD MAKE FURTHER CHECKING OF THE STATEMENT IMPOSSIBLE (E.G. A MISPLACED CONTINUATION CARD OR AN UNRECOGNIZABLE STATEMENT). THIS OFTEN RESULTS IN FURTHER ERRORS--SUCH AS, AN UNDEFINED LABEL WHICH WAS ACTUALLY DEFINED IN THE STATEMENT IN ERROR. THE PROGRAMMER WILL FIND THAT CORRECTION OF THE FIRST ERROR WILL CORRECT THE OTHERS THAT IT CAUSED.

## SENSE SWITCHES

THE ONLY SENSE SWITCH APPLICABLE TO THE DIAGNOSTIC ROUTINE IS SWITCH 2. THIS SWITCH IS TESTED AS SOON AS THE DIAGNOSTICIAN IS BROUGHT INTO CORE AND OUTPUT STATEMENTS ARE INITIALIZED ACCORDING TO THE SETTING. HENCE, THE RESETING OF SWITCH 2 ONCE THE DIAGNOSTICIAN IS ALREADY IN CORE WILL NOT CHANGE THE OUTPUT DEVICE.

## SYMBOL TABLES

THERE ARE FIVE TABLES IN THE DIAGNOSTICIAN--

TBLF - HOLDS UP TO 37 SUBROUTINE NAMES  
 TBLB - HOLDS UP TO 15 OPEN DO LABELS  
 TBLD - HOLDS UP TO 60 OPEN DO INDEXES  
 TBLA - HOLDS VARIABLE NAMES  
 TBLA1 - HOLDS STATEMENT, SEGMENT AND PROCEDURE LABELS.

EACH OF THE TABLES HOLDS 10 DIGIT FIELDS. TBLF, TBLB, AND TBLD ARE OF FIXED LENGTH. TBLA AND TBLA1 ARE OF VARIABLE LENGTH DEPENDING BOTH ON CORE SIZE AND THE SIZE OF EACH OTHER. TBLA BEGINS AT THE END OF TBLD WHEREAS TBLA1 BEGINS AT HIGH NUMBERED CORE AND WORKS ITS WAY DOWN UNTIL IT ENCOUNTERS TBLA. A RECORD MARK INDICATES THE END OF EACH TABLE. ALL 10 DIGIT ENTRIES ARE FLAGGED ON THE LEFT.

## TBLF

ENTRIES ARE MADE INTO THIS TABLE DIRECTLY FROM THE DISK. SUBROUTINE NAMES ARE BROUGHT IN AS PART OF THE INITIALIZATION. THIS TABLE IS USED ONLY FOR COMPARISON AND ONCE THE NAMES ARE BROUGHT IN, NO DELETIONS OR ADDITIONS ARE MADE. ALL VARIABLE NAMES ARE COMPARED AGAINST THIS TABLE AND AN EQUAL COMPARE RESULTS IN ERROR 40 (SUBROUTINE NAME USED AS A VARIABLE NAME). CONTENTS OF TBLF ARE NEVER OUTPUT.

## TBLB

ENTRIES ARE MADE TO THIS TABLE WHEN A DO STATEMENT IS ENCOUNTERED. THE LABEL IS HELD HERE UNTIL THE STATEMENT WITH THAT LABEL IS READ. EACH TIME A LABELED STATEMENT IS READ, THE LABEL IS COMPARED AGAINST THIS TABLE TO SEE IF IT CLOSSES A DO LOOP. IF SO, THE LABEL IS REMOVED FROM THE TABLE. IF ANY ENTRIES REMAIN AT THE END OF THE PROGRAM, THE CONTENTS OF THIS TABLE ARE PRINTED AS OPEN DUS.

## TBLD

ENTRIES ARE ALSO MADE TO THIS TABLE WHENEVER A DO STATEMENT IS ENCOUNTERED AND DELETED WHEN THE DO LOOP IS CLOSED. ENTRIES ARE COMPARED AGAINST THE INDEX OF A NEW DO LOOP OR AN IMPLIED DO AS IN A READ STATEMENT (READ1,(A(I), I=1,10). IF THE INDEX BEING COMPARED IS ALREADY IN THE TABLE, IT RESULTS IN ERROR 18. THE CONTENTS OF THIS TABLE ARE NEVER OUTPUT.

## TBLA

VARIABLE NAMES ARE ENTERED INTO THIS TABLE AS THEY ARE ENCOUNTERED. IF PUT IN BY A DIMENSION STATEMENT, A FLAG OVER THE NINTH POSITION INDICATES THAT IT HAS BEEN DIMENSIONED. (FOR EXAMPLE, DIMENSION A(20)

GOES IN AS M1000000-0). IF ENTERED BY AN INPUT STATEMENT, OR FROM THE LEFT-HAND SIDE OF AN ARITHMETIC STATEMENT, IT IS PUT IN AS DEFINED, THAT IS, WITH ONLY A FLAG AT THE LEFTMOST DIGIT (B=2. GOES IN AS M200000000). IF IT IS A VARIABLE THAT IS REFERRED TO BUT NOT YET DEFINED IT IS PUT IN WITH A FLAG ALSO OVER THE RIGHTMOST DIGIT (T=CA GOES IN AS M34100000-). WHEN THIS VARIABLE IS DEFINED LATER IN THE PROGRAM, THE FLAG IS REMOVED. IF AT THE END OF THE PROGRAM ANY ENTRIES REMAIN WITH A FLAG OVER THE RIGHTMOST DIGIT, THESE ENTRIES ARE OUTPUT AS UNDEFINED SYMBOLS. SUBSCRIPTED VARIABLES ARE CHECKED AS TO WHETHER THEY HAVE BEEN DIMENSIONED, BUT NOT AS TO WHETHER THEY HAVE BEEN DEFINED.

#### TBLA1

LABELS ARE ENTERED INTO THIS TABLE AS THEY ARE ENCOUNTERED. IF IT IS A STATEMENT, SEGMENT OR PROCEDURE LABEL IT IS MERELY PUT IN WITH A FLAG ON THE LEFTMOST DIGIT. IF REFERRED TO, BUT NOT YET DEFINED, A FLAG WILL ALSO APPEAR ON THE RIGHTMOST DIGIT. WHEN THIS LABEL IS DEFINED, THE FLAG IS REMOVED. IF AT THE END OF THE PROGRAM, ANY LABELS REMAIN WITH A FLAG ON THE RIGHTMOST DIGIT, THEY ARE OUTPUT AS UNDEFINED LABELS.

#### SUBROUTINES

THE DIAGNOSTICIAN CONTAINS A NUMBER OF SUBROUTINES WHICH REPORT BACK TO THE MAINLINE PROGRAM BY MEANS OF VARIOUS SWITCHES--

|        |                                                                                                                                                                      |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IUPROC | THE INPUT/OUTPUT PROCESSOR WHICH HANDLES READ, REREAD, PUNCH, TYPE AND PRINT STATEMENTS. CHECKS FOR A FORMAT NUMBER AND I/O LIST.                                    |
| LBPROC | PROCESSES LABELS AND ASSEMBLES THE CHARACTERS IN A PLACE CALLED - LABEL - FOR SUBSEQUENT COMPARISONS AGAINST ENTRIES IN THE SYMBOL TABLES.                           |
| TLU    | TABLE LOOK-UP ROUTINE WHICH HANDLES ALL ENTRIES AND DELETIONS TO THE SYMBOL TABLES (EXCEPT THLF WHERE ENTRIES ARE MADE FROM THE DISK AS PART OF THE INITIALIZATION). |
| STMMU  | CHECKS STATEMENT LABELS. A DIGIT IN LOCATION 563 (PUT THERE BY SCAN) CAUSES A BRANCH TO THIS ROUTINE.                                                                |

## INTERNAL SWITCHES

| SWITCH | FLAG ON THIS SWITCH INDICATES--                                                                                                           |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | PREVIOUS STATEMENT ENDED WITH A COMMA, SO EXPECT A CONTINUATION CARD (BRANCH INTO CHECKING ROUTINE WILL BE DIFFERENT FROM REGULAR ENTRY). |
| 2      | CONTINUATION CARD IS BEING PROCESSED                                                                                                      |
| 12     | THIS STATEMENT ENDS A DO LOOP                                                                                                             |
| 13     | -SYMBOL TABLE EXCEEDED- MESSAGE HAS BEEN PRINTED. DO NOT PRINT IT AGAIN.                                                                  |
| 20     | LBPROC FOUND A NUMERIC LABEL                                                                                                              |
| 21     | LBPROC FOUND A FIXED POINT LABEL                                                                                                          |
| 22     | LBPROC FOUND A DECIMAL POINT                                                                                                              |
| 23     | LBPROC FOUND AN E                                                                                                                         |
| 24     | LBPROC FOUND A SUBSCRIPTED VARIABLE                                                                                                       |
| 27     | NUMERIC SUBSCRIPT FOUND                                                                                                                   |
| 28     | FINISHED PROCESSING SUBSCRIPT                                                                                                             |
| 29     | SPECIAL CHARACTER FOUND IN SUBSCRIPT                                                                                                      |
| 30     | TLU SHOULD PUT LABEL IN TABLE                                                                                                             |
| 31     | TLU SHOULD REMOVE LABEL FROM TABLE                                                                                                        |
| 32     | TLU SHOULD PUT UNDEFINED FLAG (RIGHT-MOST POSITION) ON LABEL                                                                              |
| 35     | TLU DID NOT FIND THIS LABEL IN TABLE                                                                                                      |
| 36     | THIS LABEL IS UNDEFINED IN THE TABLE (FLAG IS ON RIGHT-MOST DIGIT)                                                                        |
| 37     | TLU SHOULD PUT DIMENSION FLAG (NINTH POSITION) ON LABEL.                                                                                  |
| 38     | LABEL FOUND IN TABLE HAS DIMENSION FLAG                                                                                                   |
| 46     | TLU REMOVED THIS LABEL FROM THE TABLE                                                                                                     |
| 47     | LBPROC SHOULD NOT SAVE CHARACTERS FOUND BECAUSE THIS IS A NUMERIC CONSTANT AND WILL NOT BE STORED.                                        |
| 48     | LBPROC FOUND A SUBROUTINE NAME                                                                                                            |
| 49     | DO STATEMENT IS BEING PROCESSED                                                                                                           |
| 52     | EXPECT A FORMAT NUMBER                                                                                                                    |
| 54     | OUTPUT STATEMENT IS BEING PROCESSED                                                                                                       |
| 61     | ARITHMETIC DEFINITION FOUND                                                                                                               |
| 63     | FIXED MODE                                                                                                                                |
| 64     | EXPONENTIAL EXPRESSION                                                                                                                    |
| 65     | PREVIOUS EXPRESSION FIXED                                                                                                                 |
| 70     | COMPUTED GO TO STATEMENT                                                                                                                  |
| 71     | DIMENSION STATEMENT                                                                                                                       |
| 73     | COMMON OR DIMENSION STATEMENT                                                                                                             |
| 99     | LBPROC FOUND EITHER A SUBSCRIPTED VARIABLE OR A SUBROUTINE                                                                                |
| 200    | NUMBER FOUND BEFORE A FORMAT SPECIFICATION                                                                                                |
| 201    | OPEN PARENTHESIS IN A FORMAT STATEMENT                                                                                                    |
| 500    | ONLY COMMON STATEMENTS PROCESSED SO FAR                                                                                                   |

501 THIS IS A COMMON STATEMENT, SO DO NOT CLEAR SWITCH 500

SWTR A TRANSFER STATEMENT HAS JUST BEEN PROCESSED.

SWTRE UNLABELED STATEMENT FOUND AFTER A TRANSFER STATEMENT

A1 TLU SHOULD USE ITS ROUTINE FOR TBLA1 (SINCE THIS TABLE GOES  
ESSENTIALLY BACKWARDS, THE METHOD FOR SEARCH, ADDITION AND  
DELETION IS SLIGHTLY ALTERED)

SEGFLG AN END SEGMENT STATEMENT HAS BEEN FOUND

FLAG AT LEAST ONE ERROR HAS BEEN FOUND IN THE SOURCE PROGRAM.

SWC PREVIOUS IF STATEMENT USED THE -C- FEATURE SO THIS STATEMENT  
NEED NOT BE NUMBERED

| ROUTINE          | INPUT                   |             | OUTPUT                                          |                                      | INTERFACES <sup>(1)</sup>             |                            |
|------------------|-------------------------|-------------|-------------------------------------------------|--------------------------------------|---------------------------------------|----------------------------|
|                  | INFORMATION             | DEVICE      | INFORMATION                                     | DEVICE                               | CALLED BY                             | CALLS                      |
| EXECUTIVE        | CONTROL CARDS           | CARD READER | CONTROL CARDS                                   | CD PUNCH, PRINTER <sup>(2,3)</sup>   | COLD START AND<br>ALL SYSTEM ROUTINES | SCAN                       |
|                  | RELOCATABLE SUBROUTINES | CARD READER | ERROR MESSAGES                                  | PRINTER <sup>(2,3)</sup>             |                                       | LABEL INDEXER              |
|                  | REL. SUBROUTINE NAMES   | DISK        | UPDATED DISK TABLE<br>#PROGRAMS & PROGRAM NAMES | DISK <sup>(2,3)</sup><br>PRINTER     |                                       | OBJECT PROGRAM             |
|                  | REL. SUBROUTINE TABLE   | DISK        | REL. SUBROUTINES                                | DISK                                 |                                       | SUBROUTINES                |
|                  |                         |             | REL. SUB. NAMES                                 | DISK                                 |                                       |                            |
| SCAN             | SOURCE STATEMENTS       | CARD READER | COMPRESSED SOURCE STMTS.                        | DISK WORKING STORAGE                 | EXECUTIVE                             | DIAGNOSTICIAN I            |
|                  |                         |             | ERROR MESSAGES                                  | PRINTER <sup>(2)</sup>               |                                       | EXECUTIVE IF NO "END" CARD |
| DIAGNOSTICIAN I  | SOURCE STMTS.           | DISK        | FORTRAN ERRORS                                  | PRINTER <sup>(3)</sup>               | SCAN                                  | DIAGNOSTICIAN II           |
| DIAGNOSTICIAN II | REL. SUB. NAMES         | DISK        |                                                 |                                      |                                       |                            |
| COMPILER I       | SOURCE STMTS.           | DISK        | FORTRAN ERRORS                                  | PRINTER <sup>(3)</sup>               | DIAGNOSTICIAN I                       | COMPILER I                 |
|                  | REL. SUB. NAMES         | DISK        | SOURCE STMTS. (IF ERRORS)                       | PRINTER-SS2 ON<br>NO LISTING-SS2 OFF |                                       | COMPILER II                |
|                  | REL. SUB. TABLE         | DISK        | COMPILED STMTS.                                 | PRINTER <sup>(3)</sup>               |                                       | EXECUTIVE-IF ERRORS        |
|                  |                         |             | OBJECT PROGRAM                                  | DISK                                 |                                       |                            |
| COMPILER II      | SOURCE STATEMENTS       | DISK        | ERROR MESSAGES                                  | PRINTER <sup>(3)</sup>               | COMPILER I                            | EXECUTIVE                  |
|                  |                         |             | SYMBOL TABLE                                    | DISK, PRINTER <sup>(3)</sup>         |                                       |                            |
| LABEL INDEXER    | SOURCE STMTS.           | DISK        | UPDATED DISK TABLE                              | DISK                                 | EXECUTIVE                             | EXECUTIVE                  |
|                  |                         |             | INDEX OF LABELS                                 | PRINTER <sup>(3)</sup>               |                                       |                            |

- (1) If a hardware error occurs in any routine or if a control card is read by a routine other than the Executive, the Executive is called.
- (2) Output is on the printer if sense switch 2 is on.  
If sense switch 2 is off, output is on the typewriter.
- (3) If sense switch 2 is off, output is on cards.

# CAD DISK ADDRESSES & INTERFACE LABELS

| CONTAINED<br>IN<br>WITHIN<br>REFERENCE TO | EXEC                       | ASUBS                    | SCAN            | DIAG I         | DIAG II        | LABEL<br>INDEX | COMPI          | COMPI II | ERR<br>SUBS |
|-------------------------------------------|----------------------------|--------------------------|-----------------|----------------|----------------|----------------|----------------|----------|-------------|
| EXECUTIVE<br>79800/79828                  | EX280F<br>FETEX<br>FETEX2  | ABND0F<br>DCFEY<br>TIGER | DCFEY<br>EXENAB | DCNEC<br>DCNEC | DCNEC<br>DCNEC | DCFS           | DCFEY<br>DCFEY | DCFEY    | TIGER       |
| DISK TABLE<br>79804/79843                 | DTDCF                      |                          |                 |                |                |                |                | DCFDY    |             |
| STATEMENT<br>SCAN<br>79800/79843          | PREDCF                     |                          |                 |                |                |                |                |          |             |
| DIAGNOSTICS I<br>79200/79266              |                            |                          | DCFDG           |                |                |                |                |          |             |
| DIAGNOSTICS II<br>79380/79399             |                            |                          |                 | DCPT2          |                |                |                |          |             |
| COMPILER I<br>79400/79556                 |                            |                          |                 |                | DCCOMP         |                |                |          |             |
| COMPILER II<br>79561/79570                |                            |                          |                 |                |                |                | EDCF           |          |             |
| CLASS A SUBS<br>79929/79997               | ASBDCF<br>ASBDCF<br>ASBDCF |                          |                 |                |                |                |                |          |             |
| ERROR SUBS<br>79591/79599                 |                            | DCFER                    |                 |                |                |                |                |          |             |
| RELOCATABLE<br>SUBROUTINES<br>79150/79199 | SUBDCF                     |                          |                 |                |                |                |                |          |             |
| REL. SUBR.<br>NAMES<br>79592/79596        | NANDCF                     |                          |                 |                |                |                | SRDCF          |          |             |
| REL. SUBR.<br>TABLE<br>79644/79649        | SATBDC                     |                          |                 |                |                |                |                |          |             |
| SOURCE<br>STATEMENTS<br>60000/60000-1     |                            |                          | DCF             |                |                |                | IDCF           |          |             |
| OBJECT<br>PROGRAM<br>? /79124             | RUNI                       | DCFSG                    |                 |                |                |                | DCF            |          |             |
| LABEL INDEX<br>79125/79199                | LABINX                     |                          |                 |                |                |                |                |          |             |

|       |         |       |       |       |       |
|-------|---------|-------|-------|-------|-------|
| 00040 | B2      | 00100 |       |       |       |
| 00050 | B3      | 00070 | 00080 | 00090 |       |
| 00640 | CALCD   | 00420 | 00430 | 00440 |       |
| 00360 | CONTN   | 00280 |       |       |       |
| 00560 | DATDRV  | 00170 |       |       |       |
| 00690 | DRIVE   | 00400 | 00410 | 00430 |       |
| 00530 | DRIVE1  | 00140 | 00150 | 00210 | 00360 |
| 00540 | DRIVE2  | 00190 | 00200 | 00220 | 00360 |
| 00680 | DTD     |       |       |       |       |
| 00630 | DTDCF1  | 00230 | 00240 | 00260 | 00270 |
|       | GRPMK   | 00030 |       |       |       |
| 00670 | LDERR   | 00330 |       |       |       |
| 00320 | LDHER   | 00290 | 00350 |       |       |
| 00470 | NOIA    | 00100 | 00520 |       |       |
| 00620 | NOINA   | 00500 |       |       |       |
| 00580 | NOINAD  | 00480 |       |       |       |
| 00400 | QNEDRV  | 00380 |       |       |       |
| 00450 | RDLD    |       |       |       |       |
| 00570 | REC     | 00050 |       |       |       |
| 00090 | SET400  | 00060 |       |       |       |
| 00510 | STRDRS  | 00530 | 00540 |       |       |
| 00550 | SYS DRV | 00120 |       |       |       |
| 00700 | TABLES  | 00020 |       |       |       |
| 00260 | WRTAB   | 00310 |       |       |       |

| LOC   | OP    | P/L   | Q     | PG/LN | LABEL  | MNEM       | OPERANDS AND REMARKS                                    |
|-------|-------|-------|-------|-------|--------|------------|---------------------------------------------------------|
| 10000 |       |       |       | 00000 | *      | C4D LOADER |                                                         |
| 10000 | 31    | 00100 | 11142 | 00010 |        | DORG       | 10000                                                   |
| 10012 | 25    | 00403 | 11443 | 00020 |        | TR         | 100, TABLES                                             |
| 10024 | 15    | 00000 | 00000 | 00000 | *      | C4D LOADER | INITIALIZATION                                          |
| 10036 | 31    | 99999 | 10724 | 00030 |        | TD         | 403, GRPMK                                              |
| 10048 | 43    | 10080 | 00000 | 00040 | B2     | TDM        | 0,0,, DETERMINE CORE SIZE                               |
| 10060 | 11    | 10039 | 00020 | 00050 | B3     | TR         | 19999, REC-1,2                                          |
| 10072 | 49    | 10036 |       | 00060 |        | BD         | SET400,0                                                |
| 10080 | 25    | 00400 | 10038 | 00070 |        | AM         | B3+3,20,10                                              |
| 10092 | 45    | 10524 | 10030 | 00080 |        | B7         | B3                                                      |
| 10104 | 34    | 00000 | 00102 | 00090 | SET400 | TD         | 400, B3+2                                               |
| 10116 | 39    | 10593 | 00100 | 00100 |        | BNR        | NOIA, B2+6,11, DETERMINE INDIRECT ADDRESSING            |
| 10128 | 34    | 00000 | 00102 | 00110 |        | RCTY       |                                                         |
| 10140 | 36    | 10578 | 00100 | 00120 |        | WATY       | SYSDRV                                                  |
| 10152 | 32    | 10578 | 00000 | 00130 |        | RCTY       |                                                         |
| 10164 | 34    | 00000 | 00102 | 00140 |        | RNTY       | DRIVE1,,, READ SYSTEM DRIVE FROM TYPEWRITER             |
| 10176 | 39    | 10661 | 00100 | 00150 |        | SF         | DRIVE1                                                  |
| 10188 | 34    | 00000 | 00102 | 00160 |        | RCTY       |                                                         |
| 10200 | 36    | 10583 | 00100 | 00170 |        | WATY       | DATDRV                                                  |
| 10212 | 32    | 10583 | 00000 | 00180 |        | RCTY       |                                                         |
| 10224 | 25    | 00401 | 10578 | 00190 |        | RNTY       | DRIVE2,,, READ DATA DRIVE FROM TYPEWRITER               |
| 10236 | 25    | 00402 | 10583 | 00200 |        | SF         | DRIVE2                                                  |
| 10248 | 25    | 10922 | 00401 | 00210 |        | TD         | 401, DRIVE1                                             |
| 10260 | 34    | 10922 | 00701 | 00220 |        | TD         | 402, DRIVE2                                             |
| 10272 | 32    | 00000 | 00000 | 00230 |        | TD         | DTDCF1,401                                              |
| 10284 | 38    | 10922 | 00702 | 00240 |        | K          | DTDCF1,00701                                            |
| 10296 | 36    | 10922 | 00703 | 00250 |        | SF         | 0                                                       |
| 10308 | 47    | 10396 | 01900 | 00260 | WRTAB  | WN         | DTDCF1,00702                                            |
| 10320 | 44    | 10352 | 00000 | 00270 |        | RN         | DTDCF1,703                                              |
| 10332 | 33    | 00000 | 00000 | 00280 |        | BN1        | CONTN,01900                                             |
| 10344 | 49    | 10284 |       | 00290 |        | BNF        | LDHER,0                                                 |
| 10352 | 34    | 00000 | 00102 | 00300 |        | CF         | 0                                                       |
| 10364 | 39    | 11109 | 00100 | 00310 |        | B7         | WRTAB                                                   |
| 10376 | 48    | 00000 | 00000 | 00320 | LDHER  | RCTY       |                                                         |
| 10388 | 49    | 10352 |       | 00330 |        | WATY       | LDERR                                                   |
| 10396 | 24    | 10578 | 10583 | 00340 |        | H          |                                                         |
| 10408 | 15    | 00182 | 00000 | 00350 |        | B7         | LDHER                                                   |
| 10420 | 46    | 10444 | 01200 | 00360 | CONTN  | C          | DRIVE1, DRIVE2                                          |
| 10432 | 15    | 00182 | 00001 | 00370 |        | TDM        | 182,0,, 0 IN 182 IF SINGLE DRIVE                        |
| 10444 | 15    | 11140 | 00005 | 00380 |        | BE         | ONEDRV                                                  |
| 10456 | 25    | 11141 | 00401 | 00390 |        | TDM        | 182,1,, 1 IN 182 IF TWO DRIVES                          |
| 10468 | 37    | 10937 | 00500 | 00400 | ONEDRV | TDM        | DRIVE-1,5,11                                            |
| 10480 | 26    | 11035 | 11141 | 00410 |        | TD         | DRIVE,401                                               |
| 10492 | 39    | 10947 | 00400 | 00420 |        | RACD       | CALCD                                                   |
| 10504 | 36    | 00183 | 00500 | 00430 |        | TF         | CALCD+98, DRIVE                                         |
| 10516 | 49    | 00188 |       | 00440 |        | WACD       | CALCD+10,,, C4D COLD START                              |
| 10524 | 34    | 00000 | 00102 | 00450 | RDLD   | RNCD       | 183                                                     |
| 10536 | 39    | 10727 | 00100 | 00460 |        | B7         | 188                                                     |
| 10548 | 34    | 00000 | 00102 | 00470 | NOIA   | RCTY       |                                                         |
| 10560 | 39    | 10879 | 00100 | 00480 |        | WATY       | NOINAD                                                  |
| 10572 | 48    | 00000 | 00000 | 00490 |        | RCTY       |                                                         |
| 10584 | 49    | 10524 |       | 00500 |        | WATY       | NOINA                                                   |
| 10578 |       | 00001 |       | 00510 | STRDRS | H          | ,,27                                                    |
| 10583 |       | 00001 |       | 00520 |        | B7         | NOIA                                                    |
| 10593 | 00034 | X2    |       | 00530 | DRIVE1 | DS         | 1, STRDRS+6                                             |
| 10661 | 00032 | X2    |       | 00540 | DRIVE2 | DS         | 1, STRDRS+11                                            |
| 10725 | 00002 |       |       | 00550 | SYSDRV | DAC        | 34, ENTER ONE DIGIT SYSTEM DISK DRIVE'                  |
| 10727 | 00017 | X2    |       | 00560 | DATDRV | DAC        | 32, ENTER ONE DIGIT DATA DISK DRIVE'                    |
| 10761 | 00020 | X2    |       | 00570 | REC    | DC         | 2, '                                                    |
| 10801 | 00020 | X2    |       | 00580 | NOINAD | DAC        | 17, YOU WILL NEED TO ,                                  |
| 10841 | 00019 | X2    |       | 00590 |        | DAC        | 20, ACQUIRE THE INDIRECT                                |
| 10879 | 00022 | X2    |       | 00600 |        | DAC        | 20, ADDRESSING FEATURE ,                                |
| 10922 | 00014 |       |       | 00610 |        | DAC        | 19, BEFORE YOU CAN USE'                                 |
| 10937 | 00080 | X2    |       | 00620 | NOINA  | DAC        | 22, THIS OPERATING SYSTEM'                              |
| 11097 | 00005 | X2    |       | 00630 | DTDCF1 | DSC        | 14, 07980000400100                                      |
| 11106 | 00001 |       |       | 00640 | CALCD  | DAS        | 80                                                      |
| 11109 | 00012 | X2    |       | 00650 |        | DAC        | 5, ,                                                    |
| 11133 | 00004 | X2    |       | 00660 |        | DC         | 1, '                                                    |
| 11141 | 00002 |       |       | 00670 | LDERR  | DAC        | 12, LD HDWR ERR'                                        |
| 11142 | 00050 |       |       | 00680 | DTD    | DAC        | 4, DISK                                                 |
| 11192 | 00050 |       |       | 00690 | DRIVE  | DS         | 2                                                       |
| 11242 | 00050 |       |       | 00700 | TABLES | DSC        | 50, 000000000000010203040002040608000306090210040802161 |
| 11292 | 00050 |       |       | 00710 |        | DSC        | 50, 00500151020060218142007041128200806142230090817263  |
| 11342 | 00050 |       |       | 00720 |        | DSC        | 50, 000000000005060708090012141618151811242720242822363 |
| 11392 | 00050 |       |       | 00730 |        | DSC        | 50, 52035304540363248445532494653604846546275445362718  |
| 11442 | 00001 |       |       | 00740 |        | DSC        | 50, 0123456789123456789-23456789-J3456789-JK456789-JKL  |
| 11443 | 00001 |       |       | 00750 |        | DSC        | 50, 56789-JKLM6789-JKLMN789-JKLMN089-JKLMNOP9-JKLMNOP0  |
| 10000 |       |       |       | 00760 |        | DSC        | 1, '                                                    |
|       |       |       |       | 00770 | GRPMK  | DGM        |                                                         |
|       |       |       |       | 00780 |        | DEND       | 10000                                                   |

# COMPUTER TECHNOLOGY

PAGE 1

39

40

[illegible]

PAGE 4

42

| LOCTN | OP | P/L         | Q | PG/LN | LABEL           | MNEM  | OPERANDS AND REMARKS                      |
|-------|----|-------------|---|-------|-----------------|-------|-------------------------------------------|
| 00000 |    | 00000       |   | 00000 | * C4D EXECUTIVE |       |                                           |
| 00025 |    | 00001       |   | 00010 | PARCK           | DS    | ,0                                        |
| 00037 |    | 00001       |   | 00020 | ZLDROW          | DS    | 1,25                                      |
| 00042 |    | 00005       |   | 00030 | ZLDCRD          | DS    | 1,37                                      |
| 00044 |    | 00001       |   | 00040 | ZLDBR           | DS    | 5,42                                      |
| 00049 |    | 00005       |   | 00050 | ZLDDC           | DS    | 1,44                                      |
| 00052 |    | 00003       |   | 00060 | ZLDSA           | DS    | 5,49                                      |
| 00057 |    | 00005       |   | 00070 | ZLDSC           | DS    | 3,52                                      |
| 00404 |    |             |   | 00080 | ZLDCA           | DS    | 5,57                                      |
| 00405 |    | 00080 X2    |   | 00090 | DORG            |       | 404                                       |
| 00565 |    | 00001 X2    |   | 00100 | INPUT           | DAS   | 80                                        |
| 00425 |    | 00010       |   | 00110 | DAC             |       | 1,1                                       |
| 00570 |    | 00005       |   | 00120 | NAME            | DS    | 10,INPUT+20                               |
| 00574 |    | 00003       |   | 00130 | NEXT            | DS    | 5,570                                     |
| 00580 |    | 00005       |   | 00140 | MAX             | DS    | 3,574                                     |
| 00585 |    | 00005       |   | 00150 | MP1NLO          | DC    | 5,00603,00580                             |
| 00590 |    | 00001       |   | 00160 | NMP2LO          | DC    | 5,00610,00585                             |
| 00595 |    | 00001       |   | 00170 | NSUB1           | DS    | 1,MAX+16                                  |
| 04499 |    | 03934       |   | 00180 | DTNM1           | DS    | 1,595                                     |
| 04491 |    | 00001       |   | 00190 | DSTAB           | DS    | 3934                                      |
| 04493 |    | 00001       |   | 00200 | GRPMK           | DGM   | DSTAB-8                                   |
| 04499 |    | 00005       |   | 00210 | MORMOV          | DS    | 1,DSTAB-6                                 |
| 04501 |    | 00050 X2    |   | 00220 | BASE            | DS    | 5,DSTAB                                   |
| 04601 |    | 00025 X2    |   | 00230 | DAYID           | DAC   | 50,                                       |
| 04651 |    | 00001 X2    |   | 00240 | DAC             |       | 25,                                       |
| 04656 |    | 00005 05348 |   | 00250 | DAYRM           | DAC   | 1,1                                       |
| 04664 |    | 00008       |   | 00260 | DSA             |       | RUNO                                      |
| 04663 |    | 00001       |   | 00270 | BRPT8           | DC    | 8,49000000                                |
| 04667 |    | 00008 X2    |   | 00280 | BRPT            | DS    | 1,BRPT8-1                                 |
| 04719 |    | 00038       |   | 00290 | OVLAP           | DAC   | 8,OVERLAP                                 |
| 04682 |    | 00001       |   | 00300 | LDCRD           | DC    | 38,34000440070132000000000038000440070249 |
| 04707 |    | 00001       |   | 00310 | LDCD            | DS    | 1,LDCRD-37                                |
| 04720 |    | 00005       |   | 00320 | ROW             | DS    | 1,LDCD+25                                 |
| 04726 |    | 00006       |   | 00330 | BRST            | DSS   | 5,LDCD+38                                 |
| 04731 |    | 00005       |   | 00340 | DRIVE           | DC    | 6,0,LDCD+44                               |
| 04734 |    | 00003       |   | 00350 | SA              | DC    | 5,0,LDCD+49                               |
| 04739 |    | 00005       |   | 00360 | SC              | DC    | 3,0,LDCD+52                               |
| 04740 |    | 00001       |   | 00370 | CA              | DC    | 5,0,LDCD+57                               |
| 04721 |    | 00004 X2    |   | 00380 |                 | DC    | 1,1,LDCD+58                               |
| 04729 |    | 00044 X2    |   | 00390 | B000            | DAC   | 4,                                        |
| 04816 |    | 00013       |   | 00395 | DAC             |       | 44,                                       |
| 04831 |    | 00001 X2    |   | 00400 | DSC             |       | 13,0,                                     |
| 04841 |    | 00010       |   | 00410 | 0000            | DAC   | 1, ,                                      |
| 04863 |    | 00022       |   | 00420 |                 | DC    | 10,0,                                     |
| 04879 |    | 00016       |   | 00430 |                 | DC    | 22,0,                                     |
| 04880 |    | 00001       |   | 00440 |                 | DC    | 16,00000000000000000000                   |
| 04883 |    | 00015 X2    |   | 00450 | NH2ZER          | DC    | 1,0,                                      |
| 04913 |    | 00009 X2    |   | 00460 | HERR            | DAC   | 15,HDWR ERR EXEC                          |
| 04931 |    | 00009 X2    |   | 00470 | UTERR           | DAS   | 9                                         |
| 04953 |    | 00006       |   | 00480 |                 | DAC   | 9, ON FILE                                |
| 04964 |    | 00011       |   | 00490 | HAS             | DC    | 6,664162                                  |
| 04975 |    | 00011       |   | 00500 | NAHDCF          | DC    | 11,58200513996                            |
| 04976 |    | 00014       |   | 00510 | ASBDCF          | DC    | 11,92900500550                            |
| 04990 |    | 00014       |   | 00520 | SUBDCF          | DSC   | 14,07965000015000                         |
| 05016 |    | 00013       |   | 00530 | SBTBOC          | DSC   | 14,07964400614400                         |
| 05021 |    | 00005       |   | 00540 | EX2DCF          | DC    | 13,7980012900100                          |
| 05022 | 31 | 13008 04722 |   | 00550 | DUMY            | DS    | 5                                         |
| 05024 |    | 00000       |   | 00560 | PRINT           | TR    | CDBUF+7,B000+1                            |
| 05034 | 12 | 05021 00001 |   | 00570 | FLAG            | DS    | ,PRINT+2                                  |
| 05046 | 31 | 13000 05021 |   | 00580 |                 | SH    | PRINT-1,1,7                               |
| 05054 | 39 | 13001 00400 |   | 00590 |                 | TR    | CDBUF-1,PRINT-1,11                        |
| 05070 | 34 | 00000 00102 |   | 00600 | WACD            | CDBUF |                                           |
| 05082 | 39 | 13001 00100 |   | 00610 | RCTY            |       |                                           |
| 05094 | 42 |             |   | 00620 | WATY            | CDBUF |                                           |
| 05096 | 36 | 00044 00703 |   | 00630 | BB2             |       | ,,0                                       |
| 05108 | 47 | 05118 01942 |   | 00640 | ROWCK           | RN    | ZLDDC,703,10                              |
| 05120 | 43 | 05224 00070 |   | 00650 | BNI             |       | **10,1942                                 |
| 05132 | 44 | 05156 05024 |   | 00660 | BD              |       | ROWCK1,70,11                              |
| 05144 | 49 | 08208 00000 |   | 00670 | BNF             |       | HDWRE,FLAG                                |
| 05156 | 34 | 00000 00102 |   | 00680 | B               |       | CUTER                                     |
| 05166 |    | 00008       |   | 00690 | HDWRE           | RCTY  |                                           |
| 05168 | 47 | 05192 00200 |   | 00700 | ASBCON          | DC    | 8,34066010,*-1                            |
| 05180 | 17 | 05022 04883 |   | 00710 | BNC2            | TYHDW |                                           |
| 05192 | 39 | 04883 00100 |   | 00720 | BTM             |       | PRINT,HERK                                |
| 05204 | 48 | 00000 00000 |   | 00730 | TYHDW           | WATY  | HERR                                      |
| 05207 |    | 00004 X2    |   | 00740 | HALT            | H     | ,,,                                       |
| 05216 | 49 | 05304       |   | 00750 | COMPL           | DAC   | 4,CODE,*-8                                |
| 05224 | 25 | 00069 00070 |   | 00760 | B7              |       | FETEX2                                    |
| 05236 | 46 | 05248 00600 |   | 00770 | ROWCK1          | TD    | 69,70,11                                  |
| 05248 | 46 | 05260 00700 |   | 00780 | BI              |       | **12,600                                  |
| 05260 | 46 | 05272 01600 |   | 00790 | BI              |       | **12,700                                  |
| 05272 | 46 | 05284 01700 |   | 00800 | BI              |       | **12,1600                                 |
| 05284 | 49 | 00000       |   | 00810 | BI              |       | **12,1700                                 |
| 05292 | 27 | 05096 05095 |   | 00820 | B7              |       |                                           |
| 05304 | 16 | 00042 09162 |   | 00830 | FETEX           | BT    | ROWCK,ROWCK-1                             |
| 05316 | 26 | 00057 05016 |   | 00840 | FETEX2          | TFM   | ZLDBR,BEGIN,7,                            |
| 05328 | 15 | 00025 00006 |   | 00850 | TF              |       | ZLDCA,EX2DCF                              |
|       |    |             |   | 00860 | TDM             |       | ZLDROW,6                                  |

HALT AFTER DISK HARDWARE CHECK

REFETCH EXEC FROM DISK

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MMEM | OPERANDS                                                     | AND    | REMARKS                                 |
|-------|----|-------|-------|-------|--------|------|--------------------------------------------------------------|--------|-----------------------------------------|
| 05340 | 49 | 00000 |       | 00870 |        | B7   | 0                                                            |        |                                         |
|       |    |       |       | 00880 | *      |      |                                                              |        |                                         |
|       |    |       |       | 00890 | *      |      |                                                              |        | R U N                                   |
|       |    |       |       | 00900 | *      |      |                                                              |        |                                         |
| 00855 |    | 00001 |       | 00910 | BSTBG  | DS   | 1,855                                                        |        |                                         |
| 00879 |    | 00001 |       | 00920 | COMBEG | DS   | 1,879                                                        |        |                                         |
| 07650 |    | 00001 |       | 00930 | UNSEG  | DS   | 1,7650                                                       |        |                                         |
| 07550 |    | 00100 |       | 00940 | SEC1US | DSS  | 100,UNSEG-100,,                                              |        | SINGLE SECTOR PRECEDING UNSEG           |
| 07554 |    | 00001 |       | 00950 | SYMSEC | DS   | 1,SEC1US+4                                                   |        |                                         |
| 07559 |    | 00001 |       | 00960 | RELBEG | DS   | 1,SEC1US+9                                                   |        |                                         |
| 07564 |    | 00001 |       | 00970 | STBEG  | DS   | 1,SEC1US+14                                                  |        |                                         |
| 07569 |    | 00001 |       | 00980 | FCTEND | DS   | 1,SEC1US+19                                                  |        |                                         |
| 07574 |    | 00000 |       | 00990 | ENDCOM | DS   | ,SEC1US+24                                                   |        |                                         |
| 07577 |    | 00001 |       | 01000 | LASTSB | DS   | 1,SEC1US+27                                                  |        |                                         |
| 07649 |    | 00001 |       | 01010 | ISUSED | DS   | 1,SEC1US+99                                                  |        |                                         |
| 05348 | 16 | 05682 | 05732 | 01020 | RUNO   | TFM  | RUN2+6                                                       | ,RUNLK |                                         |
| 05360 | 16 | 00070 | 00299 | 01025 |        | TFM  | 70                                                           | ,299   |                                         |
| 05372 | 47 | 05396 | 00200 | 01030 | RUN    | BNI  | **24,00200,,                                                 |        | FOR ENTRY VIA LINK ROUTINE              |
| 05384 | 31 | 05022 | 07392 | 01040 |        | TR   | PRINT,PRNTR                                                  |        |                                         |
| 05396 | 26 | 07499 | 00574 | 01050 |        | TF   | MAXLOC,MAX                                                   |        |                                         |
| 05408 | 11 | 07499 | 00001 | 01060 |        | AM   | MAXLOC,1,9                                                   |        |                                         |
| 05420 | 27 | 07500 | 07499 | 01070 |        | BT   | CKDT,MAXLOC                                                  |        |                                         |
| 05432 | 71 | 04719 | 00036 | 01080 |        | MF   | LDCRD,36                                                     |        |                                         |
| 05444 | 44 | 05480 | 00099 | 01090 |        | BNF  | NNOD,99                                                      |        |                                         |
| 05456 | 44 | 05536 | 07755 | 01100 |        | BNF  | RUN1,LSTENT                                                  |        |                                         |
| 05468 | 44 | 05536 | 00585 | 01110 |        | BNF  | RUN1,NMP2LO,11                                               |        |                                         |
| 05480 | 26 | 04929 | 07435 | 01120 | NNOD   | TF   | DTERR+16,NOT,,                                               |        | PROGRAM TO BE CUT OR RUN NOT ON DISK    |
| 05492 | 26 | 04921 | 00425 | 01130 | MISSER | TF   | DTERR+8,NAME                                                 |        |                                         |
| 05504 | 17 | 05022 | 04913 | 01140 |        | BTM  | PRINT,DTERR,7                                                |        |                                         |
| 05516 | 44 | 09210 | 04719 | 01150 |        | BNF  | BEG,LDCRD                                                    |        |                                         |
| 05528 | 49 | 05304 |       | 01160 |        | B7   | FETEX2,,,                                                    |        | LINK-RUN                                |
| 05536 | 25 | 04494 | 00401 | 01170 | RUN1   | TD   | BASE-5,401                                                   |        |                                         |
| 05548 | 34 | 04494 | 00701 | 01180 |        | K    | BASE-5,00701                                                 |        |                                         |
| 05560 | 26 | 00037 | 04719 | 01190 |        | TF   | ZLDCRD,LDCRD                                                 |        |                                         |
| 05572 | 15 | 00035 | 00000 | 01200 |        | TDM  | 35,0                                                         |        |                                         |
| 05584 | 26 | 00023 | 04499 | 01210 |        | TF   | 23,BASE,11,                                                  |        | STORE REG SECTOR NO AS BASE FOR SEQUEST |
| 05596 | 16 | 00042 | 05676 | 01220 |        | TFM  | ZLDBR,RUN2,7                                                 |        |                                         |
| 05608 | 15 | 00025 | 00006 | 01230 |        | TDM  | ZLDROP,6,,                                                   |        |                                         |
| 05620 | 16 | 00057 | 07550 | 01240 |        | TFM  | ZLDCA,SEC1US,7                                               |        |                                         |
| 05632 | 26 | 00049 | 04499 | 01250 |        | TF   | ZLDSA,BASE,11                                                |        |                                         |
| 05644 | 25 | 00044 | 00401 | 01260 |        | TD   | ZLDDC,401                                                    |        |                                         |
| 05656 | 16 | 00052 | 00201 | 01270 |        | TFM  | ZLDSC,201,9                                                  |        |                                         |
| 05668 | 49 | 00012 |       | 01280 |        | B7   | 12                                                           |        |                                         |
| 05676 | 46 | 05756 | 03700 | 01290 | RUN2   | BI   | RUN3,3700,,                                                  |        | BI RUNLK,03700 IF LINK PROG             |
| 05688 | 46 | 05700 | 03800 | 01300 |        | BI   | **12,3800                                                    |        |                                         |
| 05700 | 27 | 05108 | 05107 | 01310 |        | BT   | ROWCK+12,ROWCK+11                                            |        |                                         |
| 05712 | 33 | 05024 | 00000 | 01320 |        | CF   | FLAG                                                         |        |                                         |
| 05724 | 49 | 07240 |       | 01330 |        | B7   | CYLOFL                                                       |        |                                         |
| 05732 | 26 | 05803 | 07574 | 01340 | RUNLK  | TF   | DUBFIN+11,ENDCOM                                             |        |                                         |
| 05744 | 12 | 05803 | 00010 | 01350 |        | SM   | DUBFIN+11,10                                                 |        |                                         |
| 05756 | 27 | 05108 | 05107 | 01360 | RUN3   | BT   | ROWCK+12,ROWCK+11                                            |        |                                         |
| 05768 | 15 | 00035 | 00002 | 01370 |        | TDM  | 35,2                                                         |        |                                         |
| 05780 | 21 | 05822 | 07564 | 01380 |        | A    | DUBST+6,STBEG,,                                              |        | FILL SYN TAB AREA WITH FLAGGED ZERO-REG |
| 05792 | 14 | 05822 | 09999 | 01390 | DUBFIN | CM   | DUBST+6,9999                                                 |        |                                         |
| 05804 | 46 | 05848 | 01100 | 01400 |        | BH   | FETST                                                        |        |                                         |
| 05816 | 26 | 00010 | 04651 | 01410 | DUBST  | TF   | 10,DAYRM,2                                                   |        |                                         |
| 05828 | 11 | 05822 | 00010 | 01420 |        | AM   | DUBST+6,10,7                                                 |        |                                         |
| 05840 | 49 | 05792 |       | 01430 |        | B7   | DUBFIN                                                       |        |                                         |
| 05848 | 21 | 05866 | 04499 | 01440 | FETST  | A    | FETST1+6,BASE                                                |        |                                         |
| 05860 | 14 | 00003 | 00000 | 01450 | FETST1 | CM   | 3,0,29, P ADDR IS THAT OF NO.=NO. STORED SECTORS OF SYN. TAB |        |                                         |
| 05872 | 46 | 06064 | 01200 | 01460 |        | BE   | FETREL                                                       |        |                                         |
| 05884 | 16 | 00057 | 05372 | 01470 |        | TFM  | ZLDCA,BUFFER,7,                                              |        | FETCH SECTOR OF SYMBOL TABLE            |
| 05896 | 25 | 00069 | 00009 | 01480 | BUFFER | DS   | ,RUN                                                         |        |                                         |
| 05908 | 16 | 00052 | 00001 | 01485 |        | TD   | 69                                                           | ,9     |                                         |
| 05920 | 26 | 00049 | 04499 | 01490 |        | TFM  | ZLDSC,1,9                                                    |        |                                         |
| 05932 | 21 | 00049 | 07554 | 01500 |        | TF   | ZLDSA,BASE,11                                                |        |                                         |
| 05944 | 16 | 00042 | 05964 | 01510 |        | A    | ZLDSA,SYMSEC                                                 |        |                                         |
| 05956 | 49 | 00012 |       | 01520 |        | TFM  | ZLDBR,CKSTRD                                                 |        |                                         |
| 05964 | 27 | 05096 | 05095 | 01530 |        | B7   | 12                                                           |        |                                         |
| 05976 | 11 | 00049 | 00001 | 01540 | CKSTRD | BT   | ROWCK,ROWCK-1                                                |        |                                         |
| 05988 | 45 | 06032 | 05372 | 01550 |        | AM   | ZLDSA,1,7                                                    |        |                                         |
| 06000 | 24 | 00049 | 06599 | 01560 | TESTRM | BNR  | TF,BUFFER                                                    |        |                                         |
| 06012 | 46 | 06064 | 01300 | 01570 |        | C    | ZLDSA,NXM20,11                                               |        |                                         |
| 06024 | 49 | 00012 |       | 01580 |        | BNL  | FETREL                                                       |        |                                         |
| 06032 | 26 | 05376 | 05386 | 01590 |        | B7   | 12                                                           |        |                                         |
| 06044 | 31 | 05372 | 05387 | 01600 | TF     | TF   | BUFFER+4,BUFFER+14,6                                         |        |                                         |
| 06056 | 49 | 05988 |       | 01610 |        | TR   | BUFFER,BUFFER+15                                             |        |                                         |
|       |    |       |       | 01620 |        | B7   | TESTRM                                                       |        |                                         |
|       |    |       |       | 01630 | *      |      |                                                              |        |                                         |
|       |    |       |       | 01640 | *      |      |                                                              |        | LOAD RELOCATABLE SUBROUTINES            |
|       |    |       |       | 01650 | *      |      |                                                              |        |                                         |
| 00569 |    | 00001 |       | 01660 | SBINDG | DS   | 1,00569                                                      |        |                                         |
| 00573 |    | 00001 |       | 01670 | SUBDIG | DS   | 1,00573                                                      |        |                                         |
| 00578 |    | 00001 |       | 01680 | SUBSEC | DS   | 1,00578                                                      |        |                                         |
| 06064 | 34 | 04990 | 00701 | 01690 | FETREL | K    | SBTBDC,00701,,                                               |        | FETCH SUBROUTINE TABLE OVER DISK TABLE  |
| 06076 | 25 | 00069 | 00009 | 01695 |        | TD   | 69                                                           | ,9     |                                         |
| 06088 | 26 | 00052 | 04998 | 01700 |        | TF   | ZLDSC,SBTBDC+8                                               |        |                                         |
| 06100 | 16 | 00057 | 00566 | 01710 |        | TFM  | ZLDCA,566,7                                                  |        |                                         |

| LOC/TN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|--------|----|-------|-------|-------|--------|------|----------------------|
| 06112  | 16 | 00042 | 06132 | 01720 |        | TFM  | ZLDBR,AFTST,7        |
| 06124  | 49 | 00012 |       | 01730 |        | B7   | 12                   |
| 06132  | 27 | 05096 | 05095 | 01740 | AFTST  | BT   | ROWCK,ROWCK-1        |
| 06144  | 15 | 00035 | 00000 | 01750 |        | TDM  | 35,0                 |
| 06156  | 25 | 06306 | 00400 | 01760 |        | TD   | BP2ST+2,400          |
| 06168  | 43 | 06200 | 07649 | 01770 | RELCK  | BD   | SYTBB,ISUSED,7       |
| 06180  | 15 | 06787 | 00000 | 01780 |        | TDM  | LDDIG,0              |
| 06192  | 49 | 06728 |       | 01790 |        | B7   | REL6                 |
| 06200  | 15 | 06787 | 00001 | 01800 | SYTBB  | TDM  | LDDIG,1              |
| 06212  | 26 | 04663 | 07559 | 01810 |        | TF   | BRPT,RELBEG          |
| 06224  | 26 | 05021 | 04663 | 01820 |        | TF   | DUMY,BRPT            |
| 06236  | 21 | 05021 | 00573 | 01830 | REL1   | A    | DUMY,SUBDIG,7        |
| 06248  | 24 | 05021 | 07564 | 01840 |        | C    | DUMY,STBEG           |
| 06260  | 47 | 06304 | 01300 | 01850 |        | BL   | BP2ST                |
| 06272  | 17 | 05022 | 04667 | 01860 |        | BTM  | PRINT,OVLAP,7        |
| 06284  | 15 | 00035 | 00002 | 01870 |        | TDM  | 35,2                 |
| 06296  | 49 | 05304 |       | 01880 |        | B7   | FETEX2               |
| 06304  | 31 | 09990 | 04657 | 01890 | BP2ST  | TR   | 9990,BRPT-6          |
| 06316  | 26 | 00049 | 00578 | 01900 | REL7   | TF   | ZLDSA,SUBSEC,7       |
| 06328  | 16 | 00054 | 00099 | 01910 |        | TFM  | ZLDSC+2,99,7         |
| 06340  | 21 | 00054 | 00573 | 01920 | REL2   | A    | ZLDSC+2,SUBDIG,7     |
| 06352  | 26 | 00057 | 04663 | 01930 |        | TF   | ZLDCA,BRPT           |
| 06364  | 16 | 00042 | 06384 | 01940 |        | TFM  | ZLDBR,REL2,7         |
| 06376  | 49 | 00012 |       | 01950 |        | B7   | 12                   |
| 06384  | 46 | 06396 | 03700 | 01958 | REL2   | BI   | **+12,3700           |
| 06396  | 27 | 05108 | 05107 | 01960 |        | BT   | ROWCK+12,ROWCK+11    |
| 06408  | 26 | 06515 | 07559 | 01970 |        | TF   | RELOP+11,RELBEG,,    |
| 06420  | 16 | 06575 | 00001 | 01980 |        | TFM  | RELOQ+11,00001,7     |
| 06432  | 21 | 06575 | 06515 | 01990 |        | A    | RELOQ+11,RELOP+11    |
| 06444  | 16 | 06546 | 00006 | 02000 |        | TFM  | PPBEG+6,00006,7      |
| 06456  | 21 | 06546 | 06515 | 02010 |        | A    | PPBEG+6,RELOP+11     |
| 06468  | 16 | 06606 | 00011 | 02020 |        | TFM  | QPBEG+6,00011,7      |
| 06480  | 21 | 06606 | 06515 | 02030 |        | A    | QPBEG+6,RELOP+11     |
| 06492  | 16 | 06539 | 00000 | 02040 |        | TFM  | KOUNT,0,7            |
| 06504  | 44 | 06564 | 00000 | 02050 | RELOP  | BNF  | RELOQ                |
| 06516  | 44 | 06540 | 06546 | 02060 |        | BNF  | **+24,PPBEG+6,11     |
| 06528  | 32 | 06551 | 00000 | 02070 |        | SF   | PPBEG+11,,6          |
| 06539  |    | 00005 |       | 02080 | KOUNT  | DS   | 5,*                  |
| 06540  | 21 | 00000 | 07559 | 02090 | PPBEG  | A    | ,RELBEG              |
| 06552  | 33 | 06551 | 00000 | 02100 |        | CF   | PPBEG+11,,6          |
| 06564  | 44 | 06624 | 00000 | 02110 | RELOQ  | BNF  | INCRL                |
| 06576  | 44 | 06600 | 06606 | 02120 |        | BNF  | **+24,QPBEG+6,11     |
| 06588  | 32 | 06611 | 00000 | 02130 | BAS    | SF   | QPBEG+11,,6          |
| 06599  |    | 00005 |       | 02140 | NXM20  | DS   | 5,BAS+11             |
| 06600  | 21 | 00000 | 07559 | 02150 | QPBEG  | A    | ,RELBEG              |
| 06612  | 33 | 06611 | 00000 | 02160 |        | CF   | QPBEG+11,,6          |
| 06624  | 11 | 06539 | 00012 | 02170 | INCRL  | AM   | KOUNT,12,7           |
| 06636  | 24 | 06539 | 00569 | 02180 | REL3   | C    | KOUNT,SBINDG,7       |
| 06648  | 46 | 06716 | 01300 | 02190 |        | BNL  | REL5                 |
| 06660  | 11 | 06515 | 00012 | 02200 |        | AM   | RELOP+11,12,7        |
| 06672  | 11 | 06546 | 00012 | 02210 |        | AM   | PPBEG+6,12,7         |
| 06684  | 11 | 06575 | 00012 | 02220 |        | AM   | RELOQ+11,12,7        |
| 06696  | 11 | 06606 | 00012 | 02230 |        | AM   | QPBEG+6,12,7         |
| 06708  | 49 | 06506 |       | 02240 |        | B7   | RELOP                |
| 06716  | 26 | 07559 | 05021 | 02250 | REL5   | TF   | RELBEG,DUMY,,        |
| 06728  | 14 | 06179 | 07577 | 02260 | REL6   | CM   | RELCK+11,LASTSB,7    |
| 06740  | 46 | 07040 | 01200 | 02270 |        | BE   | FETASB               |
| 06752  | 12 | 06310 | 00020 | 02280 |        | SM   | BP2ST+6,20,7         |
| 06764  | 12 | 06179 | 00002 | 02290 |        | SM   | RELCK+11,2,7         |
| 06776  | 33 | 06786 | 00000 | 02300 | FLADG  | CF   | USEFLG               |
| 06786  |    | 00000 |       | 02310 | USEFLG | DS   | ,FLADG+10            |
| 06787  |    | 00000 |       | 02320 | LDDIG  | DS   | ,FLADG+11            |
| 06788  | 11 | 06247 | 00013 | 02330 |        | AM   | REL1+11,13,7         |
| 06800  | 43 | 06892 | 06179 | 02340 |        | BD   | V,RELCK+11,11        |
| 06812  | 15 | 06787 | 00000 | 02350 |        | TDM  | LDDIG,0              |
| 06824  | 32 | 06786 | 00000 | 02360 |        | SF   | USEFLG               |
| 06836  | 11 | 06647 | 00013 | 02370 | ADD2   | AM   | REL3+11,13,7         |
| 06848  | 11 | 06351 | 00013 | 02380 |        | AM   | REL2+11,13,7         |
| 06860  | 11 | 06327 | 00013 | 02390 |        | AM   | REL7+11,13,7         |
| 06872  | 44 | 06200 | 06786 | 02400 |        | BNF  | SYTBB,USEFLG         |
| 06884  | 49 | 06728 |       | 02410 |        | B7   | REL6                 |
| 06892  | 14 | 06247 | 00000 | 02420 | V      | CM   | REL1+11,0,68         |
| 06904  | 47 | 06836 | 01200 | 02430 |        | BNE  | ADD2                 |
| 06916  | 32 | 06786 | 00000 | 02440 |        | SF   | USEFLG               |
| 06927  |    | 00005 |       | 02450 | TIGER  | DC   | 5,00550 ,*           |
| 06928  | 43 | 06984 | 06787 | 02460 |        | BD   | Z,LDDIG              |
| 06940  | 12 | 06247 | 00013 | 02470 |        | SM   | REL1+11,13,7         |
| 06952  | 11 | 06179 | 00002 | 02480 |        | AM   | RELCK+11,2,7         |
| 06964  | 11 | 06310 | 00020 | 02490 |        | AM   | BP2ST+6,20,7         |
| 06976  | 49 | 06200 |       | 02500 |        | B7   | SYTBB                |
| 06984  | 11 | 06647 | 00013 | 02510 | Z      | AM   | REL3+11,13,7         |
| 06996  | 21 | 04663 | 06647 | 02520 |        | A    | BRPT,REL3+11,11      |
| 07008  | 31 | 06310 | 04657 | 02530 |        | TR   | BP2ST+6,BRPT-6,6     |
| 07020  | 22 | 04663 | 06647 | 02540 |        | S    | BRPT,REL3+11,11      |
| 07032  | 49 | 06848 |       | 02550 |        | B7   | ADD2+12              |
| 07040  | 15 | 00035 | 00002 | 02560 | FETASB | TDM  | 35,2                 |
| 07052  | 25 | 00069 | 00009 | 02565 |        | TD   | 69 ,9                |
| 07064  | 26 | 00057 | 04975 | 02570 |        | TF   | ZLDCA,ASBDCF         |

ADJUST P AND Q RELOCATABLE ADDRESSES

REPLACE RELBEG WITH RELBEG + SUB LENGTH

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS     |
|-------|----|-------|-------|-------|--------|------|--------------------------|
| 07076 | 16 | 00042 | 07096 | 02580 |        | TFM  | ZLDBR,FTASB2             |
| 07088 | 49 | 00000 |       | 02590 |        | B7   | 0                        |
| 07096 | 27 | 05096 | 05095 | 02600 | FTASB2 | BT   | ROWCK,ROWCK-1            |
| 07108 | 26 | 00879 | 07569 | 02610 |        | TF   | COMBEG,FTEND             |
| 07120 | 26 | 00855 | 07564 | 02620 |        | TF   | BSTBG,STBEG              |
| 07132 | 26 | 00055 | 05166 | 02630 |        | TF   | ZLDCA-2,ASBCON           |
| 07144 | 26 | 00042 | 06927 | 02640 |        | TF   | ZLDBR,TIGER              |
| 07156 | 49 | 00012 |       | 02650 |        | B7   | 12                       |
| 07164 | 39 | 07185 | 00100 | 02660 | ADDRS  | WATY | SYSRFB                   |
| 07176 | 48 | 08208 | 00000 | 02670 | ADDRS1 | H    | CUTER                    |
| 07184 |    |       |       | 02680 |        | DORG | *-3                      |
| 07185 |    | 00022 | X2    | 02690 | SYSRFB | DAC  | 22,RENUMBER SYSTEM DRIVE |
| 07228 | 27 | 05108 | 05107 | 02700 | TYPECK | BT   | ROWCK+12,ROWCK+11        |
| 07240 | 13 | 00049 | 00050 | 02710 | CYLOFL | MM   | 49,50,10                 |
| 07252 | 11 | 00095 | 00801 | 02720 |        | AM   | 95,1,9                   |
| 07264 | 26 | 07347 | 00049 | 02730 |        | TF   | DUMMY,ZLDSA              |
| 07276 | 16 | 00049 | 00000 | 02740 |        | TFM  | ZLDSA,0,7                |
| 07288 | 21 | 00047 | 00095 | 02750 |        | A    | ZLDSA-2,95               |
| 07312 | 34 | 00044 | 00701 | 02770 |        | K    | ZLDDC,00701,,            |
| 07324 | 22 | 07347 | 00049 | 02780 |        | S    | DUMMY, ZLDSA             |
| 07336 | 32 | 07345 | 00000 | 02790 | YMMUD  | SF   | DUMMY-2                  |
| 07347 |    | 00005 |       | 02800 | DUMMY  | DS   | 5,YMMUD+11               |
| 07348 | 22 | 00055 | 07347 | 02810 |        | S    | ZLDCA-2,DUMMY            |
| 07360 | 44 | 00000 | 05024 | 02820 |        | BNF  | 0,FLAG,,                 |
| 07372 | 21 | 00052 | 07347 | 02830 |        | A    | ZLDCS,DUMMY,,            |
| 07384 | 49 | 00000 |       | 02840 |        | B7   | 0                        |
| 07392 | 47 | 05046 | 03400 | 02850 | PRNTR  | BNI  | PRINT+24,03400,,         |
| 07404 | 34 | 00000 | 00971 | 02860 |        | SKIP | ,1                       |
| 07407 |    | 00003 | X2    | 02870 | EXIT   | DAC  | 3,OUT,*-8                |
| 07416 | 39 | 05024 | 00900 | 02880 |        | PRA  | PRINT-1,,6               |
| 07428 | 34 | 00000 | 00951 | 02890 |        | SPIM | ,1                       |
| 07435 |    | 00006 |       | 02900 | NOT    | DC   | 6,555663,*-4             |
| 07440 | 42 |       |       | 02910 |        | BB2  |                          |
| 07442 |    | 00001 |       | 02920 |        | DC   | 1,'                      |
| 07444 | 31 | 13008 | 04722 | 02930 | TYPWR  | TR   | CDBUF+7,B000+1           |
| 07456 | 12 | 05021 | 00001 | 02940 |        | SM   | PRINT-1,1,7              |
| 07468 | 31 | 13000 | 05024 | 02950 |        | TR   | CDBUF-1,PRINT-1,11       |
| 07480 | 39 | 13001 | 00400 | 02960 |        | WACD | CDBUF                    |
| 07494 |    | 00003 |       | 02970 |        | DC   | 3,34'                    |
| 07499 |    | 00005 |       | 02980 | MAXLOC | DC   | 5,0                      |
| 07500 | 16 | 07590 | 00603 | 02990 | CKDT   | TFM  | ZA+6,603,,               |
| 07512 | 33 | 00099 | 00000 | 03000 |        | CF   | 99                       |
| 07524 | 33 | 07755 | 00000 | 03010 |        | CF   | LSTENT                   |
| 07536 | 14 | 07499 | 00800 | 03020 |        | CM   | MAXLOC,0,9               |
| 07548 | 46 | 07756 | 01200 | 03030 |        | BE   | BB2                      |
| 07560 | 16 | 07581 | 00800 | 03040 |        | TFM  | CNTR,000,9               |
| 07572 | 11 | 07581 | 00061 | 03050 | CHECK  | AM   | CNTR,001,10              |
| 07581 |    | 00003 |       | 03060 | CNTR   | DS   | 3,*-2                    |
| 07584 | 24 | 00000 | 00425 | 03070 | ZA     | C    | ,NAME                    |
| 07596 | 47 | 07676 | 01200 | 03080 |        | BNE  | AA                       |
| 07608 | 26 | 04499 | 07590 | 03090 |        | TF   | BASE,ZA+6                |
| 07620 | 12 | 04499 | 00013 | 03100 |        | SM   | BASE,13,7                |
| 07632 | 26 | 06599 | 04499 | 03110 |        | TF   | NXM20,BASE               |
| 07644 | 11 | 06599 | 00020 | 03120 |        | AM   | NXM20,20,7               |
| 07656 | 32 | 00099 | 00000 | 03130 |        | SF   | 99,,,                    |
| 07668 | 49 | 07720 |       | 03140 |        | B7   | BA                       |
| 07676 | 24 | 07581 | 07499 | 03150 | AA     | C    | CNTR,CKDT-1              |
| 07688 | 46 | 07756 | 01300 | 03160 |        | BNL  | BB2                      |
| 07700 | 11 | 07590 | 00020 | 03170 |        | AM   | ZA+6,20,7                |
| 07712 | 49 | 07572 |       | 03180 |        | B7   | CHECK                    |
| 07720 | 24 | 07581 | 07499 | 03190 | BA     | C    | CNTR,CKDT-1              |
| 07732 | 47 | 07756 | 01200 | 03200 |        | BNE  | BB2                      |
| 07744 | 32 | 07755 | 00000 | 03210 | ALSTEN | SF   | LSTENT                   |
| 07755 |    | 00001 |       | 03220 | LSTENT | DS   | 1,ALSTEN+11              |
| 07756 | 42 |       |       | 03230 | BB2    | BB2  |                          |
| 07758 |    | 00014 |       | 03240 | DTDCF  | DSC  | 14,07980404000500        |
|       |    |       |       | 03250 |        | *    |                          |
|       |    |       |       | 03260 |        | *    |                          |
|       |    |       |       | 03270 |        | *    |                          |
| 07772 | 44 | 05480 | 00099 | 03280 | CUT    | BNF  | NNOD,99,,                |
| 07784 | 12 | 00574 | 00061 | 03290 |        | SM   | MAX,01,10                |
| 07796 | 26 | 00585 | 04880 | 03300 |        | TF   | NMP2LO,NMZZER,6          |
| 07808 | 12 | 00585 | 00020 | 03310 |        | SM   | NMP2LO,20,9              |
| 07820 | 12 | 00580 | 00020 | 03320 |        | SM   | MP1NLO,20,9              |
| 07832 | 44 | 07924 | 07755 | 03330 |        | BNF  | CLZGP1,LSTENT            |
| 07844 | 26 | 00570 | 04499 | 03340 | SZVOID | TF   | NEXT,BASE,11,,           |
| 07855 |    | 00005 |       | 03350 | VOIDSZ | DS   | 5,SZVOID+11              |
| 07856 | 11 | 04499 | 00004 | 03360 |        | AM   | BASE,4,7                 |
| 07868 | 26 | 00585 | 04880 | 03370 |        | TF   | NMP2LO,NMZZER,6          |
| 07880 | 16 | 00042 | 09162 | 03380 | RECDT1 | TFM  | ZLDBR,BEGIN,7            |
| 07892 | 26 | 00037 | 04719 | 03390 |        | TF   | ZLCRD,LDCRD,,            |
| 07904 | 26 | 00057 | 07771 | 03400 |        | TF   | ZLDCA,DTDCF+13           |
| 07916 | 49 | 00000 |       | 03410 |        | B7   | 0                        |
| 07924 | 15 | 07177 | 00009 | 03420 | CLZGP1 | TDM  | ADDRS1+1,9,,             |
| 07936 | 26 | 00037 | 04719 | 03430 |        | TF   | ZLCRD,LDCRD              |
| 07948 | 26 | 08219 | 04499 | 03440 |        | TF   | CUTER+11,BASE            |
| 07960 | 26 | 07855 | 06599 | 03450 |        | TF   | VOIDSZ,NXM20,11          |

C U T

CUT ENTRY K

MAX ENTRY TO BE CUT

RECORD ADJUSTED DISK TABLE

ENTRY TO BE CUT NOT LAST ENTRY

| LOCTN | OP | P/E   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 07972 | 22 | 07855 | 04499 | 03460 |        | S    | VOIDS2,BASE,11       |
| 07984 | 26 | 04731 | 06599 | 03470 |        | TF   | SA,NXM20,11,         |
| 07996 | 34 | 04726 | 00701 | 03480 |        | K    | DRIVE,00701,,        |
| 08008 | 26 | 08043 | 00570 | 03490 |        | TF   | SCONT,NEXT           |
| 08020 | 22 | 08043 | 06599 | 03500 |        | S    | SCONT,NXM20,11       |
| 08032 | 32 | 08041 | 00000 | 03510 | TNOCS  | SF   | SCONT-2              |
| 08043 |    | 00005 |       | 03520 | SCONT  | DS   | 5,TNOCS+11           |
| 08044 | 26 | 04734 | 08043 | 03530 |        | TF   | SC,SCONT,,           |
| 08056 | 33 | 08041 | 00000 | 03540 | DRAS   | CF   | SCONT-2              |
| 08067 |    | 00005 |       | 03550 | SARD   | DS   | 5,DRAS+11            |
| 08068 | 26 | 08067 | 06599 | 03560 |        | TF   | SARD,NXM20,11,       |
| 08080 | 26 | 00570 | 04499 | 03570 |        | TF   | NEXT,BASE,11         |
| 08092 | 21 | 00570 | 08043 | 03580 |        | A    | NEXT,SCONT,,         |
| 08104 | 16 | 04739 | 09074 | 03590 |        | TFM  | CA,BUFBEQ            |
| 08116 | 24 | 08043 | 08789 | 03600 | CTLOP  | C    | SCONT,TFSK+9,,       |
| 08128 | 47 | 08164 | 01100 | 03610 |        | BNH  | SMLMOV               |
| 08140 | 26 | 04734 | 08789 | 03620 |        | TF   | SC,TFSK+9            |
| 08152 | 32 | 04493 | 00000 | 03630 |        | SF   | MORMOV               |
| 08164 | 16 | 04724 | 08616 | 03640 | SMLMOV | TFM  | BRST+4,RETCT,7       |
| 08176 | 31 | 00026 | 04708 | 03650 |        | TR   | ZLDROW+1,ROW+1       |
| 08188 | 16 | 00025 | 00036 | 03660 |        | TFM  | ZLDROW,36,10         |
| 08200 | 49 | 00012 |       | 03670 |        | B7   | 12,,,                |
| 08208 | 26 | 00570 | 00000 | 03680 | CUTER  | TF   | NEXT,,               |
| 08220 | 26 | 00574 | 07581 | 03690 |        | TF   | MAX,CNTR,,           |
| 08232 | 12 | 00574 | 00801 | 03700 |        | SM   | MAX,1,9              |
| 08244 | 16 | 08346 | 00580 | 03710 |        | TFM  | DTZEO+6,MP1NLO       |
| 08256 | 16 | 00585 | 00020 | 03720 |        | TFM  | NMP2LO,20            |
| 08268 | 21 | 00585 | 08219 | 03730 |        | A    | NMP2LO,CUTER+11      |
| 08280 | 26 | 00580 | 00585 | 03740 |        | TF   | MP1NLO,NMP2LO        |
| 08292 | 12 | 00580 | 00007 | 03750 |        | SM   | MP1NLO,7             |
| 08304 | 21 | 08322 | 00580 | 03760 |        | A    | ZEODT+6,MP1NLO       |
| 08316 | 26 | 00020 | 04841 | 03770 | ZEODT  | TF   | 20,0000+10,2         |
| 08328 | 11 | 08322 | 00020 | 03780 |        | AM   | ZEODT+6,20           |
| 08340 | 24 | 00000 | 08322 | 03790 | DTZEO  | C    | ,ZEODT+6             |
| 08352 | 46 | 08316 | 01300 | 03800 |        | BNL  | ZEODT                |
| 08364 | 26 | 00585 | 04880 | 03810 |        | TF   | NMP2LO,NM2ZER,6      |
| 08376 | 15 | 00025 | 00006 | 03820 |        | TDM  | ZLDROW,6             |
| 08388 | 26 | 00057 | 08431 | 03830 |        | TF   | ZLDCA,SPECDC         |
| 08400 | 16 | 00042 | 08432 | 03840 |        | TFM  | ZLDBR,CUTER1         |
| 08412 | 49 | 00000 |       | 03850 |        | B7   | 0,,,                 |
| 08431 |    | 00013 |       | 03860 | SPECDC | DC   | 13,7984408504500     |
| 08432 | 36 | 00044 | 00703 | 03870 | CUTER1 | RN   | ZLDDC,703            |
| 08444 | 47 | 08464 | 03900 | 03880 |        | BNI  | CUTER2,03900         |
| 08456 | 49 | 08532 |       | 03890 |        | B7   | ARG                  |
| 08464 | 15 | 00025 | 00008 | 03900 | CUTER2 | TDM  | ZLDROW,8             |
| 08476 | 16 | 00042 | 08508 | 03910 |        | TFM  | ZLDBR,CUTER3         |
| 08488 | 34 | 00000 | 00102 | 03920 |        | RCTY |                      |
| 08491 |    | 00003 | X2    | 03930 | DELET  | DAC  | 3,CUT,*-8            |
| 08500 | 49 | 09052 |       | 03940 |        | B7   | RECDT                |
| 08508 | 36 | 00044 | 00703 | 03950 | CUTER3 | RN   | ZLDDC,703            |
| 08520 | 47 | 08584 | 03900 | 03960 |        | BNI  | CUTER4,03900         |
| 08532 | 44 | 08564 | 00000 | 03970 | ARG    | BNF  | MACH,PARCK           |
| 08544 | 33 | 00000 | 00000 | 03980 |        | CF   | PARCK                |
| 08556 | 49 | 00024 |       | 03990 |        | B7   | 24                   |
| 08564 | 39 | 12903 | 00100 | 04000 | MACH   | WATY | CTHER                |
| 08576 | 49 | 77777 |       | 04010 |        | B7   | 77777                |
| 08584 | 39 | 12829 | 00100 | 04020 | CUTER4 | WATY | FIXCUT               |
| 08596 | 31 | 05022 | 07444 | 04030 |        | TR   | PRINT,TYPWR          |
| 08608 | 49 | 10314 |       | 04040 |        | B7   | DISK2                |
| 08616 | 46 | 08628 | 03800 | 04050 | RETCT  | BI   | *+12,3800,8          |
| 08628 | 32 | 05024 | 00000 | 04060 |        | SF   | FLAG                 |
| 08640 | 27 | 05108 | 05107 | 04070 |        | BT   | ROWCK+12,ROWCK+11    |
| 08652 | 36 | 00044 | 00703 | 04080 |        | RN   | ZLDDC,00703          |
| 08664 | 46 | 07228 | 03800 | 04090 |        | BI   | TYPECK,03800         |
| 08676 | 27 | 05096 | 05095 | 04100 |        | BT   | ROWCK,ROWCK-1        |
| 08688 | 25 | 00069 | 00009 | 04105 |        | TD   | 69,9                 |
| 08700 | 24 | 08625 | 00025 | 04110 |        | C    | RETCT+9,ZLDROW       |
| 08712 | 46 | 08768 | 01200 | 04120 |        | BE   | CKWA,,               |
| 08724 | 31 | 00050 | 04732 | 04130 |        | TR   | ZLDSC-2,SC-2,,       |
| 08736 | 26 | 00049 | 04499 | 04140 |        | TF   | ZLDSA,BASE,11        |
| 08748 | 15 | 00025 | 00008 | 04150 |        | TDM  | ZLDROW,8             |
| 08760 | 49 | 00012 |       | 04160 |        | B7   | 12,,,                |
| 08768 | 44 | 08896 | 04493 | 04170 | CKWA   | BNF  | FIXDT,MORMOV,,       |
| 08780 | 33 | 04493 | 00000 | 04180 | TFSK   | CF   | MORMOV,,             |
| 08792 | 22 | 08043 | 04734 | 04190 |        | S    | SCONT,SC             |
| 08804 | 26 | 04731 | 08067 | 04200 |        | TF   | SA,SARD              |
| 08816 | 21 | 08067 | 04734 | 04210 |        | A    | SARD,SC              |
| 08828 | 21 | 04731 | 04734 | 04220 |        | A    | SA,SC                |
| 08840 | 21 | 04499 | 04734 | 04230 |        | A    | BASE,SC,6            |
| 08852 | 32 | 08041 | 00000 | 04240 |        | SF   | SCONT-2              |
| 08864 | 26 | 04734 | 08043 | 04250 |        | TF   | SG,SCONT             |
| 08876 | 33 | 08041 | 00000 | 04260 |        | CF   | SCONT-2              |
| 08888 | 49 | 08116 |       | 04270 |        | B7   | CTLOP,,              |
| 08896 | 34 | 07758 | 00701 | 04280 | FIXDT  | K    | DTDCF,00701,,        |
| 08908 | 26 | 08962 | 04499 | 04290 |        | TF   | UPDATE+6,BASE        |
| 08920 | 21 | 08974 | 04499 | 04300 |        | A    | MOVE+6,BASE          |
| 08932 | 21 | 08979 | 04499 | 04310 |        | A    | MOVE+11,BASE         |
| 08944 | 11 | 08962 | 00020 | 04320 | LOOP   | AM   | UPDATE+6,20,7        |

SECTOR ADDRESS N(K+1)  
SEEK CYLINDER CONTAINING K+1 ENTRY

TOTAL NO. SECTORS TO BE MOVED UP

SAVE N(K+1) AT SARD

NEW NEXT AFTER PROGRAM DELETION

TFSK+5 THRU 9 CONTAINS CORE BUF AREA SI

READ K+1 ENTRY PLUS ALL ON CYL TO CORE

BLANK OUT DSK TAB FROM CUT ENTRY ON

FETCH EXEC MINUS DISK TABLE

AFTER WRITE TO LOWER DISK  
AFTER READ PROGS FROM UPPER DISK

WRITE K+1 ENTRY PLUS ON LOWER DISK  
FLAG INDICATES MORE OF PROGRAM TO BE CUT  
CUT BUFFER SIZE IN Q ADDRESS

READ PROGS FROM NEXT CYL TO CORE  
SQUISH DISK TABLE

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL   | MNEM | OPERANDS AND REMARKS  |
|-------|----|-------|-------|-------|---------|------|-----------------------|
| 08956 | 22 | 00000 | 07855 | 04330 | UPDATE  | S    | ,VOIDSZ               |
| 08968 | 31 | 00004 | 00016 | 04340 | MOVE    | TR   | 4,16,267              |
| 08980 | 11 | 08974 | 00020 | 04350 |         | AM   | MOVE+6,20,7           |
| 08992 | 11 | 08979 | 00020 | 04360 |         | AM   | MOVE+11,20,7          |
| 09004 | 24 | 08962 | 00570 | 04370 |         | C    | UPDATE+6,NEXT,6       |
| 09016 | 47 | 08944 | 01300 | 04380 |         | BL   | LOOP                  |
| 09028 | 26 | 00585 | 04880 | 04390 |         | TF   | NMP2LO,NM2ZER,6       |
| 09040 | 16 | 00042 | 05292 | 04400 |         | TFM  | ZLDBR,FETEX           |
| 09052 | 26 | 00057 | 07771 | 04410 | RECDT   | TF   | ZLDCA,DTDCF+13        |
| 09064 | 49 | 00012 | 00000 | 04420 |         | B    | 12,,,                 |
| 09073 |    |       |       | 04430 |         | DORG | *-2                   |
|       |    |       |       | 04440 | *       |      |                       |
|       |    |       |       | 04450 | *       |      |                       |
|       |    |       |       | 04460 | *       |      |                       |
|       |    |       |       |       |         |      | H O L D               |
| 09074 | 24 | 00580 | 00425 | 04470 | HOLD    | C    | MPINLO,NAME,6         |
| 09074 |    | 00001 |       | 04480 | BUFBEQ  | DS   | 1,HOLD                |
| 09086 | 46 | 09130 | 01200 | 04490 |         | BE   | HOLD2                 |
| 09098 | 27 | 07500 | 07499 | 04500 |         | BT   | CKDT,MAXLOC           |
| 09110 | 44 | 05480 | 00099 | 04510 |         | BNF  | NNOD,99               |
| 09122 | 49 | 10062 |       | 04520 |         | B7   | NIDT2                 |
| 09130 | 44 | 10414 | 00585 | 04530 | HOLD2   | BNF  | ACTHLD,NMP2LO,11      |
| 09142 | 49 | 05480 |       | 04540 |         | B7   | NNOD                  |
| 09150 | 16 | 12291 | 00040 | 04550 | RESBEG  | TFM  | IXOFF+25,40,10        |
| 09162 | 16 | 00070 | 00299 | 04560 | BEGIN   | TFM  | 70,299,,              |
| 09174 | 27 | 05096 | 05095 | 04570 |         | BT   | ROWCK,ROWCK-1         |
| 09186 | 47 | 09210 | 00200 | 04580 |         | BNC2 | BEG                   |
| 09198 | 34 | 00000 | 00971 | 04590 |         | SKIP | ,1                    |
| 09201 |    | 00003 | X2    | 04600 | SUBAD   | DAC  | 3,SRS,*-8             |
| 09210 | 31 | 00404 | 04830 | 04610 | BEG     | TR   | INPUT-1,0000-1        |
| 09222 | 37 | 00405 | 00500 | 04620 |         | RACD | INPUT                 |
| 09234 | 14 | 00405 | 00044 | 04630 |         | CM   | INPUT,14,10           |
| 09246 | 47 | 09210 | 01200 | 04640 |         | BNE  | BEG                   |
| 09258 | 49 | 09362 |       | 04650 |         | B7   | FRMERR                |
| 09266 | 16 | 00070 | 00299 | 04660 | FROMER  | TFM  | 70,299,,              |
| 09278 | 27 | 05096 | 05095 | 04670 |         | BT   | ROWCK,ROWCK-1         |
| 09290 | 33 | 00564 | 00000 | 04680 | CFLGS   | CF   | INPUT+159,,4          |
| 09302 | 12 | 09296 | 00002 | 04690 |         | SM   | CFLGS+6,2,10          |
| 09314 | 14 | 09296 | 00406 | 04700 |         | CM   | CFLGS+6,INPUT+1,9     |
| 09326 | 47 | 09290 | 01200 | 04710 |         | BNE  | CFLGS                 |
| 09338 | 31 | 00564 | 04650 | 04720 |         | TR   | INPUT+159,DAYRM-1     |
| 09350 | 32 | 00416 | 00000 | 04730 |         | SF   | INPUT+11              |
| 09362 | 16 | 00405 | 00034 | 04740 | FRMERR  | TFM  | INPUT,34,10           |
| 09374 | 46 | 09406 | 00200 | 04750 |         | BI   | C4DP,00200            |
| 09386 | 31 | 05022 | 07444 | 04760 |         | TR   | PRINT,TYPWR           |
| 09398 | 49 | 09442 |       | 04770 |         | B7   | FRME                  |
| 09406 | 31 | 05022 | 07392 | 04780 | C4DP    | TR   | PRINT,PRNTR           |
| 09418 | 34 | 00000 | 00971 | 04790 |         | SKIP | ,1                    |
| 09421 |    | 00003 | X2    | 04800 | EXECU   | DAC  | 3,RUN,*-8             |
| 09430 | 39 | 00405 | 00400 | 04810 |         | WACD | INPUT                 |
| 09442 | 17 | 05022 | 00405 | 04820 | FRME    | BTM  | PRINT,INPUT,7         |
| 09454 | 47 | 09478 | 00100 | 04830 |         | BNC1 | RECNAME               |
| 09466 | 48 | 00000 | 00000 | 04840 |         | H    | ,,,                   |
| 09469 |    | 00004 | X2    | 04850 | STORE   | DAC  | 4,HOLD,*-8            |
| 09478 | 45 | 09502 | 00421 | 04860 | RECNAME | BNR  | INPPL,INPUT+16,7      |
| 09490 | 15 | 09489 | 00000 | 04870 |         | TDH  | RECNAME+11,0,6        |
| 09502 | 11 | 09489 | 00002 | 04880 | INPPL   | AM   | RECNAME+11,2,7        |
| 09514 | 14 | 09489 | 00425 | 04890 |         | CH   | RECNAME+11,INPUT+20,7 |
| 09526 | 46 | 09546 | 01100 | 04900 |         | BH   | CXSS1                 |
| 09538 | 49 | 09478 |       | 04910 |         | B7   | RECNAME               |
| 09546 | 16 | 09489 | 00421 | 04920 | CXSS1   | TFM  | RECNAME+11,INPUT+16,7 |
| 09558 | 24 | 00413 | 12701 | 04930 |         | C    | INPUT+8,DAY+6,,       |
| 09570 | 46 | 09902 | 01200 | 04940 |         | BE   | DATE                  |
| 09582 | 17 | 05022 | 04501 | 04950 |         | BTM  | PRINT,DAYID,7         |
| 09594 | 26 | 07499 | 00574 | 04960 |         | TF   | MAXLOC,MAX            |
| 09606 | 26 | 00563 | 04791 | 04965 |         | TF   | INPUT+158 ,B000+70    |
| 09618 | 24 | 00413 | 05213 | 04970 |         | C    | INPUT+8,COMPL+6,,     |
| 09630 | 47 | 09710 | 01200 | 04980 |         | BNE  | HLDC                  |
| 09642 | 14 | 00574 | 00800 | 04990 |         | CM   | MAX,0,9               |
| 09654 | 46 | 10082 | 01200 | 05000 |         | BE   | FCHPC                 |
| 09666 | 24 | 00574 | 09937 | 05010 |         | C    | MAX,LIMIT             |
| 09678 | 47 | 10038 | 01300 | 05020 |         | BL   | NIDT                  |
| 09690 | 17 | 05022 | 02663 | 05030 |         | BTM  | PRINT,DTFUL           |
| 09702 | 49 | 09210 |       | 05040 |         | B7   | BEG                   |
| 09710 | 24 | 00413 | 09475 | 05050 | HLDC    | C    | INPUT+8,STORE+6,,     |
| 09722 | 46 | 09074 | 01200 | 05060 |         | BE   | HOLD                  |
| 09734 | 24 | 00411 | 09425 | 05070 |         | C    | INPUT+6,EXECU+4,,     |
| 09746 | 47 | 09766 | 01200 | 05080 |         | BNE  | CUTCK                 |
| 09758 | 49 | 05372 |       | 05090 |         | B7   | RUN                   |
| 09766 | 24 | 00411 | 08495 | 05100 | CUTCK   | C    | INPUT+6,DELET+4,,     |
| 09778 | 47 | 09810 | 01200 | 05110 |         | BNE  | DSKCK                 |
| 09790 | 27 | 07500 | 07499 | 05120 |         | BT   | CKDT,MAXLOC           |
| 09802 | 49 | 07772 |       | 05130 |         | B7   | CUT                   |
| 09810 | 24 | 00413 | 12631 | 05140 | DSKCK   | C    | INPUT+8,TABOUT+6,,    |
| 09822 | 46 | 10242 | 01200 | 05150 |         | BE   | DISK                  |
| 09834 | 24 | 00411 | 09205 | 05160 |         | C    | INPUT+6,SUBAD+4,,     |
| 09846 | 46 | 10558 | 01200 | 05170 |         | BE   | SRS                   |
| 09858 | 24 | 00411 | 07411 | 05180 |         | C    | INPUT+6,EXIT+4,,      |
| 09870 | 46 | 10538 | 01200 | 05190 |         | BE   | OUT                   |

RECORD SQUISHED DISK TABLE

NORMAL ENTRY POINT TO EXEC

EXTERNAL EXEC ENTRY PT AFTER \*CARD

HALT FOR NEW JOB - SENSE SWITCH 1

DATE \* CARD CHECK

CODE \* CARD CHECK

HOLD \* CARD CHECK

CUT \* CARD CHECK

DISK \* CARD CHECK

SRS \* CARD CHECK

OUT \* CARD CHECK

| LOC   | OP | P/L   | Q     | PG/EN | LABEL  | MNEM | OPERANDS AND REMARKS                                 |
|-------|----|-------|-------|-------|--------|------|------------------------------------------------------|
| 09882 | 17 | 05022 | ±2633 | 05200 |        | BTM  | PRINT,CCERR,7, INVALID * CARD                        |
| 09894 | 49 | 09210 |       | 05210 |        | B7   | BEG                                                  |
| 09902 | 31 | 04502 | 00416 | 05220 | DATE   | TR   | DAYID+1,INPUT+11                                     |
| 09914 | 33 | 04534 | 00000 | 05230 | DATE1  | CF   | DAYID+33,,, Q ADDRESS = PREBEG                       |
| 09925 |    | 00005 |       | 05240 | PREBEG | DC   | 5,00592,DATE1+11                                     |
| 09926 | 32 | 00099 | 00000 | 05250 | DATE2  | SF   | 99,,, Q ADDRESS = LIMIT                              |
| 09937 |    | 00003 |       | 05260 | LIMIT  | DC   | 3,199,DATE2+11                                       |
| 09938 | 34 | 12702 | 00701 | 05270 |        | K    | DATDCF,00701                                         |
| 09950 | 38 | 12702 | 00702 | 05280 | DATOD  | WN   | DATDCF,00702,, STORE DATE INFO                       |
| 09962 | 36 | 12702 | 00703 | 05290 |        | RN   | DATDCF,00703                                         |
| 09974 | 47 | 10018 | 03900 | 05300 | MILBUS | BNI  | DATDAT,03900                                         |
| 09985 |    | 00002 |       | 05310 | SUBLIM | DC   | 2,37,MILBUS+11                                       |
| 09986 | 44 | 05156 | 00099 | 05320 |        | BNF  | HOWRE,99                                             |
| 09998 | 33 | 00099 | 00000 | 05330 | DCTNC  | CF   | 99,,,7                                               |
| 10007 |    | 00003 |       | 05340 | CNTCD  | DS   | 3,DCTNC+9                                            |
| 10009 |    | 00002 |       | 05350 | SUBCT  | DS   | 2,DCTNC+11                                           |
| 10010 | 49 | 09950 |       | 05360 |        | B7   | DATOD                                                |
| 10018 | 17 | 05022 | 04501 | 05370 | DATDAT | BTM  | PRINT,DAYID,7                                        |
| 10030 | 49 | 09210 |       | 05380 |        | B7   | BEG                                                  |
| 10038 | 27 | 07500 | 07499 | 05390 | NIDT   | BT   | CKDT,MAXLOC                                          |
| 10050 | 44 | 10082 | 00099 | 05400 |        | BNF  | FCHPC,99                                             |
| 10062 | 26 | 04929 | 04953 | 05410 | NIDT2  | TF   | DTERR+16,WAS,, PROGRAM TO BE CODED ALREADY ON DISK   |
| 10074 | 49 | 05492 |       | 05420 |        | B7   | MISSER                                               |
|       |    |       |       | 05422 | *      |      |                                                      |
|       |    |       |       | 05424 | *      |      |                                                      |
|       |    |       |       | 05426 | *      |      |                                                      |
|       |    |       |       |       |        |      | C O D E                                              |
| 10082 | 26 | 00580 | 00425 | 05430 | FCHPC  | TF   | MP1NLO,NAME,6                                        |
| 10094 | 26 | 00099 | 00580 | 05440 |        | TF   | 99,MP1NLO                                            |
| 10106 | 11 | 00099 | 00001 | 05450 |        | AM   | 99,1,7                                               |
| 10118 | 31 | 00099 | 00564 | 05460 |        | TR   | 99,INPUT+159,6                                       |
| 10130 | 32 | 00585 | 00000 | 05470 |        | SF   | NMP2LO,,6                                            |
| 10141 |    | 00004 |       | 05480 | SUBAR  | DC   | 4,5000,*                                             |
| 10142 | 26 | 00037 | 04719 | 05490 |        | TF   | ZLDCRD,LDCRD                                         |
| 10154 | 16 | 00042 | ±0186 | 05500 | TFM    |      | ZLDBR,RETCOD,7                                       |
| 10166 | 26 | 00057 | 07771 | 05510 |        | TF   | ZLDCA,DTDCF+13,, RECORD MAX+1 DISK TAB ENTRY ON DISK |
| 10178 | 49 | 00000 |       | 05520 |        | B7   | 0                                                    |
| 10186 | 27 | 05096 | 05095 | 05530 | RETCOD | BT   | ROWCK,ROWCK-1                                        |
| 10198 | 15 | 00025 | 00006 | 05540 |        | TDM  | ZLDROW,6,, FETCH SCAN ROUTINE                        |
| 10210 | 26 | 00042 | 09925 | 05550 |        | TF   | ZLDBR,PREBEG                                         |
| 10222 | 26 | 00057 | 12728 | 05560 |        | TF   | ZLDCA,PREDCF                                         |
| 10234 | 49 | 00000 |       | 05570 |        | B7   | 0                                                    |
| 10242 | 16 | 05059 | 00041 | 05580 | DISK   | TFM  | PRINT+37,41,10                                       |
| 10254 | 31 | 00448 | 04874 | 05590 |        | TR   | INPUT+43,NM2ZER-6                                    |
| 10266 | 73 | 00447 | 00574 | 05600 |        | TNF  | INPUT+42,HAX                                         |
| 10278 | 17 | 05022 | 00443 | 05610 |        | BTM  | PRINT,INPUT+38                                       |
| 10290 | 73 | 00447 | 00570 | 05620 |        | TNF  | INPUT+42,NEXT                                        |
| 10302 | 17 | 05022 | 00439 | 05630 |        | BTM  | PRINT,INPUT+34                                       |
| 10314 | 16 | 07581 | 00000 | 05640 | DISK2  | TFM  | CNTR,000,9                                           |
| 10326 | 24 | 07581 | 00574 | 05650 | LSTRE  | C    | CNTR,MAX                                             |
| 10338 | 46 | 10394 | 01200 | 05660 |        | BE   | RESTR                                                |
| 10350 | 11 | 07581 | 00001 | 05670 |        | AM   | CNTR,001,9                                           |
| 10362 | 17 | 05022 | 00595 | 05680 | NMENT  | BTM  | PRINT,DTNM1,7                                        |
| 10374 | 11 | 10373 | 00020 | 05690 |        | AM   | NMENT+11,20,7, PRINT NAME(I) FOR ALL I               |
| 10386 | 49 | 10326 |       | 05700 |        | B7   | LSTRE                                                |
| 10394 | 16 | 10373 | 00595 | 05710 | RESTR  | TFM  | NMENT+11,DTNM1,7                                     |
| 10406 | 49 | 09210 |       | 05720 |        | B7   | BEG                                                  |
| 10414 | 26 | 00570 | 00585 | 05730 | ACTHLD | TF   | NEXT,NMP2LO,11                                       |
| 10426 | 11 | 00574 | 00001 | 05740 |        | AM   | MAX,1,9                                              |
| 10438 | 11 | 00585 | 00020 | 05750 |        | AM   | NMP2LO,20,9                                          |
| 10450 | 11 | 00580 | 00020 | 05760 |        | AM   | MP1NLO,20,9                                          |
| 10462 | 26 | 00580 | 04841 | 05770 |        | TF   | MP1NLO,0000+10,6                                     |
| 10474 | 16 | 00042 | ±0494 | 05780 |        | TFM  | ZLDBR,CALLIX                                         |
| 10486 | 49 | 07892 |       | 05790 |        | B7   | RECDT1+12,,, RECORD UPDATED DISK TABLE               |
| 10494 | 27 | 05096 | 05095 | 05810 | CALLIX | BT   | ROWCK,ROWCK-1                                        |
| 10506 | 31 | 00038 | 12950 | 05820 |        | TR   | 38,LABINX                                            |
| 10518 | 15 | 00025 | 00006 | 05830 |        | TDM  | 25,6                                                 |
| 10530 | 49 | 00000 |       | 05840 |        | B7   | 0                                                    |
| 10538 | 36 | 00000 | 00500 | 05850 | OUT    | RNCD | 0                                                    |
| 10550 | 49 | 00000 |       | 05860 |        | B7   | 0                                                    |
|       |    |       |       | 05870 | *      |      |                                                      |
|       |    |       |       | 05880 | *      |      |                                                      |
|       |    |       |       | 05890 | *      |      |                                                      |
|       |    |       |       |       |        |      | S T O R E R E L S U B S                              |
| 00415 |    | 00008 |       | 05900 | SUBNAM | DS   | 8,INPUT+10                                           |
| 00419 |    | 00004 |       | 05910 | NSR    | DS   | 4,INPUT+14                                           |
| 00423 |    | 00008 |       | 05920 | NIDFIL | DS   | 8,INPUT+18                                           |
| 00431 |    | 00008 |       | 05930 | LENFIL | DS   | 8,INPUT+26                                           |
| 00439 |    | 00008 |       | 05940 | TNSC   | DS   | 8,INPUT+34                                           |
| 00447 |    | 00008 |       | 05950 | TNC    | DS   | 8,INPUT+42                                           |
| 13996 |    | 00404 |       | 05960 | SUBNMS | DSS  | 404,13996                                            |
| 14007 |    | 00001 |       | 05970 | SUBNM1 | DS   | 1,SUBNMS+11                                          |
| 14400 |    | 00520 |       | 05980 | SUBTAB | DSS  | 520,SUBNMS+404                                       |
| 14403 |    | 00001 |       | 05990 | LNMDAT | DS   | 1,SUBTAB+3                                           |
| 14407 |    | 00001 |       | 06000 | TOTLEN | DS   | 1,SUBTAB+7                                           |
| 14412 |    | 00001 |       | 06010 | STSCNO | DS   | 1,SUBTAB+12                                          |
| 14920 |    | 00080 |       | 06020 | SUBBUF | DSS  | 80,14920                                             |
| 14988 |    | 00005 |       | 06030 | FIRST  | DS   | 5,SUBBUF+68                                          |
| 10558 | 72 | 00419 | 10709 | 06040 | SRS    | TNS  | NSR,NSRSTR                                           |
| 10570 | 16 | 10745 | 00000 | 06050 |        | TFM  | TND,0,8                                              |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS                                        |
|-------|----|-------|-------|-------|--------|------|-------------------------------------------------------------|
| 10582 | 14 | 10709 | 00080 | 06060 |        | CM   | NSRSTR,0,10                                                 |
| 10594 | 46 | 09210 | 01200 | 06070 |        | BE   | BEG                                                         |
| 10606 | 24 | 10709 | 09985 | 06080 |        | C    | NSRSTR,SUBLIM,, CHECK NO. SUBS EXCEED LIMIT                 |
| 10618 | 47 | 10650 | 01100 | 06090 |        | BNH  | SUB1                                                        |
| 10630 | 17 | 05022 | ±2469 | 06100 |        | BTM  | PRINT,TMAYSB,7                                              |
| 10642 | 49 | 09210 |       | 06110 |        | B7   | BEG                                                         |
| 10650 | 34 | 04976 | 00701 | 06120 | SUB1   | K    | SUBDCF,00701,, SEEK CYL AND SET UP LD AREA FOR SUB STOI     |
| 10662 | 26 | 00037 | 04719 | 06130 |        | TF   | ZLDCRD,LDCRD                                                |
| 10674 | 16 | 00042 | ±0826 | 06140 |        | TFM  | ZLDBR,CKSB,7                                                |
| 10686 | 26 | 00057 | 04989 | 06150 |        | TF   | ZLDCA,SUBDCF+13                                             |
| 10698 | 32 | 00045 | 00080 | 06160 |        | SF   | ZLDSA-4,,10                                                 |
| 10709 |    | 00002 |       | 06170 | NSRSTR | DS   | 2,*                                                         |
| 10710 | 16 | 11612 | ±4412 | 06180 |        | TFM  | TOTAB+6,STSCNO,7, INIT OF STMENTS FOR SUB TAB. AND NAME EIT |
| 10722 | 16 | 11624 | ±4403 | 06190 |        | TFM  | TOTAB1+6,LNMDAT,7                                           |
| 10734 | 33 | 11620 | 00000 | 06200 |        | CF   | TOTAB1+2,,8                                                 |
| 10745 |    | 00004 |       | 06210 | TND    | DS   | 4,*                                                         |
| 10746 | 16 | 11636 | ±4407 | 06220 |        | TFM  | TOTAB2+6,TOTLEN,7                                           |
| 10758 | 33 | 11632 | 00000 | 06230 |        | CF   | TOTAB2+2                                                    |
| 10770 | 16 | 11648 | ±4007 | 06240 |        | TFM  | TOTAB3+6,SUBNM1,7                                           |
| 10782 | 33 | 11644 | 00000 | 06250 |        | CF   | TOTAB3+2,,8                                                 |
| 10793 |    | 00004 |       | 06260 | NCDS   | DS   | 4,*                                                         |
| 10794 | 31 | 00404 | 04830 | 06270 |        | TR   | INPUT-1,0000-1                                              |
| 10806 | 16 | 10009 | 00080 | 06280 |        | TFM  | SUBCT,0,10                                                  |
| 10818 | 49 | 10950 |       | 06290 |        | B7   | RDCD1                                                       |
| 10826 | 47 | 10858 | 03800 | 06300 | CKSB   | BNI  | CKSBI,03800,, RETURN PT AFTER SUB TO DISK                   |
| 10838 | 17 | 05022 | ±2561 | 06310 |        | BTM  | PRINT,EXCCYL,7                                              |
| 10850 | 49 | 09210 |       | 06320 |        | B7   | BEG                                                         |
| 10858 | 27 | 05096 | 05095 | 06330 | CKSB1  | BT   | ROWCK,ROWCK-1                                               |
| 10870 | 25 | 00069 | 00009 | 06335 |        | TD   | 69,,9                                                       |
| 10882 | 24 | 10709 | 10009 | 06340 | CKSB2  | C    | NSRSTR,SUBCT,, CHECK FOR ALL SUBS READ IN                   |
| 10894 | 47 | 10926 | 01200 | 06350 |        | BNE  | RDCD2                                                       |
| 10906 | 34 | 04990 | 00701 | 06360 |        | K    | SBTBC,00701,, SEEK SUB TABLE CYLINDER                       |
| 10918 | 49 | 12118 |       | 06370 |        | B7   | TB2DSK                                                      |
| 10926 | 21 | 00049 | 10743 | 06380 | RDCD2  | A    | ZLDSA,TND-2                                                 |
| 10938 | 16 | 11268 | ±1538 | 06390 |        | TFM  | SUBWNG+6,TOTAB0                                             |
| 10950 | 37 | 00405 | 00500 | 06400 | RDCD1  | RACD | INPUT,, READ SUB S CARD                                     |
| 10962 | 14 | 00405 | 000±3 | 06410 |        | CH   | INPUT,13,10                                                 |
| 10974 | 46 | 11006 | 01200 | 06420 |        | BE   | SUBSZ                                                       |
| 10986 | 17 | 05022 | ±2497 | 06430 |        | BTM  | PRINT,DOLCD,7                                               |
| 10998 | 49 | 09210 |       | 06440 |        | B7   | BEG                                                         |
| 11006 | 11 | 10009 | 00081 | 06450 | SUBSZ  | AM   | SUBCT,1,10                                                  |
| 11018 | 26 | 11161 | 10745 | 06460 |        | TF   | SAVE,TND                                                    |
| 11030 | 72 | 00431 | 10745 | 06470 |        | TNS  | LENFIL,TND                                                  |
| 11042 | 13 | 10745 | 00085 | 06480 |        | NH   | TND,5,10                                                    |
| 11054 | 43 | 11206 | 00099 | 06490 |        | BD   | FINTNS,99                                                   |
| 11066 | 72 | 00447 | 10793 | 06500 |        | TNS  | TNC,NCDS                                                    |
| 11078 | 72 | 00439 | 11372 | 06510 |        | TNS  | TNSC,NSCDS                                                  |
| 11090 | 72 | 00423 | 11137 | 06520 |        | TNS  | NIDFIL,NID                                                  |
| 11102 | 15 | 11112 | 00000 | 06530 | LFTJS  | TDM  | LFTJS+10,0                                                  |
| 11114 | 16 | 00415 | 00080 | 06540 |        | TFM  | INPUT+10,0,10                                               |
| 11126 | 33 | 00414 | 00000 | 06550 |        | CF   | INPUT+9,,8                                                  |
| 11137 |    | 00004 |       | 06560 | NID    | DS   | 4,*                                                         |
| 11138 | 43 | 11250 | 00406 | 06570 | LFTJUS | BD   | SBCON1,INPUT+1                                              |
| 11150 | 32 | 00408 | 00000 | 06580 |        | SF   | INPUT+3                                                     |
| 11161 |    | 00004 |       | 06590 | SAVE   | DS   | 4,*                                                         |
| 11162 | 26 | 00413 | 00415 | 06600 |        | TF   | INPUT+8,INPUT+10                                            |
| 11174 | 43 | 11226 | 11112 | 06610 |        | BD   | SBCON,LFTJS+10                                              |
| 11186 | 15 | 11112 | 00001 | 06620 |        | TDM  | LFTJS+10,1                                                  |
| 11198 | 49 | 11138 |       | 06630 |        | B7   | LFTJUS                                                      |
| 11206 | 17 | 05022 | ±2595 | 06640 | FINTNS | BTM  | PRINT,SBODLN                                                |
| 11218 | 49 | 09210 |       | 06650 |        | B7   | BEG                                                         |
| 11226 | 43 | 11250 | 00406 | 06660 | SBCON  | BD   | SBCON1,INPUT+1                                              |
| 11238 | 17 | 05022 | ±2731 | 06670 |        | BTM  | PRINT,SBNMER                                                |
| 11250 | 14 | 10745 | 00000 | 06680 | SBCON1 | CM   | TND,0,8                                                     |
| 11262 | 46 | 11318 | 01200 | 06690 | SUBWNG | BE   | SBIWR                                                       |
| 11274 | 24 | 10141 | 10745 | 06700 |        | C    | SUBAR,TND                                                   |
| 11286 | 46 | 11338 | 01300 | 06710 |        | BNL  | RDSBN                                                       |
| 11298 | 17 | 05022 | ±2537 | 06720 |        | BTM  | PRINT,STOBIG                                                |
| 11310 | 49 | 09210 |       | 06730 |        | B7   | BEG                                                         |
| 11318 | 17 | 05022 | ±2441 | 06740 | SBIWR  | BTM  | PRINT,FSBHR                                                 |
| 11330 | 49 | 09210 |       | 06750 |        | B7   | BEG                                                         |
| 11338 | 16 | 10007 | 00000 | 06760 | RDSBN  | TFM  | CNTCD,0,9                                                   |
| 11350 | 36 | 14920 | 00500 | 06770 | RDSUB  | RNCD | SUBBUF,, READ CARDS OF SUB H                                |
| 11362 | 15 | 14984 | 0000± | 06780 |        | TDM  | FIRST-4,1,711                                               |
| 11372 |    | 00004 |       | 06790 | NSCDS  | DS   | 4,*-1                                                       |
| 11374 | 11 | 10007 | 00001 | 06800 |        | AM   | CNTCD,1,9                                                   |
| 11386 | 31 | 14988 | 14920 | 06810 |        | TR   | FIRST,SUBBUF,6, STORE SUB INSTRS IN BUFFER AREA             |
| 11398 | 24 | 11372 | 10007 | 06820 |        | C    | NSCDS,CNTCD                                                 |
| 11410 | 46 | 11350 | 01100 | 06830 |        | BH   | RDSUB                                                       |
| 11422 | 46 | 11458 | 01200 | 06840 |        | BE   | CHEKCD                                                      |
| 11434 | 45 | 11494 | 14920 | 06850 | TRAIL  | BNR  | GONTN,SUBBUF                                                |
| 11446 | 11 | 10007 | 00001 | 06860 |        | AM   | CNTCD,1,9                                                   |
| 11458 | 24 | 10793 | 10007 | 06870 | CHEKCD | C    | NCDS,CNTCD                                                  |
| 11470 | 47 | 11606 | 01100 | 06880 |        | BNH  | TOTAB                                                       |
| 11482 | 36 | 14920 | 00500 | 06890 |        | RNCD | SUBBUF,, READ TRAILER CARDS AND ADJUST FOR CURE             |
| 11494 | 15 | 14920 | 0000± | 06900 | CONTN  | TDM  | SUBBUF,1,11                                                 |
| 11506 | 25 | 14924 | 00400 | 06910 |        | TD   | SUBBUF+4,400,6                                              |
| 11518 | 31 | 14920 | 14925 | 06920 |        | TR   | SUBBUF,SUBBUF+5                                             |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM                                               | OPERANDS AND REMARKS                                  |
|-------|----|-------|-------|-------|--------|----------------------------------------------------|-------------------------------------------------------|
| 11530 | 49 | 11434 |       | 06930 | B7     | TRAIL                                              |                                                       |
| 11538 | 14 | 11137 | 00000 | 06940 | TOTABO | CM                                                 | NID,0,8                                               |
| 11550 | 46 | 11606 | 01200 | 06950 | BE     | TOTAB                                              |                                                       |
| 11562 | 24 | 11161 | 11137 | 06960 | C      | SAVE,NID                                           |                                                       |
| 11574 | 46 | 11606 | 01100 | 06970 | BH     | TOTAB                                              |                                                       |
| 11586 | 17 | 05022 | +2379 | 06980 | BTM    | PRINT,MULENT,7                                     |                                                       |
| 11598 | 49 | 09210 |       | 06990 | B7     | BEG                                                |                                                       |
| 11606 | 26 | 00000 | 00049 | 07000 | TOTAB  | TF                                                 | ,ZLDSA,, MAKE ENTRIES TO SUB TABLE                    |
| 11618 | 26 | 00000 | 11137 | 07010 | TOTAB1 | TF                                                 | ,NID                                                  |
| 11630 | 26 | 00000 | 10745 | 07020 | TOTAB2 | TF                                                 | ,TND                                                  |
| 11642 | 26 | 00000 | 00415 | 07030 | TOTAB3 | TF                                                 | ,SUBNAM,, SUB NAME TO SUB NAME TABLE                  |
| 11654 | 16 | 11684 | +5001 | 07040 | TFM    | SETGM+6,15001                                      |                                                       |
| 11666 | 21 | 11684 | 10745 | 07050 | A      | SETGM+6,TND                                        |                                                       |
| 11678 | 25 | 15001 | 04491 | 07060 | SETGM  | TD                                                 | 15001,GRPMK                                           |
| 11690 | 21 | 11648 | 12439 | 07070 | A      | TOTAB3+6,INCREM                                    |                                                       |
| 11702 | 11 | 10745 | 00099 | 07080 | AM     | TND,99,8                                           |                                                       |
| 11714 | 26 | 00052 | 10743 | 07090 | TF     | ZLDSCTND-2                                         |                                                       |
| 11726 | 33 | 00051 | 00000 | 07100 | CF     | ZLDSCT-1                                           |                                                       |
| 11738 | 15 | 00050 | 00000 | 07110 | TDM    | ZLDSCT-2,0,11                                      |                                                       |
| 11750 | 14 | 00052 | 00000 | 07120 | CM     | ZLDSCT,0,9                                         |                                                       |
| 11762 | 46 | 10882 | 01200 | 07130 | BE     | CKSB2                                              |                                                       |
| 11774 | 16 | 11869 | +5000 | 07140 | TFM    | RELOCP+11,15000,7                                  |                                                       |
| 11786 | 16 | 11941 | +5001 | 07150 | TFM    | RELOCP+11,15001,7                                  |                                                       |
| 11798 | 16 | 11876 | +5002 | 07160 | TFM    | FLAGP+6,15002,7                                    |                                                       |
| 11810 | 16 | 11948 | +5007 | 07170 | TFM    | FLAGQ+6,15007,7                                    |                                                       |
| 11822 | 16 | 11912 | +5006 | 07180 | TFM    | PM5000+6,15006,7                                   |                                                       |
| 11834 | 16 | 11984 | +5011 | 07190 | TFM    | QM5000+6,15011,7                                   |                                                       |
| 11846 | 16 | 11881 | 00012 | 07200 | TFM    | COUNT,12,7                                         |                                                       |
| 11858 | 44 | 11930 | 00000 | 07210 | RELOCP | BNF                                                | RELOCP,,, RELOCATE RELATIVE TO ZERO                   |
| 11870 | 32 | 00000 | 00000 | 07220 | FLAGP  | SF                                                 |                                                       |
| 11881 |    | 00005 |       | 07230 | COUNT  | DS                                                 | 5,FLAGP+11                                            |
| 11882 | 44 | 11906 | 11912 | 07240 | BNF    | **+24,PM5000+6,11                                  |                                                       |
| 11894 | 32 | 11917 | 00000 | 07250 | SF     | PM5000+11                                          |                                                       |
| 11906 | 12 | 00000 | 05000 | 07260 | PM5000 | SM                                                 | ,5000,7                                               |
| 11918 | 33 | 11917 | 00000 | 07270 | CF     | PM5000+11                                          |                                                       |
| 11930 | 44 | 12002 | 00000 | 07280 | RELOCP | BNF                                                | INCREL                                                |
| 11942 | 32 | 00000 | 00000 | 07290 | FLAGQ  | SF                                                 |                                                       |
| 11954 | 44 | 11978 | 11984 | 07300 | BNF    | **+24,QM5000+6,11                                  |                                                       |
| 11966 | 32 | 11989 | 00000 | 07310 | SF     | QM5000+11                                          |                                                       |
| 11978 | 12 | 00000 | 05000 | 07320 | QM5000 | SM                                                 | ,5000,7                                               |
| 11990 | 33 | 11989 | 00000 | 07330 | CF     | QM5000+11                                          |                                                       |
| 12002 | 24 | 11881 | 11137 | 07340 | INCREL | C                                                  | COUNT,NID                                             |
| 12014 | 46 | 00012 | 01300 | 07350 | BNL    | 12                                                 |                                                       |
| 12026 | 11 | 11881 | 00012 | 07360 | AM     | COUNT,12,7                                         |                                                       |
| 12038 | 11 | 11869 | 00012 | 07370 | AM     | RELOCP+11,12,7                                     |                                                       |
| 12050 | 11 | 11941 | 00012 | 07380 | AM     | RELOCP+11,12,7                                     |                                                       |
| 12062 | 11 | 11876 | 00012 | 07390 | AM     | FLAGP+6,12,7                                       |                                                       |
| 12074 | 11 | 11948 | 00012 | 07400 | AM     | FLAGQ+6,12,7                                       |                                                       |
| 12086 | 11 | 11912 | 00012 | 07410 | AM     | PM5000+6,12,7                                      |                                                       |
| 12098 | 11 | 11904 | 00012 | 07420 | AM     | QM5000+6,12,7                                      |                                                       |
| 12110 | 49 | 11858 |       | 07430 | B7     | RELOCP                                             |                                                       |
| 12118 | 26 | 00057 | 05003 | 07440 | T82DSK | TF                                                 | ZLDCA,S8TBDC+13,, SET UP FOR RECORD SUB TABLE ON DISK |
| 12130 | 26 | 13997 | 10709 | 07450 | TF     | SUBNMS+1,NSRSTR                                    |                                                       |
| 12142 | 16 | 00042 | +2174 | 07460 | TFM    | ZLDBR,SBS2CH,7                                     |                                                       |
| 12154 | 25 | 14920 | 00403 | 07470 | TD     | SUBTAB+520,403                                     |                                                       |
| 12166 | 49 | 00012 |       | 07480 | B7     | 12                                                 |                                                       |
| 12178 | 27 | 05096 | 05095 | 07490 | SBS2CH | BT                                                 | ROWCK,ROWCK-1                                         |
| 12186 | 26 | 00057 | 04964 | 07500 | TF     | ZLDCA,NAMDCF,, SET UP FOR RECORD SUB NAMES ON DISK |                                                       |
| 12196 | 16 | 00042 | 09162 | 07510 | TFM    | ZLDBR,BEGIN                                        |                                                       |
| 12210 | 25 | 14398 | 04651 | 07520 | TD     | SUBNMS+402,DAYRM                                   |                                                       |
| 12222 | 25 | 14399 | 00403 | 07530 | TD     | SUBNMS+403,403                                     |                                                       |
| 12234 | 12 | 11648 | 00009 | 07540 | SM     | TOTAB3+6,9,7                                       |                                                       |
| 12246 | 25 | 11648 | 04651 | 07550 | TD     | TOTAB3+6,DAYRM,6                                   |                                                       |
| 12258 | 49 | 00000 |       | 07560 | B7     | 0                                                  |                                                       |
| 12266 | 31 | 00300 | 12284 | 07570 | IXOFF  | TR                                                 | 300,IXOFF+18                                          |
| 12278 | 11 | 12291 | 00020 | 07580 | AM     | IXOFF+25,20,10                                     |                                                       |
| 12301 |    | 00012 |       | 07590 | DC     | 12,400031800009                                    |                                                       |
| 12302 | 16 | 00369 | 00008 | 07600 | TFM    | 00369,8,2                                          |                                                       |
| 12314 | 49 | 00342 | 00000 | 07610 | B      | 342,,35                                            |                                                       |
| 12326 | 49 | 12346 |       | 07620 | B7     | RESTAD                                             |                                                       |
| 12334 | 60 | 12346 | 00000 | 07630 | BSNX   | RESTAD                                             |                                                       |
| 12345 |    | 00001 |       | 07640 | DC     | 1,,*                                               |                                                       |
| 12346 | 31 | 00300 | 12756 | 07650 | RESTAD | TR                                                 | 300,ADTAB                                             |
| 12358 | 15 | 00370 | 00007 | 07660 | TDM    | 370,7                                              |                                                       |
| 12370 | 49 | 09150 |       | 07670 | B7     | RESBEG                                             |                                                       |
| 12379 |    | 00012 | X2    | 07680 | MULENT | DAC                                                | 12,WRONG ENTRY'                                       |
| 12439 |    | 00038 |       | 07690 | INCREM | DC                                                 | 38,130000000000013000000000013000000000010            |
| 12441 |    | 00014 | X2    | 07700 | FSBWR  | DAC                                                | 14,1ST SUB WRONG'                                     |
| 12469 |    | 00014 | X2    | 07710 | TMAYSB | DAC                                                | 14,TOO MANY SUBS'                                     |
| 12497 |    | 00020 | X2    | 07720 | DOLCD  | DAC                                                | 20,\$ CARD NOT IN PLACE'                              |
| 12537 |    | 00012 | X2    | 07730 | STOBIG | DAC                                                | 12,SUB TOO BIG'                                       |
| 12561 |    | 00017 | X2    | 07740 | EXCCYL | DAC                                                | 17,SUB CYL EXCEEDED'                                  |
| 12595 |    | 00015 | X2    | 07750 | SBODLN | DAC                                                | 15,SUB ODD LENGTH'                                    |
| 12625 |    | 00004 | X2    | 07760 | TABOUT | DAC                                                | 4,DISK                                                |
| 12633 |    | 00015 | X2    | 07770 | CCERR  | DAC                                                | 15,INVALID * CARD'                                    |
| 12663 |    | 00016 | X2    | 07780 | DTFUL  | DAC                                                | 16,DISK TABLE FULL'                                   |
| 12695 |    | 00004 | X2    | 07790 | DAY    | DAC                                                | 4,DATE                                                |
| 12702 |    | 00014 |       | 07800 | DATDCF | DSC                                                | 14,07984400204500                                     |

| LOCTN | OP | P/L      | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS                               |
|-------|----|----------|-------|-------|--------|------|----------------------------------------------------|
| 12728 |    | 00013    |       | 07810 | PREDCF | DC   | 13,7960004400592                                   |
| 12731 |    | 00013 X2 |       | 07820 | SBNMER | DAC  | 13,SUB NAME ERR'                                   |
| 12756 |    | 00050    |       | 07830 | ADTAB  | DSC  | 50,0123456789123456789-23456789-J3456789-JKL       |
| 12806 |    | 00021    |       | 07840 | ADTAB2 | DSC  | 21,56789-JKLM6789-JKLMN'                           |
| 12826 |    | 00000    |       | 07850 | ENDTAB | DS   | ,ADTAB2+20                                         |
| 12829 |    | 00037 X2 |       | 07860 | FIXCUT | DAC  | 37,CUT HDWR ERR-PROGRAMS ON FILE FOLLOW'           |
| 12903 |    | 00024 X2 |       | 07870 | CTHER  | DAC  | 24,RELOAD C4D-INITIAL LOAD'                        |
| 12950 |    | 00021    |       | 07880 | LABINX | DSC  | 21,00424007912507500424'                           |
| 12982 |    |          |       | 07890 |        | DORG | 12982                                              |
| 12982 | 49 | 12266    | 00000 | 07900 |        | B    | IXOFF                                              |
| 12990 |    |          |       | 07910 |        | DORG | 12990                                              |
| 12994 |    | 00005    | 09162 | 07920 |        | DSA  | BEGIN, FROMER                                      |
| 12999 |    | 00005    | 09266 |       |        |      |                                                    |
| 13000 |    |          |       | 07930 |        | DORG | 13000                                              |
| 00185 |    | 00005    |       | 07940 | UB     | DS   | 5,185                                              |
| 13001 |    | 00001 X2 |       | 07950 | CDBUF  | DAS  | 1,13001                                            |
|       |    |          |       | 07960 | *      |      |                                                    |
|       |    |          |       | 07970 | *      |      |                                                    |
|       |    |          |       | 07980 | *      |      |                                                    |
|       |    |          |       | 07990 | INITL  | RCTY |                                                    |
| 13000 | 34 | 00000    | 00102 | 08000 |        | WATY | ORORLT                                             |
| 13012 | 39 | 13769    | 00100 | 08010 |        | RNTY | INITL+2                                            |
| 13024 | 36 | 13002    | 00100 | 08020 |        | BD   | LATLD,INITL+2                                      |
| 13036 | 43 | 13388    | 13002 | 08030 |        | BD   | TWODRS,182                                         |
| 13048 | 43 | 13284    | 00182 | 08040 | TRIAGN | RCTY |                                                    |
| 13060 | 34 | 00000    | 00102 | 08050 |        | WATY | INNEXT                                             |
| 13072 | 39 | 13597    | 00100 | 08060 |        | RCTY |                                                    |
| 13084 | 34 | 00000    | 00102 | 08070 |        | RNTY | NEXT-4                                             |
| 13096 | 36 | 00566    | 00100 | 08080 | PRG    | SF   | NEXT-4                                             |
| 13108 | 32 | 00566    | 00000 | 08090 | PRGAR  | DS   | 5,PRG+11                                           |
| 13119 |    | 00005    |       | 08100 |        | CM   | NEXT,61000,7                                       |
| 13120 | 14 | 00570    | 61000 | 08110 |        | BNL  | CHKUPR                                             |
| 13132 | 46 | 13180    | 01300 | 08120 |        | RCTY |                                                    |
| 13144 | 34 | 00000    | 00102 | 08130 |        | WATY | TOLO                                               |
| 13156 | 39 | 13667    | 00100 | 08140 |        | B    | TRIAGN                                             |
| 13168 | 49 | 13060    | 00000 | 08150 | CHKUPR | CM   | NEXT,79000,7                                       |
| 13180 | 14 | 00570    | 79000 | 08160 |        | BNH  | FIXUB                                              |
| 13192 | 47 | 13240    | 01100 | 08170 |        | RCTY |                                                    |
| 13204 | 34 | 00000    | 00102 | 08180 |        | WATY | TOHI                                               |
| 13216 | 39 | 13705    | 00100 | 08190 |        | B    | TRIAGN                                             |
| 13228 | 49 | 13060    | 00000 | 08200 | FIXUB  | TF   | PRGAR,NEXT                                         |
| 13240 | 26 | 13119    | 00570 | 08210 |        | SM   | PRGAR,60000,7                                      |
| 13252 | 12 | 13119    | 60000 | 08220 |        | TF   | UB,PRGAR                                           |
| 13264 | 26 | 00185    | 13119 | 08230 |        | B7   | ONE                                                |
| 13276 | 49 | 13308    |       | 08240 | TWODRS | TFM  | NEXT,60000,7                                       |
| 13284 | 16 | 00570    | 60000 | 08250 |        | TFM  | UB,20000,7                                         |
| 13296 | 16 | 00185    | 20000 | 08260 | ONE    | TD   | NEXT+1,GRPHK                                       |
| 13308 | 25 | 00571    | 04491 | 08270 |        | TF   | NSUB1,NEXT                                         |
| 13320 | 26 | 00590    | 00570 | 08280 |        | TFM  | MAX,0,9                                            |
| 13332 | 16 | 00574    | 00000 | 08290 |        | TD   | MAX+1,ENDTAB                                       |
| 13344 | 25 | 00575    | 12826 | 08300 |        | TF   | 603,0000+10                                        |
| 13356 | 26 | 00603    | 04841 | 08310 |        | TF   | 223,LDONE                                          |
| 13368 | 26 | 00223    | 13767 | 08320 |        | B7   | LATLD1                                             |
| 13380 | 49 | 13468    |       | 08330 | LATLD  | TD   | GETUB,401                                          |
| 13388 | 25 | 13744    | 00401 | 08340 |        | RN   | GETUB,702                                          |
| 13400 | 36 | 13744    | 00702 | 08350 |        | SH   | 18790,60000                                        |
| 13412 | 12 | 18790    | 60000 | 08360 |        | BZ   | LATLD2                                             |
| 13424 | 46 | 13456    | 01200 | 08370 |        | TF   | 185,18790                                          |
| 13436 | 26 | 00185    | 18790 | 08380 |        | B7   | LATLD1                                             |
| 13448 | 49 | 13468    |       | 08390 | LATLD2 | TFM  | 185,20000                                          |
| 13456 | 16 | 00185    | 20000 | 08400 | LATLD1 | TD   | TFSK+7,400                                         |
| 13468 | 25 | 08787    | 00400 | 08410 |        | SH   | TFSK+11,BUFEG                                      |
| 13480 | 12 | 08791    | 09074 | 08420 |        | AM   | TFSK+8,10,10                                       |
| 13492 | 11 | 08788    | 00040 | 08430 |        | TD   | DUBFIN+7,400                                       |
| 13504 | 25 | 05799    | 00400 | 08440 |        | TD   | DATDCF,401                                         |
| 13516 | 25 | 12702    | 00401 | 08450 |        | TD   | DTDCF,401                                          |
| 13528 | 25 | 07750    | 00401 | 08460 |        | TD   | DRIVE,401                                          |
| 13540 | 25 | 04726    | 00401 | 08470 |        | TD   | SURDCF,401                                         |
| 13552 | 25 | 04976    | 00401 | 08480 |        | TD   | SBTBDC,401                                         |
| 13564 | 25 | 04990    | 00401 | 08490 |        | TD   | LABINX+6,401                                       |
| 13576 | 25 | 12956    | 00401 | 08500 |        | B7   | 18000                                              |
| 13588 | 49 | 18000    |       | 08510 | INNEXT | DAC  | 35,ENTER PROGRAM STORAGE START SECTOR'             |
| 13597 |    | 00035 X2 |       | 08520 | TOLO   | DAC  | 19,TOO LOW, TRY AGAIN'                             |
| 13667 |    | 00019 X2 |       | 08530 | TOHI   | DAC  | 20,TOO HIGH, TRY AGAIN'                            |
| 13705 |    | 00020 X2 |       | 08540 | GETUB  | DSC  | 14,07980400118700                                  |
| 13744 |    | 00014    |       | 08550 | LDONE  | DC   | 10,0412500500                                      |
| 13767 |    | 00010    |       | 08560 | ORORLT | DAC  | 47,ENTER DIGIT 0 IF INITIAL LOAD, 1 IF LATER LOAD' |
| 13769 |    | 00047 X2 |       | 08570 |        | DORG | 18000                                              |
| 18000 |    |          |       | 08580 |        | TD   | 210,401                                            |
| 18000 | 25 | 00210    | 00401 | 08590 |        | SF   | 0                                                  |
| 18012 | 32 | 00000    | 00000 | 08600 | LDSYS  | WN   | 210,702                                            |
| 18024 | 38 | 00210    | 00702 | 08610 |        | RN   | 210,703                                            |
| 18036 | 36 | 00210    | 00703 | 08620 |        | BNL  | NXTLD,03900                                        |
| 18048 | 47 | 18136    | 03900 | 08630 |        | BNF  | LDERR,0                                            |
| 18060 | 44 | 18092    | 00000 | 08640 |        | CF   | 0                                                  |
| 18072 | 33 | 00000    | 00000 | 08650 |        | B7   | LDSYS                                              |
| 18084 | 49 | 18024    |       | 08660 | LDERR  | RCTY |                                                    |
| 18092 | 34 | 00000    | 00102 | 08670 |        | WATY | LDERMS                                             |
| 18104 | 39 | 18169    | 00100 |       |        |      |                                                    |

SYSTEM LOAD

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS                |
|-------|----|-------|-------|-------|--------|------|-------------------------------------|
| 18116 | 48 | 00000 | 00000 | 08680 | STOP   | H    |                                     |
| 18128 | 49 | 18116 |       | 08690 |        | B7   | STOP                                |
| 18136 | 31 | 00200 | 18192 | 08700 | NXTLD  | TR   | 200,LOADR                           |
| 18148 | 25 | 00080 | 00231 | 08710 |        | TD   | 80,231                              |
| 18160 | 49 | 00200 |       | 08720 |        | B7   | 200                                 |
| 18169 |    | 00012 | X2    | 08730 | LDERMS | DAC  | 12,LD HDWR ERR'                     |
| 18192 |    | 00032 |       | 08740 | LOADR  | DSC  | 32,360000000500310000R000104900200' |
| 13000 |    |       |       | 08750 |        | DEND | INITL                               |

54

```
04060 DCFEX 00130 00420 03880
04150 DIAGA 00690 00730 00740 00770 00880 00930 01250 01370 01630 01710 02070 02130 02230 02270 02310
02400 02480 02520 02560 02640 02720 02760 02820 02860 02950 02990 03050 03110 03210 03250
03290 03390 03430 03470
04510 ECNST 00930
03750 ENDSW 02660
04500 ERCON 00690
00930 ERCST 03340
00420 EXENAB
04080 FORMT 01240
01950 HCT 01930 01940 01970 01980 02000
03810 HDWRE 00440 03650
04100 HERR 03800
04130 INC 01110 01160 01460 02010
00840 INIT 00810 00820 00830 00950 01340 02050 02110 02170 02190 02200 02350 02370 02380 02440 02450
02600 02620 02630 02690 02800 02900 02920 02930 03030 03090 03150 03170 03180 03330 03350
03360
02170 ISB 02120
02350 ISC 01600 02180
03090 ISD 03040
02600 ISE 02360
02110 ISG 02060
02050 ISITI 01310
03150 ISP 03100
03330 ISR 03160
02900 ISS 02610
03030 IST 02910
04140 LAD 00640 00670 03580 03590 03610
01460 LPC 00790 01010 01130 01180 01320 01350 01550 01670 01740 01800 01890 01920 01960 01990 02040
00820 LP1 00640 00850
04110 NENM 00430
03520 PAR 00390 01520 01790 03490
03780 ROCK 00230 03700 03730 03950
03910 ROCK1 03790
01660 SA3 01530 01610 01750
01370 SDAT 01290
01400 SD1 00800
00340 SETSQ 00300 00340
01630 SIO 01590
00190 SQN 03620
01330 SSWD 01420
00260 START 00320 00340 00590 03750
03580 STCM 00900 00940 03560
04120 STER 03830
04170 STNSW 00380 00970
03490 STST 00700 00760 01270 01400 01650 01730 02090 02150 02250 02290 02330 02420 02500 02540 02580
02670 02740 02780 02840 02880 02970 03010 03070 03130 03230 03270 03310 03410 03450
01510 SWA 01300 01410 01540 01660 01740
01480 SWB 01000 01310 01400 01530 01590 01600 01650 01730
01830 SWC 00790 00980 01040 01080 01170 01320 01390
00370 SWCS 00320 00330 00360
01470 SWD 00990 01330
00530 TEST 00480 00500 00510 00560
00490 TL 00470 00520 00580 00600 00610 00910 01870 01880 03530 03570 03580 03600
03640 TMXDK 00150
01850 TR 01010 01060 01090 01110 01140 01160 01350 01460 01470 01500 01570 01690 01770 01820 01840
01860 01910 01930 02010
03660 WDK 03700
03830 WEM 00430 03800 03850 03860
```

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM                                      | OPERANDS          | AND               | REMARKS |
|-------|----|-------|-------|-------|--------|-------------------------------------------|-------------------|-------------------|---------|
|       |    |       |       | 00000 | **     | FORTRAN STATEMENT SCAN                    |                   |                   | 12/6/66 |
|       |    |       |       | 00010 | *      | CARD INPUT                                |                   |                   |         |
|       |    |       |       | 00020 | *      | * CONTROL CARD CALLS EXECUTIVE            |                   |                   |         |
|       |    |       |       | 00030 | *      | LAD -- ZONE ADDR OF BLANK AFTER STATEMENT |                   |                   |         |
|       |    |       |       | 00040 | *      | DIAGA -- ENTRY FOR DIAGNOSTICIAN          |                   |                   |         |
|       |    |       |       | 00050 | *      | COMPA -- ENTRY FOR COMPILER               |                   |                   |         |
|       |    |       |       | 00060 | *      | STNSW -- SET J FOR NUMBERED STATEMENT     |                   |                   |         |
|       |    |       |       | 00070 | *      | LAD-3 -- FLAGGED IF CONTINUATION REQD     |                   |                   |         |
|       |    |       |       | 00080 | *      | COMPA-1 FLAGGED IF PAR UNBALANCE          |                   |                   |         |
|       |    |       |       | 00090 | *      | (NOT ON FORMATS)                          |                   |                   |         |
|       |    |       |       | 00100 | *      |                                           |                   |                   |         |
| 00404 |    |       |       | 00110 |        | DORG                                      | 404               |                   |         |
| 00404 | 25 | 04454 | 00402 | 00120 |        | TD                                        | DCF               | ,402              |         |
| 00416 | 25 | 04475 | 00401 | 00130 |        | TD                                        | DCFEX+2           | ,401              |         |
| 00428 | 25 | 04438 | 00401 | 00140 |        | TD                                        | DCFDG-14          | ,401              |         |
| 00440 | 21 | 04021 | 00185 | 00150 |        | A                                         | TMXDK+11          | ,185              |         |
| 00452 | 49 | 18012 |       | 00160 |        | B7                                        | 18012             |                   |         |
| 00405 |    | 00000 |       | 00170 | CHI    | DS                                        | ,405              |                   |         |
| 00573 |    |       |       | 00180 |        | DORG                                      | CHI+168           |                   |         |
| 00580 |    | 00008 |       | 00190 | SQN    | DC                                        | 8,0               |                   |         |
| 00592 |    |       |       | 00200 |        | DORG                                      | 592               |                   |         |
| 00592 | 16 | 00023 | 00299 | 00205 |        | TFM                                       | 23                | ,299              |         |
| 00604 | 36 | 00044 | 00703 | 00220 |        | RN                                        | 44                | ,703              |         |
| 00616 | 17 | 04174 | 00024 | 00230 |        | BTM                                       | ROCK              | ,24               |         |
| 00628 | 16 | 00405 | 00000 | 00230 |        | TFM                                       | CHI               | ,210              |         |
| 00640 | 11 | 00634 | 00002 | 00240 |        | AM                                        | *-6               | ,2                | ,10     |
| 00652 | 44 | 00628 | 00562 | 00250 |        | BNF                                       | *-24              | ,CHI+157          |         |
| 00664 | 26 | 00563 | 04289 | 00260 | START  | TF                                        | CHI+158,CAL-13    |                   |         |
| 00676 | 37 | 00405 | 00500 | 00270 |        | RACD                                      | CHI               |                   |         |
| 00688 | 49 | 00700 | 00000 | 00280 |        | B                                         | *+12              |                   |         |
| 00700 | 14 | 00563 | 00000 | 00290 |        | CM                                        | CHI+158           | ,10               |         |
| 00712 | 47 | 00756 | 01200 | 00300 |        | BNE                                       | SETSQ             |                   |         |
| 00724 | 16 | 04009 | 00001 | 00310 |        | TFM                                       | COUNT,1,8         |                   |         |
| 00736 | 16 | 00694 | 00788 | 00320 |        | TFM                                       | START+30,SWCS     |                   |         |
| 00748 | 49 | 00800 |       | 00330 |        | B7                                        | SWCS+12           |                   |         |
| 00756 | 16 | 00694 | 00768 | 00340 | SETSQ  | TFM                                       | START+30,SETSQ+12 |                   |         |
| 00768 | 72 | 00563 | 04009 | 00350 |        | TNS                                       | CHI+158           | ,COUNT            |         |
| 00780 | 49 | 00800 |       | 00360 |        | B7                                        | SWCS+12           |                   |         |
| 00788 | 11 | 04009 | 00001 | 00370 | SWCS   | AM                                        | COUNT,1,10        |                   |         |
| 00800 | 15 | 04633 | 00000 | 00380 |        | TDM                                       | STNSW             |                   |         |
| 00812 | 16 | 03889 | 00000 | 00390 |        | TFM                                       | PAR+1             | ,811              |         |
| 00824 | 14 | 00405 | 00014 | 00400 |        | CM                                        | CHI               | ,14               | ,10     |
| 00836 | 47 | 00880 | 01200 | 00410 |        | BNE                                       | CKL               |                   |         |
| 00848 | 16 | 04473 | 12999 | 00420 | EXENAB | TFM                                       | DCFEX             | ,-12999           |         |
| 00860 | 16 | 04240 | 04539 | 00430 |        | TFM                                       | WEM+6             | ,NENM             |         |
| 00872 | 49 | 04210 | 00000 | 00440 |        | B                                         | HDWRE             |                   |         |
| 00880 |    |       |       | 00450 |        | DORG                                      | *-3               |                   |         |
| 00880 | 16 | 00903 | 00547 | 00460 | *      |                                           |                   | CHECK LAST        |         |
| 00892 | 26 | 00937 | 00000 | 00470 | CKL    | TFM                                       | TL                | ,CHI+142          |         |
| 00903 |    | 00000 |       | 00480 |        | TF                                        | TEST              |                   |         |
| 00904 | 43 | 00948 | 00937 | 00490 | TL     | DS                                        | ,*                |                   |         |
| 00916 | 43 | 00968 | 00936 | 00500 |        | BD                                        | CKRM              | ,TEST             |         |
| 00928 | 12 | 00903 | 00002 | 00510 |        | BD                                        | CKCON             | ,TEST-1           |         |
| 00937 |    | 00000 |       | 00520 |        | SM                                        | TL                | ,2                | ,10     |
| 00940 | 49 | 00892 | 00000 | 00530 | TEST   | DS                                        | ,*-2              |                   |         |
| 00948 |    |       |       | 00540 |        | B                                         | CKL+12            |                   |         |
| 00948 | 45 | 00968 | 00937 | 00550 |        | DORG                                      | *-3               |                   |         |
| 00960 | 49 | 00928 |       | 00560 | CKRM   | BNR                                       | CKCON             | ,TEST             |         |
| 00968 | 14 | 00903 | 00405 | 00570 |        | B7                                        | CKL+48            |                   |         |
| 00980 | 47 | 00664 | 01300 | 00580 | CKCON  | CM                                        | TL                | ,CHI              |         |
| 00992 | 11 | 00903 | 00002 | 00590 |        | BL                                        | START             |                   |         |
| 01004 | 26 | 00903 | 00403 | 00600 |        | AM                                        | TL                | ,2                | ,10     |
| 01016 | 45 | 01036 | 00407 | 00610 |        | TF                                        | TL                | ,403              | ,6      |
| 01028 | 49 | 01268 |       | 00620 |        | BNR                                       | *+20              | ,CHI+2            |         |
| 01036 | 44 | 01196 | 04619 | 00630 |        | B7                                        | CMNT              |                   |         |
|       |    |       |       | 00640 |        | BNF                                       | LP1-12            | ,LAD-3            |         |
| 01048 | 14 | 00415 | 00069 | 00650 | *      |                                           |                   | CONTINUE REQUIRED |         |
| 01060 | 33 | 04619 | 00000 | 00660 |        | CM                                        | CHI+10            | ,69               | ,10     |
| 01072 | 46 | 01104 | 01100 | 00670 |        | CF                                        | LAD-3             |                   |         |
| 01084 | 16 | 04627 | 00758 | 00680 |        | BH                                        | *+32              |                   |         |
| 01096 | 49 | 03854 | 00000 | 00690 |        | TFM                                       | DIAGA             | ,ERCON            |         |
| 01104 |    |       |       | 00700 |        | B                                         | STST              |                   |         |
|       |    |       |       | 00710 |        | DORG                                      | *-3               |                   |         |
| 01104 | 14 | 04627 | 00618 | 00720 | *      |                                           |                   | CONTINUE FOUND    |         |
| 01116 | 16 | 04627 | 00618 | 00730 |        | CM                                        | DIAGA             | ,ACFMT            |         |
| 01128 | 16 | 04632 | 00586 | 00740 |        | TFM                                       | DIAGA             | ,ACFMT            |         |
| 01140 | 47 | 03854 | 01100 | 00750 |        | TFM                                       | COMPA             | ,CCFMT            |         |
| 01152 | 16 | 04627 | 00623 | 00760 |        | BNH                                       | STST              |                   |         |
| 01164 | 16 | 04632 | 00591 | 00770 |        | TFM                                       | DIAGA             | ,ACIO             |         |
| 01176 | 16 | 02256 | 01902 | 00780 |        | TFM                                       | COMPA             | ,CCIO             |         |
| 01188 | 49 | 01860 |       | 00790 |        | TFM                                       | SWC+6             | ,LPC              |         |
| 01196 | 16 | 01226 | 00403 | 00800 |        | B7                                        | SD1               |                   |         |
| 01208 | 11 | 01226 | 00002 | 00810 |        | TFM                                       | INIT              | ,CHI-2            |         |
| 01220 | 14 | 01226 | 00000 | 00820 | LP1    | AM                                        | INIT              | ,2                | ,10     |
| 01226 |    | 00000 |       | 00830 |        | CM                                        | INIT              | ,10               |         |
| 01232 | 46 | 01208 | 01200 | 00840 | INIT   | DS                                        | ,*-5              |                   |         |
| 01244 | 14 | 00405 | 00043 | 00850 |        | BE                                        | LP1               |                   |         |
|       |    |       |       | 00860 | CKCM   | CM                                        | CHI,43,10         |                   |         |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL | MNEM | OPERANDS | AND | REMARKS    |
|-------|----|-------|-------|-------|-------|------|----------|-----|------------|
| 01256 | 47 | 01300 | 01200 | 00870 |       | BNE  | CSTN     |     |            |
| 01268 | 16 | 04627 | 00608 | 00880 | CMNT  | TFM  | DIAGA    |     | ,ACMT      |
| 01280 | 16 | 04632 | 00576 | 00890 |       | TFM  | COMPA    |     | ,CCMT      |
| 01292 | 49 | 03950 |       | 00900 |       | B7   | STCM     |     |            |
| 01300 | 14 | 00903 | 00419 | 00910 | CSTN  | CM   | TL       |     | ,CHI+14    |
| 01312 | 46 | 01344 | 01100 | 00920 |       | BH   | **32     |     |            |
| 01324 | 16 | 04627 | 00763 | 00930 | ERCST | TFM  | DIAGA    |     | ,ECNST     |
| 01336 | 49 | 03950 |       | 00940 |       | B7   | STCM     |     |            |
| 01344 | 14 | 01226 | 00069 | 00950 |       | CM   | INIT     |     | ,69 ,610   |
| 01356 | 47 | 01448 | 01100 | 00960 |       | BNH  | CKD      |     |            |
| 01368 | 15 | 04633 | 00004 | 00970 |       | TDM  | STNSW    |     | ,1 ,11     |
| 01380 | 16 | 02256 | 01560 | 00980 |       | TFM  | SWC+6    |     | ,CFRT      |
| 01392 | 16 | 01920 | 02238 | 00990 | C1    | TFM  | SWD+6    |     | ,CKBL      |
| 01404 | 16 | 01932 | 01744 | 01000 |       | TFM  | SWB+6    |     | ,CMPRS     |
| 01416 | 26 | 02285 | 01901 | 01010 |       | TF   | TR+11    |     | ,LPC-1     |
| 01428 | 16 | 01510 | 00091 | 01020 |       | TFM  | CMP+6    |     | ,91 ,9     |
| 01440 | 49 | 02238 |       | 01030 |       | B7   | CKBL     |     |            |
| 01448 | 16 | 02256 | 01468 | 01040 | CKD   | TFM  | SWC+6    |     | ,CKDT      |
| 01460 | 49 | 01392 |       | 01050 |       | B7   | C1       |     |            |
| 01468 | 14 | 02285 | 00044 | 01060 | CKDT  | CM   | TR+11    |     | ,44 ,610   |
| 01480 | 47 | 01744 | 01200 | 01070 |       | BNE  | CMPRS    |     |            |
| 01492 | 16 | 02256 | 01504 | 01080 |       | TFM  | SWC+6    |     | ,CMP       |
| 01504 | 26 | 00091 | 02285 | 01090 | CMP   | TF   | 91       |     | ,TR+11 ,11 |
| 01516 | 11 | 01510 | 00002 | 01100 |       | AM   | CMP+6    |     | ,2 ,10     |
| 01528 | 21 | 02285 | 04617 | 01110 |       | A    | TR+11    |     | ,INC       |
| 01540 | 43 | 01616 | 01508 | 01120 |       | BD   | CFL-12   |     | ,CMP+4     |
| 01552 | 49 | 01914 |       | 01130 |       | B7   | LPC+12   |     |            |
| 01560 | 14 | 02285 | 00046 | 01140 | CFRT  | CM   | TR+11    |     | ,46 ,610   |
| 01572 | 47 | 01744 | 01200 | 01150 |       | BNE  | CMPRS    |     |            |
| 01584 | 21 | 02285 | 04617 | 01160 |       | A    | TR+11    |     | ,INC       |
| 01596 | 16 | 02256 | 01504 | 01170 |       | TFM  | SWC+6    |     | ,CMP       |
| 01608 | 49 | 01914 |       | 01180 |       | B7   | LPC+12   |     |            |
| 01616 | 16 | 01634 | 00092 | 01190 |       | TFM  | CFL+6    |     | ,92        |
| 01628 | 33 | 00000 | 00000 | 01200 | CFL   | CF   |          |     |            |
| 01640 | 11 | 01634 | 00002 | 01210 |       | AM   | *-6      |     | ,2 ,10     |
| 01652 | 43 | 01672 | 01632 | 01220 |       | BD   | **20     |     | ,*-20      |
| 01664 | 49 | 01628 |       | 01230 |       | B7   | CFL      |     |            |
| 01672 | 24 | 04499 | 00099 | 01240 |       | C    | FORMT+8  |     | ,99        |
| 01684 | 16 | 04627 | 00613 | 01250 |       | TFM  | DIAGA    |     | ,AFMT      |
| 01696 | 16 | 04632 | 00581 | 01260 |       | TFM  | COMPA    |     | ,CFMT      |
| 01708 | 46 | 03854 | 01200 | 01270 |       | BE   | STST     |     |            |
| 01720 | 24 | 04509 | 00099 | 01280 |       | C    | DATA+8   |     | ,99        |
| 01732 | 46 | 01824 | 01200 | 01290 |       | BE   | SDAT     |     |            |
| 01744 | 16 | 01952 | 02002 | 01300 | CMPRS | TFM  | SWA+6    |     | ,A1        |
| 01756 | 16 | 01932 | 02494 | 01310 |       | TFM  | SWB+6    |     | ,ISITI ,8  |
| 01768 | 16 | 02256 | 01902 | 01320 |       | TFM  | SWC+6    |     | ,LPC       |
| 01780 | 16 | 01920 | 01934 | 01330 | SSWD  | TFM  | SWD+6    |     | ,CKLP      |
| 01792 | 16 | 01226 | 00417 | 01340 |       | TFM  | INIT     |     | ,CHI+12    |
| 01804 | 26 | 02285 | 01901 | 01350 |       | TF   | TR+11    |     | ,LPC-1     |
| 01816 | 49 | 01934 |       | 01360 |       | B7   | CKLP     |     |            |
| 01824 | 16 | 04627 | 00683 | 01370 | SDAT  | TFM  | DIAGA    |     | ,AEND      |
| 01836 | 16 | 04632 | 00726 | 01380 |       | TFM  | COMPA    |     | ,CDATA     |
| 01848 | 16 | 02256 | 02330 | 01390 |       | TFM  | SWC+6    |     | ,CKH       |
| 01860 | 16 | 01932 | 03854 | 01400 | SD1   | TFM  | SWB+6    |     | ,STST      |
| 01872 | 16 | 01952 | 02194 | 01410 |       | TFM  | SWA+6    |     | ,A3        |
| 01884 | 49 | 01780 | 00000 | 01420 |       | B    | SSWD     |     |            |
| 01892 |    |       |       | 01430 |       | DORG | *-3      |     |            |
| 01896 |    | 00005 | 00416 | 01440 |       | DSA  | CHI+11   |     |            |
| 01897 |    | 00005 | 00417 | 01450 |       | DSSA | CHI+12   |     |            |
| 01902 | 21 | 02285 | 04617 | 01460 | LPC   | A    | TR+11    |     | ,INC       |
| 01914 | 45 | 01934 | 02285 | 01470 | SWD   | BNR  | CKLP     |     | ,TR+11 ,11 |
| 01926 | 49 | 00000 | 00000 | 01480 | SWB   | B    |          |     |            |
| 01934 |    |       |       | 01490 |       | DORG | *-3      |     |            |
| 01934 | 14 | 02285 | 00024 | 01500 | CKLP  | CM   | TR+11    |     | ,24 ,610   |
| 01946 | 47 | 02002 | 01200 | 01510 | SWA   | BNE  | A1       |     |            |
| 01958 | 11 | 03888 | 00001 | 01520 |       | AM   | PAR      |     | ,1 ,710    |
| 01970 | 44 | 02094 | 01929 | 01530 |       | BNF  | SA3      |     | ,SWB+3     |
| 01982 | 16 | 01952 | 02114 | 01540 |       | TFM  | SWA+6    |     | ,A2 ,8     |
| 01994 | 49 | 01902 | 00000 | 01550 |       | B    | LPC      |     |            |
| 02002 |    |       |       | 01560 |       | DORG | *-3      |     |            |
| 02002 | 14 | 02285 | 00023 | 01570 | A1    | CM   | TR+11    |     | ,23 ,610   |
| 02014 | 47 | 02114 | 01200 | 01580 |       | BNE  | A2       |     |            |
| 02026 | 44 | 02058 | 01929 | 01590 |       | BNF  | SIO      |     | ,SWB+3     |
| 02038 | 16 | 01932 | 02774 | 01600 |       | TFM  | SWB+6    |     | ,ISC       |
| 02050 | 49 | 02094 | 00000 | 01610 |       | B    | SA3      |     |            |
| 02058 |    |       |       | 01620 |       | DORG | *-3      |     |            |
| 02058 | 16 | 04627 | 00678 | 01630 | SIO   | TFM  | DIAGA    |     | ,ADD       |
| 02070 | 16 | 04632 | 00646 | 01640 |       | TFM  | COMPA    |     | ,CDO       |
| 02082 | 16 | 01932 | 03854 | 01650 |       | TFM  | SWB+6    |     | ,STST      |
| 02094 | 16 | 01952 | 02194 | 01660 | SA3   | TFM  | SWA+6    |     | ,A3        |
| 02106 | 49 | 01902 | 00000 | 01670 |       | B    | LPC      |     |            |
| 02114 |    |       |       | 01680 |       | DORG | *-3      |     |            |
| 02114 | 14 | 02285 | 00033 | 01690 | A2    | CM   | TR+11    |     | ,33 ,610   |
| 02126 | 47 | 02194 | 01200 | 01700 |       | BNE  | A3       |     |            |
| 02138 | 16 | 04627 | 00628 | 01710 |       | TFM  | DIAGA    |     | ,AASCN     |
| 02150 | 16 | 04632 | 00596 | 01720 |       | TFM  | COMPA    |     | ,CASCN     |
| 02162 | 16 | 01932 | 03854 | 01730 |       | TFM  | SWB+6    |     | ,STST      |
| 02174 | 44 | 01902 | 01949 | 01740 |       | BNF  | LPC      |     | ,SWA+3     |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL | MNEM | OPERANDS | AND    | REMARKS |
|-------|----|-------|-------|-------|-------|------|----------|--------|---------|
| 02186 | 49 | 02094 | 00000 | 01750 |       | B    | SA3      |        |         |
| 02194 |    |       |       | 01760 |       | DORG | *-3      |        |         |
| 02194 | 14 | 02285 | 00084 | 01770 | A3    | CM   | TR+11    | ,4     | ,610    |
| 02206 | 47 | 02238 | 01200 | 01780 |       | BNE  | CKBL     |        |         |
| 02218 | 12 | 03888 | 00001 | 01790 |       | SM   | PAR      | ,1     | ,10     |
| 02230 | 49 | 01902 | 00000 | 01800 |       | B    | LPC      |        |         |
| 02238 |    |       |       | 01810 |       | DORG | *-3      |        |         |
| 02238 | 14 | 02285 | 00080 | 01820 | CKBL  | CM   | TR+11    | ,      | ,610    |
| 02250 | 47 | 02330 | 01200 | 01830 | SWC   | BNE  | CKH      |        |         |
| 02262 | 11 | 02285 | 00001 | 01840 |       | AM   | TR+11    | ,1     | ,10     |
| 02274 | 31 | 00000 | 00000 | 01850 | TR    | TR   |          |        |         |
| 02286 | 12 | 02285 | 00001 | 01860 |       | SM   | TR+11    | ,1     | ,10     |
| 02298 | 16 | 00903 | 00080 | 01870 |       | TFM  | TL       | ,      | ,610    |
| 02310 | 12 | 00903 | 00002 | 01880 |       | SM   | TL       | ,2     | ,10     |
| 02322 | 49 | 01914 | 00000 | 01890 |       | B    | LPC+12   |        |         |
| 02330 |    |       |       | 01900 |       | DORG | *-3      |        |         |
| 02330 | 14 | 02285 | 00048 | 01910 | CKH   | CM   | TR+11    | ,48    | ,6810   |
| 02342 | 47 | 01902 | 01200 | 01920 |       | BNE  | LPC      |        |         |
| 02354 | 26 | 02384 | 02280 | 01930 |       | TF   | HCT+6    | ,TR+6  |         |
| 02366 | 12 | 02384 | 00003 | 01940 |       | SM   | HCT+6    | ,3     | ,10     |
| 02378 | 14 | 00000 | 00021 | 01950 | HCT   | CM   |          | ,21    | ,10     |
| 02390 | 47 | 01902 | 01200 | 01960 |       | BNE  | LPC      |        |         |
| 02402 | 11 | 02384 | 00002 | 01970 |       | AM   | HCT+6    | ,2     | ,10     |
| 02414 | 14 | 02384 | 00070 | 01980 |       | CM   | HCT+6    | ,70    | ,610    |
| 02426 | 47 | 01902 | 01100 | 01990 |       | BNH  | LPC      |        |         |
| 02438 | 25 | 02339 | 02384 | 02000 |       | TD   | CKH+9    | ,HCT+6 | ,11     |
| 02450 | 21 | 02285 | 04617 | 02010 |       | A    | TR+11    | ,INC   |         |
| 02462 | 12 | 02339 | 00001 | 02020 |       | SM   | CKH+9    | ,1     | ,10     |
| 02474 | 43 | 02450 | 02339 | 02030 |       | BD   | *-24     | ,CKH+9 |         |
| 02486 | 49 | 01902 |       | 02040 |       | B7   | LPC      |        |         |
| 02494 | 14 | 01226 | 00049 | 02050 | ISITI | CM   | INIT     | ,49    | ,610    |
| 02506 | 47 | 02550 | 01200 | 02060 |       | BNE  | ISG      |        |         |
| 02518 | 16 | 04627 | 00633 | 02070 |       | TFM  | DIAGA    | ,AIF   |         |
| 02530 | 16 | 04632 | 00601 | 02080 |       | TFM  | COMPA    | ,CIF   |         |
| 02542 | 49 | 03854 | 00000 | 02090 |       | B    | STST     |        |         |
| 02550 |    |       |       | 02100 |       | DORG | *-3      |        |         |
| 02550 | 14 | 01226 | 00047 | 02110 | ISG   | CM   | INIT     | ,47    | ,610    |
| 02562 | 47 | 02606 | 01200 | 02120 |       | BNE  | ISB      |        |         |
| 02574 | 16 | 04627 | 00708 | 02130 |       | TFM  | DIAGA    | ,AGO   |         |
| 02586 | 16 | 04632 | 00676 | 02140 |       | TFM  | COMPA    | ,CGO   |         |
| 02598 | 49 | 03854 | 00000 | 02150 |       | B    | STST     |        |         |
| 02606 |    |       |       | 02160 |       | DORG | *-3      |        |         |
| 02606 | 14 | 01226 | 00042 | 02170 | ISB   | CM   | INIT     | ,42    | ,610    |
| 02618 | 47 | 02774 | 01200 | 02180 |       | BNE  | ISC      |        |         |
| 02630 | 11 | 01226 | 00040 | 02190 |       | AM   | INIT     | ,10    | ,10     |
| 02642 | 14 | 01226 | 00062 | 02200 |       | CM   | INIT     | ,62    | ,610    |
| 02654 | 46 | 02742 | 01100 | 02210 |       | BH   | *+88     |        |         |
| 02666 | 46 | 02710 | 01200 | 02220 |       | BE   | *+44     |        |         |
| 02678 | 16 | 04627 | 00648 | 02230 |       | TFM  | DIAGA    | ,ABGPR |         |
| 02690 | 16 | 04632 | 00616 | 02240 |       | TFM  | COMPA    | ,CBGPR |         |
| 02702 | 49 | 03854 | 00000 | 02250 |       | B    | STST     |        |         |
| 02710 |    |       |       | 02260 |       | DORG | *-3      |        |         |
| 02710 | 16 | 04627 | 00643 | 02270 |       | TFM  | DIAGA    | ,ABGSG |         |
| 02722 | 16 | 04632 | 00611 | 02280 |       | TFM  | COMPA    | ,CBGSG |         |
| 02734 | 49 | 03854 | 00000 | 02290 |       | B    | STST     |        |         |
| 02742 |    |       |       | 02300 |       | DORG | *-3      |        |         |
| 02742 | 16 | 04627 | 00638 | 02310 |       | TFM  | DIAGA    | ,ABGTR |         |
| 02754 | 16 | 04632 | 00606 | 02320 |       | TFM  | COMPA    | ,CBGTR |         |
| 02766 | 49 | 03854 | 00000 | 02330 |       | B    | STST     |        |         |
| 02774 |    |       |       | 02340 |       | DORG | *-3      |        |         |
| 02774 | 14 | 01226 | 00043 | 02350 | ISC   | CM   | INIT     | ,43    | ,610    |
| 02786 | 47 | 03010 | 01200 | 02360 |       | BNE  | ISE      |        |         |
| 02798 | 11 | 01226 | 00002 | 02370 |       | AM   | INIT     | ,2     | ,10     |
| 02810 | 14 | 01226 | 00041 | 02380 |       | CM   | INIT     | ,41    | ,610    |
| 02822 | 47 | 02866 | 01200 | 02390 |       | BNE  | *+44     |        |         |
| 02834 | 16 | 04627 | 00658 | 02400 |       | TFM  | DIAGA    | ,ACLSG |         |
| 02846 | 16 | 04632 | 00626 | 02410 |       | TFM  | COMPA    | ,CCLSG |         |
| 02858 | 49 | 03854 | 00000 | 02420 |       | B    | STST     |        |         |
| 02866 |    |       |       | 02430 |       | DORG | *-3      |        |         |
| 02866 | 11 | 01226 | 00006 | 02440 |       | AM   | INIT     | ,6     | ,10     |
| 02878 | 14 | 01226 | 00056 | 02450 |       | CM   | INIT     | ,56    | ,610    |
| 02890 | 46 | 02978 | 01100 | 02460 |       | BH   | *+88     |        |         |
| 02902 | 46 | 02946 | 01200 | 02470 |       | BE   | *+44     |        |         |
| 02914 | 16 | 04627 | 00663 | 02480 |       | TFM  | DIAGA    | ,ACNTU |         |
| 02926 | 16 | 04632 | 00631 | 02490 |       | TFM  | COMPA    | ,CCNTU |         |
| 02938 | 49 | 03854 | 00000 | 02500 |       | B    | STST     |        |         |
| 02946 |    |       |       | 02510 |       | DORG | *-3      |        |         |
| 02946 | 16 | 04627 | 00653 | 02520 |       | TFM  | DIAGA    | ,ACOMN |         |
| 02958 | 16 | 04632 | 00621 | 02530 |       | TFM  | COMPA    | ,CCOMN |         |
| 02970 | 49 | 03854 | 00000 | 02540 |       | B    | STST     |        |         |
| 02978 |    |       |       | 02550 |       | DORG | *-3      |        |         |
| 02978 | 16 | 04627 | 00668 | 02560 |       | TFM  | DIAGA    | ,ACNTL |         |
| 02990 | 16 | 04632 | 00636 | 02570 |       | TFM  | COMPA    | ,CCNTL |         |
| 03002 | 49 | 03854 | 00000 | 02580 |       | B    | STST     |        |         |
| 03010 |    |       |       | 02590 |       | DORG | *-3      |        |         |
| 03010 | 14 | 01226 | 00045 | 02600 | ISE   | CM   | INIT     | ,45    | ,610    |
| 03022 | 47 | 03290 | 01200 | 02610 |       | BNE  | ISS      |        |         |
| 03034 | 11 | 01226 | 00006 | 02620 |       | AM   | INIT     | ,6     | ,10     |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL | MNEM | OPERANDS | AND | REMARKS        |
|-------|----|-------|-------|-------|-------|------|----------|-----|----------------|
| 03046 | 45 | 03102 | 01226 | 02630 |       | BNR  | **56     |     | ,INIT ,11      |
| 03058 | 16 | 04627 | 00683 | 02640 |       | TFM  | DIAGA    |     | ,AEND          |
| 03070 | 16 | 04632 | 00651 | 02650 |       | TFM  | COMPA    |     | ,CEND          |
| 03082 | 15 | 04151 | 00001 | 02660 |       | TDM  | ENDSW+1  |     | ,1             |
| 03094 | 49 | 03854 | 00000 | 02670 |       | B    | STST     |     |                |
| 03102 |    |       |       | 02680 |       | DORG | *-3      |     |                |
| 03102 | 14 | 01226 | 00062 | 02690 |       | CM   | INIT     |     | ,62 ,610       |
| 03114 | 47 | 03202 | 01300 | 02700 |       | BL   | **88     |     |                |
| 03126 | 46 | 03170 | 01200 | 02710 |       | BE   | **44     |     |                |
| 03138 | 16 | 04627 | 00688 | 02720 |       | TFM  | DIAGA    |     | ,AEDTR         |
| 03150 | 16 | 04632 | 00656 | 02730 |       | TFM  | COMPA    |     | ,CEDTR         |
| 03162 | 49 | 03854 | 00000 | 02740 |       | B    | STST     |     |                |
| 03170 |    |       |       | 02750 |       | DORG | *-3      |     |                |
| 03170 | 16 | 04627 | 00693 | 02760 |       | TFM  | DIAGA    |     | ,AEDSG         |
| 03182 | 16 | 04632 | 00661 | 02770 |       | TFM  | COMPA    |     | ,CEDSG         |
| 03194 | 49 | 03854 | 00000 | 02780 |       | B    | STST     |     |                |
| 03202 |    |       |       | 02790 |       | DORG | *-3      |     |                |
| 03202 | 14 | 01226 | 00057 | 02800 |       | CM   | INIT     |     | ,57 ,610       |
| 03214 | 46 | 03258 | 01200 | 02810 |       | BE   | **44     |     |                |
| 03226 | 16 | 04627 | 00703 | 02820 |       | TFM  | DIAGA    |     | ,AEXPR         |
| 03238 | 16 | 04632 | 00671 | 02830 |       | TFM  | COMPA    |     | ,CEXP          |
| 03250 | 49 | 03854 | 00000 | 02840 |       | B    | STST     |     |                |
| 03258 |    |       |       | 02850 |       | DORG | *-3      |     |                |
| 03258 | 16 | 04627 | 00698 | 02860 |       | TFM  | DIAGA    |     | ,AEDPR         |
| 03270 | 16 | 04632 | 00666 | 02870 |       | TFM  | COMPA    |     | ,CEDPR         |
| 03282 | 49 | 03854 | 00000 | 02880 |       | B    | STST     |     |                |
| 03290 |    |       |       | 02890 |       | DORG | *-3      |     |                |
| 03290 | 14 | 01226 | 00062 | 02900 | ISS   | CM   | INIT     |     | ,62 ,610       |
| 03302 | 47 | 03414 | 01200 | 02910 |       | BNE  | IST      |     |                |
| 03314 | 11 | 01226 | 00002 | 02920 |       | AM   | INIT     |     | ,2 ,10         |
| 03326 | 14 | 01226 | 00045 | 02930 |       | CM   | INIT     |     | ,45 ,610       |
| 03338 | 46 | 03382 | 01200 | 02940 |       | BE   | **44     |     |                |
| 03350 | 16 | 04627 | 00748 | 02950 |       | TFM  | DIAGA    |     | ,ASTOP         |
| 03362 | 16 | 04632 | 00716 | 02960 |       | TFM  | COMPA    |     | ,CSTOP         |
| 03374 | 49 | 03854 | 00000 | 02970 |       | B    | STST     |     |                |
| 03382 |    |       |       | 02980 |       | DORG | *-3      |     |                |
| 03382 | 16 | 04627 | 00743 | 02990 |       | TFM  | DIAGA    |     | ,ASEG          |
| 03394 | 16 | 04632 | 00711 | 03000 |       | TFM  | COMPA    |     | ,CSEG          |
| 03406 | 49 | 03854 | 00000 | 03010 |       | B    | STST     |     |                |
| 03414 |    |       |       | 03020 |       | DORG | *-3      |     |                |
| 03414 | 14 | 01226 | 00063 | 03030 | IST   | CM   | INIT     |     | ,63 ,610       |
| 03426 | 47 | 03470 | 01200 | 03040 |       | BNE  | ISD      |     |                |
| 03438 | 16 | 04627 | 00753 | 03050 |       | TFM  | DIAGA    |     | ,ATYP          |
| 03450 | 16 | 04632 | 00721 | 03060 |       | TFM  | COMPA    |     | ,CTYP          |
| 03462 | 49 | 03854 | 00000 | 03070 |       | B    | STST     |     |                |
| 03470 |    |       |       | 03080 |       | DORG | *-3      |     |                |
| 03470 | 14 | 01226 | 00044 | 03090 | ISD   | CM   | INIT     |     | ,44 ,610       |
| 03482 | 47 | 03526 | 01200 | 03100 |       | BNE  | ISP      |     |                |
| 03494 | 16 | 04627 | 00673 | 03110 |       | TFM  | DIAGA    |     | ,ADIM          |
| 03506 | 16 | 04632 | 00641 | 03120 |       | TFM  | COMPA    |     | ,CDIM          |
| 03518 | 49 | 03854 | 00000 | 03130 |       | B    | STST     |     |                |
| 03526 |    |       |       | 03140 |       | DORG | *-3      |     |                |
| 03526 | 14 | 01226 | 00057 | 03150 | ISP   | CM   | INIT     |     | ,57 ,610       |
| 03538 | 47 | 03694 | 01200 | 03160 |       | BNE  | ISR      |     |                |
| 03550 | 11 | 01226 | 00002 | 03170 |       | AM   | INIT     |     | ,2 ,10         |
| 03562 | 14 | 01226 | 00059 | 03180 |       | CM   | INIT     |     | ,59 ,610       |
| 03574 | 46 | 03662 | 01100 | 03190 |       | BH   | **88     |     |                |
| 03586 | 46 | 03630 | 01200 | 03200 |       | BE   | **44     |     |                |
| 03598 | 16 | 04627 | 00713 | 03210 |       | TFM  | DIAGA    |     | ,APAUS         |
| 03610 | 16 | 04632 | 00681 | 03220 |       | TFM  | COMPA    |     | ,CPAUS         |
|       |    |       |       | 03226 | *     |      |          |     | INITIALIZE CHI |
| 03622 | 49 | 03854 | 00000 | 03230 |       | B    | STST     |     |                |
| 03630 |    |       |       | 03240 |       | DORG | *-3      |     |                |
| 03630 | 16 | 04627 | 00718 | 03250 |       | TFM  | DIAGA    |     | ,APRNT         |
| 03642 | 16 | 04632 | 00686 | 03260 |       | TFM  | COMPA    |     | ,CPRNT         |
| 03654 | 49 | 03854 | 00000 | 03270 |       | B    | STST     |     |                |
| 03662 |    |       |       | 03280 |       | DORG | *-3      |     |                |
| 03662 | 16 | 04627 | 00723 | 03290 |       | TFM  | DIAGA    |     | ,APCH          |
| 03674 | 16 | 04632 | 00691 | 03300 |       | TFM  | COMPA    |     | ,CPCH          |
| 03686 | 49 | 03854 | 00000 | 03310 |       | B    | STST     |     |                |
| 03694 |    |       |       | 03320 |       | DORG | *-3      |     |                |
| 03694 | 14 | 01226 | 00059 | 03330 | ISR   | CM   | INIT     |     | ,59 ,610       |
| 03706 | 47 | 01324 | 01200 | 03340 |       | BNE  | ERCST    |     |                |
| 03718 | 11 | 01226 | 00004 | 03350 |       | AM   | INIT     |     | ,4 ,10         |
| 03730 | 14 | 01226 | 00059 | 03360 |       | CM   | INIT     |     | ,59 ,610       |
| 03742 | 46 | 03830 | 01100 | 03370 |       | BH   | **88     |     |                |
| 03754 | 47 | 03798 | 01300 | 03380 |       | BL   | **44     |     |                |
| 03766 | 16 | 04627 | 00733 | 03390 |       | TFM  | DIAGA    |     | ,ARERD         |
| 03778 | 16 | 04632 | 00701 | 03400 |       | TFM  | COMPA    |     | ,CRERD         |
| 03790 | 49 | 03854 | 00000 | 03410 |       | B    | STST     |     |                |
| 03798 |    |       |       | 03420 |       | DORG | *-3      |     |                |
| 03798 | 16 | 04627 | 00728 | 03430 |       | TFM  | DIAGA    |     | ,ARD           |
| 03810 | 16 | 04632 | 00696 | 03440 |       | TFM  | COMPA    |     | ,CRD           |
| 03822 | 49 | 03854 | 00000 | 03450 |       | B    | STST     |     |                |
| 03830 |    |       |       | 03460 |       | DORG | *-3      |     |                |
| 03830 | 16 | 04627 | 00738 | 03470 |       | TFM  | DIAGA    |     | ,ARETN         |
| 03842 | 16 | 04632 | 00706 | 03480 |       | TFM  | COMPA    |     | ,CRETN         |
| 03854 | 14 | 03888 | 00000 | 03490 | STST  | CM   | PAR      |     | , ,10          |

| LOCTN | OP | P/L      | Q     | PG/LN | LABEL | MNEM | OPERANDS | AND REMARKS                 |
|-------|----|----------|-------|-------|-------|------|----------|-----------------------------|
| 03866 | 46 | 03890    | 01200 | 03500 |       | BE   | **24     |                             |
| 03878 | 32 | 04631    | 00000 | 03510 |       | SF   | COMPA-1  |                             |
| 03888 |    | 00000    |       | 03520 | PAR   | DS   |          | ,*-1                        |
| 03890 | 26 | 03920    | 00903 | 03530 |       | TF   | **30     | ,TL                         |
| 03902 | 12 | 03920    | 00002 | 03540 |       | SM   | **18     | ,2                          |
| 03914 | 14 | 00000    | 00023 | 03550 |       | CM   |          | ,23                         |
| 03926 | 47 | 03950    | 01200 | 03560 |       | BNE  | STCM     |                             |
| 03938 | 32 | 00900    | 00000 | 03570 |       | SF   | TL-3     |                             |
| 03950 | 26 | 04622    | 00903 | 03580 | STCM  | TF   | LAD      | ,TL                         |
| 03962 | 12 | 04622    | 00001 | 03590 |       | SM   | LAD      | ,1                          |
| 03974 | 16 | 00903    | 00000 | 03600 |       | TFM  | TL       | ,10                         |
| 03986 | 31 | 00548    | 04618 | 03610 |       | TR   | CHI+143  | ,LAD-4                      |
| 03998 | 16 | 00576    | 00000 | 03620 |       | TFM  | SQN-4,,8 |                             |
| 04009 |    | 00000    |       | 03630 | COUNT | DS   | ,*       |                             |
| 04010 | 14 | 04459    | 59998 | 03640 | TMXDK | CM   | DCF+5    | ,59998                      |
| 04022 | 46 | 04198    | 01100 | 03650 |       | BH   | HDWRE-12 |                             |
| 04034 | 15 | 00022    | 00009 | 03655 |       | TDM  | 22       | ,9                          |
| 04046 | 38 | 04454    | 00702 | 03660 | WDK   | WN   | DCF      | ,702                        |
| 04058 | 47 | 04090    | 03600 | 03670 |       | BNI  | **32     | ,3600                       |
| 04070 | 34 | 04454    | 00701 | 03680 |       | K    | DCF      | ,701                        |
| 04082 | 49 | 04046    |       | 03690 |       | B7   | **36     |                             |
| 04090 | 17 | 04174    | 04046 | 03700 |       | BTM  | ROCK     | ,WDK                        |
| 04102 | 15 | 00022    | 00009 | 03710 |       | TDM  | 22       | ,9                          |
| 04114 | 36 | 04454    | 00703 | 03720 |       | RN   | DCF      | ,703                        |
| 04126 | 17 | 04174    | 04114 | 03730 |       | BTM  | ROCK     | ,*-12                       |
| 04138 | 11 | 04459    | 00002 | 03740 |       | AM   | DCF+5    | ,2                          |
| 04150 | 49 | 00664    | 00000 | 03750 | ENDSW | B    | START    |                             |
| 04162 | 49 | 04302    | 00000 | 03770 |       | B    | CAL      |                             |
| 04174 | 47 | 04184    | 01942 | 03780 | ROCK  | BNI  | **10     | ,1942                       |
| 04186 | 43 | 04322    | 00023 | 03790 |       | BD   | ROCK1    | ,23                         |
| 04198 | 16 | 04240    | 04511 | 03800 |       | TFM  | WEM+6    | ,HERR                       |
| 04210 | 46 | 04254    | 00200 | 03810 | HDWRE | BC2  | **44     |                             |
| 04222 | 34 | 00000    | 00102 | 03820 |       | RCTY |          |                             |
| 04234 | 39 | 04563    | 00100 | 03830 | WEM   | WATY | STER     |                             |
| 04246 | 49 | 04266    |       | 03840 |       | B7   | **20     |                             |
| 04254 | 39 | 04240    | 00900 | 03850 |       | WA   | WEM+6    | ,900                        |
| 04266 | 44 | 04290    | 04237 | 03860 |       | BNF  | **24     | ,WEM+3                      |
| 04278 | 48 | 00000    | 00000 | 03870 |       | H    | ,4       |                             |
| 04290 | 31 | 04432    | 04469 | 03880 |       | TR   | CALL+38  | ,DCFEX-4                    |
| 04302 | 31 | 00000    | 04394 | 03890 | CAL   | TR   |          | ,CALL                       |
| 04314 | 49 | 00000    |       | 03900 |       | B7   |          |                             |
| 04322 | 25 | 00022    | 00023 | 03910 | ROCK1 | TD   | 22       | ,23                         |
| 04334 | 46 | 04346    | 00600 | 03920 |       | BI   | **12     | ,600                        |
| 04346 | 46 | 04358    | 00700 | 03925 |       | BI   | **12     | ,700                        |
| 04358 | 46 | 04370    | 01600 | 03930 |       | BI   | **12     | ,1600                       |
| 04370 | 46 | 04382    | 01700 | 03940 |       | BI   | **12     | ,1700                       |
| 04382 | 49 | 04173    | 00000 | 03950 |       | B    | ROCK-1   | ,6                          |
|       |    |          |       | 03960 | *     |      |          | RETURN TO EXECUTIVE ROUTINE |
| 04394 | 34 | 00044    | 00701 | 03970 | CALL  | K    | 44       | ,701                        |
| 04406 | 32 | 00000    | 00000 | 03980 |       | SF   |          |                             |
| 04418 | 36 | 00044    | 00702 | 03990 |       | RN   | 44       | ,702                        |
| 04430 | 49 | 00764    |       | 04000 |       | B7   | 764      |                             |
| 04452 |    | 00016    |       | 04010 | DCFDG | DC   | 16       | ,7920016700604'             |
| 04454 |    | 00002    |       | 04020 | DCF   | DC   | 2        | ,0                          |
| 04468 |    | 00014    |       | 04030 |       | DC   | 14       | ,6000000200404'             |
| 04473 |    | 00005    |       | 04060 | DCFEX | DC   | 5        | ,12994                      |
| 04489 |    | 00016    |       | 04070 |       | DC   | 16       | ,7980412500500'             |
| 04491 |    | 00005 X2 |       | 04080 | FORMT | DAC  | 5        | ,ORMAT                      |
| 04501 |    | 00005 X2 |       | 04090 | DATA  | DAC  | 5        | ,DATA,                      |
| 04511 |    | 00014 X2 |       | 04100 | HERR  | DAC  | 14       | ,HDWR ERR SCAN'             |
| 04539 |    | 00012 X2 |       | 04110 | NENM  | DAC  | 12       | ,NO END CARD'               |
| 04563 |    | 00025 X2 |       | 04120 | STER  | DAC  | 25       | ,WORKING STORAGE OVERFLOW'  |
| 04617 |    | 00006    |       | 04130 | INC   | DC   | 6        | ,200002                     |
| 04622 |    | 00005    |       | 04140 | LAD   | DS   | 5        |                             |
| 04627 |    | 00005    |       | 04150 | DIAGA | DS   | 5        |                             |
| 04632 |    | 00005    |       | 04160 | COMPA | DS   | 5        |                             |
| 04633 |    | 00001    |       | 04170 | STNSW | DS   | 1        |                             |
| 04634 |    | 00001    |       | 04180 |       | DGM  |          |                             |
| 00604 |    |          |       | 04190 |       | DORG | 604      |                             |
| 00608 |    | 00005    |       | 04200 | ACMT  | DS   | 5        |                             |
| 00613 |    | 00005    |       | 04210 | AFMT  | DS   | 5        |                             |
| 00618 |    | 00005    |       | 04220 | ACFMT | DS   | 5        |                             |
| 00623 |    | 00005    |       | 04230 | ACIO  | DS   | 5        |                             |
| 00628 |    | 00005    |       | 04240 | AASCN | DS   | 5        |                             |
| 00633 |    | 00005    |       | 04250 | AIF   | DS   | 5        |                             |
| 00638 |    | 00005    |       | 04260 | ABGTR | DS   | 5        |                             |
| 00643 |    | 00005    |       | 04270 | ABGSG | DS   | 5        |                             |
| 00648 |    | 00005    |       | 04280 | ABGPR | DS   | 5        |                             |
| 00653 |    | 00005    |       | 04290 | ACOMN | DS   | 5        |                             |
| 00658 |    | 00005    |       | 04300 | ACLSG | DS   | 5        |                             |
| 00663 |    | 00005    |       | 04310 | ACNTU | DS   | 5        |                             |
| 00668 |    | 00005    |       | 04320 | ACNTL | DS   | 5        |                             |
| 00673 |    | 00005    |       | 04330 | ADIM  | DS   | 5        |                             |
| 00678 |    | 00005    |       | 04340 | ADO   | DS   | 5        |                             |
| 00683 |    | 00005    |       | 04350 | AEND  | DS   | 5        |                             |
| 00688 |    | 00005    |       | 04360 | AEDTR | DS   | 5        |                             |
| 00693 |    | 00005    |       | 04370 | AEDSG | DS   | 5        |                             |
| 00698 |    | 00005    |       | 04380 | AEDPR | DS   | 5        |                             |

| LOCTN | OP | P/L   | Q | PG/LN | LABEL  | MNEM | OPERANDS | AND REMARKS |
|-------|----|-------|---|-------|--------|------|----------|-------------|
| 00703 |    | 00005 |   | 04390 | AEXPR  | DS   | 5        |             |
| 00708 |    | 00005 |   | 04400 | AGO    | DS   | 5        |             |
| 00713 |    | 00005 |   | 04410 | AP AUS | DS   | 5        |             |
| 00718 |    | 00005 |   | 04420 | APRNT  | DS   | 5        |             |
| 00723 |    | 00005 |   | 04430 | APCH   | DS   | 5        |             |
| 00728 |    | 00005 |   | 04440 | ARD    | DS   | 5        |             |
| 00733 |    | 00005 |   | 04450 | ARERD  | DS   | 5        |             |
| 00738 |    | 00005 |   | 04460 | ARETN  | DS   | 5        |             |
| 00743 |    | 00005 |   | 04470 | ASEG   | DS   | 5        |             |
| 00748 |    | 00005 |   | 04480 | ASTOP  | DS   | 5        |             |
| 00753 |    | 00005 |   | 04490 | ATYP   | DS   | 5        |             |
| 00758 |    | 00005 |   | 04500 | ERCON  | DS   | 5        |             |
| 00763 |    | 00005 |   | 04510 | ECNST  | DS   | 5        |             |
| 00572 |    |       |   | 04520 |        | DORG | 572      |             |
| 00576 |    | 00005 |   | 04530 | CCMT   | DS   | 5        |             |
| 00581 |    | 00005 |   | 04540 | CFMT   | DS   | 5        |             |
| 00586 |    | 00005 |   | 04550 | CCFMT  | DS   | 5        |             |
| 00591 |    | 00005 |   | 04560 | CCIO   | DS   | 5        |             |
| 00596 |    | 00005 |   | 04570 | CASCN  | DS   | 5        |             |
| 00601 |    | 00005 |   | 04580 | CIF    | DS   | 5        |             |
| 00606 |    | 00005 |   | 04590 | CBGTR  | DS   | 5        |             |
| 00611 |    | 00005 |   | 04600 | CBGSG  | DS   | 5        |             |
| 00616 |    | 00005 |   | 04610 | CBGPR  | DS   | 5        |             |
| 00621 |    | 00005 |   | 04620 | CCOMN  | DS   | 5        |             |
| 00626 |    | 00005 |   | 04630 | CCLSG  | DS   | 5        |             |
| 00631 |    | 00005 |   | 04640 | CCNTU  | DS   | 5        |             |
| 00636 |    | 00005 |   | 04650 | CCNTL  | DS   | 5        |             |
| 00641 |    | 00005 |   | 04660 | CDIM   | DS   | 5        |             |
| 00646 |    | 00005 |   | 04670 | CDO    | DS   | 5        |             |
| 00651 |    | 00005 |   | 04680 | CEND   | DS   | 5        |             |
| 00656 |    | 00005 |   | 04690 | CEDTR  | DS   | 5        |             |
| 00661 |    | 00005 |   | 04700 | CEDSG  | DS   | 5        |             |
| 00666 |    | 00005 |   | 04710 | CEDPR  | DS   | 5        |             |
| 00671 |    | 00005 |   | 04720 | CEXP   | DS   | 5        |             |
| 00676 |    | 00005 |   | 04730 | CGO    | DS   | 5        |             |
| 00681 |    | 00005 |   | 04740 | CP AUS | DS   | 5        |             |
| 00686 |    | 00005 |   | 04750 | CPRNT  | DS   | 5        |             |
| 00691 |    | 00005 |   | 04760 | CPCH   | DS   | 5        |             |
| 00696 |    | 00005 |   | 04770 | CRD    | DS   | 5        |             |
| 00701 |    | 00005 |   | 04780 | CRERD  | DS   | 5        |             |
| 00706 |    | 00005 |   | 04790 | CRETN  | DS   | 5        |             |
| 00711 |    | 00005 |   | 04800 | CSEG   | DS   | 5        |             |
| 00716 |    | 00005 |   | 04810 | CSTOP  | DS   | 5        |             |
| 00721 |    | 00005 |   | 04820 | CTYP   | DS   | 5        |             |
| 00726 |    | 00005 |   | 04830 | CDATA  | DS   | 5        |             |
| 00000 |    |       |   | 04850 |        | DEND |          |             |

## C4D DIAGNOSTICIAN

JANUARY 20, 1967

PAGE 1

[illegible]



[illegible]

[illegible]

[illegible]

|       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|--|
| 07550 | SW2   | 02060 | 03590 | 05010 | 07550 | 07590 |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 08770 | SW20  | 01310 | 02650 | 04400 | 04730 | 05070 | 05250 | 05940 | 07760 | 08530 | 08770 | 09090 | 09140 | 09200 | 09290 | 09470 |  |  |  |  |
|       |       | 09530 | 09680 | 10950 | 11170 | 12010 | 12950 | 13350 | 13720 | 13940 | 14380 | 16320 | 16780 |       |       |       |  |  |  |  |
| 04010 | SW200 | 03860 | 03990 | 04250 | 04770 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 03930 | SW201 | 04500 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 08800 | SW21  | 01320 | 02430 | 02640 | 04410 | 04740 | 05080 | 05860 | 05930 | 07770 | 08540 | 08800 | 09060 | 09230 | 11810 | 11850 |  |  |  |  |
|       |       | 11890 | 12691 | 13360 | 13730 | 13930 | 14390 | 16350 | 16790 |       |       |       |       |       |       |       |  |  |  |  |
| 08830 | SW22  | 08830 | 09080 | 09210 | 09380 | 09490 | 09520 |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 08860 | SW23  | 08860 | 09630 | 09640 | 09710 | 09730 |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 08880 | SW24  | 05280 | 05340 | 05830 | 05910 | 08880 | 09900 | 11210 | 11230 | 11440 | 11970 | 12070 | 12730 | 13010 | 14650 |       |  |  |  |  |
| 10000 | SW27  | 09980 | 10070 | 10110 | 10130 | 10180 | 10250 | 10440 | 16380 |       |       |       |       |       |       |       |  |  |  |  |
| 09910 | SW28  | 09910 | 09930 | 10400 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 09950 | SW29  | 09880 | 09940 | 10240 | 10380 | 10580 |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 06570 | SW30  | 01350 | 02560 | 02720 | 03100 | 03130 | 05360 | 05440 | 05730 | 05970 | 06380 | 06450 | 08010 | 08150 | 08560 | 10520 |  |  |  |  |
|       |       | 11350 | 12040 | 12980 | 13970 | 14290 | 14700 |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 06460 | SW31  | 01460 | 06460 | 06790 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 06470 | SW32  | 02730 | 05390 | 05980 | 06470 | 06680 | 06740 | 08160 | 10530 | 12050 | 12990 | 13980 | 14710 |       |       |       |  |  |  |  |
| 06330 | SW35  | 01380 | 01480 | 02350 | 02460 | 02580 | 05480 | 05750 | 05770 | 06330 | 06390 | 06800 | 07050 | 07300 | 07870 | 08040 |  |  |  |  |
|       |       | 08590 | 09350 | 10640 | 10830 | 11390 | 14320 | 16500 |       |       |       |       |       |       |       |       |  |  |  |  |
| 06340 | SW36  | 01420 | 02370 | 06340 | 07320 | 07900 | 08080 | 08670 |       |       |       |       |       |       |       |       |  |  |  |  |
| 14280 | SW37  | 05410 | 05460 | 06360 | 07060 | 09890 | 11370 | 12080 | 13020 | 14370 | 16490 |       |       |       |       |       |  |  |  |  |
| 14300 | SW38  | 02775 | 06410 | 06480 | 14300 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 06350 | SW46  | 01520 | 06350 | 06860 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 08900 | SW47  | 08900 | 09540 | 10960 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 08910 | SW48  | 05610 | 08910 | 10930 | 11090 | 11190 | 12530 | 12710 | 14230 | 16370 |       |       |       |       |       |       |  |  |  |  |
| 00740 | SW49  | 02880 | 02920 | 03060 | 03070 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 00750 | SW500 | 02950 | 14110 | 15060 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 14120 | SW501 | 14120 | 14470 | 14480 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 04870 | SW52  | 04870 | 04930 | 05110 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |
| 04860 | SW54  | 04860 | 04940 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |  |

|       |        |       |       |       |       |       |       |
|-------|--------|-------|-------|-------|-------|-------|-------|
| 11330 | T12    | 11230 |       |       |       |       |       |
| 10340 | T29    | 10310 |       |       |       |       |       |
| 06410 | T38    | 06740 |       |       |       |       |       |
| 15450 | UNDB1  | 15460 | 15470 | 15480 | 15490 | 15760 | 15770 |
| 16160 | UNDEF  | 15420 | 16000 | 16010 |       |       |       |
| 01080 | UTF    | 01050 | 01530 | 01550 | 01620 |       |       |
| 05510 | VDEF   | 05480 |       |       |       |       |       |
| 05480 | VDEF35 | 05460 |       |       |       |       |       |
| 02230 | WHERE  | 02180 | 02250 | 02260 | 02290 |       |       |
| 09240 | WIPE   | 09200 | 09220 |       |       |       |       |
| 05610 | Y1     | 05250 |       |       |       |       |       |
| 05270 | Y2     | 05610 |       |       |       |       |       |
| 05300 | Y3     | 05280 |       |       |       |       |       |
| 05320 | Y4     | 05300 |       |       |       |       |       |
| 05680 | Y5     | 05640 |       |       |       |       |       |
| 05830 | Y6     | 05780 |       |       |       |       |       |
| 05860 | Y7     | 05830 |       |       |       |       |       |
| 05930 | Y8     | 05910 |       |       |       |       |       |
| 02380 | ZAP1   | 02360 | 02490 |       |       |       |       |
| 03271 | Z1     | 03260 | 07600 |       |       |       |       |
| 03535 | Z2     | 03400 |       |       |       |       |       |
| 03540 | Z21    | 03536 |       |       |       |       |       |
| 03970 | Z3     | 04030 |       |       |       |       |       |
| 04320 | Z4     | 04300 |       |       |       |       |       |
| 05010 | Z5     | 04890 |       |       |       |       |       |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM                                                    | OPERANDS AND REMARKS                   |
|-------|----|-------|-------|-------|--------|---------------------------------------------------------|----------------------------------------|
| 00404 |    |       |       | 00000 | * C4D  | DIAGNOSTICIAN                                           |                                        |
| 00405 |    | 00080 | X2    | 00010 |        | DORG 404                                                |                                        |
| 00584 |    |       |       | 00020 | INPUT  | DAS 80                                                  | ,,,AREA WHERE STATEMENTS ARE READ INTO |
| 00584 | 25 | 00826 | 00401 | 00030 |        | DORG 584                                                |                                        |
| 00596 | 49 | 18012 |       | 00040 |        | TD DCEXEC-14 ,401                                       |                                        |
| 00604 |    |       |       | 00050 |        | B7 18012                                                |                                        |
|       |    |       |       | 00060 |        | DORG 604                                                |                                        |
|       |    |       |       | 00070 | *      | THESE DSA INSTRUCTIONS DEFINE BRANCH ADDRESSES FOR EACH |                                        |
|       |    |       |       | 00080 | *      | TYPE SOURCE STATEMENT                                   |                                        |
| 00608 |    | 00005 | 01234 | 00090 |        | DSA STORE                                               |                                        |
| 00613 |    | 00005 | 03836 | 00100 |        | DSA FRMT                                                |                                        |
| 00618 |    | 00005 | 08710 | 00110 |        | DSA CFRMT                                               |                                        |
| 00623 |    | 00005 | 08666 | 00120 |        | DSA CIO                                                 |                                        |
| 00628 |    | 00005 | ±2394 | 00130 |        | DSA ARITH                                               |                                        |
| 00633 |    | 00005 | ±4850 | 00140 |        | DSA IF                                                  |                                        |
| 00638 |    | 00005 | 08742 | 00150 |        | DSA BGTR                                                |                                        |
| 00643 |    | 00005 | 08926 | 00160 |        | DSA BGSF                                                |                                        |
| 00648 |    | 00005 | 09082 | 00170 |        | DSA BGPR                                                |                                        |
| 00653 |    | 00005 | ±5926 | 00180 |        | DSA COMMON                                              |                                        |
| 00658 |    | 00005 | 09264 | 00190 |        | DSA CLSG                                                |                                        |
| 00663 |    | 00005 | 02534 | 00200 |        | DSA END                                                 |                                        |
| 00668 |    | 00005 | 02534 | 00210 |        | DSA END                                                 |                                        |
| 00673 |    | 00005 | ±5858 | 00220 |        | DSA DIMENS                                              |                                        |
| 00678 |    | 00005 | 02616 | 00230 |        | DSA DO                                                  |                                        |
| 00683 |    | 00005 | 08590 | 00240 |        | DSA CLPT2                                               |                                        |
| 00688 |    | 00005 | 09452 | 00250 |        | DSA ENDTR                                               |                                        |
| 00693 |    | 00005 | 09380 | 00260 |        | DSA ENDSF                                               |                                        |
| 00698 |    | 00005 | 09472 | 00270 |        | DSA ENDPR                                               |                                        |
| 00703 |    | 00005 | 09540 | 00280 |        | DSA EXCPR                                               |                                        |
| 00708 |    | 00005 | ±5410 | 00290 |        | DSA GOTO                                                |                                        |
| 00713 |    | 00005 | 05694 | 00300 |        | DSA PAUSE                                               |                                        |
| 00718 |    | 00005 | 05754 | 00310 |        | DSA PUNCH                                               |                                        |
| 00723 |    | 00005 | 05754 | 00320 |        | DSA PUNCH                                               |                                        |
| 00728 |    | 00005 | 05734 | 00330 |        | DSA READ                                                |                                        |
| 00733 |    | 00005 | 05714 | 00340 |        | DSA REREAD                                              |                                        |
| 00738 |    | 00005 | 09572 | 00350 |        | DSA RETURN                                              |                                        |
| 00743 |    | 00005 | 09628 | 00360 |        | DSA SEGMT                                               |                                        |
| 00748 |    | 00005 | ±5366 | 00370 |        | DSA END2                                                |                                        |
| 00753 |    | 00005 | 03816 | 00380 |        | DSA TYPEXX                                              |                                        |
| 00758 |    | 00005 | 03572 | 00390 |        | DSA CONTER                                              |                                        |
| 00763 |    | 00005 | ±4886 | 00400 |        | DSA E20                                                 |                                        |
| 00764 | 16 | 00023 | 00299 | 00410 |        | TFM 23 ,299                                             |                                        |
| 00776 | 27 | 00882 | 00881 | 00412 |        | BT RBCHK ,RBCHK-1                                       |                                        |
| 00788 | 49 | 16688 |       | 00414 |        | B7 START                                                |                                        |
| 00797 |    | 00005 | X2    | 00420 | STNO   | DAS 5                                                   |                                        |
| 00807 |    | 00001 | X2    | 00430 |        | DAC 1, '                                                |                                        |
| 00809 |    | 00005 | X2    | 00440 | STNOM  | DAS 5                                                   |                                        |
| 00819 |    | 00001 | X2    | 00450 |        | DAC 1, '                                                |                                        |
| 00824 |    | 00005 |       | 00466 |        | DC 5 , -12994                                           |                                        |
| 00840 |    | 00016 |       | 00470 | DCEXEC | DC 16 ,7980312600400'                                   |                                        |
| 00841 |    | 00010 |       | 00480 | ERR    | DSC 10,455959000'                                       |                                        |
| 00853 |    | 00014 | X2    | 00490 | HERR   | DAC 14,HDWR ERR DIAG'                                   |                                        |
| 00881 |    | 00002 |       | 00492 |        | DC 2,0                                                  |                                        |
| 00882 | 36 | 00044 | 00703 | 00494 | RBCHK  | RN 44 ,703 ,10                                          |                                        |
| 00894 | 47 | 00904 | 01942 | 00496 |        | BNI *+10 ,1942                                          |                                        |
| 00906 | 43 | 00962 | 00023 | 00498 |        | BD RBCHK1 ,23 ,11                                       |                                        |
| 00918 | 17 | 02578 | 00853 | 00500 | HWERR  | BTM TYPE,HERR ,,,HARDWARE ERROR. CALL EXECUTIVE         |                                        |
| 00930 | 39 | 00853 | 00100 | 00510 |        | WATY HERR                                               |                                        |
| 00942 | 31 | 00038 | 00820 | 00520 |        | TR 38 ,DCEXEC-20                                        |                                        |
| 00954 | 49 | 00000 |       | 00550 |        | B7 0                                                    |                                        |
| 00962 | 25 | 00022 | 00023 | 00560 | RBCHK1 | TD 22 ,23 ,11                                           |                                        |
| 00974 | 46 | 00986 | 00600 | 00570 |        | BI *+12 ,600                                            |                                        |
| 00986 | 46 | 00998 | 01600 | 00580 |        | BI *+12 ,1600                                           |                                        |
| 00998 | 46 | 01010 | 01700 | 00600 |        | BI *+12 ,1700                                           |                                        |
| 01010 | 49 | 00000 |       | 00610 |        | B7                                                      |                                        |
| 01018 | 27 | 00882 | 00881 | 00615 |        | BT RBCHK ,RBCHK-1                                       |                                        |
| 01030 | 15 | ±7065 | 00000 | 00620 | CSYMT9 | TDM TBLB+9,0,2 ,,,CLEAR SYMBOL TABLE AREA               |                                        |
| 01042 | 11 | 01036 | 00010 | 00630 |        | AM CSYMT9+6,10                                          |                                        |
| 01054 | 14 | 01036 | ±9995 | 00640 | CZ1    | CM CSYMT9+6,TBLA1+9                                     |                                        |
| 01066 | 47 | 01030 | 01200 | 00650 |        | BNE CSYMT9                                              |                                        |
| 01078 | 15 | ±7836 | 00000 | 00660 | CSYMT1 | TDM TBLA+10,0,2                                         |                                        |
| 01090 | 11 | 01084 | 00010 | 00670 |        | AM CSYMT1+6,10                                          |                                        |
| 01102 | 14 | 01084 | ±9996 | 00680 | CZ2    | CM CSYMT1+6,TBLA1+10                                    |                                        |
| 01114 | 47 | 01078 | 01200 | 00690 |        | BNE CSYMT1                                              |                                        |
| 01126 | 25 | 17826 | 07246 | 00700 |        | TD TBLA,RM ,,,INITIALIZE TABLES                         |                                        |
| 01138 | 25 | 17056 | 07246 | 00710 |        | TD TBLB,RM                                              |                                        |
| 01150 | 25 | ±9995 | 07246 | 00720 | CZ3    | TD TBLA1+9,RM                                           |                                        |
| 01162 | 25 | 17216 | 07246 | 00730 | FLAG   | TD TBLD,RM                                              |                                        |
| 01174 | 25 | 17215 | 07246 | 00740 | SW49   | TD TBLD-1,RM                                            |                                        |
| 01186 | 25 | 17825 | 07246 | 00750 | SW500  | TD TBLA-1,RM                                            |                                        |
| 01198 | 16 | 01496 | 00000 | 00760 |        | TFM NESM,0,10                                           |                                        |
| 01210 | 31 | 00038 | 01253 | 00770 |        | TR 38 ,DCF-6                                            |                                        |
| 01222 | 26 | 01381 | 00570 | 00780 |        | TF STNXT,570                                            |                                        |
| 01234 | 15 | 00022 | 00009 | 00782 | STORE  | TDM 22 ,9                                               |                                        |
| 01246 | 49 | 00024 | 01274 | 00785 |        | B 24 ,STCOM                                             |                                        |
| 01259 |    | 00002 |       | 00790 | DCF    | DC 2,0                                                  |                                        |
| 01273 |    | 00014 |       | 00795 |        | DC 14,60000000200404'                                   |                                        |
| 01274 | 27 | 00894 | 00893 | 00810 | STCOM  | BT RBCHK+12 ,RBCHK+11                                   |                                        |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 01286 | 71 | 01874 | 00549 | 00830 | NSEEK  | MF   | S3,549               |
| 01298 | 71 | 01286 | 00561 | 00840 |        | MF   | NSEEK,561            |
| 01310 | 32 | 00548 | 00000 | 00850 |        | SF   | 548                  |
| 01322 | 26 | 02189 | 00552 | 00860 |        | TF   | STRMAD,552           |
| 01334 | 26 | 02101 | 00557 | 00870 |        | TF   | STBRAD,557           |
| 01346 | 26 | 02521 | 00576 | 00880 |        | TF   | STRNO,576            |
| 01358 | 31 | 00552 | 07233 | 00890 |        | TR   | 552,RECM-1,6         |
| 01370 | 32 | 00557 | 00000 | 00900 |        | SF   | 557                  |
| 01381 |    | 00005 |       | 00910 | STNXT  | DC   | 5,0,*                |
| 01382 | 11 | 00049 | 00002 | 00920 |        | AM   | 49 ,2 ,10            |
| 01394 | 26 | 00805 | 07256 | 00930 |        | TF   | STNO+8,CLEAR         |
| 01406 | 14 | 00405 | 00043 | 00940 |        | CM   | INPUT,43,10          |
| 01418 | 46 | 00557 | 01200 | 00950 |        | BE   | 557,,6               |
| 01430 | 14 | 00405 | 00000 | 00960 |        | CM   | INPUT,0,10           |
| 01442 | 47 | 01726 | 01200 | 00970 |        | BNE  | NO3C                 |
| 01454 | 44 | 01474 | 04372 | 00980 |        | BNF  | SW9,SW1              |
| 01466 | 49 | 01498 |       | 00990 |        | B7   | STTST1               |
| 01474 | 43 | 03572 | 00414 | 01000 | SW9    | BD   | CONTER,INPUT+9       |
| 01486 | 33 | 01966 | 00000 | 01020 |        | CF   | SW12                 |
| 01496 |    | 00002 |       | 01030 | NESM   | DC   | 2,0,*-1              |
| 01498 | 43 | 01598 | 00563 | 01040 | STTST1 | BD   | STMNO,563            |
| 01510 | 44 | 01546 | 15378 | 01050 |        | BNF  | UTF,SWTR             |
| 01522 | 44 | 01566 | 01534 | 01060 |        | BNF  | SWTRE,SWC            |
| 01534 | 33 | 01534 | 00000 | 01070 | SWC    | CF   | SWC                  |
| 01546 | 33 | 01566 | 00000 | 01080 | UTF    | CF   | SWTRE                |
| 01558 | 49 | 01578 |       | 01090 |        | B7   | BRANCH               |
| 01566 | 32 | 01566 | 00000 | 01100 | SWTRE  | SF   | SWTRE                |
| 01578 | 33 | 01610 | 00000 | 01110 | BRANCH | CF   | SEGFLG               |
| 01590 | 49 | 00557 |       | 01120 |        | B7   | 557,,6               |
| 01598 | 44 | 01622 | 01610 | 01130 | STMNO  | BNF  | TD,SEGFLG            |
| 01610 | 17 | 02132 | 00025 | 01140 | SEGFLG | BTM  | ERROR9,25,10         |
| 01622 | 25 | 00415 | 07246 | 01150 | TD     | TD   | 415,RM               |
| 01634 | 31 | 00808 | 00404 | 01160 |        | TR   | STNOM-1,INPUT-1      |
| 01646 | 15 | 00415 | 00000 | 01170 |        | TCM  | 415,0                |
| 01658 | 14 | 00809 | 00000 | 01180 | NO3A   | CM   | STNOM,,10            |
| 01670 | 47 | 01746 | 01200 | 01190 |        | BNE  | NO3B                 |
| 01682 | 31 | 00808 | 00810 | 01200 | CZERO  | TR   | STNOM-1,STNOM+1      |
| 01694 | 45 | 01658 | 00809 | 01210 |        | BNR  | NO3A,STNOM           |
| 01706 | 26 | 00805 | 07256 | 01220 | CLSNO  | TF   | STNO+ 8,CLEAR        |
| 01718 | 49 | 02022 |       | 01230 |        | B7   | C                    |
| 01726 | 17 | 02132 | 00047 | 01240 | NO3C   | BTM  | ERROR9,17,10         |
| 01738 | 49 | 01706 |       | 01260 |        | B7   | CLSNO                |
| 01746 | 14 | 00809 | 00070 | 01270 | NO3B   | CM   | STNOM,70,10          |
| 01758 | 46 | 01682 | 01200 | 01280 |        | BE   | CZERO                |
| 01770 | 17 | 09936 | 00809 | 01290 |        | BTM  | LBPROC,STNOM         |
| 01782 | 44 | 01726 | 09960 | 01310 |        | BNF  | NO3C,SW20            |
| 01794 | 44 | 01726 | 09972 | 01320 |        | BNF  | NO3C,SW21            |
| 01806 | 26 | 07244 | 09926 | 01330 |        | TF   | ARG,LABEL-2          |
| 01818 | 26 | 00805 | 09926 | 01340 |        | TF   | STNO+ 8,LABEL-2      |
| 01830 | 32 | 07602 | 00000 | 01350 |        | SF   | SW30                 |
| 01842 | 17 | 07262 | 39995 | 01370 | CZ4    | BTM  | TLU1,TBLA1+9         |
| 01854 | 44 | 01874 | 07346 | 01380 |        | BNF  | S3 ,SW35             |
| 01866 | 49 | 01930 |       | 01390 |        | B7   | NO3E                 |
| 01874 | 11 | 07285 | 00010 | 01400 | S3     | AM   | TLU-1,10             |
| 01886 | 33 | 07285 | 00000 | 01410 |        | CF   | TLU-1,,6             |
| 01898 | 44 | 01918 | 07358 | 01420 |        | BNF  | E3 ,SW36             |
| 01910 | 49 | 01930 |       | 01430 |        | B7   | NO3E                 |
| 01918 | 17 | 02132 | 00003 | 01440 | E3     | BTM  | ERROR9,3,10          |
| 01930 | 32 | 01942 | 00000 | 01450 | NO3E   | SF   | SW80                 |
| 01942 | 32 | 07498 | 00000 | 01460 | SW80   | SF   | SW31                 |
| 01954 | 17 | 07286 | 47056 | 01470 |        | BTM  | TLU,TBLB             |
| 01966 | 44 | 01986 | 07346 | 01480 | SW12   | BNF  | S1 ,SW35             |
| 01978 | 49 | 02022 |       | 01490 |        | B7   | C                    |
| 01986 | 32 | 01966 | 00000 | 01500 | S1     | SF   | SW12                 |
| 01998 | 12 | 01496 | 00001 | 01510 |        | SM   | NESM,1,10            |
| 02010 | 44 | 02054 | 07370 | 01520 |        | BNF  | S2 ,SW46             |
| 02022 | 44 | 01546 | 01966 | 01530 | C      | BNF  | UTF,SW12             |
| 02034 | 44 | 02110 | 01942 | 01540 |        | BNF  | NO3F,SW80            |
| 02046 | 49 | 01546 |       | 01550 |        | B7   | UTF                  |
| 02054 | 12 | 07285 | 00001 | 01560 | S2     | SM   | TLU-1,1              |
| 02066 | 24 | 07244 | 07285 | 01570 |        | C    | ARG,TLU-1,11         |
| 02078 | 46 | 01942 | 01200 | 01580 |        | BE   | SW80                 |
| 02090 | 33 | 01942 | 00000 | 01590 |        | CF   | SW80                 |
| 02101 |    | 00000 |       | 01595 | STBRAD | DS   | ,*                   |
| 02102 | 49 | 01942 |       | 01600 |        | B7   | SW80                 |
| 02110 | 17 | 02132 | 00007 | 01610 | NO3F   | BTM  | ERROR9,7,10          |
| 02122 | 49 | 01546 |       | 01620 |        | B7   | UTF                  |
| 02130 |    | 00002 |       | 01630 |        | DS   | 2                    |
| 02132 | 33 | 02166 | 00000 | 01640 | ERROR9 | CF   | ERROR                |
| 02144 | 26 | 02143 | 02131 | 01650 |        | TF   | ERROR9+11,ERROR9-1   |
| 02156 | 49 | 02190 |       | 01660 |        | B7   | ERROR1               |
| 02164 |    | 00002 |       | 01670 |        | DS   | 2                    |
| 02166 | 26 | 02143 | 02165 | 01710 | ERROR  | TF   | ERROR9+11,ERROR-1    |
| 02178 | 32 | 02166 | 00000 | 01720 |        | SF   | ERROR                |
| 02185 |    |       |       | 01730 | DORG   | DC   | *-4                  |
| 02189 |    | 00005 |       | 01740 | STRMAD | DC   | 5,0                  |
| 02190 | 11 | 02189 | 00001 | 01750 | ERROR1 | AM   | STRMAD,1             |
| 02202 | 26 | 02220 | 02189 | 01760 |        | TF   | CRM10+6,STRMAD       |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS                                   |
|-------|----|-------|-------|-------|--------|------|--------------------------------------------------------|
| 02214 | 15 | 00000 | 00000 | 01770 | CRM10  | TDM  | ,0                                                     |
| 02226 | 12 | 02220 | 00002 | 01780 |        | SM   | CRM10+6,2                                              |
| 02238 | 45 | 02258 | 02220 | 01790 |        | BNR  | CRM1,CRM10+6,11                                        |
| 02250 | 49 | 02214 |       | 01800 |        | B7   | CRM10                                                  |
| 02258 | 12 | 02189 | 00001 | 01810 | CRM1   | SM   | STRMAD,1                                               |
| 02270 | 16 | 02300 | 00563 | 01820 |        | TFM  | CLFGI+6,INPUT+158                                      |
| 02282 | 16 | 02305 | 00547 | 01830 |        | TFM  | CLFGI+11,INPUT+142                                     |
| 02294 | 26 | 00563 | 00547 | 01840 | CLFGI  | TF   | INPUT+158,INPUT+142,27,,,SHIFT STATEMENT FOR PRINT OUT |
| 02306 | 12 | 02300 | 00002 | 01850 |        | SM   | CLFGI+6,2                                              |
| 02318 | 12 | 02305 | 00002 | 01860 |        | SM   | CLFGI+11,2                                             |
| 02330 | 14 | 02305 | 00403 | 01870 |        | CM   | CLFGI+11,INPUT-2                                       |
| 02342 | 47 | 02294 | 01200 | 01880 |        | BNE  | CLFGI                                                  |
| 02354 | 47 | 02378 | 03400 | 01890 | CRD1   | BNI  | P2 ,03400                                              |
| 02366 | 34 | 00000 | 00971 | 01900 |        | SKIP | ,1                                                     |
| 02378 | 31 | 00404 | 00841 | 01910 | P2     | TR   | INPUT-1,ERR                                            |
| 02390 | 33 | 02143 | 00000 | 01920 |        | CF   | ERROR9+11                                              |
| 02402 | 73 | 00415 | 02143 | 01930 |        | TNF  | INPUT+10,ERROR9+11                                     |
| 02414 | 16 | 00419 | 00034 | 01940 |        | TFM  | INPUT+14,34,8                                          |
| 02426 | 73 | 00571 | 02521 | 01950 |        | TNF  | 571,STRND                                              |
| 02438 | 31 | 00572 | 07233 | 01960 |        | TR   | 572,RECM-1                                             |
| 02450 | 39 | 00405 | 00900 | 01970 | PRA1   | PRA  | INPUT                                                  |
| 02462 | 32 | 01162 | 00000 | 01980 |        | SF   | FLAG                                                   |
| 02474 | 31 | 00404 | 00420 | 01990 |        | TR   | INPUT-1,INPUT+15                                       |
| 02486 | 31 | 02189 | 07233 | 02000 |        | TR   | STRMAD,RECM-1,6                                        |
| 02498 | 26 | 00557 | 02101 | 02010 |        | TF   | 557,STBRAD                                             |
| 02510 | 32 | 00557 | 00000 | 02020 |        | SF   | 557                                                    |
| 02521 |    | 00005 |       | 02030 | STRND  | DC   | 5,0,*                                                  |
| 02522 | 44 | 02566 | 02166 | 02040 |        | BNF  | P3, ERROR                                              |
| 02534 | 33 | 15378 | 00000 | 02050 | END    | CF   | SWTR                                                   |
| 02546 | 33 | 08678 | 00000 | 02060 |        | CF   | SW2                                                    |
| 02558 | 49 | 03468 |       | 02070 |        | B7   | DOEND1                                                 |
| 02566 | 42 | 00000 | 00000 | 02080 | P3     | BB   |                                                        |
| 02573 |    |       |       | 02090 |        | DORG | *-4                                                    |
| 02577 |    | 00005 |       | 02100 |        | DS   | 5                                                      |
| 02578 | 47 | 02602 | 03400 | 02110 | TYPE   | BNI  | P1 ,03400                                              |
| 02590 | 34 | 00000 | 00971 | 02120 |        | SKIP | ,1                                                     |
| 02602 | 39 | 02577 | 00900 | 02130 | P1     | PRA  | TYPE-1,,6                                              |
| 02614 | 42 |       |       | 02140 |        | BB2  |                                                        |
| 02616 | 16 | 02687 | 00001 | 02150 | DO     | TFM  | DOCNT,1,10                                             |
| 02628 | 16 | 02670 | 00421 | 02160 |        | TFM  | FIND+6,INPUT+16                                        |
| 02640 | 26 | 09928 | 07256 | 02170 |        | TF   | LABEL,CLEAR                                            |
| 02652 | 16 | 02694 | 09920 | 02180 | SW13   | TFM  | WHERE+6,LABEL-8                                        |
| 02664 | 14 | 00000 | 00070 | 02190 | FIND   | CM   | ,70,10                                                 |
| 02676 | 47 | 02756 | 01300 | 02200 |        | BL   | FST                                                    |
| 02686 |    |       |       | 02210 |        | DORG | *-1                                                    |
| 02687 |    | 00002 |       | 02220 | DOCNT  | DC   | 2,0                                                    |
| 02688 | 26 | 00000 | 02670 | 02230 | WHERE  | TF   | ,FIND+6,11                                             |
| 02700 | 11 | 02670 | 00002 | 02240 |        | AM   | FIND+6,2                                               |
| 02712 | 11 | 02694 | 00002 | 02250 |        | AM   | WHERE+6,2                                              |
| 02724 | 14 | 02694 | 09930 | 02260 |        | CM   | WHERE+6,LABEL+2                                        |
| 02736 | 46 | 02780 | 01200 | 02270 |        | BE   | E10                                                    |
| 02748 | 49 | 02664 |       | 02280 |        | B7   | FIND                                                   |
| 02756 | 14 | 02694 | 09920 | 02290 | FST    | CM   | WHERE+6,LABEL-8                                        |
| 02768 | 47 | 02792 | 01200 | 02300 |        | BNE  | ISNU                                                   |
| 02780 | 17 | 02166 | 00010 | 02310 | E10    | BTM  | ERROR,10,10                                            |
| 02792 | 31 | 07235 | 09919 | 02320 | ISNU   | TR   | ARG- 9,LABEL-9                                         |
| 02804 | 17 | 07262 | 39995 | 02340 | CZ5    | BTM  | TLU1,TBLA1+9                                           |
| 02816 | 44 | 02836 | 07346 | 02350 |        | BNF  | Q1 ,SW35                                               |
| 02828 | 49 | 02848 |       | 02360 |        | B7   | ZAP1                                                   |
| 02836 | 44 | 02952 | 07358 | 02370 | Q1     | BNF  | BADNEW,SW36                                            |
| 02848 | 31 | 00059 | 09919 | 02380 | ZAP1   | TR   | 59,LABEL-9                                             |
| 02860 | 26 | 00099 | 02670 | 02390 |        | TF   | 99,FIND+6                                              |
| 02872 | 45 | 02972 | 02670 | 02400 | HOE    | BNR  | CHL21,FIND+6,11                                        |
| 02884 | 27 | 09936 | 00099 | 02410 |        | BT   | LBPROC,99                                              |
| 02896 | 44 | 02780 | 09972 | 02430 |        | BNF  | E10,SW21                                               |
| 02908 | 26 | 07244 | 09926 | 02440 |        | TF   | ARG,LABEL-2                                            |
| 02920 | 17 | 07286 | 17216 | 02450 |        | BTM  | TLU,TBLD                                               |
| 02932 | 44 | 03016 | 07346 | 02460 |        | BNF  | E18,SW35                                               |
| 02944 | 49 | 03028 |       | 02470 |        | B7   | SAFE                                                   |
| 02952 | 17 | 02132 | 00009 | 02480 | BADNEW | BTM  | ERROR9,09,10                                           |
| 02964 | 49 | 02848 |       | 02490 |        | B7   | ZAP1                                                   |
| 02972 | 14 | 02670 | 00021 | 02500 | CHL21  | CM   | FIND+6,21,610                                          |
| 02984 | 47 | 02780 | 01100 | 02510 |        | BNH  | E10                                                    |
| 02996 | 11 | 02670 | 00002 | 02520 |        | AM   | FIND+6,2                                               |
| 03008 | 49 | 02872 |       | 02530 |        | B7   | HOE                                                    |
| 03016 | 17 | 02132 | 00018 | 02540 | E18    | BTM  | ERROR9,18,10                                           |
| 03028 | 26 | 00079 | 09926 | 02550 | SAFE   | TF   | 79,LABEL-2                                             |
| 03040 | 32 | 07602 | 00000 | 02560 |        | SF   | SW30                                                   |
| 03052 | 17 | 07286 | 17826 | 02570 |        | BTM  | TLU,TBLA                                               |
| 03064 | 44 | 03260 | 07346 | 02580 |        | BNF  | TUOF,SW35                                              |
| 03076 | 14 | 09935 | 00033 | 02590 | COMPEQ | CM   | LBPROC-1,33,610                                        |
| 03088 | 47 | 02780 | 01200 | 02600 |        | BNE  | E10                                                    |
| 03100 | 11 | 09935 | 00002 | 02610 |        | AM   | LBPROC-1,2                                             |
| 03112 | 27 | 09936 | 09935 | 02620 | PRM3   | BT   | LBPROC,LBPROC-1                                        |
| 03124 | 44 | 02780 | 09972 | 02640 |        | BNF  | E10,SW21                                               |
| 03136 | 44 | 03204 | 09960 | 02650 |        | BNF  | NONN,SW20                                              |
| 03148 | 45 | 03304 | 09935 | 02660 | PRM2   | BNR  | COMP1,LBPROC-1,11                                      |
| 03160 | 14 | 02687 | 00002 | 02670 |        | CM   | DOCNT,2,10                                             |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS   |
|-------|----|-------|-------|-------|--------|------|------------------------|
| 03172 | 47 | 02780 | 01300 | 02680 |        | BL   | E10                    |
| 03184 | 46 | 03396 | 01200 | 02690 |        | BE   | SETM3                  |
| 03196 | 49 | 03408 |       | 02700 |        | B7   | FPROC                  |
| 03204 | 26 | 07244 | 09926 | 02710 | NONN   | TF   | ARG,LABEL-2            |
| 03216 | 32 | 07602 | 00000 | 02720 |        | SF   | SW30                   |
| 03228 | 32 | 07510 | 00000 | 02730 |        | SF   | SW32                   |
| 03240 | 17 | 07286 | 17826 | 02740 |        | BTM  | TLU,TBLA               |
| 03252 | 49 | 03148 |       | 02750 |        | B7   | PRM2                   |
| 03260 | 12 | 07285 | 00001 | 02760 | TUDF   | SM   | TLU-1,1                |
| 03272 | 33 | 07285 | 00000 | 02770 |        | CF   | TLU-1,,6               |
| 03284 | 44 | 03076 | 16138 | 02775 |        | BNF  | COMPEQ ,SW38           |
| 03296 | 49 | 02780 |       | 02780 |        | B7   | E10                    |
| 03304 | 14 | 09935 | 00023 | 02790 | COMP1  | CM   | LBPROC-1,23,610        |
| 03316 | 47 | 02780 | 01200 | 02800 |        | BNE  | E10                    |
| 03328 | 11 | 02687 | 00001 | 02810 |        | AM   | DOCNT,1,10             |
| 03340 | 14 | 02687 | 00004 | 02820 |        | CM   | DOCNT,4,10             |
| 03352 | 46 | 02780 | 01200 | 02830 |        | BE   | E10                    |
| 03364 | 11 | 09935 | 00002 | 02840 |        | AM   | LBPROC-1,2             |
| 03376 | 45 | 03112 | 09935 | 02850 |        | BNR  | PRM3,LBPROC-1,11,,1244 |
| 03388 | 49 | 02780 |       | 02860 |        | B7   | E10                    |
| 03396 | 26 | 00099 | 07256 | 02870 | SETM3  | TF   | 99,CLEAR               |
| 03408 | 32 | 01174 | 00000 | 02880 | FPROC  | SF   | SW49                   |
| 03420 | 33 | 15378 | 00000 | 02890 | DOEND  | CF   | SWTR                   |
| 03432 | 44 | 03468 | 01966 | 02900 |        | BNF  | DOEND1,SW12            |
| 03444 | 17 | 02132 | 00008 | 02910 |        | BTM  | ERROR9,8,10            |
| 03456 | 33 | 01174 | 00000 | 02920 |        | CF   | SW49                   |
| 03468 | 44 | 03492 | 01566 | 02930 | DOEND1 | BNF  | CF500,SWTRE            |
| 03480 | 17 | 02132 | 00039 | 02940 |        | BTM  | ERROR9,39,10           |
| 03492 | 33 | 01186 | 00000 | 02950 | CF500  | CF   | SW500                  |
| 03504 | 33 | 02166 | 00000 | 02960 |        | CF   | ERROR                  |
| 03516 | 44 | 03536 | 04372 | 02970 |        | BNF  | NOTYP1,SW1             |
| 03528 | 49 | 01234 |       | 02980 |        | B7   | STORE                  |
| 03536 | 44 | 03560 | 01286 | 02990 | NOTYP1 | BNF  | STTST,NSEEK            |
| 03548 | 17 | 02132 | 00005 | 03000 |        | BTM  | ERROR9,5,10            |
| 03560 | 44 | 03628 | 01874 | 03004 | STTST  | BNF  | TSW12,S3               |
| 03572 | 17 | 02132 | 00002 | 03006 | CONTER | BTM  | ERROR9,02,10           |
| 03584 | 33 | 04372 | 00000 | 03008 |        | CF   | SW1                    |
| 03596 | 33 | 01874 | 00000 | 03010 |        | CF   | S3                     |
| 03608 | 33 | 01286 | 00000 | 03012 |        | CF   | NSEEK                  |
| 03619 |    | 00002 |       | 03014 | NPFR   | DC   | 2,0,*                  |
| 03620 | 49 | 05826 |       | 03016 |        | B7   | IOPROC+24              |
| 03628 | 44 | 03676 | 01966 | 03020 | TSW12  | BNF  | NEDO,SW12              |
| 03640 | 13 | 01496 | 00010 | 03030 |        | MM   | NESM,010,9             |
| 03652 | 11 | 00099 | 17216 | 03040 |        | AM   | 99,TBLD                |
| 03664 | 25 | 00099 | 07246 | 03050 |        | TD   | 99,RM,6                |
| 03676 | 44 | 01234 | 01174 | 03060 | NEDO   | BNF  | STORE,SW49             |
| 03688 | 33 | 01174 | 00000 | 03070 |        | CF   | SW49                   |
| 03700 | 16 | 07400 | 08290 | 03080 |        | TFM  | REC+6,RESET            |
| 03712 | 26 | 07244 | 00079 | 03090 |        | TF   | ARG,79                 |
| 03724 | 32 | 07602 | 00000 | 03100 |        | SF   | SW30                   |
| 03736 | 17 | 07286 | 17216 | 03110 |        | BTM  | TLU,TBLD               |
| 03748 | 31 | 07235 | 00059 | 03120 |        | TR   | ARG-9,59               |
| 03760 | 32 | 07602 | 00000 | 03130 |        | SF   | SW30                   |
| 03772 | 17 | 07286 | 17056 | 03140 |        | BTM  | TLU,TBLB               |
| 03784 | 11 | 01496 | 00001 | 03150 |        | AM   | NESM,1,10              |
| 03796 | 16 | 07400 | 07974 | 03160 |        | TFM  | REC+6,COMPAR           |
| 03808 | 49 | 01234 |       | 03170 |        | B7   | STORE                  |
| 03816 | 16 | 09935 | 00425 | 03230 | TYPEXX | TFM  | LBPROC-1,INPUT+20      |
| 03828 | 49 | 05766 |       | 03240 |        | B7   | PUNCH+12               |
| 03836 | 16 | 03619 | 00000 | 03249 | FRMT   | TFM  | NPFR,,10               |
| 03848 | 24 | 00805 | 07256 | 03250 |        | C    | STNO+8,CLEAR           |
| 03860 | 47 | 03884 | 01200 | 03260 |        | BNE  | Z1                     |
| 03872 | 17 | 02132 | 00029 | 03270 |        | BTM  | ERROR9,29,10           |
| 03884 | 33 | 01286 | 00000 | 03271 | Z1     | CF   | NSEEK                  |
| 03896 | 16 | 03938 | 00417 | 03280 |        | TFM  | FMAT1+6,INPUT+12       |
| 03908 | 16 | 04123 | 00418 | 03290 |        | TFM  | FMAT2+11,INPUT+13      |
| 03920 | 16 | 04118 | 00416 | 03300 |        | TFM  | FMAT2+6,INPUT+11       |
| 03932 | 14 | 00417 | 00000 | 03310 | FMAT1  | CM   | INPUT+12,,10           |
| 03944 | 46 | 04112 | 01200 | 03320 |        | BE   | FMAT2                  |
| 03956 | 14 | 03938 | 00024 | 03321 |        | CM   | FMAT1+6,24,610         |
| 03968 | 46 | 04248 | 01200 | 03322 |        | BE   | NPF                    |
| 03980 | 14 | 03938 | 00004 | 03323 |        | CM   | FMAT1+6,04,610         |
| 03992 | 46 | 04268 | 01200 | 03324 |        | BE   | NPFS                   |
| 04004 | 14 | 03938 | 00048 | 03330 |        | CM   | FMAT1+6,48,610         |
| 04016 | 46 | 04144 | 01200 | 03340 |        | BE   | FMAT3                  |
| 04028 | 11 | 03938 | 00002 | 03350 | FORMA  | AM   | FMAT1+6,2              |
| 04040 | 11 | 04118 | 00002 | 03360 |        | AM   | FMAT2+6,2              |
| 04052 | 11 | 04123 | 00002 | 03370 |        | AM   | FMAT2+11,2             |
| 04064 | 45 | 03932 | 03938 | 03380 | FMAT1X | BNR  | FMAT1,FMAT1+6,11       |
| 04076 | 12 | 03938 | 00002 | 03390 |        | SM   | FMAT1+6,2              |
| 04088 | 45 | 04288 | 03938 | 03400 |        | BNR  | Z2 ,FMAT1+6,11         |
| 04100 | 17 | 02166 | 00029 | 03410 | E29    | BTM  | ERROR,29,1011          |
| 04112 | 31 | 00416 | 00418 | 03420 | FMAT2  | TR   | INPUT+11,INPUT+13      |
| 04124 | 49 | 04064 |       | 03430 |        | B7   | FMAT1X                 |
| 04132 | 11 | 04574 | 00001 | 03440 |        | AM   | EDIT2+10,1,9           |
| 04144 | 27 | 04420 | 03938 | 03450 | FMAT3  | BT   | EDIT,FMAT1+6           |
| 04156 | 11 | 04574 | 00001 | 03460 |        | AM   | EDIT2+10,1,9           |
| 04168 | 13 | 04574 | 00002 | 03470 |        | MM   | EDIT2+10,2,10          |

,,,UNLABELED STATEMENT FOLLOWING  
,,,TRANSFER STATEMENT

,,,CONTINUATION ERROR

,,,IF DO STATEMENT,HOLD INDEX AND  
,,,LABEL

,,,CHECK TYPE

,,,CHECK FORMAT

,,,FORMAT ERROR

,,,FORMAT CONTINUATION ENTERS HERE

,,,IS THIS HOLLERITH FIELD

,,,SQUEEZE FORMAT EXCEPT H-TYPE

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 04180 | 21 | 03938 | 00099 | 03480 |        | A    | FMAT1+6,99           |
| 04192 | 21 | 04118 | 00099 | 03490 |        | A    | FMAT2+6,99           |
| 04204 | 21 | 04123 | 00099 | 03500 |        | A    | FMAT2+11,99          |
| 04216 | 24 | 03938 | 00552 | 03510 |        | C    | FMAT1+6,552          |
| 04228 | 46 | 04100 | 01100 | 03520 |        | BH   | E29                  |
| 04240 | 49 | 04064 |       | 03530 |        | B7   | FMAT1X               |
| 04248 | 11 | 03619 | 00081 | 03531 | NPF    | AM   | NPFR,1,10            |
| 04260 | 49 | 04028 |       | 03532 |        | B7   | FORMA                |
| 04268 | 12 | 03619 | 00081 | 03533 | NPFS   | SM   | NPFR,1,10            |
| 04280 | 49 | 04028 |       | 03534 |        | B7   | FORMA                |
| 04288 | 14 | 03619 | 00080 | 03535 | Z2     | CM   | NPFR,0,10            |
| 04300 | 46 | 04324 | 01200 | 03536 |        | BE   | Z21                  |
| 04312 | 32 | 01286 | 00000 | 03537 |        | SF   | NSEEK                |
| 04324 | 14 | 03938 | 00084 | 03540 | Z21    | CM   | FMAT1+6,4,610        |
| 04336 | 46 | 04384 | 01200 | 03550 |        | BE   | FMAT4                |
| 04348 | 14 | 03938 | 00023 | 03560 |        | CM   | FMAT1+6,23,610       |
| 04360 | 47 | 04100 | 01200 | 03570 |        | BNE  | E29                  |
| 04372 | 32 | 04372 | 00000 | 03580 | SW1    | SF   | SW1                  |
| 04384 | 44 | 04614 | 08678 | 03590 | FMAT4  | BNF  | NO2,SW2              |
| 04396 | 16 | 09935 | 00417 | 03594 |        | TFM  | LBPROC-1,INPUT+12    |
| 04408 | 49 | 04662 | 00000 | 03600 |        | B    | FMATRP+12            |
| 04420 | 12 | 04419 | 00002 | 03610 | EDIT   | SM   | EDIT-1,2             |
| 04432 | 16 | 04574 | 00800 | 03620 |        | TFM  | EDIT2+10,,9          |
| 04444 | 16 | 04486 | 04574 | 03630 |        | TFM  | EDIT1+30,EDIT2+10    |
| 04456 | 14 | 04419 | 00070 | 03640 | EDIT1  | CM   | EDIT-1,70,610        |
| 04468 | 47 | 04564 | 01300 | 03650 |        | BL   | EDIT2                |
| 04480 | 25 | 04574 | 04419 | 03660 |        | TD   | EDIT2+10,EDIT-1,11   |
| 04492 | 12 | 04419 | 00002 | 03670 |        | SM   | EDIT-1,2             |
| 04504 | 14 | 04419 | 00417 | 03680 |        | CM   | EDIT-1,417           |
| 04516 | 47 | 04564 | 01300 | 03690 |        | BL   | EDIT2                |
| 04528 | 12 | 04486 | 00001 | 03700 |        | SM   | EDIT1+30,1           |
| 04540 | 14 | 04486 | 04571 | 03710 |        | CM   | EDIT1+30,EDIT2+7     |
| 04552 | 47 | 04456 | 01200 | 03720 |        | BNE  | EDIT1                |
| 04564 | 32 | 04572 | 00000 | 03730 | EDIT2  | SF   | EDIT2+8              |
| 04576 | 14 | 04574 | 00862 | 03740 |        | CM   | EDIT2+10,62,9        |
| 04588 | 47 | 10518 | 01100 | 03750 |        | BNH  | BB2                  |
| 04600 | 17 | 02166 | 00029 | 03760 | E43    | BTM  | ERROR,29,1011        |
| 04612 | 42 |       |       | 03770 |        | BB2  |                      |
| 04614 | 16 | 09935 | 00429 | 03820 | NO2    | TFM  | LBPROC-1,INPUT+24    |
| 04626 | 14 | 09935 | 00024 | 03830 |        | CM   | LBPROC-1,24,610      |
| 04638 | 47 | 04100 | 01200 | 03840 |        | BNE  | E29                  |
| 04650 | 11 | 09935 | 00002 | 03850 | FMATRP | AM   | LBPROC-1,2           |
| 04662 | 33 | 04830 | 00000 | 03860 |        | CF   | SW200                |
| 04674 | 14 | 09935 | 00084 | 03870 |        | CM   | LBPROC-1,4,610       |
| 04686 | 46 | 05574 | 01200 | 03880 |        | BE   | FMATE2               |
| 04698 | 14 | 09935 | 00021 | 03890 |        | CM   | LBPROC-1,21,610      |
| 04710 | 46 | 04862 | 01200 | 03900 |        | BE   | FMATTC               |
| 04722 | 14 | 09935 | 00023 | 03910 |        | CM   | LBPROC-1,23,610      |
| 04734 | 46 | 05210 | 01200 | 03920 |        | BE   | TFRM                 |
| 04746 | 14 | 09935 | 00020 | 03930 | SW201  | CM   | LBPROC-1,20,610      |
| 04758 | 46 | 04100 | 01200 | 03940 |        | BE   | E29                  |
| 04770 | 14 | 09935 | 00021 | 03950 |        | CM   | LBPROC-1,21,610      |
| 04782 | 46 | 04650 | 01200 | 03960 |        | BE   | FMATRP               |
| 04794 | 14 | 09935 | 00070 | 03970 | Z3     | CM   | LBPROC-1,70,610      |
| 04806 | 47 | 04882 | 01300 | 03980 |        | BL   | MLM1                 |
| 04818 | 32 | 04830 | 00000 | 03990 |        | SF   | SW200                |
| 04828 |    | 00002 |       | 04000 | FMATSZ | DC   | 2,0,*-1              |
| 04830 | 11 | 09935 | 00002 | 04010 | SW200  | AM   | LBPROC-1,2           |
| 04842 | 11 | 04828 | 00001 | 04020 |        | AM   | FMATSZ,1             |
| 04854 | 49 | 04794 |       | 04030 |        | B7   | Z3                   |
| 04862 | 11 | 09935 | 00002 | 04040 | FMATTC | AM   | LBPROC-1,2           |
| 04874 | 49 | 05542 |       | 04050 |        | B7   | FMATET               |
| 04882 | 14 | 04828 | 00083 | 04060 | MLM1   | CM   | FMATSZ,03,10         |
| 04894 | 47 | 04918 | 01300 | 04070 |        | BL   | MLM                  |
| 04906 | 17 | 02132 | 00041 | 04080 |        | BTM  | ERROR9,41,10         |
| 04918 | 15 | 04828 | 00000 | 04090 | MLM    | TDM  | FMATSZ,0             |
| 04930 | 14 | 09935 | 00048 | 04100 |        | CM   | LBPROC-1,48,610,H    |
| 04942 | 46 | 05106 | 01200 | 04110 |        | BE   | FMATH                |
| 04954 | 14 | 09935 | 00046 | 04120 |        | CM   | LBPROC-1,46,610,F    |
| 04966 | 46 | 05242 | 01200 | 04130 |        | BE   | FMATF                |
| 04978 | 14 | 09935 | 00049 | 04140 |        | CM   | LBPROC-1,49,610,I    |
| 04990 | 46 | 05606 | 01200 | 04150 |        | BE   | FMATI                |
| 05002 | 14 | 09935 | 00045 | 04160 |        | CM   | LBPROC-1,45,610,E    |
| 05014 | 46 | 05242 | 01200 | 04170 |        | BE   | FMATF                |
| 05026 | 14 | 09935 | 00067 | 04180 |        | CM   | LBPROC-1,67,610,X    |
| 05038 | 46 | 05662 | 01200 | 04190 |        | BE   | FMATX                |
| 05050 | 14 | 09935 | 00041 | 04200 |        | CM   | LBPROC-1,41,610,A    |
| 05062 | 46 | 05402 | 01200 | 04210 |        | BE   | FMATA                |
| 05074 | 14 | 09935 | 00024 | 04220 |        | CM   | LBPROC-1,24,610,I    |
| 05086 | 47 | 04100 | 01200 | 04230 |        | BNE  | E29                  |
| 05098 | 49 | 04650 |       | 04240 |        | B7   | FMATRP               |
| 05106 | 44 | 04600 | 04830 | 04250 | FMATH  | BNF  | E43,SW200            |
| 05118 | 27 | 04420 | 09935 | 04260 |        | BT   | EDIT,LBPROC-1        |
| 05130 | 11 | 04574 | 00081 | 04270 |        | AM   | EDIT2+10,1,10        |
| 05142 | 13 | 04574 | 00082 | 04280 |        | MM   | EDIT2+10,2,10        |
| 05154 | 21 | 09935 | 00099 | 04290 |        | A    | LBPROC-1,99          |
| 05166 | 45 | 05186 | 09935 | 04300 |        | BNR  | Z4 ,LBPROC-1,11      |
| 05178 | 49 | 04600 |       | 04310 |        | B7   | E43                  |

...,DOES FORMAT END WITH A RIGHT  
 ...,PARENTHESIS  
 ...,IF IT ENDS WITH A COMMA, INDICATE  
 ...,CONTINUATION SHOULD FOLLOW.

...,CHECK SIZE OF HOLLERITH FIELD

...,CHECK H-TYPE FORMAT

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS   |
|-------|----|-------|-------|-------|--------|------|------------------------|
| 05186 | 14 | 09935 | 00023 | 04320 | Z4     | CM   | LBPROC-1,23,610        |
| 05198 | 47 | 04662 | 01200 | 04330 |        | BNE  | FMATRP+12              |
| 05210 | 11 | 09935 | 00002 | 04340 | TFRM   | AM   | LBPROC-1,2             |
| 05222 | 45 | 04662 | 09935 | 04350 |        | BNR  | FMATRP+12, LBPROC-1,11 |
| 05234 | 49 | 02534 |       | 04360 |        | B7   | END                    |
| 05242 | 11 | 09935 | 00002 | 04370 | FMATF  | AM   | LBPROC-1,2             |
| 05254 | 27 | 09936 | 09935 | 04380 |        | BT   | LBPROC, LBPROC-1       |
| 05266 | 44 | 04100 | 09960 | 04400 |        | BNF  | E29, SW20              |
| 05278 | 44 | 05298 | 09972 | 04410 |        | BNF  | FMATF2, SW21           |
| 05290 | 49 | 04100 |       | 04420 |        | B7   | E29                    |
| 05298 | 12 | 09935 | 00002 | 04430 | FMATF2 | SM   | LBPROC-1,2             |
| 05310 | 14 | 09935 | 00003 | 04440 |        | CM   | LBPROC-1,3,610         |
| 05322 | 46 | 04100 | 01200 | 04450 |        | BE   | E29                    |
| 05334 | 11 | 09935 | 00002 | 04460 |        | AM   | LBPROC-1,2             |
| 05346 | 14 | 09935 | 00023 | 04470 | FMATR  | CM   | LBPROC-1,23,610        |
| 05358 | 47 | 05494 | 01200 | 04480 |        | BNE  | HERE                   |
| 05370 | 11 | 09935 | 00002 | 04490 |        | AM   | LBPROC-1,2             |
| 05382 | 45 | 04746 | 09935 | 04500 |        | BNR  | SW201, LBPROC-1,11     |
| 05394 | 49 | 02534 |       | 04510 |        | B7   | END                    |
| 05402 | 11 | 09935 | 00004 | 04520 | FMATA  | AM   | LBPROC-1,4             |
| 05414 | 14 | 09935 | 00070 | 04530 |        | CM   | LBPROC-1,70,610        |
| 05426 | 46 | 04600 | 01300 | 04540 |        | BNL  | E43                    |
| 05438 | 12 | 09935 | 00002 | 04550 |        | SM   | LBPROC-1,2             |
| 05450 | 14 | 09935 | 00075 | 04560 |        | CM   | LBPROC-1,75,610        |
| 05462 | 46 | 04600 | 01100 | 04570 |        | BH   | E43                    |
| 05474 | 11 | 09935 | 00002 | 04580 |        | AM   | LBPROC-1,2             |
| 05486 | 49 | 05346 |       | 04590 |        | B7   | FMATR                  |
| 05494 | 14 | 09935 | 00021 | 04600 | HERE   | CM   | LBPROC-1,21,610        |
| 05506 | 46 | 04650 | 01200 | 04610 |        | BE   | FMATRP                 |
| 05518 | 14 | 09935 | 00004 | 04620 |        | CM   | LBPROC-1,4,610         |
| 05530 | 47 | 04600 | 01200 | 04630 |        | BNE  | E43                    |
| 05542 | 14 | 09935 | 00023 | 04640 | FMATET | CM   | LBPROC-1,23,610        |
| 05554 | 47 | 04662 | 01200 | 04650 |        | BNE  | FMATRP+12              |
| 05566 | 49 | 05210 |       | 04660 |        | B7   | TFRM                   |
| 05574 | 11 | 09935 | 00002 | 04670 | FMATE2 | AM   | LBPROC-1,2             |
| 05586 | 45 | 05542 | 09935 | 04680 |        | BNR  | FMATET, LBPROC-1,11    |
| 05598 | 49 | 02534 |       | 04690 |        | B7   | END                    |
| 05606 | 11 | 09935 | 00002 | 04700 | FMATI  | AM   | LBPROC-1,2             |
| 05618 | 27 | 09936 | 09935 | 04710 |        | BT   | LBPROC, LBPROC-1       |
| 05630 | 44 | 04100 | 09960 | 04730 |        | BNF  | E29, SW20              |
| 05642 | 44 | 04100 | 09972 | 04740 |        | BNF  | E29, SW21              |
| 05654 | 49 | 05346 |       | 04750 |        | B7   | FMATR                  |
| 05662 | 11 | 09935 | 00002 | 04760 | FMATX  | AM   | LBPROC-1,2             |
| 05674 | 44 | 04100 | 04830 | 04770 |        | BNF  | E29, SW200             |
| 05686 | 49 | 05346 |       | 04780 |        | B7   | FMATR                  |
| 05694 | 45 | 14886 | 00427 | 04790 | PAUSE  | BNR  | E20, INPUT+22          |
| 05706 | 49 | 02534 |       | 04800 |        | B7   | END                    |
| 05714 | 16 | 09935 | 00429 | 04810 | REREAD | TFM  | LBPROC-1, INPUT+24     |
| 05726 | 49 | 05778 |       | 04820 |        | B7   | PUNCH+24               |
| 05734 | 16 | 09935 | 00425 | 04830 | READ   | TFM  | LBPROC-1, INPUT+20     |
| 05746 | 49 | 05778 |       | 04840 |        | B7   | PUNCH+24               |
| 05754 | 16 | 09935 | 00427 | 04850 | PUNCH  | TFM  | LBPROC-1, INPUT+22     |
| 05766 | 32 | 05766 | 00000 | 04860 | SW54   | SF   | SW54                   |
| 05778 | 32 | 05778 | 00000 | 04870 | SW52   | SF   | SW52                   |
| 05790 | 16 | 06317 | 00000 | 04880 |        | TFM  | NP, 0,10               |
| 05802 | 45 | 05934 | 09935 | 04890 | IOPROC | BNR  | Z5, LBPROC-1,11        |
| 05814 | 17 | 02166 | 00021 | 04900 |        | BTM  | ERROR, 21,10           |
| 05826 | 44 | 05846 | 04372 | 04910 |        | BNF  | CF524, SW1             |
| 05838 | 49 | 02534 |       | 04920 |        | B7   | END                    |
| 05846 | 33 | 05778 | 00000 | 04930 | CF524  | CF   | SW52                   |
| 05858 | 33 | 05766 | 00000 | 04940 |        | CF   | SW54                   |
| 05870 | 14 | 06317 | 00000 | 04950 |        | CM   | NP, 0,10               |
| 05882 | 47 | 02534 | 01200 | 04960 |        | BNE  | END                    |
| 05894 | 33 | 01286 | 00000 | 04970 |        | CF   | NSEEK                  |
| 05906 | 49 | 02534 |       | 04980 |        | B7   | END                    |
| 05914 | 17 | 02132 | 00023 | 04990 | IOB1   | BTM  | ERROR9, 23,10          |
| 05926 | 49 | 06118 |       | 05000 |        | B7   | IDOX                   |
| 05934 | 44 | 06014 | 08678 | 05010 | Z5     | BNF  | NTST5, SW2             |
| 05946 | 14 | 09935 | 00024 | 05012 | IOD1   | CM   | LBPROC-1,24,610        |
| 05958 | 47 | 06162 | 01200 | 05014 |        | BNE  | IDOE                   |
| 05970 | 11 | 06317 | 00001 | 05016 |        | AM   | NP, 1,10               |
| 05982 | 11 | 09935 | 00002 | 05018 | ALP    | AM   | LBPROC-1,2             |
| 05994 | 45 | 05946 | 09935 | 05020 | CONTIO | BNR  | IOD1, LBPROC-1,11      |
| 06006 | 49 | 05814 |       | 05024 |        | B7   | IOPROC+12              |
| 06014 | 14 | 09935 | 00070 | 05030 | NTST5  | CM   | LBPROC-1,70,610        |
| 06026 | 47 | 05914 | 01300 | 05040 |        | BL   | IOB1                   |
| 06038 | 27 | 09936 | 09935 | 05050 |        | BT   | LBPROC, LBPROC-1       |
| 06050 | 44 | 05914 | 09960 | 05070 |        | BNF  | IOB1, SW20             |
| 06062 | 44 | 05914 | 09972 | 05080 |        | BNF  | IOB1, SW21             |
| 06074 | 17 | 16582 | 06086 | 05090 |        | BTM  | NONAME, +12            |
| 06086 | 45 | 06118 | 09935 | 05100 |        | BNR  | IDOX, LBPROC-1,11      |
| 06098 | 44 | 05814 | 05778 | 05110 |        | BNF  | IOPROC+12, SW52        |
| 06110 | 49 | 05826 |       | 05120 |        | B7   | IOPROC+24              |
| 06118 | 14 | 09935 | 00023 | 05130 | IDOX   | CM   | LBPROC-1,23,610        |
| 06130 | 46 | 06482 | 01200 | 05140 |        | BE   | CONST                  |
| 06142 | 17 | 02132 | 00026 | 05150 |        | BTM  | ERROR9, 26,10          |
| 06154 | 49 | 05982 |       | 05160 |        | B7   | ALP                    |
| 06162 | 27 | 09936 | 09935 | 05230 | IOE    | BT   | LBPROC, LBPROC-1       |

,,,CHECK F-TYPE AND E-TYPE FORMAT

,,,CHECK A-TYPE FORMAT

,,,CHECK I-TYPE FORMAT

,,,CHECK X-TYPE FORMAT

,,,CHECK REREAD

,,,CHECK READ

,,,CHECK PUNCH

,,,INPUT-OUTPUT PROCESSOR

,,,COMMA MISSING IN AN I-O STATEMENT

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 06174 | 44 | 06558 | 09960 | 05250 |        | BNF  | Y1 ,SW20             |
| 06186 | 49 | 05814 |       | 05260 |        | B7   | IOPROC+12            |
| 06194 | 26 | 07244 | 09926 | 05270 | Y2     | TF   | ARG,LABEL-2          |
| 06206 | 44 | 06230 | 10020 | 05280 |        | BNF  | Y3 ,SW24             |
| 06218 | 11 | 09935 | 00002 | 05290 |        | AM   | LBPROC-1,2           |
| 06230 | 45 | 06250 | 09935 | 05300 | Y3     | BNR  | Y4 ,LBPROC-1,11      |
| 06242 | 49 | 06274 |       | 05310 |        | B7   | IOIA                 |
| 06250 | 14 | 09935 | 00033 | 05320 | Y4     | CM   | LBPROC-1,33,610      |
| 06262 | 46 | 06670 | 01200 | 05330 |        | BE   | ION                  |
| 06274 | 44 | 06294 | 10020 | 05340 | IOIA   | BF   | IOG,SW24             |
| 06286 | 49 | 06430 |       |       |        |      |                      |
| 06294 | 44 | 06374 | 05766 | 05350 |        | BNF  | IOI,SW54             |
| 06306 | 32 | 07602 | 00000 | 05360 |        | SF   | SW30                 |
| 06316 |    |       |       | 05370 |        | DORG | *-1                  |
| 06317 |    | 00002 |       | 05380 | NP     | DC   | 2,0                  |
| 06318 | 32 | 07510 | 00000 | 05390 |        | SF   | SW32                 |
| 06330 | 17 | 07286 | 17826 | 05400 |        | BTM  | TLU,TBL              |
| 06342 | 44 | 06430 | 16114 | 05410 |        | BNF  | IOG,SW 7             |
| 06354 | 17 | 02132 | 00031 | 05420 | ER31   | BTM  | ERRC 9,31,10         |
| 06366 | 49 | 06430 |       | 05430 |        | B7   | IOG                  |
| 06374 | 32 | 07602 | 00000 | 05440 | IOI    | SF   | SW30                 |
| 06386 | 17 | 07286 | 17826 | 05450 |        | BTM  | TLU,TBLA             |
| 06398 | 44 | 06418 | 16114 | 05460 |        | BNF  | VDEF35,SW37          |
| 06410 | 49 | 06354 |       | 05470 |        | B7   | ER31                 |
| 06418 | 44 | 06450 | 07346 | 05480 | VDEF35 | BNF  | VDEF,SW35            |
| 06430 | 45 | 06526 | 09935 | 05490 | IOG    | BNR  | IOH ,LBPROC-1,11     |
| 06442 | 49 | 05826 |       | 05500 |        | B7   | IOPROC+24            |
| 06450 | 12 | 07285 | 00001 | 05510 | VDEF   | SM   | TLU-1,1              |
| 06462 | 33 | 07285 | 00000 | 05520 |        | CF   | TLU-1,,6             |
| 06474 | 49 | 06430 |       | 05530 |        | B7   | IOG                  |
| 06482 | 11 | 09935 | 00002 | 05540 | CONTST | AM   | LBPROC-1,2           |
| 06494 | 45 | 05946 | 09935 | 05550 |        | BNR  | IOD1,LBPROC-1,11     |
| 06506 | 32 | 04372 | 00000 | 05560 | SS1    | SF   | SW1                  |
| 06518 | 49 | 05826 |       | 05570 |        | B7   | IOPROC+24            |
| 06526 | 14 | 09935 | 00023 | 05580 | IOH    | CM   | LBPROC-1,23,610      |
| 06538 | 46 | 06482 | 01200 | 05590 |        | BE   | CONTST               |
| 06550 | 49 | 05814 |       | 05600 |        | B7   | IOPROC+12            |
| 06558 | 44 | 06194 | 10056 | 05610 | Y1     | BNF  | Y2 ,SW48             |
| 06570 | 17 | 02132 | 00040 | 05620 |        | BTM  | ERROR9,40,10         |
| 06582 | 14 | 09935 | 00004 | 05630 | IOF    | CM   | LBPROC-1,4,610       |
| 06594 | 46 | 06638 | 01200 | 05640 |        | BE   | Y5                   |
| 06606 | 11 | 09935 | 00002 | 05650 |        | AM   | LBPROC-1,2           |
| 06618 | 45 | 06582 | 09935 | 05660 |        | BNR  | IOF,LBPROC-1,11      |
| 06630 | 49 | 05826 |       | 05670 |        | B7   | IOPROC+24            |
| 06638 | 11 | 09935 | 00002 | 05680 | Y5     | AM   | LBPROC-1,2           |
| 06650 | 45 | 06526 | 09935 | 05690 |        | BNR  | IOH,LBPROC-1,11      |
| 06662 | 49 | 05826 |       | 05700 |        | B7   | IOPROC+24            |
| 06670 | 14 | 06317 | 00001 | 05710 | ION    | CM   | NP,1,10              |
| 06682 | 47 | 06818 | 01200 | 05720 |        | BNE  | IO28                 |
| 06694 | 32 | 07602 | 00000 | 05730 |        | SF   | SW30                 |
| 06706 | 17 | 07286 | 17826 | 05740 |        | BTM  | TLU,TBLA             |
| 06718 | 44 | 06762 | 07346 | 05750 |        | BNF  | CUI0,SW35            |
| 06730 | 17 | 07286 | 17216 | 05760 | TDOL   | BTM  | TLU,TBLD             |
| 06742 | 44 | 06794 | 07346 | 05770 |        | BNF  | IO18,SW35            |
| 06754 | 49 | 06806 |       | 05780 |        | B7   | Y6                   |
| 06762 | 12 | 07285 | 00001 | 05790 | CUI0   | SM   | TLU-1,1              |
| 06774 | 33 | 07285 | 00000 | 05800 |        | CF   | TLU-1,,6             |
| 06786 | 49 | 06730 |       | 05810 |        | B7   | TDOL                 |
| 06794 | 17 | 02132 | 00018 | 05820 | IO18   | BTM  | ERROR9,18,10         |
| 06806 | 44 | 06838 | 10020 | 05830 | Y6     | BNF  | Y7 ,SW24             |
| 06818 | 17 | 02166 | 00028 | 05840 | IO28   | BTM  | ERROR,28,10          |
| 06830 | 49 | 05826 |       | 05850 |        | B7   | IOPROC+24            |
| 06838 | 44 | 06818 | 09972 | 05860 | Y7     | BNF  | IO28,SW21            |
| 06850 | 16 | 06961 | 00000 | 05870 |        | TFM  | IO28UE+11,,10        |
| 06862 | 11 | 09935 | 00002 | 05880 | IONB   | AM   | LBPROC-1,2           |
| 06874 | 27 | 09936 | 09935 | 05890 |        | BT   | LBPROC,LBPROC-1      |
| 06886 | 44 | 06906 | 10020 | 05910 |        | BNF  | Y8 ,SW24             |
| 06898 | 49 | 06818 |       | 05920 |        | B7   | IO28                 |
| 06906 | 44 | 06818 | 09972 | 05930 | Y8     | BNF  | IO28,SW21            |
| 06918 | 44 | 06938 | 09960 | 05940 |        | BNF  | IO28U,SW20           |
| 06930 | 49 | 06986 |       | 05950 |        | B7   | IONA                 |
| 06938 | 26 | 07244 | 09926 | 05960 | IO28U  | TF   | ARG,LABEL-2          |
| 06950 | 32 | 07602 | 00000 | 05970 | IO28UE | SF   | SW30                 |
| 06962 | 32 | 07510 | 00000 | 05980 |        | SF   | SW32                 |
| 06974 | 17 | 07286 | 17826 | 05990 |        | BTM  | TLU,TBLA             |
| 06986 | 11 | 06961 | 00001 | 06000 | IONA   | AM   | IO28UE+11,1,10       |
| 06998 | 45 | 07050 | 09935 | 06010 |        | BNR  | J1 ,LBPROC-1,11      |
| 07010 | 49 | 06818 |       | 06020 |        | B7   | IO28                 |
| 07018 | 11 | 09935 | 00002 | 06030 | COTST2 | AM   | LBPROC-1,2           |
| 07030 | 45 | 06874 | 09935 | 06040 |        | BNR  | IONB+12,LBPROC-1,11  |
| 07042 | 49 | 06506 |       | 06050 |        | B7   | SS1                  |
| 07050 | 14 | 09935 | 00023 | 06060 | J1     | CM   | LBPROC-1,23,610      |
| 07062 | 46 | 07018 | 01200 | 06070 |        | BE   | COTST2               |
| 07074 | 14 | 06961 | 00002 | 06080 |        | CM   | IO28UE+11,2,10       |
| 07086 | 47 | 07122 | 01300 | 06090 |        | BL   | E28                  |
| 07098 | 14 | 06961 | 00003 | 06100 |        | CM   | IO28UE+11,3,10       |
| 07110 | 47 | 07134 | 01100 | 06110 |        | BNH  | J2                   |
| 07122 | 17 | 02132 | 00028 | 06120 | E28    | BTM  | ERROR9,28,10         |

,,,HAS THIS VARIABLE BEEN DIMENSIONED

,,,IS THIS STATEMENT CONTINUED ON NEXT  
,,,CARD,,,IS A DO INDEX BEING MODIFIED WITHIN  
,,,THE LOOP

,,,CLEAR UNDEFINED FLAG ON THIS LABEL

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 07134 | 14 | 09935 | 00004 | 06130 | J2     | CM   | LBPROC-1,4,610       |
| 07146 | 46 | 07190 | 01200 | 06140 |        | BE   | JNPT                 |
| 07158 | 49 | 06818 |       | 06150 |        | B7   | IO28                 |
| 07166 | 14 | 09935 | 00004 | 06160 | J3     | CM   | LBPROC-1,4,610       |
| 07178 | 47 | 06526 | 01200 | 06170 |        | BNE  | IOH                  |
| 07190 | 12 | 06317 | 00001 | 06180 | JNPT   | SM   | NP,1,10              |
| 07202 | 11 | 09935 | 00002 | 06190 |        | AM   | LBPROC-1,2           |
| 07214 | 45 | 07166 | 09935 | 06200 |        | BNR  | J3 ,LBPROC-1,11      |
| 07226 | 49 | 05826 |       | 06210 |        | B7   | IOPROC+24            |
| 07234 |    | 00002 |       | 06220 | RECM   | DC   | 2,0'                 |
| 07244 |    | 00010 |       | 06230 | ARG    | DC   | 10,0                 |
| 07245 |    | 00001 |       | 06240 |        | DC   | 1,1                  |
| 07246 |    | 00001 |       | 06250 | RM     | DC   | 1,1                  |
| 07256 |    | 00010 |       | 06260 | CLEAR  | DC   | 10,0                 |
| 07261 |    | 00005 |       | 06264 |        | DS   | 5                    |
| 07262 | 26 | 07285 | 07261 | 06270 | TLU1   | TF   | TLU-1,*-1            |
| 07274 | 32 | 07274 | 00000 | 06274 | A1     | SF   | A1                   |
| 07286 | 16 | 07304 | 07237 | 06280 | TLU    | TFM  | CFLG+6,ARG-7         |
| 07298 | 33 | 00000 | 00000 | 06290 | CFLG   | CF   |                      |
| 07310 | 11 | 07304 | 00002 | 06300 |        | AM   | CFLG+6,2             |
| 07322 | 14 | 07304 | 07245 | 06310 |        | CM   | CFLG+6,ARG+1         |
| 07334 | 47 | 07298 | 01200 | 06320 |        | BNE  | CFLG                 |
| 07346 | 32 | 07346 | 00000 | 06330 | SW35   | SF   | SW35                 |
| 07358 | 33 | 07358 | 00000 | 06340 | SW36   | CF   | SW36                 |
| 07370 | 33 | 07370 | 00000 | 06350 | SW46   | CF   | SW46                 |
| 07382 | 33 | 16114 | 00000 | 06360 |        | CF   | SW37                 |
| 07394 | 45 | 07974 | 07285 | 06370 | REC    | BNR  | COMPAR,TLU-1,11      |
| 07406 | 44 | 07854 | 07602 | 06380 | OUTTLU | BNF  | TSW31,SW30           |
| 07418 | 44 | 07486 | 07346 | 06390 |        | BNF  | BRBK,SW35            |
| 07430 | 49 | 07554 |       | 06400 |        | B7   | PUT                  |
| 07438 | 44 | 07486 | 16138 | 06410 | T38    | BNF  | BRBK,SW38            |
| 07450 | 12 | 07285 | 00002 | 06420 |        | SM   | TLU-1,2              |
| 07462 | 32 | 07285 | 00000 | 06430 |        | SF   | TLU-1,,6             |
| 07474 | 11 | 07285 | 00002 | 06440 |        | AM   | TLU-1,2              |
| 07486 | 33 | 07602 | 00000 | 06450 | BRBK   | CF   | SW30                 |
| 07498 | 33 | 07498 | 00000 | 06460 | SW31   | CF   | SW31                 |
| 07510 | 33 | 07510 | 00000 | 06470 | SW32   | CF   | SW32                 |
| 07522 | 33 | 16138 | 00000 | 06480 |        | CF   | SW38                 |
| 07534 | 33 | 07274 | 00000 | 06490 |        | CF   | A1                   |
| 07546 | 42 | 00000 | 00000 | 06500 | BB     | BB   |                      |
| 07553 |    |       |       | 06510 |        | DORG | *-4                  |
| 07554 | 44 | 07578 | 07274 | 06520 | PUT    | BNF  | PUTR,A1              |
| 07566 | 12 | 07285 | 00018 | 06530 |        | SM   | TLU-1,18             |
| 07578 | 11 | 07285 | 00009 | 06550 | PUTR   | AM   | TLU-1,9              |
| 07590 | 45 | 07610 | 07285 | 06560 |        | BNR  | J4 ,TLU-1,11         |
| 07602 | 49 | 08482 |       | 06570 | SW30   | B7   | STE                  |
| 07610 | 44 | 07774 | 07274 | 06580 | J4     | BNF  | J4R,A1               |
| 07622 | 11 | 07285 | 00009 | 06590 |        | AM   | TLU-1,9              |
| 07634 | 33 | 07235 | 00000 | 06600 |        | CF   | ARG-9                |
| 07646 | 26 | 07285 | 07244 | 06610 |        | TF   | TLU-1,ARG,6          |
| 07658 | 12 | 07285 | 00011 | 06620 |        | SM   | TLU-1,11             |
| 07670 | 33 | 07285 | 00000 | 06630 |        | CF   | TLU-1,,6             |
| 07682 | 11 | 07285 | 00002 | 06640 |        | AM   | TLU-1,2              |
| 07694 | 32 | 07285 | 00000 | 06650 |        | SF   | TLU-1,,6             |
| 07706 | 11 | 07285 | 00009 | 06660 |        | AM   | TLU-1,9              |
| 07718 | 32 | 07235 | 00000 | 06670 |        | SF   | ARG-9                |
| 07730 | 44 | 07846 | 07510 | 06680 |        | BNF  | FIN,SW32             |
| 07742 | 32 | 07285 | 00000 | 06690 |        | SF   | TLU-1,,6             |
| 07754 | 12 | 07285 | 00010 | 06700 |        | SM   | TLU-1,10             |
| 07766 | 49 | 07486 |       | 06710 |        | B7   | BRBK                 |
| 07774 | 11 | 07285 | 00001 | 06720 | J4R    | AM   | TLU-1,1              |
| 07786 | 26 | 07285 | 07245 | 06730 |        | TF   | TLU-1,ARG+1,6        |
| 07798 | 44 | 07438 | 07510 | 06740 |        | BNF  | T38,SW32             |
| 07810 | 12 | 07285 | 00001 | 06750 |        | SM   | TLU-1,1              |
| 07822 | 32 | 07285 | 00000 | 06760 |        | SF   | TLU-1,,6             |
| 07834 | 11 | 07285 | 00001 | 06770 |        | AM   | TLU-1,1              |
| 07846 | 49 | 07486 |       | 06780 | FIN    | B7   | BRBK                 |
| 07854 | 44 | 07486 | 07498 | 06790 | TSW31  | BNF  | BRBK,SW31            |
| 07866 | 44 | 07886 | 07346 | 06800 |        | BNF  | J5 ,SW35             |
| 07878 | 49 | 07486 |       | 06810 |        | B7   | BRBK                 |
| 07886 | 26 | 07960 | 07285 | 06820 | J5     | TF   | MOVE+6,TLU-1         |
| 07898 | 12 | 07960 | 00010 | 06830 |        | SM   | MOVE+6,10            |
| 07910 | 45 | 07954 | 07285 | 06840 |        | BNR  | MOVE,TLU-1,11        |
| 07922 | 25 | 07960 | 07246 | 06850 |        | TD   | MOVE+6,RM,6          |
| 07934 | 32 | 07370 | 00000 | 06860 |        | SF   | SW46                 |
| 07946 | 49 | 07486 |       | 06870 |        | B7   | BRBK                 |
| 07954 | 31 | 00000 | 07285 | 06880 | MOVE   | TR   | ,TLU-1,11            |
| 07966 | 49 | 07486 |       | 06890 |        | B7   | BRBK                 |
| 07974 | 44 | 07998 | 07274 | 06900 | COMPAR | BNF  | COMPR,A1             |
| 07986 | 12 | 07285 | 00009 | 06910 |        | SM   | TLU-1,9              |
| 07998 | 11 | 07285 | 00001 | 06930 | COMPR  | AM   | TLU-1,1              |
| 08010 | 24 | 07236 | 07285 | 06940 |        | C    | ARG-8 ,TLU-1,11      |
| 08022 | 47 | 08334 | 01200 | 06950 |        | BNE  | RESET1               |
| 08034 | 11 | 07285 | 00007 | 06960 |        | AM   | TLU-1,7              |
| 08046 | 44 | 08218 | 07285 | 06970 |        | BNF  | ADD1,TLU-1,11        |
| 08058 | 33 | 07285 | 00000 | 06980 |        | CF   | TLU-1,,6             |
| 08070 | 11 | 07285 | 00001 | 06990 |        | AM   | TLU-1,1              |
| 08082 | 24 | 07244 | 07285 | 07000 |        | C    | ARG,TLU-1,11         |

,,,HOLDS COMPARISON ARG FOR TLU SUB

,,,ROUTINE TO SEARCH TABLES

,,,HAS WHOLE TABLE BEEN SEARCHED

,,,SET DIMENSION FLAG ON LABEL

,,,PUT LABEL IN TBLA1

,,,PUT LABEL IN TBLA, TBLB OR TBLD

,,,SET UNDEFINED FLAG ON LABEL

,,,REMOVE LABEL FROM TABLE

,,,COMPARE LABEL WITH THOSE IN TABLE

,,,COMPARE FIRST 2 DIGITS OF ARG TO LABEL

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 08094 | 47 | 08174 | 01200 | 07010 |        | BNE  | RESETU               |
| 08106 | 12 | 07285 | 00001 | 07020 |        | SM   | TLU-1,1              |
| 08118 | 32 | 07285 | 00000 | 07030 |        | SF   | TLU-1,,6             |
| 08130 | 11 | 07285 | 00002 | 07040 |        | AM   | TLU-1,2              |
| 08142 | 33 | 07346 | 00000 | 07050 |        | CF   | SW35                 |
| 08154 | 32 | 16114 | 00000 | 07060 |        | SF   | SW37                 |
| 08166 | 49 | 07406 |       | 07070 |        | B7   | OUTTLU               |
| 08174 | 12 | 07285 | 00001 | 07080 | RESETU | SM   | TLU-1,1              |
| 08186 | 32 | 07285 | 00000 | 07090 |        | SF   | TLU-1,,6             |
| 08198 | 11 | 07285 | 00002 | 07100 |        | AM   | TLU-1,2              |
| 08210 | 49 | 07394 |       | 07110 |        | B7   | REC                  |
| 08218 | 11 | 07285 | 00001 | 07120 | ADD1   | AM   | TLU-1,1              |
| 08230 | 44 | 08378 | 07285 | 07130 |        | BNF  | NOFLG,TLU-1,11       |
| 08242 | 33 | 07285 | 00000 | 07140 |        | CF   | TLU-1,,6             |
| 08254 | 24 | 07244 | 07285 | 07150 |        | C    | ARG,TLU-1,11         |
| 08266 | 32 | 07285 | 00000 | 07160 |        | SF   | TLU-1,,6             |
| 08278 | 46 | 08402 | 01200 | 07170 |        | BE   | EQUAL                |
| 08290 | 44 | 08314 | 07274 | 07180 | RESET  | BNF  | RESETR,A1            |
| 08302 | 12 | 07285 | 00011 | 07190 |        | SM   | TLU-1,11             |
| 08314 | 11 | 07285 | 00001 | 07210 | RESETR | AM   | TLU-1,1              |
| 08326 | 49 | 07394 |       | 07220 |        | B7   | REC                  |
| 08334 | 44 | 08358 | 07274 | 07230 | RESET1 | BNF  | RES1R,A1             |
| 08346 | 12 | 07285 | 00011 | 07240 |        | SM   | TLU-1,11             |
| 08358 | 11 | 07285 | 00009 | 07260 | RES1R  | AM   | TLU-1,9              |
| 08370 | 49 | 07394 |       | 07270 |        | B7   | REC                  |
| 08378 | 24 | 07244 | 07285 | 07280 | NOFLG  | C    | ARG,TLU-1,11         |
| 08390 | 47 | 08290 | 01200 | 07290 |        | BNE  | RESET                |
| 08402 | 33 | 07346 | 00000 | 07300 | EQUAL  | CF   | SW35                 |
| 08414 | 44 | 08438 | 07285 | 07310 |        | BNF  | FIX,TLU-1,11         |
| 08426 | 32 | 07358 | 00000 | 07320 |        | SF   | SW36                 |
| 08438 | 44 | 08462 | 07274 | 07330 | FIX    | BNF  | FIXR,A1              |
| 08450 | 12 | 07285 | 00011 | 07340 |        | SM   | TLU-1,11             |
| 08462 | 11 | 07285 | 00001 | 07360 | FIXR   | AM   | TLU-1,1              |
| 08474 | 49 | 07406 |       | 07370 |        | B7   | OUTTLU               |
| 08482 | 44 | 07486 | 02652 | 07380 | STE    | BNF  | BRBK,SW13            |
| 08494 | 33 | 02652 | 00000 | 07390 |        | CF   | SW13                 |
| 08506 | 16 | 02131 | 00032 | 07400 |        | TFM  | ERROR9-1,32,10       |
| 08518 | 15 | 02567 | 00009 | 07410 |        | TDM  | P3+1,9               |
| 08530 | 16 | 02572 | 08550 | 07420 |        | TFM  | P3+6,E32B            |
| 08542 | 49 | 02132 |       | 07430 |        | B7   | ERROR9               |
| 08550 | 15 | 02567 | 00002 | 07440 | E32B   | TDM  | P3+1,2               |
| 08562 | 49 | 07486 | 08634 | 07450 |        | B    | BRBK ,TOPT2          |
| 08575 |    | 00002 |       | 07460 | DCPT2  | DC   | 2,0                  |
| 08583 |    | 00008 |       | 07470 |        | DC   | 8,79380020           |
| 08588 |    | 00005 | ±2394 | 07480 |        | DSA  | ARITH                |
| 08589 |    | 00001 |       | 07490 |        | DC   | 1,'                  |
| 08590 | 31 | 01253 | 00038 | 07500 | CLPT2  | TR   | DCF-6 ,38            |
| 08602 | 31 | 00038 | 08569 | 07504 |        | TR   | 38 ,DCPT2-6          |
| 08614 | 15 | 00022 | 00009 | 07510 |        | TDM  | 22 ,9                |
| 08626 | 49 | 00000 |       | 07515 |        | B7   |                      |
| 08634 | 27 | 00882 | 00881 | 07520 | TOPT2  | BT   | RBCHK ,RBCHK-1       |
| 08646 | 31 | 00038 | 01253 | 07524 |        | TR   | 38 ,DCF-6            |
| 08658 | 49 | 13034 |       | 07530 |        | B7   | FINISH               |
| 08666 | 16 | 09935 | 00417 | 07540 | CIO    | TFM  | LBPROC-1,INPUT+12    |
| 08678 | 32 | 08678 | 00000 | 07550 | SW2    | SF   | SW2                  |
| 08690 | 33 | 04372 | 00000 | 07560 |        | CF   | SW1                  |
| 08702 | 49 | 05802 |       | 07570 |        | B7   | IOPROC               |
| 08710 | 33 | 04372 | 00000 | 07580 | CFRMT  | CF   | SW1                  |
| 08722 | 32 | 08678 | 00000 | 07590 |        | SF   | SW2                  |
| 08734 | 49 | 03884 |       | 07600 |        | B7   | Z1                   |
| 08742 | 33 | 01566 | 00000 | 07610 | BGTR   | CF   | SWTRE                |
| 08754 | 45 | 08774 | 00437 | 07620 |        | BNR  | BGTRC,INPUT+32       |
| 08766 | 49 | 02534 |       | 07630 |        | B7   | END                  |
| 08774 | 14 | 00437 | 00045 | 07640 | BGTRC  | CM   | INPUT+32,45,10       |
| 08786 | 46 | 02534 | 01200 | 07650 |        | BE   | END                  |
| 08798 | 14 | 00437 | 00046 | 07660 |        | CM   | INPUT+32,46,10       |
| 08810 | 46 | 02534 | 01200 | 07670 |        | BE   | END                  |
| 08822 | 17 | 02166 | 00019 | 07680 |        | BTM  | ERROR,19,10          |
| 08834 | 49 | 02534 |       | 07690 |        | B7   | END                  |
| 08845 |    | 00005 |       | 07700 |        | DS   | 5                    |
| 08846 | 45 | 08870 | 09935 | 07710 | SGPRSB | BNR  | BBTT,LBPROC-1,11     |
| 08858 | 17 | 02166 | 00015 | 07720 | E15    | BTM  | ERROR,15,10          |
| 08870 | 27 | 09936 | 09935 | 07730 | BBTT   | BT   | LBPROC,LBPROC-1      |
| 08882 | 45 | 08858 | 09935 | 07740 |        | BNR  | E15,LBPROC-1,11      |
| 08894 | 44 | 08858 | 09960 | 07760 |        | BNF  | E15,SW20             |
| 08906 | 44 | 08858 | 09972 | 07770 |        | BNF  | E15,SW21             |
| 08918 | 49 | 08845 |       | 07780 |        | B7   | SGPRSB-1,,6          |
| 08926 | 24 | 09916 | 07256 | 07790 | BGSG   | C    | OPSEG,CLEAR          |
| 08938 | 47 | 09062 | 01200 | 07800 |        | BNE  | E1                   |
| 08950 | 16 | 09935 | 00441 | 07810 |        | TFM  | LBPROC-1,INPUT+36    |
| 08962 | 17 | 08846 | 08974 | 07820 |        | BTM  | SGPRSB,BGSGP         |
| 08974 | 26 | 09916 | 09926 | 07830 | BGSGP  | TF   | OPSEG,LABEL-2        |
| 08986 | 26 | 07244 | 09926 | 07840 |        | TF   | ARG,LABEL-2          |
| 08998 | 17 | 07262 | 39995 | 07860 | CZ10   | BTM  | TLU1,TBLA1+9         |
| 09010 | 44 | 09042 | 07346 | 07870 |        | BNF  | TBS36,SW35           |
| 09022 | 17 | 02132 | 00004 | 07880 | E4     | BTM  | ERROR9,4,10          |
| 09034 | 49 | 02534 |       | 07890 |        | B7   | END                  |
| 09042 | 44 | 02534 | 07358 | 07900 | TBS36  | BNF  | END,SW36             |

,,,MATCH HAS BEEN FOUND AND LABEL WAS  
,,,DIMENSIONED

,,,LABEL FOUND IN TABLE

,,,SYMBOL TABLE EXCEEDED

,,,DCF DIAG PART 2

,,,CHECK CONTINUATION I-0

,,,CHECK CONTINUATION FORMAT

,,,CHECK BEGIN TRACE

,,,CHECK BEGIN SEGMENT

,,,SEGMENT + PROCEDURE SUBROUTINE

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 09054 | 49 | 09022 |       | 07910 |        | B7   | E4                   |
| 09062 | 17 | 02132 | 00001 | 07920 | E1     | BTM  | ERROR9,1,10          |
| 09074 | 49 | 02534 |       | 07930 |        | B7   | END                  |
| 09082 | 33 | 01566 | 00000 | 07940 | BGPR   | CF   | SWTRE                |
| 09094 | 24 | 09262 | 07256 | 07950 |        | C    | OPPROC,CLEAR         |
| 09106 | 47 | 09062 | 01200 | 07960 |        | BNE  | E1                   |
| 09118 | 16 | 09935 | 00445 | 07970 |        | TFM  | LBPROC-1,INPUT+40    |
| 09130 | 17 | 08846 | 09142 | 07980 |        | BTM  | SGPRSB ,BGPRP        |
| 09142 | 26 | 07244 | 09926 | 07990 | BGPRP  | TF   | ARG,LABEL-2          |
| 09154 | 26 | 09262 | 09926 | 08000 |        | TF   | OPPROC,LABEL-2       |
| 09166 | 32 | 07602 | 00000 | 08010 |        | SF   | SW30                 |
| 09178 | 17 | 07262 | 09995 | 08030 | CZ11   | BTM  | TLU1,TBLA1+9         |
| 09190 | 44 | 09210 | 07346 | 08040 |        | BNF  | PROC1,SW35           |
| 09202 | 49 | 02534 |       | 08050 |        | B7   | END                  |
| 09210 | 11 | 07285 | 00010 | 08060 | PROC1  | AM   | TLU-1,10             |
| 09222 | 33 | 07285 | 00000 | 08070 |        | CF   | TLU-1,,6             |
| 09234 | 44 | 09888 | 07358 | 08080 |        | BNF  | ERR3,SW36            |
| 09246 | 49 | 02534 |       | 08090 |        | B7   | END                  |
| 09262 |    | 00010 |       | 08100 | OPPROC | DC   | 10,0                 |
| 09264 | 32 | 09264 | 00000 | 08110 | CLSG   | SF   | CLSG                 |
| 09276 | 16 | 09935 | 00439 | 08120 |        | TFM  | LBPROC-1,INPUT+34    |
| 09288 | 17 | 08846 | 09300 | 08130 | CLSG1  | BTM  | SGPRSB,CLSGP         |
| 09300 | 26 | 07244 | 09926 | 08140 | CLSGP  | TF   | ARG,LABEL-2          |
| 09312 | 32 | 07602 | 00000 | 08150 |        | SF   | SW30                 |
| 09324 | 32 | 07510 | 00000 | 08160 |        | SF   | SW32                 |
| 09336 | 17 | 07262 | 09995 | 08180 | CZ12   | BTM  | TLU1,TBLA1+9         |
| 09348 | 44 | 15366 | 09540 | 08190 |        | BNF  | END2,EXCPR           |
| 09360 | 33 | 09540 | 00000 | 08200 |        | CF   | EXCPR                |
| 09372 | 49 | 02534 |       | 08210 |        | B7   | END                  |
| 09380 | 32 | 01610 | 00000 | 08220 | ENDSG  | SF   | SEGFLG               |
| 09392 | 16 | 09935 | 00437 | 08230 |        | TFM  | LBPROC-1,INPUT+32    |
| 09404 | 17 | 08846 | 09416 | 08240 |        | BTM  | SGPRSB ,ENDSGP       |
| 09416 | 24 | 09916 | 09926 | 08250 | ENDSGP | C    | OPSEG,LABEL-2        |
| 09428 | 47 | 09062 | 01200 | 08260 |        | BNE  | E1                   |
| 09440 | 26 | 09916 | 07256 | 08270 |        | TF   | OPSEG,CLEAR          |
| 09452 | 33 | 01566 | 00000 | 08280 | ENDTR  | CF   | SWTRE                |
| 09464 | 49 | 02534 |       | 08290 |        | B7   | END                  |
| 09472 | 16 | 09935 | 00441 | 08300 | ENDPR  | TFM  | LBPROC-1,INPUT+36    |
| 09484 | 17 | 08846 | 09496 | 08310 |        | BTM  | SGPRSB ,ENDPRP       |
| 09496 | 24 | 09262 | 09926 | 08320 | ENDPRP | C    | OPPROC,LABEL-2       |
| 09508 | 47 | 09062 | 01200 | 08330 |        | BNE  | E1                   |
| 09520 | 26 | 09262 | 07256 | 08340 |        | TF   | OPPROC,CLEAR         |
| 09532 | 49 | 09452 |       | 08350 |        | B7   | ENDTR                |
| 09540 | 16 | 09935 | 00449 | 08360 | EXCPR  | TFM  | LBPROC-1,INPUT+44    |
| 09552 | 32 | 09540 | 00000 | 08370 |        | SF   | EXCPR                |
| 09564 | 49 | 09288 |       | 08380 |        | B7   | CLSG1                |
| 09572 | 16 | 09935 | 00429 | 08390 | RETURN | TFM  | LBPROC-1,INPUT+24    |
| 09584 | 17 | 08846 | 09596 | 08400 |        | BTM  | SGPRSB ,RETURP       |
| 09596 | 24 | 09262 | 09926 | 08410 | RETURP | C    | OPPROC,LABEL-2       |
| 09608 | 47 | 09062 | 01200 | 08420 |        | BNE  | E1                   |
| 09620 | 49 | 02534 |       | 08430 |        | B7   | END                  |
| 09628 | 33 | 01566 | 00000 | 08440 | SEGMT  | CF   | SWTRE                |
| 09640 | 26 | 09916 | 07256 | 08450 |        | TF   | OPSEG,CLEAR          |
| 09652 | 32 | 01610 | 00000 | 08460 |        | SF   | SEGFLG               |
| 09664 | 44 | 09022 | 09264 | 08470 |        | BNF  | E4,CLSG              |
| 09676 | 45 | 09696 | 00431 | 08480 |        | BNR  | SEG1,INPUT+26        |
| 09688 | 49 | 08858 |       | 08490 |        | B7   | E15                  |
| 09696 | 16 | 09935 | 00431 | 08500 | SEG1   | TFM  | LBPROC-1,INPUT+26    |
| 09708 | 27 | 09936 | 09935 | 08510 | SEG2   | BT   | LBPROC,LBPROC-1      |
| 09720 | 44 | 08858 | 09960 | 08530 |        | BNF  | E15,SW20             |
| 09732 | 44 | 08858 | 09972 | 08540 |        | BNF  | E15,SW21             |
| 09744 | 26 | 07244 | 09926 | 08550 |        | TF   | ARG,LABEL-2          |
| 09756 | 32 | 07602 | 00000 | 08560 |        | SF   | SW30                 |
| 09768 | 17 | 07262 | 09995 | 08580 | CZ13   | BTM  | TLU1,TBLA1+9         |
| 09780 | 44 | 09844 | 07346 | 08590 |        | BNF  | SEG3,SW35            |
| 09792 | 45 | 09812 | 09935 | 08600 | SEG4   | BNR  | ADSEG,LBPROC-1,11    |
| 09804 | 49 | 02534 |       | 08610 |        | B7   | END                  |
| 09812 | 11 | 09935 | 00002 | 08620 | ADSEG  | AM   | LBPROC-1,2           |
| 09824 | 45 | 09708 | 09935 | 08630 |        | BNR  | SEG2,LBPROC-1,11     |
| 09836 | 49 | 02534 |       | 08640 |        | B7   | END                  |
| 09844 | 11 | 07285 | 00010 | 08650 | SEG3   | AM   | TLU-1,10             |
| 09856 | 33 | 07285 | 00000 | 08660 |        | CF   | TLU-1,,6             |
| 09868 | 44 | 09888 | 07358 | 08670 |        | BNF  | ERR3,SW36            |
| 09880 | 49 | 09792 |       | 08680 |        | B7   | SEG4                 |
| 09888 | 17 | 02132 | 00003 | 08690 | ERR3   | BTM  | ERROR9,3,10          |
| 09900 | 49 | 09792 |       | 08700 |        | B7   | SEG4                 |
| 09916 |    | 00010 |       | 08710 | OPSEG  | DC   | 10,0                 |
| 09928 |    | 00012 |       | 08720 | LABEL  | DC   | 12,0                 |
| 09929 |    | 00001 |       | 08730 |        | DC   | 1,'                  |
| 09934 |    | 00005 |       | 08740 |        | DC   | 5,0                  |
| 09936 | 26 | 09928 | 07256 | 08750 | LBPROC | TF   | LABEL,CLEAR          |
| 09948 | 16 | 09971 | 00001 | 08760 |        | TFM  | NCHAR,1,10           |
| 09960 | 33 | 09960 | 00000 | 08770 | SW20   | CF   | SW20                 |
| 09970 |    |       |       | 08780 |        | DORG | *-1                  |
| 09971 |    | 00002 |       | 08790 | NCHAR  | DC   | 2,0                  |
| 09972 | 33 | 09972 | 00000 | 08800 | SW21   | CF   | SW21                 |
| 09982 |    |       |       | 08810 |        | DORG | *-1                  |
| 09983 |    | 00002 |       | 08820 | NSUB   | DC   | 2,0                  |

...,CHECK BEGIN PROCEDURE  
 ...,HOLDS OPEN PROCEDURE LABEL  
 ...,CHECK CALL SEGMENT  
 ...,END TRACE STATEMENT -NO CHECKING  
 ...,CHECK END PROCEDURE STATEMENT  
 ...,CHECK EXECUTE PROCEDURE STATEMENT  
 ...,CHECK RETURN STATEMENT  
 ...,CHECK SEGMENT STATEMENT  
 ...,HOLDS OPEN SEGMENT LABEL  
 ...,SUBROUTINE TO PROCESS LABELS

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 09984 | 33 | 09984 | 00000 | 08830 | SW22   | CF   | SW22                 |
| 09994 |    |       |       | 08840 |        | DORG | *-1                  |
| 09995 |    | 00002 |       | 08850 | NCHAR1 | DC   | 2,0                  |
| 09996 | 33 | 09996 | 00000 | 08860 | SW23   | CF   | SW23                 |
| 10008 | 33 | 10678 | 00000 | 08870 |        | CF   | SW99                 |
| 10020 | 33 | 10020 | 00000 | 08880 | SW24   | CF   | SW24                 |
| 10032 | 33 | 12258 | 00000 | 08890 |        | CF   | DIMFLG               |
| 10044 | 33 | 10044 | 00000 | 08900 | SW47   | CF   | SW47                 |
| 10056 | 33 | 10056 | 00000 | 08910 | SW48   | CF   | SW48                 |
| 10068 | 45 | 10100 | 09935 | 08920 |        | BNR  | J15 ,LBPROC-1,11     |
| 10080 | 16 | 02165 | 00012 | 08930 | E12    | TFM  | ERROR-1,12,10        |
| 10092 | 49 | 02166 |       | 08940 |        | B7   | ERROR                |
| 10100 | 14 | 09935 | 00070 | 08950 | J15    | CM   | LBPROC-1,70,610      |
| 10112 | 46 | 10260 | 01300 | 08960 |        | BNL  | SET20                |
| 10124 | 14 | 09935 | 00003 | 08970 |        | CM   | LBPROC-1,03,610      |
| 10136 | 46 | 10248 | 01200 | 08980 |        | BE   | SET22                |
| 10148 | 14 | 09935 | 00055 | 08990 |        | CM   | LBPROC-1,55,610      |
| 10160 | 46 | 10272 | 01100 | 09000 |        | BH   | SCAN                 |
| 10172 | 14 | 09935 | 00049 | 09010 |        | CM   | LBPROC-1,49,610      |
| 10184 | 46 | 10228 | 01300 | 09020 |        | BNL  | FXD                  |
| 10196 | 14 | 09935 | 00034 | 09030 |        | CM   | LBPROC-1,34,610      |
| 10208 | 47 | 10080 | 01100 | 09040 |        | BNH  | E12                  |
| 10220 | 49 | 10272 |       | 09050 |        | B7   | SCAN                 |
| 10228 | 32 | 09972 | 00000 | 09060 | FXD    | SF   | SW21                 |
| 10240 | 49 | 10272 |       | 09070 |        | B7   | SCAN                 |
| 10248 | 32 | 09984 | 00000 | 09080 | SET22  | SF   | SW22                 |
| 10260 | 32 | 09960 | 00000 | 09090 | SET20  | SF   | SW20                 |
| 10272 | 16 | 10290 | 09918 | 09100 | SCAN   | TFM  | STOR+6,LABEL-10      |
| 10284 | 26 | 00000 | 09935 | 09110 | STOR   | TF   | ,LBPROC-1,11         |
| 10296 | 11 | 09935 | 00002 | 09120 | GOBK   | AM   | LBPROC-1,2           |
| 10308 | 45 | 10606 | 09935 | 09130 |        | BNR  | CHL33,LBPROC-1,11    |
| 10320 | 44 | 10340 | 09960 | 09140 | DONE   | BNF  | J16 ,SW20            |
| 10332 | 49 | 10364 |       | 09150 |        | B7   | J17                  |
| 10340 | 14 | 09971 | 00006 | 09160 | J16    | CM   | NCHAR,6,10           |
| 10352 | 46 | 10080 | 01300 | 09170 |        | BNL  | E12                  |
| 10364 | 14 | 09971 | 00001 | 09180 | J17    | CM   | NCHAR,1,10           |
| 10376 | 46 | 10586 | 01200 | 09190 |        | BE   | TTSW22               |
| 10388 | 44 | 10432 | 09960 | 09200 | GONE   | BNF  | WIPE,SW20            |
| 10400 | 44 | 10420 | 09984 | 09210 |        | BNF  | ST21,SW22            |
| 10412 | 49 | 10432 |       | 09220 |        | B7   | WIPE                 |
| 10420 | 32 | 09972 | 00000 | 09230 | ST21   | SF   | SW21                 |
| 10432 | 16 | 10450 | 09919 | 09240 | WIPE   | TFM  | CLF+6,LABEL-9        |
| 10444 | 33 | 00000 | 00000 | 09250 | CLF    | CF   |                      |
| 10456 | 11 | 10450 | 00002 | 09260 |        | AM   | CLF+6,2              |
| 10468 | 14 | 10450 | 09929 | 09270 |        | CM   | CLF+6,LABEL+1        |
| 10480 | 47 | 10444 | 01200 | 09280 |        | BNE  | CLF                  |
| 10492 | 44 | 10506 | 09960 | 09290 |        | BNF  | *+14,SW20            |
| 10504 | 42 |       |       | 09294 |        | BB2  |                      |
| 10506 | 44 | 10520 | 10678 | 09300 |        | BNF  | SUBN,SW99            |
| 10518 | 42 |       |       | 09310 | BB2    | BB2  |                      |
| 10520 | 32 | 10520 | 00000 | 09320 | SUBN   | SF   | SUBN                 |
| 10532 | 49 | 12018 |       | 09330 |        | B7   | FFNC                 |
| 10540 | 33 | 10520 | 00000 | 09340 | SUBFIN | CF   | SUBN                 |
| 10552 | 44 | 10566 | 07346 | 09350 |        | BNF  | *+14,SW35            |
| 10564 | 42 |       |       | 09354 |        | BB2  |                      |
| 10566 | 16 | 02165 | 00040 | 09360 |        | TFM  | ERROR-1,40,10        |
| 10578 | 49 | 02166 |       | 09370 |        | B7   | ERROR                |
| 10586 | 44 | 10388 | 09984 | 09380 | TTSW22 | BNF  | GONE,SW22            |
| 10598 | 49 | 10722 |       | 09390 |        | B7   | E11                  |
| 10606 | 14 | 09935 | 00033 | 09400 | CHL33  | CM   | LBPROC-1,33,610      |
| 10618 | 46 | 10898 | 01100 | 09410 |        | BH   | AN                   |
| 10630 | 14 | 09935 | 00003 | 09420 |        | CM   | LBPROC-1,03,610      |
| 10642 | 46 | 10710 | 01200 | 09430 |        | BE   | TSW22                |
| 10654 | 14 | 09935 | 00024 | 09440 |        | CM   | LBPROC-1,24,610      |
| 10666 | 47 | 10786 | 01200 | 09450 |        | BNE  | PMTEST               |
| 10678 | 32 | 10678 | 00000 | 09460 | SW99   | SF   | SW99                 |
| 10690 | 44 | 11066 | 09960 | 09470 |        | BNF  | INTA,SW20            |
| 10702 | 49 | 10722 |       | 09480 |        | B7   | E11                  |
| 10710 | 44 | 10742 | 09984 | 09490 | TSW22  | BNF  | ST22,SW22            |
| 10722 | 16 | 02165 | 00011 | 09500 | E11    | TFM  | ERROR-1,11,10        |
| 10734 | 49 | 02166 |       | 09510 |        | B7   | ERROR                |
| 10742 | 32 | 09984 | 00000 | 09520 | ST22   | SF   | SW22                 |
| 10754 | 44 | 10080 | 09960 | 09530 |        | BNF  | E12,SW20             |
| 10766 | 44 | 10998 | 10044 | 09540 | TST27  | BNF  | STOR1,SW47           |
| 10778 | 49 | 10296 |       | 09550 |        | B7   | GOBK                 |
| 10786 | 14 | 09935 | 00010 | 09560 | PMTEST | CM   | LBPROC-1,10,610      |
| 10798 | 46 | 10866 | 01200 | 09570 |        | BE   | TSW23                |
| 10810 | 14 | 09935 | 00020 | 09580 |        | CM   | LBPROC-1,20,610      |
| 10822 | 46 | 10866 | 01200 | 09590 |        | BE   | TSW23                |
| 10834 | 14 | 09935 | 00013 | 09600 |        | CM   | LBPROC-1,13,610      |
| 10846 | 47 | 10320 | 01200 | 09610 |        | BNE  | DONE                 |
| 10858 | 49 | 10080 |       | 09620 |        | B7   | E12                  |
| 10866 | 44 | 10320 | 09996 | 09630 | TSW23  | BNF  | DONE,SW23            |
| 10878 | 33 | 09996 | 00000 | 09640 |        | CF   | SW23                 |
| 10890 | 49 | 10766 |       | 09650 |        | B7   | TST27                |
| 10898 | 14 | 09935 | 00070 | 09660 | AN     | CM   | LBPROC-1,70,610      |
| 10910 | 46 | 10766 | 01300 | 09670 |        | BNL  | TST27                |
| 10922 | 44 | 10998 | 09960 | 09680 |        | BNF  | STOR1,SW20           |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 10934 | 14 | 09935 | 00045 | 09690 |        | CM   | LBPROC-1,45,610      |
| 10946 | 47 | 10722 | 01200 | 09700 |        | BNE  | E11                  |
| 10958 | 44 | 10978 | 09996 | 09710 |        | BNF  | ST23,SW23            |
| 10970 | 49 | 10722 |       | 09720 |        | B7   | E11                  |
| 10978 | 32 | 09996 | 00000 | 09730 | ST23   | SF   | SW23                 |
| 10990 | 49 | 10766 |       | 09740 |        | B7   | TST27                |
| 10998 | 11 | 09971 | 00001 | 09750 | STOR1  | AM   | NCHAR,1,10           |
| 11010 | 14 | 09971 | 00006 | 09760 |        | CM   | NCHAR,6,10           |
| 11022 | 46 | 12362 | 01100 | 09770 |        | BH   | ISNUM                |
| 11034 | 11 | 10290 | 00002 | 09780 |        | AM   | STOR+6,2             |
| 11046 | 26 | 10290 | 09935 | 09790 |        | TF   | STOR+6,LBPROC-1,611  |
| 11058 | 49 | 10296 |       | 09800 |        | B7   | GOBK                 |
| 11066 | 16 | 07285 | ±7826 | 09810 | INTA   | TFM  | TLU-1,TBLA           |
| 11078 | 25 | 09927 | 07246 | 09820 |        | TD   | LABEL-1,RM           |
| 11090 | 31 | 07235 | 09917 | 09830 |        | TR   | ARG- 9,LABEL-11      |
| 11102 | 15 | 07547 | 00009 | 09840 |        | TDM  | BB+1,9               |
| 11114 | 16 | 07552 | ±1994 | 09850 |        | TFM  | BB+6,OTLU            |
| 11126 | 49 | 07286 |       | 09860 |        | B7   | TLU                  |
| 11134 | 16 | 11940 | ±1202 | 09870 | FUDGE  | TFM  | BNCH+6,RETUR         |
| 11146 | 49 | 11226 |       | 09880 |        | B7   | SW29                 |
| 11154 | 44 | 12278 | 16114 | 09890 | SUBSCR | BNF  | E27,SW37             |
| 11166 | 32 | 10020 | 00000 | 09900 |        | SF   | SW24                 |
| 11178 | 32 | 11178 | 00000 | 09910 | SW28   | SF   | SW28                 |
| 11190 | 16 | 09983 | 00000 | 09920 |        | TFM  | NSUB,0,10            |
| 11202 | 44 | 10320 | 11178 | 09930 | RETUR  | BNF  | DONE,SW28            |
| 11214 | 33 | 11226 | 00000 | 09940 |        | CF   | SW29                 |
| 11226 | 16 | 09995 | 00000 | 09950 | SW29   | TFM  | NCHAR1,0,10          |
| 11238 | 26 | 07244 | 07256 | 09960 |        | TF   | ARG,CLEAR            |
| 11250 | 16 | 11456 | 07236 | 09970 |        | TFM  | PUT1+6,ARG-8         |
| 11262 | 33 | 11286 | 00000 | 09980 |        | CF   | SW27                 |
| 11274 | 11 | 09935 | 00002 | 09990 |        | AM   | LBPROC-1,2           |
| 11286 | 45 | 11318 | 09935 | 10000 | SW27   | BNR  | CENUM,LBPROC-1,11    |
| 11298 | 16 | 02165 | 000±3 | 10010 | E13    | TFM  | ERROR-1,13,10        |
| 11310 | 49 | 02166 |       | 10020 |        | B7   | ERROR                |
| 11318 | 14 | 09935 | 00070 | 10030 | CENUM  | CM   | LBPROC-1,70,610      |
| 11330 | 46 | 11386 | 01300 | 10040 |        | BNL  | TNCH                 |
| 11342 | 14 | 09935 | 00033 | 10050 |        | CM   | LBPROC-1,33,610      |
| 11354 | 47 | 11574 | 01100 | 10060 |        | BNH  | SPEC                 |
| 11366 | 44 | 11450 | 11286 | 10070 |        | BNF  | PUT1,SW27            |
| 11378 | 49 | 11298 |       | 10080 |        | B7   | E13                  |
| 11386 | 14 | 09995 | 00000 | 10090 | TNCH   | CM   | NCHAR1,0,10          |
| 11398 | 46 | 11430 | 01200 | 10100 |        | BE   | ST27                 |
| 11410 | 44 | 11450 | 11286 | 10110 |        | BNF  | PUT1,SW27            |
| 11422 | 49 | 11474 |       | 10120 |        | B7   | INCR                 |
| 11430 | 32 | 11286 | 00000 | 10130 | ST27   | SF   | SW27                 |
| 11442 | 49 | 11474 |       | 10140 |        | B7   | INCR                 |
| 11450 | 26 | 00000 | 09935 | 10150 | PUT1   | TF   | ,LBPROC-1,11         |
| 11462 | 11 | 11456 | 00002 | 10160 |        | AM   | PUT1+6,2             |
| 11474 | 11 | 09995 | 00001 | 10170 | INCR   | AM   | NCHAR1,1,10          |
| 11486 | 44 | 11530 | 11286 | 10180 |        | BNF  | ALTEST,SW27          |
| 11498 | 14 | 09995 | 00004 | 10190 |        | CM   | NCHAR1,4,10          |
| 11510 | 46 | 11298 | 01100 | 10200 |        | BH   | E13                  |
| 11522 | 49 | 11554 |       | 10210 |        | B7   | OFF29                |
| 11530 | 14 | 09995 | 00005 | 10220 | ALTEST | CM   | NCHAR1,5,10          |
| 11542 | 46 | 11298 | 01100 | 10230 |        | BH   | E13                  |
| 11554 | 33 | 11226 | 00000 | 10240 | OFF29  | CF   | SW29                 |
| 11566 | 49 | 11274 |       | 10250 |        | B7   | SW27-12              |
| 11574 | 14 | 09935 | 00023 | 10260 | SPEC   | CM   | LBPROC-1,23,610      |
| 11586 | 46 | 11750 | 01200 | 10270 |        | BE   | NS                   |
| 11598 | 14 | 09935 | 00004 | 10280 |        | CM   | LBPROC-1,04,610      |
| 11610 | 46 | 11738 | 01200 | 10290 |        | BE   | ST28                 |
| 11622 | 14 | 09935 | 00010 | 10300 |        | CM   | LBPROC-1,10,610      |
| 11634 | 46 | 11670 | 01200 | 10310 |        | BE   | T29                  |
| 11646 | 14 | 09935 | 00020 | 10320 |        | CM   | LBPROC-1,20,610      |
| 11658 | 47 | 11298 | 01200 | 10330 |        | BNE  | E13                  |
| 11670 | 11 | 09935 | 00002 | 10340 | T29    | AM   | LBPROC-1,2           |
| 11682 | 14 | 09935 | 00070 | 10350 |        | CM   | LBPROC-1,70,610      |
| 11694 | 47 | 11298 | 01300 | 10360 |        | BL   | E13                  |
| 11706 | 12 | 09935 | 00002 | 10370 |        | SM   | LBPROC-1,2           |
| 11718 | 44 | 11942 | 11226 | 10380 |        | BNF  | ST29,SW29            |
| 11730 | 49 | 11298 |       | 10390 |        | B7   | E13                  |
| 11738 | 33 | 11178 | 00000 | 10400 | ST28   | CF   | SW28                 |
| 11750 | 11 | 09983 | 00001 | 10410 | NS     | AM   | NSUB,1,10            |
| 11762 | 14 | 09983 | 00002 | 10420 |        | CM   | NSUB,2,10            |
| 11774 | 46 | 11974 | 01100 | 10430 |        | BH   | E16                  |
| 11786 | 44 | 11806 | 11286 | 10440 | TSSW27 | BNF  | FXTEST,SW27          |
| 11798 | 49 | 11934 |       | 10450 |        | B7   | BNCH                 |
| 11806 | 14 | 07236 | 00055 | 10460 | FXTEST | CM   | ARG- 8,55,10         |
| 11818 | 46 | 11298 | 01100 | 10470 |        | BH   | E13                  |
| 11830 | 14 | 07236 | 00049 | 10480 |        | CM   | ARG- 8,49,10         |
| 11842 | 47 | 11298 | 01300 | 10490 |        | BL   | E13                  |
| 11854 | 15 | 07547 | 00009 | 10500 |        | TDM  | BB+1,9               |
| 11866 | 16 | 07552 | ±1922 | 10510 |        | TFM  | BB+6,OPTBLC          |
| 11878 | 32 | 07602 | 00000 | 10520 |        | SF   | SW30                 |
| 11890 | 32 | 07510 | 00000 | 10530 |        | SF   | SW32                 |
| 11902 | 16 | 07285 | ±7826 | 10540 |        | TFM  | TLU-1,TBLA           |
| 11914 | 49 | 07286 |       | 10550 |        | B7   | TLU                  |
| 11922 | 15 | 07547 | 00002 | 10560 | OPTBLC | TDM  | BB+1,2               |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 11934 | 49 | 11202 |       | 10570 | BNCH   | B7   | RETUR                |
| 11942 | 32 | 11226 | 00000 | 10580 | ST29   | SF   | SW29                 |
| 11954 | 16 | 11940 | 11134 | 10590 |        | TFM  | BNCH+6,FUDGE         |
| 11966 | 49 | 11786 |       | 10600 |        | B7   | TSSW27               |
| 11974 | 16 | 02165 | 00016 | 10610 | E16    | TFM  | ERROR-1,16,10        |
| 11986 | 49 | 02166 |       | 10620 |        | B7   | ERROR                |
| 11994 | 15 | 07547 | 00002 | 10630 | OTLU   | TDM  | BB+1,2               |
| 12006 | 44 | 11154 | 07346 | 10640 |        | BNF  | SUBSCR,SW35          |
| 12018 | 26 | 07244 | 09926 | 10650 | FFNC   | TF   | ARG,LABEL-2          |
| 12030 | 16 | 12060 | 07243 | 10660 |        | TFM  | FF2+6,ARG-1          |
| 12042 | 16 | 12072 | 07244 | 10670 |        | TFM  | FF1+6,ARG            |
| 12054 | 32 | 07243 | 00000 | 10680 | FF2    | SF   | ARG-1,,2             |
| 12066 | 14 | 07244 | 00000 | 10690 | FF1    | CM   | ARG,0,210            |
| 12078 | 47 | 12122 | 01200 | 10700 |        | BNE  | FF3                  |
| 12090 | 12 | 12072 | 00002 | 10710 |        | SM   | FF1+6,2              |
| 12102 | 12 | 12060 | 00002 | 10720 |        | SM   | FF2+6,2              |
| 12114 | 49 | 12054 |       | 10730 |        | B7   | FF2                  |
| 12122 | 14 | 12072 | 00046 | 10740 | FF3    | CM   | FF1+6,46,610         |
| 12134 | 47 | 12158 | 01200 | 10750 |        | BNE  | LUSUB                |
| 12146 | 16 | 12072 | 00000 | 10760 |        | TFM  | FF1+6,0,610          |
| 12158 | 15 | 07547 | 00009 | 10770 | LUSUB  | TDM  | BB+1,9               |
| 12170 | 16 | 07552 | 12202 | 10780 |        | TFM  | BB+6,TBLFB           |
| 12182 | 16 | 07285 | 16676 | 10790 |        | TFM  | TLU-1,TBLF           |
| 12194 | 49 | 07286 |       | 10800 |        | B7   | TLU                  |
| 12202 | 15 | 07547 | 00002 | 10810 | TBLFB  | TDM  | BB+1,2               |
| 12214 | 44 | 12234 | 10520 | 10820 |        | BF   | SUBFIN,SUBN          |
| 12226 | 49 | 10540 |       |       |        |      |                      |
| 12234 | 44 | 12342 | 07346 | 10830 |        | BNF  | SET48,SW35           |
| 12246 | 44 | 12278 | 15962 | 10840 |        | BNF  | E27,SW73             |
| 12258 | 32 | 12258 | 00000 | 10850 | DIMFLG | SF   | DIMFLG               |
| 12270 | 49 | 10388 |       | 10860 |        | B7   | GONE                 |
| 12278 | 16 | 02131 | 00027 | 10870 | E27    | TFM  | ERROR9-1,27,10       |
| 12290 | 16 | 02572 | 12322 | 10880 |        | TFM  | P3+6,GONE1           |
| 12302 | 15 | 02567 | 00009 | 10890 |        | TDM  | P3+1,9               |
| 12314 | 49 | 02132 |       | 10900 |        | B7   | ERROR9               |
| 12322 | 15 | 02567 | 00002 | 10910 | GONE1  | TDM  | P3+1,2               |
| 12334 | 49 | 11166 |       | 10920 |        | B7   | SUBSCR+12            |
| 12342 | 32 | 10056 | 00000 | 10930 | SET48  | SF   | SW48                 |
| 12354 | 49 | 10388 |       | 10940 |        | B7   | GONE                 |
| 12362 | 44 | 10080 | 09960 | 10950 | ISNUM  | BNF  | E12,SW20             |
| 12374 | 32 | 10044 | 00000 | 10960 |        | SF   | SW47                 |
| 12386 | 49 | 10296 |       | 10970 |        | B7   | G0BK                 |
| 12394 | 33 | 12442 | 00000 | 10980 | ARITH  | CF   | SW61                 |
| 12402 |    |       |       | 10990 |        | DORG | *-3                  |
| 12403 |    | 00002 |       | 11000 | DC1    | DC   | 2,0                  |
| 12405 |    | 00002 |       | 11010 | NEXP   | DC   | 2,0                  |
| 12406 | 14 | 00417 | 00070 | 11020 |        | CM   | INPUT+12,70,10       |
| 12418 | 47 | 12442 | 01300 | 11030 |        | BL   | SW61                 |
| 12430 | 17 | 02166 | 00030 | 11040 | E30    | BTM  | ERROR,30,1011        |
| 12442 | 14 | 00417 | 00041 | 11050 | SW61   | CM   | INPUT+12,41,10       |
| 12454 | 47 | 12430 | 01300 | 11060 |        | BL   | E30                  |
| 12466 | 17 | 09936 | 00417 | 11070 |        | BTM  | LBPROC,INPUT+12      |
| 12478 | 44 | 12622 | 10056 | 11090 |        | BNF  | TST24,SW48           |
| 12490 | 17 | 02132 | 00040 | 11100 |        | BTM  | ERROR9,40,10         |
| 12502 | 32 | 12442 | 00000 | 11110 | E31    | SF   | SW61,,5              |
| 12514 | 32 | 12514 | 00000 | 11120 | SW65   | SF   | SW65                 |
| 12526 | 44 | 12862 | 12514 | 11130 | SW63   | BNF  | ISE,SW65             |
| 12538 | 11 | 09935 | 00002 | 11140 |        | AM   | LBPROC-1,2           |
| 12550 | 27 | 09936 | 09935 | 11150 |        | BT   | LBPROC,LBPROC-1      |
| 12562 | 44 | 12582 | 09960 | 11170 |        | BNF  | K1 ,SW20             |
| 12574 | 49 | 12502 |       | 11180 |        | B7   | E31                  |
| 12582 | 44 | 12602 | 10056 | 11190 | K1     | BNF  | K2 ,SW48             |
| 12594 | 49 | 12502 |       | 11200 |        | B7   | E31                  |
| 12602 | 44 | 12642 | 10020 | 11210 | K2     | BNF  | K31,SW24             |
| 12614 | 49 | 12502 |       | 11220 |        | B7   | E31                  |
| 12622 | 44 | 12738 | 10020 | 11230 | TST24  | BNF  | T12,SW24             |
| 12634 | 49 | 12526 |       | 11240 |        | B7   | SW63                 |
| 12642 | 45 | 12666 | 09935 | 11250 | K31    | BNR  | K3,LBPROC-1,11       |
| 12654 | 17 | 02166 | 00030 | 11260 |        | BTM  | ERROR,30,1011        |
| 12666 | 14 | 09935 | 00023 | 11270 | K3     | CM   | LBPROC-1,23,610      |
| 12678 | 46 | 12750 | 01200 | 11280 |        | BE   | T                    |
| 12690 | 14 | 09935 | 00004 | 11290 |        | CM   | LBPROC-1,4,610       |
| 12702 | 46 | 12726 | 01200 | 11300 |        | BE   | K32                  |
| 12714 | 17 | 02166 | 00030 | 11310 |        | BTM  | ERROR,30,1011        |
| 12726 | 11 | 09935 | 00002 | 11320 | K32    | AM   | LBPROC-1,2           |
| 12738 | 33 | 12514 | 00000 | 11330 | T12    | CF   | SW65                 |
| 12750 | 26 | 07244 | 09926 | 11340 | T      | TF   | ARG,LABEL-2          |
| 12762 | 32 | 07602 | 00000 | 11350 |        | SF   | SW30                 |
| 12774 | 17 | 07286 | 17826 | 11360 |        | BTM  | TLU,TBLA             |
| 12786 | 44 | 12810 | 16114 | 11370 |        | BNF  | TSW35,SW37           |
| 12798 | 17 | 02132 | 00031 | 11380 |        | BTM  | ERROR9,31,10         |
| 12810 | 44 | 12830 | 07346 | 11390 | TSW35  | BNF  | CLFGUD,SW35          |
| 12822 | 49 | 12526 |       | 11400 |        | B7   | SW63                 |
| 12830 | 12 | 07285 | 00001 | 11410 | CLFGUD | SM   | TLU-1,1              |
| 12842 | 33 | 07285 | 00000 | 11420 |        | CF   | TLU-1,,6             |
| 12854 | 49 | 12526 |       | 11430 |        | B7   | SW63                 |
| 12862 | 44 | 12886 | 10020 | 11440 | ISE    | BNF  | K5,SW24              |
| 12874 | 11 | 09935 | 00002 | 11450 |        | AM   | LBPROC-1,2           |

,,,CHECK ARITHMETIC STATEMENTS

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|-------|------|----------------------|
| 12886 | 14 | 09935 | 00033 | 11460 | K5    | CM   | LBPROC-1,33,610      |
| 12898 | 47 | 12430 | 01200 | 11470 |       | BNE  | E30                  |
| 12910 | 16 | 13840 | ±2430 | 11480 |       | TFM  | L24+18,E30           |
| 12922 | 33 | 12922 | 00000 | 11490 | SW64  | CF   | SW64                 |
| 12934 | 32 | 12934 | 00000 | 11500 | SW66  | SF   | SW66                 |
| 12946 | 33 | 12946 | 00005 | 11510 | SW62  | CF   | SW62,5               |
| 12958 | 33 | 12526 | 00000 | 11520 |       | CF   | SW63                 |
| 12970 | 16 | 12525 | 00000 | 11530 |       | TFM  | SW63-1,0             |
| 12982 | 16 | 12957 | 00000 | 11540 |       | TFM  | SW62+11,0            |
| 12994 | 33 | 12521 | 00000 | 11550 |       | CF   | SW63-5               |
| 13006 | 33 | 12953 | 00000 | 11560 |       | CF   | SW62+7               |
| 13018 | 16 | 12405 | 00000 | 11570 |       | TFM  | NEXP,0,10            |
| 13030 | 16 | 13309 | ±2526 | 11580 |       | TFM  | MODE+11,SW63         |
| 13042 | 11 | 09935 | 00002 | 11590 | RET   | AM   | LBPROC-1,2           |
| 13054 | 16 | 13236 | ±2958 | 11600 |       | TFM  | CNTRS+6,SW62+12      |
| 13066 | 45 | 13086 | 09935 | 11610 |       | BNR  | K6 ,LBPROC-1,11      |
| 13078 | 49 | 12430 |       | 11620 |       | B7   | E30                  |
| 13086 | 14 | 09935 | 00040 | 11630 | K6    | CM   | LBPROC-1,40,610      |
| 13098 | 46 | 13250 | 01100 | 11640 |       | BH   | TEN                  |
| 13110 | 14 | 09935 | 00003 | 11650 |       | CM   | LBPROC-1,03,610      |
| 13122 | 46 | 13250 | 01200 | 11660 |       | BE   | TEN                  |
| 13134 | 14 | 09935 | 00010 | 11670 |       | CM   | LBPROC-1,10,610      |
| 13146 | 46 | 13042 | 01200 | 11680 |       | BE   | RET                  |
| 13158 | 14 | 09935 | 00020 | 11690 |       | CM   | LBPROC-1,20,610      |
| 13170 | 46 | 13042 | 01200 | 11700 |       | BE   | RET                  |
| 13182 | 14 | 09935 | 00024 | 11710 |       | CM   | LBPROC-1,24,610      |
| 13194 | 47 | 12430 | 01200 | 11720 |       | BNE  | E30                  |
| 13206 | 44 | 13042 | 12922 | 11730 |       | BNF  | RET,SW64             |
| 13218 | 22 | 13236 | 12405 | 11740 |       | S    | CNTRS+6,NEXP         |
| 13230 | 11 | 00000 | 00001 | 11750 | CNTRS | AM   | ,1,10                |
| 13242 | 49 | 13042 |       | 11760 |       | B7   | RET                  |
| 13250 | 27 | 09936 | 09935 | 11770 | TEN   | BT   | LBPROC,LBPROC-1      |
| 13262 | 44 | 13318 | 12946 | 11790 |       | BNF  | ST62,SW62            |
| 13274 | 44 | 13362 | 12934 | 11800 |       | BNF  | ST66,SW66            |
| 13286 | 44 | 14086 | 09972 | 11810 |       | BNF  | FMOD,SW21            |
| 13298 | 44 | 14098 | 00000 | 11820 | MODE  | BNF  | E33                  |
| 13310 | 49 | 14110 |       | 11830 |       | B7   | TWELVE               |
| 13318 | 32 | 12946 | 00000 | 11840 | ST62  | SF   | SW62                 |
| 13330 | 44 | 14110 | 09972 | 11850 |       | BNF  | TWELVE,SW21          |
| 13342 | 32 | 12526 | 00000 | 11860 |       | SF   | SW63                 |
| 13354 | 49 | 14110 |       | 11870 |       | B7   | TWELVE               |
| 13362 | 32 | 12934 | 00000 | 11880 | ST66  | SF   | SW66                 |
| 13374 | 44 | 13418 | 09972 | 11890 |       | BNF  | TST,SW21             |
| 13386 | 12 | 13309 | 00001 | 11900 |       | SM   | MODE+11,1            |
| 13398 | 32 | 13309 | 00000 | 11910 |       | SF   | MODE+11,,6           |
| 13410 | 49 | 14110 |       | 11920 |       | B7   | TWELVE               |
| 13418 | 44 | 13442 | 13309 | 11930 | TST   | BNF  | K7 ,MODE+11,11       |
| 13430 | 17 | 02132 | 00033 | 11940 |       | BTM  | ERROR9,33,10         |
| 13442 | 12 | 13309 | 00001 | 11950 | K7    | SM   | MODE+11,1            |
| 13454 | 49 | 14110 |       | 11960 |       | B7   | TWELVE               |
| 13462 | 44 | 13506 | 10020 | 11970 | K8    | BNF  | K9,SW24              |
| 13474 | 11 | 09935 | 00002 | 11980 |       | AM   | LBPROC-1,2           |
| 13486 | 44 | 13506 | 12442 | 11990 |       | BNF  | K9 ,SW61             |
| 13498 | 49 | 12502 |       | 12000 |       | B7   | E31                  |
| 13506 | 44 | 13526 | 09960 | 12010 | K9    | BNF  | NNM,SW20             |
| 13518 | 49 | 13618 |       | 12020 |       | B7   | NTST                 |
| 13526 | 26 | 07244 | 09926 | 12030 | NNM   | TF   | ARG,LABEL-2          |
| 13538 | 32 | 07602 | 00000 | 12040 |       | SF   | SW30                 |
| 13550 | 32 | 07510 | 00000 | 12050 |       | SF   | SW32                 |
| 13562 | 17 | 07286 | ±7826 | 12060 |       | BTM  | TLU,TBLA             |
| 13574 | 44 | 13594 | 10020 | 12070 |       | BF   | NTST,SW24            |
| 13586 | 49 | 13618 |       |       |       |      |                      |
| 13594 | 44 | 13618 | 16114 | 12080 |       | BNF  | NTST,SW37            |
| 13606 | 17 | 02132 | 00031 | 12090 |       | BTM  | ERROR9,31,10         |
| 13618 | 22 | 13236 | 12405 | 12100 | NTST  | S    | CNTRS+6,NEXP         |
| 13630 | 45 | 13650 | 09935 | 12110 |       | BNR  | K10 ,LBPROC-1,11     |
| 13642 | 49 | 02534 |       | 12120 |       | B7   | END                  |
| 13650 | 44 | 13722 | 12922 | 12130 | K10   | BNF  | CMPR,SW64            |
| 13662 | 43 | 13722 | 13236 | 12140 |       | BD   | CMPR,CNTRS+6,11      |
| 13674 | 11 | 13309 | 00001 | 12150 |       | AM   | MODE+11,1            |
| 13686 | 12 | 12405 | 00001 | 12160 |       | SM   | NEXP,1,10            |
| 13698 | 46 | 13802 | 01200 | 12170 |       | BZ   | OFF64                |
| 13710 | 11 | 13236 | 00001 | 12180 |       | AM   | CNTRS+6,1            |
| 13722 | 14 | 09935 | 00004 | 12190 | CMPR  | CM   | LBPROC-1,04,610      |
| 13734 | 47 | 13822 | 01200 | 12200 |       | BNE  | L24                  |
| 13746 | 32 | 13782 | 00000 | 12210 |       | SF   | K11                  |
| 13758 | 44 | 13782 | 12922 | 12220 |       | BNF  | K11 ,SW64            |
| 13770 | 12 | 13236 | 00001 | 12230 |       | SM   | CNTRS+6,1,610        |
| 13782 | 11 | 09935 | 00002 | 12240 | K11   | AM   | LBPROC-1,2           |
| 13794 | 49 | 13630 |       | 12250 |       | B7   | NTST+12              |
| 13802 | 33 | 12922 | 00000 | 12260 | OFF64 | CF   | SW64                 |
| 13814 | 49 | 13722 |       | 12270 |       | B7   | CMPR                 |
| 13822 | 14 | 09935 | 00024 | 12280 | L24   | CM   | LBPROC-1,24,610      |
| 13834 | 46 | 12430 | 01100 | 12290 |       | BH   | E30                  |
| 13846 | 44 | 13882 | 13782 | 12300 |       | BNF  | L241,K11             |
| 13858 | 33 | 13782 | 00000 | 12310 |       | CF   | K11                  |
| 13870 | 46 | 12430 | 01200 | 12320 |       | BE   | E30                  |
| 13882 | 14 | 09935 | 00014 | 12330 | L241  | CM   | LBPROC-1,14,610      |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 13894 | 46 | 13962 | 01200 | 12340 |        | BE   | SETUP                |
| 13906 | 14 | 09935 | 00023 | 12350 |        | CM   | LBPROC-1,23,610      |
| 13918 | 46 | 12430 | 01200 | 12360 |        | BE   | E30                  |
| 13930 | 14 | 09935 | 00003 | 12370 |        | CM   | LBPROC-1,03,610      |
| 13942 | 46 | 12430 | 01200 | 12380 |        | BE   | E30                  |
| 13954 | 49 | 13042 |       | 12390 |        | B7   | RET                  |
| 13962 | 11 | 09935 | 00002 | 12400 | SETUP  | AM   | LBPROC-1,2           |
| 13974 | 45 | 13994 | 09935 | 12410 |        | BNR  | K12 ,LBPROC-1,11     |
| 13986 | 49 | 12430 |       | 12420 |        | B7   | E30                  |
| 13994 | 14 | 09935 | 00014 | 12430 | K12    | CM   | LBPROC-1,14,610      |
| 14006 | 47 | 13054 | 01200 | 12440 |        | BNE  | RET+12               |
| 14018 | 32 | 12922 | 00000 | 12450 |        | SF   | SW64                 |
| 14030 | 33 | 12934 | 00000 | 12460 |        | CF   | SW66                 |
| 14042 | 11 | 12405 | 00001 | 12470 |        | AM   | NEXP,1,10            |
| 14054 | 14 | 12405 | 00005 | 12480 |        | CM   | NEXP,5,10            |
| 14066 | 46 | 12430 | 01100 | 12490 |        | BH   | E30                  |
| 14078 | 49 | 13042 |       | 12500 |        | B7   | RET                  |
| 14086 | 44 | 14110 | 13309 | 12510 | FMOD   | BNF  | TWELVE,MODE+11,11    |
| 14098 | 17 | 02132 | 00033 | 12520 | E33    | BTM  | ERROR9,33,10         |
| 14110 | 44 | 13462 | 10056 | 12530 | TWELVE | BNF  | K8 ,SW48             |
| 14122 | 16 | 12403 | 00001 | 12540 | AFPR   | TFM  | DC1,1,10             |
| 14134 | 16 | 14176 | 13618 | 12550 |        | TFM  | BIX+18,NTST          |
| 14146 | 32 | 12514 | 00000 | 12560 |        | SF   | SW65                 |
| 14158 | 11 | 09935 | 00002 | 12570 | BIX    | AM   | LBPROC-1,2           |
| 14170 | 44 | 13618 | 12514 | 12580 |        | BNF  | NTST,SW65            |
| 14182 | 45 | 14202 | 09935 | 12590 |        | BNR  | BIX9,LBPROC-1,11     |
| 14194 | 49 | 12430 |       | 12600 |        | B7   | E30                  |
| 14202 | 14 | 09935 | 00024 | 12610 | BIX9   | CM   | LBPROC-1,24,610      |
| 14214 | 47 | 14246 | 01200 | 12620 |        | BNE  | PL                   |
| 14226 | 11 | 12403 | 00001 | 12630 |        | AM   | DC1,1,10             |
| 14238 | 49 | 14158 |       | 12640 |        | B7   | BIX                  |
| 14246 | 14 | 09935 | 00020 | 12650 | PL     | CM   | LBPROC-1,20,610      |
| 14258 | 46 | 14158 | 01200 | 12660 |        | BE   | BIX                  |
| 14270 | 14 | 09935 | 00010 | 12670 |        | CM   | LBPROC-1,10,610      |
| 14282 | 46 | 14158 | 01200 | 12680 |        | BE   | BIX                  |
| 14294 | 27 | 09936 | 09935 | 12686 |        | BT   | LBPROC,LBPROC-1      |
| 14306 | 44 | 14326 | 12922 | 12688 |        | BF   | PL12 ,SW64           |
| 14318 | 49 | 14350 |       |       |        |      |                      |
| 14326 | 44 | 14382 | 09972 | 12691 |        | BNF  | FMOD1,SW21           |
| 14338 | 44 | 14394 | 13309 | 12692 |        | BNF  | E33T,MODE+11,11      |
| 14350 | 33 | 12922 | 00000 | 12706 | PL12   | CF   | SW64                 |
| 14362 | 44 | 14414 | 10056 | 12710 |        | BNF  | K14 ,SW48            |
| 14374 | 49 | 14146 |       | 12720 |        | B7   | AFPR+24              |
| 14382 | 44 | 14350 | 13309 | 12721 | FMOD1  | BNF  | PL12,MODE+11,11      |
| 14394 | 17 | 02132 | 00033 | 12722 | E33T   | BTM  | ERROR9,33,10         |
| 14406 | 49 | 14350 |       | 12723 |        | B7   | PL12                 |
| 14414 | 44 | 14458 | 10020 | 12730 | K14    | BNF  | CC,SW24              |
| 14426 | 11 | 09935 | 00002 | 12740 | COOL   | AM   | LBPROC-1,2           |
| 14438 | 44 | 14458 | 12442 | 12750 |        | BNF  | CC ,SW61             |
| 14450 | 49 | 12502 |       | 12760 |        | B7   | E31                  |
| 14458 | 45 | 14478 | 09935 | 12770 | CC     | BNR  | *+20,LBPROC-1,11     |
| 14470 | 49 | 12430 |       | 12780 |        | B7   | E30                  |
| 14478 | 14 | 09935 | 00023 | 12790 |        | CM   | LBPROC-1,23,610      |
| 14490 | 46 | 14686 | 01200 | 12800 |        | BE   | THIRT                |
| 14502 | 14 | 09935 | 00004 | 12810 |        | CM   | LBPROC-1,04,610      |
| 14514 | 46 | 14806 | 01200 | 12820 |        | BE   | DECCNT               |
| 14526 | 14 | 09935 | 00024 | 12830 |        | CM   | LBPROC-1,24,610      |
| 14538 | 46 | 12430 | 01300 | 12840 |        | BNL  | E30                  |
| 14550 | 14 | 09935 | 00003 | 12850 |        | CM   | LBPROC-1,03,610      |
| 14562 | 46 | 12430 | 01200 | 12860 |        | BE   | E30                  |
| 14574 | 14 | 09935 | 00014 | 12870 |        | CM   | LBPROC-1,14,610      |
| 14586 | 47 | 14686 | 01200 | 12880 |        | BNE  | THIRT                |
| 14598 | 11 | 09935 | 00002 | 12890 |        | AM   | LBPROC-1,2           |
| 14610 | 45 | 14630 | 09935 | 12900 |        | BNR  | CCN32,LBPROC-1,11    |
| 14622 | 49 | 12430 |       | 12910 |        | B7   | E30                  |
| 14630 | 14 | 09935 | 00014 | 12920 | CCN32  | CM   | LBPROC-1,14,610      |
| 14642 | 47 | 14674 | 01200 | 12922 |        | BNE  | SUBTT                |
| 14654 | 32 | 12922 | 00000 | 12924 |        | SF   | SW64                 |
| 14666 | 49 | 14686 |       | 12930 |        | B7   | THIRT                |
| 14674 | 12 | 09935 | 00002 | 12940 | SUBTT  | SM   | LBPROC-1,2           |
| 14686 | 44 | 14706 | 09960 | 12950 | THIRT  | BNF  | K15 ,SW20            |
| 14698 | 49 | 14158 |       | 12960 |        | B7   | BIX                  |
| 14706 | 26 | 07244 | 09926 | 12970 | K15    | TF   | ARG,LABEL-2          |
| 14718 | 32 | 07602 | 00000 | 12980 |        | SF   | SW30                 |
| 14730 | 32 | 07510 | 00000 | 12990 |        | SF   | SW32                 |
| 14742 | 17 | 07286 | 17826 | 13000 |        | BTM  | TLU,TBLA             |
| 14754 | 44 | 14774 | 10020 | 13010 |        | BF   | BIX,SW24             |
| 14766 | 49 | 14158 |       |       |        |      |                      |
| 14774 | 44 | 14158 | 16114 | 13020 |        | BNF  | BIX,SW37             |
| 14786 | 17 | 02132 | 00031 | 13030 |        | BTM  | ERROR9,31,10         |
| 14798 | 49 | 14158 |       | 13040 |        | B7   | BIX                  |
| 14806 | 12 | 12403 | 00001 | 13050 | DECCNT | SM   | DC1,1,10             |
| 14818 | 47 | 14426 | 01200 | 13060 |        | BNZ  | COOL                 |
| 14830 | 33 | 12514 | 00000 | 13070 |        | CF   | SW65                 |
| 14842 | 49 | 14686 |       | 13080 |        | B7   | THIRT                |
| 14850 | 16 | 15261 | 00000 | 13090 | IF     | TFM  | NSN,0,10             |
| 14862 | 16 | 09935 | 00425 | 13100 |        | TFM  | LBPROC-1,INPUT+20    |
| 14874 | 45 | 14906 | 09935 | 13110 |        | BNR  | K16 ,LBPROC-1,11     |

,,CHECK IF STATEMENTS

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 14886 | 17 | 02166 | 00020 | 13120 | E20    | BTM  | ERROR,20,1011        |
| 14898 | 49 | 01234 |       | 13130 |        | B7   | STORE                |
| 14906 | 14 | 09935 | 00004 | 13140 | K16    | CM   | LBPROC-1,04,610      |
| 14918 | 47 | 15042 | 01200 | 13150 |        | BNE  | CREEP                |
| 14930 | 11 | 09935 | 00002 | 13160 |        | AM   | LBPROC-1,2           |
| 14942 | 45 | 14962 | 09935 | 13170 |        | BNR  | K17 ,LBPROC-1,11     |
| 14954 | 49 | 14886 |       | 13180 |        | B7   | E20                  |
| 14962 | 14 | 09935 | 00070 | 13190 | K17    | CM   | LBPROC-1,70,610      |
| 14974 | 46 | 15342 | 01300 | 13200 |        | BNL  | PNUM                 |
| 14986 | 14 | 09935 | 00043 | 13210 |        | CM   | LBPROC-1,43,610      |
| 14998 | 47 | 14874 | 01200 | 13220 |        | BNE  | IF+24                |
| 15010 | 32 | 01534 | 00000 | 13230 |        | SF   | SWC                  |
| 15022 | 11 | 09935 | 00002 | 13240 |        | AM   | LBPROC-1,2           |
| 15034 | 49 | 15294 |       | 13250 |        | B7   | AFC                  |
| 15042 | 11 | 09935 | 00002 | 13260 | CREEP  | AM   | LBPROC-1,2           |
| 15054 | 49 | 14874 |       | 13270 |        | B7   | IF+24                |
| 15062 | 14 | 09935 | 00043 | 13280 | PNUMT  | CM   | LBPROC-1,43,610      |
| 15074 | 47 | 15118 | 01200 | 13290 |        | BNE  | PNUM2                |
| 15086 | 32 | 01534 | 00000 | 13300 |        | SF   | SWC                  |
| 15098 | 11 | 09935 | 00002 | 13310 |        | AM   | LBPROC-1,2           |
| 15110 | 49 | 15190 |       | 13320 |        | B7   | AFC1                 |
| 15118 | 27 | 09936 | 09935 | 13330 | PNUM2  | BT   | LBPROC,LBPROC-1      |
| 15130 | 44 | 15354 | 09960 | 13350 |        | BNF  | E36,SW20             |
| 15142 | 44 | 15354 | 09972 | 13360 |        | BNF  | E36,SW21             |
| 15154 | 14 | 09971 | 00004 | 13370 |        | CM   | NCHAR,4,10           |
| 15166 | 46 | 15354 | 01100 | 13380 |        | BH   | E36                  |
| 15178 | 17 | 16582 | 15190 | 13390 |        | BTM  | NONAME,*+12          |
| 15190 | 45 | 15270 | 09935 | 13400 | AFC1   | BNR  | OOT,LBPROC-1,11      |
| 15202 | 14 | 15261 | 00002 | 13410 |        | CM   | NSN,2,10             |
| 15214 | 47 | 15354 | 01300 | 13420 |        | BL   | E36                  |
| 15226 | 16 | 13840 | 15366 | 13430 |        | TFM  | L24+18,END2          |
| 15238 | 16 | 09935 | 00421 | 13440 |        | TFM  | LBPROC-1,INPUT+16    |
| 15250 | 33 | 12442 | 00000 | 13450 |        | CF   | SW61                 |
| 15260 |    |       |       | 13460 |        | DORG | *-1                  |
| 15261 |    | 00002 |       | 13470 | NSN    | DC   | 2,0                  |
| 15262 | 49 | 12922 |       | 13480 |        | B7   | SW64                 |
| 15270 | 14 | 15261 | 00002 | 13490 | OOT    | CM   | NSN,2,10             |
| 15282 | 46 | 15354 | 01300 | 13500 |        | BNL  | E36                  |
| 15294 | 14 | 09935 | 00023 | 13510 | AFC    | CM   | LBPROC-1,23,610      |
| 15306 | 47 | 15354 | 01200 | 13520 |        | BNE  | E36                  |
| 15318 | 11 | 15261 | 00001 | 13530 |        | AM   | NSN,1,10             |
| 15330 | 11 | 09935 | 00002 | 13540 |        | AM   | LBPROC-1,2           |
| 15342 | 45 | 15062 | 09935 | 13550 | PNUM   | BNR  | PNUMT,LBPROC-1,11    |
| 15354 | 17 | 02166 | 00036 | 13560 | E36    | BTM  | ERROR,36,10          |
| 15366 | 32 | 15378 | 00000 | 13570 | END2   | SF   | SWTR                 |
| 15378 | 44 | 02546 | 01966 | 13580 | SWTR   | BNF  | END+12,SW12          |
| 15390 | 17 | 02166 | 00008 | 13590 |        | BTM  | ERROR,8,10           |
| 15402 | 49 | 02546 |       | 13600 |        | B7   | END+12               |
| 15410 | 16 | 09935 | 00425 | 13610 | GOTO   | TFM  | LBPROC-1,INPUT+20    |
| 15422 | 45 | 15466 | 09935 | 13620 |        | BNR  | AB3 ,LBPROC-1,11     |
| 15434 | 17 | 02166 | 00006 | 13630 | SW70   | BTM  | ERROR,06,10          |
| 15446 | 33 | 15434 | 00000 | 13640 |        | CF   | SW70                 |
| 15458 | 49 | 15366 |       | 13650 |        | B7   | END2                 |
| 15466 | 14 | 09935 | 00024 | 13660 | AB3    | CM   | LBPROC-1,24,610      |
| 15478 | 47 | 15514 | 01200 | 13670 |        | BNE  | GOTOX                |
| 15490 | 32 | 15434 | 00000 | 13680 |        | SF   | SW70                 |
| 15502 | 11 | 09935 | 00002 | 13690 |        | AM   | LBPROC-1,2           |
| 15514 | 27 | 09936 | 09935 | 13700 | GOTOX  | BT   | LBPROC,LBPROC-1      |
| 15526 | 44 | 15434 | 09960 | 13720 |        | BNF  | SW70,SW20            |
| 15538 | 44 | 15434 | 09972 | 13730 |        | BNF  | SW70,SW21            |
| 15550 | 14 | 09971 | 00004 | 13740 |        | CM   | NCHAR,4,10           |
| 15562 | 46 | 15434 | 01100 | 13750 |        | BH   | SW70                 |
| 15574 | 17 | 16582 | 15586 | 13760 |        | BTM  | NONAME,*+12          |
| 15586 | 44 | 15838 | 15434 | 13770 |        | BNF  | GOTOE,SW70           |
| 15598 | 45 | 15618 | 09935 | 13780 |        | BNR  | AB4 ,LBPROC-1,11     |
| 15610 | 49 | 15434 |       | 13790 |        | B7   | SW70                 |
| 15618 | 14 | 09935 | 00023 | 13800 | AB4    | CM   | LBPROC-1,23,610      |
| 15630 | 46 | 15502 | 01200 | 13810 |        | BE   | GOTOX-12             |
| 15642 | 14 | 09935 | 00004 | 13820 |        | CM   | LBPROC-1,4,610       |
| 15654 | 47 | 15434 | 01200 | 13830 |        | BNE  | SW70                 |
| 15666 | 33 | 15434 | 00000 | 13840 |        | CF   | SW70                 |
| 15678 | 11 | 09935 | 00002 | 13850 |        | AM   | LBPROC-1,2           |
| 15690 | 45 | 15710 | 09935 | 13860 |        | BNR  | AB5 ,LBPROC-1,11     |
| 15702 | 49 | 15434 |       | 13870 |        | B7   | SW70                 |
| 15710 | 14 | 09935 | 00023 | 13880 | AB5    | CM   | LBPROC-1,23,610      |
| 15722 | 47 | 15434 | 01200 | 13890 |        | BNE  | SW70                 |
| 15734 | 11 | 09935 | 00002 | 13900 |        | AM   | LBPROC-1,2           |
| 15746 | 27 | 09936 | 09935 | 13910 |        | BT   | LBPROC,LBPROC-1      |
| 15758 | 44 | 15434 | 09972 | 13930 |        | BNF  | SW70,SW21            |
| 15770 | 44 | 15790 | 09960 | 13940 |        | BNF  | GOTOJ,SW20           |
| 15782 | 49 | 15434 |       | 13950 |        | B7   | SW70                 |
| 15790 | 26 | 07244 | 09926 | 13960 | GOTOJ  | TF   | ARG,LABEL-2          |
| 15802 | 32 | 07602 | 00000 | 13970 |        | SF   | SW30                 |
| 15814 | 32 | 07510 | 00000 | 13980 |        | SF   | SW32                 |
| 15826 | 17 | 07286 | 17826 | 13990 |        | BTM  | TLU,TBLA             |
| 15838 | 45 | 15434 | 09935 | 14000 | GOTOE  | BNR  | SW70,LBPROC-1,11     |
| 15850 | 49 | 15446 |       | 14010 |        | B7   | SW70+12              |
| 15858 | 14 | 00419 | 00056 | 14020 | DIMENS | CM   | INPUT+14,56,10       |

,,,STATEMENT IS UNRECOGNIZABLE

,,,DO LOOP ENDS WITH A TRANSFER  
,,,STATEMENT

,,,CHECK GO TO STATEMENTS

,,,CHECK DIMENSION STATEMENTS

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 15870 | 46 | 02780 | 01200 | 14030 |        | BE   | E10                  |
| 15882 | 16 | 09935 | 00435 | 14040 |        | TFM  | LBPROC-1,INPUT+30    |
| 15894 | 16 | 15917 | 00000 | 14050 |        | TFM  | NDS,0,10             |
| 15906 | 32 | 15906 | 00000 | 14060 | SW71   | SF   | SW71                 |
| 15916 |    |       |       | 14070 |        | DORG | *-1                  |
| 15917 |    | 00002 |       | 14080 | NDS    | DC   | 2,0                  |
| 15918 | 49 | 15962 |       | 14090 |        | B7   | SW73                 |
| 15926 | 16 | 09935 | 00429 | 14100 | COMMON | TFM  | LBPROC-1,INPUT+24    |
| 15938 | 44 | 16094 | 01186 | 14110 |        | BNF  | E22,SW500            |
| 15950 | 32 | 15950 | 00000 | 14120 | SW501  | SF   | SW501                |
| 15962 | 32 | 15962 | 00000 | 14130 | SW73   | SF   | SW73                 |
| 15974 | 45 | 16006 | 09935 | 14140 |        | BNR  | AB6 ,LBPROC-1,11     |
| 15986 | 17 | 02132 | 00037 | 14150 | E37    | BTM  | ERROR9,37,10         |
| 15998 | 49 | 16302 |       | 14160 |        | B7   | END1                 |
| 16006 | 14 | 09935 | 00024 | 14170 | AB6    | CM   | LBPROC-1,24,610      |
| 16018 | 47 | 16050 | 01200 | 14180 |        | BNE  | GTLB                 |
| 16030 | 49 | 15986 |       | 14190 |        | B7   | E37                  |
| 16038 | 11 | 09935 | 00002 | 14200 |        | AM   | LBPROC-1,2           |
| 16050 | 27 | 09936 | 09935 | 14210 | GTLB   | BT   | LBPROC,LBPROC-1      |
| 16062 | 44 | 16546 | 10056 | 14230 |        | BNF  | NO48,SW48            |
| 16074 | 17 | 02132 | 00040 | 14240 |        | BTM  | ERROR9,40,10         |
| 16086 | 49 | 16186 |       | 14250 |        | B7   | SW74                 |
| 16094 | 17 | 02132 | 00022 | 14260 | E22    | BTM  | ERROR9,22,10         |
| 16106 | 49 | 15962 |       | 14270 |        | B7   | SW73                 |
| 16114 | 26 | 07244 | 09926 | 14280 | SW37   | TF   | ARG,LABEL-2          |
| 16126 | 32 | 07602 | 00000 | 14290 |        | SF   | SW30                 |
| 16138 | 71 | 16138 | 12258 | 14300 | SW38   | MF   | SW38,DIMFLG          |
| 16150 | 17 | 07286 | 17826 | 14310 |        | BTM  | TLU,TBLA             |
| 16162 | 44 | 16558 | 07346 | 14320 |        | BNF  | E38,SW35             |
| 16174 | 44 | 16370 | 10678 | 14330 |        | BNF  | COM3,SW99            |
| 16186 | 32 | 16186 | 00000 | 14340 | SW74   | SF   | SW74                 |
| 16198 | 11 | 09935 | 00002 | 14350 |        | AM   | LBPROC-1,2           |
| 16210 | 49 | 15974 |       | 14360 |        | B7   | SW73+12              |
| 16218 | 44 | 16114 | 16186 | 14370 | NO24   | BNF  | SW37,SW74            |
| 16230 | 44 | 16290 | 09960 | 14380 |        | BNF  | E42,SW20             |
| 16242 | 44 | 16290 | 09972 | 14390 |        | BNF  | E42,SW21             |
| 16254 | 11 | 15917 | 00001 | 14400 |        | AM   | NDS,1,10             |
| 16266 | 14 | 15917 | 00002 | 14410 |        | CM   | NDS,2,10             |
| 16278 | 47 | 16390 | 01100 | 14420 |        | BNH  | FINUP                |
| 16290 | 17 | 02166 | 00044 | 14430 | E42    | BTM  | ERROR,14,10          |
| 16302 | 33 | 15906 | 00000 | 14440 | END1   | CF   | SW71                 |
| 16314 | 33 | 16186 | 00000 | 14450 |        | CF   | SW74                 |
| 16326 | 33 | 15962 | 00000 | 14460 |        | CF   | SW73                 |
| 16338 | 44 | 03492 | 15950 | 14470 |        | BNF  | CF500,SW501          |
| 16350 | 33 | 15950 | 00000 | 14480 |        | CF   | SW501                |
| 16362 | 49 | 03504 |       | 14490 |        | B7   | CF500+12             |
| 16370 | 44 | 16390 | 15906 | 14500 | COM3   | BF   | E37,SW71             |
| 16382 | 49 | 15986 |       |       |        |      |                      |
| 16390 | 45 | 16410 | 09935 | 14510 | FINUP  | BNR  | AB7 ,LBPROC-1,11     |
| 16402 | 49 | 16302 |       | 14520 |        | B7   | END1                 |
| 16410 | 14 | 09935 | 00004 | 14530 | AB7    | CM   | LBPROC-1,04,610      |
| 16422 | 47 | 16482 | 01200 | 14540 |        | BNE  | CMTST                |
| 16434 | 44 | 15986 | 16186 | 14550 |        | BNF  | E37,SW74             |
| 16446 | 16 | 15917 | 00000 | 14560 |        | TFM  | NDS,0,10             |
| 16458 | 33 | 16186 | 00000 | 14570 |        | CF   | SW74                 |
| 16470 | 11 | 09935 | 00002 | 14580 |        | AM   | LBPROC-1,2           |
| 16482 | 45 | 16502 | 09935 | 14590 | CMTST  | BNR  | AB8 ,LBPROC-1,11     |
| 16494 | 49 | 16302 |       | 14600 |        | B7   | END1                 |
| 16502 | 14 | 09935 | 00023 | 14610 | AB8    | CM   | LBPROC-1,23,610      |
| 16514 | 47 | 15986 | 01200 | 14620 |        | BNE  | E37                  |
| 16526 | 11 | 09935 | 00002 | 14630 |        | AM   | LBPROC-1,2           |
| 16538 | 49 | 15974 |       | 14640 |        | B7   | SW73+12              |
| 16546 | 44 | 16218 | 10020 | 14650 | NO48   | BNF  | NO24,SW24            |
| 16558 | 17 | 02132 | 00038 | 14660 | E38    | BTM  | ERROR9,38,10         |
| 16570 | 49 | 16302 |       | 14670 |        | B7   | END1                 |
| 16581 |    | 00005 |       | 14680 |        | DC   | 5,0                  |
| 16582 | 26 | 07244 | 09926 | 14690 | NONAME | TF   | ARG,LABEL-2          |
| 16594 | 32 | 07602 | 00000 | 14700 |        | SF   | SW30                 |
| 16606 | 32 | 07510 | 00000 | 14710 |        | SF   | SW32                 |
| 16618 | 17 | 07262 | 39995 | 14730 | CZ8    | BTM  | TLU1,TBLA1+9         |
| 16630 | 24 | 07244 | 00805 | 14740 |        | C    | ARG,STNO+8           |
| 16642 | 47 | 16581 | 01200 | 14750 |        | BNE  | NONAME-1,,6          |
| 16654 | 17 | 02132 | 00046 | 14760 |        | BTM  | ERROR9,16,10         |
| 16666 | 49 | 16581 | 00000 | 14770 |        | B    | NONAME-1,,6          |
| 16674 |    |       |       | 14780 |        | DORG | *-3                  |
| 16674 |    | 00002 |       | 14790 | NSRS   | DSC  | 2,0                  |
| 16676 |    | 00001 |       | 14800 | TBLF   | DC   | 1,1                  |
| 17055 |    | 00379 |       | 14810 |        | DS   | 10*37+9              |
| 17056 |    | 00001 |       | 14820 | TBLB   | DC   | 1,1                  |
| 17215 |    | 00159 |       | 14830 |        | DS   | 10*15+9              |
| 17216 |    | 00001 |       | 14840 | TBLD   | DC   | 1,1                  |
| 17825 |    | 00609 |       | 14850 |        | DS   | 10*60+9              |
| 17826 |    | 00001 |       | 14860 | TBLA   | DC   | 1,1                  |
| 39986 |    |       |       | 14870 |        | DORG | TBLA+22160           |
| 39986 |    | 00001 |       | 14880 | TBLA1  | DC   | 1,1                  |
| 16676 |    |       |       | 14890 |        | DORG | TBLF                 |
| 16676 | 27 | 00882 | 00881 | 14900 |        | BT   | RBCHK,RBCHK-1        |
| 16688 | 47 | 16932 | 00200 | 14910 | START  | BNC2 | NOPRTR               |

...CHECK COMMON STATEMENTS  
 ...COMMON STATEMENT NOT FIRST STATEMENT  
 ...IN PROGRAM  
 ...TRANSFER STATEMENT TRANSFERS  
 ...TO ITSELF.  
 ...HOLDS SUB NAMES  
 ...HOLDS OPEN DO LABELS  
 ...HOLDS OPEN DO INDEXES  
 ...HOLDS VARIABLE NAMES  
 ...HOLDS STATEMENT, SEGMENT AND  
 ...PROCEDURE LABELS

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS                        |
|-------|----|-------|-------|-------|--------|------|---------------------------------------------|
| 16700 | 25 | 01259 | 00402 | 14920 | CZ     | TD   | DCF,402 ,,,INITIALIZE TO CORE SIZE AND DISK |
| 16712 | 25 | 16917 | 00401 | 14940 |        | TD   | DCSUBS ,401                                 |
| 16724 | 25 | 08575 | 00401 | 14950 |        | TD   | DCPT2 ,401                                  |
| 16736 | 25 | 01061 | 00400 | 14960 |        | TD   | CZ1+7,400                                   |
| 16748 | 25 | 01109 | 00400 | 14970 |        | TD   | CZ2+7,400                                   |
| 16760 | 25 | 01152 | 00400 | 14980 |        | TD   | CZ3+2,400                                   |
| 16772 | 25 | 01849 | 00400 | 14990 |        | TD   | CZ4+7,400                                   |
| 16784 | 25 | 02811 | 00400 | 15000 |        | TD   | CZ5+7,400                                   |
| 16796 | 25 | 16625 | 00400 | 15010 |        | TD   | CZ8+7,400                                   |
| 16808 | 25 | 09005 | 00400 | 15020 |        | TD   | CZ10+7,400                                  |
| 16820 | 25 | 09185 | 00400 | 15030 |        | TD   | CZ11+7,400                                  |
| 16832 | 25 | 09343 | 00400 | 15040 |        | TD   | CZ12+7,400                                  |
| 16844 | 25 | 09775 | 00400 | 15050 |        | TD   | CZ13+7,400                                  |
| 16856 | 32 | 01186 | 00000 | 15060 |        | SF   | SW500                                       |
| 16868 | 32 | 02652 | 00000 | 15070 |        | SF   | SW13                                        |
| 16880 | 31 | 00038 | 16911 | 15080 |        | TR   | 38 ,DCSUBS-6                                |
| 16892 | 15 | 00022 | 00009 | 15090 |        | TDM  | 22 ,9                                       |
| 16904 | 49 | 00000 | 01018 | 15100 |        | B    | ,CSYMT9-12                                  |
| 16917 |    | 00002 |       | 15110 | DCSUBS | DC   | 2,0                                         |
| 16925 |    | 00008 |       | 15120 |        | DC   | 8,79582005                                  |
| 16930 |    | 00005 | ±6674 | 15130 |        | DSA  | NSRS                                        |
| 16931 |    | 00001 |       | 15140 |        | DC   | 1,1                                         |
| 16932 | 16 | 02355 | 00041 | 15150 | NOPRTR | TFM  | CRD1+1,41,10 ,,,INITIALIZE FOR PUNCH OUTPUT |
| 16944 | 16 | 02367 | 00041 | 15160 |        | TFM  | CRD1+13,41,10                               |
| 16956 | 15 | 02459 | 00004 | 15170 |        | TDM  | PRA1+9,4                                    |
| 16968 | 16 | 00919 | 00041 | 15180 |        | TFM  | HWERR+1,41,10                               |
| 16980 | 49 | 16700 |       | 15190 |        | B7   | CZ                                          |
|       |    |       |       | 15200 | *      |      |                                             |
|       |    |       |       | 15210 | *      |      | DIAGNOSTICIAN 2 CALLED IN BY CLPT2          |
|       |    |       |       | 15220 | *      |      |                                             |
| 12394 |    |       |       | 15230 |        | DORG | ARITH ,,,BEGIN PART 2                       |
| 12398 |    | 00005 |       | 15240 |        | DS   | 5                                           |
| 12400 | 26 | 00413 | 07256 | 15250 | TBLPRT | TF   | INPUT+8,CLEAR,2 ,,,ROUTINE TO PRINT TABLES  |
| 12412 | 11 | 12406 | 00010 | 15260 |        | AM   | TBLPRT+6,10                                 |
| 12424 | 14 | 12406 | 00573 | 15270 |        | CM   | TBLPRT+6,INPUT+168                          |
| 12436 | 47 | 12400 | 01300 | 15280 |        | BL   | TBLPRT                                      |
| 12448 | 16 | 12406 | 00413 | 15290 |        | TFM  | TBLPRT+6,INPUT+8                            |
| 12460 | 31 | 00564 | 07233 | 15300 |        | TR   | INPUT+159,RECM-1                            |
| 12472 | 44 | 12540 | 13334 | 15310 |        | BNF  | GL9,J13                                     |
| 12484 | 33 | 12484 | 00000 | 15320 | J11    | CF   | J11                                         |
| 12496 | 26 | 00417 | 13489 | 15330 |        | TF   | INPUT+12,DOXXX+12                           |
| 12508 | 32 | 01162 | 00000 | 15340 |        | SF   | FLAG                                        |
| 12520 | 49 | 12940 |       | 15350 |        | B7   | TBPRT0                                      |
| 12528 | 32 | 12484 | 00000 | 15360 | GL     | SF   | J11                                         |
| 12540 | 11 | 12399 | 00009 | 15370 | GL9    | AM   | TBLPRT-1,9                                  |
| 12552 | 26 | 09926 | 12399 | 15380 | GL10   | TF   | LABEL-2,TBLPRT-1,11                         |
| 12564 | 44 | 12744 | 09926 | 15390 |        | BNF  | J8 ,LABEL-2                                 |
| 12576 | 44 | 12848 | 13008 | 15400 |        | BNF  | GSN,SWPF                                    |
| 12588 | 44 | 12788 | 12764 | 15410 |        | BNF  | J9,SWUDT                                    |
| 12600 | 26 | 00425 | 13475 | 15420 |        | TF   | INPUT+20,UNDEF+20                           |
| 12612 | 32 | 01162 | 00000 | 15430 |        | SF   | FLAG                                        |
| 12624 | 49 | 12940 |       | 15440 |        | B7   | TBPRT0                                      |
| 12632 | 26 | 00563 | 07256 | 15450 | UNDB1  | TF   | INPUT+158,CLEAR,2                           |
| 12644 | 12 | 12638 | 00010 | 15460 |        | SM   | UNDB1+6,10                                  |
| 12656 | 14 | 12638 | 00403 | 15470 |        | CM   | UNDB1+6,INPUT-2                             |
| 12668 | 47 | 12632 | 01200 | 15480 |        | BNF  | UNDB1                                       |
| 12680 | 16 | 12638 | 00563 | 15490 |        | TFM  | UNDB1+6,INPUT+158                           |
| 12692 | 44 | 12764 | 13334 | 15500 |        | BNF  | SWUDT,J13                                   |
| 12704 | 44 | 12528 | 12484 | 15510 |        | BNF  | GL,J11                                      |
| 12716 | 49 | 12848 |       | 15520 |        | B7   | GSN                                         |
| 12724 | 44 | 12540 | 07274 | 15530 | TA1    | BNF  | GL9,A1                                      |
| 12736 | 49 | 12552 |       | 15540 |        | B7   | GL10                                        |
| 12744 | 44 | 12788 | 13008 | 15550 | J8     | BNF  | J9,SWPF                                     |
| 12756 | 49 | 12848 |       | 15560 |        | B7   | GSN                                         |
| 12764 | 44 | 12848 | 12764 | 15570 | SWUDT  | BNF  | GSN,SWUDT                                   |
| 12776 | 33 | 12764 | 00000 | 15580 |        | CF   | SWUDT                                       |
| 12788 | 33 | 09926 | 00000 | 15590 | J9     | CF   | LABEL-2                                     |
| 12800 | 26 | 13031 | 09926 | 15600 |        | TF   | STADD+11,LABEL-2,6                          |
| 12812 | 11 | 13031 | 00020 | 15610 |        | AM   | STADD+11,20                                 |
| 12824 | 14 | 13031 | 00573 | 15620 |        | CM   | STADD+11,573                                |
| 12836 | 46 | 12940 | 01200 | 15630 |        | BE   | TBPRT0                                      |
| 12848 | 44 | 12880 | 07274 | 15640 | GSN    | BNF  | GSNR,A1                                     |
| 12860 | 12 | 12399 | 00010 | 15650 |        | SM   | TBLPRT-1,10                                 |
| 12872 | 49 | 12892 |       | 15660 |        | B7   | GSNR+12                                     |
| 12880 | 11 | 12399 | 00001 | 15670 | GSNR   | AM   | TBLPRT-1,1                                  |
| 12892 | 45 | 12724 | 12399 | 15680 |        | BNR  | TA1,TBLPRT-1,11                             |
| 12904 | 14 | 13031 | 00413 | 15690 |        | CM   | STADD+11,INPUT+8                            |
| 12916 | 46 | 13008 | 01200 | 15700 |        | BE   | SWPF                                        |
| 12928 | 16 | 12994 | ±2996 | 15710 |        | TFM  | J90+6,SWPF1                                 |
| 12940 | 16 | 13031 | 00413 | 15720 | TBPRT0 | TFM  | STADD+11,INPUT+8                            |
| 12952 | 47 | 12976 | 03400 | 15730 | J91    | BNI  | J10,03400                                   |
| 12964 | 34 | 00000 | 00971 | 15740 | J912   | SKIP | ,1                                          |
| 12976 | 39 | 00405 | 00900 | 15750 | J10    | PRA  | INPUT                                       |
| 12988 | 49 | 12632 |       | 15760 | J90    | B7   | UNDB1                                       |
| 12996 | 16 | 12994 | ±2632 | 15770 | SWPF1  | TFM  | J90+6,UNDB1                                 |
| 13008 | 33 | 13008 | 00000 | 15780 | SWPF   | CF   | SWPF                                        |
| 13020 | 33 | 07274 | 00413 | 15790 | STADD  | CF   | A1,INPUT+8,7                                |
| 13032 | 42 |       |       | 15800 |        | BB2  |                                             |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS                              |
|-------|----|-------|-------|-------|--------|------|---------------------------------------------------|
| 13034 | 25 | 13439 | 00401 | 15820 | FINISH | TD   | DCCOMP ,401 ,,,INITIALIZE FOR CORE SIZE AND DRIVE |
| 13046 | 25 | 13173 | 00400 | 15830 |        | TD   | CZ6+7,400                                         |
| 13058 | 25 | 13229 | 00400 | 15840 |        | TD   | CZ7+7,400                                         |
| 13070 | 47 | 13494 | 00200 | 15850 |        | BNC2 | NPRT2                                             |
| 13082 | 14 | 00417 | 00045 | 15860 | FINSI  | CM   | INPUT+12,45,10                                    |
| 13094 | 47 | 13538 | 01200 | 15870 |        | BNE  | DATA                                              |
| 13106 | 44 | 00419 | 00055 | 15872 |        | CM   | INPUT+14 ,55 ,20                                  |
| 13118 | 47 | 13538 | 01200 | 15874 |        | BNE  | DATA                                              |
| 13130 | 45 | 13538 | 00423 | 15876 |        | BNR  | DATA ,INPUT+18                                    |
| 13142 | 44 | 13166 | 01966 | 15880 |        | BNF  | CZ6 ,SW12                                         |
| 13154 | 17 | 02132 | 00068 | 15890 |        | BTM  | ERROR9,8,10                                       |
| 13166 | 45 | 13186 | 39995 | 15900 | CZ6    | BNR  | J12,TBLA1+9                                       |
| 13178 | 49 | 13234 |       | 15910 |        | B7   | FIB                                               |
| 13186 | 32 | 12764 | 00000 | 15920 | J12    | SF   | SWUDT                                             |
| 13198 | 32 | 13008 | 00000 | 15930 |        | SF   | SWPF                                              |
| 13210 | 32 | 07274 | 00000 | 15940 |        | SF   | A1                                                |
| 13222 | 17 | 12400 | 39986 | 15950 | CZ7    | BTM  | TBLPRT,TBLA1 ,,,PRINT UNDEFINED LABELS            |
| 13234 | 45 | 13254 | 17826 | 15960 | FIB    | BNR  | PTBLA,TBLA                                        |
| 13246 | 49 | 13314 |       | 15970 |        | B7   | FINA                                              |
| 13254 | 32 | 13008 | 00000 | 15980 | PTBLA  | SF   | SWPF                                              |
| 13266 | 32 | 12764 | 00000 | 15990 |        | SF   | SWUDT                                             |
| 13278 | 26 | 13469 | 13493 | 16000 |        | TF   | UNDEF+14,SMBLS+2 ,,,PRINT UNDEFINED SYMBOLS       |
| 13290 | 33 | 13466 | 00000 | 16010 |        | CF   | UNDEF+11                                          |
| 13302 | 17 | 12400 | 17826 | 16020 |        | BTM  | TBLPRT,TBLA                                       |
| 13314 | 45 | 13334 | 17056 | 16030 | FINA   | BNR  | J13 ,TBLB                                         |
| 13326 | 49 | 13358 |       | 16040 |        | B7   | TIGER                                             |
| 13334 | 32 | 13334 | 00000 | 16050 | J13    | SF   | J13                                               |
| 13346 | 17 | 12400 | 17056 | 16060 |        | BTM  | TBLPRT,TBLB ,,,PRINT OPEN DOS                     |
| 13358 | 31 | 00038 | 13433 | 16070 | TIGER  | TR   | 38 ,DCCOMP-6                                      |
| 13370 | 16 | 00068 | 00299 | 16080 |        | TFM  | 68 ,299                                           |
| 13382 | 26 | 00570 | 01381 | 16100 |        | TF   | 570,STNXT                                         |
| 13394 | 44 | 13414 | 01162 | 16110 |        | BNF  | C4D1,FLAG                                         |
| 13406 | 49 | 00000 |       | 16120 |        | B7   | 0                                                 |
| 13414 | 32 | 00039 | 00000 | 16130 | C4D1   | SF   | 39 ,,,INDICATE NO ERRORS HAVE BEEN FOUND          |
| 13426 | 49 | 00000 | 00760 | 16140 |        | B    | ,760                                              |
| 13439 |    | 00002 |       | 16150 | DCCOMP | DC   | 2,0                                               |
| 13453 |    | 00014 |       | 16155 |        | DC   | 14 ,7940016000572'                                |
| 13455 |    | 00011 | X2    | 16160 | UNDEF  | DAC  | 11,UNDEF LABLS                                    |
| 13477 |    | 00007 | X2    | 16170 | DOXXX  | DAC  | 7,OPEN DO                                         |
| 13491 |    | 00002 | X2    | 16180 | SMBLS  | DAC  | 2,SM                                              |
| 13494 | 16 | 12953 | 00041 | 16190 | NPRT2  | TFM  | J91+1,41,10 ,,,INITIALIZE FOR PUNCH OUTPUT        |
| 13506 | 15 | 12985 | 00004 | 16200 |        | TDM  | J10+9,4                                           |
| 13518 | 16 | 12965 | 00041 | 16210 |        | TFM  | J912+1,41,10                                      |
| 13530 | 49 | 13082 |       | 16220 |        | B7   | FINSI                                             |
| 13538 | 16 | 09935 | 00425 | 16230 | DATA   | TFM  | LBPROC-1,INPUT+20 ,,,CHECK DATA STATEMENT         |
| 13550 | 32 | 13550 | 00000 | 16240 | DTFLG  | SF   | DTFLG                                             |
| 13562 | 11 | 09935 | 00002 | 16250 |        | AM   | LBPROC-1,2                                        |
| 13574 | 45 | 13618 | 09935 | 16260 |        | BNR  | MOON1,LBPROC-1,11                                 |
| 13586 | 44 | 13654 | 13550 | 16270 | MOON2  | BNF  | E41,DTFLG                                         |
| 13598 | 16 | 01596 | 13082 | 16280 | ENDATA | TFM  | BRANCH+18,FINSI                                   |
| 13610 | 49 | 01234 |       | 16290 |        | B7   | STORE                                             |
| 13618 | 44 | 13926 | 13550 | 16300 | MOON1  | BNF  | THCON,DTFLG                                       |
| 13630 | 27 | 09936 | 09935 | 16310 |        | BT   | LBPROC,LBPROC-1                                   |
| 13642 | 44 | 13674 | 09960 | 16320 |        | BNF  | FXLC,SW20                                         |
| 13654 | 17 | 02132 | 00035 | 16330 | E41    | BTM  | ERROR9,35,10                                      |
| 13666 | 49 | 13598 |       | 16340 |        | B7   | ENDATA                                            |
| 13674 | 71 | 13674 | 09972 | 16350 | FXLC   | MF   | FXLC,SW21                                         |
| 13686 | 44 | 13818 | 10678 | 16360 |        | BNF  | REGLAB,SW99                                       |
| 13698 | 44 | 13718 | 10056 | 16370 |        | BF   | E40D,SW48                                         |
| 13710 | 49 | 14226 |       |       |        |      |                                                   |
| 13718 | 44 | 14318 | 11286 | 16380 |        | BNF  | E24,SW27                                          |
| 13730 | 11 | 09935 | 00002 | 16390 |        | AM   | LBPROC-1,2                                        |
| 13742 | 33 | 13550 | 00000 | 16400 | CDATF  | CF   | DTFLG                                             |
| 13754 | 49 | 14090 |       | 16410 |        | B7   | BNR                                               |
| 13762 | 14 | 09935 | 00021 | 16420 | SLSH1  | CM   | LBPROC-1,21,610                                   |
| 13774 | 47 | 13654 | 01200 | 16430 |        | BNE  | E41                                               |
| 13786 | 11 | 09935 | 00002 | 16440 |        | AM   | LBPROC-1,2                                        |
| 13798 | 45 | 13618 | 09935 | 16450 |        | BNR  | MOON1,LBPROC-1,11                                 |
| 13810 | 49 | 13586 |       | 16460 |        | B7   | MOON2                                             |
| 13818 | 26 | 07244 | 09926 | 16470 | REGLAB | TF   | ARG,LABEL-2                                       |
| 13830 | 17 | 07286 | 17826 | 16480 |        | BTM  | TLU,TBLA                                          |
| 13842 | 44 | 13862 | 16114 | 16490 |        | BF   | E31D,SW37                                         |
| 13854 | 49 | 14246 |       |       |        |      |                                                   |
| 13862 | 44 | 13882 | 07346 | 16500 |        | BNF  | CUDFF,SW35                                        |
| 13874 | 49 | 13742 |       | 16510 |        | B7   | CDATF                                             |
| 13882 | 12 | 07285 | 00001 | 16520 | CUDFF  | SM   | TLU-1,1                                           |
| 13894 | 33 | 07285 | 00000 | 16530 |        | CF   | TLU-1,,6                                          |
| 13906 | 11 | 07285 | 00001 | 16540 |        | AM   | TLU-1,1                                           |
| 13918 | 49 | 13742 |       | 16550 |        | B7   | CDATF                                             |
| 13926 | 26 | 13976 | 09935 | 16555 | THCON  | TF   | THCO+6,LBPROC-1                                   |
| 13938 | 11 | 13976 | 00002 | 16560 |        | AM   | THCO+6,2                                          |
| 13950 | 45 | 13970 | 13976 | 16565 |        | BNR  | THCO,THCO+6,11                                    |
| 13962 | 49 | 13654 |       | 16570 |        | B7   | E41                                               |
| 13970 | 14 | 00000 | 00048 | 16580 | THCO   | CM   | ,48,10                                            |
| 13982 | 47 | 14110 | 01200 | 16590 |        | BNE  | NUMB1                                             |
| 13994 | 14 | 09935 | 00075 | 16600 |        | CM   | LBPROC-1,75,610                                   |
| 14006 | 46 | 14266 | 01100 | 16610 |        | BH   | E34                                               |
| 14018 | 16 | 14089 | 00060 | 16620 |        | TFM  | HOLCON,0,10                                       |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 14030 | 25 | 14089 | 09935 | 16630 |        | TD   | HOLCON,LBPROC-1,11   |
| 14042 | 11 | 14089 | 00002 | 16640 |        | AM   | HOLCON,2,10          |
| 14054 | 13 | 14089 | 00002 | 16650 |        | MM   | HOLCON,2,9           |
| 14066 | 21 | 09935 | 00099 | 16660 |        | A    | LBPROC-1,99          |
| 14078 | 32 | 13550 | 00000 | 16670 | STDT   | SF   | DTFLG                |
| 14088 |    |       |       | 16680 |        | DORG | *-1                  |
| 14089 |    | 00002 |       | 16690 | HOLCON | DC   | 2,0                  |
| 14090 | 45 | 13762 | 09935 | 16700 | BNR    | BNR  | SLSH1,LBPROC-1,11    |
| 14102 | 49 | 13654 |       | 16710 |        | B7   | E41                  |
| 14110 | 14 | 09935 | 00010 | 16720 | NUMB1  | CM   | LBPROC-1,10,610      |
| 14122 | 46 | 13654 | 01200 | 16730 |        | BE   | E41                  |
| 14134 | 14 | 09935 | 00020 | 16740 |        | CM   | LBPROC-1,20,610      |
| 14146 | 47 | 14170 | 01200 | 16750 |        | BNE  | PROCL                |
| 14158 | 11 | 09935 | 00002 | 16760 |        | AM   | LBPROC-1,2           |
| 14170 | 27 | 09936 | 09935 | 16770 | PROCL  | BT   | LBPROC,LBPROC-1      |
| 14182 | 44 | 13654 | 09960 | 16780 |        | BNF  | E41,SW20             |
| 14194 | 44 | 14286 | 09972 | 16790 |        | BNF  | TFXL,SW21            |
| 14206 | 44 | 14298 | 13674 | 16800 |        | BNF  | E33D,FXLC            |
| 14218 | 49 | 14078 |       | 16810 |        | B7   | STDT                 |
| 14226 | 17 | 02132 | 00040 | 16820 | E40D   | BTM  | ERROR9,40,10         |
| 14238 | 49 | 13598 |       | 16830 |        | B7   | ENDATA               |
| 14246 | 17 | 02132 | 00031 | 16840 | E31D   | BTM  | ERROR9,31,10         |
| 14258 | 49 | 13598 |       | 16850 |        | B7   | ENDATA               |
| 14266 | 17 | 02132 | 00034 | 16860 | E34    | BTM  | ERROR9,34,10         |
| 14278 | 49 | 13598 |       | 16870 |        | B7   | ENDATA               |
| 14286 | 44 | 14078 | 13674 | 16880 | TFXL   | BNF  | STDT ,FXLC           |
| 14298 | 17 | 02132 | 00033 | 16890 | E33D   | BTM  | ERROR9,33,10         |
| 14310 | 49 | 13598 |       | 16900 |        | B7   | ENDATA               |
| 14318 | 17 | 02132 | 00024 | 16910 | E24    | BTM  | ERROR9,24,10         |
| 14330 | 49 | 13730 |       | 16920 |        | B7   | CDATF-12             |
| 16688 |    |       |       | 16930 |        | DEND | START                |

# LABELS IN C4D COMPILER I

ASCAN---COMPILES THE INSTRUCTIONS FOR ALL ARITHMETIC EXPRESSIONS. EACH OF THE CLASS A ARITHMETIC SUBROUTINES SPECIFIES THE ARITHMETIC OPERATION TO BE PERFORMED ON A VARIABLE FOUND IN FAC (THE FLOATING ACCUMULATOR) BY A SECOND VARIABLE. FOR THIS REASON, AT THE BEGINNING OF EVERY ARITHMETIC STATEMENT WILL BE A TRANSMIT FIELD TO FAC FROM THE INITIAL VARIABLE ADDRESS. ARITHMETIC IS PERFORMED BY A BRANCH AND TRANSMIT TO THE APPROPRIATE CLASS A SUBROUTINE THE VALUE OF THE SECOND OR SUBSEQUENT VARIABLE.

BEGI---CAUSES A NEW STATEMENT TO BE READ FROM THE DISK WORKING STORAGE FOR COMPILATION. THE NEW STATEMENT IS OUTPUT WITH ITS OBJECT-TIME REFERENCED ADDRESS EITHER UNTO A CARD OR ONTO THE PRINTER. IF A NUMBERED STATEMENT, THE NUMBER IS STRIPPED AND THEN CONTROL IS SENT TO THE TYPE OF STATEMENT AS PREVIOUSLY DETERMINED IN THE SCAN SECTION OF THE SYSTEM. BEGIN---INITIALIZES AND RESETS INDICATORS IN PREPARATION FOR THE PROCESSING OF A STATEMENT AND CHECKS TO SEE IF THE SYMBOL TABLE AT OBJECT TIME WILL OVERLAP THE MAINLINE PROGRAM AT OBJECT TIME.

BEGPRU---CONVERTS THE BEGIN PROCEDURE STATEMENT TO IN-LINE INSTRUCTIONS. FIRST, A BRANCH AROUND THE PROCEDURE, AND SECONDLY, THE BRANCH WHICH CONSTITUTES THE EXIT FROM THE PROCEDURE. A TRANSMIT FIELD INSTRUCTION WHICH IS THE FIRST EXECUTED INSTRUCTION IN THE PROCEDURE AND FILLS THE EXIT BRANCH ADDRESS, IMMEDIATELY FOLLOWS THE BRANCH INSTRUCTIONS.

BEGSEG---IS REFERENCED BY THE BEGIN SEGMENT STATEMENT AFTER THE SEGMENT NUMBER IS OBTAINED BY ..GETNO... THE CORE INSTRUCTION ADDRESS ...L... IS RESET TO THE STARTING POINT OF THE SEGMENT. THE SECTOR INCREMENT IS PLACED INTO THE SYMBOL TABLE FROM ..DCF + 5... EXIT IS TO ..BEGIN... .

BEGTR---IS ENTERED BY THE BEGIN TRACE STATEMENT. IT SETS THE TRACE SWITCH ..TRX.. AND IF A TRACE FORMAT IS PART OF THE BEGIN TRACE STATEMENT, THE IN-LINE INSTRUCTION, TFM TRFL + 11, ESTABLISHES THE NEW FORMAT FOR THE TRACE OUTPUT.

BEREC---BEGINS THE THREE IN-LINE INSTRUCTIONS WHICH ARE COMPILED FOR THE BEGIN PROCEDURE STATEMENT-BRANCH, BRANCH, AND TRANSMIT FIELD. THE INITIAL BRANCH IS A BRANCH AROUND THE PROCEDURE STATEMENTS. THE SECOND BRANCH IS THE BRANCH TO THE STATEMENT FOLLOWING THE EXECUTE PROCEDURE. THE TRANSMIT FIELD MOVES THE RETURN ADDRESS FROM THE SYMBOL TABLE TO THE PRECEDING BRANCH INSTRUCTION.

BUFBAS---IS THE 100-DIGIT BUFFER USED FOR THE ACCUMULATION OF IN-LINE INSTRUCTIONS.

CALLSG---IS REFERENCED FROM THE CALL SEGMENT STATEMENT AFTER OBTAINING THE SEGMENT NUMBER, THE INSTRUCTION BRANCH AND TRANSMIT IMMEDIATE TO ..CALSR.. WITH A 0 ADDRESS OF THE SYMBOL TABLE LOCATION OF THE NUMBERED SEGMENT ENDING IN 6 IS GENERATED.

CCAL---IS THE SUBROUTINE THAT CALLS THE EXECUTIVE INTO CORE AND TRANSMITS CONTROL BACK TO THE EXECUTIVE. IT IS MOVED TO CORE LOCATION

ZERO AND EXECUTED FROM THAT LOCATION. IT IS THE EQUIVALENT OF A COLD START.

CEND---IS ENTERED FOR THE COMPILATION OF THE END STATEMENT. AFTER SETTING THE END SWITCH, COMPILE 2 IS READ INTO CORE IF NOT PREVIOUSLY READ BY THE COMPILATION OF A DATA STATEMENT. THE NUMBER OF SECTORS FROM THE BEGINNING OF THE PROGRAM ON DISK TO THE BEGINNING OF THE SYMBOL TABLE ON THE DISK, THE NEXT UNUSED CORE ADDRESS, THE OBJECT TIME ADDRESS OF THE NEXT AVAILABLE SYMBOL TABLE ENTRY AND THE ADDRESS OF THE FIRST SYMBOL IN THE SYMBOL TABLE ARE COLLECTED AND OUTPUT TO THE DISK ALONG WITH THE 80 DIGIT USED FUNCTION TABLE INTO THE FIRST SECTOR OF THE OBJECT PROGRAM LOCATION. THIS CONTROL SECTOR IS USED AT OBJECT LOAD TIME TO DEFINE THE EXTENT OF THE SYMBOL TABLE, THE CORE ADDRESS FOR RELOCATING THE CALLED SUBROUTINES AND DEFINING THE SUBROUTINES CALLED.

CEXP---IS USED WHEN \*\* IS ENCOUNTERED DENOTING EXPONENTIATION. DIGITS ARE PLACED IN THE USED FUNCTION TABLE AT ..USED FS-4.. AND AT ..USED FS-6.. TO CALL THE ALOG AND EXP RELOCATABLE SUBROUTINES WHICH ARE USED WHEN THE \*\* IS SPECIFIED.

CFCT---COMPILES INSTRUCTIONS WHEN RELOCATABLE SUBROUTINE NAMES HAVE BEEN ENCOUNTERED IN THE ARITHMETIC STATEMENT.

CFXN---IS THE SUBROUTINE WHICH DECIPHERS A NUMERIC LABEL FROM THE INPUT BUFFER ..CHI.. WHICH IS IN ALPHA MODE AND PLACES THE NUMBER IN NUMERIC MODE IN ..SYM.. . EXITS FROM ..CFXN.. ARE EITHER TO ..SMTLU.. SYMBOL TABLE LOOK-UP OR A RETURN TO THE CALLING SUBROUTINE.

CODE---PLACES THE VARIABLE NAMES INTO THE INSTRUCTIONS, ..INST1.. AND ..INST2.. TO BE ASSOCIATED WITH THE PREVIOUSLY SELECTED SUBROUTINE ENTRY ADDRESSES WHICH HAVE BEEN PLACED IN THE P ADDRESS OF THE INSTRUCTIONS.

COMM---IS ENTERED BY THE COMMON STATEMENT AND PLACES NAMES OF SUBSCRIPTED VARIABLES AND NON-SUBSCRIPTED VARIABLES INTO THE SYMBOL TABLE IN THE SEQUENCE SPECIFIED BY THE COMMON STATEMENT. SUBSCRIPTED VARIABLES WILL HAVE TWO SYM TAB LOCATIONS ASSIGNED - SEE ..DIM...

COMP---IS USED IN SYMBOL TABLE LOOKUP FOR MATCHING A GIVEN SYMBOL WITH THE ENTRIES IN THE SYMBOL TABLE.

CONTRL---PLACES THE NUMERIC REFERENCE OR ARGUMENT AS THE Q FIELD OF A CONTROL INSTRUCTION. IF SWITCH 2 IS OFF, ANY PRINTER CONTROL OPERATION WILL BE BYPASSED.

GRAM---IS THE 10-DIGIT FIELD WHICH INITIALIZES THE SYMBOL TABLE. -00000000\*\*

CSORN---SUBROUTINE DECIPHERS LABELS FROM THE INPUT BUFFER ..CHI.. TO DETERMINE WHETHER THEY ARE NUMBERS, FLOATING POINT VARIABLE NAMES, OR FIXED POINT VARIABLE NAMES. THE RESULTING LABEL OR NUMBER IS PLACED IN ..SYM.. .

DATA---IS ENTERED ON ENCOUNTERING A DATA STATEMENT. IT CALLS THE COMPILE 2 SECTION OF THE COMPILER FROM DISK AND PROCEEDS TO PLACE CONSTANTS ONTO THE DISK TO BE PLACED ONTO THE SYMBOL TABLE AT LOAD TIME.

DCF---IS THE DISK CONTROL FIELD USED TO PLACE A STRING OF 100 DIGITS OF COMPILED INSTRUCTIONS OR SYMBOL TABLE ENTRY CONSTANTS INTO THE PROGRAM

AREA OF THE DISK.

DIM---IS ENTERED BY THE DIMENSION STATEMENT AND PLACES NAMES OF SUBSCRIPTED VARIABLES INTO THE SYMBOL TABLE. EVERY SUBSCRIPTED LABEL WILL HAVE TWO SYMBOLS ALLOCATED AT COMPILE TIME. THE FIRST (HIGH CORE) POSITION WILL CONTAIN THE NAME OF THE VARIABLE. THE SECOND LOCATION WILL CONTAIN THE CORE ADDRESS AT OBJECT RUN TIME OF THE LAST ELEMENT OF THE ARRAY AND THE WIDTH OF THE ARRAY IF DOUBLE DIMENSIONED. EXIT IS TO ..BEGIN.. .

DO---THE STATEMENT NUMBER INDICATING THE TERMINATION OF THE DO IS FIRST OBTAINED THROUGH THE SUBROUTINE ..CFXN.. . A FIELD IN THE SYMBOL TABLE LOCATION ASSOCIATED WITH THIS STATEMENT NUMBER IS DECREMENTED PRODUCING A COUNT OF THE NUMBER OF DOS TO BE TERMINATED BY THIS STATEMENT. THEN THE INDEX OF THE DO IS OBTAINED THROUGH SUBROUTINE ..CSORN.. . THE INSTRUCTION FOR INITIALIZING THE DO INDEX IS ESTABLISHED AND AT ..ELL.. WE BEGIN DETERMINING WHETHER THE INITIAL, TERMINAL AND INCREMENT VALUES OF THE INDEX ARE CONSTANTS OR VARIABLES. FINALLY, A FOUR-ADDRESS STRING IS DEVELOPED IN ..DSADO.. WHICH CONSISTS OF 1)THE INDEX, 2)THE RETURN CORE LOCATION, 3)THE TERMINAL VALUE OF THE INDEX AND 4)INCREMENT OF THE INDEX. THIS 20-DIGIT STRING IS MOVED TO THE TOP OF THE SYMBOL TABLE (LOW NUMBERED CORE) AND WILL OVERLAY TWO SYMBOL TABLE LOCATIONS UNTIL THE TERMINAL DO STATEMENT IS ENCOUNTERED AND COMPILED. EXIT IS TO ..BEGIN.. .

EDCF---IDENTIFIES THE DISK CONTROL FIELD FOR THE COMPILE 2 SECTION OF THE COMPILER.

ENDPRU---GENERATES A BRANCH TO THE EXIT FROM THE PROCEDURE AND ESTABLISHES THE ADDRESS OF THE END OF THE PROCEDURE.

ENDSEG---IS ENTERED FROM THE END SEGMENT STATEMENT. IT SETS AN EARLY TERMINATION TO THE SEGMENT ..SEG.. SUBROUTINE BEFORE BRANCHING THERETO.

ENDTR---END OF TRACE, TURNS OFF THE TRACE SWITCH.

EQ2---EQ2,EQ3,AND EQ4 DETERMINE WHETHER AN ARITHMETIC OPERATOR OTHER THAN THE EQUAL SIGN IS USED IN A STATEMENT. IF NOT, THE STATEMENT WILL BE COMPILED AS A SINGLE TRANSMIT FIELD INSTRUCTION.

EXPRUC---IS ENTERED FROM THE EXECUTE PROCEDURE CONVERTING IT TO A BRANCH AND TRANSMIT IMMEDIATE WITH THE ADDRESS OF THE NEXT MAINLINE INSTRUCTION TO THE PROCEDURE LOCATION IN THE SYMBOL TABLE. THERE THE OBJECT TIME STARTING LOCATION OF THE PROCEDURE IS FOUND.

EXREC---IS THE INSTRUCTION BRANCH AND TRANSMIT FIELD IMMEDIATE TO THE SYMBOL TABLE LOCATION OF THE PROCEDURE, WHICH IS COMPILED IN-LINE FOR THE EXECUTE PROCEDURE STATEMENT. THIS INSTRUCTION IS UNIQUELY  
17XXXX2XXXXX

FCEND---IDENTIFIES THE FIRST SYMBOL TABLE ADDRESS (LOWER NUMBERED CORE) AFTER THE FUNCTION NAMES.

FLNUHB---IS USED FOR CONVERTING THE ALPHA FORM OF FLOATING POINT NUMBERS TO THE INTERNAL ..EXCESS 50.. NUMERIC FORM. THIS SUBROUTINE EXITS TO SYMBOL TABLE LOOK-UP EXCEPT WHEN REFERENCED IN A DATA STATEMENT.

FORMAT---FIRST, THE OBJECT TIME CORE ADDRESS OF THE FORMAT STRING IS PLACED IN THE SYMBOL TABLE. AT ..FSCAN.., WE DECIPHER THE CHARACTERS IN THE FORMAT STATEMENT.

FXNUMB---CONVERTS THE ALPHAMERIC FIXED POINT NUMBERS TO NUMERIC MODE FOR THE NUMBERS IN ARITHMETIC EXPRESSIONS. NUMBERS WHICH ARE USED AS LABELS ARE NOT HANDLED IN THIS SUBROUTINE BUT RATHER IN ..CFXN..

GETNO---IS A SUBROUTINE WHICH OBTAINS THE NUMERIC LABEL FOR PROCEDURES AND SEGMENTS.

GOTO---IF THE TEST FOR A COMPUTED GOTO IS NOT SATISFIED-----WE UTILIZE THE SUBROUTINE ..CFXN.. TO OBTAIN SYMBOL TABLE LOCATION OF THE NUMBERED STATEMENT WHICH IS REFERENCED. THIS SYMBOL LOCATION IS THEN PLACED IN A BRANCH INSTRUCTION AND COMPILED AS 8 DIGITS IN-LINE. EXIT IS TO ..BEGIN... IF THE GOTO IS A COMPUTED GOTO, THE ..GOTORC.. RECORD IS PLACED IN ..PHI.. AND WE PROCEED TO, BY MEANS OF ..CFXN.. SUBROUTINE, ACCUMULATE A STRING OF SYMBOL TABLE ADDRESSES ASSOCIATED WITH THE STATEMENT NUMBERS REFERENCED IN THE COMPUTED GOTO STATEMENT. AT THE END OF THE STRING OF STATEMENT NUMBERS, THE INDEX IS FOUND BY THE SUBROUTINE ..CSORN.. AND THE ..GOTORC.. ADDRESSES ARE MODIFIED FOR CORE LOCATION AND THE ADDRESS OF THE INDEX. THE STRING IS OUTPUT BY ..PUTPHI... EXIT IS TO ..BEGIN..

GOTORC---IS THE IN-LINE SEQUENCE OF INSTRUCTIONS COMPILED FOR A COMPUTED GOTO. IT PROVIDES THE CHECKING OF THE MAGNITUDE OF THE INDEX AND ALSO THAT THE INDEX HAS BEEN DEFINED.

IDCF---IS THE DISK CONTROL FIELD UTILIZED FOR OBTAINING SCANNED SOURCE STATEMENTS FROM WORKING STORAGE ON THE DISK.

IF---IS ENTERED BY EACH IF STATEMENT. AFTER SETTING THE IF SWITCH, THE ..ASCAN.. SUBROUTINE IS ENTERED FOR COMPILING THE ARGUMENT OF THE IF. ON CONCLUDING THE COMPILATION OF THE ARGUMENT, THE SUBROUTINE ..TEN.. IS ENTERED FOR COMPILING THE NECESSARY BRANCH INSTRUCTIONS TO THE NUMBERED STATEMENTS. IF THE CONTINUATION CHARACTER IS USED, THIS SIMPLY ELIMINATES ONE OF THE BRANCH INSTRUCTIONS FOLLOWING THE COMPILATION OF THE IF ARGUMENT. EXIT IS TO ..BEGIN..

INITL---INITIALIZES THE DISK CONTROL FIELDS AND MEMORY SENSITIVE AREAS IN THE COMPILER.

INST1,INST2---ARE THE COMPILER LOCATIONS IN WHICH OBJECT TIME INSTRUCTIONS ARE ASSEMBLED.

IO1---IS ENTERED FOLLOWING THE SELECTION OF ONE OF THE I/O STATEMENTS READ, REREAD, PRINT, PUNCH, TYPE. IN IT, THE FORMAT NUMBER IS OBTAINED BY THE SUBROUTINE ..CFXN.. AND ITS SYMTAB ADDRESS IS OUTPUT TO THE INSTRUCTION STRING.

IO2---SETS THE EXIT FROM THE I/O SUBROUTINE WHEN THE END OF THE I/O LIST HAS BEEN ENCOUNTERED. IT PRODUCES THE IN-LINE INSTRUCTION IDENTIFYING THE END OF THE LIST WITH A Q FIELD OF 2 DIGITS -0.. EXIT IS TO ..BEGIN.

IO3---PROVIDES TESTING FOR THE IMPLIED DO IN THE I/O LIST AND OUTPUTS THE VARIABLE ADDRESSES WHEN SUCH AN IMPLIED DO IS NOT PRESENT.

IO4---PROVIDES THE STACKING OF THE ADDRESSES OF THE VARIABLES WITHIN THE IMPLIED DO UNTIL THE INDEX OF THE IMPLIED DO BECOMES AVAILABLE, AT WHICH TIME WE BRANCH TO ..D01.. FOR THE INITIALIZING OF THE DO. THE EXIT FROM DO BRINGS US TO ..I05.. WHERE THE STACKED VARIABLE ADDRESSES ARE OUTPUT AND TERMINATED WITH THE BRANCH TO ..TD01... EACH VARIABLE IN THE I/O LIST PRODUCES AN INSTRUCTION BRANCH AND TRANSMIT IMMEDIATE TO LOOK, THE VARIABLE ADDRESS.

L---IS THE OBJECT TIME CORE ADDRESS FOR EACH INSTRUCTION AND IS INCREMENTED AS COMPILED INSTRUCTIONS ARE MOVED INTO ..BUFBA... .

LAST---IS A READ BACK CHECK AT THE TIME THE COMPILER IS INITIALLY READ INTO CORE.

LSTC---THIS SUBROUTINE PERMITS THE OUTPUT OF REFERENCED SOURCE STATEMENTS TO EITHER CARDS OR THE PRINTER.

LSTPG---CAUSES THE ENTIRE PROGRAM TO BE LISTED ON THE PRINTER IF THE DIAGNOSTICIAN HAS FOUND ERRORS IN THE PROGRAM.

LSTT---THIS SUBROUTINE PERMITS THE OUTPUT OF ERROR MESSAGES TO EITHER THE PRINTER OR THE TYPEWRITER.

MEMCAP---IS SET IN THE INITIALIZATION OF THE COMPILER AND IDENTIFIES THE MEMORY CAPACITY OF THE COMPUTER.

MOUN7---INITIALIZES THE SYMBOL TABLE FROM ..FCTEND.. AT THE HIGH END OF CORE DOWN TO THE POSITION ..LAST+12.. THE CHARACTERISTIC FIELD IN THE SYMBOL TABLE IS -00000000\*\*. THE LAST POSITION IN THE SYMBOL TABLE WILL BE RECOGNIZED BY \*\* BEING REPLACED BY 0F.

MUSPCE---THIS SUBROUTINE OUTPUTS THE MESSAGE SYN TAB FULL WHEN ATTEMPTING TO PUT ANOTHER SYMBOL INTO THE SYMBOL TABLE AND THERE IS NOT ADEQUATE SPACE IN THE SYMBOL TABLE OR WHEN A 20 DIGIT DO RECORD IS TO BE PLACED AT THE END OF THE SYMBOL TABLE--THAT IS, IN LOW CORE--BUT OTHER SYMBOLS OCCUPY THE NEXT AVAILABLE LOCATIONS. THE EXIT FROM THIS SUBROUTINE IS ..BEGIN.. WHICH PERMITS THE FURTHER COMPILATION OF ADDITIONAL STATEMENTS, HOWEVER, THE REFERENCED CORE ADDRESS OF INSTRUCTIONS THEREAFTER WILL NOT BE CORRECT.

PAUSE---COMPILES TO A BRANCH AND TRANSMIT IMMEDIATE TO ..DTR... . THE Q ADDRESS OF THE PAUSE INSTRUCTION WILL BE A 5-DIGIT FIELD OF ZEROS (-0000).

PHI---IS A BUFFER AREA IN WHICH FORMAT STRINGS AND COMPUTED GOTO INSTRUCTIONS ARE COMPILED PRIOR TO BEING PLACED ON THE DISK. ITS LENGTH IS 400 DIGITS.

PUTEB---PROVIDES FOR THE STACKING OF VARIABLE ADDRESSES PRIOR TO THEIR USE IN THE STRING OF ARITHMETIC OPERATIONAL INSTRUCTIONS.

PUTPHI---IS THE SUBROUTINE USED FOR OUTPUTTING FORMAT STRINGS AND ALSO THE COMPUTED GOTO STRING. ..PUTX.. UTILIZES ..PUTPHI.. IN PART FOR THE OUTPUTTING OF INSTRUCTIONS. WHEN A STRING OF 100 DIGITS HAS BEEN DEVELOPED IN ..BUFBA... , THIS IS MOVED TO THE DISK BY ..PDK...AND ..BUFBA... IS RESET TO TAKE THE NEXT STRING.

PUT1 AND PUT2---SUBROUTINES EXAMINE AN INSTRUCTION AS DEVELOPED IN

..INST1.. AND ..INST2.. TO DETERMINE IF ANY SUBSCRIPTION IS REQUIRED IN THE INSTRUCTION. IF SO, THE SUBSCRIBING INSTRUCTIONS ARE MOVED INTO ..OUT..., THE INSTRUCTION IS MOVED INTO ..OUT+60.. AND THE NECESSARY ADDRESS MODIFICATION IS ACCOMPLISHED ULTIMATELY BRANCHING TO ..PUTX.. WHERE THE INSTRUCTION WITH ANY ADDRESS MODIFICATION REQUIRED FOR THE SUBSCRIPTION IS PUT INTO THE OUTPUT STRING ..BUFBAS...

SCRIPT---SUBROUTINE IS ENTERED TO INTERPRET THE SUBSCRIPT OF A SUBSCRIPTED VARIABLE. IF THE SUBSCRIPT IS NUMERIC, THE OBJECT-TIME CORE ADDRESS IS ADJUSTED CORRESPONDINGLY. IF THE SUBSCRIPT IS A VARIABLE, THEN A 15-DIGIT RECORD IDENTIFYING THE WIDTH OF THE ARRAY, THE FIRST INDEX AND THE SECOND INDEX IS LOCATED AT THE TOP OF ..PHI.. (A BUFFER AREA) FOR USE LATER BY THE SUBROUTINES ..PUT1.. OR ..PUT2...

SEG---IS REFERENCED FROM THE SEGMENT STATEMENT AFTER SETTING THE SEG EXIT BRANCH. THE END INSTRUCTION IS PLACED IN ..OUT.. AND OUTPUT AS AN IN-LINE INSTRUCTION. SHOULD THE END SEGMENT OR THE SEGMENT STATEMENT EVER BE EXECUTED AT OBJECT TIME, THE RESULT WILL BE AS THOUGH THE END STATEMENT HAD BEEN EXECUTED. THE LAST CORE LOCATION OF THE SEGMENT OR UN-SEGMENTED PORTION IS COMPARED WITH THE LAST CORE LOCATION OF ANY PREVIOUS SEGMENTS AND THE GREATER OF THESE PLACED IN ..LMAX.. WHICH LATER WILL BE USED FOR LOCATING THE RELOCATABLE SUBROUTINES AT OBJECT LOAD TIME. ANY REMAINING INSTRUCTIONS IN THE COMPILED INSTRUCTION STRING ..BUFBAS.. ARE OUTPUT TO THE DISK, AND FINALLY, IF THIS IS A SEGMENT STATEMENT, THE OBJECT TIME CORE ADDRESS IS MOVED INTO THE SYMBOL TABLE OF EACH DEFINED SEGMENT. THIS SUBROUTINE EXITS TO ..BEGIN...

SMTLU---SUBROUTINE IS ENTERED WHEN A VARIABLE NAME HAS BEEN PLACED IN ..SYM.. AND IT IS DESIRED TO OBTAIN THE OBJECT TIME CORE ADDRESS ASSOCIATED WITH THIS LABEL. IF THE LABEL IS IN THE SYMBOL TABLE, ITS ADDRESS IS RECOVERABLE FROM ..SMCNT... IF THE VARIABLE IS NOT IN THE SYMBOL TABLE, IT WILL BE PLACED IN THE NEXT AVAILABLE LOCATION AND ITS ADDRESS AT OBJECT RUNNING TIME WILL AGAIN BE FOUND IN ..SMCNT... THE ADDRESS ..SMTLU1+11.. IS THE COMPILE TIME ADDRESS OF THIS VARIABLE IN THE SYMBOL TABLE.

SMTST---TESTS TO SEE IF THE SYMBOL IN ..SYM.. IS A NAME IN THE FUNCTION TABLE, AND IF SO, A DIGIT IS PLACED IN THE USED FUNCTION TABLE ..USEDFS.. FOR THE CALLING OF RELOCATABLE SUBROUTINE AT LOAD TIME.

SSB---IN THE ..ASCAN.. SUBROUTINE IS ADDRESSED WHEN THE EQUAL SIGN HAS BEEN DETECTED AND PROVIDES FOR THE STORING OF THE COMPUTED RESULT TO CONCLUDE THE ARITHMETIC STATEMENT. NOTE, THE MODE OF THE VARIABLE IN ..INST1.. AND ..INST2.. IS DENOTED BY THE DIGIT IN ..INST +14... A ZERO IN THIS POSITION DENOTES A FLOATING POINT VARIABLE. A DIGIT IN THIS POSITION DENOTES A FIXED POINT VARIABLE. ALSO, A FLAG IN POSITION ..INST +12.. WILL OCCUR IF THE VARIABLE IS A SUBSCRIPTED VARIABLE. IN ..INST +13.. WILL BE THE NUMBER OF THE SUBSCRIPT. THIS WILL BE USED IN ..PUT1.. AND ..PUT2.. TO DETERMINE WHICH SUBSCRIPT MODIFICATION IS REQUIRED FOR THE VARIABLE IN QUESTION.

STOP---COMPILES TO A BRANCH AND TRANSMIT IMMEDIATE TO ..DTRB.... THE Q FIELD WILL BE A 4-DIGIT FIELD OF THE NUMBERED STOP.

SUBI---IS THE SET OF SUBSCRIPTING INSTRUCTIONS WHICH ARE USED IN ..PUT1.. AND ..PUT2.. AND WHICH GO IN-LINE DEPENDING ON THE SINGLE OR DOUBLE SUBSCRIPTED VARIABLE REQUIREMENTS.

SYM---IS THE LOCATION WHERE ALL SYMBOLS---VARIABLE NAMES, NUMERIC LABELS AND CONSTANTS---ARE LOCATED PRIOR TO THEIR ASSOCIATION WITH AN ADDRESS IN THE SYMBOL TABLE.

TESTDO---AFTER EVERY NON-TRANSFER STATEMENT IS COMPILED THE DO SWITCH IS HEREIN TESTED TO DETERMINE IF THE STATEMENT WERE NUMBERED AND IF IT WERE A TERMINAL DO STATEMENT. IF SO THE LAST 20-DIGIT RECORD PLACED BY ..DO.. IS CALLED INTO ..OUT.. AND THE TERMINAL DO STATEMENTS ARE COMPLETED FROM THIS RECORD. THESE STATEMENTS RESIDE IN THE COMPILER UNDER THE NAME ..DURCRD... THE 20 DIGIT RECORD IS RESTORED TO THE CONVENTIONAL -00000000\*-00000000# FIELDS AND THE SUBROUTINE CONCLUDES WITH A TEST TO DETERMINE IF THE STATEMENT TERMINATES MORE THAN ONE DO STATEMENT. THE SUBROUTINE EXITS TO ..BEGIN...

TFSAVE---PROVIDES FOR TEMPORARY STORAGE OF PARTIALLY COMPILED RESULTS.

TRIT---CAUSES THE FINAL INSTRUCTION OF A STATEMENT STRING TO PERMIT TRACING AT OBJECT TIME RUNNING.

TRY---BRANCHES TO THE INITIALIZATION OF THE SYMBOL TABLE AFTER ALL RELOCATABLE SUBROUTINE NAMES HAVE BEEN STORED IN THE SYMBOL TABLE.

USEDPS---IS A STRING OF 80 DIGITS TO PERMIT IDENTIFICATION OF THE 37 POSSIBLE SUBROUTINES WHICH MAY BE REFERENCED IN THE SOURCE PROGRAMS.

## LABELS IN COMPILE II

COMPILE 2 IS BROUGHT INTO CORE FROM THE DISK BY THE END STATEMENT OR BY THE DATA STATEMENT. BOTH THE END AND THE DATA STATEMENTS CAUSE THE END INSTRUCTION TO BE COMPILED AND THE FINAL LIST OF INSTRUCTIONS TO BE PLACED ONTO THE DISK AS THE TERMINAL SECTOR OF THE PROGRAM INSTRUCTIONS. FOLLOWING THESE PROGRAM SECTORS ON THE DISK WILL BE SECTORS CONTAINING THE BRANCH POINTS OF THE SYMBOL TABLE AND CONSTANTS WHICH HAVE BEEN ENTERED INTO THE SYMBOL TABLE.

DATLP---PLACES CONSTANTS INTO THE VARIABLE LOCATIONS IN THE SYMBOL TABLE ACCORDING TO THE DEFINITIONS PROVIDED IN THE DATA STATEMENT. EXIT FROM THIS SUBROUTINE IS TO..BEGIN...

DCFDT---IS THE DISK CONTROL FIELD OF THE DISK TABLE (PROGRAM INDEX) WHICH IS ADJUSTED TO INDICATE THE SATISFACTORY COMPILATION OF EACH PROGRAM.

NOTE, THE INITIAL TRANSMIT DIGITS ARE EXECUTED AT SYSTEM LOAD TIME AND ADJUST THE SUBROUTINE PACKAGE FOR MEMORY SIZE AND SYSTEM DISK DEFINITION

OST---INITIALIZES THE SUBROUTINE FOR OUTPUTTING THE REFERENCED SYMBOL TABLE AND ALSO PLACING THE CONSTANTS AND BRANCH POINTS ONTO THE DISK.

SADR---FILLS THE OBJECT TIME CORE ADDRESS OF THE SYMBOL.

SMTBO---LOCATES THE END OF THE SYMBOL TABLE AND DEVELOPS THE SECTOR WHICH CONTAINS THE SECTOR INCREMENT TO THE SYMBOL TABLE, THE NEXT CORE LOCATION FOLLOWING THE LONGEST SEGMENT, THE END (LOW CORE) OF THE SYMBOL TABLE, THE BEGINNING (HIGH CORE) OF THE SYMBOL TABLE, AND THE END (LOW CORE) OF THE COMMON AREA. THESE ADDRESSES ARE FOLLOWED BY THE USED FUNCTION TABLE AND THIS ENTIRE SECTOR IS LOCATED IMMEDIATELY BEFORE THE FIRST SECTOR OF THE COMPILED PROGRAM.

SSV---HANDLES THE ADDRESSES OF SUBSCRIPTED VARIABLES.

TPRO---TESTS NUMERIC LABELS TO DETERMINE WHETHER THEY ARE STATEMENT NUMBERS, SEGMENT NUMBERS, FORMAT NUMBERS, OR PROCEDURE NUMBERS.

UPDKM---AFTER TESTING TO SEE THAT NO OVERLAP OCCURRED AND THE SYMBOL TABLE WAS NOT FILLED, THIS UPDATES THE PROGRAM INDEX OF THE EXECUTIVE TO PERMIT THE RUNNING OR HOLDING OF THE COMPILED PROGRAM.

WDSK---WRITES A SECTOR OF CONSTANTS AND BRANCH POINTS ONTO THE DISK. THIS SEGMENT HAS THE FORMAT A 5-DIGIT ADDRESS AND A 10-DIGIT FIELD REPEATED 6 TIMES.

# LABELS IN THE CLASS A SUBROUTINES

ADCK---CHECKS THE DEFINITION OF THE ARGUMENT OF AN ..IF.. STATEMENT AND SETS THE HIGH POS AND EQUAL ZERO MACHINE INDICATORS.

AOUT---IS THE ENTRY POINT FOR OUTPUTTING A VARIABLE UNDER THE ..A.. SPECIFICATION.

BSEGA---CONTAINS THE SECTOR ADDRESS-60000 OF THE FIRST SECTOR OF THE COMPILED PROGRAM AND IS USED TO LOCATE THE BEGINNING SECTOR OF SEGMENTS WITHIN EACH PROGRAM.

BSTBG---IS THE ADDRESS FOLLOWING THE LAST SYMBOL PLACED INTO THE SYMBOL TABLE.

CALSR---IS THE ENTRY POINT FOR CALLING INTO CORE A NEW SEGMENT AND IS EXECUTED FOR THE ..CALL SEGMENT.. STATEMENT.

CARD---BLANKS THE REMAINING OF 80 COLUMNS IN THE I/O BUFFER IN PREPARATION FOR THE OUTPUT OF THE BUFFER ONTO A CARD.

COMBEG---IS THE ADDRESS WHICH IDENTIFIES THE LOCATION OF THE FIRST VARIABLE IN THE SYMBOL TABLE AFTER THE RELOCATABLE FUNCTION NAMES.

DCFER---IS THE DISK CONTROL FIELD OF THE ERROR SECTION OF THE SUBROUTINES.

DTRB---CAUSES ANY TRACED VARIABLES REMAINING IN THE I/O BUFFER TO BE OUTPUT PRIOR TO THE EXECUTION OF A ..PAUSE, STOP OR END.. STATEMENT.

ERMA---CONTAINS THE ADDRESS OF THE FIRST DIGIT OF THE ERROR MESSAGE TO BE OUTPUT WHEN BRANCHING TO ..ERR..

ERU---IS THE ENTRY POINT FOR THE ERROR MESSAGE ..UFLO.. --UNDERFLOW.

ERR---CAUSES THE PRESET ERROR MESSAGE TO BE OUTPUT BY MEANS OF READING INTO CORE THE ERROR SECTION OF THE SUBROUTINES.

ERROR---CONVERTS AN F SPEC TO AN E SPECIFICATION IF THE NUMBER IS TOO LARGE TO BE OUTPUT UNDER THE F SPEC.

ESMA---IS THE LOCATION OF THE ADDRESS OF THE ..STOP OR END.. MESSAGE.

ETYPE---IS THE ENTRY POINT FOR OUTPUTTING A NUMBER UNDER THE ..E.. SPECIFICATION.

FAD---IS THE SUBROUTINE ENTRY POINT FOR FLOATING ADDITION.

FAXB---IS THE ENTRY POINT FOR RAISING A QUANTITY TO A POSITIVE FLOATING POINT VARIABLE OR CONSTANT.

FAXBN---IS THE ENTRY POINT FOR RAISING A QUANTITY TO A NEGATIVE FLOATING POINT VARIABLE OR CONSTANT.

FAXI---IS THE ENTRY POINT FOR RAISING A QUANTITY TO A POSITIVE FIXED POINT VARIABLE OR CONSTANT.

FAXIN---IS THE ENTRY POINT FOR RAISING A QUANTITY TO A NEGATIVE FIXED POINT VARIABLE OR CONSTANT.

FDV---IS THE ENTRY POINT FOR FLOATING POINT DIVISION.

FDVR---IS THE ENTRY POINT FOR REVERSED FLOATING DIVIDE.

FIX---IS THE ENTRY POINT FOR CONVERTING A FLOATING POINT VALUE TO THE FIXED POINT MODE.

FLOAT---IS THE ENTRY POINT FOR CONVERTING A FIXED POINT NUMBER TO THE FLOATING POINT MODE.

FMP---IS THE ENTRY POINT FOR FLOATING POINT MULTIPLICATION.  
 FSB---IS THE ENTRY POINT FOR FLOATING POINT SUBTRACTION.  
 FTYPE---IS THE ENTRY POINT FOR THE OUTPUT UNDER THE F SPECIFICATION.  
 FXA---IS THE ENTRY POINT FOR FIXED POINT ADDITION.  
 FXD---IS THE ENTRY POINT FOR FIXED POINT DIVIDE.  
 FXDR---IS THE ENTRY POINT FOR FIXED POINT REVERSED DIVISION.  
 FXM---IS THE ENTRY POINT FOR FIXED POINT MULTIPLICATION.  
 FXS---IS THE ENTRY POINT FOR FIXED POINT SUBTRACTION.  
 HTYPE---IS THE ENTRY POINT FOR THE I/O OF ..HOLLERITH.. CONSTANTS IN THE  
     ..FORMAT.. STRING.  
 INCHI---THIS SUBROUTINE IS A RECORD TRANSMITTED TO ZERO AS THE LAST SUB-  
     ROUTINE EXECUTED PRIOR TO OBJECT TIME RUNNING. IT INITIALIZES ..INOUT..  
     (THE INPUT-OUTPUT BUFFER) LOCATED AT 404 THROUGH 693 TO --\*--\*--\*...  
 INPUT---IS THE ENTRY POINT FOR THE INPUT OF F,E,I AND A TYPE SPECIFICATIONS.  
 ISETYP---CHECKS TO SEE IF THE VARIABLE OUTPUT WAS AN ..ETYPE.., AND IF SO,  
     DEVELOPS THE EXPONENT TO FOLLOW THE NUMERIC VALUE.  
 ITYPE---PLACES ALL FIXED POINT NUMBERS IN THE I/O BUFFER. A FLAG AT  
     ..FAC-1.. IS THE 2 DIGIT EXPONENT FOR AN ..ETYPE.. VARIABLE. A FLAG AT  
     ..FAC-3.. IDENTIFIES THE ADDRESS FOR TRACED OUTPUT.  
 IXCK---CHECKS THE DEFINITION WITHIN RANGE OF THE INDEX OF A COMPUTED  
     ..GOTO.. STATEMENT.  
 LNKFLG---PROVIDES THE ENTRY TO THE EXECUTIVE WHEN AN ASTERISK CONTROL CARD  
     HAS BEEN READ BY A PROGRAM UNDER EXECUTION. CONTROL IS TRANSFERRED TO  
     THE EXECUTIVE FOR THE PROCESSING OF THE CONTROL CARD.  
 LOOK---IS THE ENTRY POINT FOR EACH VARIABLE IN AN I/O LIST AFTER THE FORMAT  
     HAS BEEN PRE-SET BY THE I/O DEFINITION.  
 LTPAR---SETS THE IDENTITY OF THE BEGINNING OF A ..FORMAT..  
 NUMBR---IS THE ENTRY POINT FOR THE INPUT OR OUTPUT OF NUMBERS UNDER THE  
     F,E,I OR A TYPE SPECS.  
 POST---RESETS THE I/O SUBROUTINE FOR A NEW LINE FOR INPUT OR OUTPUT.  
 PRBS---WILL CONTAIN THE SECTOR ADDRESS -60000, OF THE BEGINNING OF PROGRAM  
     STORAGE AS ALLOCATED AT SYSTEM LOAD. THIS WILL BE USED TO PREVENT DATA  
     SECTORS FROM BEING WRITTEN ONTO THE DISK IN THE PROGRAM STORAGE AREA.  
 PRTR---IS THE ENTRY POINT FOR THE ..PRINT.. STATEMENT AND ESTABLISHES THE  
     FORMAT FOR THE OUTPUT LIST.  
 RACD---IS THE ENTRY POINT FOR THE ..READ.. STATEMENT AND ESTABLISHES THE  
     FORMAT FOR THE INPUT LIST.  
 READ---IS THE ACTUAL INPUT-OUTPUT INSTRUCTION.  
 RSST---IS AN ADDRESS AVAILABLE IN THE FORMAT STRING TO PERMIT A REPETITION  
     OF ONE OR MORE FORMAT SPECIFICATIONS A DESIGNATED NUMBER OF TIMES. IT  
     OCCURS IN THE FORMAT STRING CORRESPONDING TO THE RIGHT PARENTHESIS OF A  
     MULTIPLE FORMAT SPECIFICATION.  
 RTPAR---RESETS THE ..FORMAT.. STRING TO REPEAT THE ..FORMAT.. AND ALSO EXE-  
     CUTES THE I/O WHICH HAS BEEN THUS FAR COMPLETED.  
 RVSGN---REVERSES THE SIGN OF THE VARIABLE IN ..FAC..

SETONE---PROVIDES FOR SETTING ..FAC.. TO FLOATING POINT POSITIVE ONE.  
 SLASH---IS AN ADDRESS IN THE FORMAT STRING WHICH WILL TERMINATE A LINE OF  
 INPUT-OUTPUT AND INITIALIZE THE I/O STRING FOR A NEW LINE.  
 STFMT---CHECKS TO SEE IF ANY TRACED VARIABLES ARE IN THE I/O BUFFER AND  
 OUTPUTS THESE VARIABLES, IF THEY EXIST, PRIOR TO THE EXECUTION OF AN  
 INPUT OR OUTPUT STATEMENT.  
 TIGER---IS THE NORMAL EXIT TO THE EXECUTIVE FROM A RUNNING PROGRAM FOLLOW-  
 ING THE EXECUTION OF AN ..END.. OR A ..STOP.. STATEMENT.  
 TRFL---IS THE ENTRY POINT WHEN A FLOATING POINT VARIABLE MAY BE TRACED.  
 TRFM---IS A FIELD WHICH REPLACES ..READ.. WHEN THE I/O BUFFER CONTAINS 4  
 TRACED VARIABLES FOR THE OUTPUT OF THESE TRACED VARIABLES.  
 BUFFER CONTAINS 4 TRACED VARIABLES FOR THE OUTPUT OF THESE TRACED VAR-  
 IABLES.  
 TRFMT---IS THE FORMAT STRING UTILIZED WHEN TRACED VARIABLES ARE OUTPUT TO  
 CARDS.  
 TRFX---IS THE ENTRY POINT WHEN A FIXED POINT VARIABLE IS TO BE TRACED.  
 TRUT---CAUSES THE OUTPUT OF THE I/O BUFFER IF AN OUTPUT STATEMENT HAS BEEN  
 COMPLETED OR RETURNS TO THE MAINLINE PROGRAM IF A SINGLE VARIABLE HAS  
 JUST BEEN PUT INTO THE I/O BUFFER BY TRACING.  
 TVAR---TESTS THE VARIABLE IN THE ADDRESSED SUBROUTINE AND ALSO THE VARIABLE  
 IN ..FAC.. FOR DEFINITION.  
 UDV---SETS THE ERROR MESSAGE WHEN A VARIABLE IS UNDEFINED.  
 WACD---IS THE ENTRY POINT FOR THE ..PUNCH.. STATEMENT AND ESTABLISHES THE  
 FORMAT FOR THE OUTPUT LIST.  
 WATYE---IS THE ENTRY POINT FOR THE ..TYPE.. STATEMENT AND ESTABLISHES THE  
 FORMAT FOR THE OUTPUT LIST.  
 WRITE---DETERMINES WHETHER THE I/O BUFFER MUST BE CLEARED FOR CARD OUTPUT  
 OR WHETHER A RECORD MARK IS TO BE PLACED AT THE END OF THE OUTPUT IN THE  
 BUFFER FOR TRANSFER TO THE TYPEWRITER OR PRINTER.  
 XTYPE---IS THE ENTRY POINT FOR THE X SPECIFICATION, SPECIFYING A NUMBER OF  
 COLUMNS TO BE SKIPPED.  
 ZERFAC---IS THE ENTRY POINT FOR ZEROING THE FLOATING ACCUMULATOR.

LABELS IN THE ERROR SECTION OF THE CLASS A SUBROUTINES.

CDINS---BEGINS THE 3 STATEMENTS FOR THE OUTPUTTING OF THE SYMBOL TABLE TO CARDS.

D43BUF---IS THE BUFFER FROM WHICH THE SYMBOL TABLE IS OUTPUT FOLLOWING AN ERROR. THIS BUFFER IS FILLED BY A READ TO THE DISK AND A READ. FROM THE DISK TO THE BUFFER PRIOR TO THE OUTPUT.

DPEND---DETERMINES WHEN THE END OF THE SYMBOL TABLE HAS BEEN OUTPUT AND RETURNS CONTROL TO THE EXECUTIVE.

ERR1---DETERMINES WHETHER THE MESSAGE TO BE OUTPUT IS A ..STOP.. OR..END.. IN WHICH CASE CONTROL RETURNS TO THE EXECUTIVE.

ERR2---IS THE ENTRY POINT WHEN AN ERROR HAS BEEN DETECTED AT RUN TIME. THE ERROR MESSAGE IS ESTABLISHED FOR OUTPUT TO BE FOLLOWED BY THE ENTIRE SYMBOL TABLE IF SWITCH 3 IS ON.

PERR---PREPARES THE MESSAGE TO BE OUTPUT TO A CARD.

PRTER---OUTPUTS THE MESSAGE TO THE PRINTER IF SWITCH 2 IS ON.

TERR---CAUSES THE MESSAGE TO BE OUTPUT TO THE TYPEWRITER WHEN SWITCH 2 IS OFF.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]



|       |        |                                                                                                                                                                      |
|-------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 04130 | ROCK1  | 04090                                                                                                                                                                |
| 28600 | ROW    | 28710 28750                                                                                                                                                          |
| 16310 | .ROWBR | 16080                                                                                                                                                                |
| 16210 | ROWCK  | 16060 16270 16270 20840 20860 20870 21010 21020 23640 23650                                                                                                          |
| 16270 | ROWCK1 | 16220                                                                                                                                                                |
| 09340 | RPFMT  | 08690 09390 09480                                                                                                                                                    |
| 09110 | RPPR1  | 08410 09050 09080 09170 09500                                                                                                                                        |
| 09150 | RPPR2  | 09130 09140 09510                                                                                                                                                    |
| 09190 | RPR    | 09060                                                                                                                                                                |
| 09380 | RPT1   | 09340                                                                                                                                                                |
| 20090 | RSAD   | 20060                                                                                                                                                                |
| 20030 | RSST   | 09070 19190 19250                                                                                                                                                    |
| 22490 | RT     | 16400 17020 17070 17120 17220 17780 17940 18270 18430 22460 22480                                                                                                    |
| 20630 | RTPAR  | 09190 19270                                                                                                                                                          |
| 20670 | RTPARX | 19190 19880 20560 20650                                                                                                                                              |
| 13420 | RVINST | 09950 12580 12650 12800 13120                                                                                                                                        |
| 17340 | RVSGN  | 13420 13420                                                                                                                                                          |
| 10420 | S      | 10670 10920 11320 11510 11930 12020                                                                                                                                  |
| 28830 | SA     | 28300 28320 28400 28430 28440 28490 28500 28760                                                                                                                      |
| 20820 | SAD    | 20800 20810 23960                                                                                                                                                    |
| 14760 | SADR   | 14670 15030 15050 15160 15270 15340 15560                                                                                                                            |
| 02460 | SALT   | 02440 02480 02560 02570 02790 02830 03330 03340                                                                                                                      |
| 02590 | SALT1  | 02570                                                                                                                                                                |
| 02820 | SALT2  | 02780 02790                                                                                                                                                          |
| 21340 | SAVE   | 21480 21490 21770 22020 22290 22300                                                                                                                                  |
| 29150 | SAVEM  | 29090                                                                                                                                                                |
| 29040 | SAVES  | 29080                                                                                                                                                                |
| 29030 | SAVE1  | 29010                                                                                                                                                                |
| 13520 | SBSWCH | 03360 03500 04000 06090 06210 06940 08010 14390 14460                                                                                                                |
| 28840 | SC     | 28350 28550 28790                                                                                                                                                    |
| 03360 | SCRIPT | 03990                                                                                                                                                                |
| 05770 | SEG    | 00100 05760 14190                                                                                                                                                    |
| 21030 | SEGIN  | 21010 22440 23580                                                                                                                                                    |
| 18690 | SETONE | 17810 18300 25140                                                                                                                                                    |
| 23080 | SETSIF | 23040 23400                                                                                                                                                          |
| 14530 | SFDFAT | 14420 14500                                                                                                                                                          |
| 29850 | SGNTAB | 29880 29910                                                                                                                                                          |
| 20490 | SIGN   | 21350 21510 21620 21710 21790 21830 22070 22090                                                                                                                      |
| 24400 | SIN    | 24390                                                                                                                                                                |
| 24990 | SINC7  | 24690                                                                                                                                                                |
| 24560 | SIN1   | 24380 24410 24880                                                                                                                                                    |
| 24880 | SIN2   | 24460 24650 24770                                                                                                                                                    |
| 24920 | SIN2P  | 24520                                                                                                                                                                |
| 24930 | SIN2S  | 24560                                                                                                                                                                |
| 20960 | SKDK   | 16080                                                                                                                                                                |
| 14180 | SKEM   | 14150                                                                                                                                                                |
| 21170 | SKIP   | 21100 21130                                                                                                                                                          |
| 00440 | SKPPCH | 00410 00440 15680                                                                                                                                                    |
| 20170 | SLASH  | 09010 19830 20640 20700                                                                                                                                              |
| 05350 | SLOT   | 00830 00840 00850 08290 08310                                                                                                                                        |
| 02060 | SMCNT  | 01950 01980 02030 02110 02200 02220 02240 02280 03380 03860 04020 04490 04630 04680 05700<br>06040 06120 06230 06900 06910 06920 06970 07020 07360 07850 10090 14260 |
| 01980 | SMLOOP | 02050 02140 02160                                                                                                                                                    |
| 02070 | SMNOT  | 02020                                                                                                                                                                |
| 29070 | SMSST  | 29150                                                                                                                                                                |
| 14200 | SMTBO  | 14180                                                                                                                                                                |
| 01950 | SMTLU  | 02560 06960 06960 11830 14220                                                                                                                                        |
| 02010 | SMTLU1 | 00790 00830 00850 00870 01960 01970 01990 02090 02180 03400 04570 04650 04730 05620 05960<br>06860 07390 07400 07410 08370                                           |
| 02140 | SMTST  | 01900 01930 02000 02070 02550 06950                                                                                                                                  |
| 13830 | SNL    | 13810 13820 13840                                                                                                                                                    |
| 26470 | SQERM  | 26440                                                                                                                                                                |
| 26160 | SQRT   |                                                                                                                                                                      |
| 26310 | SQRT1  | 26340 26350 26370 26410                                                                                                                                              |
| 26350 | SQRT2  | 26320                                                                                                                                                                |
| 13920 | SRDCF  | 13730 13740                                                                                                                                                          |
| 13970 | SRN    | 13780 13800 13860 13860                                                                                                                                              |
| 11090 | SS     | 10470 10890                                                                                                                                                          |
| 10640 | SSA    | 10420 10850                                                                                                                                                          |
| 10480 | SSB    | 10440                                                                                                                                                                |
| 13080 | SSBCD  | 13010 13180                                                                                                                                                          |
| 11010 | SSC    | 10770 11910                                                                                                                                                          |
| 11480 | SSCA   | 11020                                                                                                                                                                |
| 11420 | SSCB   | 11040                                                                                                                                                                |
| 14840 | SSV    | 14820                                                                                                                                                                |
| 10870 | SSO01  | 10720                                                                                                                                                                |
| 11130 | SSI    | 10790 10940                                                                                                                                                          |
| 11170 | SS2    | 10970                                                                                                                                                                |
| 10930 | SS3    | 10810 11950                                                                                                                                                          |
| 10860 | SS4    | 10740                                                                                                                                                                |
| 10980 | SS5    | 10830 11410                                                                                                                                                          |
| 11190 | SS6    | 02300 10690                                                                                                                                                          |
| 25020 | STAB   | 24400                                                                                                                                                                |
| 25830 | STEP   | 25790                                                                                                                                                                |
| 19820 | STFMT  | 19130 19660 19690 19720 19770                                                                                                                                        |
| 23610 | STM    | 19400                                                                                                                                                                |
| 13630 | STNSW  | 00760                                                                                                                                                                |
| 04930 | STOP   | 00110                                                                                                                                                                |
| 19390 | STOPSR | 19360                                                                                                                                                                |
| 29130 | STORE  | 29060 29110                                                                                                                                                          |
| 21620 | STOW   | 21270 21740 21800 21850                                                                                                                                              |

[illegible]

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM                           | OPERANDS                          | AND       | REMARKS    |
|-------|----|-------|-------|-------|--------|--------------------------------|-----------------------------------|-----------|------------|
|       |    |       |       | 00000 | **     | C4D-PDQ COMPILER + SUBROUTINES | 1/20/67                           |           |            |
| 00404 |    |       |       | 00010 |        | DORG                           | 404                               |           |            |
| 00404 | 25 | 05552 | 00401 | 00020 |        | TD                             | DCFEX,401                         |           |            |
| 00416 | 49 | 18012 |       | 00030 |        | B7                             | 18012                             |           |            |
| 00572 |    |       |       | 00040 |        | DORG                           | 572                               |           |            |
| 00576 |    | 00005 | 01092 | 00050 |        | DSA                            | BEG1,FORMAT                       |           |            |
| 00581 |    | 00005 | 01086 |       |        |                                |                                   |           |            |
| 00586 |    | 00005 | 01270 | 00060 | CCFMT  | DSA                            | CONFMT                            | ,IO3-24   | ,ASCAN ,IF |
| 00591 |    | 00005 | 09778 |       |        |                                |                                   |           |            |
| 00596 |    | 00005 | 02426 |       |        |                                |                                   |           |            |
| 00601 |    | 00005 | 01772 |       |        |                                |                                   |           |            |
| 00606 |    | 00005 | 08354 | 00070 |        | DSA                            | BEGTR,BEGSEG,BEGPRO,COMM,CALLSG   |           |            |
| 00611 |    | 00005 | 06782 |       |        |                                |                                   |           |            |
| 00616 |    | 00005 | 05732 |       |        |                                |                                   |           |            |
| 00621 |    | 00005 | 09022 |       |        |                                |                                   |           |            |
| 00626 |    | 00005 | 06874 |       |        |                                |                                   |           |            |
| 00631 |    | 00005 | 06274 | 00080 |        | DSA                            | TESTDO,CONTRL,DIM,DO,CEND,ENDTR   |           |            |
| 00636 |    | 00005 | 06142 |       |        |                                |                                   |           |            |
| 00641 |    | 00005 | 09054 |       |        |                                |                                   |           |            |
| 00646 |    | 00005 | 08536 |       |        |                                |                                   |           |            |
| 00651 |    | 00005 | 08950 |       |        |                                |                                   |           |            |
| 00656 |    | 00005 | 08516 |       |        |                                |                                   |           |            |
| 00661 |    | 00005 | 06934 | 00090 |        | DSA                            | ENDSEG,ENDPRO,EXPROC,GOTO,PAUSE   |           |            |
| 00666 |    | 00005 | 05836 |       |        |                                |                                   |           |            |
| 00671 |    | 00005 | 05568 |       |        |                                |                                   |           |            |
| 00676 |    | 00005 | 07190 |       |        |                                |                                   |           |            |
| 00681 |    | 00005 | 06036 |       |        |                                |                                   |           |            |
| 00686 |    | 00005 | 09570 | 00100 |        | DSA                            | PRINT,PUNCH,RDCD,RERED,XETURN,SEG |           |            |
| 00691 |    | 00005 | 09550 |       |        |                                |                                   |           |            |
| 00696 |    | 00005 | 09518 |       |        |                                |                                   |           |            |
| 00701 |    | 00005 | 09466 |       |        |                                |                                   |           |            |
| 00706 |    | 00005 | 05848 |       |        |                                |                                   |           |            |
| 00711 |    | 00005 | 06954 |       |        |                                |                                   |           |            |
| 00716 |    | 00005 | 06068 | 00110 |        | DSA                            | STOP                              | ,TYPE     | ,DATA      |
| 00721 |    | 00005 | 09498 |       |        |                                |                                   |           |            |
| 00726 |    | 00005 | 08962 |       |        |                                |                                   |           |            |
| 00729 |    | 00008 | X2    | 00120 | OVERL  | DAC                            | 8,OVERLAP                         | ,         |            |
| 00759 |    | 00016 |       | 00130 |        | DC                             | 16                                | ,0        |            |
| 00761 |    | 00081 | X2    | 00140 | CHI    | DAS                            | 81                                |           |            |
| 00760 |    |       |       | 00150 |        | DORG                           | CHI-1                             |           |            |
| 00760 | 16 | 00070 | 00299 | 00160 | LAST   | TFM                            | 70                                | ,299      |            |
| 00772 | 36 | 00044 | 00703 | 00170 |        | RN                             | 44                                | ,703      |            |
| 00784 | 47 | 15898 | 01900 | 00180 |        | BNI                            | INITL                             | ,1900     |            |
| 00796 | 43 | 00816 | 00070 | 00190 |        | BD                             | **20                              | ,70       | ,11        |
| 00808 | 49 | 05134 |       | 00200 |        | B7                             | HDWRER                            |           |            |
| 00816 | 25 | 00069 | 00070 | 00210 |        | TD                             | 69                                | ,70       | ,11        |
| 00828 | 46 | 00840 | 00600 | 00220 |        | BI                             | **12                              | ,600      |            |
| 00840 | 46 | 00852 | 01600 | 00230 |        | BI                             | **12                              | ,1600     |            |
| 00852 | 46 | 00864 | 01700 | 00240 |        | BI                             | **12                              | ,1700     |            |
| 00864 | 49 | 00000 | 00000 | 00250 |        | B                              |                                   |           |            |
| 00876 | 15 | 15910 | 00000 | 00260 | MOON7  | TDM                            | INITL+12                          | ,         |            |
| 00882 |    | 00001 |       | 00270 |        | DSC                            | 1                                 | ,8        | ,*-5       |
| 00888 | 26 | 00906 | 07868 | 00280 |        | TF                             | **18                              | ,FCTEND   |            |
| 00900 | 26 | 00000 | 07851 | 00290 |        | TF                             |                                   | ,CRAM     |            |
| 00912 | 12 | 00906 | 00010 | 00300 |        | SM                             | *-6                               | ,10       | ,10        |
| 00924 | 45 | 00900 | 15910 | 00310 |        | BNR                            | *-24                              | ,INITL+12 |            |
| 00935 |    | 00001 |       | 00320 |        | DSC                            | 1                                 | ,8        | ,*         |
| 00936 | 15 | 15910 | 00000 | 00330 |        | TDM                            | INITL+12                          | ,         |            |
| 00942 |    | 00001 |       | 00340 |        | DSC                            | 1                                 | ,8        | ,*-5       |
| 00948 | 26 | 08890 | 00906 | 00350 |        | TF                             | EMM+6                             | ,MOON7+30 |            |
| 00960 | 11 | 07719 | 00001 | 00360 |        | AM                             | DCF+5                             | ,1        | ,10        |
| 00972 | 16 | 05085 | 00001 | 00370 | BEGIN  | TFM                            | SUBN,1,10                         |           |            |
| 00984 | 14 | 07856 | 99999 | 00380 |        | CM                             | L                                 | ,99999    |            |
| 00995 |    | 00000 |       | 00390 | LSMCNT | DS                             |                                   | ,*        |            |
| 00996 | 47 | 01056 | 01100 | 00400 |        | BNH                            | **60                              |           |            |
| 01008 | 44 | 01056 | 01044 | 00410 |        | BNF                            | **48                              | ,SKPPCH   |            |
| 01020 | 26 | 00761 | 01723 | 00420 |        | TF                             | CHI,AVOID                         |           |            |
| 01032 | 17 | 05332 | 00729 | 00430 |        | BTM                            | LSTC                              | ,OVERL    |            |
| 01044 | 33 | 01044 | 00000 | 00440 | SKPPCH | CF                             | SKPPCH                            | ,         | ,0         |
| 01056 | 26 | 05258 | 06661 | 00450 |        | TF                             | IFSWCH                            | ,FX1-3    |            |
| 01068 | 16 | 04586 | 07884 | 00460 |        | TFM                            | PUTETB+6                          | ,PHI+12   |            |
| 01080 | 16 | 04776 | 08332 | 00470 |        | TFM                            | GORE+66                           | ,TOP      |            |
| 01092 | 11 | 07733 | 00002 | 00480 | BEG1   | AM                             | IDCF+5                            | ,2        | ,10        |
| 01104 | 15 | 05132 | 00009 | 00490 |        | TDM                            | ROCK+22                           | ,9        |            |
| 01116 | 36 | 07728 | 00702 | 00500 |        | RN                             | IDCF,702                          |           |            |
| 01128 | 47 | 01160 | 03600 | 00510 |        | BNI                            | **32                              | ,3600     |            |
| 01140 | 34 | 07728 | 00701 | 00520 |        | K                              | IDCF                              | ,701      |            |
| 01152 | 49 | 01104 |       | 00530 |        | B7                             | BEG1+12                           |           |            |
| 01160 | 36 | 07728 | 00703 | 00540 |        | RN                             | IDCF                              | ,703      |            |
| 01172 | 17 | 05110 | 01116 | 00550 |        | BTM                            | ROCK                              | ,BEG1+24  |            |
| 01184 | 73 | 00755 | 07856 | 00560 | ADF    | TNF                            | CHI-6                             | ,L        |            |
| 01196 | 11 | 00908 | 00356 | 00570 |        | AM                             | LAD                               | ,CHI-405  | ,9         |
| 01208 | 26 | 01330 | 00908 | 00580 |        | TF                             | LSTO+30                           | ,LAD      |            |
| 01220 | 46 | 01252 | 00200 | 00590 |        | BC2                            | **32                              |           |            |
| 01232 | 39 | 00745 | 00400 | 00600 |        | WACD                           | CHI-16                            |           |            |
| 01244 | 49 | 01300 |       | 00610 |        | B7                             | LSTO                              |           |            |
| 01252 | 16 | 05237 | 00745 | 00620 |        | TFM                            | LSTT-1                            | ,CHI-16   |            |
| 01264 | 73 | 00911 | 00932 | 00630 |        | TNF                            | CHI+150,CHI+171                   |           |            |

| LOC   | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 01276 | 26 | 00913 | 01723 | 00640 |        | TF   | CHI+152,AVOID        |
| 01288 | 27 | 05288 | 05287 | 00650 |        | BT   | LSTP ,LSTP-1         |
| 01300 | 33 | 00917 | 00000 | 00660 | LSTO   | CF   | COMPA-1              |
| 01312 | 32 | 00918 | 00000 | 00670 |        | SF   | COMPA                |
| 01324 | 31 | 00908 | 01720 | 00680 |        | TR   | LAD ,AVOID-3 ,6      |
| 01336 | 14 | 00918 | 00586 | 00690 |        | CM   | COMPA ,CCFMT ,711    |
| 01348 | 46 | 00918 | 01200 | 00700 |        | BE   | COMPA , ,6           |
| 01360 | 14 | 00918 | 00591 | 00710 |        | CM   | COMPA ,CCFMT+5 ,711  |
| 01372 | 46 | 00918 | 01200 | 00720 |        | BE   | COMPA , ,6           |
| 01384 | 43 | 01416 | 00761 | 00730 |        | BD   | *+32 ,CHI            |
| 01396 | 31 | 00760 | 00762 | 00740 |        | TR   | CHI-1 ,CHI+1         |
| 01408 | 49 | 01384 |       | 00750 |        | B7   | *-24                 |
| 01416 | 44 | 00918 | 00919 | 00760 |        | BNF  | COMPA ,STNSW ,6      |
|       |    |       |       | 00770 | *      |      | STATEMENT NUMBER     |
| 01428 | 17 | 02486 | 01440 | 00780 |        | BTM  | CFXN,*+12,7          |
| 01440 | 26 | 01462 | 02778 | 00790 |        | TF   | *+22,SMTLU1+10       |
| 01452 | 44 | 01520 | 00005 | 00800 |        | BNF  | CFM ,5               |
|       |    |       |       | 00810 | *      |      | END OF DO            |
| 01464 | 15 | 05257 | 00007 | 00820 |        | TDM  | DOSWCH,7,11          |
| 01476 | 26 | 06543 | 02778 | 00830 |        | TF   | SLOT+5 ,SMTLU1+10    |
| 01488 | 26 | 06573 | 07856 | 00840 |        | TF   | SLOT+35 ,L           |
| 01500 | 26 | 06567 | 02778 | 00850 |        | TF   | SLOT+29 ,SMTLU1+10   |
| 01512 | 49 | 00918 |       | 00860 |        | B7   | COMPA , ,6           |
| 01520 | 26 | 01537 | 02778 | 00870 | CFM    | TF   | *+17 ,SMTLU1+10      |
| 01532 | 26 | 00004 | 07856 | 00880 |        | TF   | 4 ,L                 |
| 01544 | 49 | 00918 |       | 00890 |        | B7   | COMPA , ,56          |
|       |    |       |       | 00900 |        |      | *OUTPUT ROUTINES     |
| 01552 | 16 | 01607 | 07678 | 00910 | PUT1   | TFM  | PUT2+35,INST1        |
| 01564 | 49 | 01584 |       | 00920 |        | B7   | PUT2+12,,5           |
| 01572 | 16 | 01607 | 07698 | 00930 | PUT2   | TFM  | PUT2+35,INST2        |
| 01584 | 31 | 00000 | 06666 | 00940 |        | TR   | OUT ,SUBI            |
| 01596 | 31 | 00060 | 00000 | 00950 |        | TR   | OUT+60               |
| 01608 | 26 | 01638 | 01607 | 00960 |        | TF   | *+30 ,*-1            |
| 01620 | 11 | 01638 | 00011 | 00970 |        | AM   | *+18 ,11 ,10         |
| 01632 | 16 | 00000 | 00060 | 00980 |        | TFM  | ,FAC                 |
| 01644 | 43 | 01700 | 00072 | 00990 |        | BD   | *+56 ,OUT+72         |
| 01656 | 43 | 01700 | 00073 | 01000 |        | BD   | *+44 ,OUT+73         |
| 01668 | 16 | 02133 | 00012 | 01010 |        | TFM  | PUTX-1,12,10         |
| 01680 | 31 | 00000 | 00060 | 01020 |        | TR   | OUT ,OUT+60          |
| 01692 | 49 | 02134 |       | 01030 |        | B7   | PUTX                 |
| 01700 | 44 | 01668 | 00072 | 01040 |        | BNF  | *-32 ,OUT+72         |
| 01712 | 33 | 00073 | 00000 | 01050 |        | CF   | OUT+73               |
| 01721 |    | 00002 |       | 01060 |        | DC   | 2 ,30, *-2           |
| 01723 |    | 00002 |       | 01070 | AVOID  | DC   | 2 , , *              |
| 01724 | 13 | 00073 | 00015 | 01080 |        | MM   | OUT+73 ,15 ,10       |
| 01736 | 16 | 01771 | 08333 | 01090 |        | TFM  | *+35,TOP+1           |
| 01748 | 22 | 01771 | 00099 | 01100 |        | S    | *+23,99              |
| 01760 | 31 | 00081 | 00000 | 01110 |        | TR   | OUT+81               |
| 01772 | 26 | 00047 | 00071 | 01120 |        | TF   | OUT+47 ,OUT+71       |
| 01784 | 44 | 01808 | 02142 | 01130 |        | BNF  | *+24 ,PUTX+8         |
| 01796 | 26 | 00047 | 00066 | 01140 |        | TF   | OUT+47 ,OUT+66       |
| 01808 | 45 | 01936 | 00090 | 01150 |        | BNR  | BL2 ,OUT+90          |
| 01820 | 26 | 00059 | 00089 | 01160 | BL1    | TF   | OUT+59 ,OUT+89       |
| 01832 | 31 | 00000 | 00036 | 01170 |        | TR   | OUT ,OUT+36          |
| 01844 | 26 | 00006 | 07856 | 01180 |        | TF   | OUT+6 ,L             |
| 01856 | 11 | 00006 | 00035 | 01190 |        | AM   | OUT+6 ,35            |
| 01868 | 44 | 01892 | 02142 | 01200 |        | BNF  | *+24 ,PUTX+8         |
| 01880 | 12 | 00006 | 00005 | 01210 |        | SM   | OUT+6 ,5 ,10         |
| 01892 | 26 | 00018 | 00006 | 01220 |        | TF   | OUT+18 ,OUT+6        |
| 01904 | 12 | 00018 | 00001 | 01230 |        | SM   | OUT+18 ,1 ,10        |
| 01916 | 16 | 02133 | 00036 | 01240 |        | TFM  | PUTX-1,36,10         |
| 01928 | 49 | 02134 |       | 01250 |        | B7   | PUTX                 |
| 01936 | 44 | 01956 | 00094 | 01260 | BL2    | BNF  | *+20 ,OUT+94         |
| 01948 | 49 | 01820 |       | 01270 |        | B7   | BL1                  |
| 01956 | 16 | 02133 | 00072 | 01280 |        | TFM  | PUTX-1,72,10         |
| 01968 | 21 | 00042 | 07856 | 01290 |        | A    | OUT+42 ,L            |
| 01980 | 21 | 00054 | 07856 | 01300 |        | A    | OUT+54 ,L            |
| 01992 | 26 | 00006 | 00094 | 01310 |        | TF   | OUT+6 ,OUT+94        |
| 02004 | 26 | 00011 | 00084 | 01320 |        | TF   | OUT+11 ,OUT+84       |
| 02016 | 26 | 00035 | 00089 | 01330 |        | TF   | OUT+35 ,OUT+89       |
| 02028 | 44 | 02064 | 02142 | 01340 |        | BNF  | *+36 ,PUTX+8         |
| 02040 | 12 | 00042 | 00005 | 01350 |        | SM   | OUT+42 ,5 ,10        |
| 02052 | 12 | 00054 | 00005 | 01360 |        | SM   | OUT+54 ,5 ,10        |
| 02064 | 44 | 02134 | 00035 | 01370 |        | BNF  | PUTX ,OUT+35         |
| 02076 | 12 | 00042 | 00012 | 01380 |        | SM   | OUT+42 ,12           |
| 02088 | 12 | 00054 | 00012 | 01390 |        | SM   | OUT+54 ,12           |
| 02100 | 31 | 00024 | 00036 | 01400 |        | TR   | OUT+24 ,OUT+36       |
| 02112 | 16 | 02133 | 00060 | 01410 |        | TFM  | PUTX-1,60,10         |
| 02124 | 49 | 02134 | 00000 | 01420 |        | B    | PUTX                 |
| 02134 |    |       |       | 01430 |        | DORG | *-1                  |
| 02134 | 33 | 02134 | 00000 | 01440 | PUTX   | CF   | *                    |
| 02146 | 26 | 02167 | 02133 | 01450 |        | TF   | PUTPHI-1,PUTX-1      |
| 02158 | 49 | 02192 | 00000 | 01460 |        | B    | PUTPHI+24            |
| 02168 |    |       |       | 01470 |        | DORG | *-1                  |
| 02168 | 32 | 02134 | 00000 | 01480 | PUTPHI | SF   | PUTX                 |
| 02180 | 25 | 00012 | 01723 | 01490 |        | TD   | OUT+12 ,AVOID        |
| 02192 | 12 | 02167 | 00001 | 01500 |        | SM   | PUTPHI-1,1,10        |
| 02204 | 46 | 02218 | 01300 | 01510 |        | BNL  | *+14                 |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 02216 | 42 |       |       | 01520 |        | BB2  |                      |
| 02218 | 14 | 02284 | 07842 | 01530 |        | CM   | PUTTD+6 ,BUFBAS+100  |
| 02230 | 46 | 02334 | 01300 | 01540 |        | BNL  | DUMP                 |
| 02242 | 44 | 02278 | 02134 | 01550 |        | BNF  | PUTTD ,PUTX          |
| 02254 | 25 | 00000 | 07872 | 01560 |        | TD   | OUT ,PHI             |
| 02266 | 31 | 07872 | 07873 | 01570 |        | TR   | PHI,PHI+1            |
| 02278 | 25 | 07742 | 00000 | 01580 | PUTTD  | TD   | BUFBAS ,OUT ,2       |
| 02290 | 31 | 00000 | 00001 | 01590 |        | TR   | OUT ,OUT+1           |
| 02302 | 11 | 07856 | 00001 | 01600 |        | AM   | L ,1 ,10             |
| 02314 | 11 | 02284 | 00001 | 01610 |        | AM   | PUTTD+6 ,1 ,10       |
| 02326 | 49 | 02192 |       | 01620 |        | B7   | PUTPHI+24            |
| 02334 | 14 | 07719 | 79125 | 01630 | DUMP   | CM   | DCF+5 ,79125         |
| 02346 | 46 | 07630 | 01300 | 01640 |        | BNL  | PGOL                 |
| 02358 | 15 | 05132 | 00009 | 01650 |        | TDM  | ROCK+22 ,9           |
| 02370 | 38 | 07714 | 00702 | 01660 | WDK    | WN   | DCF ,702             |
| 02382 | 47 | 02414 | 03600 | 01670 |        | BNL  | **32 ,3600           |
| 02394 | 34 | 07714 | 00701 | 01680 |        | K    | DCF ,701             |
| 02406 | 49 | 02370 |       | 01690 |        | B7   | *-36                 |
| 02414 | 36 | 07714 | 00703 | 01700 |        | RN   | DCF ,703             |
| 02426 | 16 | 05109 | 02370 | 01710 |        | TFM  | ROCK-1 ,WDK          |
| 02438 | 46 | 05122 | 01900 | 01720 |        | BI   | ROCK+12 ,1900        |
| 02450 | 11 | 07719 | 00001 | 01730 |        | AM   | DCF+5 ,1 ,10         |
| 02462 | 16 | 02284 | 07742 | 01740 |        | TFM  | PUTTD+6 ,BUFBAS      |
| 02474 | 49 | 02242 | 00000 | 01750 | DMPBR  | B    | PUTTD-36             |
| 02486 | 16 | 08339 | 00000 | 01760 | CFXN   | TFM  | SYM-4,,8             |
| 02498 | 16 | 02528 | 08339 | 01770 |        | TFM  | **30,SYM-4           |
| 02510 | 11 | 02528 | 00001 | 01780 |        | AM   | **18,1,10            |
| 02522 | 25 | 08340 | 00761 | 01790 |        | TD   | SYM-3,CHI            |
| 02534 | 31 | 00760 | 00762 | 01800 |        | TR   | CHI-1 ,CHI+1         |
| 02546 | 45 | 02566 | 00761 | 01810 |        | BNR  | **20,CHI             |
| 02558 | 49 | 02614 |       | 01820 |        | B7   | **56                 |
| 02566 | 14 | 00761 | 00000 | 01830 |        | CM   | CHI,,10              |
| 02578 | 46 | 02534 | 01200 | 01840 |        | BE   | *-44                 |
| 02590 | 14 | 00761 | 00069 | 01850 |        | CM   | CHI,69,10            |
| 02602 | 46 | 02510 | 01100 | 01860 |        | BH   | CFXN+24              |
| 02614 | 26 | 02637 | 02528 | 01870 |        | TF   | **23,CFXN+42         |
| 02626 | 26 | 08343 | 00000 | 01880 |        | TF   | SYM                  |
| 02638 | 32 | 08340 | 00000 | 01890 |        | SF   | SYM-3                |
| 02650 | 16 | 02919 | 08350 | 01900 |        | TFM  | SMTST+11 ,COMP-3     |
| 02662 | 44 | 02688 | 02484 | 01910 |        | BNF  | **26 ,CFXN-2         |
| 02674 | 42 |       |       | 01920 |        | BB2  |                      |
| 02676 | 16 | 02919 | 08351 | 01930 |        | TFM  | SMTST+11 ,COMP-2     |
| 02688 | 26 | 03123 | 02485 | 01940 |        | TF   | CSORN-1 ,CFXN-1 ,7   |
| 02700 | 26 | 02827 | 07862 | 01950 | SMTLU  | TF   | SMCNT,MEMCAP-1       |
| 02712 | 26 | 02778 | 07861 | 01960 |        | TF   | SMTLU1+10,MEMCAP-2   |
| 02724 | 49 | 02768 |       | 01970 |        | B7   | SMTLU1               |
| 02732 | 12 | 02826 | 00001 | 01980 | SMLUOP | SM   | SMCNT-1,1,10         |
| 02744 | 12 | 02778 | 00001 | 01990 |        | SM   | SMTLU1+10,1,10       |
| 02756 | 33 | 02919 | 00000 | 02000 |        | CF   | SMTST+11 , ,6        |
| 02768 | 26 | 08353 | 00009 | 02010 | SMTLU1 | TF   | COMP,9               |
| 02780 | 44 | 02828 | 08349 | 02020 |        | BNF  | SMNOT,COMP-4         |
| 02792 | 26 | 02826 | 08352 | 02030 |        | TF   | SMCNT-1,COMP-1       |
| 02804 | 15 | 08349 | 00000 | 02040 |        | TDM  | COMP-4,0             |
| 02816 | 49 | 02732 | 99999 | 02050 |        | B    | SMLUOP,99999,7       |
| 02827 |    | 00000 |       | 02060 | SMCNT  | DS   | ,*                   |
| 02828 | 45 | 02908 | 08353 | 02070 | SMNOT  | BNR  | SMTST,COMP           |
| 02840 | 45 | 07482 | 08352 | 02080 |        | BNR  | NOSPCE,COMP-1        |
| 02852 | 26 | 02869 | 02778 | 02090 |        | TF   | **17,SMTLU1+10       |
| 02864 | 26 | 00009 | 08343 | 02100 |        | TF   | 9,SYM                |
| 02876 | 26 | 00995 | 02827 | 02110 |        | TF   | LSMCNT ,SMCNT        |
| 02888 | 43 | 09086 | 05255 | 02120 |        | BD   | DMM,DMSWCH           |
| 02900 | 49 | 05030 |       | 02130 |        | B7   | PUTETA-12            |
| 02908 | 44 | 02732 | 00000 | 02140 | SMTST  | BNF  | SMLUOP               |
| 02920 | 24 | 08353 | 08343 | 02150 |        | C    | COMP,SYM             |
| 02932 | 47 | 02732 | 01200 | 02160 |        | BNE  | SMLUOP               |
| 02944 | 31 | 08345 | 04609 | 02170 |        | TR   | COMP-8,ETAC-7        |
| 02956 | 24 | 02779 | 07868 | 02180 |        | C    | SMTLU1+11,FCTEND     |
| 02968 | 47 | 05006 | 01100 | 02190 |        | BNH  | PUTETA-36            |
| 02980 | 25 | 03002 | 02826 | 02200 |        | TD   | **22,SMCNT-1         |
| 02992 | 43 | 03016 | 00200 | 02210 |        | BD   | **24,200             |
| 03004 | 11 | 02826 | 00001 | 02220 |        | AM   | SMCNT-1,1,10         |
| 03016 | 16 | 03070 | 07529 | 02230 |        | TFM  | **54 ,USEDIFS-99     |
| 03028 | 26 | 03063 | 02826 | 02240 |        | TF   | **35,SMCNT-1         |
| 03040 | 32 | 03062 | 00000 | 02250 |        | SF   | **22                 |
| 03052 | 11 | 03070 | 00000 | 02260 |        | AM   | **18,                |
| 03064 | 15 | 07529 | 00001 | 02270 |        | TDM  | USEDIFS-99 ,1        |
| 03076 | 15 | 02827 | 00000 | 02280 |        | TDM  | SMCNT,0              |
| 03088 | 16 | 00761 | 00046 | 02290 |        | TFM  | CHI,46,10            |
| 03100 | 16 | 03123 | 03358 | 02300 |        | TFM  | CSORN-1 ,SS6         |
| 03112 | 49 | 05042 | 00000 | 02310 |        | B    | PUTETA               |
| 03124 | 14 | 00761 | 00003 | 02320 | CSORN  | CM   | CHI,3,10             |
| 03136 | 15 | 03159 | 00000 | 02330 |        | TDM  | FXORFL               |
| 03148 | 46 | 03536 | 01200 | 02340 |        | BE   | NUMBER               |
| 03159 |    | 00001 |       | 02350 | FXORFL | DS   | 1 ,*                 |
| 03160 | 14 | 00761 | 00070 | 02360 |        | CM   | CHI,70,10            |
| 03172 | 46 | 03536 | 01300 | 02370 |        | BNL  | NUMBER               |
| 03184 | 14 | 00761 | 00048 | 02380 |        | CM   | CHI,48,10            |
| 03196 | 46 | 03216 | 01100 | 02390 |        | BH   | **20                 |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 03208 | 49 | 03252 |       | 02400 |        | B7   | CS                   |
| 03216 | 14 | 00761 | 00055 | 02410 |        | CM   | CHI,55,10            |
| 03228 | 46 | 03252 | 01100 | 02420 |        | BH   | CS                   |
| 03240 | 15 | 03159 | 00002 | 02430 |        | TDM  | FXORFL,2             |
| 03252 | 16 | 03282 | 08335 | 02440 | CS     | TFM  | SALT+6 ,SYM-8        |
| 03264 | 26 | 08344 | 06663 | 02450 |        | TF   | SYM+1 ,FX1-1         |
| 03276 | 26 | 08335 | 00761 | 02460 | SALT   | TF   | SYM-8,CHI            |
| 03288 | 31 | 00760 | 00762 | 02470 |        | TR   | CHI-1 ,CHI+1         |
| 03300 | 11 | 03282 | 00002 | 02480 |        | AM   | SALT+6,2,10          |
| 03312 | 14 | 00761 | 00040 | 02490 |        | CM   | CHI,40,10            |
| 03324 | 46 | 04276 | 01300 | 02500 |        | BNL  | SYMCHK               |
| 03336 | 33 | 08342 | 00000 | 02510 |        | CF   | SYM-1                |
| 03348 | 33 | 08340 | 00000 | 02520 |        | CF   | SYM-3                |
| 03360 | 33 | 08338 | 00000 | 02530 |        | CF   | SYM-5                |
| 03372 | 33 | 08336 | 00000 | 02540 |        | CF   | SYM-7                |
| 03384 | 16 | 02919 | 08344 | 02550 | EXSYM  | TFM  | SMTST+11 ,COMP-9     |
| 03396 | 44 | 02700 | 03320 | 02560 |        | BNF  | SMTLU ,SALT+44       |
| 03408 | 31 | 03312 | 03428 | 02570 |        | TR   | SALT+36 ,SALT1       |
| 03420 | 49 | 03512 |       | 02580 |        | B7   | NUMBER-24            |
| 03428 | 14 | 00761 | 00040 | 02590 | SALT1  | CM   | CHI ,40 ,10          |
| 03440 | 46 | 04276 | 01300 | 02600 |        | BNL  | SYMCHK               |
| 03451 |    | 00001 |       | 02610 |        | DC   | 1 ,',*               |
| 03452 | 15 | 03159 | 00002 | 02620 | FXNUMB | TDM  | FXORFL ,2            |
| 03464 | 26 | 08333 | 06654 | 02630 |        | TF   | SYM-10 ,FL1          |
| 03476 | 26 | 03499 | 03762 | 02640 |        | TF   | **23,NUMB1+6         |
| 03488 | 26 | 08344 | 00000 | 02650 |        | TF   | SYM+1                |
| 03500 | 32 | 08334 | 00000 | 02660 |        | SF   | SYM-9                |
| 03512 | 32 | 08343 | 00000 | 02670 |        | SF   | SYM                  |
| 03524 | 49 | 03384 | 00000 | 02680 |        | B    | EXSYM                |
| 03536 | 26 | 08343 | 06654 | 02690 | NUMBER | TF   | SYM ,FL1             |
| 03548 | 16 | 03535 | 03888 | 02700 |        | TFM  | NUMBER-1,NUMB3       |
| 03560 | 16 | 03762 | 08334 | 02710 |        | TFM  | NUMB1+6 ,SYM-9       |
| 03572 | 14 | 00761 | 00070 | 02720 |        | CM   | CHI,70,10            |
| 03584 | 47 | 03804 | 01200 | 02730 |        | BNE  | NUMB                 |
| 03596 | 31 | 00760 | 00762 | 02740 |        | TR   | CHI-1,CHI+1          |
| 03608 | 49 | 03572 |       | 02750 |        | B7   | *-36                 |
| 03616 | 14 | 00761 | 00048 | 02760 | NUMB4  | CM   | CHI ,48 ,10          |
| 03628 | 47 | 03708 | 01200 | 02770 |        | BNE  | NUMB6                |
| 03640 | 25 | 03693 | 08334 | 02780 |        | TD   | SALT2+9 ,SYM-9       |
| 03652 | 31 | 03312 | 03684 | 02790 |        | TR   | SALT+36 ,SALT2       |
| 03664 | 31 | 00760 | 00762 | 02800 |        | TR   | CHI-1 ,CHI+1         |
| 03676 | 49 | 03252 |       | 02810 |        | B7   | CS                   |
| 03684 | 12 | 03693 | 00001 | 02820 | SALT2  | SM   | **9 ,1 ,810          |
| 03696 | 46 | 03276 | 01100 | 02830 |        | BH   | SALT                 |
| 03707 |    | 00001 |       | 02840 |        | DC   | 1 ,',*               |
| 03708 | 14 | 00761 | 00069 | 02850 | NUMB6  | CM   | CHI ,69 ,10          |
| 03720 | 47 | 03452 | 01100 | 02860 |        | BNH  | FXNUMB               |
| 03732 | 14 | 03762 | 08343 | 02870 |        | CM   | NUMB1+6,SYM          |
| 03744 | 46 | 03768 | 01100 | 02880 |        | BH   | NUMB1+12             |
| 03756 | 25 | 00000 | 00761 | 02890 | NUMB1  | TD   | ,CHI                 |
| 03768 | 31 | 00760 | 00762 | 02900 |        | TR   | CHI-1,CHI+1          |
| 03780 | 11 | 03762 | 00001 | 02910 |        | AM   | NUMB1+6,1            |
| 03792 | 11 | 08333 | 00001 | 02920 | NUMB5  | AM   | SYM-10 ,1 ,010       |
| 03804 | 14 | 00761 | 00003 | 02930 | NUMB   | CM   | CHI,3,10             |
| 03816 | 47 | 03616 | 01200 | 02940 |        | BNE  | NUMB4                |
| 03828 | 26 | 03990 | 03762 | 02950 | FLNUMB | TF   | NUMB2+6,NUMB1+6      |
| 03840 | 14 | 08333 | 00051 | 02960 |        | CM   | SYM-10 ,51 ,10       |
| 03852 | 46 | 03876 | 01200 | 02970 |        | BE   | **24                 |
| 03864 | 16 | 03535 | 03996 | 02980 |        | TFM  | NUMBER-1,NUMB2+12    |
| 03876 | 26 | 03930 | 03535 | 02990 |        | TF   | VARBR+6,NUMBER-1     |
| 03888 | 12 | 08333 | 00001 | 03000 | NUMB3  | SM   | SYM-10 ,1 ,10        |
| 03900 | 31 | 00760 | 00762 | 03010 |        | TR   | CHI-1,CHI+1          |
| 03912 | 14 | 00761 | 00070 | 03020 |        | CM   | CHI,70,10            |
| 03924 | 46 | 00000 | 01200 | 03030 | VARBR  | BE   |                      |
| 03936 | 47 | 04016 | 01100 | 03040 |        | BNH  | CMPAR                |
| 03948 | 16 | 03930 | 03996 | 03050 |        | TFM  | VARBR+6,NUMB2+12     |
| 03960 | 14 | 03990 | 08343 | 03060 |        | CM   | NUMB2+6 ,SYM         |
| 03972 | 46 | 03996 | 01100 | 03070 |        | BH   | NUMB2+12             |
| 03984 | 25 | 00000 | 00761 | 03080 | NUMB2  | TD   | ,CHI                 |
| 03996 | 11 | 03990 | 00001 | 03090 |        | AM   | NUMB2+6,1            |
| 04008 | 49 | 03900 |       | 03100 |        | B7   | NUMB3+12             |
| 04016 | 14 | 00761 | 00045 | 03110 | CMPAR  | CM   | CHI,45,10            |
| 04028 | 47 | 04208 | 01200 | 03120 |        | BNE  | PLUS+12              |
| 04040 | 26 | 04206 | 03802 | 03130 |        | TF   | PLUS+10,NUMB5+10     |
| 04052 | 14 | 00763 | 00020 | 03140 |        | CM   | CHI+2,20,10          |
| 04064 | 47 | 04100 | 01300 | 03150 |        | BL   | **36                 |
| 04076 | 47 | 04112 | 01200 | 03160 |        | BNE  | **36                 |
| 04088 | 15 | 04197 | 00002 | 03170 |        | TDM  | PLUS+1,2             |
| 04100 | 31 | 00760 | 00762 | 03180 |        | TR   | CHI-1,CHI+1          |
| 04112 | 25 | 04207 | 00763 | 03190 |        | TD   | PLUS+11,CHI+2        |
| 04124 | 31 | 00760 | 00764 | 03200 |        | TR   | CHI-1,CHI+3          |
| 04136 | 14 | 00761 | 00069 | 03210 |        | CM   | CHI,69,10            |
| 04148 | 47 | 04196 | 01100 | 03220 |        | BNH  | PLUS                 |
| 04160 | 22 | 04206 | 04207 | 03230 |        | S    | PLUS+10,PLUS+11      |
| 04172 | 25 | 04207 | 00761 | 03240 |        | TD   | PLUS+11,CHI          |
| 04184 | 31 | 00760 | 00762 | 03250 |        | TR   | CHI-1,CHI+1          |
| 04196 | 11 | 08333 | 00000 | 03260 | PLUS   | AM   | SYM-10               |
| 04208 | 26 | 08343 | 08341 | 03270 |        | TF   | SYM ,SYM-2           |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 04220 | 15 | 03159 | 00000 | 03280 |        | TDM  | FXORFL,0             |
| 04232 | 32 | 08343 | 00000 | 03290 |        | SF   | SYM                  |
| 04244 | 43 | 03524 | 08336 | 03300 |        | BD   | NUMBER-12 ,SYM-7     |
| 04256 | 16 | 08335 | 00000 | 03310 |        | TFM  | SYM-8 , ,10          |
| 04268 | 49 | 03524 |       | 03320 |        | B7   | NUMBER-12            |
| 04276 | 14 | 03282 | 08345 | 03330 | SYMHK  | CM   | SALT+6,SYM+2         |
| 04288 | 47 | 03276 | 01200 | 03340 |        | BNE  | SALT                 |
| 04300 | 49 | 11840 |       | 03350 |        | B7   | IFSS                 |
| 04308 | 15 | 05254 | 00002 | 03360 | SCRIPT | TDM  | SBSWCH,2             |
| 04320 | 31 | 04599 | 04608 | 03370 |        | TR   | ETAN,ETAC-8          |
| 04332 | 26 | 04603 | 02827 | 03380 |        | TF   | ETAN+4,SMCNT         |
| 04344 | 11 | 04602 | 00001 | 03390 |        | AM   | ETAN+3,1,10          |
| 04356 | 26 | 04390 | 02778 | 03400 |        | TF   | **34,SMTLU1+10       |
| 04368 | 12 | 04390 | 00001 | 03410 |        | SM   | **22,1,10            |
| 04380 | 26 | 00004 | 00004 | 03420 |        | TF   | OUT+4 ,4             |
| 04392 | 17 | 04794 | 04404 | 03430 |        | BTM  | COLECT,**12          |
| 04404 | 31 | 00005 | 05264 | 03440 |        | TR   | OUT+5 ,SYMB5B-4      |
| 04416 | 22 | 04602 | 04997 | 03450 |        | S    | ETAN+3,NOMB          |
| 04428 | 14 | 00761 | 00023 | 03460 |        | CM   | CHI,23,10            |
| 04440 | 46 | 04618 | 01200 | 03470 |        | BE   | TWODIM               |
| 04452 | 44 | 04710 | 00009 | 03480 | QUERY  | BNF  | GORE ,OUT+9          |
| 04464 | 31 | 00760 | 00762 | 03490 |        | TR   | CHI-1,CHI+1          |
| 04476 | 15 | 05254 | 00000 | 03500 |        | TDM  | SBSWCH               |
| 04488 | 25 | 04606 | 03159 | 03510 |        | TD   | ETAN+7,FXORFL        |
| 04500 | 43 | 05074 | 05256 | 03520 |        | BD   | PETA,FLAGSW          |
| 04512 | 11 | 04586 | 00038 | 03530 |        | AM   | PUTETB+6 ,18 ,10     |
| 04524 | 24 | 04586 | 04776 | 03540 |        | C    | PUTETB+6 ,GORE+66    |
| 04536 | 47 | 04568 | 01100 | 03550 |        | BNH  | **32                 |
| 04548 | 26 | 05393 | 05381 | 03560 |        | TF   | ERFMT+10 ,ERIOLS+10  |
| 04560 | 49 | 10742 |       | 03570 |        | B7   | TRAN+24              |
| 04568 | 12 | 04586 | 00009 | 03580 |        | SM   | PUTETB+6 ,9 ,10      |
| 04580 | 31 | 00000 | 04599 | 03590 | PUTETB | TR   | ,ETAN                |
| 04592 | 49 | 03123 | 00000 | 03600 |        | B    | CSORN-1 , ,6         |
| 04599 |    | 00000 |       | 03610 | ETAN   | DS   | ,*-4                 |
| 04607 |    | 00004 |       | 03620 |        | DS   | 4                    |
| 04616 |    | 00009 |       | 03630 | ETAC   | DC   | 9,1                  |
| 04618 | 17 | 04794 | 04630 | 03640 | TWODIM | BTM  | COLECT,**12          |
| 04630 | 31 | 00010 | 05264 | 03650 |        | TR   | OUT+10 ,SYMB5B-4     |
| 04642 | 23 | 00004 | 04997 | 03660 |        | M    | OUT+4 ,NOMB          |
| 04654 | 32 | 00096 | 00000 | 03670 |        | SF   | 96                   |
| 04666 | 22 | 04602 | 00099 | 03680 |        | S    | ETAN+3,99            |
| 04678 | 21 | 04602 | 00004 | 03690 |        | A    | ETAN+3 ,OUT+4        |
| 04690 | 44 | 04710 | 00014 | 03700 |        | BNF  | GORE ,OUT+14         |
| 04702 | 49 | 04452 |       | 03710 |        | B7   | QUERY                |
| 04710 | 11 | 05085 | 00001 | 03720 | GORE   | AM   | SUBN,1,10            |
| 04722 | 26 | 04605 | 05085 | 03730 |        | TF   | ETAN+6,SUBN          |
| 04734 | 13 | 05085 | 00035 | 03740 |        | MM   | SUBN,15,10           |
| 04746 | 16 | 04776 | 08333 | 03750 |        | TFM  | **30,TOP+1           |
| 04758 | 22 | 04776 | 00099 | 03760 |        | S    | **18,99              |
| 04770 | 31 | 00000 | 00001 | 03770 |        | TR   | ,OUT+1               |
| 04782 | 49 | 04464 | 00000 | 03780 |        | B    | QUERY+12             |
| 04794 | 15 | 04987 | 00003 | 03790 | COLECT | TDM  | FAGR+1,3             |
| 04806 | 16 | 05268 | 00000 | 03800 |        | TFM  | SYMB5B,0,711         |
| 04818 | 16 | 04997 | 00000 | 03810 |        | TFM  | NOMB,,8              |
| 04830 | 31 | 00760 | 00762 | 03820 |        | TR   | CHI-1,CHI+1          |
| 04842 | 14 | 00761 | 00069 | 03830 |        | CM   | CHI,69,10            |
| 04854 | 46 | 04962 | 01100 | 03840 |        | BH   | FAGR-24              |
| 04866 | 17 | 03252 | 00002 | 03850 |        | BTM  | CS,2,10              |
| 04878 | 26 | 05268 | 02827 | 03860 |        | TF   | SYMB5B,SMCNT         |
| 04890 | 14 | 00761 | 00040 | 03870 |        | CM   | CHI,10,10            |
| 04902 | 46 | 04950 | 01200 | 03880 |        | BE   | **48                 |
| 04914 | 14 | 00761 | 00020 | 03890 |        | CM   | CHI,20,10            |
| 04926 | 47 | 04998 | 01200 | 03900 |        | BNE  | FAGR+12              |
| 04938 | 15 | 04987 | 00002 | 03910 |        | TDM  | FAGR+1,2             |
| 04950 | 31 | 00760 | 00762 | 03920 |        | TR   | CHI-1,CHI+1          |
| 04962 | 17 | 02486 | 00000 | 03930 |        | BTM  | CFXN,,10             |
| 04974 | 26 | 04997 | 08343 | 03940 |        | TF   | NOMB,SYM             |
| 04986 | 33 | 04997 | 00000 | 03950 | FAGR   | CF   | NOMB                 |
| 04998 | 49 | 04793 |       | 03960 |        | B7   | COLECT-1 , ,6        |
| 04997 |    | 00000 |       | 03970 | NOMB   | DS   | ,FAGR+11             |
| 05006 | 14 | 00761 | 00024 | 03980 |        | CM   | CHI,24,10            |
| 05018 | 46 | 04308 | 01242 | 03990 |        | BE   | SCRIPT,42            |
| 05030 | 43 | 05028 | 05254 | 04000 |        | BD   | *-2,SBSWCH           |
| 05042 | 31 | 04599 | 04608 | 04010 | PUTETA | TR   | ETAN,ETAC-8          |
| 05054 | 26 | 04603 | 02827 | 04020 |        | TF   | ETAN+4,SMCNT         |
| 05066 | 49 | 04488 |       | 04030 |        | B7   | QUERY+36             |
| 05074 | 32 | 04606 | 00000 | 04040 | PETA   | SF   | ETAN+7               |
| 05085 |    | 00002 |       | 04050 | SUBN   | DC   | 2 ,0 ,*              |
| 05086 | 15 | 05256 | 00000 | 04060 |        | TDM  | FLAGSW,0             |
| 05098 | 49 | 04512 | 00000 | 04070 |        | B    | PUTETB-68            |
| 05110 | 47 | 05120 | 01942 | 04080 | ROCK   | BNI  | **10 ,1942           |
| 05122 | 43 | 05166 | 00299 | 04090 |        | BD   | ROCK1 ,299           |
| 05134 | 17 | 05238 | 05481 | 04100 | HDWRER | BTM  | LSST ,HERRM          |
| 05146 | 48 | 00049 | 09290 | 04110 |        | H    | 49 ,CDAT ,5          |
| 05158 | 49 | 07642 |       | 04120 |        | B7   | CEXEC                |
| 05166 | 25 | 05132 | 05133 | 04130 | ROCK1  | TD   | ROCK+22 ,ROCK+23 ,11 |
| 05178 | 46 | 05190 | 00600 | 04140 |        | BI   | **12 ,600            |
| 05190 | 46 | 05202 | 00700 | 04150 |        | BI   | **12 ,700            |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS       | AND REMARKS       |
|-------|----|-------|-------|-------|--------|------|----------------|-------------------|
| 05202 | 46 | 05214 | 01600 | 04160 |        | BI   | **12           | ,1600             |
| 05214 | 46 | 05226 | 01700 | 04170 |        | BI   | **12           | ,1700             |
| 05226 | 49 | 05109 | 00000 | 04180 |        | B    | ROCK-1         | ,6                |
| 05238 | 46 | 05288 | 00200 | 04190 | LSTT   | BC2  | LSTP           |                   |
| 05250 | 34 | 00000 | 00102 | 04200 | BA     | RCTY |                |                   |
| 05262 | 34 | 00000 | 00102 | 04210 |        | RCTY |                |                   |
| 05268 |    | 00000 |       | 04220 | SYMB5B | DS   |                | ,*-5              |
| 05269 |    | 00001 |       | 04230 |        | DC   | 1              | ,',*-4            |
| 05274 | 39 | 05237 | 00100 | 04240 |        | WATY | LSTT-1         | ,6                |
| 05286 | 42 |       |       | 04250 |        | BB2  |                | ,0                |
| 05288 | 39 | 05237 | 00900 | 04260 | LSTP   | WA   | LSTT-1,900,6   |                   |
| 05300 | 47 | 05324 | 03400 | 04270 |        | BNI  | **24,3400      |                   |
| 05312 | 34 | 00000 | 00971 | 04280 |        | K    |                | ,971              |
| 05324 | 42 | 00000 | 00000 | 04290 |        | BB   |                |                   |
| 05332 |    |       |       | 04300 |        | DORG | **3            |                   |
| 05332 | 26 | 05237 | 05331 | 04310 | LSTC   | TF   | LSTT-1         | ,LSTC-1           |
| 05344 | 46 | 05288 | 00200 | 04320 |        | BC2  | LSTP           |                   |
| 05356 | 39 | 05237 | 00400 | 04330 |        | WACD | LSTT-1         | ,6                |
| 05368 | 42 |       |       | 04340 |        | BB2  |                |                   |
| 05371 |    | 00006 | X2    | 04350 | ERIOLS | DAC  | 6              | ,IOLIST           |
| 05383 |    | 00016 | X2    | 04360 | ERFMT  | DAC  | 16             | ,FORMAT TOO LONG' |
| 05415 |    | 00017 | X2    | 04370 | ERRMSS | DFAC | 17             | ,SYM TAB FULL'    |
| 05449 |    | 00016 | X2    | 04380 | DKOLM  | DAC  | 16             | ,NO ROOM ON FILE' |
| 05481 |    | 00014 | X2    | 04390 | HERRM  | DAC  | 14             | ,HDWR ERR COMP'   |
| 05508 | 34 | 00044 | 00701 | 04400 | CCAL   | K    | 44             | ,701              |
| 05520 | 32 | 00000 | 00000 | 04410 |        | SF   |                |                   |
| 05532 | 36 | 00044 | 00702 | 04420 |        | RN   | 44             | ,702              |
| 05544 | 49 | 12994 | 00000 | 04430 |        | B    | 12994          | ,6,NORM           |
| 05552 |    |       |       | 04440 |        | DORG | **3            |                   |
| 05552 |    | 00001 |       | 04450 | DCFEX  | DC   | 1              | ,0                |
| 05566 |    | 00014 |       | 04460 |        | DC   | 14             | ,7980412500500'   |
| 05568 | 17 | 05640 | 05580 | 04470 | EXPROC | BTM  | GETNO,**12     |                   |
| 05580 | 31 | 00000 | 06769 | 04480 |        | TR   | OUT            | ,EXREC            |
| 05592 | 26 | 00005 | 02826 | 04490 |        | TF   | OUT+5          | ,SMCNT-1          |
| 05604 | 21 | 00011 | 07856 | 04500 |        | A    | OUT+11         | ,L                |
| 05616 | 17 | 02134 | 00012 | 04510 | GPXTD  | BTM  | PUTX,12,10     |                   |
| 05628 | 49 | 06274 | 00000 | 04520 |        | B    | TESTDO         |                   |
| 05640 | 31 | 00760 | 00762 | 04530 | GETNO  | TR   | CHI-1,CHI+1    |                   |
| 05652 | 14 | 00761 | 00069 | 04540 |        | CM   | CHI,69,10      |                   |
| 05664 | 47 | 05640 | 01100 | 04550 |        | BNH  | **24           |                   |
| 05676 | 17 | 02486 | 05688 | 04560 |        | BTM  | CFXN,**12      |                   |
| 05688 | 26 | 05717 | 02778 | 04570 |        | TF   | **29           | ,SMTLU1+10        |
| 05700 | 12 | 05717 | 00001 | 04580 |        | SM   | **17,1,10      |                   |
| 05712 | 26 | 00009 | 08343 | 04590 | ADM1   | TF   | 9              | ,SYM              |
| 05724 | 49 | 05639 |       | 04600 |        | B7   | GETNO-1        | ,6                |
| 05732 | 17 | 05640 | 05744 | 04610 | BEGPRO | BTM  | GETNO,**12     |                   |
| 05744 | 31 | 00000 | 06728 | 04620 |        | TR   | OUT            | ,BEREC            |
| 05756 | 21 | 00005 | 02826 | 04630 |        | A    | OUT+5          | ,SMCNT-1          |
| 05768 | 17 | 02134 | 00016 | 04640 |        | BTM  | PUTX,16,10     |                   |
| 05780 | 26 | 05797 | 02778 | 04650 |        | TF   | **17,SMTLU1+10 |                   |
| 05792 | 26 | 00004 | 07856 | 04660 |        | TF   | 4              | ,L                |
| 05804 | 21 | 00006 | 07856 | 04670 |        | A    | OUT+6          | ,L                |
| 05816 | 26 | 00010 | 02826 | 04680 |        | TF   | OUT+10         | ,SMCNT-1          |
| 05828 | 49 | 05616 |       | 04690 |        | B7   | GPXTD          |                   |
| 05836 | 32 | 05848 | 00000 | 04700 | ENDPRO | SF   | XETURN         |                   |
| 05848 | 17 | 05640 | 05860 | 04710 | XETURN | BTM  | GETNO,**12     |                   |
| 05860 | 31 | 00000 | 06736 | 04720 |        | TR   | OUT            | ,BEREC+8          |
| 05872 | 26 | 05894 | 02778 | 04730 |        | TF   | **22,SMTLU1+10 |                   |
| 05884 | 21 | 00006 | 00004 | 04740 |        | A    | OUT+6          | ,4                |
| 05896 | 17 | 02134 | 00008 | 04750 | GPX8   | BTM  | PUTX,8,10      |                   |
| 05908 | 44 | 00972 | 05848 | 04760 |        | BNF  | BEGIN,XETURN   |                   |
| 05920 | 33 | 05848 | 00000 | 04770 |        | CF   | XETURN         |                   |
| 05932 | 26 | 05949 | 05717 | 04780 |        | TF   | **17           | ,ADM1+5           |
| 05944 | 26 | 00004 | 07856 | 04790 |        | TF   | 4              | ,L                |
| 05956 | 49 | 00972 | 00000 | 04800 |        | B    | BEGIN          |                   |
| 05963 |    |       |       | 04810 |        | DORG | **4            |                   |
| 05965 |    | 00003 |       | 04820 |        | DC   | 3              | ,68               |
| 05966 | 17 | 03690 | 00030 | 04830 | GOTORC | BTM  | IXCK,30,711    |                   |
| 05978 | 17 | 03758 | 00000 | 04840 |        | BTM  | IXMX           | ,9                |
| 05990 | 13 | 00009 | 00004 | 04850 |        | MM   | 9              | ,4,10             |
| 06002 | 11 | 00099 | 00067 | 04860 |        | AM   | 99             | ,67               |
| 06014 | 26 | 00065 | 00099 | 04870 |        | TF   | 65             | ,99,011           |
| 06026 | 49 | 00000 |       | 04880 | GGG    | B7   |                |                   |
| 06034 |    | 00002 |       | 04890 |        | DC   | 2              | ,'                |
| 06036 | 16 | 07689 | 00000 | 04900 | PAUSE  | TFM  | INST1+11       |                   |
| 06048 | 26 | 07685 | 06135 | 04910 |        | TF   | INST1+7        | ,CONTRL-7         |
| 06060 | 49 | 06250 |       | 04920 |        | B7   | GPT1-12        |                   |
| 06068 | 31 | 00760 | 00768 | 04930 | STOP   | TR   | CHI-1          | ,CHI+7            |
| 06080 | 26 | 07685 | 06135 | 04940 |        | TF   | INST1+7        | ,CONTRL-7         |
| 06092 | 17 | 02486 | 00000 | 04950 |        | BTM  | CFXN,,10       |                   |
| 06104 | 49 | 06238 |       | 04960 |        | B7   | GPT1-24        |                   |
| 06112 | 47 | 00024 | 00200 | 04970 | BR2    | BNC2 | 24             | ,2                |
| 06127 |    | 00004 |       | 04980 |        | DC   | 4              | ,'                |
| 06128 | 17 | 03594 | 00000 | 04990 | ENDINS | BTM  | DTRB           | ,0710             |
| 06141 |    | 00002 |       | 05000 |        | DC   | 2,'            |                   |
| 06142 | 31 | 00760 | 00774 | 05010 | CONTRL | TR   | CHI-1          | ,CHI+13           |
| 06154 | 16 | 07679 | 00034 | 05020 |        | TFM  | INST1+1,34,10  |                   |
| 06166 | 17 | 02486 | 00000 | 05030 |        | BTM  | CFXN,,10       |                   |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL      | MNEM                              | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|------------|-----------------------------------|----------------------|
| 06178 | 14 | 08343 | 00900 | 05040 | CM         | SYM                               | ,900 ,8              |
| 06190 | 47 | 06238 | 01300 | 05050 | BL         | GPT1-24                           |                      |
| 06202 | 31 | 07698 | 06112 | 05060 | TR         | INST2                             | ,BR2                 |
| 06214 | 21 | 07704 | 07856 | 05070 | A          | INST2+6                           | ,L                   |
| 06226 | 27 | 01572 | 01571 | 05080 | BT         | PUT2                              | ,PUT2-1              |
| 06238 | 26 | 07689 | 08343 | 05090 | TF         | INST1+11                          | ,SYM                 |
| 06250 | 31 | 07690 | 07847 | 05100 | TR         | INST1+12                          | ,CRAM-4              |
| 06262 | 27 | 01552 | 01551 | 05110 | GPT1 BT    | PUT1                              | ,PUT1-1              |
| 06274 | 44 | 00972 | 05257 | 05120 | TESTDO BNF | BEGIN                             | ,DOSWCH              |
| 06286 | 31 | 00000 | 06582 | 05130 | TR         | OUT                               | ,DORCRD              |
| 06298 | 12 | 08890 | 00020 | 05140 | SM         | EMM+6,20                          |                      |
| 06310 | 26 | 06333 | 08890 | 05150 | TF         | **23,EMM+6                        |                      |
| 06322 | 31 | 00064 | 00000 | 05160 | TR         | OUT+64                            |                      |
| 06334 | 26 | 06352 | 06333 | 05170 | TF         | **18,*-1                          |                      |
| 06346 | 15 | 00000 | 00000 | 05180 | TDM        |                                   |                      |
| 06357 |    | 00001 |       | 05190 | DC         | 1,',*                             |                      |
| 06358 | 11 | 06352 | 00010 | 05200 | AM         | *-6,10                            |                      |
| 06370 | 26 | 06388 | 06352 | 05210 | TF         | **18,*-18                         |                      |
| 06382 | 26 | 00000 | 07851 | 05220 | TF         | ,CRAM                             |                      |
| 06394 | 11 | 06388 | 00010 | 05230 | AM         | *-6,10                            |                      |
| 06406 | 26 | 06424 | 06388 | 05240 | TF         | **18,*-18                         |                      |
| 06418 | 26 | 00000 | 07851 | 05250 | TF         | ,CRAM                             |                      |
| 06430 | 26 | 00011 | 00083 | 05260 | TD01 TF    | OUT+11,OUT+83                     |                      |
| 06442 | 26 | 00018 | 00068 | 05270 | TF         | OUT+18,OUT+68                     |                      |
| 06454 | 26 | 00023 | 00083 | 05280 | TF         | OUT+23,OUT+83                     |                      |
| 06466 | 26 | 00042 | 00068 | 05290 | TF         | OUT+42,OUT+68                     |                      |
| 06478 | 26 | 00035 | 00078 | 05300 | TF         | OUT+35,OUT+78                     |                      |
| 06490 | 26 | 00047 | 00078 | 05310 | TF         | OUT+47,OUT+78                     |                      |
| 06502 | 26 | 00054 | 00073 | 05320 | TF         | OUT+54,OUT+73                     |                      |
| 06514 | 17 | 02134 | 00060 | 05330 | BTM        | PUTX,60,10                        |                      |
| 06526 | 41 | 10146 | 00000 | 05340 | NOP        | IO6                               |                      |
| 06538 | 11 | 00005 | 00081 | 05350 | SLOT AM    | 5 ,1 ,10                          |                      |
| 06550 | 47 | 06286 | 01300 | 05360 | BN         | TESTDO+12                         |                      |
| 06562 | 16 | 00004 | 00000 | 05370 | TFM        | 4                                 |                      |
| 06574 | 49 | 00972 |       | 05380 | B7         | BEGIN                             |                      |
| 06582 | 17 | 07610 | 00000 | 05390 | DORCRD BTM | ADCK,,01                          |                      |
| 06594 | 21 | 00000 | 00000 | 05400 | A          | ,,012                             |                      |
| 06606 | 17 | 07610 | 00000 | 05410 | BTM        | ADCK,,01                          |                      |
| 06629 |    | 00012 |       | 05420 | DC         | 12,2400000000000                  |                      |
| 06642 |    | 00013 |       | 05430 | DC         | 13,4700000001100'                 |                      |
| 06654 |    | 00012 |       | 05440 | FL1 DC     | 12 ,5100000000000                 |                      |
| 06664 |    | 00010 |       | 05450 | FX1 DC     | 10 , -1                           |                      |
| 06666 | 13 | 00000 | 00000 | 05460 | SUB1 MM    | ,,27                              |                      |
| 06678 | 32 | 00096 | 00000 | 05470 | SF         | 96                                |                      |
| 06690 | 21 | 00099 | 00000 | 05480 | A          | 99,,27                            |                      |
| 06702 | 16 | 00071 | 00000 | 05490 | TFM        | 71,,27                            |                      |
| 06714 | 22 | 00070 | 00099 | 05500 | S          | 70,99,27                          |                      |
| 06726 |    | 00001 |       | 05510 | DC         | 1,'                               |                      |
| 06728 | 49 | 00010 |       | 05520 | BEREC B7   | 10,,25                            |                      |
| 06736 | 49 | 00008 |       | 05530 | B7         | 8,,26                             |                      |
| 06744 | 26 | 00002 | 00001 | 05540 | TF         | 2,1,26                            |                      |
| 06756 | 17 | 07610 | 00000 | 05550 | BTM        | ADCK                              |                      |
| 06768 |    | 00001 |       | 05560 | DC         | 1,'                               |                      |
| 06769 |    | 00001 |       | 05570 | EXREC DC   | 1,1                               |                      |
| 06775 |    | 00006 |       | 05580 | DC         | 6,7000002                         |                      |
| 06781 |    | 00006 |       | 05590 | DC         | 6,00012'                          |                      |
| 06782 | 17 | 05640 | 06794 | 05600 | BEGSEG BTM | GETNO ,**12                       |                      |
| 06794 | 16 | 01185 | 00073 | 05610 | TFM        | ADF+1 ,73 ,10                     |                      |
| 06806 | 26 | 06828 | 02778 | 05620 | TF         | **22 ,SMTLU1+10                   |                      |
| 06818 | 26 | 07856 | 00005 | 05630 | TF         | L ,5                              |                      |
| 06830 | 26 | 06847 | 05717 | 05640 | TF         | **17 ,ADM1+5                      |                      |
| 06842 | 26 | 00005 | 07719 | 05650 | TF         | 5 ,DCF+5                          |                      |
| 06854 | 22 | 06848 | 00570 | 05660 | S          | *-6 ,NEXTP ,6                     |                      |
| 06866 | 49 | 00972 |       | 05670 | B7         | BEGIN                             |                      |
| 06874 | 17 | 05640 | 06886 | 05680 | CALLSG BTM | GETNO ,**12                       |                      |
| 06886 | 31 | 07678 | 06918 | 05690 | TR         | INST1 ,CALSRC                     |                      |
| 06898 | 26 | 07688 | 02826 | 05700 | TF         | INST1+10 ,SMCNT-1                 |                      |
| 06910 | 49 | 06262 |       | 05710 | B7         | GPT1                              |                      |
| 06918 | 17 | 04840 | 00000 | 05720 | CALSRC BTM | CALSR                             |                      |
| 06928 |    |       |       | 05730 | DORG       | *-1                               |                      |
| 06933 |    | 00006 |       | 05740 | DC         | 6 ,6000'                          |                      |
| 06934 | 16 | 07124 | 00972 | 05750 | ENDSEG TFM | ESEGBR+6 ,BEGIN ,SET SEG EXIT     |                      |
| 06946 | 49 | 06966 |       | 05760 | B7         | SEG+12                            |                      |
| 06954 | 16 | 07124 | 07126 | 05770 | SEG TFM    | ESEGBR+6 ,ESEGBR+8                |                      |
| 06966 | 31 | 00000 | 06128 | 05780 | TR         | OUT,ENDINS                        |                      |
| 06978 | 16 | 01185 | 00041 | 05790 | TFM        | ADF+1 ,41 ,10                     |                      |
| 06990 | 26 | 00755 | 06605 | 05800 | TF         | CHI-6,DORCRD+23                   |                      |
| 07002 | 26 | 00013 | 00403 | 05810 | TF         | OUT+13 ,403                       |                      |
| 07014 | 17 | 02134 | 00014 | 05820 | BTM        | PUTX ,14 ,10                      |                      |
| 07026 | 14 | 07856 | 00000 | 05830 | CM         | L                                 |                      |
| 07037 |    | 00000 |       | 05840 | LMAX DS    | ,*                                |                      |
| 07038 | 47 | 07062 | 01300 | 05850 | BL         | **24                              |                      |
| 07050 | 26 | 07037 | 07856 | 05860 | TF         | LMAX ,L                           |                      |
| 07062 | 14 | 02284 | 07742 | 05870 | CM         | PUTTD+6 ,BUFBAS ,OUT LAST TO DISK |                      |
| 07074 | 46 | 07118 | 01200 | 05880 | BE         | ESEGBR                            |                      |
| 07086 | 16 | 02480 | 07106 | 05890 | TFM        | DMPBR+6 ,ESEGBR-12                |                      |
| 07098 | 49 | 02334 |       | 05900 | B7         | DUMP                              |                      |
| 07106 | 16 | 02480 | 02242 | 05910 | TFM        | DMPBR+6 ,PUTTD-36                 |                      |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL   | MNEM            | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|---------|-----------------|----------------------|
| 07118 | 49 | 07126 |       | 05920 | ESEGBR  | B7              | **8                  |
| 07126 | 45 | 07146 | 00763 | 05930 | BNR     | **20            | ,CHI+2               |
| 07138 | 49 | 00972 |       | 05940 | B7      | BEGIN           |                      |
| 07146 | 17 | 05640 | 07158 | 05950 | BTM     | GETNO           | ,**12                |
| 07158 | 26 | 07175 | 02778 | 05960 | TF      | **17            | ,SMTLU1+10           |
| 07170 | 26 | 00005 | 07856 | 05970 | TF      | 5               | ,L                   |
| 07182 | 49 | 07126 |       | 05980 | B7      | ESEGBR+8        |                      |
| 07190 | 31 | 00760 | 00768 | 05990 | GOTO    | TR              | CHI-1,CHI+7          |
| 07202 | 14 | 00761 | 00024 | 06000 | CM      | CHI,24,10       |                      |
| 07214 | 46 | 07270 | 01200 | 06010 | BE      | COMPUT          |                      |
| 07226 | 31 | 00000 | 06026 | 06020 | TR      | OUT             | ,GGG                 |
| 07238 | 17 | 02486 | 07250 | 06030 | BTM     | CFXN,**12       |                      |
| 07250 | 26 | 00005 | 02826 | 06040 | TF      | OUT+5           | ,SMCNT-1             |
| 07262 | 49 | 05896 | 00000 | 06050 | B       | GPX8            |                      |
| 07270 |    |       |       | 06060 | DORG    | *-3             |                      |
| 07270 | 16 | 07336 | 07943 | 06070 | COMPUT  | TFM             | KK+6,PHI+71          |
| 07282 | 31 | 07869 | 05963 | 06080 | TR      | PHI-3,GOTORC-3  |                      |
| 07294 | 15 | 05254 | 00001 | 06090 | TDM     | SBSWCH,1        |                      |
| 07306 | 31 | 00760 | 00762 | 06100 | TR      | CHI-1,CHI+1     |                      |
| 07318 | 17 | 02486 | 07330 | 06110 | BTM     | CFXN            | ,**12                |
| 07330 | 26 | 00000 | 02826 | 06120 | KK      | TF              | ,SMCNT-1             |
| 07342 | 11 | 07871 | 00004 | 06130 | AM      | PHI -1,4,10     |                      |
| 07354 | 11 | 07336 | 00004 | 06140 | AM      | KK+6,4,10       |                      |
| 07366 | 11 | 07895 | 00001 | 06150 | AM      | PHI+23          | ,1                   |
| 07378 | 43 | 07294 | 00760 | 06160 | BD      | COMPUT+24,CHI-1 | ,10                  |
| 07390 | 21 | 07926 | 07856 | 06170 | A       | PHI+54          | ,L                   |
| 07402 | 21 | 07919 | 07856 | 06180 | A       | PHI+47          | ,L                   |
| 07414 | 31 | 00760 | 00764 | 06190 | TR      | CHI-1,CHI+3     |                      |
| 07426 | 17 | 03124 | 07438 | 06200 | BTM     | CSORN,**12      |                      |
| 07438 | 15 | 05254 | 00000 | 06210 | TDM     | SBSWCH,0        |                      |
| 07450 | 22 | 07883 | 07856 | 06220 | S       | PHI+11,L        |                      |
| 07462 | 26 | 07902 | 02827 | 06230 | TF      | PHI+30          | ,SMCNT               |
| 07474 | 49 | 11250 |       | 06240 | B7      | GPHBG           |                      |
| 07482 | 43 | 00972 | 07540 | 06250 | NOSPC   | BD              | BEGIN,NSPC           |
| 07494 | 31 | 00760 | 05414 | 06260 | TR      | CHI-1           | ,ERRMSS-1            |
| 07506 | 16 | 05237 | 00761 | 06270 | TFM     | LSTT-1          | ,CHI                 |
| 07518 | 27 | 05238 | 05237 | 06280 | BT      | LSTT            | ,LSTT-1              |
| 07530 | 15 | 07540 | 00001 | 06290 | TDM     | NSPC            | ,1                   |
| 07540 |    | 00000 |       | 06300 | NSPC    | DS              | ,*-1                 |
| 07542 | 49 | 00972 | 00000 | 06310 | B       | BEGIN           |                      |
| 07549 |    |       |       | 06320 | DORG    | *-4             |                      |
| 07588 |    | 00040 |       | 06330 | DC      | 40              | ,0                   |
| 07589 |    | 00040 |       | 06340 | DSC     | 40              | ,0                   |
| 07628 |    | 00000 |       | 06350 | USEDIFS | DS              | ,*                   |
| 07629 |    | 00001 |       | 06360 | DC      | 1,'             |                      |
| 07630 | 17 | 05238 | 05449 | 06370 | PGOL    | BTM             | LSTT,DKOLM           |
| 07642 | 31 | 00000 | 05508 | 06380 | CEXEC   | TR              | ,CCAL                |
| 07654 | 49 | 00000 | 00000 | 06390 | BRINST  | B               | ,0                   |
| 07664 |    | 00001 |       | 06400 | DC      | 1               | ,',*-1               |
| 07666 | 41 | 00000 | 00000 | 06410 | NOP     |                 | ,,,,,                |
| 07678 | 26 | 00060 | 00000 | 06420 | INST1   | TF              | FAC                  |
| 07693 |    | 00004 |       | 06430 | DC      | 4,'             |                      |
| 07697 |    | 00004 |       | 06440 | DS      | 4               |                      |
| 07698 | 27 | 00892 | 00000 | 06450 | INST2   | BT              | FAD                  |
| 07713 |    | 00004 |       | 06460 | DC      | 4,'             |                      |
| 07714 |    | 00001 |       | 06470 | DCF     | DC              | 1,0                  |
| 07719 |    | 00005 |       | 06480 | DS      | 5               |                      |
| 07722 |    | 00003 |       | 06490 | DC      | 3               | ,1                   |
| 07727 |    | 00005 | 07742 | 06500 | DSA     | BUFBAS          |                      |
| 07728 |    | 00001 |       | 06510 | IDCF    | DC              | 1,0                  |
| 07733 |    | 00005 |       | 06520 | DC      | 5               | ,59998               |
| 07736 |    | 00003 |       | 06530 | DC      | 3               | ,2                   |
| 07741 |    | 00005 | 00760 | 06540 | DSA     | CHI-1           |                      |
| 07742 |    | 00001 |       | 06550 | BUFBAS  | DS              | 1                    |
| 07841 |    | 00099 |       | 06560 | DS      | 99              |                      |
| 07850 |    | 00009 |       | 06570 | DC      | 9,'             |                      |
| 07851 |    | 00001 |       | 06580 | CRAM    | DC              | 1,'                  |
| 07856 |    | 00005 |       | 06590 | L       | DC              | 5,7650               |
| 07857 |    | 00001 |       | 06600 | DC      | 1,'             |                      |
| 07863 |    | 00006 |       | 06610 | MEMCAP  | DC              | 6,19999'             |
| 07868 |    | 00005 |       | 06620 | FCTEND  | DS              | 5                    |
| 07872 |    | 00004 |       | 06630 | PHI     | DS              | 4                    |
| 08342 |    | 00470 |       | 06640 | DS      | 470             |                      |
| 08343 |    | 00001 |       | 06650 | SYM     | DS              | 1                    |
| 08353 |    | 00010 |       | 06660 | COMP    | DS              | 10                   |
| 08354 | 32 | 08366 | 00000 | 06670 | BEGTR   | SF              | TRX                  |
| 08366 | 43 | 08386 | 00781 | 06680 | TRX     | BD              | **20,CHI+20          |
| 08378 | 49 | 01092 |       | 06690 | B7      | BEG1            |                      |
| 08386 | 31 | 07678 | 08502 | 06700 | TR      | INST1           | ,TRFMF               |
| 08398 | 25 | 07685 | 00781 | 06710 | TD      | INST1+7         | ,CHI+20              |
| 08410 | 31 | 00760 | 00788 | 06720 | TR      | CHI-1           | ,CHI+27              |
| 08422 | 17 | 02486 | 00000 | 06730 | BTM     | CFXN            | ,10                  |
| 08434 | 32 | 08342 | 00000 | 06740 | SF      | SYM-1           |                      |
| 08446 | 26 | 07689 | 08343 | 06750 | TF      | INST1+11        | ,SYM                 |
| 08458 | 71 | 07689 | 07688 | 06760 | MF      | INST1+11        | ,INST1+10            |
| 08470 | 32 | 07685 | 00000 | 06770 | SF      | INST1+7         |                      |
| 08482 | 27 | 01552 | 01551 | 06780 | BT      | PUT1            | ,PUT1-1              |
| 08494 | 49 | 01092 |       | 06790 | B7      | BEG1            |                      |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 08502 | 16 | 03381 | 01500 | 06800 | TRFMF  | TFM  | TRFL+11 ,1500        |
| 08514 |    | 00001 |       | 06810 | DC     | 1    | ,                    |
| 08516 | 33 | 08366 | 00000 | 06820 | ENDTR  | CF   | TRX                  |
| 08528 | 49 | 01092 |       | 06830 |        | B7   | BEG1                 |
| 08536 | 31 | 00760 | 00764 | 06840 | DO     | TR   | CHI-1,CHI+3          |
| 08548 | 17 | 02486 | 08560 | 06850 |        | BTM  | CFXN,**12            |
| 08560 | 26 | 08577 | 02778 | 06860 |        | TF   | **17,SMTLU1+10       |
| 08572 | 12 | 00005 | 00001 | 06870 |        | SM   | 5 ,1 ,10             |
| 08584 | 17 | 03124 | 08596 | 06880 |        | BTM  | CSORN,**12           |
| 08596 | 31 | 00000 | 06744 | 06890 | DO1    | TR   | OUT,EXEC-25          |
| 08608 | 26 | 00006 | 02827 | 06900 |        | TF   | OUT+6 ,SMCNT         |
| 08620 | 26 | 00023 | 02827 | 06910 |        | TF   | OUT+23,SMCNT         |
| 08632 | 26 | 08919 | 02827 | 06920 |        | TF   | DSADO ,SMCNT         |
| 08644 | 26 | 08343 | 06664 | 06930 |        | TF   | SYM ,FX1             |
| 08656 | 15 | 05254 | 00002 | 06940 |        | TDM  | SBSWCH ,2            |
| 08668 | 16 | 02919 | 08344 | 06950 |        | TFM  | SMTST+11 ,COMP-9     |
| 08680 | 27 | 02700 | 02699 | 06960 |        | BT   | SMTLU ,SMTLU-1       |
| 08692 | 26 | 08934 | 02827 | 06970 |        | TF   | DSADO+15 ,SMCNT      |
| 08704 | 16 | 08758 | 08919 | 06980 |        | TFM  | KAY+6,DSADO          |
| 08716 | 31 | 00760 | 00762 | 06990 | ELL    | TR   | CHI-1,CHI+1          |
| 08728 | 17 | 03124 | 08740 | 07000 |        | BTM  | CSORN ,**12          |
| 08740 | 11 | 08758 | 00005 | 07010 |        | AM   | **18,5               |
| 08752 | 26 | 00000 | 02827 | 07020 | KAY    | TF   | ,SMCNT               |
| 08764 | 14 | 00761 | 00004 | 07030 |        | CM   | CHI ,04 ,10          |
| 08776 | 46 | 08800 | 01200 | 07040 |        | BE   | **24                 |
| 08788 | 45 | 08716 | 00763 | 07050 |        | BNR  | ELL,CHI+2            |
| 08800 | 26 | 00011 | 08924 | 07060 |        | TF   | OUT+11 ,DSADO+5      |
| 08812 | 17 | 02134 | 00024 | 07070 |        | BTM  | PUTX,24,10           |
| 08824 | 26 | 08924 | 07856 | 07080 |        | TF   | DSADO+5,L            |
| 08836 | 41 | 10006 | 00000 | 07090 | DO2    | NOP  | IO5                  |
| 08848 | 26 | 08883 | 08890 | 07100 |        | TF   | **35 ,EMM+6          |
| 08860 | 11 | 08883 | 00019 | 07110 |        | AM   | **23 ,19 ,10         |
| 08872 | 45 | 07482 | 00000 | 07120 |        | BNR  | NOSPCE               |
| 08884 | 31 | 00000 | 08915 | 07130 | EMM    | TR   | ,DSADO-4             |
| 08896 | 11 | 08890 | 00020 | 07140 |        | AM   | **6,20               |
| 08908 | 49 | 00972 | 00000 | 07150 |        | B    | BEGIN                |
| 08915 |    |       |       | 07160 |        | DORG | **4                  |
| 08919 |    | 00005 | 00000 | 07170 | DSADO  | DSA  | 0,0,0,0              |
| 08924 |    | 00005 | 00000 |       |        |      |                      |
| 08929 |    | 00005 | 00000 |       |        |      |                      |
| 08934 |    | 00005 | 00000 |       |        |      |                      |
| 08935 |    | 00001 |       | 07180 |        | DC   | 1 ,                  |
| 08936 |    | 00001 |       | 07190 | EDCF   | DC   | 1 ,0                 |
| 08941 |    | 00005 |       | 07200 |        | DC   | 5 ,79561             |
| 08944 |    | 00003 |       | 07210 |        | DC   | 3 ,20                |
| 08949 |    | 00005 | 09022 | 07220 |        | DSA  | COMM                 |
| 08950 | 15 | 08960 | 00001 | 07230 | CEND   | TDM  | ENDSW ,1 ,11         |
| 08960 |    | 00000 |       | 07240 | ENDSW  | DS   | ,*-1                 |
| 08962 | 15 | 05132 | 00009 | 07250 | DATA   | TDM  | ROCK+22 ,9           |
| 08974 | 34 | 08936 | 00701 | 07260 |        | K    | EDCF ,701            |
| 08986 | 36 | 08936 | 00702 | 07270 |        | RN   | EDCF ,702            |
| 08998 | 36 | 08936 | 00703 | 07280 |        | RN   | EDCF ,703            |
| 09010 | 17 | 05110 | 08974 | 07290 |        | BTM  | ROCK ,DATA+12        |
| 09022 | 31 | 00760 | 00772 | 07300 | COMM   | TR   | CHI-1 ,CHI+11        |
| 09034 | 15 | 05255 | 00004 | 07310 |        | TDM  | DMSWCH ,4 ,11        |
| 09046 | 49 | 03252 |       | 07320 |        | B7   | CS                   |
| 09054 | 15 | 05255 | 00004 | 07330 | DIM    | TDM  | DMSWCH,4             |
| 09066 | 31 | 00760 | 00778 | 07340 |        | TR   | CHI-1,CHI+17         |
| 09078 | 49 | 03252 |       | 07350 |        | B7   | CS                   |
| 09086 | 26 | 09345 | 02827 | 07360 | DMM    | TF   | DIMONT,SMCNT         |
| 09098 | 14 | 00761 | 00024 | 07370 |        | CM   | CHI ,24 ,10          |
| 09110 | 47 | 09346 | 01200 | 07380 |        | BNE  | DIMB+12              |
| 09122 | 12 | 02778 | 00001 | 07390 |        | SM   | SMTLU1+10,1,10       |
| 09134 | 26 | 09199 | 02778 | 07400 |        | TF   | DIMA+5,SMTLU1+10     |
| 09146 | 26 | 09339 | 02778 | 07410 |        | TF   | DIMB+5,SMTLU1+10     |
| 09158 | 11 | 09344 | 00001 | 07420 |        | AM   | DIMONT-1,1,10        |
| 09170 | 31 | 00760 | 00762 | 07430 |        | TR   | CHI-1 ,CHI+1         |
| 09182 | 17 | 02486 | 00000 | 07440 |        | BTM  | CFXN,0,10            |
| 09194 | 26 | 19994 | 08343 | 07450 | DIMA   | TF   | 19994,SYM            |
| 09206 | 14 | 00761 | 00004 | 07460 |        | CM   | CHI ,4 ,10           |
| 09218 | 31 | 00760 | 00762 | 07470 |        | TR   | CHI-1 ,CHI+1         |
| 09230 | 46 | 09422 | 01200 | 07480 |        | BE   | DIMC                 |
| 09242 | 26 | 08353 | 08343 | 07490 |        | TF   | SYM+10,SYM           |
| 09254 | 17 | 02486 | 00000 | 07500 |        | BTM  | CFXN,,10             |
| 09266 | 23 | 08353 | 08343 | 07510 |        | M    | SYM+10,SYM           |
| 09278 | 32 | 00096 | 00000 | 07520 |        | SF   | 96                   |
| 09290 | 31 | 00760 | 00762 | 07530 |        | TR   | CHI-1 ,CHI+1         |
| 09302 | 22 | 09344 | 00099 | 07540 |        | S    | DIMONT-1,99          |
| 09314 | 44 | 09334 | 09344 | 07550 |        | BNF  | **20,DIMONT-1        |
| 09326 | 49 | 09446 |       | 07560 |        | B7   | ABORT                |
| 09334 | 16 | 19999 | 00000 | 07570 | DIMB   | TFM  | 19999,               |
| 09345 |    | 00000 |       | 07580 | DIMONT | DS   | ,*                   |
| 09346 | 45 | 09402 | 00763 | 07590 |        | BNR  | DIMD,CHI+2           |
| 09358 | 44 | 09382 | 05255 | 07600 |        | BNF  | **24 ,DMSWCH         |
| 09370 | 26 | 08847 | 09345 | 07610 |        | TF   | ENDCOM ,DIMONT       |
| 08847 |    | 00000 |       | 07620 | ENDCOM | DS   | ,DO2+11              |
| 09382 | 15 | 05255 | 00000 | 07630 |        | TDM  | DMSWCH               |
| 09394 | 49 | 00972 |       | 07640 |        | B7   | BEGIN                |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS  |
|-------|----|-------|-------|-------|--------|------|-----------------------|
| 09402 | 31 | 00760 | 00762 | 07650 | DIMD   | TR   | CHI-1 ,CHI+1          |
| 09414 | 49 | 03252 |       | 07660 |        | B7   | CS                    |
| 09422 | 22 | 09344 | 08343 | 07670 | DIMC   | S    | DIMONT-1,SYM          |
| 09434 | 44 | 09334 | 09344 | 07680 | BNF    |      | DIMB,DIMONT-1         |
| 09446 | 16 | 07641 | 05415 | 07690 | ABORT  | TFM  | PGOL+11,ERRMSS        |
| 09458 | 49 | 07630 |       | 07700 |        | B7   | PGOL                  |
| 09466 | 16 | 07704 | 03850 | 07710 | RERED  | TFM  | INST2+6 ,RERD         |
| 09478 | 31 | 00760 | 00772 | 07720 |        | TR   | CHI-1 ,CHI+11         |
| 09490 | 49 | 09594 |       | 07730 |        | B7   | IO1                   |
| 09498 | 16 | 07704 | 03886 | 07740 | TYPE   | TFM  | INST2+6 ,WATYE        |
| 09510 | 49 | 09530 |       | 07750 |        | B7   | RDCD+12               |
| 09518 | 16 | 07704 | 03790 | 07760 | RDCD   | TFM  | INST2+6,RACD          |
| 09530 | 31 | 00760 | 00768 | 07770 |        | TR   | CHI-1 ,CHI+7          |
| 09542 | 49 | 09594 |       | 07780 |        | B7   | IO1                   |
| 09550 | 16 | 07704 | 03982 | 07790 | PUNCH  | TFM  | INST2+6 ,WACD         |
| 09562 | 49 | 09582 |       | 07800 |        | B7   | IO1-12                |
| 09570 | 16 | 07704 | 03922 | 07810 | PRINT  | TFM  | INST2+6 ,PRTR         |
| 09582 | 31 | 00760 | 00770 | 07820 |        | TR   | CHI-1 ,CHI+9          |
| 09594 | 16 | 07699 | 00027 | 07830 | IO1    | TFM  | INST2+1,27,10         |
| 09606 | 17 | 02486 | 09618 | 07840 |        | BTM  | CFXN,**12             |
| 09618 | 26 | 09640 | 02826 | 07850 |        | TF   | **22,SMCNT-1          |
| 09630 | 16 | 07709 | 00006 | 07860 |        | TFM  | INST2+11,6            |
| 09642 | 31 | 07710 | 07847 | 07870 |        | TR   | INST2+12 ,CRAM-4      |
| 09654 | 27 | 01572 | 01571 | 07880 |        | BT   | PUT2,PUT2-1           |
| 09666 | 26 | 07704 | 01084 | 07890 |        | TF   | INST2+6,IOINST+6      |
| 09678 | 45 | 09722 | 00763 | 07900 | IO2    | BNR  | IO2+44 ,CHI+2         |
| 09690 | 16 | 07712 | 00000 | 07910 |        | TFM  | INST2+14 ,            |
| 09702 | 27 | 01572 | 01571 | 07920 |        | BT   | PUT2 ,PUT2-1          |
| 09714 | 49 | 06274 |       | 07930 |        | B7   | TESTDO                |
| 09722 | 14 | 00761 | 00023 | 07940 |        | CM   | CHI,23,10             |
| 09734 | 31 | 00760 | 00762 | 07950 | IO7    | TR   | CHI-1 ,CHI+1          |
| 09746 | 47 | 09678 | 01200 | 07960 |        | BNE  | IO2                   |
| 09758 | 45 | 09802 | 00763 | 07970 |        | BNR  | IO3 ,CHI+2            |
| 09770 | 49 | 01092 |       | 07980 |        | B7   | BEG1                  |
| 09778 | 31 | 00760 | 00772 | 07990 |        | TR   | CHI-1 ,CHI+11         |
| 09790 | 41 | 09942 | 00000 | 08000 |        | NOP  | IO4+48                |
| 09802 | 15 | 05254 | 00000 | 08010 | IO3    | TDM  | SBSWCH                |
| 09814 | 14 | 00761 | 00024 | 08020 |        | CM   | CHI ,24 ,10           |
| 09826 | 46 | 09894 | 01200 | 08030 |        | BE   | IO4                   |
| 09838 | 17 | 03124 | 09850 | 08040 |        | BTM  | CSORN,**12            |
| 09850 | 31 | 07705 | 04586 | 08050 |        | TR   | INST2+7 ,PUTETB+6 ,11 |
| 09862 | 27 | 01572 | 01571 | 08060 |        | BT   | PUT2,PUT2-1           |
| 09874 | 12 | 04586 | 00009 | 08070 |        | SM   | PUTETB+6,9            |
| 09886 | 49 | 09678 |       | 08080 |        | B7   | IO2                   |
| 09894 | 15 | 08837 | 00009 | 08090 | IO4    | TDM  | DO2+1 ,9              |
| 09906 | 15 | 09791 | 00009 | 08100 |        | TDM  | IO3-11 ,9             |
| 09918 | 16 | 04586 | 07893 | 08110 |        | TFM  | PUTETB+6 ,PHI+21      |
| 09930 | 31 | 00760 | 00762 | 08120 |        | TR   | CHI-1 ,CHI+1          |
| 09942 | 45 | 09962 | 00763 | 08130 |        | BNR  | **20 ,CHI+2           |
| 09954 | 49 | 01092 |       | 08140 |        | B7   | BEG1                  |
| 09962 | 17 | 03124 | 09974 | 08150 |        | BTM  | CSORN ,**12           |
| 09974 | 14 | 00761 | 00033 | 08160 |        | CM   | CHI ,33 ,10           |
| 09986 | 46 | 08596 | 01200 | 08170 |        | BE   | DO1                   |
| 09998 | 49 | 09930 |       | 08180 |        | B7   | IO4+36                |
| 10006 | 15 | 08837 | 00001 | 08190 | IO5    | TDM  | DO2+1 ,1              |
| 10018 | 15 | 09791 | 00001 | 08200 |        | TDM  | IO3-11 ,1             |
| 10030 | 16 | 10053 | 07902 | 08210 |        | TFM  | **23 ,PHI+30          |
| 10042 | 31 | 07705 | 00000 | 08220 |        | TR   | INST2+7               |
| 10054 | 27 | 01572 | 01571 | 08230 |        | BT   | PUT2 ,PUT2-1          |
| 10066 | 11 | 10053 | 00009 | 08240 |        | AM   | IO5+47 ,9 ,10         |
| 10078 | 24 | 10053 | 04586 | 08250 |        | C    | IO5+47 ,PUTETB+6      |
| 10090 | 47 | 10042 | 01300 | 08260 |        | BL   | IO5+36                |
| 10102 | 31 | 00000 | 06582 | 08270 |        | TR   | OUT ,DORCRD           |
| 10114 | 31 | 00064 | 08915 | 08280 |        | TR   | OUT+64,DSADO-4        |
| 10126 | 15 | 06527 | 00009 | 08290 |        | TDM  | SLOT-11 ,9            |
| 10138 | 49 | 06430 |       | 08300 |        | B7   | TDO1                  |
| 10146 | 15 | 06527 | 00001 | 08310 | IO6    | TDM  | SLOT-11 ,1            |
| 10158 | 16 | 05085 | 00001 | 08320 |        | TFM  | SUBN ,1 ,10           |
| 10170 | 49 | 09734 |       | 08330 |        | B7   | IO7                   |
| 10178 | 47 | 04122 | 00000 | 08340 | IOINST | BTM  | LOOK , ,0             |
| 10186 |    |       |       | 08350 |        | DORG | **3                   |
| 10186 | 31 | 00760 | 00770 | 08360 | FORMAT | TR   | CHI-1 ,CHI+9          |
| 10198 | 26 | 10215 | 02778 | 08370 |        | TF   | **17,SMTLU1+10        |
| 10210 | 26 | 00005 | 07856 | 08380 |        | TF   | 5 ,L                  |
| 10222 | 26 | 10239 | 10215 | 08390 |        | TF   | **17 ,*-7             |
| 10234 | 11 | 00005 | 00006 | 08400 |        | AM   | 5 ,6 ,10              |
| 10246 | 16 | 11041 | 00000 | 08410 |        | TFM  | RPPR1+11 , ,10        |
| 10258 | 16 | 10840 | 07878 | 08420 |        | TFM  | TRANS+18,PHI+6        |
| 10270 | 31 | 07869 | 11761 | 08430 |        | TR   | PHI-3,FMTSP-10        |
| 10282 | 31 | 00760 | 00762 | 08440 | FSCAN  | TR   | CHI-1,CHI+1           |
| 10294 | 45 | 01314 | 00763 | 08450 |        | BNR  | **20 ,CHI+2           |
| 10306 | 49 | 01092 |       | 08460 |        | B7   | BEG1                  |
| 10314 | 14 | 00761 | 00023 | 08470 |        | CM   | CHI,23,10             |
| 10326 | 46 | 10282 | 01200 | 08480 |        | BE   | FSCAN                 |
| 10338 | 14 | 00761 | 00000 | 08490 |        | CM   | CHI,,10               |
| 10350 | 46 | 10282 | 01200 | 08500 |        | BE   | FSCAN                 |
| 10362 | 14 | 00761 | 00024 | 08510 |        | CM   | CHI,24,10             |
| 10374 | 47 | 10418 | 01200 | 08520 |        | BNE  | SWLP                  |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 10386 | 16 | 10845 | 04784 | 08530 |        | TFM  | TRANS+23,LTPAR       |
| 10398 | 16 | 10864 | ±0282 | 08540 |        | TFM  | TRNSBR+6,FSCAN       |
| 10410 | 49 | 10718 |       | 08550 |        | B7   | TRAN                 |
| 10418 | 47 | 10894 | 01100 | 08560 | SWLP   | BNH  | PUNCT                |
| 10430 | 14 | 00761 | 00069 | 08570 |        | CM   | CHI,69,10            |
| 10442 | 46 | 11378 | 01100 | 08580 |        | BH   | HOLL                 |
| 10454 | 25 | 10841 | 00761 | 08590 |        | TD   | TRANS+19,CHI         |
| 10466 | 16 | 10669 | 00000 | 08600 |        | TFM  | EFIND,,9             |
| 10478 | 14 | 00761 | 00041 | 08610 |        | CM   | CHI ,41 ,10          |
| 10490 | 46 | 10538 | 01200 | 08620 |        | BE   | TIER                 |
| 10502 | 14 | 00761 | 00049 | 08630 |        | CM   | CHI,49,10            |
| 10514 | 46 | 10538 | 01200 | 08640 |        | BE   | TIER                 |
| 10526 | 16 | 10669 | 00000 | 08650 |        | TFM  | EFIND,,10            |
| 10538 | 31 | 00760 | 00762 | 08660 | TIER   | TR   | CHI-1,CHI+1          |
| 10550 | 17 | 02486 | 00000 | 08670 |        | BTM  | CFXN,00,10           |
| 10562 | 27 | 10868 | 10867 | 08680 |        | BT   | WIDTST ,WIDTST-1     |
| 10574 | 26 | 11311 | 08343 | 08690 |        | TF   | RPFMT+21 ,SYM        |
| 10586 | 16 | 10845 | 00000 | 08700 |        | TFM  | TRANS+23,00,10       |
| 10598 | 44 | 10658 | 10668 | 08710 |        | BNF  | PRETRN,EFIND-1       |
| 10610 | 31 | 00760 | 00762 | 08720 |        | TR   | CHI-1,CHI+1          |
| 10622 | 17 | 02486 | 00000 | 08730 |        | BTM  | CFXN,,10             |
| 10634 | 32 | 08342 | 00000 | 08740 |        | SF   | SYM-1                |
| 10646 | 26 | 10845 | 08343 | 08750 |        | TF   | TRANS+23,SYM         |
| 10658 | 33 | 10842 | 00000 | 08760 | PRETRN | CF   | TRANS+20             |
| 10669 |    | 00002 |       | 08770 | EFIND  | DS   | 2,*                  |
| 10670 | 33 | 10844 | 00000 | 08780 |        | CF   | TRANS+22             |
| 10682 | 32 | 10845 | 00000 | 08790 |        | SF   | TRANS+23             |
| 10694 | 32 | 10841 | 00000 | 08800 |        | SF   | TRANS+19             |
| 10706 | 16 | 10864 | ±0294 | 08810 |        | TFM  | TRNSBR+6,FSCAN+12    |
| 10718 | 14 | 10840 | 08337 | 08820 | TRAN   | CM   | TRANS+18 ,PHI+465    |
| 10730 | 47 | 10822 | 01100 | 08830 |        | BNH  | TRANS                |
| 10742 | 31 | 00730 | 05382 | 08840 |        | TR   | CHI-31 ,ERFMT-1      |
| 10754 | 36 | 07728 | 00700 | 08850 |        | RN   | IDCF ,700            |
| 10766 | 31 | 01330 | 01722 | 08860 |        | TR   | LSTO+30 ,AVOID-1 ,6  |
| 10778 | 17 | 05332 | 00731 | 08870 |        | BTM  | LSTC ,CHI-30         |
| 10790 | 46 | 07642 | 00200 | 08880 |        | BC2  | CEXEC                |
| 10802 | 27 | 05250 | 05249 | 08890 |        | BT   | BA,BA-1              |
| 10814 | 49 | 07642 |       | 08900 |        | B7   | CEXEC                |
| 10822 | 11 | 10840 | 00005 | 08910 | TRANS  | AM   | **18,5,10            |
| 10834 | 16 | 07878 | 00000 | 08920 |        | TFM  | PHI+6                |
| 10846 | 21 | 07871 | 10833 | 08930 |        | A    | PHI-1,TRANS+11       |
| 10858 | 49 | 00000 | 00000 | 08940 | TRNSBR | B    |                      |
| 10868 |    |       |       | 08950 |        | DORG | *-1                  |
| 10868 | 32 | 08342 | 00000 | 08960 | WIDTST | SF   | SYM-1                |
| 10880 | 26 | 10843 | 08343 | 08970 |        | TF   | TRANS+21,SYM         |
| 10892 | 42 |       |       | 08980 |        | BB2  |                      |
| 10894 | 14 | 00761 | 04221 | 08990 | PUNCT  | CM   | CHI ,4221 ,10        |
| 10906 | 47 | 10950 | 01200 | 09000 |        | BNE  | **44                 |
| 10918 | 16 | 10845 | 04370 | 09010 |        | TFM  | TRANS+23,SLASH       |
| 10930 | 16 | 10864 | ±0282 | 09020 |        | TFM  | TRNSBR+6,FSCAN       |
| 10942 | 49 | 10718 |       | 09030 |        | B7   | TRAN                 |
| 10950 | 41 | 00000 | 00000 | 09040 |        | NOP  |                      |
| 10962 | 12 | 11041 | 00001 | 09050 |        | SM   | RPPR1+11 ,1 ,10      |
| 10974 | 47 | 11122 | 01100 | 09060 |        | BNH  | RPR                  |
| 10986 | 16 | 10845 | 04226 | 09070 |        | TFM  | TRANS+23 ,RSST       |
| 10998 | 16 | 10864 | ±1018 | 09080 |        | TFM  | TRNSBR+6 ,RPPR1-12   |
| 11010 | 49 | 10718 |       | 09090 |        | B7   | TRAN                 |
| 11018 | 11 | 10840 | 00002 | 09100 |        | AM   | TRANS+18 ,2 ,10      |
| 11030 | 16 | 10840 | 00000 | 09110 | RPPR1  | TFM  | TRANS+18 , ,610      |
| 11042 | 11 | 07871 | 00002 | 09120 |        | AM   | PHI-1 ,2 ,10         |
| 11054 | 12 | 11089 | 07872 | 09130 |        | SM   | RPPR2+11 ,PHI        |
| 11066 | 21 | 11089 | 07856 | 09140 |        | A    | RPPR2+11 ,L          |
| 11078 | 16 | 10845 | 00000 | 09150 | RPPR2  | TFM  | TRANS+23 ,           |
| 11090 | 16 | 10864 | ±0282 | 09160 |        | TFM  | TRNSBR+6 ,FSCAN      |
| 11102 | 16 | 11041 | 00000 | 09170 |        | TFM  | RPPR1+11 , ,10       |
| 11114 | 49 | 10718 |       | 09180 |        | B7   | TRAN                 |
| 11122 | 16 | 10845 | 04728 | 09190 | RPR    | TFM  | TRANS+23 ,RTPAR      |
| 11134 | 16 | 10864 | ±1154 | 09200 |        | TFM  | TRNSBR+6,FINISH      |
| 11146 | 49 | 10718 |       | 09210 |        | B7   | TRAN                 |
| 11154 | 16 | 11184 | 07872 | 09220 | FINISH | TFM  | **30,PHI             |
| 11166 | 21 | 11184 | 07871 | 09230 |        | A    | **18,PHI-1           |
| 11178 | 31 | 00000 | 07659 | 09240 |        | TR   | ,BRINST+5            |
| 11190 | 25 | 11213 | 07871 | 09250 |        | TD   | **23,PHI-1           |
| 11202 | 43 | 11226 | 00210 | 09260 |        | BD   | **24,210             |
| 11214 | 11 | 07871 | 00001 | 09270 |        | AM   | PHI-1,1,10           |
| 11226 | 26 | 07878 | 07856 | 09280 |        | TF   | PHI+6,L              |
| 11238 | 21 | 07878 | 07871 | 09290 |        | A    | PHI+6,PHI-1          |
| 11250 | 27 | 02168 | 07871 | 09300 | GPHBG  | BT   | PUTPHI ,PHI-1        |
| 11262 | 49 | 00972 |       | 09310 |        | B7   | BEGIN                |
| 11270 | 31 | 00760 | 00772 | 09320 | CONFMT | TR   | CHI-1 ,CHI+11        |
| 11282 | 49 | 10294 |       | 09330 |        | B7   | FSCAN+12 , ,5        |
| 11290 | 16 | 10717 | ±1334 | 09340 | RPFMT  | TFM  | TRAN-1 ,RPT1         |
| 11302 | 32 | 08342 | 00000 | 09350 |        | SF   | SYM-1                |
| 11314 | 26 | 11313 | 08343 | 09360 |        | TF   | *-1 ,SYM             |
| 11326 | 49 | 10294 |       | 09370 |        | B7   | FSCAN+12             |
| 11334 | 16 | 10717 | ±0294 | 09380 | RPT1   | TFM  | TRAN-1 ,FSCAN+12     |
| 11346 | 12 | 11313 | 00001 | 09390 |        | SM   | RPFMT+23 ,1 ,10      |
| 11358 | 46 | 10718 | 01100 | 09400 |        | BH   | TRAN                 |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS                   |
|-------|----|-------|-------|-------|--------|------|----------------------------------------|
| 11370 | 49 | 10294 |       | 09410 |        | B7   | FSCAN+12                               |
| 11378 | 17 | 02486 | 00000 | 09420 | HOLL   | BTM  | CFXN,,10                               |
| 11390 | 14 | 00761 | 00067 | 09430 |        | CM   | CHI,67,10                              |
| 11402 | 46 | 11574 | 01200 | 09440 |        | BE   | HOL1                                   |
| 11414 | 14 | 00761 | 00048 | 09450 |        | CM   | CHI,48,10                              |
| 11426 | 46 | 11506 | 01200 | 09460 |        | BE   | HOL2                                   |
| 11438 | 14 | 00761 | 00024 | 09470 |        | CM   | CHI ,24 ,10                            |
| 11450 | 47 | 11290 | 01200 | 09480 |        | BNE  | RPFMT                                  |
| 11462 | 32 | 08342 | 00000 | 09490 |        | SF   | SYM-1                                  |
| 11474 | 26 | 11041 | 08343 | 09500 |        | TF   | RPPR1+11 ,SYM                          |
| 11486 | 26 | 11089 | 10840 | 09510 |        | TF   | RPPR2+11 ,TRANS+18                     |
| 11498 | 49 | 10282 |       | 09520 |        | B7   | FSCAN                                  |
| 11506 | 27 | 10868 | 10867 | 09530 | HOL2   | BT   | WIDTST ,WIDTST-1                       |
| 11518 | 16 | 10845 | 05172 | 09540 |        | TFM  | TRANS+23,HTYPE                         |
| 11530 | 16 | 11665 | 11686 | 09550 |        | TFM  | HOLL1+11,HCONT2                        |
| 11542 | 31 | 00760 | 00762 | 09560 |        | TR   | CHI-1,CHI+1                            |
| 11554 | 16 | 10864 | 11618 | 09570 |        | TFM  | TRNSBR+6,HCONT1                        |
| 11566 | 49 | 10718 | 00000 | 09580 |        | B    | TRAN                                   |
| 11574 |    |       |       | 09590 |        | DORG | *-3                                    |
| 11574 | 27 | 10868 | 10867 | 09600 | HOL1   | BT   | WIDTST ,WIDTST-1                       |
| 11586 | 16 | 10845 | 05136 | 09610 |        | TFM  | TRANS+23 ,XTYPE                        |
| 11598 | 16 | 11665 | 11742 | 09620 |        | TFM  | HOLL1+11 ,HCONT4+24                    |
| 11610 | 49 | 11554 |       | 09630 |        | B7   | *-56                                   |
| 11618 | 16 | 10833 | 00002 | 09640 | HCONT1 | TFM  | TRANS+11,2,10                          |
| 11630 | 32 | 08342 | 00000 | 09650 |        | SF   | SYM-1                                  |
| 11642 | 26 | 10845 | 08343 | 09660 |        | TF   | TRANS+23,SYM                           |
| 11654 | 16 | 10864 | 11686 | 09670 | HOLL1  | TFM  | TRNSBR+6,HCONT2                        |
| 11666 | 49 | 10718 |       | 09680 |        | B7   | TRAN                                   |
| 11674 | 31 | 00760 | 00762 | 09690 | HCONT3 | TR   | CHI-1,CHI+1                            |
| 11686 | 16 | 10864 | 11718 | 09700 | HCONT2 | TFM  | TRNSBR+6,HCONT4                        |
| 11698 | 26 | 10845 | 00761 | 09710 |        | TF   | TRANS+23,CHI                           |
| 11710 | 49 | 10718 |       | 09720 |        | B7   | TRAN                                   |
| 11718 | 12 | 08343 | 00001 | 09730 | HCONT4 | SM   | SYM,1,10                               |
| 11730 | 46 | 11674 | 01100 | 09740 |        | BP   | HCONT3                                 |
| 11742 | 16 | 10833 | 00005 | 09750 |        | TFM  | TRANS+11,5,10                          |
| 11754 | 49 | 10282 | 00000 | 09760 |        | B    | FSCAN                                  |
| 11761 |    |       |       | 09770 |        | DORG | *-4                                    |
| 11771 |    | 00011 |       | 09780 | FMTSP  | DC   | 11,749000000                           |
| 11772 | 31 | 00760 | 00766 | 09790 | IF     | TR   | CHI-1,CHI+5                            |
| 11784 | 16 | 08092 | 00049 | 09800 |        | TFM  | PHI+220,49,10                          |
| 11796 | 16 | 12435 | 00049 | 09810 |        | TFM  | OMM1,49,10                             |
| 11808 | 15 | 05253 | 00001 | 09820 |        | TDM  | FSTSW,1                                |
| 11820 | 32 | 05258 | 00000 | 09830 |        | SF   | IFSWCH                                 |
| 11832 | 49 | 12438 |       | 09840 |        | B7   | ASCAN+12                               |
| 11840 | 31 | 00000 | 12388 | 09850 | IFSS   | TR   | OUT ,IFSSRC                            |
| 11852 | 31 | 00760 | 00772 | 09860 |        | TR   | CHI-1 ,CHI+11                          |
| 11864 | 17 | 02486 | 00000 | 09870 |        | BTM  | CFXN , ,10                             |
| 11876 | 32 | 08342 | 00000 | 09880 |        | SF   | SYM-1                                  |
| 11888 | 26 | 00009 | 08343 | 09890 |        | TF   | OUT+9 ,SYM                             |
| 11900 | 16 | 12191 | 00024 | 09900 |        | TFM  | THAT+11 ,24 ,10                        |
| 11912 | 49 | 12060 |       | 09910 |        | B7   | ELEVEN-12                              |
| 11920 | 26 | 11943 | 04586 | 09920 | TEN    | TF   | *+23,PUTETB+6                          |
| 11932 | 31 | 07685 | 00000 | 09930 |        | TR   | INST1+7                                |
| 11944 | 26 | 07684 | 15822 | 09940 |        | TF   | INST1+6 ,TFFAC-4                       |
| 11956 | 31 | 07698 | 15800 | 09950 |        | TR   | INST2,RVINST                           |
| 11968 | 44 | 11988 | 07691 | 09960 |        | BNF  | *+20,INST1+13                          |
| 11980 | 49 | 12000 |       | 09970 |        | B7   | *+20                                   |
| 11988 | 27 | 01552 | 01551 | 09980 |        | BT   | PUT1,PUT1-1                            |
| 12000 | 44 | 12024 | 07692 | 09990 |        | BNF  | *+24,INST1+14                          |
| 12012 | 27 | 01572 | 01571 | 10000 |        | BT   | PUT2,PUT2-1                            |
| 12024 | 31 | 00000 | 12412 | 10010 |        | TR   | OUT ,IFRC+36                           |
| 12036 | 17 | 02134 | 00012 | 10020 |        | BTM  | PUTX ,12 ,10                           |
| 12048 | 31 | 00000 | 12376 | 10030 |        | TR   | OUT ,IFRC                              |
| 12060 | 16 | 12126 | 00005 | 10040 |        | TFM  | KKK+6 ,OUT+5                           |
| 12072 | 31 | 00760 | 00762 | 10050 | ELEVEN | TR   | CHI-1 ,CHI+1 ,2                        |
| 12084 | 14 | 00761 | 00069 | 10060 |        | CM   | CHI ,69 ,10                            |
| 12096 | 47 | 12212 | 01100 | 10070 |        | BNH  | NEXTIF                                 |
| 12108 | 17 | 02486 | 12120 | 10080 |        | BTM  | CFXN ,*+12                             |
| 12120 | 26 | 00000 | 02826 | 10090 | KKK    | TF   | ,SMCNT-1                               |
| 12132 | 11 | 12126 | 00012 | 10100 |        | AM   | KKK+6 ,12 ,10                          |
| 12144 | 45 | 12072 | 00763 | 10110 |        | BNR  | ELEVEN ,CHI+2                          |
| 12156 | 44 | 12180 | 00001 | 10120 |        | BNF  | THAT ,OUT+1                            |
| 12168 | 12 | 12191 | 00004 | 10130 |        | SM   | *+23 ,4 ,10                            |
| 12180 | 17 | 02134 | 00036 | 10140 | THAT   | BTM  | PUTX ,36 ,10                           |
| 12192 | 16 | 12191 | 00036 | 10150 |        | TFM  | *-1 ,36 ,10                            |
| 12204 | 49 | 00972 |       | 10160 |        | B7   | BEGIN                                  |
| 12212 | 31 | 00760 | 00762 | 10170 | NEXTIF | TR   | CHI-1 ,CHI+1 , , ROUTINE FOR CONTINUES |
| 12224 | 12 | 12191 | 00012 | 10180 |        | SM   | THAT+11 ,12 ,10                        |
| 12236 | 44 | 12280 | 00008 | 10190 |        | BNF  | ARIIF ,OUT+8                           |
| 12248 | 43 | 12180 | 12125 | 10200 |        | BD   | THAT ,KKK+5 , , SENSE SWITCH C CHECK   |
| 12260 | 15 | 00001 | 00007 | 10210 |        | TDM  | OUT+1 ,7                               |
| 12272 | 49 | 12144 |       | 10220 |        | B7   | THAT-36                                |
| 12280 | 15 | 00025 | 00006 | 10230 | ARIIF  | TDM  | OUT+25 ,6 ,11 , ARITH C ROUTINE        |
| 12292 | 44 | 12324 | 00002 | 10240 |        | BNF  | M1 ,OUT+2                              |
| 12304 | 44 | 12344 | 00014 | 10250 |        | BNF  | M01 ,OUT+14                            |
| 12316 | 49 | 12180 |       | 10260 |        | B7   | THAT                                   |
| 12324 | 31 | 00000 | 00012 | 10270 | M1     | TR   | OUT ,OUT+12                            |
| 12336 | 49 | 12356 |       | 10280 |        | B7   | *+20                                   |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 12344 | 31 | 00012 | 00024 | 10290 | M01    | TR   | OUT+12 ,OUT+24       |
| 12356 | 33 | 00001 | 00000 | 10300 |        | CF   | OUT+1                |
| 12368 | 49 | 12144 |       | 10310 |        | B7   | THAT-36              |
| 12376 | 47 | 00000 | 01300 | 10320 | IFRC   | BL   | , ,1                 |
| 12388 | 46 | 00000 | 01200 | 10330 | IFSSRC | BE   | , ,1                 |
| 12400 | 49 | 00000 | 01100 | 10340 |        | B    | ,01100 ,1            |
| 12412 | 17 | 07610 | 00060 | 10350 |        | BTM  | ADCK,FAC             |
| 12424 |    | 00001 |       | 10360 |        | DC   | 1 ,'                 |
| 12426 | 16 | 12435 | 00000 | 10370 | ASCAN  | TFM  | OMM1,00,10           |
| 12435 |    | 00002 |       | 10380 | OMM1   | DC   | 2 ,0 ,*-2            |
| 12438 | 16 | 14707 | 00000 | 10390 |        | TFM  | ACC,,9               |
| 12450 | 16 | 13484 | 08092 | 10400 |        | TFM  | POTOMH+6,PHI+220     |
| 12462 | 16 | 04586 | 07884 | 10410 |        | TFM  | POTETB+6,PHI+12      |
| 12474 | 45 | 12718 | 00763 | 10420 | S      | BNR  | SSA,CHI+2            |
| 12486 | 14 | 12435 | 00033 | 10430 |        | CM   | OMM1,33,10           |
| 12498 | 46 | 12542 | 01200 | 10440 |        | BE   | SSB                  |
| 12510 | 14 | 12435 | 00024 | 10450 |        | CM   | OMM1,-24,10          |
| 12522 | 46 | 12558 | 01200 | 10460 |        | BE   | **36                 |
| 12534 | 49 | 13238 |       | 10470 |        | B7   | SS                   |
| 12542 | 17 | 13738 | 00000 | 10480 | SSB    | BTM  | CODE,,10             |
| 12554 | 44 | 15410 | 05252 | 10490 |        | BNF  | FOF ,EQSW            |
| 12566 | 43 | 12634 | 07692 | 10500 |        | BD   | **68 ,INST1+14       |
| 12578 | 43 | 12614 | 07712 | 10510 |        | BD   | **36 ,INST2+14       |
| 12590 | 44 | 12654 | 07690 | 10520 | EQ2    | BNF  | EQ3 ,INST1+12        |
| 12602 | 44 | 12686 | 07710 | 10530 |        | BNF  | EQ4 ,INST2+12        |
| 12614 | 33 | 05252 | 00000 | 10540 |        | CF   | EQSW                 |
| 12626 | 49 | 15410 |       | 10550 |        | B7   | FOF                  |
| 12634 | 43 | 12590 | 07712 | 10560 |        | BD   | EQ2 ,INST2+14        |
| 12646 | 49 | 12614 |       | 10570 |        | B7   | **32                 |
| 12654 | 31 | 07680 | 07685 | 10580 | EQ3    | TR   | INST1+2 ,INST1+7     |
| 12666 | 31 | 07685 | 07705 | 10590 |        | TR   | INST1+7 ,INST2+7     |
| 12678 | 49 | 15634 |       | 10600 |        | B7   | ZOT+12               |
| 12686 | 26 | 07684 | 07689 | 10610 | EQ4    | TF   | INST1+6 ,INST1+11    |
| 12698 | 26 | 07689 | 07709 | 10620 |        | TF   | INST1+11 ,INST2+11   |
| 12710 | 49 | 15622 |       | 10630 |        | B7   | ZOT                  |
| 12718 | 14 | 00761 | 00040 | 10640 | SSA    | CM   | CHI,40,10            |
| 12730 | 47 | 12766 | 01100 | 10650 |        | BNH  | **36                 |
| 12742 | 15 | 05253 | 00000 | 10660 |        | TDM  | FSTSW                |
| 12754 | 17 | 03124 | 12474 | 10670 |        | BTM  | CSORN,S              |
| 12766 | 14 | 00761 | 00033 | 10680 |        | CM   | CHI ,33 ,10          |
| 12778 | 46 | 13358 | 01200 | 10690 |        | BE   | SS6                  |
| 12790 | 33 | 05252 | 00000 | 10700 |        | CF   | EQSW                 |
| 12802 | 14 | 00761 | 00040 | 10710 |        | CM   | CHI,10,10            |
| 12814 | 46 | 12990 | 01200 | 10720 |        | BE   | SS001                |
| 12826 | 14 | 00761 | 00020 | 10730 |        | CM   | CHI,20,10            |
| 12838 | 46 | 12978 | 01200 | 10740 |        | BE   | SS4                  |
| 12850 | 15 | 05253 | 00000 | 10750 |        | TDM  | FSTSW                |
| 12862 | 14 | 00761 | 00004 | 10760 |        | CM   | CHI,4,10             |
| 12874 | 46 | 13142 | 01200 | 10770 |        | BE   | SSC                  |
| 12886 | 14 | 00761 | 00021 | 10780 |        | CM   | CHI,21,10            |
| 12898 | 46 | 13286 | 01200 | 10790 |        | BE   | SS1                  |
| 12910 | 14 | 00761 | 00014 | 10800 |        | CM   | CHI,14,10            |
| 12922 | 46 | 13054 | 01200 | 10810 |        | BE   | SS3                  |
| 12934 | 14 | 00761 | 00024 | 10820 |        | CM   | CHI,24,10            |
| 12946 | 46 | 13110 | 01200 | 10830 |        | BE   | SS5                  |
| 12958 | 14 | 00761 | 00003 | 10840 |        | CM   | CHI,3,10             |
| 12970 | 49 | 12742 |       | 10850 |        | B7   | SSA+24               |
| 12978 | 15 | 05256 | 00005 | 10860 | SS4    | TDM  | FLAGSW,5             |
| 12990 | 43 | 13022 | 05253 | 10870 | SS001  | BD   | **32 ,FSTSW          |
| 13002 | 15 | 05256 | 00000 | 10880 |        | TDM  | FLAGSW,0             |
| 13014 | 49 | 13238 |       | 10890 |        | B7   | SS                   |
| 13022 | 15 | 05253 | 00000 | 10900 |        | TDM  | FSTSW,0              |
| 13034 | 31 | 00760 | 00762 | 10910 |        | TR   | CHI-1,CHI+1          |
| 13046 | 49 | 12474 |       | 10920 |        | B7   | S                    |
| 13054 | 14 | 00763 | 00014 | 10930 | SS3    | CM   | CHI+2,14,10          |
| 13066 | 47 | 13286 | 01200 | 10940 |        | BNE  | SS1                  |
| 13078 | 31 | 00760 | 00762 | 10950 |        | TR   | CHI-1 ,CHI+1         |
| 13090 | 15 | 05256 | 00005 | 10960 |        | TDM  | FLAGSW,5             |
| 13102 | 49 | 13334 |       | 10970 |        | B7   | SS2                  |
| 13110 | 15 | 05253 | 00001 | 10980 | SS5    | TDM  | FSTSW,1              |
| 13122 | 11 | 14707 | 00001 | 10990 |        | AM   | ACC,1,10             |
| 13134 | 49 | 13454 |       | 11000 |        | B7   | POTOMG               |
| 13142 | 14 | 12435 | 00024 | 11010 | SSC    | CM   | OMM1,24,10           |
| 13154 | 46 | 13690 | 01200 | 11020 |        | BE   | SSCA                 |
| 13166 | 14 | 12435 | 00024 | 11030 |        | CM   | OMM1,-24,10          |
| 13178 | 46 | 13622 | 01200 | 11040 |        | BE   | SSCB                 |
| 13190 | 14 | 12435 | 00046 | 11050 |        | CM   | OMM1,46,10           |
| 13202 | 46 | 15058 | 01200 | 11060 |        | BE   | CFCT                 |
| 13214 | 14 | 12435 | 00049 | 11070 |        | CM   | OMM1,49,10           |
| 13226 | 46 | 11920 | 01200 | 11080 |        | BE   | TEN                  |
| 13238 | 14 | 12435 | 00040 | 11090 | SS     | CM   | OMM1,10,10           |
| 13250 | 46 | 13894 | 01200 | 11100 |        | BE   | CADD                 |
| 13262 | 14 | 12435 | 00020 | 11110 |        | CM   | OMM1,20,10           |
| 13274 | 46 | 14466 | 01200 | 11120 |        | BE   | CSUB                 |
| 13286 | 14 | 12435 | 00021 | 11130 | SS1    | CM   | OMM1,21,10           |
| 13298 | 46 | 14562 | 01200 | 11140 |        | BE   | CDIV                 |
| 13310 | 14 | 12435 | 00014 | 11150 |        | CM   | OMM1,14,10           |
| 13322 | 46 | 14542 | 01200 | 11160 |        | BE   | CMULT                |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS  |
|-------|----|-------|-------|-------|--------|------|-----------------------|
| 13334 | 14 | 12435 | 000±4 | 11170 | SS2    | CM   | OMM1,-14,10           |
| 13346 | 46 | 14686 | 01200 | 11180 |        | BE   | CEXP                  |
| 13358 | 15 | 05253 | 00001 | 11190 | SS6    | TDM  | FSTSW,1               |
| 13370 | 16 | 07679 | 00026 | 11200 | TFSAVE | TFM  | INST1+1 ,26 ,10       |
| 13382 | 26 | 13417 | 04586 | 11210 |        | TF   | **35,PUTETB+6         |
| 13394 | 12 | 13417 | 00089 | 11220 |        | SM   | **23,9,10             |
| 13406 | 31 | 07680 | 00000 | 11230 |        | TR   | INST1+2               |
| 13418 | 15 | 07690 | 00000 | 11240 |        | TDM  | INST1+12,0            |
| 13430 | 44 | 13454 | 07686 | 11250 |        | BNF  | PUTOMG,INST1+8        |
| 13442 | 44 | 13554 | 07688 | 11260 |        | BNF  | TFSV1 ,INST1+10       |
| 13454 | 43 | 13522 | 05256 | 11270 | PUTOMG | BD   | **68,FLAGSW           |
| 13466 | 11 | 13484 | 00002 | 11280 |        | AM   | **18,2                |
| 13478 | 26 | 00000 | 00761 | 11290 | PUTOMH | TF   | ,CHI                  |
| 13490 | 26 | 12435 | 00761 | 11300 |        | TF   | OMM1,CHI              |
| 13502 | 31 | 00760 | 00762 | 11310 |        | TR   | CHI-1,CHI+1           |
| 13514 | 49 | 12474 |       | 11320 |        | B7   | S                     |
| 13522 | 32 | 00761 | 00000 | 11330 |        | SF   | CHI                   |
| 13534 | 15 | 05256 | 00000 | 11340 |        | TDM  | FLAGSW                |
| 13546 | 49 | 13466 |       | 11350 |        | B7   | PUTOMG+12             |
| 13554 | 16 | 07689 | 00060 | 11360 | TFSV1  | TFM  | INST1+11 ,FAC         |
| 13566 | 27 | 01552 | 01551 | 11370 |        | BT   | PUT1,PUT1-1           |
| 13578 | 26 | 13608 | 13417 | 11380 |        | TF   | **30,TFSAVE+47        |
| 13590 | 11 | 13608 | 00088 | 11390 |        | AM   | **18,8,10             |
| 13602 | 32 | 00000 | 00000 | 11400 |        | SF   |                       |
| 13614 | 49 | 13122 |       | 11410 |        | B7   | SS5+12                |
| 13622 | 31 | 07685 | 04586 | 11420 | SSCB   | TR   | INST1+7 ,PUTETB+6 ,11 |
| 13634 | 44 | 13666 | 07692 | 11430 |        | BNF  | **32,INST1+14         |
| 13646 | 33 | 07692 | 00000 | 11440 |        | CF   | INST1+14              |
| 13658 | 49 | 13678 |       | 11450 |        | B7   | **20                  |
| 13666 | 32 | 07692 | 00000 | 11460 |        | SF   | INST1+14              |
| 13678 | 31 | 04586 | 07685 | 11470 |        | TR   | PUTETB+6 ,INST1+7 ,6  |
| 13690 | 31 | 00760 | 00762 | 11480 | SSCA   | TR   | CHI-1,CHI+1           |
| 13702 | 12 | 13484 | 00082 | 11490 |        | SM   | PUTOMH+6,2,10         |
| 13714 | 26 | 12435 | 13484 | 11500 |        | TF   | OMM1 ,PUTOMH+6 ,11    |
| 13726 | 49 | 12474 | 00000 | 11510 |        | B    | S                     |
| 13738 | 26 | 07684 | 15822 | 11520 | CODE   | TF   | INST1+6 ,TFFAC-4      |
| 13750 | 16 | 07699 | 00027 | 11530 |        | TFM  | INST2+1,27,10         |
| 13762 | 26 | 13809 | 04586 | 11540 |        | TF   | CODA+11,PUTETB+6      |
| 13774 | 31 | 07705 | 04586 | 11550 |        | TR   | INST2+7 ,PUTETB+6 ,11 |
| 13786 | 12 | 13809 | 00089 | 11560 |        | SM   | **23,9,10             |
| 13798 | 31 | 07685 | 00000 | 11570 | CODA   | TR   | INST1+7               |
| 13810 | 43 | 13836 | 07712 | 11580 |        | BD   | **26,INST2+14         |
| 13822 | 43 | 15354 | 07692 | 11590 |        | BD   | FIX1 ,INST1+14        |
| 13834 | 42 |       |       | 11600 |        | BB2  |                       |
| 13836 | 43 | 13880 | 07692 | 11610 |        | BD   | CODD,INST1+14         |
| 13848 | 14 | 12435 | 000±4 | 11620 |        | CM   | OMM1,-14,10           |
| 13860 | 46 | 15726 | 01200 | 11630 |        | BE   | FXEXP                 |
| 13872 | 49 | 15374 |       | 11640 |        | B7   | FLOAT1                |
| 13880 | 11 | 14001 | 00040 | 11650 | CODD   | AM   | OP ,40 ,10            |
| 13892 | 42 |       |       | 11660 |        | BB2  |                       |
| 13894 | 16 | 14001 | ±5831 | 11670 | CADD   | TFM  | OP,AFAD               |
| 13906 | 17 | 13738 | 00080 | 11680 |        | BTM  | CODE,,10              |
| 13918 | 44 | 14366 | 07692 | 11690 |        | BNF  | CADDH,INST1+14        |
| 13930 | 44 | 14422 | 07712 | 11700 |        | BNF  | CADDK,INST2+14        |
| 13942 | 15 | 05256 | 00003 | 11710 |        | TDM  | FLAGSW,3              |
| 13954 | 44 | 14326 | 07711 | 11720 |        | BNF  | CADDH,INST2+13        |
| 13966 | 31 | 07705 | 07685 | 11730 | CADDI  | TR   | INST2+7,INST1+7       |
| 13978 | 16 | 14003 | 000±4 | 11740 | CADDK  | TFM  | COMMON+1,41,1011      |
| 13990 | 26 | 07704 | 00000 | 11750 | C      | TF   | INST2+6               |
| 14001 |    | 00005 |       | 11760 | OP     | DS   | 5 ,*                  |
| 14002 | 41 | 01552 | 01551 | 11770 | COMMON | NOP  | PUT1,PUT1-1           |
| 14014 | 44 | 14038 | 14003 | 11780 |        | BNF  | **24,COMMON+1         |
| 14026 | 27 | 01572 | 01571 | 11790 |        | BT   | PUT2,PUT2-1           |
| 14038 | 12 | 04586 | 000±8 | 11800 |        | SM   | PUTETB+6,18,10        |
| 14050 | 26 | 08343 | 14707 | 11810 |        | TF   | SYM,ACC               |
| 14062 | 16 | 02485 | ±4082 | 11820 |        | TFM  | CFXN-1 ,**20          |
| 14074 | 49 | 02676 |       | 11830 |        | B7   | SMTLU-24              |
| 14082 | 26 | 14112 | 04586 | 11840 |        | TF   | **30,PUTETB+6         |
| 14094 | 11 | 14112 | 00086 | 11850 |        | AM   | **18,6,10             |
| 14106 | 32 | 00000 | 00000 | 11860 |        | SF   |                       |
| 14118 | 12 | 13484 | 00082 | 11870 |        | SM   | PUTOMH+6,2,10         |
| 14130 | 26 | 14153 | 13484 | 11880 |        | TF   | **23,PUTOMH+6         |
| 14142 | 26 | 12435 | 00000 | 11890 |        | TF   | OMM1                  |
| 14154 | 14 | 00761 | 00084 | 11900 |        | CM   | CHI,4,10              |
| 14166 | 46 | 13142 | 01200 | 11910 |        | BE   | SSC                   |
| 14178 | 45 | 14198 | 00763 | 11920 |        | BNR  | **20,CHI+2            |
| 14190 | 49 | 12486 |       | 11930 |        | B7   | S+12                  |
| 14198 | 14 | 00763 | 000±4 | 11940 |        | CM   | CHI+2,14,10           |
| 14210 | 46 | 13078 | 01200 | 11950 |        | BE   | SS3+24                |
| 14222 | 14 | 12435 | 00024 | 11960 |        | CM   | OMM1,24,10            |
| 14234 | 46 | 13454 | 01200 | 11970 |        | BE   | PUTOMG                |
| 14246 | 14 | 12435 | 00024 | 11980 |        | CM   | OMM1,-24,10           |
| 14258 | 46 | 13454 | 01200 | 11990 |        | BE   | PUTOMG                |
| 14270 | 14 | 12435 | 00033 | 12000 |        | CM   | OMM1,33,10            |
| 14282 | 46 | 13454 | 01200 | 12010 |        | BE   | PUTOMG                |
| 14294 | 49 | 12474 |       | 12020 |        | B7   | S                     |
| 14302 | 15 | 05256 | 00004 | 12030 | CADDL  | TDM  | FLAGSW,4              |
| 14314 | 11 | 14001 | 00085 | 12040 |        | AM   | OP,5,10               |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------------------|
| 14326 | 44 | 14346 | 07691 | 12050 | CADDB  | BNF  | CADD0,INST1+13       |
| 14338 | 49 | 13978 |       | 12060 |        | B7   | CADDC                |
| 14346 | 16 | 14003 | 00027 | 12070 | CADDD  | TFM  | COMMON+1,27,1011     |
| 14358 | 49 | 13990 |       | 12080 |        | B7   | C                    |
| 14366 | 44 | 14446 | 07712 | 12090 | CADDDH | BNF  | CADDJ+12,INST2+14    |
| 14378 | 44 | 14434 | 07711 | 12100 |        | BNF  | CADDJ,INST2+13       |
| 14390 | 15 | 05256 | 00004 | 12110 |        | TDM  | FLAGSW,4             |
| 14402 | 11 | 14001 | 00085 | 12120 |        | AM   | OP,5,10              |
| 14414 | 49 | 13966 |       | 12130 |        | B7   | CADDI                |
| 14422 | 44 | 14302 | 07711 | 12140 | CADDK  | BNF  | CADDL,INST2+13       |
| 14434 | 11 | 14001 | 00085 | 12150 | CADDJ  | AM   | OP,5,10              |
| 14446 | 15 | 05256 | 00000 | 12160 |        | TDM  | FLAGSW,              |
| 14458 | 49 | 13954 |       | 12170 |        | B7   | CADDI-12             |
| 14466 | 16 | 14001 | 15831 | 12180 | CSUB   | TFM  | OP,AFAD              |
| 14478 | 17 | 13738 | 00080 | 12190 |        | BTM  | CODE,,10             |
| 14490 | 44 | 14522 | 07712 | 12200 |        | BNF  | CSUBA,INST2+14       |
| 14502 | 33 | 07712 | 00000 | 12210 |        | CF   | INST2+14             |
| 14514 | 49 | 13918 |       | 12220 |        | B7   | CADD+24              |
| 14522 | 32 | 07712 | 00000 | 12230 | CSUBA  | SF   | INST2+14             |
| 14534 | 49 | 13918 |       | 12240 |        | B7   | CADD+24              |
| 14542 | 16 | 14001 | 15841 | 12250 | CMULT  | TFM  | OP,AFMP              |
| 14554 | 49 | 14574 |       | 12260 |        | B7   | CDIV+12              |
| 14562 | 16 | 14001 | 15851 | 12270 | CDIV   | TFM  | OP,AFDV              |
| 14574 | 17 | 13738 | 00000 | 12280 |        | BTM  | CODE                 |
| 14586 | 44 | 14654 | 07692 | 12290 |        | BNF  | CMDA,INST1+14        |
| 14598 | 44 | 14666 | 07712 | 12300 |        | BNF  | CMDA+12,INST2+14     |
| 14610 | 15 | 05256 | 00000 | 12310 |        | TDM  | FLAGSW               |
| 14622 | 44 | 14326 | 07711 | 12320 | CMDB   | BNF  | CADDB,INST2+13       |
| 14634 | 11 | 14001 | 00085 | 12330 |        | AM   | OP,5,10              |
| 14646 | 49 | 13966 |       | 12340 |        | B7   | CADDI                |
| 14654 | 44 | 14610 | 07712 | 12350 | CMDA   | BNF  | CMDB-12,INST2+14     |
| 14666 | 15 | 05256 | 00005 | 12360 |        | TDM  | FLAGSW,5             |
| 14678 | 49 | 14622 |       | 12370 |        | B7   | CMDB                 |
| 14686 | 16 | 14001 | 15861 | 12380 | CEXP   | TFM  | OP,AFXP              |
| 14698 | 17 | 13738 | 00080 | 12390 |        | BTM  | CODE,,10             |
| 14707 |    | 00003 |       | 12400 | ACC    | DS   | 3 ,*-2               |
| 14710 | 15 | 07624 | 00001 | 12410 |        | TDM  | USED FS-4 ,1         |
| 14722 | 15 | 07622 | 00001 | 12420 |        | TDM  | USED FS-6 ,1         |
| 14734 | 44 | 14758 | 07712 | 12430 |        | BNF  | **+24,INST2+14       |
| 14746 | 11 | 14001 | 00085 | 12440 |        | AM   | OP,5,10              |
| 14758 | 44 | 14886 | 07711 | 12450 |        | BNF  | CEXPA,INST2+13       |
| 14770 | 31 | 15041 | 07685 | 12460 | TR     |      | TEMP,INST1+7         |
| 14782 | 16 | 07692 | 00000 | 12470 | TFM    |      | INST1+14,,8          |
| 14794 | 26 | 07684 | 07709 | 12480 | TF     |      | INST1+6 ,INST2+11    |
| 14806 | 16 | 07689 | 00060 | 12490 | TFM    |      | INST1+11 ,FAC        |
| 14818 | 27 | 01552 | 01551 | 12500 | BT     |      | PUT1,PUT1-1          |
| 14830 | 31 | 07685 | 15041 | 12510 | TR     |      | INST1+7,TEMP         |
| 14842 | 26 | 07684 | 15822 | 12520 | TF     |      | INST1+6 ,TFFAC-4     |
| 14854 | 44 | 14962 | 07691 | 12530 | BNF    |      | CEXPB,INST1+13       |
| 14866 | 27 | 01552 | 01551 | 12540 | BT     |      | PUT1,PUT1-1          |
| 14878 | 49 | 14898 |       | 12550 |        | B7   | CEXPA+12             |
| 14886 | 44 | 14962 | 07691 | 12560 | CEXPA  | BNF  | CEXPB,INST1+13       |
| 14898 | 44 | 14942 | 07692 | 12570 |        | BNF  | CEXPC,INST1+14       |
| 14910 | 26 | 07689 | 15811 | 12580 | TF     |      | INST1+11,RVINST+11   |
| 14922 | 16 | 14003 | 00027 | 12590 | CEXPB  | TFM  | COMMON+1,27,1011     |
| 14934 | 49 | 13990 |       | 12600 |        | B7   | C                    |
| 14942 | 16 | 14003 | 00041 | 12610 | CEXPB  | TFM  | COMMON+1,41,1011     |
| 14954 | 49 | 13990 |       | 12620 |        | B7   | C                    |
| 14962 | 44 | 14922 | 07692 | 12630 | CEXPB  | BNF  | CEXPB,INST1+14       |
| 14974 | 31 | 15041 | 07698 | 12640 | TR     |      | TEMP,INST2           |
| 14986 | 26 | 07710 | 15812 | 12650 | TF     |      | INST2+12,RVINST+12   |
| 14998 | 27 | 01552 | 01551 | 12660 | BT     |      | PUT1,PUT1-1          |
| 15010 | 27 | 01572 | 01571 | 12670 | BT     |      | PUT2,PUT2-1          |
| 15022 | 31 | 07698 | 15041 | 12680 | TR     |      | INST2,TEMP           |
| 15034 | 49 | 14942 |       | 12690 |        | B7   | CEXPB                |
| 15041 |    | 00001 |       | 12700 | TEMP   | DS   | 1                    |
| 15056 |    | 00015 |       | 12710 |        | DS   | 15                   |
| 15058 | 17 | 13738 | 00080 | 12720 | CFCT   | BTM  | CODE,,10             |
| 15070 | 26 | 07704 | 07689 | 12730 |        | TF   | INST2+6,INST1+11     |
| 15082 | 31 | 00760 | 00762 | 12740 |        | TR   | CHI-1 ,CHI+1         |
| 15094 | 44 | 15186 | 07712 | 12750 |        | BNF  | CFCTA,INST2+14       |
| 15106 | 44 | 15242 | 07711 | 12760 |        | BNF  | CFCTB,INST2+13       |
| 15118 | 44 | 15142 | 07692 | 12770 |        | BNF  | **+24,INST1+14       |
| 15130 | 15 | 05256 | 00002 | 12780 |        | TDM  | FLAGSW,2             |
| 15142 | 16 | 14003 | 00027 | 12790 |        | TFM  | COMMON+1,27,1011     |
| 15154 | 31 | 07678 | 15800 | 12800 | TR     |      | INST1,RVINST         |
| 15166 | 31 | 07705 | 15818 | 12810 | TR     |      | INST2+7 ,TFFAC-8     |
| 15178 | 49 | 14002 |       | 12820 |        | B7   | COMMON               |
| 15186 | 44 | 15310 | 07711 | 12830 | CFCTA  | BNF  | CFCTC,INST2+13       |
| 15198 | 16 | 14003 | 00041 | 12840 |        | TFM  | COMMON+1,41,1011     |
| 15210 | 44 | 15166 | 07692 | 12850 |        | BNF  | CFCTA-20,INST1+14    |
| 15222 | 15 | 05256 | 00002 | 12860 |        | TDM  | FLAGSW,2             |
| 15234 | 49 | 15166 |       | 12870 |        | B7   | CFCTA-20             |
| 15242 | 44 | 15266 | 07692 | 12880 | CFCTB  | BNF  | **+24,INST1+14       |
| 15254 | 15 | 05256 | 00002 | 12890 |        | TDM  | FLAGSW,2             |
| 15266 | 26 | 07684 | 15822 | 12900 | TF     |      | INST1+6 ,TFFAC-4     |
| 15278 | 31 | 07685 | 07705 | 12910 | TR     |      | INST1+7,INST2+7      |
| 15290 | 27 | 01552 | 01551 | 12920 | BT     |      | PUT1,PUT1-1          |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS     |
|-------|----|-------|-------|-------|--------|------|--------------------------|
| 15302 | 49 | 15142 |       | 12930 |        | B7   | CFCT+84                  |
| 15310 | 16 | 14003 | 0004+ | 12940 | CFCTC  | TFM  | COMMON+1,41,1011         |
| 15322 | 44 | 14002 | 07692 | 12950 |        | BNF  | COMMON,INST1+14          |
| 15334 | 15 | 05256 | 00002 | 12960 |        | TDM  | FLAGSW,2                 |
| 15346 | 49 | 14002 |       | 12970 |        | B7   | COMMON                   |
| 15354 | 16 | 15445 | +5768 | 12980 | FIX1   | TFM  | TWAGS+11 ,FIX2           |
| 15366 | 49 | 15386 |       | 12990 |        | B7   | **20                     |
| 15374 | 16 | 15445 | +5784 | 13000 | FLOAT1 | TFM  | TWAGS+11 ,FLOAT2         |
| 15386 | 16 | 15479 | 00027 | 13010 |        | TFM  | SSBCD+13,27,10           |
| 15398 | 33 | 05252 | 00000 | 13020 |        | CF   | EQSW                     |
| 15410 | 31 | 15041 | 07685 | 13030 | FOF    | TR   | TEMP,INST1+7             |
| 15422 | 31 | 07685 | 07705 | 13040 |        | TR   | INST1+7,INST2+7          |
| 15434 | 31 | 07698 | 15768 | 13050 | TWAGS  | TR   | INST2,FIX2               |
| 15446 | 44 | 15466 | 07691 | 13060 |        | BNF  | **20,INST1+13            |
| 15458 | 49 | 15478 |       | 13070 |        | B7   | **20                     |
| 15466 | 27 | 01552 | 01551 | 13080 | SSBCD  | BT   | PUT1,PUT1-1              |
| 15478 | 41 | 01572 | 01571 | 13090 |        | NOP  | PUT2,PUT2-1              |
| 15490 | 41 | 00000 | 00000 | 13100 |        | NOP  |                          |
| 15502 | 44 | 15538 | 07692 | 13110 |        | BNF  | **36,INST1+14            |
| 15514 | 31 | 07698 | 15800 | 13120 |        | TR   | INST2,RVINST             |
| 15526 | 27 | 01572 | 01571 | 13130 |        | BT   | PUT2,PUT2-1              |
| 15538 | 31 | 07685 | 15041 | 13140 |        | TR   | INST1+7,TEMP             |
| 15550 | 31 | 15717 | 07685 | 13150 |        | TR   | TRAREC+1 ,INST1+7        |
| 15562 | 26 | 07684 | 07689 | 13160 |        | TF   | INST1+6 ,INST1+11        |
| 15574 | 16 | 07689 | 00060 | 13170 |        | TFM  | INST1+11 ,FAC            |
| 15586 | 16 | 15479 | 00041 | 13180 |        | TFM  | SSBCD+13 ,41             |
| 15598 | 44 | 15622 | 08366 | 13190 |        | BNF  | ZOT ,TRX                 |
| 15610 | 44 | 15666 | 05252 | 13200 |        | BNF  | TRIT ,EQSW               |
| 15622 | 32 | 02142 | 00000 | 13210 | ZOT    | SF   | PUTX+8                   |
| 15634 | 27 | 01552 | 01551 | 13220 |        | BT   | PUT1 ,PUT1-1             |
| 15646 | 33 | 02142 | 00000 | 13230 |        | CF   | PUTX+8                   |
| 15658 | 49 | 06274 |       | 13240 |        | B7   | TESTDD                   |
| 15666 | 31 | 07678 | 15710 | 13250 | TRIT   | TR   | INST1 ,TRAREC-6          |
| 15678 | 43 | 15634 | 07692 | 13260 |        | BD   | ZOT+12 ,INST1+14         |
| 15690 | 16 | 07684 | 03370 | 13270 |        | TFM  | INST1+6 ,TRFL            |
| 15702 | 49 | 15634 | 00000 | 13280 |        | B    | ZOT+12                   |
| 15710 |    |       |       | 13290 |        | DORG | *-3                      |
| 15711 |    | 00002 |       | 13300 |        | DC   | 2,17                     |
| 15716 |    | 00005 | 03334 | 13310 | TRAREC | DSA  | TRFX                     |
| 15721 |    | 00005 |       | 13320 |        | DC   | 5,-90500                 |
| 15725 |    | 00004 |       | 13330 |        | DC   | 4,'                      |
| 15726 | 16 | 14001 | +5761 | 13340 | FXEXP  | TFM  | OP,**35                  |
| 15738 | 15 | 03159 | 00000 | 13350 |        | TDM  | FXORFL                   |
| 15750 | 49 | 14734 | 02130 | 13360 |        | B    | CEXP+48,FAXI,7           |
| 15766 |    | 00005 | 02070 | 13370 |        | DSA  | FAXIN                    |
| 15768 | 27 | 03054 | 03053 | 13380 | FIX2   | BT   | FIX ,FIX-1               |
| 15783 |    | 00004 |       | 13390 |        | DC   | 4,'                      |
| 15784 | 27 | 03230 | 03229 | 13400 | FLOAT2 | BT   | FLOAT ,FLOAT-1           |
| 15799 |    | 00004 |       | 13410 |        | DC   | 4,'                      |
| 15800 | 27 | 01806 | 01805 | 13420 | RVINST | BT   | RVSGN,RVSGN-1,0          |
| 15815 |    | 00004 |       | 13430 |        | DC   | 4,'                      |
| 15826 |    | 00011 |       | 13440 | TFFAC  | DC   | 11 ,2600060000'          |
| 15831 |    | 00005 | 00892 | 13450 | AFAD   | DSA  | FAD ,FSB                 |
| 15836 |    | 00005 | 00832 |       |        |      |                          |
| 15841 |    | 00005 | 02762 | 13460 | AFMP   | DSA  | FMP ,FMP                 |
| 15846 |    | 00005 | 02762 |       |        |      |                          |
| 15851 |    | 00005 | 02270 | 13470 | AFDV   | DSA  | FDV ,FDVR                |
| 15856 |    | 00005 | 02234 |       |        |      |                          |
| 15861 |    | 00005 | 02626 | 13480 | AFXP   | DSA  | FAXB ,FAXBN              |
| 15866 |    | 00005 | 02566 |       |        |      |                          |
| 15871 |    | 00005 | 01558 | 13490 |        | DSA  | FXA,FXS,FXM,FXM,FXD,FXDR |
| 15876 |    | 00005 | 01508 |       |        |      |                          |
| 15881 |    | 00005 | 01608 |       |        |      |                          |
| 15886 |    | 00005 | 01608 |       |        |      |                          |
| 15891 |    | 00005 | 01718 |       |        |      |                          |
| 15896 |    | 00005 | 01682 |       |        |      |                          |
| 05252 |    | 00000 |       | 13500 | EQSW   | DS   | ,BA+2                    |
| 05253 |    | 00000 |       | 13510 | FSTSW  | DS   | ,BA+3                    |
| 05254 |    | 00000 |       | 13520 | SBSWCH | DS   | ,BA+4                    |
| 05255 |    | 00000 |       | 13530 | DMSWCH | DS   | ,BA+5                    |
| 05256 |    | 00000 |       | 13540 | FLAGSW | DS   | ,BA+6                    |
| 05257 |    | 00000 |       | 13550 | DOSWCH | DS   | ,BA+7                    |
| 05258 |    | 00000 |       | 13560 | IFSWCH | DS   | ,BA+8                    |
| 07914 |    | 00000 |       | 13570 | RHO    | DS   | ,PHI+42                  |
| 08078 |    | 00000 |       | 13580 | IMAGE  | DS   | ,PHI+206                 |
| 08332 |    | 00000 |       | 13590 | TOP    | DS   | ,PHI+460                 |
| 00000 |    | 00000 |       | 13600 | OUT    | DS   | ,0                       |
| 00908 |    | 00000 |       | 13610 | LAD    | DS   | ,CHI+147                 |
| 00918 |    | 00000 |       | 13620 | COMPA  | DS   | ,CHI+157                 |
| 00919 |    | 00000 |       | 13630 | STNSW  | DS   | ,CHI+158                 |
| 00570 |    | 00000 |       | 13640 | NEXTP  | DS   | ,570                     |
| 15898 | 25 | 07728 | 00402 | 13650 | INITL  | TD   | IDCF ,402                |
| 15910 | 25 | 05552 | 00401 | 13660 |        | TD   | DCFEX ,401               |
| 15922 | 44 | 16232 | 00039 | 13670 |        | BNF  | LSTPG ,39                |
| 15934 | 25 | 07858 | 00400 | 13680 |        | TD   | MEMCAP-5 ,400            |
| 15946 | 26 | 07868 | 07862 | 13690 |        | TF   | FCTEND,MEMCAP-1          |
| 15958 | 25 | 07714 | 00401 | 13700 |        | TD   | DCF ,401                 |
| 15970 | 25 | 08936 | 00401 | 13710 |        | TD   | EDCF ,401                |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL | MNEM | OPERANDS        | AND REMARKS |
|-------|----|-------|-------|-------|-------|------|-----------------|-------------|
| 15982 | 26 | 07719 | 00570 | 13720 |       | TF   | DCF+5           | ,NEXTP      |
| 15994 | 25 | 16206 | 00401 | 13730 |       | TD   | SRDCF           | ,401        |
| 16006 | 36 | 16206 | 00702 | 13740 |       | RN   | SRDCF           | ,702        |
| 16018 | 14 | 16253 | 00080 | 13750 |       | CM   | NO              | ,10         |
| 16030 | 26 | 08847 | 07868 | 13760 | TRY   | TF   | ENDCOM          | ,FCTEND     |
| 16042 | 46 | 00876 | 01200 | 13770 |       | BE   | MOON7           |             |
| 16054 | 26 | 07868 | 16263 | 13780 |       | TF   | FCTEND          | ,SRN        |
| 16066 | 12 | 07867 | 00081 | 13790 |       | SM   | FCTEND-1        | ,1          |
| 16078 | 26 | 16229 | 16263 | 13800 |       | TF   | CCC+8           | ,SRN        |
| 16090 | 16 | 16125 | 16222 | 13810 |       | TFM  | SNL+11          | ,CCC+1      |
| 16102 | 11 | 16125 | 00082 | 13820 |       | AM   | SNL+11          | ,2          |
| 16114 | 43 | 16102 | 00000 | 13830 | SNL   | BD   | *-12            |             |
| 16126 | 31 | 16125 | 16194 | 13840 |       | TR   | SNL+11          | ,FRECK      |
| 16138 | 26 | 07868 | 16229 | 13850 |       | TF   | FCTEND          | ,CCC+8      |
| 16150 | 31 | 16254 | 16264 | 13860 |       | TR   | SRN-9           | ,SRN+1      |
| 16162 | 12 | 07867 | 00081 | 13870 |       | SM   | FCTEND-1        | ,1          |
| 16174 | 12 | 16253 | 00081 | 13880 |       | SM   | NO              | ,1          |
| 16186 | 49 | 16030 |       | 13890 |       | B7   | TRY             |             |
| 16194 | 46 | 00000 | 00000 | 13900 | FRECK | BI   |                 |             |
| 16205 |    | 00001 |       | 13910 |       | DC   | 1,',*           |             |
| 16206 |    | 00001 |       | 13920 | SRDCF | DC   | 1               | ,0          |
| 16214 |    | 00008 |       | 13930 |       | DC   | 8               | ,79582005   |
| 16219 |    | 00005 | 16252 | 13940 |       | DSA  | CCC+31          |             |
| 16221 |    | 00006 | X2    | 13950 | CCC   | DAC  | 6,AAAAAA        |             |
| 16253 |    | 00000 |       | 13960 | NO    | DS   |                 | ,CCC+32     |
| 16263 |    | 00000 |       | 13970 | SRN   | DS   |                 | ,CCC+42     |
| 16232 | 47 | 07642 | 00200 | 13980 | LSTPG | BNC2 | CEXEC           |             |
| 16244 | 34 | 00000 | 00971 | 13990 |       | K    |                 | ,971        |
| 16256 | 26 | 01306 | 16298 | 14000 |       | TF   | LSTO+6          | ,BLST+6     |
| 16268 | 16 | 01185 | 00041 | 14010 |       | TFM  | ADF+1           | ,41         |
| 16280 | 49 | 01092 | 00000 | 14020 |       | B    | BEG1            |             |
| 16292 | 49 | 16304 | 00000 | 14030 | BLST  | B    | LSTST           |             |
| 16304 | 14 | 00918 | 00651 | 14040 | LSTST | CM   | COMPA           | ,CCFMT+65   |
| 16316 | 34 | 00000 | 00951 | 14050 |       | K    |                 | ,951        |
| 16328 | 47 | 01092 | 01200 | 14060 |       | BNE  | BEG1            |             |
| 16340 | 49 | 07642 | 00000 | 14070 |       | B    | CEXEC           |             |
|       |    |       |       | 14080 | *     |      |                 |             |
|       |    |       |       | 14090 | *     |      |                 |             |
|       |    |       |       | 14100 | *     |      |                 |             |
|       |    |       |       | 14110 | *     |      |                 |             |
|       |    |       |       | 14120 |       |      |                 |             |
| 09022 |    |       |       |       |       | DORG | COMM            |             |
| 09022 | 26 | 08968 | 05157 | 14130 |       | TF   | DATA+6          | ,HDWRER+23  |
| 09034 | 14 | 07124 | 00972 | 14140 |       | CM   | ESEGBR+6        | ,BEGIN      |
| 09046 | 46 | 09082 | 01200 | 14150 |       | BE   | SKEM            |             |
| 09058 | 31 | 00000 | 06128 | 14160 |       | TR   | OUT             | ,ENDINS     |
| 09070 | 17 | 02134 | 00012 | 14170 |       | BTM  | PUTX            | ,12         |
| 09082 | 16 | 07124 | 09102 | 14180 | SKEM  | TFM  | ESEGBR+6        | ,SMTBO      |
| 09094 | 49 | 06966 |       | 14190 |       | B7   | SEG+12          |             |
| 09102 | 16 | 02485 | 09134 | 14200 | SMTBO | TFM  | CFXN-1          | ,*+32       |
| 09114 | 16 | 08343 | 00999 | 14210 |       | TFM  | SYM             | ,999        |
| 09126 | 49 | 02676 |       | 14220 |       | B7   | SMTLU-24        |             |
| 09134 | 26 | 07746 | 07719 | 14230 |       | TF   | BUFBA+4         | ,DCF+5      |
| 09146 | 22 | 07746 | 00570 | 14240 |       | S    | BUFBA+4         | ,NEXTP      |
| 09158 | 26 | 07751 | 07037 | 14250 |       | TF   | BUFBA+9         | ,LMAX       |
| 09170 | 26 | 07756 | 02827 | 14260 |       | TF   | BUFBA+14        | ,SMCNT      |
| 09182 | 26 | 07761 | 07868 | 14270 |       | TF   | BUFBA+19        | ,FCTEND     |
| 09194 | 31 | 07762 | 07549 | 14280 |       | TR   | BUFBA+20        | ,USEDIFS-79 |
| 09206 | 26 | 07766 | 08847 | 14290 |       | TF   | BUFBA+24        | ,ENDCOM     |
| 09218 | 22 | 07628 | 07628 | 14300 |       | S    | USEDIFS         | ,USEDIFS    |
| 09230 | 26 | 07037 | 07719 | 14310 |       | TF   | LMAX            | ,DCF+5      |
| 09242 | 26 | 07719 | 00570 | 14320 |       | TF   | DCF+5           | ,NEXTP      |
| 09254 | 27 | 10458 | 10457 | 14330 |       | BT   | IMOUT           | ,IMOUT-1    |
| 09266 | 16 | 07727 | 08078 | 14340 |       | TFM  | DCF+13          | ,IMAGE      |
| 09278 | 26 | 07719 | 07037 | 14350 |       | TF   | DCF+5           | ,LMAX       |
| 09290 | 43 | 09562 | 08960 | 14360 | CDAT  | BD   | OST             | ,ENDSW      |
| 09302 | 31 | 00760 | 00768 | 14370 |       | TR   | CHI-1           | ,CHI+7      |
| 09314 | 31 | 00760 | 00762 | 14380 | DATLP | TR   | CHI-1           | ,CHI+1      |
| 09326 | 15 | 05254 | 00000 | 14390 |       | TDM  | SBSWCH          |             |
| 09338 | 16 | 01185 | 00041 | 14400 |       | TFM  | ADF+1           | ,41         |
| 09350 | 26 | 00755 | 06605 | 14410 |       | TF   | CHI-6,DORCRD+23 |             |
| 09362 | 16 | 09495 | 00033 | 14420 |       | TFM  | SFDAT+1         | ,33         |
| 09374 | 17 | 03124 | 09386 | 14430 |       | BTM  | CSORN           | ,*+12       |
| 09386 | 26 | 09705 | 04603 | 14440 |       | TF   | OCADR           | ,ETAN+4     |
| 09398 | 31 | 00760 | 00762 | 14450 |       | TR   | CHI-1           | ,CHI+1      |
| 09410 | 15 | 05254 | 00004 | 14460 |       | TDM  | SBSWCH          | ,4          |
| 09422 | 14 | 00761 | 00020 | 14470 |       | CM   | CHI             | ,20         |
| 09434 | 47 | 09470 | 01200 | 14480 |       | BNE  | *+36            |             |
| 09446 | 31 | 00760 | 00762 | 14490 |       | TR   | CHI-1           | ,CHI+1      |
| 09458 | 16 | 09495 | 00041 | 14500 |       | TFM  | SFDAT+1         | ,41         |
| 09470 | 16 | 03530 | 09494 | 14510 |       | TFM  | NUMBER-6        | ,*+24       |
| 09482 | 17 | 03124 | 09494 | 14520 |       | BTM  | CSORN           | ,*+12       |
| 09494 | 33 | 08343 | 00000 | 14530 | SFDAT | CF   | SYM             |             |
| 09506 | 25 | 08344 | 00403 | 14540 |       | TD   | SYM+1           | ,403        |
| 09518 | 31 | 00089 | 08334 | 14550 |       | TR   | 89              | ,SYM-9      |
| 09530 | 27 | 10386 | 10385 | 14560 |       | BT   | CONGO           | ,CONGO-1    |
| 09542 | 45 | 09314 | 00765 | 14570 |       | BNR  | DATLP           | ,CHI+4      |
| 09554 | 49 | 00972 |       | 14580 |       | B7   | BEGIN           |             |
| 09562 | 26 | 09681 | 07862 | 14590 | OST   | TF   | TADR            | ,MEMCAP-1   |

COMPILE II  
READ INTO CORE BY DATA/END

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS | AND REMARKS |
|-------|----|-------|-------|-------|--------|------|----------|-------------|
| 09574 | 26 | 09705 | 07862 | 14600 |        | TF   | OCADR    | ,MEMCAP-1   |
| 09586 | 16 | 09900 | 07914 | 14610 |        | TFM  | DBUF+6   | ,RHO        |
| 09598 | 31 | 08178 | 07550 | 14620 |        | TR   | PHI+306  | ,USED FS-78 |
| 09610 | 31 | 08254 | 07551 | 14630 |        | TR   | PHI+382  | ,USED FS-77 |
| 09622 | 31 | 07872 | 00744 | 14640 |        | TR   | PHI      | ,CHI-17     |
| 09634 | 25 | 08344 | 00403 | 14650 |        | TD   | SYM+1    | ,403        |
| 09646 | 31 | 07886 | 08305 | 14660 | RET    | TR   | PHI+14   | ,PHI+433    |
| 09658 | 16 | 09741 | 09988 | 14670 |        | TFM  | SADR-1   | ,RETURN+10  |
| 09670 | 26 | 08343 | 00000 | 14680 |        | TF   | SYM      | ,           |
| 09681 |    | 00000 |       | 14690 | TADR   | DS   |          | ,*          |
| 09682 | 44 | 10010 | 08343 | 14700 |        | BNF  | NONCON   | ,SYM        |
| 09694 | 33 | 08343 | 00000 | 14710 |        | CF   | SYM      |             |
| 09705 |    | 00000 |       | 14720 | OCADR  | DS   |          | ,*          |
| 09706 | 31 | 00089 | 08334 | 14730 |        | TR   | 89       | ,SYM-9      |
| 09718 | 27 | 10386 | 10385 | 14740 |        | BT   | CONGO    | ,CONGO-1    |
| 09730 | 26 | 07891 | 00000 | 14750 |        | TF   | PHI+19   |             |
| 09742 | 73 | 07883 | 09705 | 14760 | SADR   | TNF  | PHI+11   | ,OCADR      |
| 09754 | 44 | 09882 | 07886 | 14770 |        | BNF  | TDS      | ,PHI+14     |
| 09766 | 26 | 09800 | 09680 | 14780 | QVAR   | TF   | **34     | ,TADR-1     |
| 09778 | 12 | 09800 | 00001 | 14790 |        | SM   | **22     | ,1          |
| 09790 | 44 | 09894 | 00005 | 14800 |        | BNF  | DBUF     | ,5          |
| 09802 | 26 | 09824 | 09800 | 14810 |        | TF   | **22     | ,*-2        |
| 09814 | 44 | 09834 | 00006 | 14820 |        | BNF  | SSV      | ,6          |
| 09826 | 49 | 09894 |       | 14830 |        | B7   | DBUF     |             |
| 09834 | 12 | 09680 | 00001 | 14840 | SSV    | SM   | TADR-1   | ,1          |
| 09846 | 26 | 09705 | 09681 | 14850 |        | TF   | OCADR    | ,TADR       |
| 09858 | 16 | 09888 | 07907 | 14860 |        | TFM  | TDS+6    | ,PHI+35     |
| 09870 | 26 | 08343 | 09705 | 14870 |        | TF   | SYM      | ,OCADR      |
| 09882 | 73 | 07907 | 08343 | 14880 | TDS    | TNF  | PHI+35   | ,SYM        |
| 09894 | 31 | 07914 | 07872 | 14890 | DBUF   | TR   | RHO      | ,PHI        |
| 09906 | 11 | 09900 | 00040 | 14900 |        | AM   | **6      | ,40         |
| 09918 | 14 | 09900 | 08074 | 14910 |        | CM   | **18     | ,RHO+160    |
| 09930 | 16 | 09888 | 07907 | 14920 |        | TFM  | TDS+6    | ,PHI+35     |
| 09942 | 47 | 09978 | 01200 | 14930 |        | BNE  | RETURN   |             |
| 09954 | 17 | 05332 | 07915 | 14940 |        | BTM  | LSTC     | ,RHO+1      |
| 09966 | 16 | 09900 | 07914 | 14950 |        | TFM  | DBUF+6   | ,RHO        |
| 09978 | 12 | 09704 | 00001 | 14960 | RETURN | SM   | OCADR-1  | ,1          |
| 09990 | 12 | 09680 | 00001 | 14970 |        | SM   | TADR-1   | ,1          |
| 10002 | 49 | 09646 |       | 14980 |        | B7   | RET      |             |
| 10010 | 16 | 09888 | 07903 | 14990 | NONCON | TFM  | TDS+6    | ,PHI+31     |
| 10022 | 44 | 10066 | 08341 | 15000 |        | BNF  | NONACC   | ,SYM-2      |
| 10034 | 14 | 08343 | 00999 | 15010 |        | CM   | SYM      | ,999        |
| 10046 | 46 | 10632 | 01200 | 15020 |        | BE   | ENDP     |             |
| 10058 | 49 | 09742 |       | 15030 |        | B7   | SADR     |             |
| 10066 | 44 | 10612 | 08340 | 15040 | NONACC | BNF  | VAR      | ,SYM-3      |
| 10078 | 16 | 09741 | 10221 | 15050 |        | TFM  | SADR-1   | ,TPSN       |
| 10090 | 26 | 10124 | 09680 | 15060 | TPRO   | TF   | **34     | ,TADR-1     |
| 10102 | 12 | 10124 | 00001 | 15070 |        | SM   | **22     | ,1          |
| 10114 | 44 | 10198 | 00006 | 15080 |        | BNF  | TPRO1    | ,6          |
| 10126 | 26 | 10148 | 10124 | 15090 |        | TF   | **22     | ,*-2        |
| 10138 | 24 | 08343 | 00009 | 15100 |        | C    | SYM      | ,9          |
| 10150 | 47 | 10198 | 01200 | 15110 |        | BNE  | TPRO1    |             |
| 10162 | 27 | 10234 | 10233 | 15120 |        | BT   | BGO      | ,BGO-1      |
| 10174 | 12 | 09680 | 00001 | 15130 |        | SM   | TADR-1   | ,1          |
| 10186 | 12 | 09704 | 00001 | 15140 |        | SM   | OCADR-1  | ,1          |
| 10198 | 27 | 10234 | 10233 | 15150 | TPRO1  | BT   | BGO      | ,BGO-1      |
| 10210 | 49 | 09730 | 00000 | 15160 |        | B    | SADR-12  |             |
| 10218 |    |       |       | 15170 |        | DORG | *-3      |             |
| 10221 |    | 00004 |       | 15180 | TPSN   | DC   | 4        | ,6255       |
| 10225 |    | 00004 |       | 15190 |        | DC   | 4        | ,4654       |
| 10229 |    | 00004 |       | 15200 |        | DC   | 4        | ,6247       |
| 10233 |    | 00004 |       | 15210 |        | DC   | 4        | ,5759       |
| 10234 | 31 | 00089 | 07654 | 15220 | BGO    | TR   | 89       | ,BRINST     |
| 10246 | 26 | 10268 | 09680 | 15230 |        | TF   | **22     | ,TADR-1     |
| 10258 | 44 | 10314 | 00001 | 15240 |        | BNF  | BGO1     | ,1          |
| 10270 | 26 | 10292 | 10268 | 15250 |        | TF   | **22     | ,*-2        |
| 10282 | 26 | 00095 | 00005 | 15260 |        | TF   | 95       | ,5          |
| 10294 | 11 | 09741 | 00004 | 15270 |        | AM   | SADR-1   | ,4          |
| 10306 | 49 | 10386 |       | 15280 |        | B7   | CONGO    |             |
| 10314 | 26 | 10336 | 09680 | 15290 | BGO1   | TF   | **22     | ,TADR-1     |
| 10326 | 26 | 00095 | 00004 | 15300 |        | TF   | 95       | ,4          |
| 10338 | 33 | 00091 | 00000 | 15310 |        | CF   | 91       |             |
| 10350 | 47 | 10386 | 01200 | 15320 |        | BNE  | CONGO    |             |
| 10362 | 26 | 00097 | 00095 | 15330 |        | TF   | 97       | ,95         |
| 10374 | 16 | 09741 | 10233 | 15340 |        | TFM  | SADR-1   | ,TPSN+12    |
| 10386 | 26 | 00088 | 09705 | 15350 | CONGO  | TF   | 88       | ,OCADR      |
| 10398 | 33 | 00084 | 00000 | 15360 |        | CF   | 84       |             |
| 10410 | 31 | 08078 | 00084 | 15370 | GOER   | TR   | IMAGE    | ,84         |
| 10422 | 11 | 10416 | 00015 | 15380 |        | AM   | **6      | ,15         |
| 10434 | 14 | 10416 | 08168 | 15390 |        | CM   | GOER+6   | ,IMAGE+90   |
| 10446 | 47 | 10456 | 01342 | 15400 |        | BL   | **10     | ,42         |
| 10458 | 14 | 07719 | 79125 | 15410 | IMOUT  | CM   | DCF+5    | ,79125      |
| 10470 | 46 | 07630 | 01300 | 15420 |        | BNL  | PGOL     |             |
| 10482 | 15 | 05132 | 00009 | 15430 | WDSK   | TDM  | ROCK+22  | ,9          |
| 10494 | 38 | 07714 | 00702 | 15440 |        | WN   | DCF      | ,702        |
| 10506 | 47 | 10538 | 03600 | 15450 |        | BNI  | **32     | ,3600       |
| 10518 | 34 | 07714 | 00701 | 15460 |        | K    | DCF      | ,701        |
| 10530 | 49 | 10494 |       | 15470 |        | B7   | *-36     |             |

| LOCN  | OP | P/L   | Q     | PG/LN | LABEL  | MNEM    | OPERANDS       | AND | REMARKS        |
|-------|----|-------|-------|-------|--------|---------|----------------|-----|----------------|
| 10538 | 36 | 07714 | 00703 | 15480 |        | RN      | DCF            |     | ,703           |
| 10550 | 16 | 05109 | ±0494 | 15490 |        | TFM     | ROCK-1         |     | ,WDSK+12       |
| 10562 | 46 | 05122 | 01900 | 15500 |        | BI      | ROCK+12        |     | ,1900          |
| 10574 | 16 | 10416 | 08078 | 15510 |        | TFM     | GOER+6,IMAGE   |     |                |
| 10586 | 25 | 08078 | 00403 | 15520 |        | TD      | IMAGE          |     | ,403           |
| 10598 | 11 | 07719 | 00001 | 15530 |        | AM      | DCF+5          |     | ,1             |
| 10610 | 42 |       |       | 15540 |        | BB2     |                |     | ,10            |
| 10612 | 26 | 07895 | 08343 | 15550 | VAR    | TF      | PHI+23         |     | ,SYM           |
| 10624 | 49 | 09742 |       | 15560 |        | B7      | SADR           |     |                |
| 10632 | 45 | 10652 | 08078 | 15570 | ENDP   | BNR     | **20           |     | ,IMAGE         |
| 10644 | 49 | 10664 |       | 15580 |        | B7      | **20           |     |                |
| 10652 | 27 | 10458 | 10457 | 15590 |        | BT      | IMOUT          |     | ,IMOUT-1       |
| 10664 | 14 | 09900 | 07914 | 15600 |        | CM      | DBUF+6         |     | ,RHO           |
| 10676 | 46 | 10712 | 01200 | 15610 |        | BE      | UPDKM          |     |                |
| 10688 | 31 | 09900 | 08211 | 15620 |        | TR      | DBUF+6         |     | ,PHI+339       |
| 10700 | 17 | 05332 | 07915 | 15630 |        | BTM     | LSTC           |     | ,RHO+1         |
| 10712 | 16 | 07548 | 07642 | 15640 | UPDKM  | TFM     | NSPC+8         |     | ,CEXEC         |
| 10724 | 43 | 07494 | 07540 | 15650 |        | BD      | NOSPCE+12,NSPC |     |                |
| 10736 | 16 | 05237 | 00729 | 15660 |        | TFM     | LSTT-1,OVERL   |     |                |
| 10748 | 26 | 00761 | 01723 | 15670 |        | TF      | CHI,AVOID      |     |                |
| 10760 | 44 | 07518 | 01044 | 15680 |        | BNF     | NOSPCE+36      |     | ,SKPPCH        |
| 10772 | 25 | 10984 | 00401 | 15690 |        | TD      | DCFDT          |     | ,401           |
| 10784 | 34 | 10984 | 00701 | 15700 |        | K       | DCFDT          |     | ,701           |
| 10796 | 26 | 05268 | 07719 | 15710 |        | TF      | SYMSB          |     | ,DCF+5         |
| 10808 | 26 | 08919 | 07719 | 15720 |        | TF      | DSADO          |     | ,DCF+5         |
| 10820 | 22 | 08919 | 07037 | 15730 |        | S       | DSADO          |     | ,LMAX          |
| 10832 | 32 | 08917 | 00000 | 15740 |        | SF      | DSADO-2        |     |                |
| 10844 | 15 | 05132 | 00009 | 15750 |        | TDM     | ROCK+22        |     | ,9             |
| 10856 | 36 | 10984 | 00702 | 15760 |        | RN      | DCFDT          |     | ,702           |
| 10868 | 17 | 05110 | ±0856 | 15770 |        | BTM     | ROCK           |     | ,*-12          |
| 10880 | 26 | 10910 | 00585 | 15780 |        | TF      | **30           |     | ,585           |
| 10892 | 11 | 10910 | 00001 | 15790 |        | AM      | **18           |     | ,1             |
| 10904 | 26 | 00000 | 05269 | 15800 |        | TF      |                |     | ,SYMSB+1       |
| 10916 | 12 | 10910 | 000±8 | 15810 |        | SM      | *-6            |     | ,18            |
| 10928 | 26 | 10910 | 08919 | 15820 |        | TF      | *-18           |     | ,DSADO         |
| 10940 | 15 | 05132 | 00009 | 15830 |        | TDM     | ROCK+22        |     | ,9             |
| 10952 | 38 | 10984 | 00702 | 15840 |        | WN      | DCFDT          |     | ,702           |
| 10964 | 17 | 05110 | ±0952 | 15850 |        | BTM     | ROCK           |     | ,*-12          |
| 10976 | 49 | 07642 | 00000 | 15860 |        | B       | CEXEC          |     |                |
| 10984 |    |       |       | 15870 |        | DORG    | *-3            |     |                |
| 10984 |    | 00001 |       | 15880 | DCFDT  | DC      | 1              |     | ,0             |
| 10997 |    | 00013 |       | 15890 |        | DC      | 13             |     | ,7980404000500 |
|       |    |       |       | 15900 | *      |         |                |     |                |
|       |    |       |       | 15910 | *      |         |                |     |                |
|       |    |       |       | 15920 | *      | C4D-PDQ | SUBROUTINES    |     | 5-4-65         |
|       |    |       |       | 15930 | *      |         |                |     |                |
| 00404 |    |       |       | 15940 |        | DORG    | 404            |     |                |
| 00404 | 25 | 02696 | 00400 | 15950 |        | TD      | CZ1+2          |     | ,400           |
| 00416 | 25 | 02720 | 00400 | 15960 |        | TD      | CZ2+2          |     | ,400           |
| 00428 | 25 | 03016 | 00400 | 15970 |        | TD      | CZ3+2          |     | ,400           |
| 00440 | 25 | 03028 | 00400 | 15980 |        | TD      | CZ4+2          |     | ,400           |
| 00452 | 25 | 02046 | 00401 | 15990 |        | TD      | DCFSG,401      |     |                |
| 00464 | 25 | 06517 | 00401 | 16000 |        | TD      | DCFER-5,401    |     |                |
| 00476 | 25 | 02030 | 00401 | 16010 |        | TD      | CALL+44,401    |     |                |
| 00488 | 26 | 01067 | 00185 | 16020 |        | TF      | PRBS           |     | ,185           |
| 00500 | 49 | 18000 | 00000 | 16030 |        | B       | 18000          |     |                |
| 00550 |    |       |       | 16040 |        | DORG    | 550            |     |                |
| 00550 | 36 | 00044 | 00703 | 16050 | TIGEX  | RN      | 44             |     | ,703           |
| 00562 | 49 | 00710 |       | 16060 |        | B7      | ROWCK          |     |                |
| 00570 | 26 | 00700 | 00023 | 16070 |        | TF      | BSEGA          |     | ,23            |
| 00582 | 16 | 00820 | 00506 | 16080 |        | TFM     | ROWBR+6        |     | ,SKDK          |
| 00594 | 31 | 00000 | 00614 | 16090 |        | TR      |                |     | ,INCHI         |
| 00606 | 49 | 00000 |       | 16100 |        | B7      |                |     |                |
| 00614 | 26 | 00405 | 00061 | 16110 | INCHI  | TF      | INOUT          |     | ,61            |
| 00626 | 11 | 00006 | 00002 | 16120 |        | AM      | 6              |     | ,2             |
| 00638 | 14 | 00006 | 00693 | 16130 |        | CM      | 6              |     | ,INOUT+288     |
| 00650 | 47 | 00000 | 01300 | 16140 |        | BL      |                |     |                |
| 00662 | 49 | 07650 | 00000 | 16150 |        | B       | 7650,03        |     |                |
| 00675 |    | 00002 |       | 16160 |        | DC      | 2              |     | ,1             |
| 00404 |    |       |       | 16170 |        | DORG    | 404            |     |                |
| 00405 |    | 00146 | X2    | 16180 | INOUT  | DAS     | 146            |     |                |
| 00700 |    | 00005 |       | 16190 | BSEGA  | DS      | 5              |     |                |
| 00709 |    | 00009 |       | 16200 | DIVDIG | DC      | 9              |     | ,011223344     |
| 00710 | 47 | 00570 | 01900 | 16210 | ROWCK  | BNI     | TIGEX+20       |     | ,1900          |
| 00722 | 43 | 00766 | 00299 | 16220 |        | BD      | ROWCK1         |     | ,299           |
| 00734 | 39 | 00749 | 00100 | 16230 |        | WATY    | HDER           |     |                |
| 00746 | 48 | 00000 | 00000 | 16240 |        | H       |                |     |                |
| 00749 |    | 00005 | X2    | 16250 | HDER   | DAC     | 5              |     | ,HDER1         |
| 00758 | 49 | 01954 |       | 16260 |        | B7      | TIGER          |     | ,*-8           |
| 00766 | 25 | 00732 | 00733 | 16270 | ROWCK1 | TD      | ROWCK+22       |     | ,ROWCK+23      |
| 00778 | 46 | 00790 | 00600 | 16280 |        | BI      | **12           |     | ,600           |
| 00790 | 46 | 00802 | 01600 | 16290 |        | BI      | **12           |     | ,1600          |
| 00802 | 46 | 00814 | 01700 | 16300 |        | BI      | **12           |     | ,1700          |
| 00814 | 49 | 00000 |       | 16310 | ROWBR  | B7      |                |     |                |
| 00830 |    | 00010 |       | 16320 |        | DS      | 10             |     |                |
| 00832 | 26 | 00891 | 00831 | 16330 | FSB    | TF      | FAD-1          |     | ,*-1           |
| 00844 | 32 | 00891 | 00000 | 16340 |        | SF      | FAD-1          |     | ,, SUBTRACT    |
| 00855 |    | 00000 |       | 16350 | BSTBG  | DS      |                |     | ,*             |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL                  | MNEM | OPERANDS       | AND REMARKS                     |
|-------|----|-------|-------|-------|------------------------|------|----------------|---------------------------------|
| 00856 | 44 | 00892 | 00831 | 16360 |                        | BNF  | FAD ,FSB-1     | ,, REVERSE SIGN                 |
| 00868 | 33 | 00891 | 00000 | 16370 |                        | CF   | FAD-1          |                                 |
| 00879 |    | 00000 |       | 16380 | COMBEG                 | DS   |                | ,*                              |
| 00880 | 41 | 00000 | 00000 | 16390 |                        | NOP  |                |                                 |
| 00892 | 16 | 06570 | 00891 | 16400 | FAD                    | TFM  | RT+6 ,*-1      |                                 |
| 00904 | 49 | 06532 |       | 16410 |                        | B7   | TVAR           |                                 |
| 00912 | 15 | 01127 | 00005 | 16420 |                        | TDM  | ADCT2-36 ,5    |                                 |
| 00924 | 16 | 01314 | 00061 | 16430 |                        | TFM  | FAD3+30 ,FAC+1 |                                 |
| 00936 | 24 | 00052 | 00883 | 16440 |                        | C    | FAC-8 ,FAD-9   |                                 |
| 00948 | 46 | 01164 | 01200 | 16450 |                        | BE   | FAD1-36        |                                 |
| 00960 | 46 | 01008 | 01300 | 16460 |                        | BNL  | **+48          |                                 |
| 00972 | 26 | 00831 | 00060 | 16470 |                        | TF   | FSB-1 ,FAC     | ,, LARGER OPERAND TO FAC        |
| 00984 | 26 | 00060 | 00891 | 16480 |                        | TF   | FAC ,FAD-1     |                                 |
| 00996 | 26 | 00891 | 00831 | 16490 |                        | TF   | FAD-1 ,FSB-1   |                                 |
| 01008 | 22 | 00883 | 00052 | 16500 |                        | S    | FAD-9 ,FAC-8   | ,, COMPUTE RIGHT SHIFT          |
| 01020 | 14 | 00883 | 00000 | 16510 |                        | CM   | FAD-9 ,8       | ,1011                           |
| 01032 | 47 | 01488 | 01300 | 16520 |                        | BL   | ENDD           | ,, EXIT ON SHIFT OVER 8         |
| 01044 | 26 | 01211 | 01163 | 16530 |                        | TF   | FAD1+11 ,ADCT2 |                                 |
| 01056 | 32 | 01207 | 00000 | 16540 |                        | SF   | FAD1+7         |                                 |
| 01067 |    | 00000 |       | 16550 | PRBS                   | DS   |                | ,*                              |
| 01068 | 21 | 01211 | 00883 | 16560 |                        | A    | FAD1+11 ,FAD-9 |                                 |
| 01080 | 28 | 00891 | 00891 | 16570 |                        | LD   | FAD-1 ,FAD-1   |                                 |
| 01092 | 44 | 01116 | 00099 | 16580 |                        | BNF  | **+24 ,99      |                                 |
| 01104 | 32 | 01211 | 00000 | 16590 |                        | SF   | FAD1+11 ,      | ,6                              |
| 01116 | 15 | 00061 | 00005 | 16600 |                        | TDM  | FAC+1 ,5       |                                 |
| 01128 | 28 | 00060 | 00060 | 16610 |                        | LD   | FAC ,FAC       |                                 |
| 01140 | 44 | 01164 | 00099 | 16620 |                        | BNF  | **+24 ,99      |                                 |
| 01152 | 32 | 00061 | 00892 | 16630 |                        | SF   | FAC+1 ,FAD     | ,5                              |
| 01163 |    | 00000 |       | 16640 | ADCT2                  | DS   |                | ,*                              |
| 01164 | 26 | 00831 | 00052 | 16650 |                        | TF   | FSB-1 ,FAC-8   | ,, SAVE EXPONENT AND            |
| 01176 | 16 | 00052 | 00000 | 16660 |                        | TFM  | FAC-8 ,0       | ,10, EXPAND FIELDS              |
| 01188 | 15 | 00883 | 00000 | 16670 |                        | TDM  | FAD-9 ,0       | ,11                             |
| 01200 | 21 | 00060 | 00891 | 16680 | FAD1                   | A    | FAC ,FAD-1     | ,27, ADD WITH SHIFT             |
| 01212 | 25 | 00099 | 01206 | 16690 |                        | TD   | 99 ,FAD1+6     | ,11                             |
| 01224 | 14 | 00060 | 00000 | 16700 |                        | CM   | FAC ,          | ,10                             |
| 01236 | 26 | 01211 | 01271 | 16710 |                        | TF   | FAD1+11 ,ADCT1 |                                 |
| 01248 | 46 | 01376 | 01200 | 16720 |                        | BE   | ZERFAC         |                                 |
| 01260 | 33 | 00060 | 00891 | 16730 |                        | CF   | FAC ,FAD-1     | ,5                              |
| 01271 |    | 00000 |       | 16740 | ADCT1                  | DS   |                | ,*                              |
| 01272 | 46 | 01284 | 01400 | 16750 |                        | BV   | **+12          |                                 |
| 01284 | 43 | 01396 | 00052 | 16760 | FAD3                   | BD   | FAD2 ,FAC-8    | ,, BRANCH FOR CARRY             |
| 01296 | 43 | 01440 | 00053 | 16770 |                        | BD   | ENDD-48 ,FAC-7 | ,, NORMALIZING LOOP             |
| 01308 | 31 | 00061 | 01354 | 16780 |                        | TR   | FAC+1 ,FILL    |                                 |
| 01320 | 31 | 00053 | 00054 | 16790 |                        | TR   | FAC-7 ,FAC-6   |                                 |
| 01332 | 12 | 00831 | 00001 | 16800 |                        | SM   | FSB-1 ,1       | ,10, CORRECT EXPONENT           |
| 01344 | 46 | 01296 | 01300 | 16810 |                        | BNN  | **+48 ,        | ,, TEST FOR UNDERFLOW           |
| 01355 |    | 00001 |       | 16820 |                        | DC   | 1 ,            | ,*                              |
| 01354 |    | 00000 |       | 16830 | FILL                   | DS   |                | ,*-1 ,FILL DIGIT MAY BE CHANGED |
| 01356 | 16 | 03285 | 05148 | 16840 | ERO                    | TFM  | ERMA ,UNFLM-1  |                                 |
| 01368 | 49 | 06588 |       | 16850 |                        | B7   | ERR            |                                 |
| 01376 | 26 | 00060 | 01868 | 16860 | ZERFAC                 | TF   | FAC ,FZEREC-9  | ,, ZERO RESULT                  |
| 01388 | 49 | 01488 |       | 16870 |                        | B7   | ENDD           |                                 |
| 01396 | 11 | 00060 | 00005 | 16880 | FAD2                   | AM   | FAC ,5         | ,10, ROUND                      |
| 01408 | 26 | 00060 | 00059 | 16890 |                        | TF   | FAC ,FAC-1     | ,, SHIFT FOR CARRY              |
| 01420 | 11 | 00831 | 00001 | 16900 |                        | AM   | FSB-1 ,1       | ,10                             |
| 01432 | 49 | 01284 |       | 16910 |                        | B7   | FAD3           |                                 |
| 01440 | 26 | 00052 | 00831 | 16920 |                        | TF   | FAC-8 ,FSB-1   |                                 |
| 01452 | 46 | 06588 | 01400 | 16930 |                        | BV   | ERR            |                                 |
| 01464 | 44 | 01488 | 00099 | 16940 |                        | BNF  | **+24 ,99      |                                 |
| 01476 | 32 | 00060 | 00000 | 16950 |                        | SF   | FAC            |                                 |
| 01488 | 49 | 01496 |       | 16960 | ENDD                   | B7   | **+8           |                                 |
| 01496 | 42 | 00000 | 00000 | 16970 | BB                     | BB   |                |                                 |
|       |    |       |       | 16980 | *                      |      |                |                                 |
|       |    |       |       | 16990 | *                      |      |                |                                 |
|       |    |       |       | 17000 | *                      |      |                |                                 |
|       |    |       |       | 17010 | *                      |      |                |                                 |
|       |    |       |       | 17020 | FIXED POINT ARITHMETIC |      |                |                                 |
| 01508 | 16 | 06570 | 01507 | 17020 | FXS                    | TFM  | RT+6 ,*-1      |                                 |
| 01520 | 49 | 06532 |       | 17030 |                        | B7   | TVAR           |                                 |
| 01528 | 22 | 00060 | 01507 | 17040 |                        | S    | FAC ,FXS-1     |                                 |
| 01540 | 49 | 01488 | 00000 | 17050 |                        | B    | ENDD           |                                 |
| 01556 |    | 00005 |       | 17060 |                        | DS   | 5              |                                 |
| 01558 | 16 | 06570 | 01557 | 17070 | FXA                    | TFM  | RT+6 ,*-1      |                                 |
| 01570 | 49 | 06532 |       | 17080 |                        | B7   | TVAR           |                                 |
| 01578 | 21 | 00060 | 01557 | 17090 |                        | A    | FAC ,FXA-1     |                                 |
| 01590 | 49 | 01488 | 00000 | 17100 |                        | B    | ENDD           |                                 |
| 01606 |    | 00005 |       | 17110 |                        | DS   | 5              |                                 |
| 01608 | 16 | 06570 | 01607 | 17120 | FXM                    | TFM  | RT+6 ,*-1      |                                 |
| 01620 | 49 | 06532 |       | 17130 |                        | B7   | TVAR           |                                 |
| 01628 | 23 | 00060 | 01607 | 17140 |                        | M    | FAC ,FXM-1     |                                 |
| 01640 | 32 | 00090 | 00000 | 17150 |                        | SF   | 90             |                                 |
| 01652 | 26 | 00060 | 00099 | 17160 |                        | TF   | FAC,99         |                                 |
| 01664 | 49 | 01488 | 00000 | 17170 |                        | B    | ENDD           |                                 |
| 01680 |    | 00005 |       | 17180 |                        | DS   | 5              |                                 |
| 01682 | 26 | 01717 | 00060 | 17190 | FXDR                   | TF   | FXD-1,FAC      |                                 |
| 01694 | 26 | 00060 | 01681 | 17200 |                        | TF   | FAC,*-13       |                                 |
| 01706 | 41 | 00000 | 00000 | 17210 |                        | NOP  |                |                                 |
| 01718 | 16 | 06570 | 01717 | 17220 | FXD                    | TFM  | RT+6 ,*-1      |                                 |
| 01730 | 49 | 06532 |       | 17230 |                        | B7   | TVAR           |                                 |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM                               | OPERANDS AND REMARKS             |
|-------|----|-------|-------|-------|--------|------------------------------------|----------------------------------|
| 01738 | 14 | 01717 | 00000 | 17240 | CM     | FXD-1                              | , ,10                            |
| 01750 | 46 | 06588 | 01200 | 17250 | BE     | ERR                                |                                  |
| 01762 | 28 | 00099 | 00060 | 17260 | LD     | 99,FAC                             |                                  |
| 01774 | 29 | 00090 | 01717 | 17270 | D      | 90                                 | ,FXD-1                           |
| 01786 | 26 | 00060 | 00089 | 17280 | TF     | FAC                                | ,89                              |
| 01798 | 49 | 01488 |       | 17290 | B7     | ENDD                               | , ,5                             |
|       |    |       |       | 17300 | *      |                                    |                                  |
|       |    |       |       | 17310 | *      |                                    |                                  |
|       |    |       |       | 17320 | *      | NEGATION ROUTINE                   |                                  |
|       |    |       |       | 17330 | *      |                                    |                                  |
| 01806 | 44 | 01476 | 00060 | 17340 | RVSgn  | BNF ENDD-12,FAC                    |                                  |
| 01818 | 33 | 00060 | 00000 | 17350 | CF     | FAC                                |                                  |
| 01830 | 49 | 01488 | 00000 | 17360 | B      | ENDD                               |                                  |
| 01837 |    |       |       | 17370 | DORG   | --4                                |                                  |
|       |    |       |       | 17380 | *      |                                    |                                  |
|       |    |       |       | 17390 | *      |                                    |                                  |
|       |    |       |       | 17400 | *      | SYMBOLS AND CONSTANTS              |                                  |
|       |    |       |       | 17410 | *      |                                    |                                  |
| 00060 |    | 00000 |       | 17420 | FAC    | DS                                 | ,60                              |
| 01846 |    | 00010 |       | 17430 | FLTONE | DC                                 | 10,5110000000                    |
| 01858 |    | 00012 |       | 17440 | FNINES | DC                                 | 12,999999999999                  |
| 01877 |    | 00019 |       | 17450 | FZERE  | DC                                 | 19,1                             |
| 01888 |    | 00011 |       | 17460 | LOG10  | DC                                 | 11,2302585093                    |
| 01902 |    | 00014 |       | 17470 | ONE    | DC                                 | 14,10000000000000                |
| 01907 |    | 00005 |       | 17480 | DC     |                                    | 5,99995                          |
| 01910 |    | 00003 |       | 17490 | DC     |                                    | 3,0                              |
| 01916 |    | 00006 |       | 17500 | DC     |                                    | 6,999500                         |
| 01918 |    | 00002 |       | 17510 | DC     |                                    | 2,0                              |
| 01925 |    | 00007 |       | 17520 | DC     |                                    | 7,9950331                        |
| 01926 |    | 00001 |       | 17530 | DC     |                                    | 1,0                              |
| 01934 |    | 00008 |       | 17540 | LOG11  | DC                                 | 8,95310180                       |
| 01943 |    | 00009 |       | 17550 | LOG2   | DC                                 | 9,693147181                      |
| 01953 |    | 00010 |       | 17560 | FIXER  | DC                                 | 10,5810000000                    |
| 01954 | 16 | 02028 | ±2994 | 17570 | TIGER  | TFM                                | CALL+42 ,12994 ,711,NORMAL       |
| 01966 | 31 | 00000 | 01986 | 17580 | TR     |                                    | ,CALL                            |
| 01978 | 49 | 00000 |       | 17590 | B7     |                                    |                                  |
| 01986 | 34 | 00044 | 00701 | 17600 | CALL   | K                                  | 44 ,701                          |
| 01998 | 32 | 00000 | 00000 | 17610 | SF     |                                    |                                  |
| 02010 | 36 | 00044 | 00702 | 17620 | RN     | 44                                 | ,702                             |
| 02022 | 49 | 12999 | 00000 | 17630 | LNKFLG | B                                  | 12999 , ,6                       |
| 02030 |    |       |       | 17640 | DORG   | --3                                |                                  |
| 02045 |    | 00016 |       | 17650 | ABNDCF | DC                                 | 16 ,79804125005000               |
| 02046 |    | 00001 |       | 17660 | DCFSG  | DC                                 | 1 ,0                             |
| 02059 |    | 00013 |       | 17670 | DC     | 13                                 | ,20000000                        |
|       |    |       |       | 17680 | *      |                                    |                                  |
|       |    |       |       | 17690 | *      |                                    |                                  |
|       |    |       |       | 17700 | *      | EXPONENTIATION ROUTINES            |                                  |
|       |    |       |       | 17710 | *      |                                    |                                  |
| 02069 |    | 00010 |       | 17720 | DS     | 10                                 |                                  |
| 02070 | 26 | 02129 | 02069 | 17730 | FAXIN  | TF                                 | FAXI-1 ,*-1                      |
| 02082 | 32 | 02129 | 00000 | 17740 | SF     | FAXI-1                             |                                  |
| 02094 | 44 | 02118 | 02069 | 17750 | BNF    | **24                               | ,FAXIN-1                         |
| 02106 | 33 | 02129 | 00000 | 17760 | CF     | FAXI-1                             |                                  |
| 02118 | 41 | 00000 | 00000 | 17770 | NOP    |                                    |                                  |
| 02130 | 16 | 06570 | 02129 | 17780 | FAXI   | TFM                                | RT+6 ,*-1                        |
| 02142 | 49 | 06532 |       | 17790 | B7     | TVAR                               |                                  |
| 02150 | 14 | 02129 | 00000 | 17800 | CM     | FAXI-1                             | , ,10                            |
| 02162 | 46 | 03034 | 01200 | 17810 | BE     | SETONE                             |                                  |
| 02174 | 46 | 02494 | 01100 | 17820 | BP     | FAXI1                              |                                  |
| 02186 | 33 | 02129 | 00000 | 17830 | CF     | FAXI-1                             |                                  |
| 02198 | 16 | 01494 | 02494 | 17840 | TFM    | ENDD+6                             | ,FAXI1                           |
| 02210 | 26 | 02233 | 01846 | 17850 | TF     | FDVR-1,FLTONE                      |                                  |
| 02222 | 41 | 00000 | 00000 | 17860 | NOP    |                                    |                                  |
|       |    |       |       | 17870 | *      |                                    |                                  |
|       |    |       |       | 17880 | *      |                                    |                                  |
|       |    |       |       | 17890 | *      | FLOATING DIVIDE AND REVERSE DIVIDE |                                  |
|       |    |       |       | 17900 | *      |                                    |                                  |
| 02234 | 26 | 02269 | 00060 | 17910 | FDVR   | TF                                 | FDV-1,FAC,, INTERCHANGE OPERANDS |
| 02246 | 26 | 00060 | 02233 | 17920 | TF     | FAC,FDVR-1                         |                                  |
| 02258 | 41 | 00000 | 00000 | 17930 | NOP    |                                    |                                  |
| 02270 | 16 | 06570 | 02269 | 17940 | FDV    | TFM                                | RT+6 ,*-1                        |
| 02282 | 49 | 06532 |       | 17950 | B7     | TVAR                               |                                  |
| 02290 | 32 | 00053 | 00000 | 17960 | SF     | FAC-7                              |                                  |
| 02302 | 25 | 02369 | 02262 | 17970 | TD     | DVRND+11                           | ,FDV-8,,ROUNDING                 |
| 02314 | 28 | 00091 | 00060 | 17980 | LD     | 91,FAC                             |                                  |
| 02326 | 43 | 02346 | 02262 | 17990 | BD     | DVRND-12                           | ,FDV-8                           |
| 02338 | 49 | 06588 |       | 18000 | B7     | ERR                                |                                  |
| 02346 | 32 | 02262 | 00000 | 18010 | SF     | FDV-8                              |                                  |
| 02358 | 25 | 00092 | 00700 | 18020 | DVRND  | TD                                 | 92 ,DIVDIG-9                     |
| 02370 | 29 | 00091 | 02269 | 18030 | D      | 91,FDV-1,,                         | DIVIDE                           |
| 02382 | 46 | 01376 | 01200 | 18040 | BE     | ZERFAC                             |                                  |
| 02394 | 25 | 00099 | 00091 | 18050 | TD     | 99,91,,                            | SAVE SIGN                        |
| 02406 | 22 | 00052 | 02261 | 18060 | S      | FAC-8,FDV-9,,                      | SUBTRACT EXPONENTS               |
| 02418 | 43 | 02462 | 00083 | 18070 | BD     | FDV1,83                            |                                  |
| 02430 | 32 | 00084 | 00000 | 18080 | SF     | 84,,,                              | LEADING ZERO                     |
| 02442 | 16 | 02753 | 00050 | 18090 | TFM    | FMP-9,50,10,SET EXP ADJUST         |                                  |
| 02454 | 49 | 02934 |       | 18100 | B7     | FMP2-12                            |                                  |
| 02462 | 26 | 00060 | 00090 | 18110 | FDV1   | TF                                 | FAC,90,, NON-ZERO LEADING DIGIT  |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS             |
|-------|----|-------|-------|-------|--------|------|----------------------------------|
| 02474 | 16 | 02753 | 00051 | 18120 |        | TFM  | FMP-9,51,10, SET EXP ADJUST      |
| 02486 | 49 | 02946 |       | 18130 |        | B7   | FMP2,,, GO TO TEST AND END       |
|       |    |       |       | 18140 | *      |      |                                  |
|       |    |       |       | 18150 | *      |      |                                  |
| 02494 | 26 | 02761 | 00060 | 18160 | FAX11  | TF   | FMP-1,FAC                        |
| 02506 | 16 | 01494 | 02518 | 18170 |        | TFM  | ENDD+6,*,12,,SET RETURN ADDRESS  |
| 02518 | 12 | 02129 | 00001 | 18180 |        | SM   | FAX1-1,1,10                      |
| 02530 | 46 | 02762 | 01100 | 18190 |        | BP   | FMP                              |
| 02542 | 16 | 01494 | 01496 | 18200 |        | TFM  | ENDD+6, BB,, RESTORE COMMON EXIT |
| 02554 | 42 | 00000 | 00000 | 18210 |        | BB   |                                  |
| 02566 | 26 | 02625 | 02565 | 18220 | FAXBN  | TF   | FAXB-1 ,*-1                      |
| 02578 | 32 | 02625 | 00000 | 18230 |        | SF   | FAXB-1                           |
| 02590 | 44 | 02614 | 02565 | 18240 |        | BNF  | *+24 ,FAXBN-1                    |
| 02602 | 33 | 02625 | 00000 | 18250 |        | CF   | FAXB-1                           |
| 02614 | 41 | 00000 | 00000 | 18260 |        | NOP  |                                  |
| 02626 | 16 | 06570 | 02625 | 18270 | FAXB   | TFM  | RT+6 ,*-1                        |
| 02638 | 49 | 06532 |       | 18280 |        | B7   | TVAR                             |
| 02646 | 11 | 02625 | 00000 | 18290 |        | AM   | FAXB-1 , ,10                     |
| 02658 | 46 | 03034 | 01200 | 18300 |        | BE   | SETONE                           |
| 02670 | 11 | 00060 | 00000 | 18310 |        | AM   | FAC , ,10                        |
| 02682 | 46 | 01376 | 01200 | 18320 |        | BE   | ZERFAC                           |
| 02694 | 26 | 19929 | 00060 | 18330 | CZ1    | TF   | LTAB-1 ,FAC                      |
| 02706 | 16 | 01494 | 02726 | 18340 |        | TFM  | ENDD+6,*,20,,SET RETURN ADDRESS  |
| 02718 | 49 | 19930 |       | 18350 | CZ2    | B7   | LTAB                             |
| 02726 | 26 | 02761 | 02625 | 18360 |        | TF   | FMP-1,FAXB-1                     |
| 02738 | 16 | 01494 | 03002 | 18370 |        | TFM  | ENDD+6,FAXB1,,SET RETURN ADDRESS |
| 02750 | 41 | 00000 | 00000 | 18380 |        | NOP  |                                  |
|       |    |       |       | 18390 | *      |      |                                  |
|       |    |       |       | 18400 | *      |      |                                  |
|       |    |       |       | 18410 | *      |      | FLOATING MULTIPLY                |
|       |    |       |       | 18420 | *      |      |                                  |
| 02762 | 16 | 06570 | 02761 | 18430 | FMP    | TFM  | RT+6 ,*-1                        |
| 02774 | 49 | 06532 |       | 18440 |        | B7   | TVAR                             |
| 02782 | 32 | 00053 | 00000 | 18450 |        | SF   | FAC-7                            |
| 02794 | 32 | 02754 | 00000 | 18460 |        | SF   | FMP-8                            |
| 02806 | 23 | 00060 | 02761 | 18470 |        | M    | FAC,FMP-1,, MULTIPLY             |
| 02818 | 46 | 01376 | 01200 | 18480 |        | BE   | ZERFAC                           |
| 02830 | 43 | 02910 | 00084 | 18490 |        | BD   | FMP1,84,, TEST LEADING DIGIT     |
| 02842 | 11 | 00093 | 00005 | 18500 |        | AM   | 93,5,, ROUND PRODUCT             |
| 02854 | 43 | 02922 | 00084 | 18510 |        | BD   | FMP1+12,84,, BRANCH IF CARRY     |
| 02866 | 32 | 00085 | 00000 | 18520 |        | SF   | 85                               |
| 02878 | 12 | 00052 | 00051 | 18530 |        | SM   | FAC-8,51,10, ADJUST EXPONENT     |
| 02890 | 26 | 00060 | 00092 | 18540 |        | TF   | FAC,92                           |
| 02902 | 49 | 02946 |       | 18550 |        | B7   | FMP2                             |
| 02910 | 11 | 00092 | 00005 | 18560 | FMP1   | AM   | 92,5,, ROUND PRODUCT             |
| 02922 | 12 | 00052 | 00050 | 18570 |        | SM   | FAC-8,50,10, ADJUST EXPONENT     |
| 02934 | 26 | 00060 | 00091 | 18580 |        | TF   | FAC,91                           |
| 02946 | 46 | 02958 | 01400 | 18590 | FMP2   | BV   | *+12                             |
| 02958 | 21 | 00052 | 02753 | 18600 |        | A    | FAC-8 ,FMP-9                     |
| 02970 | 33 | 00053 | 00000 | 18610 |        | CF   | FAC-7                            |
| 02982 | 46 | 01452 | 01300 | 18620 |        | BNN  | ENDD-36                          |
| 02994 | 49 | 01356 |       | 18630 |        | B7   | ERO                              |
|       |    |       |       | 18640 | *      |      |                                  |
|       |    |       |       | 18650 | *      |      |                                  |
| 03002 | 16 | 01494 | 01496 | 18660 | FAXB1  | TFM  | ENDD+6, BB,, RESTORE COMMON EXIT |
| 03014 | 26 | 19949 | 00060 | 18670 | CZ3    | TF   | ETAB-1 ,FAC                      |
| 03026 | 49 | 19950 |       | 18680 | CZ4    | B7   | ETAB                             |
| 03034 | 26 | 00060 | 01846 | 18690 | SETONE | TF   | FAC,FLTONE                       |
| 03046 | 49 | 01488 |       | 18700 |        | B7   | ENDD , ,5                        |
|       |    |       |       | 18710 | *      |      |                                  |
|       |    |       |       | 18720 | *      |      |                                  |
|       |    |       |       | 18730 | *      |      | FIX A FLOATING POINT NUMBER      |
|       |    |       |       | 18740 | *      |      |                                  |
| 03054 | 14 | 00052 | 00058 | 18750 | FIX    | CM   | FAC-8 ,58 ,10                    |
| 03066 | 45 | 03086 | 00060 | 18760 |        | BNR  | *+20 ,FAC                        |
| 03078 | 49 | 06576 |       | 18770 |        | B7   | UDV                              |
| 03086 | 46 | 06588 | 01100 | 18780 |        | BH   | ERR                              |
| 03098 | 47 | 03130 | 01200 | 18790 |        | BNE  | FIX3                             |
| 03110 | 16 | 00052 | 00000 | 18800 |        | TFM  | FAC-8,00,10                      |
| 03122 | 49 | 01488 |       | 18810 |        | B7   | ENDD                             |
| 03130 | 26 | 00891 | 01953 | 18820 | FIX3   | TF   | FAD-1 ,FIXER                     |
| 03142 | 15 | 01127 | 00000 | 18830 |        | TDM  | ADCT2-36 ,0                      |
| 03154 | 16 | 01494 | 03198 | 18840 |        | TFM  | ENDD+6,*,44,,SET RETURN ADDRESS  |
| 03166 | 44 | 00924 | 00060 | 18850 |        | BNF  | FAD+32 ,FAC                      |
| 03178 | 32 | 00891 | 00000 | 18860 |        | SF   | FAD-1                            |
| 03190 | 49 | 00924 |       | 18870 |        | B7   | FAD+32                           |
| 03198 | 16 | 01494 | 01496 | 18880 |        | TFM  | ENDD+6, BB,, RESTORE COMMON EXIT |
| 03210 | 12 | 00053 | 00581 | 18890 |        | SM   | FAC-7 ,581 ,9                    |
| 03222 | 49 | 01488 |       | 18900 |        | B7   | ENDD , ,5                        |
|       |    |       |       | 18910 | *      |      |                                  |
|       |    |       |       | 18920 | *      |      |                                  |
|       |    |       |       | 18930 | *      |      | FIX A FIXED POINT NUMBER         |
|       |    |       |       | 18940 | *      |      |                                  |
| 03230 | 45 | 03250 | 00060 | 18950 | FLOAT  | BNR  | *+20 ,FAC                        |
| 03242 | 49 | 06576 |       | 18960 |        | B7   | UDV                              |
| 03250 | 16 | 00831 | 00060 | 18970 |        | TFM  | FSB-1 ,60 ,10                    |
| 03262 | 28 | 00062 | 00060 | 18980 |        | LD   | FAC+2 ,FAC                       |
| 03274 | 33 | 00053 | 05680 | 18990 |        | CF   | FAC-7 ,OFLM-1 ,7                 |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL              | MNEM | OPERANDS       | AND REMARKS  |
|-------|----|-------|-------|-------|--------------------|------|----------------|--------------|
| 03285 |    | 00000 |       | 19000 | ERMA               | DS   |                | ,*           |
| 03286 | 16 | 00052 | 00000 | 19010 |                    | TFM  | FAC-8          | ,10          |
| 03298 | 16 | 01314 | 00063 | 19020 |                    | TFM  | FAD3+30        | ,FAC+3       |
| 03310 | 14 | 00062 | 00000 | 19030 |                    | CM   | FAC+2,,10      |              |
| 03322 | 49 | 01248 | 00000 | 19040 |                    | B    | FAD1+48        |              |
|       |    |       |       | 19050 | * TRACE SUBROUTINE |      |                |              |
| 03334 | 16 | 03518 | 91500 | 19060 | TRFX               | TFM  | TRFMT+5        | ,91500 ,711  |
| 03346 | 26 | 03369 | 03333 | 19070 |                    | TF   | TRFL-1         | ,TRFX-1      |
| 03358 | 49 | 03382 | 00000 | 19080 |                    | B    | TRFL+12        |              |
| 03370 | 16 | 03518 | 51500 | 19090 | TRFL               | TFM  | TRFMT+5        | ,51508 ,711  |
| 03382 | 26 | 03369 | 00060 | 19100 |                    | TF   | TRFL-1         | ,FAC ,6      |
| 03394 | 47 | 03404 | 00442 | 19110 |                    | BN1  | **10           | ,442         |
| 03406 | 44 | 03478 | 04158 | 19120 |                    | BNF  | TR1            | ,TRCX        |
| 03418 | 26 | 04158 | 04030 | 19130 |                    | TF   | TRCX           | ,STFMT       |
| 03430 | 26 | 04475 | 03551 | 19140 |                    | TF   | TYP            | ,TRFM+9      |
| 03442 | 47 | 03466 | 00200 | 19150 |                    | BNC2 | **24           |              |
| 03454 | 15 | 04475 | 00009 | 19160 |                    | TDM  | TYP            | ,9 ,11       |
| 03466 | 16 | 04424 | 00405 | 19170 |                    | TFM  | NEXT           | ,INOUT       |
| 03478 | 16 | 04121 | 03369 | 19180 | TR1                | TFM  | LOOK-1         | ,TRFL-1 ,711 |
| 03490 | 31 | 04761 | 04233 | 19190 |                    | TR   | RTPARX         | ,RSST+7      |
| 03502 | 49 | 04122 | 00000 | 19200 |                    | B    | LOOK           |              |
| 03509 |    |       |       | 19210 |                    | DORG | **4            |              |
| 03513 |    | 00005 | 04784 | 19220 | TRFMT              | DSA  | LTPAR          |              |
| 03518 |    | 00005 |       | 19230 |                    | DC   | 5              | , -90500     |
| 03523 |    | 00005 |       | 19240 |                    | DC   | 5              | , -90500     |
| 03528 |    | 00005 | 04226 | 19250 |                    | DSA  | RSST           |              |
| 03530 |    | 00002 |       | 19260 |                    | DC   | 2              | ,3           |
| 03535 |    | 00005 | 03513 | 19270 |                    | DSA  | TRFMT          | ,RTPAR       |
| 03540 |    | 00005 | 04728 |       |                    |      |                |              |
| 03542 | 39 | 00405 | 00400 | 19280 | TRFM               | WACD | INOUT          | , ,0         |
| 03552 |    |       |       | 19290 |                    | DORG | **1            |              |
| 03554 |    | 00003 |       | 19300 | OTSV               | DC   | 3              | ,137         |
| 03555 |    | 00005 | 00405 | 19310 |                    | DSSA | INOUT          |              |
| 03560 |    | 00004 |       | 19320 |                    | DSC  | 4              | ,4'          |
| 03569 |    | 00006 |       | 19330 | PINS               | DS   | 6              |              |
| 03570 | 16 | 03285 | 05374 | 19340 | ERIN               | TFM  | ERMA           | ,INVAR-1 ,07 |
| 03582 | 49 | 06588 | 00000 | 19350 |                    | B    | ERR            |              |
| 03594 | 44 | 03626 | 03592 | 19360 | DTRB               | BNF  | STOPSR         | ,DTRB-2      |
| 03606 | 16 | 07597 | 05720 | 19370 |                    | TFM  | ESMA           | ,ENDM        |
| 03618 | 49 | 06588 |       | 19380 |                    | B7   | ERR            |              |
| 03626 | 44 | 03658 | 03590 | 19390 | STOPSR             | BNF  | PAUSS          | ,DTRB-4      |
| 03638 | 16 | 07597 | 05146 | 19400 |                    | TFM  | ESMA           | ,STM         |
| 03650 | 49 | 06588 |       | 19410 |                    | B7   | ERR            |              |
| 03658 | 47 | 01954 | 00300 | 19420 | PAUSS              | BNC3 | TIGER          |              |
| 03670 | 48 | 00000 | 00000 | 19430 |                    | H    |                |              |
| 03673 |    | 00005 | X2    | 19440 | UDVM               | DAC  | 5,UNDV',*-8    |              |
| 03682 | 42 | 00000 | 00000 | 19450 |                    | BB   |                |              |
| 03690 |    |       |       | 19460 |                    | DORG | **3            |              |
| 03690 | 45 | 03710 | 03689 | 19470 | IXCK               | BNR  | **20,IXCK-1,11 |              |
| 03702 | 49 | 06576 |       | 19480 |                    | B7   | UDV            |              |
| 03710 | 14 | 03689 | 00000 | 19490 |                    | CM   | IXCK-1,,610    |              |
| 03722 | 46 | 01496 | 01100 | 19500 |                    | BH   | BB             |              |
| 03734 | 16 | 03285 | 05690 | 19510 | IXERR              | TFM  | ERMA           | ,IXERM-1     |
| 03746 | 49 | 06588 | 00000 | 19520 |                    | B    | ERR            |              |
| 03758 | 24 | 03689 | 03757 | 19530 | IXMX               | C    | IXCK-1         | ,IXMX-1 ,6   |
| 03770 | 46 | 03734 | 01100 | 19540 |                    | BH   | IXERR          |              |
| 03782 | 42 | 00000 | 00000 | 19550 |                    | BB   |                |              |
| 03790 |    |       |       | 19560 |                    | DORG | **3            |              |
|       |    |       |       | 19570 | *                  |      |                |              |
|       |    |       |       | 19580 | *                  |      |                |              |
|       |    |       |       | 19590 | *                  |      |                |              |
|       |    |       |       | 19600 | *                  |      |                |              |
|       |    |       |       | 19610 | IN/OUT SUBROUTINES |      |                |              |
| 03790 | 15 | 03562 | 00005 | 19610 | RACD               | TDM  | OTSV+8         | ,5 ,0        |
| 03802 | 26 | 03569 | 03790 | 19620 |                    | TF   | PINS           | ,RACD        |
| 03814 | 33 | 04018 | 00000 | 19630 |                    | CF   | LTX            |              |
| 03825 |    | 00000 |       | 19640 | BOX                | DS   |                | ,*           |
| 03826 | 16 | 03554 | 00237 | 19650 |                    | TFM  | OTSV           | ,237 ,9      |
| 03838 | 49 | 04030 | 00000 | 19660 |                    | B    | STFMT          |              |
| 03850 | 16 | 03554 | 00241 | 19670 | RERD               | TFM  | OTSV           | ,241 ,09     |
| 03862 | 26 | 03569 | 03850 | 19680 |                    | TF   | PINS           | ,RERD        |
| 03874 | 49 | 04030 | 00000 | 19690 |                    | B    | STFMT          |              |
| 03886 | 15 | 03562 | 00001 | 19700 | WATYE              | TDM  | OTSV+8         | ,1 ,011      |
| 03898 | 26 | 03569 | 03886 | 19710 |                    | TF   | PINS           | ,WATYE       |
| 03910 | 49 | 04006 | 00000 | 19720 |                    | B    | STFMT-24       |              |
| 03922 | 15 | 03562 | 00001 | 19730 | PRTR               | TDM  | OTSV+8         | ,1 ,011      |
| 03934 | 26 | 03569 | 03922 | 19740 |                    | TF   | PINS           | ,PRTR        |
| 03946 | 47 | 03970 | 00200 | 19750 |                    | BNC2 | **24           |              |
| 03958 | 15 | 03562 | 00009 | 19760 |                    | TDM  | OTSV+8         | ,9 ,11       |
| 03970 | 49 | 04006 | 00000 | 19770 |                    | B    | STFMT-24       |              |
| 03982 | 15 | 03562 | 00004 | 19780 | WACD               | TDM  | OTSV+8         | ,4 ,0        |
| 03994 | 26 | 03569 | 03982 | 19790 |                    | TF   | PINS           | ,WACD        |
| 04006 | 16 | 03554 | 00039 | 19800 |                    | TFM  | OTSV           | ,39 ,10      |
| 04018 | 32 | 04018 | 03508 | 19810 | LTX                | SF   | LTX            | ,TRFMT-5 ,7  |
| 04030 | 16 | 04564 | 04054 | 19820 | STFMT              | TFM  | CMPLT+6        | ,**24        |
| 04042 | 44 | 04382 | 04158 | 19830 |                    | BNF  | SLASH+12       | ,TRCX        |
| 04054 | 71 | 04762 | 04018 | 19840 |                    | MF   | LTPARX         | ,LTX         |
| 04066 | 26 | 04475 | 03562 | 19850 |                    | TF   | TYP            | ,OTSV+8      |
| 04078 | 26 | 04158 | 03569 | 19860 |                    | TF   | TRCX           | ,PINS        |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM                                            | OPERANDS      | AND REMARKS                     |
|-------|----|-------|-------|-------|--------|-------------------------------------------------|---------------|---------------------------------|
| 04090 | 16 | 04424 | 00405 | 19870 |        | TFM                                             | NEXT          | ,INOUT                          |
| 04102 | 16 | 04761 | 00000 | 19880 |        | TFM                                             | RTPARX        | , ,9                            |
| 04114 | 42 | 00000 | 00000 | 19890 |        | BB                                              |               |                                 |
| 04122 |    |       |       | 19900 |        | DORG                                            | *-3           |                                 |
|       |    |       |       | 19910 |        | * ROUTINE THAT DECIPHERS FORMAT SPECIFICATIONS  |               |                                 |
| 04122 | 16 | 04564 | 04646 | 19920 | LOOK   | TFM                                             | CMPLT+6       | ,POST                           |
| 04134 | 11 | 04157 | 00005 | 19930 |        | AM                                              | *+23,5        |                                 |
| 04146 | 26 | 04576 | 00000 | 19940 |        | TF                                              | BRNCH+6       |                                 |
| 04157 |    | 00000 |       | 19950 | PINFMT | DS                                              | ,*            |                                 |
| 04158 | 16 | 04615 | 00034 | 19960 | TRCX   | TFM                                             | STOWX         | ,34 ,01011                      |
| 04170 | 44 | 04570 | 04576 | 19970 |        | BNF                                             | BRNCH,BRNCH+6 |                                 |
|       |    |       |       | 19980 |        | * IF NO FLAG,NUMERIC SPEC. OTHER WISE ( / ) X H |               |                                 |
| 04182 | 44 | 05368 | 04120 | 19990 |        | BNF                                             | NUMBR         | ,LOOK-2                         |
| 04194 | 16 | 04564 | 01496 | 20000 |        | TFM                                             | CMPLT+6       | ,BB                             |
| 04206 | 44 | 01496 | 04466 | 20010 |        | BNF                                             | BB            | ,OUTD                           |
| 04218 | 49 | 04406 |       | 20020 |        | B7                                              | WRITE         |                                 |
| 04226 | 11 | 04157 | 00002 | 20030 | RSST   | AM                                              | PINFMT        | ,2 ,810                         |
| 04235 |    | 00001 |       | 20040 |        | DC                                              | 1             | , ,*-2                          |
| 04238 | 12 | 04760 | 00001 | 20050 |        | SM                                              | CTR           | ,1 ,10                          |
| 04250 | 46 | 04286 | 01100 | 20060 |        | BH                                              | RSAD          |                                 |
| 04262 | 46 | 04318 | 01200 | 20070 |        | BE                                              | ERP           |                                 |
| 04274 | 26 | 04760 | 04157 | 20080 |        | TF                                              | CTR           | ,PINFMT ,11                     |
| 04286 | 11 | 04157 | 00005 | 20090 | RSAD   | AM                                              | PINFMT        | ,5 ,10                          |
| 04298 | 26 | 04157 | 04157 | 20100 |        | TF                                              | PINFMT        | ,PINFMT ,11                     |
| 04310 | 49 | 04122 |       | 20110 |        | B7                                              | LOOK          |                                 |
| 04318 | 11 | 04157 | 00005 | 20120 | ERP    | AM                                              | PINFMT        | ,5 ,10                          |
| 04330 | 49 | 04122 |       | 20130 |        | B7                                              | LOOK          |                                 |
| 04338 | 47 | 04502 | 03400 | 20140 | EOL    | BNI                                             | JEAN,3400     |                                 |
| 04350 | 34 | 00000 | 00971 | 20150 |        | K                                               | ,971          |                                 |
| 04362 | 49 | 04502 |       | 20160 |        | B7                                              | JEAN          |                                 |
| 04370 | 44 | 04466 | 04466 | 20170 | SLASH  | BNF                                             | READ          | ,OUTD                           |
| 04382 | 14 | 04424 | 00405 | 20180 |        | CM                                              | NEXT,INOUT    |                                 |
| 04394 | 46 | 04578 | 01200 | 20190 |        | BE                                              | FLAGS-36      |                                 |
| 04406 | 44 | 04672 | 04475 | 20200 | WRITE  | BNF                                             | CARD          | ,TYP                            |
| 04418 | 16 | 00405 | 00000 | 20210 |        | TFM                                             | INOUT,,10     |                                 |
| 04429 |    | 00001 |       | 20220 |        | DC                                              | 1,*,*         |                                 |
| 04424 |    | 00000 |       | 20230 | NEXT   | DS                                              |               | ,*-5                            |
| 04430 | 25 | 04443 | 04475 | 20240 |        | TD                                              | *+13          | ,TYP                            |
| 04442 | 49 | 04466 | 00000 | 20250 |        | B                                               | READ          |                                 |
| 04454 | 34 | 00005 | 00102 | 20260 |        | RCTY                                            | 00005         | , ,25689, P IS 10005 TO PRINT + |
| 04464 |    | 00001 |       | 20270 |        | DC                                              | 1,*,*-1       |                                 |
| 04455 |    | 00000 |       | 20280 | FIXFLG | DS                                              | ,*-10         |                                 |
| 04466 | 39 | 00405 | 00000 | 20290 | READ   | WA                                              | INOUT         |                                 |
| 04466 |    | 00000 |       | 20300 | OUTD   | DS                                              |               | ,READ                           |
| 04475 |    | 00000 |       | 20310 | TYP    | DS                                              |               | ,READ+9                         |
| 04478 | 25 | 04491 | 04475 | 20320 |        | TD                                              | *+13,TYP      |                                 |
| 04490 | 49 | 04338 | 00000 | 20330 |        | B                                               | EOL           |                                 |
| 04502 | 44 | 04522 | 04466 | 20340 | JEAN   | BNF                                             | *+20,OUTD     |                                 |
| 04514 | 49 | 04546 |       | 20350 |        | B7                                              | *+32          |                                 |
| 04522 | 14 | 00405 | 00014 | 20360 |        | CM                                              | INOUT         | ,14 ,10                         |
| 04534 | 46 | 01966 | 01200 | 20370 |        | BE                                              | TIGER+12      |                                 |
| 04546 | 32 | 04762 | 00000 | 20380 |        | SF                                              | LTPARX        |                                 |
| 04558 | 49 | 04646 | 00000 | 20390 | CMPLT  | B                                               | POST          |                                 |
| 04570 | 49 | 00000 | 00000 | 20400 | BRNCH  | B                                               | ,,1           |                                 |
| 04577 |    |       |       | 20410 |        | DORG                                            | *-4           |                                 |
| 04577 |    | 00001 |       | 20420 |        | DC                                              | 1, *          |                                 |
| 04578 | 44 | 04672 | 04475 | 20430 |        | BNF                                             | CARD          | ,TYP                            |
| 04590 | 25 | 04603 | 04475 | 20440 |        | TD                                              | *+13          | ,TYP                            |
| 04602 | 49 | 04634 | 00000 | 20450 |        | B                                               | POST-12       |                                 |
| 04614 | 34 | 00000 | 00102 | 20460 | FLAGS  | RCTY                                            |               |                                 |
| 04614 |    | 00000 |       | 20470 | HTYPEX | DS                                              |               | ,FLAGS                          |
| 04615 |    | 00000 |       | 20480 | STOWX  | DS                                              |               | ,FLAGS+1                        |
| 04617 |    | 00000 |       | 20490 | SIGN   | DS                                              |               | ,FLAGS+3                        |
| 04618 |    | 00000 |       | 20500 | ETYPEX | DS                                              |               | ,FLAGS+4                        |
| 04619 |    | 00000 |       | 20510 | ITYPEX | DS                                              |               | ,FLAGS+5                        |
| 04621 |    | 00000 |       | 20520 | FTYPEX | DS                                              |               | ,FLAGS+7                        |
| 04626 | 49 | 04646 |       | 20530 |        | B7                                              | POST          |                                 |
| 04634 | 34 | 00000 | 00951 | 20540 |        | K                                               |               | ,951                            |
| 04646 | 16 | 04424 | 00405 | 20550 | POST   | TFM                                             | NEXT          | ,INOUT                          |
| 04658 | 44 | 04122 | 04761 | 20560 |        | BNF                                             | LOOK          | ,RTPARX                         |
| 04670 | 42 |       |       | 20570 |        | BB2                                             |               |                                 |
| 04672 | 16 | 04424 | 00000 | 20580 | CARD   | TFM                                             | NEXT          | , ,610                          |
| 04684 | 11 | 04424 | 00002 | 20590 |        | AM                                              | NEXT          | ,2 ,10                          |
| 04696 | 14 | 04424 | 00567 | 20600 |        | CM                                              | NEXT          | ,INOUT+162                      |
| 04708 | 47 | 04672 | 01300 | 20610 |        | BN                                              | CARD          |                                 |
| 04720 | 49 | 04466 |       | 20620 |        | B7                                              | READ          |                                 |
| 04728 | 26 | 04157 | 03825 | 20630 | RTPAR  | TF                                              | PINFMT,BOX    |                                 |
| 04740 | 44 | 04370 | 04120 | 20640 |        | BNF                                             | SLASH         | ,LOOK-2                         |
| 04752 | 32 | 04761 | 00000 | 20650 |        | DS                                              | RTPARX        |                                 |
| 04762 |    | 00000 |       | 20660 | LTPARX | SF                                              |               | ,*-1                            |
| 04761 |    | 00000 |       | 20670 | RTPARX | DS                                              |               | ,*-2                            |
| 04760 |    | 00002 |       | 20680 | CTR    | DC                                              | 2             | , ,*-3                          |
| 04764 | 44 | 01496 | 04466 | 20690 |        | BNF                                             | BB            | ,OUTD                           |
| 04776 | 49 | 04382 |       | 20700 |        | B7                                              | SLASH+12      |                                 |
| 04784 | 26 | 03825 | 04157 | 20710 | LTPAR  | TF                                              | BOX,PINFMT    |                                 |
| 04796 | 44 | 04816 | 04762 | 20720 |        | BNF                                             | *+20          | ,LTPARX                         |
| 04808 | 49 | 04122 |       | 20730 |        | B7                                              | LOOK          |                                 |
| 04816 | 44 | 04466 | 04466 | 20740 |        | BNF                                             | READ          | ,OUTD                           |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL                                    | MNEM | OPERANDS AND REMARKS           |
|-------|----|-------|-------|-------|------------------------------------------|------|--------------------------------|
| 04828 | 49 | 04122 | 00000 | 20750 |                                          | B    | LOOK                           |
|       |    |       |       | 20760 | *                                        |      |                                |
|       |    |       |       | 20770 | *                                        |      |                                |
|       |    |       |       | 20780 | *                                        |      | CALL SEGMENT                   |
| 04840 | 26 | 02059 | 04839 | 20790 | CALSR                                    | TF   | DCFSG+13 ,CALSR-1 ,11,COREADDR |
| 04852 | 26 | 04887 | 04839 | 20800 |                                          | TF   | SAD+11 ,CALSR-1                |
| 04864 | 12 | 04886 | 00001 | 20810 |                                          | SM   | SAD+10 ,1 ,10                  |
| 04876 | 26 | 02051 | 00000 | 20820 | SAD                                      | TF   | DCFSG+5 , ,7                   |
| 04888 | 21 | 02051 | 00700 | 20830 |                                          | A    | DCFSG+5 ,BSEGA                 |
| 04900 | 15 | 00732 | 00009 | 20840 |                                          | TDM  | ROWCK+22 ,9                    |
| 04912 | 49 | 05048 |       | 20850 |                                          | B7   | RDDK                           |
| 04920 | 16 | 00716 | 04940 | 20860 | RCK                                      | TFM  | ROWCK+6 ,**20                  |
| 04932 | 49 | 00710 |       | 20870 |                                          | B7   | ROWCK                          |
| 04940 | 32 | 02047 | 00000 | 20880 |                                          | SF   | DCFSG+1                        |
| 04952 | 13 | 02051 | 00050 | 20890 |                                          | MM   | DCFSG+5 ,50 ,10                |
| 04964 | 26 | 00090 | 00095 | 20900 |                                          | TF   | 90 ,95                         |
| 04976 | 11 | 00090 | 00001 | 20910 |                                          | AM   | 90 ,1 ,10                      |
| 04988 | 21 | 00090 | 00090 | 20920 |                                          | A    | 90 ,90                         |
| 05000 | 22 | 02051 | 00092 | 20930 |                                          | S    | DCFSG+5 ,92                    |
| 05012 | 22 | 02057 | 02051 | 20940 |                                          | S    | DCFSG+11 ,DCFSG+5              |
| 05024 | 26 | 02051 | 00092 | 20950 |                                          | TF   | DCFSG+5 ,92                    |
| 05036 | 34 | 02046 | 00701 | 20960 | SKDK                                     | K    | DCFSG ,701                     |
| 05048 | 36 | 02046 | 00700 | 20970 | RDDK                                     | RN   | DCFSG ,700                     |
| 05060 | 36 | 02046 | 00701 | 20980 |                                          | RN   | DCFSG ,701                     |
| 05072 | 46 | 04920 | 03800 | 20990 |                                          | BI   | RCK ,3800                      |
| 05084 | 47 | 04920 | 03700 | 21000 |                                          | BNI  | RCK ,3700                      |
| 05096 | 16 | 00716 | 05116 | 21010 |                                          | TFM  | ROWCK+6 ,SEGIN                 |
| 05108 | 49 | 00710 |       | 21020 |                                          | B7   | ROWCK                          |
| 05116 | 26 | 05134 | 04839 | 21030 | SEGIN                                    | TF   | **18 ,CALSR-1 ,11              |
| 05128 | 49 | 04839 |       | 21040 |                                          | B7   | CALSR-1 , ,6                   |
|       |    |       |       | 21050 | *                                        |      |                                |
|       |    |       |       | 21060 | *                                        |      |                                |
|       |    |       |       | 21070 | * COMBINED                               |      |                                |
| 05136 | 16 | 05267 | 05159 | 21080 | XTYPE                                    | TFM  | TF+11,**23                     |
| 05148 | 33 | 04614 | 00000 | 21090 |                                          | CF   | HTYPEX,,10                     |
| 05160 | 44 | 05244 | 04615 | 21100 |                                          | BNF  | SKIP,STOWX                     |
| 05172 | 11 | 04157 | 00002 | 21110 | HTYPE                                    | AM   | PINFMT ,2 ,10                  |
| 05184 | 26 | 05347 | 04157 | 21120 |                                          | TF   | COUNT ,PINFMT ,11              |
| 05196 | 44 | 05244 | 04614 | 21130 | LOOP                                     | BNF  | SKIP,HTYPEX                    |
| 05208 | 11 | 04157 | 00002 | 21140 |                                          | AM   | PINFMT,2,10                    |
| 05220 | 44 | 05276 | 04466 | 21150 |                                          | BNF  | HR ,OUTD                       |
| 05232 | 26 | 05267 | 04157 | 21160 |                                          | TF   | TF+11,PINFMT                   |
| 05244 | 44 | 05288 | 04466 | 21170 | SKIP                                     | BNF  | XR ,OUTD                       |
| 05256 | 26 | 04424 | 00000 | 21180 | TF                                       | TF   | NEXT , ,6                      |
| 05268 | 49 | 05288 |       | 21190 |                                          | B7   | XR                             |
| 05276 | 26 | 04157 | 04424 | 21200 | HR                                       | TF   | PINFMT ,NEXT ,611              |
| 05288 | 11 | 04424 | 00002 | 21210 | XR                                       | AM   | NEXT ,2 ,10                    |
| 05300 | 14 | 04424 | 00693 | 21220 |                                          | CM   | NEXT ,INOUT+288                |
| 05312 | 46 | 03570 | 01100 | 21230 |                                          | BH   | ERIN                           |
| 05324 | 12 | 05347 | 00001 | 21240 |                                          | SM   | COUNT ,1 ,10                   |
| 05336 | 46 | 05196 | 01100 | 21250 |                                          | BP   | LOOP                           |
| 05347 |    | 00000 |       | 21260 | COUNT                                    | DS   | ,*                             |
| 05348 | 44 | 05676 | 04615 | 21270 |                                          | BNF  | STOW,STOWX                     |
| 05360 | 49 | 04122 |       | 21280 |                                          | B7   | LOOK , ,5                      |
| 05368 | 33 | 04576 | 00000 | 21290 | NUMBR                                    | CF   | BRNCH+6                        |
| 05380 | 32 | 04573 | 00000 | 21300 |                                          | SF   | BRNCH+3                        |
| 05391 |    | 00000 |       | 21310 | EXP                                      | DS   | ,*                             |
| 05392 | 32 | 04575 | 00000 | 21320 |                                          | SF   | BRNCH+5                        |
| 05403 |    | 00001 |       | 21330 |                                          | DC   | 1,*,*                          |
| 05402 |    | 00000 |       | 21340 | SAVE                                     | DS   | ,*-1                           |
| 05404 | 31 | 04615 | 04455 | 21350 |                                          | TR   | SIGN-2,FIXFLG                  |
| 05416 | 44 | 06608 | 04466 | 21360 |                                          | BNF  | INPUT ,OUTD                    |
|       |    |       |       | 21370 | *THE FOLLOWING ROUTINES PREPARE          |      |                                |
|       |    |       |       | 21380 | *NUMERIC DATA FOR OUTPUT                 |      |                                |
| 05428 | 31 | 00061 | 01875 | 21390 |                                          | TR   | FAC+1 ,FZEREC-2                |
| 05440 | 26 | 00060 | 04122 | 21400 |                                          | TF   | FAC ,LOOK-1 ,11                |
| 05452 | 45 | 05472 | 00060 | 21410 |                                          | BNR  | **20 ,FAC                      |
| 05464 | 49 | 06576 |       | 21420 |                                          | B7   | UDV                            |
| 05472 | 14 | 04572 | 00099 | 21430 |                                          | CM   | BRNCH+2,99,1011                |
| 05484 | 46 | 06130 | 01200 | 21440 |                                          | BE   | ITYPE                          |
| 05496 | 14 | 04572 | 00094 | 21450 |                                          | CM   | BRNCH+2 ,94 ,1011              |
| 05508 | 46 | 05940 | 01100 | 21460 |                                          | BH   | ADUT                           |
|       |    |       |       | 21470 | * STORE SIGN FOR E OR F,SAVE EXPONENT    |      |                                |
| 05520 | 26 | 05402 | 00052 | 21480 |                                          | TF   | SAVE ,FAC-8                    |
| 05532 | 12 | 05402 | 00050 | 21490 |                                          | SM   | SAVE ,50 ,10                   |
| 05544 | 44 | 05568 | 00060 | 21500 |                                          | BNF  | **24 ,FAC                      |
| 05556 | 16 | 04617 | 00020 | 21510 |                                          | TFM  | SIGN,20,10                     |
| 05568 | 16 | 05392 | 00003 | 21520 |                                          | TFM  | EXP+1 ,3 ,9                    |
| 05580 | 14 | 04572 | 00095 | 21530 |                                          | CM   | BRNCH+2,95,1011                |
| 05592 | 47 | 06382 | 01300 | 21540 |                                          | BL   | FTYPE                          |
| 05604 | 32 | 04618 | 00000 | 21550 | ETYPE                                    | SF   | ETYPEX                         |
| 05616 | 16 | 05391 | 00000 | 21560 |                                          | TFM  | EXP , ,10                      |
| 05628 | 26 | 05347 | 04574 | 21570 |                                          | TF   | COUNT,BRNCH+4                  |
| 05640 | 22 | 05347 | 04576 | 21580 |                                          | S    | COUNT,BRNCH+6                  |
| 05652 | 12 | 05347 | 00006 | 21590 |                                          | SM   | COUNT,6,10                     |
| 05664 | 46 | 05136 | 01100 | 21600 | TIE                                      | BP   | XTYPE                          |
|       |    |       |       | 21610 | * ROUTINE TO STORE DIGITS IN OUTPUT BAND |      |                                |
| 05676 | 26 | 04424 | 04617 | 21620 | STOW                                     | TF   | NEXT ,SIGN ,6                  |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL                                    | MNEM       | OPERANDS AND REMARKS                     |
|-------|----|-------|-------|-------|------------------------------------------|------------|------------------------------------------|
| 05688 | 11 | 04424 | 00002 | 21630 |                                          | AM         | NEXT,2,10                                |
| 05700 | 14 | 04424 | 00693 | 21640 |                                          | CM         | NEXT,INOUT+288                           |
| 05712 | 46 | 03570 | 01100 | 21650 |                                          | BH         | ERIN                                     |
| 05724 | 12 | 05391 | 00001 | 21660 |                                          | SM         | EXP,1,10                                 |
| 05736 | 47 | 05884 | 01300 | 21670 |                                          | BN         | HOHO                                     |
| 05748 | 15 | 00052 | 00007 | 21680 |                                          | TDM        | FAC-8,7,11                               |
| 05760 | 33 | 00053 | 00000 | 21690 | N50X                                     | CF         | FAC-7                                    |
| 05772 | 44 | 05828 | 04619 | 21700 |                                          | BNF        | B,ITYPEX                                 |
| 05784 | 26 | 04617 | 00053 | 21710 |                                          | TF         | SIGN,FAC-7                               |
| 05796 | 31 | 00053 | 00054 | 21720 |                                          | TR         | FAC-7,FAC-6                              |
| 05808 | 15 | 00062 | 00000 | 21730 |                                          | TDM        | FAC+2                                    |
| 05820 | 49 | 05676 |       | 21740 |                                          | B7         | STOW                                     |
| 05828 | 44 | 05784 | 04621 | 21750 | B                                        | BNF        | N50X+24,FTYPEX                           |
|       |    |       |       | 21760 | * INSERT ZEROS AFTER DEC. IF EXP SMALL   |            |                                          |
| 05840 | 11 | 05402 | 00001 | 21770 |                                          | AM         | SAVE,1,10                                |
| 05852 | 46 | 05784 | 01100 | 21780 |                                          | BP         | N50X+24                                  |
| 05864 | 16 | 04617 | 00070 | 21790 |                                          | TFM        | SIGN,70,10                               |
| 05876 | 49 | 05676 |       | 21800 |                                          | B7         | STOW                                     |
| 05884 | 44 | 06070 | 04619 | 21810 | HOHO                                     | BNF        | ISETYP,ITYPEX                            |
| 05896 | 33 | 04619 | 00000 | 21820 |                                          | CF         | ITYPEX                                   |
| 05908 | 16 | 04617 | 00003 | 21830 |                                          | TFM        | SIGN,3,10                                |
| 05920 | 26 | 05391 | 04576 | 21840 |                                          | TF         | EXP,BRNCH+6                              |
| 05932 | 49 | 05676 |       | 21850 |                                          | B7         | STOW                                     |
| 05940 | 32 | 00051 | 00000 | 21860 | ADUT                                     | SF         | FAC-9                                    |
| 05952 | 26 | 04424 | 00052 | 21870 |                                          | TF         | NEXT,FAC-8,6                             |
| 05964 | 11 | 04424 | 00002 | 21880 |                                          | AM         | NEXT,2,10                                |
| 05976 | 14 | 04424 | 00693 | 21890 |                                          | CM         | NEXT,INOUT+288                           |
| 05988 | 46 | 03570 | 01100 | 21900 |                                          | BH         | ERIN                                     |
| 06000 | 31 | 00051 | 00053 | 21910 |                                          | TR         | FAC-9,FAC-7                              |
| 06012 | 12 | 04574 | 00001 | 21920 |                                          | SM         | BRNCH+4,1,10                             |
| 06024 | 47 | 05940 | 01200 | 21930 |                                          | BNE        | ADUT                                     |
| 06036 | 42 |       |       | 21940 |                                          | B82        |                                          |
| 06038 | 44 | 01376 | 04121 | 21950 | TROT                                     | BNF        | ZERFAC,LOOK-1                            |
| 06050 | 16 | 04121 | 03368 | 21960 |                                          | TFM        | LOOK-1,TRFL-2                            |
| 06062 | 49 | 04122 |       | 21970 |                                          | B7         | LOOK                                     |
|       |    |       |       | 21980 | *EXIT TO ISETYP AFTER PASS1 OF I TYPE,   |            |                                          |
|       |    |       |       | 21990 | *AND 2ND PASS E,F,D TYPE                 |            |                                          |
| 06070 | 44 | 06038 | 04618 | 22000 |                                          | ISETYP BNF | TROT,ITYPEX                              |
|       |    |       |       | 22010 | * TACK ON EXPONENT                       |            |                                          |
| 06082 | 31 | 00059 | 05401 | 22020 |                                          | TR         | FAC-1,SAVE-1                             |
| 06094 | 16 | 04574 | 00003 | 22030 |                                          | TFM        | BRNCH+4,3,10                             |
| 06106 | 16 | 04424 | 00045 | 22040 |                                          | TFM        | NEXT,45,610                              |
| 06118 | 11 | 04424 | 00002 | 22050 |                                          | AM         | NEXT,2,10                                |
|       |    |       |       | 22060 | * NOW ENTER I TYPE TO FILE AWAY EXPONENT |            |                                          |
| 06130 | 16 | 04619 | 00000 | 22070 | ITYPE                                    | TFM        | SIGN+2,0000,8, Q IS 1000 TO PRINT + SIGN |
| 06142 | 44 | 06178 | 00060 | 22080 |                                          | BNF        | **36,FAC                                 |
| 06154 | 16 | 04617 | 00020 | 22090 |                                          | TFM        | SIGN,20,10                               |
| 06166 | 33 | 00060 | 00000 | 22100 |                                          | CF         | FAC                                      |
| 06178 | 44 | 06222 | 00059 | 22110 |                                          | BNF        | **44,FAC-1                               |
| 06190 | 31 | 00053 | 00059 | 22120 |                                          | TR         | FAC-7,FAC-1                              |
| 06202 | 16 | 05392 | 00023 | 22130 |                                          | TFM        | EXP+1,23,9                               |
| 06214 | 49 | 06338 |       | 22140 |                                          | B7         | A+12                                     |
| 06222 | 44 | 06266 | 00057 | 22150 |                                          | BNF        | **44,FAC-3                               |
| 06234 | 31 | 00053 | 00057 | 22160 |                                          | TR         | FAC-7,FAC-3                              |
| 06246 | 16 | 05392 | 00043 | 22170 |                                          | TFM        | EXP+1,43,911                             |
| 06258 | 49 | 06338 |       | 22180 |                                          | B7         | A+12                                     |
| 06266 | 26 | 00065 | 00063 | 22190 |                                          | TF         | FAC+5,FAC+3                              |
| 06278 | 16 | 05392 | 00003 | 22200 |                                          | TFM        | EXP+1,103,9                              |
| 06290 | 43 | 06338 | 00053 | 22210 |                                          | BD         | **48,FAC-7                               |
| 06302 | 31 | 00053 | 00054 | 22220 |                                          | TR         | FAC-7,FAC-6                              |
| 06314 | 12 | 05391 | 00001 | 22230 |                                          | SM         | EXP,1,10                                 |
| 06326 | 45 | 06290 | 00056 | 22240 | A                                        | BNR        | **36,FAC-4                               |
| 06338 | 26 | 05347 | 04574 | 22250 |                                          | TF         | COUNT,BRNCH+4                            |
| 06350 | 12 | 05347 | 00001 | 22260 |                                          | SM         | COUNT,1,10                               |
| 06362 | 22 | 05347 | 05391 | 22270 |                                          | S          | COUNT,EXP                                |
| 06374 | 49 | 05664 |       | 22280 |                                          | B7         | TIE                                      |
| 06382 | 26 | 05391 | 05402 | 22290 | FTYPE                                    | TF         | EXP,SAVE                                 |
| 06394 | 44 | 06418 | 05402 | 22300 |                                          | BNF        | **24,SAVE                                |
| 06406 | 16 | 05391 | 00000 | 22310 |                                          | TFM        | EXP,10                                   |
| 06418 | 26 | 05347 | 04574 | 22320 |                                          | TF         | COUNT,BRNCH+4                            |
| 06430 | 12 | 05347 | 00002 | 22330 |                                          | SM         | COUNT,2,10                               |
| 06442 | 22 | 05347 | 04576 | 22340 |                                          | S          | COUNT,BRNCH+6                            |
| 06454 | 22 | 05347 | 05391 | 22350 |                                          | S          | COUNT,EXP                                |
| 06466 | 47 | 06498 | 01300 | 22360 |                                          | BN         | ERROR                                    |
| 06478 | 32 | 04621 | 00000 | 22370 |                                          | SF         | FTYPEX                                   |
| 06490 | 49 | 05664 |       | 22380 |                                          | B7         | TIE                                      |
|       |    |       |       | 22390 | * CHANGE TO E TYPE                       |            |                                          |
| 06498 | 16 | 04576 | 00008 | 22400 | ERROR                                    | TFM        | BRNCH+6,8,10                             |
| 06510 | 49 | 05604 |       | 22410 |                                          | B7         | ETYPE                                    |
| 06522 |    | 00006 |       | 22420 | DCFER                                    | DC         | 6,79591                                  |
| 06525 |    | 00003 |       | 22430 |                                          | DC         | 3,9                                      |
| 06530 |    | 00005 | 05116 | 22440 |                                          | DSA        | SEGIN                                    |
| 06531 |    | 00001 |       | 22450 |                                          | DC         | 1,1                                      |
| 06532 | 45 | 06552 | 06570 | 22460 | TVAR                                     | BNR        | **20,RT+6,11                             |
| 06544 | 49 | 06576 |       | 22470 |                                          | B7         | UDV                                      |
| 06552 | 11 | 06570 | 00021 | 22480 |                                          | AM         | RT+6,21,10                               |
| 06564 | 45 | 00000 | 00060 | 22490 | RT                                       | BNR        | FAC                                      |
| 06576 | 16 | 03285 | 03672 | 22500 | UDV                                      | TFM        | ERMA,UDVM-1                              |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL | MNEM | OPERANDS   | AND REMARKS |
|-------|----|-------|-------|-------|-------|------|------------|-------------|
| 06588 | 31 | 02046 | 06517 | 22510 | ERR   | TR   | DCFSG      | ,DCFER-5    |
| 06600 | 49 | 04900 |       | 22520 |       | B7   | RCK-20     |             |
|       |    |       |       | 22530 |       |      |            |             |
| 06608 | 31 | 00040 | 01859 | 22540 |       | TR   | FAC-20     | ,FZEREC-18  |
| 06620 | 31 | 00058 | 01860 | 22550 |       | TR   | FAC-2      | ,FZEREC-17  |
| 06632 | 16 | 07233 | 08033 | 22560 |       | TFM  | DX+1       | ,33         |
| 06644 | 14 | 04572 | 00091 | 22570 |       | CM   | BRNCH+2    | ,91         |
| 06656 | 46 | 07442 | 01200 | 22580 |       | BE   | AIN        |             |
| 06668 | 26 | 06953 | 06760 | 22590 |       | TF   | AX+1       | ,LP+8       |
| 06680 | 14 | 04572 | 00099 | 22600 |       | CM   | BRNCH+2    | ,99         |
| 06692 | 46 | 06716 | 01200 | 22610 |       | BE   | **+24      |             |
| 06704 | 32 | 06953 | 00000 | 22620 |       | SF   | FL         |             |
| 06716 | 16 | 07243 | 00000 | 22630 |       | TFM  | EX+4       |             |
| 06728 | 16 | 07037 | 08041 | 22640 |       | TFM  | EX1+1      | ,41         |
| 06740 | 16 | 06946 | 00050 | 22650 |       | TFM  | TD+6       | ,FAC-10     |
| 06752 | 14 | 04424 | 11093 | 22660 | LP    | CM   | NEXT       | ,11003      |
| 06764 | 46 | 07378 | 01200 | 22670 |       | BE   | DEC        |             |
| 06776 | 14 | 04424 | 00020 | 22680 |       | CM   | NEXT       | ,20         |
| 06788 | 46 | 07258 | 01200 | 22690 |       | BE   | NEG        |             |
| 06800 | 14 | 04424 | 00010 | 22700 |       | CM   | NEXT       | ,10         |
| 06812 | 46 | 07346 | 01200 | 22710 |       | BE   | POS        |             |
| 06824 | 14 | 04424 | 00045 | 22720 |       | CM   | NEXT       | ,45         |
| 06836 | 46 | 07346 | 01200 | 22730 |       | BE   | POS        |             |
| 06848 | 14 | 04424 | 00070 | 22740 |       | CM   | NEXT       | ,70         |
| 06860 | 47 | 06904 | 01100 | 22750 |       | BNH  | DX1        |             |
| 06872 | 32 | 06952 | 00000 | 22760 |       | SF   | AX         |             |
| 06884 | 32 | 07232 | 00000 | 22770 |       | SF   | DX         |             |
| 06896 | 49 | 06928 |       | 22780 |       | B7   | TD-12      |             |
| 06904 | 44 | 06964 | 06952 | 22790 | DX1   | BNF  | NXIN       | ,AX         |
| 06916 | 44 | 07422 | 07232 | 22800 |       | BNF  | UDZ        | ,DX         |
| 06928 | 11 | 06946 | 00001 | 22810 |       | AM   | TD+6       | ,1          |
| 06940 | 25 | 00000 | 04424 | 22820 | TD    | TD   |            | ,NEXT       |
| 06952 | 11 | 07035 | 00001 | 22830 | AX    | AM   | INT        | ,1          |
| 06953 |    | 00000 |       | 22840 | FL    | DS   |            | ,AX+1       |
| 06964 | 11 | 04424 | 00002 | 22850 | NXIN  | AM   | NEXT       | ,2          |
| 06976 | 12 | 04574 | 00001 | 22860 |       | SM   | BRNCH+4    | ,1          |
| 06988 | 46 | 06752 | 01100 | 22870 |       | BP   | LP         |             |
| 07000 | 44 | 07184 | 06953 | 22880 |       | BNF  | FX         | ,FL         |
| 07012 | 14 | 06946 | 07242 | 22890 |       | CM   | TD+6       | ,EX+3       |
| 07024 | 46 | 03570 | 01100 | 22900 |       | BH   | ERIN       |             |
| 07035 |    | 00000 |       | 22910 | INT   | DS   |            | ,*          |
| 07036 | 21 | 07035 | 06946 | 22920 | EX1   | A    | INT        | ,TD+6       |
| 07048 | 22 | 07035 | 04576 | 22930 |       | S    | INT        | ,BRNCH+6    |
| 07060 | 22 | 07035 | 07231 | 22940 |       | S    | INT        | ,DZ         |
| 07072 | 46 | 07084 | 01400 | 22950 |       | BV   | **+12      |             |
| 07084 | 11 | 07035 | 00050 | 22960 |       | AM   | INT        | ,50         |
| 07096 | 46 | 03570 | 01400 | 22970 |       | BV   | ERIN       |             |
| 07108 | 43 | 07140 | 00051 | 22980 |       | BD   | **+32      | ,FAC-9      |
| 07120 | 16 | 07035 | 00000 | 22990 |       | TFM  | INT        | ,10         |
| 07132 | 49 | 07152 |       | 23000 |       | B7   | **+20      |             |
| 07140 | 47 | 03570 | 01300 | 23010 |       | BN   | ERIN       |             |
| 07152 | 26 | 00050 | 07035 | 23020 |       | TF   | FAC-10     | ,INT        |
| 07164 | 26 | 00060 | 00058 | 23030 |       | TF   | FAC        | ,FAC-2      |
| 07176 | 49 | 07220 |       | 23040 |       | B7   | SETSF      |             |
| 07184 | 14 | 06946 | 00060 | 23050 | FX    | CM   | TD+6       | ,FAC        |
| 07196 | 46 | 03570 | 01100 | 23060 |       | BH   | ERIN       |             |
| 07208 | 26 | 00060 | 06946 | 23070 |       | TF   | FAC        | ,TD+6       |
| 07220 | 32 | 00051 | 00000 | 23080 | SETSF | SF   | FAC-9      | ,11         |
| 07231 |    | 00000 |       | 23090 | DZ    | DS   |            | ,*          |
| 07232 | 33 | 00060 | 00000 | 23100 | DX    | CF   | FAC        |             |
| 07239 |    | 00000 |       | 23110 | EX    | DS   |            | ,*-4        |
| 07244 | 26 | 04121 | 00060 | 23120 |       | TF   | LOOK-1     | ,FAC        |
| 07256 | 42 |       |       | 23130 |       | BB2  |            | ,6          |
| 07258 | 44 | 07326 | 06952 | 23140 | NEG   | BNF  | STSF       | ,AX         |
| 07270 | 16 | 07037 | 00022 | 23150 |       | TFM  | EX1+1      | ,22         |
| 07282 | 16 | 06946 | 07239 | 23160 |       | TFM  | TD+6       | ,EX         |
| 07294 | 15 | 06952 | 00004 | 23170 |       | TDM  | AX         | ,4          |
| 07306 | 44 | 03570 | 06953 | 23180 |       | BNF  | ERIN       | ,FL         |
| 07318 | 49 | 06964 |       | 23190 |       | B7   | NXIN       |             |
| 07326 | 15 | 07233 | 00002 | 23200 | STSF  | TDM  | DX+1       | ,2          |
| 07338 | 49 | 06964 |       | 23210 |       | B7   | NXIN       |             |
| 07346 | 44 | 06964 | 06952 | 23220 | POS   | BNF  | NXIN       | ,AX         |
| 07358 | 15 | 07036 | 00002 | 23230 |       | TDM  | EX1        | ,2          |
| 07370 | 49 | 07282 |       | 23240 |       | B7   | NEG+24     |             |
| 07378 | 16 | 04576 | 00000 | 23250 | DEC   | TFM  | BRNCH+6    | ,10         |
| 07390 | 14 | 06953 | 00041 | 23260 |       | CM   | AX+1,41,10 |             |
| 07402 | 46 | 03570 | 01200 | 23270 |       | BE   | ERIN       |             |
| 07414 | 49 | 07294 |       | 23280 |       | B7   | NEG+36     |             |
| 07422 | 11 | 07231 | 00001 | 23290 | UDZ   | AM   | DZ         | ,1          |
| 07434 | 49 | 06964 |       | 23300 |       | B7   | NXIN       |             |
| 07442 | 16 | 04576 | 00006 | 23310 | AIN   | TFM  | BRNCH+6    | ,6          |
| 07454 | 22 | 04576 | 04574 | 23320 |       | S    | BRNCH+6    | ,BRNCH+4    |
| 07466 | 31 | 00051 | 00053 | 23330 |       | TR   | FAC-9      | ,FAC-7      |
| 07478 | 26 | 00060 | 04424 | 23340 |       | TF   | FAC        | ,NEXT       |
| 07490 | 33 | 00059 | 00000 | 23350 |       | CF   | FAC-1      |             |
| 07502 | 11 | 04424 | 00002 | 23360 |       | AM   | NEXT       | ,2          |
| 07514 | 12 | 04574 | 00001 | 23370 |       | SM   | BRNCH+4    | ,1          |
| 07526 | 46 | 07466 | 01100 | 23380 |       | BH   | AIN+24     | ,10         |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS        |
|-------|----|-------|-------|-------|--------|------|-----------------------------|
| 07538 | 12 | 04576 | 00001 | 23390 | CL     | SM   | BRNCH+6 ,1 ,10              |
| 07550 | 47 | 07220 | 01100 | 23400 |        | BNH  | SETSF                       |
| 07562 | 31 | 00051 | 00053 | 23410 |        | TR   | FAC-9 ,FAC-7                |
| 07574 | 16 | 00060 | 00000 | 23420 |        | TFM  | FAC , ,10                   |
| 07586 | 33 | 00059 | 00000 | 23430 |        | CF   | FAC-1                       |
| 07597 |    | 00000 |       | 23440 | ESMA   | DS   | ,*                          |
| 07598 | 49 | 07538 | 00000 | 23450 |        | B    | CL                          |
| 07610 | 45 | 07630 | 07609 | 23460 | ADCK   | BNR  | **20,ADCK-1,11              |
| 07622 | 49 | 06576 |       | 23470 |        | B7   | UDV                         |
| 07630 | 11 | 07609 | 00000 | 23480 |        | AM   | ADCK-1,,610                 |
| 07642 | 42 |       |       | 23490 |        | BB2  |                             |
|       |    |       |       | 23500 | *      |      |                             |
|       |    |       |       | 23510 | *      |      |                             |
|       |    |       |       | 23520 | *      |      |                             |
|       |    |       |       | 23530 | *      |      |                             |
|       |    |       |       | 23540 |        | DORG | 404                         |
| 00404 |    |       |       | 23550 |        | TD   | D43OUT ,402                 |
| 00404 | 25 | 05768 | 00402 | 23560 |        | TD   | D43IN ,402                  |
| 00416 | 25 | 05782 | 00402 | 23570 |        | B7   | 18000                       |
| 00428 | 49 | 18000 |       | 23580 |        | DORG | SEGIN                       |
| 05116 |    |       |       | 23590 |        | B7   | ERBEG                       |
| 05116 | 49 | 05220 |       | 23600 |        | DAC  | 11 , STOP                   |
| 05125 |    | 00011 | X2    | 23610 | STM    | DC   | 1 ,0                        |
| 05146 |    | 00001 |       | 23620 | UNFLM  | DAC  | 5 ,UFLO'                    |
| 05149 |    | 00005 | X2    | 23630 | ERM    | DAC  | 31,SEGMENT SYMTAB ADDR      |
| 05159 |    | 00031 | X2    | 23640 | ERBEG  | TF   | ROWCK+6 ,DSTPR+6            |
| 05220 | 26 | 00716 | 05802 | 23650 |        | B7   | ROWCK                       |
| 05232 | 49 | 00710 |       | 23660 |        | TF   | CMPLT+6,TERR+6,8            |
| 05240 | 26 | 04564 | 05598 | 23670 |        | BNF  | WRITE ,TRCX                 |
| 05252 | 44 | 04406 | 04158 | 23680 | ERR1   | BNF  | ERR2,ESMA-4                 |
| 05264 | 44 | 05556 | 07593 | 23690 |        | TF   | ERM+19 ,ESMA ,11            |
| 05276 | 26 | 05178 | 07597 | 23700 |        | BNF  | **24 ,ERM-3 ,STOP SETS THIS |
| 05288 | 44 | 05312 | 05156 | 23710 |        | TNF  | ERM+16 ,DTRB-1              |
| 05300 | 73 | 05175 | 03593 | 23720 |        | CF   | ERR1-16                     |
| 05312 | 33 | 05248 | 00000 | 23730 |        | BNC2 | TERR                        |
| 05324 | 47 | 05592 | 00200 | 23740 | PRTER  | PRA  | ERM                         |
| 05336 | 39 | 05159 | 00900 | 23750 |        | BNF  | PERR ,ERR1-16 ,ENDSTOP      |
| 05348 | 44 | 05384 | 05248 | 23760 |        | BNC3 | PERR                        |
| 05360 | 47 | 05384 | 00300 | 23770 |        | H    |                             |
| 05372 | 48 | 00000 | 00000 | 23780 | INVAR  | DAC  | 5,ERIO',*-8                 |
| 05375 |    | 00005 | X2    | 23790 | PERR   | CF   | ERR1+23                     |
| 05384 | 33 | 05287 | 00000 | 23795 |        | TDM  | ERM+88 ,                    |
| 05396 | 15 | 05247 | 00000 | 23800 |        | S    | PERR-12 ,PERR-12            |
| 05408 | 22 | 05372 | 05372 | 23830 |        | WACD | ERM                         |
| 05420 | 39 | 05159 | 00400 | 23840 |        | BNF  | TIGER ,ERR1-16              |
| 05432 | 44 | 01954 | 05248 | 23850 |        | BNC3 | TIGER                       |
| 05444 | 47 | 01954 | 00300 | 23860 |        | SM   | BSTBG,99                    |
| 05456 | 12 | 00855 | 00099 | 23870 |        | BC2  | DSTPR                       |
| 05468 | 46 | 05796 | 00200 | 23880 |        | AM   | BSTBG,30                    |
| 05480 | 11 | 00855 | 00030 | 23890 |        | TF   | D43OUT+12 ,CZ2+5            |
| 05492 | 26 | 05780 | 02723 | 23900 |        | TR   | DCDWN,CDINS                 |
| 05504 | 31 | 05880 | 05524 | 23910 |        | B7   | D43SK                       |
| 05516 | 49 | 05820 |       | 23920 | CDINS  | WNCD | D43LOC-4                    |
| 05524 | 38 | 05638 | 00400 | 23930 |        | SM   | D43OUT+12,7,8               |
| 05536 | 12 | 05780 | 00007 | 23940 |        | B7   | DPEND                       |
| 05548 | 49 | 05940 |       | 23950 |        | DC   | 1,'                         |
| 05555 |    | 00001 |       | 23960 | ERR2   | TNF  | ERM+46 ,SAD+10              |
| 05556 | 73 | 05205 | 04886 | 23970 |        | TR   | ERM+51 ,ERMA ,11            |
| 05568 | 31 | 05210 | 03285 | 23980 |        | TR   | ERM+59,IR2-1                |
| 05580 | 31 | 05218 | 05650 | 23990 | TERR   | RCTY | ERR1 , ,2                   |
| 05592 | 34 | 05264 | 00102 | 24000 |        | WATY | ERM                         |
| 05604 | 39 | 05159 | 00100 | 24010 |        | BNC2 | PRTER+12                    |
| 05616 | 47 | 05348 | 00200 | 24020 |        | B7   | PRTER                       |
| 05628 | 49 | 05336 |       | 24060 |        | DAC  | 1, ,                        |
| 05637 |    | 00001 | X2    | 24070 |        | DNB  | 10                          |
| 05647 |    | 00010 |       | 24080 | D43LOC | DC   | 6,0,*-5                     |
| 05642 |    | 00006 |       | 24082 | D43BUF | DS   | 1                           |
| 05648 |    | 00001 |       | 24084 | IR2    | DAC  | 15,, NEXT INSTR---          |
| 05651 |    | 00015 | X2    | 24086 | OFLM   | DAC  | 5,OFLO'                     |
| 05681 |    | 00005 | X2    | 24088 | IXERM  | DAC  | 5 ,IXER'                    |
| 05691 |    | 00005 | X2    | 24090 |        | DAC  | 10 ,END                     |
| 05701 |    | 00010 | X2    | 24100 | ENDM   | DC   | 1 ,0                        |
| 05720 |    | 00001 |       | 24108 |        | DORG | D43BUF+100                  |
| 05748 |    |       |       | 24109 |        | DNB  | 20                          |
| 05767 |    | 00020 |       | 24110 | D43OUT | DSC  | 14,06000000100000           |
| 05768 |    | 00014 |       | 24120 | D43IN  | DSC  | 9,060000001                 |
| 05782 |    | 00009 |       | 24130 |        | DSA  | D43BUF                      |
| 05795 |    | 00005 | 05648 | 24150 | DSTPR  | SPIM | ERBEG+20 ,3 ,2              |
| 05796 | 34 | 05240 | 00953 | 24160 |        | TF   | D43OUT+11 ,CZ2+4            |
| 05808 | 26 | 05779 | 02722 | 24170 | D43SK  | K    | D43OUT,701                  |
| 05820 | 34 | 05768 | 00701 | 24180 | D43LOP | TF   | D43LOC-1,D43OUT+12          |
| 05832 | 26 | 05641 | 05780 | 24190 |        | CF   | D43LOC-4                    |
| 05844 | 33 | 05638 | 00000 | 24200 |        | WN   | D43OUT,702                  |
| 05856 | 38 | 05768 | 00702 | 24210 |        | RN   | D43IN,702                   |
| 05868 | 36 | 05782 | 00702 | 24220 | DCDWN  | BNI  | D43PR,03400                 |
| 05880 | 47 | 05904 | 03400 | 24230 |        | SKIP | ,1                          |
| 05892 | 34 | 00000 | 00971 | 24240 | D43PR  | PRD  | D43LOC-4                    |
| 05904 | 35 | 05638 | 00900 | 24250 |        | SPIM | ,1                          |
| 05916 | 34 | 00000 | 00951 |       |        |      |                             |

# COMPUTER TECHNOLOGY

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL | MNEM                        | OPERANDS AND REMARKS                       |
|-------|----|-------|-------|-------|-------|-----------------------------|--------------------------------------------|
| 05928 | 12 | 05779 | 00001 | 24260 |       | SM                          | D43OUT+11,1,9                              |
| 05940 | 24 | 05780 | 00854 | 24270 | DPEND | C                           | D43OUT+12,BSTBG-1                          |
| 05952 | 46 | 05832 | 01100 | 24280 |       | BH                          | D43LOP                                     |
| 05964 | 49 | 01954 |       | 24290 |       | B7                          | TIGER                                      |
|       |    |       |       | 24300 | *     |                             |                                            |
|       |    |       |       | 24310 | *     |                             | C4D RELOCATABLE SUBROUTINES APRIL 29, 1965 |
|       |    |       |       | 24320 | *     |                             |                                            |
|       |    |       |       | 24330 | *     |                             |                                            |
|       |    |       |       | 24340 | *     |                             | SINE AND COSINE                            |
|       |    |       |       | 24350 | *     |                             |                                            |
| 05000 |    |       |       | 24360 |       | DORG                        | 5000                                       |
| 05000 | 26 | 00060 | 19989 | 24370 | COS   | TF                          | FAC,CTAB-1                                 |
| 05012 | 25 | 05228 | 00004 | 24380 |       | TDM                         | SIN1,4,011                                 |
| 05024 | 49 | 05060 | 00000 | 24390 |       | B                           | SIN+24,,0                                  |
| 05036 | 26 | 00060 | 19969 | 24400 | SIN   | TF                          | FAC,STAB-1                                 |
| 05048 | 25 | 05228 | 00002 | 24410 |       | TDM                         | SIN1,2,0                                   |
| 05060 | 33 | 00099 | 00000 | 24420 |       | CF                          | 99                                         |
| 05072 | 45 | 05096 | 00060 | 24430 |       | BNR                         | **24,FAC,0                                 |
| 05084 | 49 | 06576 | 00000 | 24440 |       | B                           | UDV                                        |
| 05096 | 14 | 00052 | 00047 | 24450 |       | CM                          | FAC-8,47,10                                |
| 05108 | 47 | 05612 | 01300 | 24460 |       | BL                          | SIN2,,0, BRANCH FOR SMALL ARG.             |
| 05120 | 26 | 05203 | 00042 | 24470 |       | TFM                         | **83,42,09                                 |
| 05132 | 21 | 05203 | 00052 | 24480 |       | A                           | **71,FAC-8,0                               |
| 05144 | 43 | 05588 | 05201 | 24490 |       | BD                          | ERRTR ,**57 ,01                            |
| 05156 | 32 | 00053 | 00000 | 24500 |       | SF                          | FAC-7                                      |
| 05168 | 16 | 00079 | 00000 | 24510 |       | TFM                         | 79,0                                       |
| 05180 | 23 | 05658 | 00060 | 24520 |       | M                           | SIN2P,FAC,0                                |
| 05192 | 26 | 00060 | 00000 | 24530 |       | TF                          | FAC,,, X IN FIXED-POINT REVS               |
| 05204 | 44 | 05228 | 00099 | 24540 |       | BNF                         | **24,99,0                                  |
| 05216 | 32 | 00060 | 00000 | 24550 |       | SF                          | FAC                                        |
| 05228 | 42 | 00060 | 05671 | 24560 | SIN1  | NOP                         | FAC,SIN25,1, BECOMES ADD FOR SINE          |
| 05240 | 33 | 00060 | 00000 | 24570 |       | CF                          | FAC                                        |
| 05252 | 15 | 00047 | 00000 | 24580 |       | TDM                         | FAC-13,0,11                                |
| 05264 | 21 | 00060 | 00060 | 24590 |       | A                           | FAC,FAC,, X IN HALF REVOLUTIONS            |
| 05276 | 22 | 00060 | 01902 | 24600 |       | S                           | FAC,ONE                                    |
| 05288 | 33 | 00060 | 00000 | 24610 |       | CF                          | FAC                                        |
| 05300 | 21 | 00060 | 00060 | 24620 |       | A                           | FAC,FAC                                    |
| 05312 | 22 | 00060 | 01902 | 24630 |       | S                           | FAC,ONE,, X IN RIGHT ANGLES                |
| 05324 | 25 | 00099 | 00060 | 24640 |       | TD                          | 99,FAC                                     |
| 05336 | 43 | 05624 | 00047 | 24650 |       | BD                          | SIN2+12,FAC-13,0                           |
| 05348 | 32 | 00048 | 00000 | 24660 |       | SF                          | FAC-12                                     |
| 05360 | 23 | 00057 | 00057 | 24670 |       | M                           | FAC-3,FAC-3                                |
| 05372 | 26 | 00040 | 00088 | 24680 |       | TF                          | FAC-20,88,, X SQUARED                      |
| 05384 | 26 | 05431 | 05704 | 24690 |       | TFM                         | **47,SINC7,017                             |
| 05396 | 16 | 00070 | 25149 | 24700 |       | TFM                         | FAC+10,15149                               |
| 05408 | 23 | 00040 | 00070 | 24710 |       | M                           | FAC-20,FAC+10                              |
| 05420 | 26 | 00070 | 00000 | 24720 |       | TF                          | FAC+10,,, LOOP TO EVALUATE                 |
| 05432 | 22 | 00070 | 00090 | 24730 |       | S                           | FAC+10,90,, HASTINGS APPROX.               |
| 05444 | 22 | 05431 | 00008 | 24740 |       | SM                          | **13,8,07                                  |
| 05456 | 44 | 05408 | 00083 | 24750 |       | BNF                         | **48,83,0                                  |
| 05468 | 23 | 00060 | 00070 | 24760 |       | M                           | FAC,FAC+10                                 |
| 05480 | 43 | 05624 | 00078 | 24770 |       | BD                          | SIN2+12,78,0, RESULT = 1                   |
| 05492 | 46 | 01376 | 01200 | 24780 |       | BZ                          | ZERFAC , , , RESULT = 0                    |
| 05504 | 26 | 00073 | 00099 | 24790 |       | TF                          | FAC+13,99                                  |
| 05516 | 25 | 00074 | 01877 | 24800 |       | TD                          | FAC+14,FZERE                               |
| 05528 | 16 | 00052 | 00050 | 24810 |       | TFM                         | FAC-8,50,10                                |
| 05540 | 43 | 01464 | 00053 | 24820 |       | BD                          | ENDD-24,FAC-7                              |
| 05552 | 12 | 00052 | 00001 | 24830 |       | SM                          | FAC-8,1,10, LOOP TO NORMALIZE              |
| 05564 | 31 | 00053 | 00054 | 24840 |       | TR                          | FAC-7,FAC-6                                |
| 05576 | 49 | 05540 | 00000 | 24850 |       | B                           | **36,,0                                    |
| 05588 | 16 | 03285 | 05706 | 24860 | ERRTR | TFM                         | ERMA,TRIG-1,1                              |
| 05600 | 49 | 06588 | 00000 | 24870 |       | B                           | ERR                                        |
| 05612 | 44 | 01488 | 05228 | 24880 | SIN2  | BNF                         | ENDD,SIN1,1                                |
| 05624 | 26 | 00060 | 01846 | 24890 |       | TF                          | FAC,FLTONE                                 |
| 05636 | 49 | 01464 | 00000 | 24900 |       | B                           | ENDD-24                                    |
| 05643 |    |       |       | 24910 |       | DORG                        | **4                                        |
| 05658 |    | 00016 |       | 24920 | SIN2P | DC                          | 16,159154943092,, CONSTANTS                |
| 05671 |    | 00013 |       | 24930 | SIN25 | DC                          | 13,-25000000000000                         |
| 05680 |    | 00009 |       | 24940 |       | DC                          | 9,157079632                                |
| 05688 |    | 00008 |       | 24950 |       | DC                          | 8,64596371                                 |
| 05689 |    | 00001 |       | 24960 |       | DC                          | 1,0                                        |
| 05696 |    | 00007 |       | 24970 |       | DC                          | 7,7968968                                  |
| 05698 |    | 00002 |       | 24980 |       | DC                          | 2,0                                        |
| 05704 |    | 00006 |       | 24990 | SINC7 | DC                          | 6,467377                                   |
| 05707 |    | 00005 | X2    | 25000 | TRIG  | DAC                         | 5,TRIG'                                    |
| 19990 |    | 00000 |       | 25010 | CTAB  | DS                          | ,19990                                     |
| 19970 |    | 00000 |       | 25020 | STAB  | DS                          | ,19970                                     |
|       |    |       |       | 25030 | *     |                             |                                            |
|       |    |       |       | 25040 | *     |                             |                                            |
|       |    |       |       | 25050 | *     |                             | EXPONENTIAL TO BASE E                      |
|       |    |       |       | 25060 | *     |                             |                                            |
| 05000 |    |       |       | 25070 |       | DORG                        | 5000                                       |
| 05000 | 45 | 05024 | 19949 | 25080 | BNR   | **24,ETAB-1,0               |                                            |
| 05012 | 49 | 06576 | 00000 | 25090 | B     | UDV                         |                                            |
| 05024 | 28 | 00060 | 19949 | 25100 | LD    | FAC                         | ,ETAB-1 , , GET ARGUMENT, SAVE SIGN        |
| 05036 | 14 | 00055 | 53112 | 25110 | CM    | FAC-5,53112                 |                                            |
| 05048 | 46 | 05516 | 01300 | 25120 | BNL   | EXP2,,0, EXPONENT TOO LARGE |                                            |
| 05060 | 14 | 00052 | 00042 | 25130 | CM    | FAC-8,42,10                 |                                            |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS                |
|-------|----|-------|-------|-------|--------|------|-------------------------------------|
| 05072 | 47 | 03034 | 01100 | 25140 |        | BNH  | SETONE,,, SMALL EXPONENT            |
| 05084 | 32 | 00053 | 00000 | 25150 |        | SF   | FAC-7                               |
| 05096 | 26 | 00098 | 01877 | 25160 |        | TF   | 98,FZERE                            |
| 05108 | 16 | 05138 | 00140 | 25170 |        | TFM  | **30,140,09                         |
| 05120 | 22 | 05138 | 00052 | 25180 |        | S    | **18,FAC-8,0                        |
| 05132 | 21 | 00000 | 00060 | 25190 |        | A    | ,FAC,, FIX ARGUMENT                 |
| 05144 | 16 | 00052 | 00050 | 25200 |        | TFM  | FAC-8,50,9                          |
| 05156 | 11 | 00052 | 00001 | 25210 |        | AM   | FAC-8,1,10, LOOP TO SET EXPONENT    |
| 05168 | 22 | 00091 | 01888 | 25220 |        | S    | 91,LOG10                            |
| 05180 | 46 | 05156 | 01300 | 25230 |        | BNN  | *-24,,0                             |
| 05192 | 44 | 05252 | 00099 | 25240 |        | BNF  | **60 ,99 ,0                         |
| 05204 | 32 | 00052 | 00000 | 25250 |        | SF   | FAC-8 ,,, COMPLEMENT NEGATIVE       |
| 05216 | 11 | 00052 | 00101 | 25260 |        | AM   | FAC-8 ,101 ,9, ARGUMENT             |
| 05228 | 33 | 00091 | 00000 | 25270 |        | CF   | 91                                  |
| 05240 | 49 | 05264 | 00000 | 25280 |        | B    | **24 , ,0                           |
| 05252 | 21 | 00091 | 01888 | 25290 |        | A    | 91,LOG10,, CORRECT OVERDRAFT        |
| 05264 | 32 | 00051 | 00000 | 25300 |        | SF   | FAC-9                               |
| 05276 | 26 | 00063 | 01899 | 25310 |        | TF   | FAC+3 ,ONE-3                        |
| 05288 | 16 | 05359 | 00063 | 25320 |        | TFM  | EXP1-1 ,FAC+3,010,INITIALIZE LOOP   |
| 05300 | 16 | 05347 | 01943 | 25330 |        | TFM  | EXP1-13,LOG2,07                     |
| 05312 | 16 | 05342 | 00091 | 25340 |        | TFM  | EXP1-18,91,010                      |
| 05324 | 49 | 05420 | 00000 | 25350 |        | B    | EXP1+60 , ,0                        |
| 05336 | 22 | 00091 | 01943 | 25360 |        | S    | 91 ,LOG2                            |
| 05348 | 21 | 00063 | 00063 | 25370 |        | A    | FAC+3 ,FAC+3                        |
| 05360 | 43 | 05336 | 00082 | 25380 | EXP1   | BD   | *-24,82,0, LOOP TO ELIMINATE DIGIT  |
| 05372 | 12 | 05359 | 00001 | 25390 |        | SM   | EXP1-1,1,010                        |
| 05384 | 12 | 05347 | 00009 | 25400 |        | SM   | EXP1-13,9,010                       |
| 05396 | 12 | 05342 | 00001 | 25410 |        | SM   | EXP1-18,1,010                       |
| 05408 | 31 | 00082 | 00083 | 25420 |        | TR   | 82,83,, STEP FOR NEXT DIGIT         |
| 05420 | 32 | 00082 | 00000 | 25430 |        | SF   | 82                                  |
| 05432 | 45 | 05360 | 00093 | 25440 |        | BNR  | EXP1,93,0                           |
| 05444 | 26 | 00048 | 00086 | 25450 |        | TF   | 48 ,86                              |
| 05456 | 23 | 00062 | 00048 | 25460 |        | M    | FAC+2 ,48                           |
| 05468 | 21 | 00062 | 00090 | 25470 |        | A    | FAC+2 ,90 ,,, MULTIPLY BY 1+X       |
| 05480 | 11 | 00061 | 00005 | 25480 |        | AM   | FAC+1,5,10                          |
| 05492 | 33 | 00053 | 00000 | 25490 |        | CF   | FAC-7                               |
| 05504 | 49 | 01488 | 00000 | 25500 |        | B    | ENDD                                |
| 05516 | 44 | 06588 | 00099 | 25510 | EXP2   | BNF  | ERR,99 ,,, LARGE ARGUMENT           |
| 05528 | 49 | 01356 | 00000 | 25520 |        | B    | ERO                                 |
| 05535 |    |       |       | 25530 |        | DORG | *-4                                 |
| 19950 |    | 00000 |       | 25540 | ETAB   | DS   | ,19950                              |
|       |    |       |       | 25550 | *      |      |                                     |
|       |    |       |       | 25560 | *      |      |                                     |
|       |    |       |       | 25570 | *      |      | NATURAL LOGARITHM                   |
|       |    |       |       | 25580 | *      |      |                                     |
| 05000 |    |       |       | 25590 |        | DORG | 5000                                |
| 05000 | 45 | 05024 | 19929 | 25600 | ALOG   | BNR  | **24,LTAB-1,0                       |
| 05012 | 49 | 06576 | 00000 | 25610 |        | B    | UDV                                 |
| 05024 | 26 | 00050 | 19929 | 25620 |        | TF   | FAC-10,LTAB-1                       |
| 05036 | 14 | 00050 | 00000 | 25630 |        | CM   | FAC-10,0,711                        |
| 05048 | 47 | 05540 | 01100 | 25640 |        | BNP  | ELOG,,0                             |
| 05060 | 12 | 00042 | 00050 | 25650 |        | SM   | FAC-18,50,10                        |
| 05072 | 23 | 01888 | 00042 | 25660 |        | M    | LOG10,FAC-18                        |
| 05084 | 26 | 00065 | 00099 | 25670 |        | TF   | FAC+5,99,, LOG OF CHARACTERISTIC    |
| 05096 | 32 | 00043 | 00000 | 25680 |        | SF   | FAC-17                              |
| 05108 | 28 | 00097 | 00050 | 25690 |        | LD   | 97,FAC-10                           |
| 05120 | 14 | 00091 | 00050 | 25700 | LOOP1  | CM   | 91,50,10, LOOP TILL OVER 0.5        |
| 05132 | 46 | 05180 | 01300 | 25710 |        | BNL  | INIT,,0, ANSWER BUILDS UP IN FAC+5  |
| 05144 | 21 | 00097 | 00097 | 25720 |        | A    | 97,97,                              |
| 05156 | 22 | 00065 | 01943 | 25730 |        | S    | FAC+5,LOG2                          |
| 05168 | 49 | 05120 | 00000 | 25740 |        | B    | LOOP1,,0                            |
| 05180 | 16 | 05222 | 00091 | 25750 | INIT   | TFM  | LOG1+6,91,010, INITIALIZE LOOP      |
| 05192 | 16 | 05251 | 00098 | 25760 |        | TFM  | LOG1+35,98,010                      |
| 05204 | 16 | 05263 | 01934 | 25770 |        | TFM  | LOG1+47,LOG11,07                    |
| 05216 | 14 | 00000 | 99990 | 25780 | LOG1   | CM   | ,99990,7, LOOP TILL OVER 0.9999     |
| 05228 | 46 | 05276 | 01300 | 25790 |        | BNL  | STEP,,0, FIRST 1.1, THEN 1-01, ETC  |
| 05240 | 21 | 00099 | 00000 | 25800 |        | A    | 99,,                                |
| 05252 | 22 | 00065 | 00000 | 25810 |        | S    | FAC+5                               |
| 05264 | 49 | 05216 | 00000 | 25820 |        | B    | LOG1,,0                             |
| 05276 | 11 | 05222 | 00001 | 25830 | STEP   | AM   | LOG1+6,1,010,STEP 1.1 TO 1.01, ETC. |
| 05288 | 12 | 05251 | 00001 | 25840 |        | SM   | LOG1+35,1,010                       |
| 05300 | 12 | 05263 | 00009 | 25850 |        | SM   | LOG1+47,9,07                        |
| 05312 | 46 | 05216 | 01400 | 25860 |        | BV   | LOG1,,0, NO OVERFLOW AT END         |
| 05324 | 21 | 00065 | 00098 | 25870 |        | A    | FAC+5,98                            |
| 05336 | 22 | 00065 | 01898 | 25880 |        | S    | FAC+5,ONE-4,,LOG X = X-1            |
| 05348 | 16 | 00052 | 00054 | 25890 |        | TFM  | FAC-8,54,10                         |
| 05360 | 25 | 00099 | 00065 | 25900 |        | TD   | 99,FAC+5,, SAVE SIGN                |
| 05372 | 33 | 00065 | 00000 | 25910 |        | CF   | FAC+5                               |
| 05384 | 46 | 01376 | 01200 | 25920 |        | BZ   | ZERFAC,, TEST FOR ZERO              |
| 05396 | 25 | 00066 | 01877 | 25930 |        | TD   | FAC+6,FZERE                         |
| 05408 | 43 | 05468 | 00054 | 25940 | NORMAL | BD   | LOGR,FAC-6,0                        |
| 05420 | 31 | 00054 | 00055 | 25950 |        | TR   | FAC-6,FAC-5,,NORMALIZING LOOP       |
| 05432 | 25 | 00065 | 01354 | 25960 |        | TD   | FAC+5,FILL                          |
| 05444 | 12 | 00052 | 00001 | 25970 |        | SM   | FAC-8,1,10                          |
| 05456 | 49 | 05408 | 00000 | 25980 |        | B    | NORMAL,,0                           |
| 05468 | 11 | 00062 | 00005 | 25990 | LOGR   | AM   | FAC+2,5,10, ROUND RESULT            |
| 05480 | 33 | 00053 | 00000 | 26000 |        | CF   | FAC-7                               |
| 05492 | 43 | 01464 | 00053 | 26010 |        | BD   | ENDD-24,FAC-7,, TEST FOR CARRY      |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL | MNEM | OPERANDS AND REMARKS              |
|-------|----|-------|-------|-------|-------|------|-----------------------------------|
| 05504 | 12 | 00052 | 00001 | 26020 |       | SM   | FAC-8,1,10                        |
| 05516 | 31 | 00053 | 00054 | 26030 |       | TR   | FAC-7,FAC-6                       |
| 05528 | 49 | 01464 | 00000 | 26040 |       | B    | ENDD-24                           |
| 05540 | 46 | 06588 | 01200 | 26050 | ELOG  | BE   | ERR                               |
| 05552 | 16 | 03285 | 05572 | 26060 |       | TFM  | ERMA ,ERLNM-1 ,1                  |
| 05564 | 49 | 06588 | 00000 | 26070 |       | B    | ERR                               |
| 05571 |    |       |       | 26080 |       | DORG | *-4                               |
| 05573 |    | 00005 | x2    | 26090 | ERLNM | DAC  | 5 ,ERLN'                          |
| 19930 |    | 00000 |       | 26100 | LTAB  | DS   | ,19930                            |
|       |    |       |       | 26110 | *     |      |                                   |
|       |    |       |       | 26120 | *     |      |                                   |
|       |    |       |       | 26130 | *     |      |                                   |
|       |    |       |       | 26140 | *     |      | SQUARE ROOT                       |
| 05000 |    |       |       | 26150 |       | DORG | 5000                              |
| 05000 | 31 | 00044 | 01841 | 26160 | SQRT  | TR   | FAC-16,FLTONE-5                   |
| 05012 | 45 | 05036 | 19909 | 26170 |       | BNR  | **24,QTAB-1,0                     |
| 05024 | 49 | 06576 | 00000 | 26180 |       | B    | UDV                               |
| 05036 | 21 | 00071 | 19909 | 26190 |       | A    | FAC+11,QTAB-1                     |
| 05048 | 46 | 01376 | 01200 | 26200 |       | BE   | ZERFAC                            |
| 05060 | 47 | 05336 | 01300 | 26210 |       | BN   | NSQR , ,0                         |
| 05072 | 13 | 00063 | 00050 | 26220 |       | MM   | FAC+3,50,10                       |
| 05084 | 11 | 00098 | 00255 | 26230 |       | AM   | 98,255,9                          |
| 05096 | 25 | 00080 | 01877 | 26240 |       | TD   | FAC+20 ,FZERE                     |
| 05108 | 15 | 00072 | 00005 | 26250 |       | TDM  | FAC+12 ,5                         |
| 05120 | 16 | 00063 | 00000 | 26260 |       | TFM  | FAC+3,0,9                         |
| 05132 | 43 | 05168 | 00098 | 26270 |       | BD   | **36,98,0                         |
| 05144 | 26 | 00073 | 00072 | 26280 |       | TF   | FAC+13 ,FAC+12                    |
| 05156 | 15 | 00062 | 00000 | 26290 |       | TDM  | FAC+2                             |
| 05168 | 46 | 05186 | 00065 | 26300 |       | TFM  | **18,FAC+5,010                    |
| 05180 | 21 | 00000 | 00053 | 26310 | SQRT1 | A    | ,FAC-7                            |
| 05192 | 43 | 05228 | 00062 | 26320 |       | BD   | SQRT2,FAC+2,0                     |
| 05204 | 12 | 00053 | 00002 | 26330 |       | SM   | FAC-7,2,10                        |
| 05216 | 49 | 05180 | 00000 | 26340 |       | B    | SQRT1,,0                          |
| 05228 | 26 | 05246 | 05186 | 26350 | SQRT2 | TF   | **18,SQRT1+6,01                   |
| 05240 | 22 | 00000 | 00053 | 26360 |       | S    | ,FAC-7                            |
| 05252 | 41 | 05186 | 00001 | 26370 |       | AM   | SQRT1+6,1,010                     |
| 05264 | 31 | 00043 | 00044 | 26380 |       | TR   | FAC-17,FAC-16                     |
| 05276 | 33 | 00060 | 00000 | 26390 |       | CF   | FAC                               |
| 05288 | 32 | 00061 | 00000 | 26400 |       | SF   | FAC+1                             |
| 05300 | 45 | 05180 | 00072 | 26410 |       | BNR  | SQRT1,FAC+12,0                    |
| 05312 | 26 | 00052 | 00097 | 26420 |       | TF   | FAC-8,97                          |
| 05324 | 49 | 01488 | 00000 | 26430 |       | B    | ENDD                              |
| 05336 | 16 | 03285 | 05356 | 26440 | NSQR  | TFM  | ERMA ,SQERM-1 ,1                  |
| 05348 | 49 | 06588 | 00000 | 26450 |       | B    | ERR                               |
| 05355 |    |       |       | 26460 |       | DORG | *-4                               |
| 05357 |    | 00005 | x2    | 26470 | SQERM | DAC  | 5 ,NSQR'                          |
| 19910 |    | 00000 |       | 26480 | QTAB  | DS   | ,19910                            |
|       |    |       |       | 26490 | *     |      |                                   |
|       |    |       |       | 26500 | *     |      |                                   |
|       |    |       |       | 26510 | *     |      | ABSOLUTE VALUE                    |
|       |    |       |       | 26520 | *     |      |                                   |
| 05000 |    |       |       | 26530 |       | DORG | 5000                              |
| 05000 | 45 | 05024 | 19889 | 26540 |       | BNR  | **24,ATAB-1,0                     |
| 05012 | 49 | 06576 | 00000 | 26550 |       | B    | UDV                               |
| 05024 | 28 | 00060 | 19889 | 26560 | ABS   | LD   | FAC,ATAB-1                        |
| 05036 | 42 |       |       | 26570 |       | BB2  |                                   |
| 19890 |    | 00000 |       | 26580 | ATAB  | DS   | ,19890                            |
|       |    |       |       | 26590 | *     |      |                                   |
|       |    |       |       | 26600 | *     |      |                                   |
|       |    |       |       | 26610 | *     |      | ABSOLUTE VALUE OF AN INTEGER      |
|       |    |       |       | 26620 | *     |      |                                   |
| 05000 |    |       |       | 26630 |       | DORG | 5000                              |
| 05000 | 45 | 05024 | 19869 | 26640 | NABS  | BNR  | **24,NTAB-1,0                     |
| 05012 | 49 | 06576 | 00000 | 26650 |       | B    | UDV                               |
| 05024 | 28 | 00060 | 19869 | 26660 |       | LD   | FAC,NTAB-1                        |
| 05036 | 42 |       |       | 26670 |       | BB2  |                                   |
| 19870 |    | 00000 |       | 26680 | NTAB  | DS   | ,19870                            |
|       |    |       |       | 26690 | *     |      |                                   |
|       |    |       |       | 26700 | *     |      |                                   |
|       |    |       |       | 26710 | *     |      | ARCTANGENT SUBROUTINE             |
|       |    |       |       | 26720 | *     |      |                                   |
| 05000 |    |       |       | 26730 |       | DORG | 5000                              |
| 05000 | 45 | 05024 | 19849 | 26740 |       | BNR  | **24,TTAB-1,0                     |
| 05012 | 49 | 06576 | 00000 | 26750 |       | B    | UDV                               |
| 05024 | 28 | 00060 | 19849 | 26760 | ATAN  | LD   | FAC,TTAB-1,, GET ARGUMENT AND     |
| 05036 | 25 | 05635 | 00099 | 26770 |       | TD   | ATAN4+11,99,0, SAVE SIGN          |
| 05048 | 14 | 00052 | 00043 | 26780 |       | CM   | FAC-8,43,10                       |
| 05060 | 47 | 01464 | 01300 | 26790 |       | BL   | ENDD-24                           |
| 05072 | 14 | 00052 | 00051 | 26800 |       | CM   | FAC-8,51,10                       |
| 05084 | 47 | 05132 | 01300 | 26810 |       | BL   | ATAN1,,0                          |
| 05096 | 26 | 02233 | 01846 | 26820 |       | TF   | FDVR-1,FLTONE                     |
| 05108 | 26 | 01495 | 05696 | 26830 |       | TF   | ENDD+7,ATAN1B+1,1,SET RETURN ADDR |
| 05120 | 49 | 02234 | 00000 | 26840 |       | B    | FDVR,,, GET RECIPROCAL            |
| 05132 | 18 | 00084 | 00000 | 26850 | ATAN1 | LDM  | 84,0,10                           |
| 05144 | 46 | 05198 | 00442 | 26860 |       | TFM  | **54,142,09                       |
| 05156 | 22 | 05198 | 00052 | 26870 |       | S    | **42,FAC-8,0                      |
| 05168 | 43 | 05204 | 05196 | 26880 |       | BD   | **36,**28,01                      |
| 05180 | 32 | 00053 | 00000 | 26890 |       | SF   | FAC-7                             |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM           | OPERANDS AND REMARKS             |
|-------|----|-------|-------|-------|--------|----------------|----------------------------------|
| 05192 | 21 | 00000 | 00060 | 26900 |        | A              | ,FAC,, FIX ARGUMENT              |
| 05204 | 26 | 00068 | 00099 | 26910 |        | TF             | FAC+8,99                         |
| 05216 | 14 | 00057 | 00000 | 26920 |        | CM             | FAC-3                            |
| 05228 | 46 | 05552 | 01200 | 26930 |        | BZ             | ATAN3+24,,0                      |
| 05240 | 46 | 05299 | 00041 | 26940 |        | TFM            | ATAN2+11,11,010                  |
| 05252 | 46 | 05539 | 05723 | 26950 |        | TFM            | ATAN3+11,ATAN2-11,017            |
| 05264 | 42 | 05299 | 00001 | 26960 |        | SM             | ATAN2+11,1,010                   |
| 05276 | 41 | 05539 | 00041 | 26970 |        | AM             | ATAN3+11,11,010                  |
| 05288 | 14 | 00085 | 00000 | 26980 | ATAN2  | CM             | 85                               |
| 05300 | 47 | 05264 | 01300 | 26990 |        | BL             | *-36,,0, LOOP TO BRACKET ARG.    |
| 05312 | 23 | 00065 | 05299 | 27000 |        | M              | FAC+5,*-13,1                     |
| 05324 | 32 | 00086 | 00000 | 27010 |        | SF             | 86                               |
| 05336 | 11 | 00087 | 00040 | 27020 |        | AM             | 87,10,10, 1 + AX                 |
| 05348 | 26 | 00050 | 00094 | 27030 |        | TF             | FAC-10,94                        |
| 05360 | 28 | 00091 | 00064 | 27040 |        | LD             | 91,FAC+4                         |
| 05372 | 22 | 00081 | 05299 | 27050 |        | S              | 81,ATAN2+11,1, X-A               |
| 05384 | 29 | 00090 | 00050 | 27060 |        | D              | 90,FAC-10,, Y = (X-A)/(1+AX)     |
| 05396 | 26 | 00079 | 00090 | 27070 |        | TF             | 79,90,, ARGUMENT LESS THAN 0.1   |
| 05408 | 23 | 00076 | 00076 | 27080 |        | M              | 76,76                            |
| 05420 | 26 | 00050 | 00092 | 27090 |        | TF             | FAC-10,92,, Y SQUARED            |
| 05432 | 13 | 00048 | 19786 | 27100 |        | MM             | FAC-12,19786                     |
| 05444 | 26 | 00064 | 05723 | 27110 |        | TF             | FAC+4,ATANC2,1                   |
| 05456 | 22 | 00064 | 00094 | 27120 |        | S              | FAC+4,94,, EVALUATE POLYNOMIAL   |
| 05468 | 23 | 00064 | 00050 | 27130 |        | M              | FAC+4,FAC-10                     |
| 05480 | 26 | 00064 | 05716 | 27140 |        | TF             | FAC+4,ATANC1,1                   |
| 05492 | 22 | 00064 | 00092 | 27150 |        | S              | FAC+4,92                         |
| 05504 | 23 | 00064 | 00079 | 27160 |        | M              | FAC+4,79                         |
| 05516 | 26 | 00064 | 01871 | 27170 |        | TF             | FAC+4,FZERE-6                    |
| 05528 | 21 | 00064 | 00000 | 27180 | ATAN3  | A              | FAC+4,, ATAN(A)                  |
| 05540 | 21 | 00065 | 00091 | 27190 |        | A              | FAC+5,91,, ATAN(X)               |
| 05552 | 25 | 00069 | 01877 | 27200 |        | TD             | FAC+9,FZERE-6                    |
| 05564 | 44 | 05624 | 01495 | 27210 |        | BNF            | ATAN4,ENDD+7,0                   |
| 05576 | 16 | 01494 | 01496 | 27220 |        | TFM            | ENDD+6,BB                        |
| 05588 | 33 | 01495 | 00000 | 27230 |        | CF             | ENDD+7                           |
| 05600 | 22 | 00064 | 05707 | 27240 |        | S              | FAC+4,ATANP2,1,COMPLEMENT RESULT |
| 05612 | 33 | 00064 | 00000 | 27250 |        | CF             | FAC+4                            |
| 05624 | 15 | 00099 | 00000 | 27260 | ATAN4  | TDM            | 99                               |
| 05636 | 16 | 00052 | 00051 | 27270 |        | TFM            | FAC-8,51,10                      |
| 05648 | 43 | 01464 | 00053 | 27280 |        | BD             | ENDD-24,FAC-7                    |
| 05660 | 31 | 00053 | 00054 | 27290 |        | TR             | FAC-7,FAC-6,,NORMALIZE           |
| 05672 | 12 | 00052 | 00001 | 27300 |        | SM             | FAC-8,1,10                       |
| 05684 | 49 | 05648 | 05132 | 27310 |        | B              | *-36 ,ATAN1,01                   |
| 05695 |    | 00000 |       | 27320 | ATAN1B | DS             | ,*                               |
| 05707 |    | 00012 |       | 27330 | ATANP2 | DC             | 12,157079632679                  |
| 05716 |    | 00009 |       | 27340 | ATANC1 | DC             | 9,999999996                      |
| 05723 |    | 00007 |       | 27350 | ATANC2 | DC             | 7,3333253                        |
| 05734 |    | 00011 |       | 27360 | ATANT  | DC             | 11,78539816340                   |
| 05745 |    | 00011 |       | 27370 |        | DC             | 11,73281510179                   |
| 05756 |    | 00011 |       | 27380 |        | DC             | 11,67474094222                   |
| 05767 |    | 00011 |       | 27390 |        | DC             | 11,61072596439                   |
| 05778 |    | 00011 |       | 27400 |        | DC             | 11,54041950027                   |
| 05789 |    | 00011 |       | 27410 |        | DC             | 11,46364760900                   |
| 05800 |    | 00011 |       | 27420 |        | DC             | 11,38050637711                   |
| 05811 |    | 00011 |       | 27430 |        | DC             | 11,29145679448                   |
| 05822 |    | 00011 |       | 27440 |        | DC             | 11,19739555985                   |
| 05833 |    | 00011 |       | 27450 |        | DC             | 11,9966865249                    |
| 05844 |    | 00011 |       | 27460 |        | DC             | 11,0                             |
| 19850 |    | 00000 |       | 27470 | TTAB   | DS             | ,19850                           |
|       |    |       |       | 27480 | *      |                |                                  |
|       |    |       |       | 27490 | *      |                |                                  |
|       |    |       |       | 27500 | *      |                |                                  |
|       |    |       |       | 27510 | *      |                |                                  |
| 05000 |    |       |       | 27520 |        | DORG           | 5000                             |
| 05000 | 45 | 05024 | 19829 | 27530 | BNR    | **24,DTAB-1,0  |                                  |
| 05012 | 49 | 06576 | 00000 | 27540 | B      | UDV            |                                  |
| 05024 | 28 | 00060 | 19829 | 27550 | LD     | FAC ,DTAB-1    |                                  |
| 05036 | 14 | 00052 | 00050 | 27560 | CM     | FAC-8 ,50 ,10  |                                  |
| 05048 | 47 | 01376 | 01100 | 27570 | BNH    | ZERFAC         |                                  |
| 05060 | 14 | 00052 | 00058 | 27580 | CM     | FAC-8 ,58 ,10  |                                  |
| 05072 | 46 | 01464 | 01300 | 27590 | BNL    | ENDD-24        |                                  |
| 05084 | 46 | 05114 | 00003 | 27600 | TFM    | **30 ,3 ,07    |                                  |
| 05096 | 41 | 05114 | 00052 | 27610 | A      | **18 ,FAC-8 ,0 |                                  |
| 05108 | 31 | 00000 | 01869 | 27620 | TR     | FZERE-8        |                                  |
| 05120 | 49 | 01464 | 00000 | 27630 | B      | ENDD-24        |                                  |
| 19830 |    | 00000 |       | 27640 | DTAB   | DS             | ,19830                           |
|       |    |       |       | 27650 | *      |                |                                  |
|       |    |       |       | 27660 | *      |                |                                  |
|       |    |       |       | 27670 | *      |                |                                  |
|       |    |       |       | 27680 | *      |                |                                  |
| 05000 |    |       |       | 27690 |        | DORG           | 5000                             |
| 05000 | 44 | 05108 | 05023 | 27700 | BNF    | MULT,**23,01   |                                  |
| 05012 | 33 | 05023 | 00000 | 27710 | CF     | **11,,011      |                                  |
| 05024 | 45 | 05048 | 19809 | 27720 | BNR    | **24,PTAB-1,0  |                                  |
| 05036 | 49 | 06576 | 00000 | 27730 | B      | UDV            |                                  |
| 05048 | 13 | 19809 | 00005 | 27740 | MM     | PTAB-1,05,10   |                                  |
| 05060 | 43 | 05084 | 00099 | 27750 | BD     | MOVE,99,0      |                                  |
| 05072 | 11 | 19809 | 00001 | 27760 | AM     | PTAB-1,01,10   |                                  |
| 05084 | 26 | 05206 | 19809 | 27770 | MOVE   | TF             | NR, PTAB-1,0                     |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS                                              |
|-------|----|-------|-------|-------|--------|------|-------------------------------------------------------------------|
| 05096 | 33 | 05202 | 00000 | 27780 |        | CF   | NR-4,,0                                                           |
| 05108 | 23 | 05196 | 05206 | 27790 | MULT   | M    | F,NR,01                                                           |
| 05120 | 32 | 00090 | 00000 | 27800 |        | SF   | 90                                                                |
| 05132 | 26 | 05206 | 00099 | 27810 |        | TF   | NR,99,0                                                           |
| 05144 | 26 | 00060 | 00094 | 27820 |        | TF   | FAC,94                                                            |
| 05156 | 16 | 00055 | 00000 | 27830 |        | TFM  | FAC-5,0                                                           |
| 05168 | 33 | 00056 | 00000 | 27840 |        | CF   | FAC-4                                                             |
| 05180 | 49 | 01488 |       | 27850 |        | B7   | ENDD                                                              |
| 05196 |    | 00010 |       | 27860 | F      | DC   | 10,8212890627                                                     |
| 05206 |    | 00010 |       | 27870 | NR     | DC   | 10,0                                                              |
| 19810 |    | 00000 |       | 27880 | PTAB   | DS   | ,19810                                                            |
|       |    |       |       | 27890 | *      |      |                                                                   |
|       |    |       |       | 27900 | *      |      |                                                                   |
|       |    |       |       | 27910 | *      | MOVE | (TRANSFERS RECORDS TO AND FROM DISK, ALSO USED TO SEE A CYLINDER) |
|       |    |       |       | 27920 | *      |      |                                                                   |
|       |    |       |       | 27930 | *      |      |                                                                   |
|       |    |       |       | 27940 | *      |      |                                                                   |
| 05000 |    |       |       | 27950 |        | DORG | 5000                                                              |
| 05000 | 45 | 05024 | 19789 | 27960 |        | BNR  | MVENT,MTAB-1,0                                                    |
| 05012 | 49 | 06576 | 00000 | 27970 |        | B    | UDV                                                               |
| 05024 | 44 | 05108 | 05031 | 27980 | MVENT  | BNF  | MVENT2,AFTINI,017                                                 |
| 05031 |    | 00000 |       | 27990 | AFTINI | DS   | ,MVENT+7                                                          |
| 05036 | 33 | 05031 | 00000 | 28000 |        | CF   | AFTINI,,0                                                         |
| 05048 | 21 | 05227 | 00879 | 28010 |        | A    | XXX1+11,COMBEG,0                                                  |
| 05060 | 21 | 05299 | 00879 | 28020 |        | A    | ALR+11,COMBEG,0                                                   |
| 05072 | 21 | 05383 | 00879 | 28030 |        | A    | XXX2+11,COMBEG,0                                                  |
| 05084 | 21 | 05443 | 00879 | 28040 |        | A    | XXX3+11,COMBEG,0                                                  |
| 05096 | 21 | 05635 | 00879 | 28050 |        | A    | XXX4+11,COMBEG,0                                                  |
| 05108 | 45 | 05132 | 05227 | 28060 | MVENT2 | BNR  | **24,XXX1+11,0111                                                 |
| 05120 | 49 | 06576 | 00000 | 28070 |        | B    | UDV                                                               |
| 05132 | 45 | 05156 | 05383 | 28080 |        | BNR  | **24,XXX2+11,0111                                                 |
| 05144 | 49 | 06576 | 00000 | 28090 |        | B    | UDV                                                               |
| 05156 | 45 | 05180 | 00879 | 28100 |        | BNR  | **24,COMBEG,011                                                   |
| 05168 | 49 | 06576 | 00000 | 28110 |        | B    | UDV                                                               |
| 05180 | 45 | 05204 | 05299 | 28120 |        | BNR  | **24,ALR+11,0111                                                  |
| 05192 | 49 | 06576 | 00000 | 28130 |        | B    | UDV                                                               |
| 05204 | 26 | 05973 | 05993 | 28140 |        | TF   | CA,TNDG1,01,                                                      |
| 05216 | 22 | 05973 | 00020 | 28150 | XXX1   | S    | CA,20,0711,                                                       |
| 05228 | 47 | 05288 | 01100 | 28160 |        | BNH  | ALR,,0                                                            |
| 05240 | 49 | 05264 | 00000 | 28170 |        | B    | OUTMV,,0                                                          |
| 05252 | 16 | 05977 | 04449 | 28180 | DERR   | TFM  | MOVEM+2,4449,08                                                   |
| 05264 | 16 | 03285 | 05974 | 28190 | OUTMV  | TFM  | ERMA ,MOVEM-1 ,1                                                  |
| 05276 | 49 | 06588 | 00000 | 28200 |        | B    | ERR                                                               |
| 05288 | 21 | 05973 | 00030 | 28210 | ALR    | A    | CA,30,0711,                                                       |
| 05299 |    | 00000 |       | 28220 | LR     | DS   | ,*                                                                |
| 05300 | 47 | 05264 | 01100 | 28230 |        | BNH  | OUTMV,,0,                                                         |
| 05312 | 23 | 05973 | 00879 | 28240 |        | M    | CA,COMBEG,011,                                                    |
| 05324 | 47 | 05264 | 01100 | 28250 |        | BNH  | OUTMV,,0                                                          |
| 05336 | 32 | 00096 | 00000 | 28260 |        | SF   | 96,,7                                                             |
| 05347 |    | 00000 |       | 28270 | NXCYL  | DS   | ,*                                                                |
| 05348 | 14 | 00098 | 00200 | 28280 |        | CM   | 98,200,9                                                          |
| 05360 | 46 | 05264 | 01100 | 28290 |        | BH   | OUTMV,,0                                                          |
| 05372 | 26 | 05965 | 00010 | 28300 | XXX2   | TF   | SA,10,0711,                                                       |
| 05383 |    | 00000 |       | 28310 | MNR    | DS   | ,*                                                                |
| 05384 | 22 | 05965 | 05299 | 28320 |        | S    | SA,LR,0111,                                                       |
| 05396 | 47 | 05264 | 01300 | 28330 |        | BL   | OUTMV,,0                                                          |
| 05408 | 43 | 05264 | 00879 | 28340 |        | BD   | OUTMV,COMBEG,011,                                                 |
| 05420 | 26 | 05968 | 00098 | 28350 |        | TF   | SC,98,0,                                                          |
| 05432 | 23 | 05383 | 00001 | 28360 | XXX3   | M    | MNR,1,06711,                                                      |
| 05443 |    | 00000 |       | 28370 | RL     | DS   | ,*                                                                |
| 05444 | 24 | 00099 | 01067 | 28380 |        | C    | 99,PRBS                                                           |
| 05456 | 46 | 05264 | 01100 | 28390 |        | BH   | OUTMV,,0                                                          |
| 05468 | 23 | 05443 | 05965 | 28400 |        | M    | RL,SA,016                                                         |
| 05480 | 32 | 00095 | 00000 | 28410 |        | SF   | 95,,,                                                             |
| 05491 |    | 00000 |       | 28420 | DUMMY  | DS   | ,*                                                                |
| 05492 | 26 | 05965 | 00099 | 28430 |        | TF   | SA,99,0                                                           |
| 05504 | 11 | 05965 | 00000 | 28440 |        | AM   | SA,60000,07,                                                      |
| 05516 | 25 | 05960 | 00402 | 28450 |        | TD   | DKCF,402,0                                                        |
| 05528 | 43 | 05564 | 19789 | 28460 |        | BD   | AA1,MTAB-1,0                                                      |
| 05540 | 34 | 05960 | 00701 | 28470 |        | K    | DKCF,00701,0                                                      |
| 05552 | 49 | 01376 | 00000 | 28480 |        | B    | ZERFAC                                                            |
| 05564 | 26 | 05491 | 05965 | 28490 | AA1    | TF   | DUMMY,SA,01                                                       |
| 05576 | 13 | 05965 | 00050 | 28500 |        | MM   | SA,50,010                                                         |
| 05588 | 11 | 00095 | 00801 | 28510 |        | AM   | 95,1,9                                                            |
| 05600 | 26 | 05345 | 00095 | 28520 |        | TF   | NXCYL-2,95,0                                                      |
| 05612 | 21 | 05345 | 00095 | 28530 |        | A    | NXCYL-2,95,0,                                                     |
| 05624 | 16 | 05973 | 00039 | 28540 | XXX4   | TFM  | CA,39,0711                                                        |
| 05636 | 22 | 05971 | 05968 | 28550 |        | S    | CA-2,SC,01,                                                       |
| 05648 | 47 | 05264 | 01100 | 28560 |        | BNH  | OUTMV,,0                                                          |
| 05660 | 24 | 05973 | 00855 | 28570 |        | C    | CA,BSTBG,0                                                        |
| 05672 | 47 | 05264 | 01100 | 28580 |        | BNH  | OUTMV,,0                                                          |
| 05684 | 16 | 00099 | 00000 | 28590 |        | TFM  | 99,0,1011                                                         |
| 05696 | 44 | 05732 | 19789 | 28600 | ROW    | BNF  | AA2,MTAB-1,0                                                      |
| 05708 | 36 | 05960 | 00702 | 28610 |        | RN   | DKCF,00702,0                                                      |
| 05720 | 49 | 05756 | 00000 | 28620 |        | B    | AA3,,0                                                            |
| 05732 | 38 | 05960 | 00702 | 28630 | AA2    | WN   | DKCF,00702,0                                                      |
| 05744 | 36 | 05960 | 00703 | 28640 |        | RN   | DKCF,00703,0                                                      |
| 05756 | 46 | 05780 | 03900 | 28650 | AA3    | BI   | AA4,03900,0,                                                      |

CHECK FOR ZERO OR NEG FIRST RECORD (FIRST RECORD) IN Q ADDRESS

(LAST RECORD) IN Q ADDRESS

CHECK LAST REC GRTR 0 AND FIRST OR=15  
CHECK FOR REC LENGTH GREATER THAN ZERO

(MAX NO. RECORDS) IN Q ADDRESS

CHECK NO WDS/REC IS MULTIPLE OF 10  
SECTOR COUNT  
(RECORD LENGTH) IN Q ADDRESS

DUMMY CONTAINS SAVED SECTOR ADDRESS

1ST SECTOR ADDRESS, NEXT CYLINDER

CORE ADDRESS

ANY INDICATOR CHECK

| LOCTN | OP | P/L      | Q     | PG/LN | LABEL | MNEM              | OPERANDS AND REMARKS                              |
|-------|----|----------|-------|-------|-------|-------------------|---------------------------------------------------|
| 05768 | 49 | 01376    | 00000 | 28660 |       | B                 | ZERFAC                                            |
| 05780 | 47 | 05840    | 03600 | 28670 | AA4   | BNF               | BOF,03600,0, WRONG ADDRESS CHECK                  |
| 05792 | 44 | 05252    | 00099 | 28680 |       | BNF               | DERR,99,0                                         |
| 05804 | 33 | 00099    | 00000 | 28690 |       | CF                | 99                                                |
| 05816 | 34 | 05960    | 00701 | 28700 | BSK   | K                 | DKCF,00701,0                                      |
| 05828 | 49 | 05696    | 00000 | 28710 |       | B                 | ROW,,0                                            |
| 05840 | 47 | 05888    | 03700 | 28720 | BOF   | BNF               | NOHDW,03700,0, WRONG LENGTH REC/READ BACK CHECK   |
| 05852 | 44 | 05252    | 00098 | 28730 |       | BNF               | DERR,98,0                                         |
| 05864 | 33 | 00098    | 00000 | 28740 |       | CF                | 98                                                |
| 05876 | 49 | 05696    | 00000 | 28750 |       | B                 | ROW,,0                                            |
| 05888 | 26 | 05965    | 05347 | 28760 | NOHDW | TF                | SA,NXCYL,01                                       |
| 05900 | 22 | 05491    | 05347 | 28770 |       | S                 | DUMMY,NXCYL,01                                    |
| 05912 | 32 | 05489    | 00000 | 28780 |       | SF                | DUMMY-2,,0                                        |
| 05924 | 21 | 05968    | 05491 | 28790 |       | A                 | SC,DUMMY,01                                       |
| 05936 | 22 | 05971    | 05491 | 28800 |       | S                 | CA-2,DUMMY,01                                     |
| 05948 | 49 | 05816    | 00000 | 28810 |       | B                 | BSK,,0                                            |
| 05960 |    | 00014    |       | 28820 | DKCF  | DSS               | 14                                                |
| 05965 |    | 00000    |       | 28830 | SA    | DS                | ,DKCF+5                                           |
| 05968 |    | 00000    |       | 28840 | SC    | DS                | ,DKCF+8                                           |
| 05973 |    | 00000    |       | 28850 | CA    | DS                | ,DKCF+13                                          |
| 05975 |    | 00005 X2 |       | 28860 | MOVEM | DAC               | 5,TASK'                                           |
| 05993 |    | 00010    |       | 28870 | TNDG1 | DC                | 10,1,                                             |
| 19790 |    | 00000    |       | 28880 | MTAB  | DS                | ,19790                                            |
|       |    |          |       | 28890 | *     |                   |                                                   |
|       |    |          |       | 28900 | *     |                   |                                                   |
|       |    |          |       | 28910 | *     | MOD(N/M)          | EVALUATES N MOD M                                 |
|       |    |          |       | 28920 | *     |                   |                                                   |
| 05000 |    |          |       | 28930 |       | DORG              | 5000                                              |
| 05000 | 26 | 00060    | 00099 | 28940 |       | TF                | 60,99                                             |
| 05012 | 42 |          |       | 28950 |       | BB2               |                                                   |
|       |    |          |       | 28960 | *     |                   |                                                   |
|       |    |          |       | 28970 | *     |                   |                                                   |
|       |    |          |       | 28980 | *     | SAVE(             | TO SAVE AND RETRIEVE INPUT INFO FOR LATER REREAD) |
|       |    |          |       | 28990 | *     |                   |                                                   |
| 05000 |    |          |       | 29000 |       | DORG              | 5000                                              |
| 05000 | 45 | 05024    | 19749 | 29010 | BNR   | SAVE1,SVTAB,0     |                                                   |
| 05012 | 49 | 06576    | 00000 | 29020 | B     | UDV               |                                                   |
| 05024 | 44 | 05084    | 19749 | 29030 | SAVE1 | BNF               | RETRV,SVTAB,0                                     |
| 05036 | 33 | 05038    | 00000 | 29040 | SAVES | CF                | **2,,02                                           |
| 05048 | 26 | 00565    | 04429 | 29050 |       | TF                | INOUT+160,NEXT+5                                  |
| 05060 | 31 | 05134    | 00404 | 29060 | TR    |                   | STORE,INOUT-1,0                                   |
| 05072 | 42 | 00000    | 00000 | 29070 | SMSST | BB                |                                                   |
| 05084 | 44 | 05120    | 05038 | 29080 | RETRV | BNF               | RETR1,SAVES+2,01                                  |
| 05096 | 16 | 03285    | 05074 | 29090 | TFM   | ERRA,SAVEM-1,1    |                                                   |
| 05108 | 49 | 06588    | 00000 | 29100 | B     | ERR               |                                                   |
| 05120 | 31 | 00404    | 05134 | 29110 | RETR1 | TR                | INOUT-1,STORE,1                                   |
| 05132 | 42 |          |       | 29120 |       | BB2               |                                                   |
| 05134 |    | 00160    |       | 29130 | STORE | DSS               | 160                                               |
| 05295 |    | 00002    |       | 29140 |       | DC                | 2,0'                                              |
| 05075 |    | 00005 X2 |       | 29150 | SAVEM | DAC               | 5,SAVE',SMSST+3                                   |
| 19749 |    | 00000    |       | 29160 | SVTAB | DS                | ,19749                                            |
|       |    |          |       | 29170 | *     |                   |                                                   |
|       |    |          |       | 29180 | *     |                   |                                                   |
|       |    |          |       | 29190 | *     | LINK              |                                                   |
|       |    |          |       | 29200 | *     |                   |                                                   |
| 05000 |    |          |       | 29210 |       | DORG              | 5000                                              |
| 05000 | 45 | 05024    | 19729 | 29220 | BNR   | **24              | ,LKTAB-1 ,0                                       |
| 05012 | 49 | 06576    | 00000 | 29230 | B     | UDV               |                                                   |
| 05024 | 32 | 02022    | 00000 | 29240 | SF    | LNKFLG            |                                                   |
| 05036 | 26 | 00425    | 19729 | 29250 | TF    | 425               | ,LKTAB-1                                          |
| 05048 | 16 | 02038    | 00073 | 29260 | TFM   | ABNDCF-7          | ,073 ,9                                           |
| 05060 | 16 | 02028    | 04656 | 29270 | TFM   | ABNDCF-17         | ,4656 ,711                                        |
| 05072 | 49 | 01966    |       | 29280 | B7    | TIGER+12          |                                                   |
| 19730 |    | 00000    |       | 29290 | LKTAB | DS                | ,19730                                            |
|       |    |          |       | 29300 | *     |                   |                                                   |
|       |    |          |       | 29310 | *     |                   |                                                   |
|       |    |          |       | 29320 | *     | NFIL              | SUBROUTINE TO CONVERT INTEGER TO ALPHAMERIC       |
|       |    |          |       | 29330 | *     |                   |                                                   |
| 05000 |    |          |       | 29340 |       | DORG              | 5000                                              |
| 05000 | 45 | 05024    | 19709 | 29350 | BNR   | NFILA             | , NFTAB ,0                                        |
| 05012 | 49 | 06576    | 00000 | 29360 | B     | UDV               |                                                   |
| 05024 | 14 | 19704    | 00000 | 29370 | NFILA | CM                | NFTAB-5 , 0 , 7                                   |
| 05036 | 46 | 05204    | 01100 | 29380 | BP    | NFILE             | , ,0                                              |
| 05048 | 32 | 19705    | 00000 | 29390 | NFILB | SF                | NFTAB-4 , , 7                                     |
| 05060 | 26 | 05059    | 19709 | 29400 | TF    | NFILB+11, NFTAB   | ,0                                                |
| 05072 | 73 | 19709    | 05059 | 29410 | TNF   | NFTAB             | , NFILB+11, 1                                     |
| 05084 | 43 | 05144    | 19701 | 29420 | NFILC | BD                | NFILD , NFTAB-8 ,0 10                             |
| 05096 | 15 | 19780    | 00000 | 29430 | TDM   | NFTAB-9 , 0       | , 5                                               |
| 05108 | 11 | 05095    | 00002 | 29440 | AM    | NFILC+11, 2       | ,0 10                                             |
| 05120 | 11 | 05102    | 00002 | 29450 | AM    | NFILC+18, 2       | ,0 10                                             |
| 05132 | 43 | 05084    | 05102 | 29460 | BD    | NFILC             | , NFILC+18,01                                     |
| 05144 | 32 | 19700    | 00000 | 29470 | NFILD | SF                | NFTAB-9                                           |
| 05156 | 26 | 00060    | 19709 | 29480 | TF    | FAC               | , NFTAB                                           |
| 05168 | 16 | 05095    | 19701 | 29490 | TFM   | NFILC+11, NFTAB-8 | ,0 10                                             |
| 05180 | 16 | 05102    | 19700 | 29500 | TFM   | NFILC+18, NFTAB-9 | ,0 10                                             |
| 05192 | 42 | 00000    | 00000 | 29510 | BB    |                   |                                                   |
| 05195 |    | 00005 X2 |       | 29520 | DAC   | 5,NFIL',*-8       |                                                   |

| LOCTN | OP | P/L      | Q     | PG/LN | LABEL  | MNEM     | OPERANDS AND REMARKS                       |
|-------|----|----------|-------|-------|--------|----------|--------------------------------------------|
| 05204 | 16 | 03285    | 05194 | 29530 | NFILE  | TFM      | ERMA , *-10 , 17                           |
| 05216 | 49 | 06588    |       | 29540 |        | B7       | ERR                                        |
| 19709 |    | 00000    |       | 29550 | NFTAB  | DS       | ,19709                                     |
|       |    |          |       | 29560 | *      |          |                                            |
|       |    |          |       | 29570 | *      |          |                                            |
|       |    |          |       | 29580 | *      | NUPL     | MODIFY PAGE AND LINE CONTROL               |
|       |    |          |       | 29590 | *      |          |                                            |
| 05000 |    |          |       | 29600 |        | DORG     | 5000                                       |
| 05000 | 45 | 05024    | 19689 | 29610 | BNR    | NUPLA    | , NUTAB ,0                                 |
| 05012 | 49 | 06576    | 00000 | 29620 | B      | UDV      |                                            |
| 05024 | 43 | 05072    | 19689 | 29630 | NUPLA  | BD       | NUPLB , NUTAB ,0                           |
| 05036 | 43 | 05120    | 19688 | 29640 |        | BD       | NUPLC , NUTAB-1 ,0                         |
| 05048 | 16 | 03285    | 05160 | 29650 |        | TFM      | ERMA , NUPLD-1 ,17                         |
| 05060 | 49 | 06588    | 00000 | 29660 |        | B        | ERR                                        |
| 05072 | 44 | 05098    | 19689 | 29670 | NUPLB  | BNF      | **26 , NUTAB ,0                            |
| 05084 | 15 | 04339    | 00007 | 29680 |        | TDM      | EOL+1,7                                    |
| 05096 | 42 |          |       | 29690 |        | BB2      |                                            |
| 05098 | 15 | 04339    | 00009 | 29700 |        | TDM      | EOL+1,9                                    |
| 05110 | 42 |          |       | 29710 |        | BB2      |                                            |
| 05119 |    |          |       | 29720 |        | DORG     | **8                                        |
| 05120 | 44 | 05146    | 19689 | 29730 | NUPLC  | BNF      | **26 , NUTAB ,0                            |
| 05132 | 15 | 04477    | 00000 | 29740 |        | TDM      | READ+11, 0                                 |
| 05144 | 42 |          |       | 29750 |        | BB2      |                                            |
| 05146 | 15 | 04477    | 00001 | 29760 |        | TDM      | READ+11, 1                                 |
| 05158 | 42 |          |       | 29770 |        | BB2      |                                            |
| 05161 |    | 00005 X2 |       | 29780 | NUPLD  | DAC      | 5,NUPL                                     |
| 19689 |    | 00000    |       | 29790 | NUTAB  | DS       | ,19689                                     |
|       |    |          |       | 29800 | *      | SGN      | 10 C4D SUBROUTINE                          |
|       |    |          |       | 29810 | *      |          | THE ARGUMENT OF SGN IS EXAMINED AND CAUSES |
|       |    |          |       | 29820 | *      | FAC      | = 1. IF POSITIVE                           |
|       |    |          |       | 29830 | *      | OR FAC   | = 0. IF ZERO                               |
|       |    |          |       | 29840 | *      | OR FAC   | = -1. IF NEGATIVE                          |
| 19810 |    | 00000    |       | 29850 | SGNTAB | DS       | ,19810                                     |
|       |    |          |       | 29860 | *      |          | LOCATED TO REPLACE PSEUDO RANDOM INTEGER   |
| 05000 |    |          |       | 29870 |        | DORG     | 5000                                       |
| 05000 | 45 | 05024    | 19809 | 29880 | BNR    | **24     | ,SGNTAB-1 ,0                               |
| 05012 | 49 | 06576    | 00000 | 29890 | B      | UDV      |                                            |
| 05024 | 26 | 00060    | 01846 | 29900 | TF     | FAC      | ,FLTONE                                    |
| 05036 | 14 | 19809    | 00000 | 29910 | CM     | SGNTAB-1 | , ,10                                      |
| 05048 | 46 | 01376    | 01200 | 29920 | BE     | ZERFAC   |                                            |
| 05060 | 47 | 01476    | 01300 | 29930 | BL     | ENDD-12  |                                            |
| 05072 | 42 | 00000    | 00000 | 29940 | BB     |          |                                            |
| 05074 |    |          |       | 29950 |        | DORG     | **9                                        |
| 00972 |    |          |       | 29960 |        | DEND     | BEGIN                                      |

# LABELS IN THE FORTRAN LABEL INDEXER

A---CONTAINS ADDRESS OF TOP OF STATEMENT NUMBER TABLE.

AA---IN THE ..PUTV..ROUTINE, CHECKS FOR END OF VARIABLE NAME, SKIPS IMBEDDED  
BLANKS, SETS DEFINING FLAG IN ..SCAN.., TRANSMITS VARIABLE SYMBOL RANGE  
TO ..SYMCK.. AND EXITS TO ..SYMCK...

ADTO---IN THE ..EQCHK.. ROUTINE, INCREMENTS LOCATION ..ADR.. IN INPUT  
BUFFER (CHI) WHEN CHECKING THE TYPE OF STATEMENT BY SPECIAL CHARACTER.  
ENTERED FROM ..LPAR.. AND ..A3... EXIT TO ..A1...

AD5--- IN THE OUTPUT SECTION, ADDS 5 TO LOCATION BEING CHECKED IN SYMBOL  
TABLE ..VA+35.. BEFORE CHECKING FOR DEFINITION DIGIT AT ..VA+24..  
BECAUSE OF PREVIOUS CHECK FOR NEXT LABEL.

ARITH---HANDLES ARITHMETIC STATEMENTS SETTING REFERENCE DEFINITION  
INDICATOR ..REDEI.. FOR LEFT AND RIGHT OF EQUAL SIGN. EXIT TO  
..PUTTST...

ASTMSG---ALPHA MESSAGE---\* OTHER CARDS WHERE VARIABLES ARE DEFINED--OUTPUT  
IN ..CALSYS.. BEFORE BRINGING THE EXECUTIVE IN.

A1---IN THE ..EQCHK..ROUTINE, CHECKS FOR END OF SOURCE STATEMENT WHILE  
CHECKING TYPE OF STATEMENT BY SPECIAL CHARACTERS. EXITS TO ..LPAR..  
OR ..ETEST...

A2---IN THE ..EQCHK.. ROUTINE, CHECKS IF LEFT PARENTHESIS OR COMMA IS FIRST  
SPECIAL CHARACTER. EXITS TO ..A3.. FOR LEFT PARENTHESIS, TO ..COMIO..  
FOR COMMA.

A3---IN THE ..EQCHK.. ROUTINE, CHECKS FOR EQUAL SIGN, EXIT TO ..DOTEST..  
OR IF LEFT PARENTHESIS FOLLOWED BY EQUAL SIGN, EXIT TO ..ARITH..

BA2---PUTS AVOID ..0+.. AT END OF SOURCE STATEMENT.

BEG---BEGINNING OF LABEL INDEXER PROPER. SETS FLAG DEFINING BLANK FIELD  
..BLK.. IN THE BLANK RECORD ..BLK1...

BLK---BLANK FIELD OF 10 DIGITS.

BLK1---BLANK RECORD OF 80 ALPHA CHARACTERS, 160 DIGITS.

BRS---IN THE ..SYMCK.. ROUTINE, PUTS SEQUENCE NUMBER ..SEON.. AND REFERENCE  
DEFINITION INDEX ..REDEI.. INTO THE SYMBOL TABLE. RESTORES DIGIT  
COVERED BY MOVING THE SYMBOL TABLE FOR ENTRY AND RETURNS TO MAINLINE  
SECTION.

BRV---IN THE ..SYMCK.. ROUTINE, ENTERS LABEL INTO SYMBOL TABLE. EXITS TO  
..BRS...

BTREF---SETS ..REDEI.. TO REFERENCE CARD. EXITS TO ..STATNO.. WITH RETURN  
TO ..READ...

CALSYS---OUTPUTS ..ASTMSG.. AND CALLS SYSTEM EXECUTIVE.

CFLAG---SETS UP ..FLAG.. TO CLEAR FLAGS IN THE FIRST N POSITIONS OF THE  
INPUT BUFFER ..CHI.. FOR A COMPARE. N IS TRANSMITTED WITH THE CALL.

CHI--- THE INPUT BUFFER. 100 ALPHA CHARACTERS.

CKDEC---IN THE ..PUTTST.. ROUTINE, CHECKS FOR DECIMAL AND MOVES FIRST  
CHARACTER OUT OF BUFFER AREA ..CHI... EXIT TO ..CNUM.. FOR DECIMAL.

EXIT TO ..PUTTST+24.. FOR NON-DECIMAL.

CKNUM---IN THE ..PUTTST.. ROUTINE, CHECKS FOR NUMERIC, MOVES FIRST CHARACTER OUT OF BUFFER AREA ..CHI.. AND EXITS TO ..PUTTST+24.. FOR NUMERIC. EXITS TO ..PUTV.. FOR NON-NUMERIC.

CKNV---IN THE ..STATNO.. ROUTINE, CHECKS FOR NUMERIC. EXITS TO ..INT.. FOR NUMERIC. MOVES FIRST CHARACTER OUT OF BUFFER AREA AND EXITS TO ..STATNO.. FOR NON-NUMERIC.

CLOUT---IN THE ..OUTP.. ROUTINE, BLANKS THE OUTPUT BUFFER ..OUT.. AND RETURNS TO MAIN LINE.

CLSCAN---MOVES LEADING BLANKS OUT OF BUFFER AREA ..CHI.. AND CHECKS FOR ..DATA.. STATEMENT. EXIT TO ..NO DATA.. OR ..DATAACK...

CNT---USED FOR COUNTING OR TEMPORARY STORAGE OF 2 DIGITS.

CNUM---IN THE ..PUTTST.. SUBROUTINE. CHECKS FOR END OF STATEMENT. IF NOT, EXIT TO ..CNUM1.., OTHERWISE, TO ..PUTTST+42.. INDIRECT. ..PUTTST+42.. IS NORMALLY ..READ.. BUT IN THE CASE OF AN--IF--, IT IS ALTERED TO ..IFRET...

CNUM1---IN THE ..PUTTST.. SUBROUTINE. IF NUMBER, EXIT TO ..NUMB.., IF --E--, MOVE--E-- AND SIGN OUT AND THEN EXIT TO ..PUTTST+24.., OTHERWISE EXIT TO ..CKNUM+24...

COM---IN COMMON I/O ROUTINE ..RESTO... IF COMMA, EXIT TO ..RESTO+12... IF RIGHT PARENTHESIS, EXIT TO ..ECHK... IF LEFT PARENTHESIS, EXIT TO ..RESTO+12...

COMA---IN ..DOTEST.. ROUTINE. CHECKS FOR A COMMA BEFORE LEFT PARENTHESIS INDICATING A --DO--. IF LEFT PARENTHESIS, EXIT TO ..ARITH... IF COMMA, SET ..REDEI.. TO REFERENCE AND EXIT TO ..STATNO.. WITH RETURN TO ..ARITH..., OTHERWISE, EXIT TO ..DOTEST+24...

COMIO---DETERMINES TYPE OF STATEMENT BY FIRST LETTER. --C-- COMMON EXIT TO ..READ.., --R-- READ EXIT TO ..INPUT.., --S-- SEGMENT EXIT TO ..SEGLST.., OTHERWISE OUTPUT STATEMENT SO SET ..REDEI.. TO REFERENCE AND EXIT TO ..STATNO.. AND RETURN TO SET ..REST.. TO REFERENCE AND EXIT TO ..RESTU...

CONT---EXIT TO ..NUM.. FOR NON-CONTINUATION CARD. EXIT TO ..READ.. FOR CONTINUATION OF FORMAT. ANY OTHER CONTINUATION, MOVE CHARACTERS TO NON-NUMBER AND EXIT TO ..RESTO...

CSYS---RECORD CONTAINING INSTRUCTIONS AND DISK CONTROL FIELD FOR CALLING SYSTEM EXECUTIVE.

CTST---CHECKS FIRST LETTER OF STATEMENT FOR --C--. NOT EQUAL, EXIT TO ..TRA.., OTHERWISE, CHECK SECOND CHARACTER FOR AN --O--. IF EQUAL, EXIT TO ..READ... IT IS A CONTINUE OR CONTROL.

DATA---SETS ..REDEI.. TO DEFINITION, MOVES --DATA,-- OUT OF BUFFER AREA AND EXITS TO ..PUTTST.. TO GET VARIABLE INTO SYMBOL TABLE. ON RETURN, ALL SUBSCRIPTS AND DATA ARE SKIPPED TO SECOND SLASH THEN NEXT VARIABLE IS PULLED ..PUTTST.., ETC. FINAL EXIT IS TO ..READ.. THROUGH DETECTION OF END OF STATEMENT IN ..PUTTST...

DATAACK---COMPARE THE FIRST 5 CHARACTERS IN THE BUFFER ..CHI.. TO --DATA,--.

EXIT TO ..DATA.. IF EQUAL, EXIT TO ..NODATA.. IF UNEQUAL.  
 DATASP---ALPHA CONSTANT --DATA,-- USED IN ..DATAACK...  
 DCF---DISK CONTROL FIELD USED FOR READING SOURCE STATEMENTS FROM DISK.  
 DCFS---DISK CONTROL FIELD USED FOR READING SYSTEM EXECUTIVE FROM DISK.  
 DTEST---ROUTINE FOR TESTING FOR --DO--. EXIT TO ..ARITH.. IF FIRST  
 CHARACTER IS NOT A --D--, OTHERWISE EXIT TO ..COMA...  
 DWN---CONTAINS THE SIZE OF THE SYMBOL TABLE SHIFT FOR EACH TIME THROUGH  
 ..SYMCK.. 15 FOR A NEW ENTRY OR 5 FOR THE ENTRY OF A SEQUENCE NUMBER  
 ONLY.  
 E---EXIT TO ..VAROT1+24.. TO PICK UP MULTIPLE DEFINITION OF LAST VARIABLE  
 IN SYMBOL TABLE THE FIRST TIME THROUGH. THE SECOND TIME THROUGH, EXIT  
 IS TO ..EOUT...  
 ECHK---IN THE I/O ROUTINE ..RESTO.. CHECKS TO SEE IF THERE ARE ANY MORE  
 VARIABLES IN THE LIST. IF NONE LEFT EXIT TO ..READ.., IF ONLY ONE  
 EXIT TO ..RESTO.., IF MORE THAN ONE EXIT TO ..SPCHA...  
 END---PUTS BLANK FIELD AT THE END OF THE SYMBOL TABLE TO ALLOW  
 IDENTIFICATION OF THE END IN OUTPUT.  
 EOUT---OUTPUTS LAST LINE FOR BOTH VARIABLES AND STATEMENT NUMBERS. EXITS  
 TO ..VAROT.. FOR STATEMENT NUMBER, TO ..EOUT+12.. FOR VARIABLE.  
 EQCHK---ROUTINE FOR CHECKING TYPE OF STATEMENT BY ARRANGEMENT OF SPECIAL  
 CHARACTERS, 1ST - COMMON OR I/O EXIT TO ..COMIO.. THEN= ARITHMETIC  
 EXIT TO ..ARITH.. = 1ST IS ARITHMETIC OR DO EXIT TO ..DTEST.. NO, OR=  
 EXIT TO ..ETEST.. FOR FURTHER CHECKING. SETS FORMAT INDICATOR ..ETEST..  
 TO NON FORMAT SETS LEFT PAR INDICATOR ..A2.. OFF.  
 ETEST---CHECKS FIRST LETTER OF STATEMENT FOR --E-- IF LOW EXIT TO ..CTST..  
 IF HIGH EXIT TO ..ITEST.. IF --E-- CHECKS FOR AVOID IN 4TH POSITION IF  
 NO, EXIT TO ..TRAC.. IF YES, EXIT TO ..END..  
 FIF---CONTAINS ADDRESS..FIF+6.. OF STATEMENT NUMBER IN TEMPORARY AREA.  
 FIN---IN ..FLAG.. ROUTINE CHECKS FOR DONE. IF DONE, BRANCH BACK. IF NOT,  
 RETURN TO ..FLAG+12.. AND CONTINUE.  
 FINISH---IN..STATNO.. ROUTINE MOVES STATEMENT NUMBER 6 FROM TEMPORARY AREA  
 INTO ..SCAN.. AND CLEARS FLAGS. SETSUP ..SYMCK.. FOR STATEMENT NUMBER  
 CHECK AND EXITS TO ..SYMCK...  
 FLAG---RESTORES FLAGS IF ENTERED FROM ..RFLAG.. OR CLEARS FLAGS IF ENTERED  
 FROM ..CFLAG.. IN THE INPUT BUFFER ..CHI...  
 FRMTS---CHECKS FOR EXACT SPELLING OF FORMAT. EXIT TO ..NOMFR.. IF NOT  
 FORMAT. SET FORMAT INDICATOR ..FTEST.. AND EXIT TO ..READ.. FOR  
 FORMAT.  
 FRMTSP---ALPHA SPELLING OF FORMAT.  
 FTEST---MOVES BLANK OUT OF INPUT BUFFER ..CHI... EXIT TO ..LARRY...  
 GO---INCREASES DISK CONTROL FIELD FOR NEXT READ. EXIT TO ..STER.. IF  
 INVALID STATEMENT. IF COMMENT CARD, OUTPUTS FIRST EXIT TO  
 ..READ.. EXIT TO ..SEQ.. FOR NON-COMMENT.  
 HDWR---ALPHA MESSAGE- HDWR ERR LAB INDX  
 HDWRE---OUTPUT HARDWARE ERROR..HDWR.. AND CALLS SYSTEM.

HTYP---HANDLES HOLLERITH FIELDS IN THE DATA STATEMENT. SKIPS OVER THE  
 CHARACTERS IN HOLLERITH DATA.  
 IF---PLACES AVOID AFTER LAST RT. PAR. AND SETS RETURN FROM ..PUTTST.. TO BE  
 ..IFRET.. EXITS TO ..STOPIF...  
 IFRET---RESTORES RETURN IN ..PUTTST.., MOVES AVOID OUT OF BUFFER ..CHI..  
 EXITS TO ..IFS...  
 IFS---PULLS STATEMENT NUMBERS FROM-IF- BY WAY OF ..STATNO.. EXIT IS THROUGH  
 ..STATNO.. TO ..READ...  
 INPUT---SETS UP ..RESTO.. ROUTINE FOR INPUT STATEMENTS AND PULLS FORMAT  
 NUMBER, EXIT TO ..RESTO...  
 INT---IN..STATNO.. ROUTINE. INITIALIZES TEMPORARY ADDRESS ..FIF+6.. AND  
 ..SCAN.. AND CHECKS FOR END OF STATEMENT NUMBER. EXIT TO ..FINISH..  
 FOR END OF STATEMENT NUMBER OTHERWISE TO ..FIF...  
 ITEST---COMPARES FOR -I- AS FIRST CHARACTER. EXIT TO ..RTEST.. IF HIGH.  
 TO ..IF.. IF EQUAL. OTHERWISE -GO TO- EXIT TO ..BTREF.. IF COMPUTED  
 -GO TO- PULL STATEMENT NUMBERS OF COMPUTED GO TO AND INDEX WITH EXIT  
 TO ..READ...  
 LEADBL---PUTS ADDRESS OF FIRST NON-BLANK CHARACTER IN ..LEADBL+23... EXIT  
 TO ..READ.. FOR BLANK CARD. OTHERWISE EXIT TO ..CLSCAN...  
 LIN2---SETS RETURN TO ..LIN3.. FOR SECOND TIME THROUGH ENTRY IN TABLE IN  
 ..SQ...  
 LIN3---ENTERED AFTER SECOND TIME THROUGH TABLE ENTRY. OUTPUTS FIRST PART  
 OF OUTPUT AND SETS UP FOR OUTPUT OF MULTIPLE DEFINITION LINE. EXIT  
 TO ..LIN4+12...  
 LIN4---OUTPUTS MULTIPLE DEFINITION LINES WHEN FULL. EXIT TO ..SQ1...  
 LPAR---IN..EQCHK.. ROUTINE CHECKS FOR LEFT PAR.  
 MEM---CONTAINS CORE SIZE  
 NODATA---RESTORES FLAGS IN BUFFER AFTER ..DATAACK.. WHEN NOT A DATA STATEMENT.  
 NONFR---RESTORES FLAGS IN BUFFER AFTER ..FRMTS.. WHEN NOT-FORMAT-..  
 NUM---CHECKS FOR LEADING STATEMENT NUMBER. IF NONE, EXIT TO ..EQCHK..  
 OTHERWISE PULL STATEMENT NUMBER AND EXIT TO ..FTEST...  
 NUMB---IN ..PUTTST.. ROUTINE MOVES NUMBER OUT OF BUFFER, IF END OF  
 STATEMENT EXIT TO ..PUTTST+36.. OTHERWISE EXIT TO ..CNUM...  
 OK---IN ..SYMCK.. ROUTINE, MOVES DOWN SYMBOL TABLE TO MAKE ROOM FOR ENTRY.  
 OUT---OUTPUT BUFFER.  
 OUTAD---CONTAINS ADDRESS IN SYMBOL TABLE BEING LOOKED AT DURING BREAKDOWN  
 FOR OUTPUT.  
 OUTP---OUTPUT ROUTINE, OUTPUTS..OUT.. AND THEN FILLS ..OUT.. WITH BLANKS.  
 CHECKS FOR PAGE OVERFLOW.  
 PRI---IN ..OUTP.. ROUTINE PUTS RECORD MARK AFTER LAST CHARACTER AND PRINTS  
 LINE.  
 PRINT---IN ..OUTP.. ROUTINE CHECKS FOR PAGE OVERFLOW.  
 PUT---IN ..SYMCK.. ROUTINE, ENTRY POINT FOR NEW ENTRY AT BOTTOM OF TABLE.  
 PUTTST---ROUTINE TO PULL VARIABLES AND SKIP OVER FIXED AND FLOATING POINT  
 NUMBERS.

PUTV---PART OF ..PUTTST.. ROUTINE TO HANDLE VARIABLES. IN COMBINATION WITH  
 ..AA.. PUTS VARIABLE IN ..SCAN.. AND EXITS TO ..SYMCK...

PUT1---IN ..SYMCK.. IS BRANCH POINT FOR PUTTING SEQUENCE NUMBER IN TABLE  
 WHERE LABEL IS ALREADY IN TABLE.

PUT2---IN ..SYMCK.. HANDLES ACTUAL ADJUSTMENT OF SYMBOL TABLE ADDRESSES.  
 EXITS TO ..BRV.. FOR LABEL AND SEQUENCE NUMBER, TO ..BRS.. FOR  
 SEQUENCE NUMBER ONLY.

PUT3---IN ..SYMCK.. SETS UP FOR MOVING SYMBOL TABLE, IF NECESSARY.

READ---READS SOURCE STATEMENT FROM DISK AND CHECKS FOR HARDWARE ERROR.  
 EXIT TO ..GO.. IF NO ERROR, EXIT TO ..HDWRE.. IF ERROR.

REDEI---REFERENCED, DEFINED INDICATOR. 1 INDICATES THAT THE USE OF  
 STATEMENT NUMBER OR VARIABLE IS DEFINITION, 0 INDICATES A REFERENCE  
 USE.

REST---CONTAINS THE NORMAL CONDITION OF THE ..REDEI.. FOR HANDLING I/O  
 STATEMENTS.

RESTO---IN I/O ROUTINE THIS RESTORES THE ..REDEI.. TO ITS NORMAL STATE AFTER  
 THE HANDLING OF A SPECIAL CASE, SUCH AS SUBSCRIPTS WHICH ARE  
 REFERENCED IN A ..READ.. STATEMENT THAT HAS DEFINED AS ITS NORMAL  
 STATE.

RFLAG---SETS UP ..FLAG.. TO RESTORE FLAGS IN THE FIRST N POSITIONS OF THE  
 INPUT BUFFER ..CHI.. AFTER A COMPARE. N IS TRANSMITTED WITH THE CALL.

RTEST---CHECKS FIRST LETTER OF STATEMENT FOR AN --R--. EQUAL EXIT TO  
 ..BTREF.. FOR READ STATEMENT WITH NO LIST. IF A --P-- EXIT TO  
 ..BTREF.. FOR PRINT OR PUNCH WITH NO LIST. IF --T-- EXIT TO ..BTREF..  
 FOR TYPE WITH NO LIST. IF --S-- EXIT TO ..SEGLST.. FOR SEGMENT  
 STATEMENT. OTHERWISE GO TO ..READ...

SCAN---WILL CONTAIN STATEMENT NUMBER OR VARIABLE WHEN ENTERING ..SYNCH.. TO  
 CHECK SYMBOL TABLE.

SEGLST---SETS ..REDEI.. TO DEFINED FOR SEGMENT STATEMENT AND STARTS LOOP TO  
 PULL SEGMENT NUMBERS IN ..STATNO...

SEQ---BRANCH POINT FOR NON-COMMENT CARD FROM ..GO...

SEQN---CONTAINS CARD SEQUENCE NUMBER.

SHIFT---IN HOLLERITH ROUTINE ..HTYP.. THIS MOVES ..CHI.. DOWN BY ONE  
 CHARACTER.

SPCHA---IN COMMON I/O ROUTINE ..RESTO.. CHECKS FOR AN EQUAL SIGN. IF NON-  
 SPECIAL CHARACTER EXIT TO ..ECHK+12... IF AN EQUAL SIGN SET UP ..REDEI..  
 FOR IMPLIED DO INDEX DEFINITION AND EXIT TO ..RESTO+12.. OTHERWISE  
 EXIT TO ..RESTO...

SQ---IN OUTPUT ROUTINE HANDLES SEQUENCE NUMBER OUTPUT. CHECKS FOR END OF  
 TABLE IN SEARCH. 1ST TIME THROUGH CHECKS FOR REFERENCES. 2ND TIME  
 THROUGH CHECKS FOR MULTIPLE DEFINITIONS.

SQ1---PUTS SEQUENCE NUMBER IN OUTPUT AREA.

STATNO---START OF SUBROUTINE TO SEARCH SYMBOL TABLE FOR ENTRY AND ENTER  
 EITHER LABEL OR SEQUENCE NUMBER OR BOTH.

STER---WRITES ERROR MESSAGE ..STERR.. AND CALLS SYSTEM.

STERR---ALPHA MESSAGE- NO INDEX, \*HOLD SHOULD FOLLOW \*CODE.

STNAD---CONTAINS THE ADDRESS OF THE BOTTOM OF THE STATEMENT NUMBER SYMBOL  
TABLE.

STNO---BRANCH POINT FOR OUTPUT OF STATEMENT NUMBERS. CHECKS FOR END OF  
TABLE.

STOPIF---PUTS AVOID IN PLACE OF LAST ) IN IF STATEMENT FOR PULLING  
VARIABLES AND ALTERS ..PUTTST.. TO RETURN TO ..IFRET.. ON HITTING  
AVOID.

SUB---SUBTRACTS 14 FROM ..SYMCK+11.. TO BYPASS LAST LABEL CHECKED AND ONE  
SEQUENCE NUMBER IN TABLE FOR FURTHER CHECKING.

SYMCK---CHECKS FOR LABEL ENTRY WHILE SEARCHING TABLES.

S2---BRANCH POINT. ALSO SUBTRACTS 5 TO SKIP OVER SEQUENCE NUMBERS IN  
SEARCH OF TABLE.

TEST---COMPARES ..SCAN.. TO LABEL IN TABLE. IF MATCH EXIT TO ..PUT1.. TO  
ENTER SEQUENCE NUMBER. BECAUSE OF ORDERING CAN EITHER CONTINUE SEARCH  
..SUB.. OR ENTER LABEL ..PUT3...

TRA---EXIT TO ..READ.. IF FIRST CHARACTER IS A --D--. IF --A-- EXIT TO  
..BTREF.. ACCEPT WITH NO LIST. IF --T-- IS 6TH CHARACTER EXIT TO  
..READ.. BEGIN TRACE. IF 6TH CHARACTER IS --P-- EXIT TO ..STATNO.. FOR  
BEGIN PROCEDURE OTHERWISE EXIT TO ..BTREF.. FOR BEGIN SEGMENT.

TRAC---IF 4TH CHARACTER IS A --T-- EXIT TO ..READ.. FOR END TRACE.  
OTHERWISE TO ..BTREF.. FOR END SEGMENT, EXECUTE PROCEDURE, OR END  
PROCEDURE.

VA---CHECKS FOR 1ST DEFINITION IN OUTPUT SECTION EXIT TO ..VDEF.. IF FOUND.  
EXIT TO ..VDEF+24.. IF END OF TABLE OR NEXT LABEL REACHED.

VAR---ALPHA MESSAGE FOR OUTPUT.

VARAD---CONTAINS ADDRESS OF BOTTOM OF VARIABLE SYMBOL TABLE.

VAROT---ADJUSTS OUTPUT SECTION FOR OUTPUT OF VARIABLES.

VAROT1---RETURN IN OUTPUT SECTION TO START ON NEXT LABEL.

VDEF---PUTS 1ST DEFINITION IN OUTPUT BUFFER AND SAVES ADDRESS TO START  
SEARCH FOR MULTIPLE DEFINITION.

V1---PUTS LABEL IN OUTPUT BUFFER, BLANKS LEADING ZEROS, AND RESTORES COUNT  
FOR OUTPUT OF SEQUENCE NUMBERS.

ZEREND---ZEROS TOP OF CORE FOR SYMBOL TABLES, ADJUSTS FOR CORE SIZE, AND  
SEEKS FOR 1ST SOURCE CARD.

|       |         |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|
| 03830 | A       | 00250 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04330 | AA      | 04300 | 04310 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07110 | ADR     | 01280 | 01300 | 01340 | 01370 | 01410 | 01440 | 01910 | 01920 | 01930 | 01940 | 01980 | 02000 | 02520 | 02530 | 02570 |  |  |  |
|       |         | 02590 | 03000 | 03010 | 03040 | 03080 | 03120 | 03130 | 03140 |       |       |       |       |       |       |       |  |  |  |
| 01370 | ADTO    | 01450 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 06320 | AD5     | 06280 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04640 | ARITH   | 01470 | 02510 | 02540 | 02580 | 02620 | 03170 |       |       |       |       |       |       |       |       |       |  |  |  |
| 07290 | ASTMSG  | 06750 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01300 | A1      | 01380 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01400 | A2      | 01290 | 01350 | 01360 | 01400 | 01470 |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01440 | A3      | 01400 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00580 | BA2     | 00540 | 03120 | 05090 | 06940 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00130 | BEG     | 00040 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07030 | BLK     | 03540 | 03550 | 03920 | 05590 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07000 | BLK1    | 00130 | 00160 | 00470 | 05610 | 06960 | 07030 |       |       |       |       |       |       |       |       |       |  |  |  |
| 05420 | BRS     | 05010 | 05200 | 05520 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 05370 | BRV     | 04920 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 02470 | BTREF   | 02690 | 02750 | 02810 | 02900 | 03300 | 03330 | 03360 |       |       |       |       |       |       |       |       |  |  |  |
| 06740 | CALSYS  | 00112 | 00118 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04440 | CFLAG   | 00780 | 01120 | 04450 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07040 | CHI     | 00129 | 00390 | 00420 | 00470 | 00530 | 00580 | 00580 | 00590 | 00620 | 00640 | 00730 | 00750 | 00790 | 00820 | 00950 |  |  |  |
|       |         | 00950 | 00960 | 01010 | 01060 | 01080 | 01080 | 01090 | 01130 | 01160 | 01280 | 01530 | 01560 | 01590 | 01760 | 01800 |  |  |  |
|       |         | 01910 | 01940 | 02090 | 02090 | 02140 | 02220 | 02250 | 02260 | 02260 | 02270 | 02280 | 02290 | 02300 | 02310 | 02310 |  |  |  |
|       |         | 02340 | 02380 | 02420 | 02500 | 02630 | 02650 | 02730 | 02760 | 02790 | 02850 | 02880 | 02940 | 02980 | 02980 | 03000 |  |  |  |
|       |         | 03210 | 03210 | 03280 | 03310 | 03340 | 03370 | 03430 | 03470 | 03490 | 03490 | 03560 | 03590 | 03620 | 03640 | 03640 |  |  |  |
|       |         | 03930 | 03960 | 03990 | 04000 | 04000 | 04030 | 04050 | 04070 | 04090 | 04090 | 04120 | 04120 | 04130 | 04160 | 04190 |  |  |  |
|       |         | 04190 | 04250 | 04290 | 04290 | 04300 | 04330 | 04350 | 04500 | 05610 | 07050 | 07060 |       |       |       |       |  |  |  |
| 03990 | CKDEC   | 03930 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04160 | CKNUM   | 03970 | 04080 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03470 | CKNV    | 03430 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 06960 | CLOUT   | 06820 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00710 | CLSCAN  | 00630 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07120 | CNT     | 02990 | 03030 | 03060 | 05850 | 06540 | 06580 |       |       |       |       |       |       |       |       |       |  |  |  |
| 04030 | CNUM    | 04130 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04050 | CNUM1   | 04030 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01800 | COM     | 01760 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 02570 | COMA    | 02530 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01530 | COMIO   | 01430 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00900 | CONT    | 00170 | 00440 | 00460 | 00510 | 00550 | 00760 | 00900 | 05550 |       |       |       |       |       |       |       |  |  |  |
| 02630 | CTST    | 02350 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 02080 | DATA    | 00860 | 02160 | 02170 | 02180 | 02200 | 02320 |       |       |       |       |       |       |       |       |       |  |  |  |
| 00820 | DATAACK | 00790 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07090 | DATASP  | 00820 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00126 | DCF     | 00180 | 00300 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07240 | DCFS    | 00012 | 06770 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 02500 | DOTEST  | 01490 | 02600 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07130 | DWN     | 04900 | 05030 | 05160 | 05290 | 05300 |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 06670 | E       | 05810 | 06470 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01910 | ECHK    | 01830 | 01990 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 05550 | END     | 02390 | 05530 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 06720 | EQUT    | 05730 | 05730 | 06670 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01270 | EQCHK   | 01020 | 01100 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 02340 | ETEST   | 01320 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03620 | FIF     | 03530 | 03560 | 03690 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04580 | FIN     | 04530 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03680 | FINSH   | 03570 | 03600 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04500 | FLAG    | 04440 | 04460 | 04490 | 04520 | 04530 | 04540 | 04550 | 04580 | 04600 | 05070 | 05490 |       |       |       |       |  |  |  |
| 01160 | FRMTS   | 01130 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07080 | FRMTSP  | 01160 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01060 | FTEST   | 00930 | 01050 | 01190 | 01270 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07170 | HDWR    | 00110 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00100 | HDWRE   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 02250 | HTYP    | 02160 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 02980 | IF      | 02870 | 03090 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03200 | IFRET   | 03160 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03230 | IFS     | 03140 | 03240 | 03270 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01700 | INPUT   | 01580 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03530 | INT     | 03480 | 03650 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 02850 | ITEST   | 02360 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01090 | LARRY   | 01070 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00620 | LEADBL  | 00680 | 00690 | 00710 | 00730 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 05950 | LIN2    | 05910 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 05980 | LIN3    | 05950 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 06570 | LIN4    | 06020 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01340 | LPAR    | 01300 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00140 | MEM     | 00210 | 00220 | 00230 | 00240 | 00250 | 00260 | 00270 | 00280 |       |       |       |       |       |       |       |  |  |  |
| 00880 | NODATA  | 00800 | 00830 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01230 | NONFR   | 01140 | 01170 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01010 | NUM     | 00900 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04120 | NUMB    | 04060 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03525 | NUMR    | 03530 | 03540 | 03620 | 03680 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 05240 | OK      | 05150 | 05160 | 05180 | 05190 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07050 | OUT     | 05210 | 05620 | 05760 | 05860 | 05990 | 06100 | 06110 | 06120 | 06170 | 06380 | 06590 | 06750 | 06810 | 06870 | 06890 |  |  |  |
|       |         | 06950 | 06960 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03810 | OUTAD   | 00230 | 05650 | 05690 | 05790 | 05820 | 05840 | 05890 | 06010 | 06080 | 06100 | 06200 | 06390 | 06420 | 06440 | 06450 |  |  |  |
|       |         | 06480 | 06500 | 06530 | 06610 | 06630 |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 06800 | OUTP    | 00480 | 00500 | 05220 | 05630 | 05700 | 05740 | 05770 | 05980 | 06050 | 06570 | 06720 | 06740 | 06760 | 06980 |       |  |  |  |
| 06870 | PRI     | 06840 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 06840 | PRINT   | 06800 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04980 | PUT     | 04790 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03910 | PUTTST  | 01750 | 02110 | 02970 | 03160 | 03200 | 03910 | 04010 | 04040 | 04100 | 04140 | 04200 | 04650 |       |       |       |  |  |  |

|       |        |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|
| 04240 | PUTV   | 04180 | 04340 | 04360 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 05010 | PUT1   | 04860 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 05290 | PUT2   | 04920 | 05010 | 05140 | 05270 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 05070 | PUT3   | 04930 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00016 | RCKT   | 00020 | 00070 | 00121 | 00121 | 00310 |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00310 | READ   | 00125 | 00400 | 00440 | 00500 | 00660 | 00930 | 01210 | 01550 | 01770 | 01960 | 02430 | 02480 | 02670 | 02720 | 02780 |  |  |  |
|       |        | 02840 | 02970 | 03200 | 03390 | 03440 | 03940 |       |       |       |       |       |       |       |       |       |  |  |  |
| 07140 | REDEI  | 01030 | 01630 | 01700 | 01740 | 02040 | 02080 | 02470 | 02610 | 02830 | 02920 | 02960 | 03230 | 03260 | 04640 | 04670 |  |  |  |
|       |        | 05450 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01690 | REST   | 01660 | 01730 | 01740 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01740 | RESTO  | 00980 | 01670 | 01810 | 01870 | 01950 | 02010 | 02050 |       |       |       |       |       |       |       |       |  |  |  |
| 04490 | RFLAG  | 00850 | 00880 | 01180 | 01230 | 04450 | 04590 |       |       |       |       |       |       |       |       |       |  |  |  |
| 00050 | ROCK   | 00030 | 00030 | 00340 | 00340 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00121 | ROCK1  | 00070 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03280 | RTEST  | 02860 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07150 | SCAN   | 03550 | 03690 | 03700 | 03730 | 03740 | 03770 | 03800 | 03920 | 04240 | 04370 | 04840 | 05370 |       |       |       |  |  |  |
| 03260 | SEGLST | 01610 | 03380 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00510 | SEQ    | 00430 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07060 | SEQN   | 05210 | 05420 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 02310 | SHIFT  | 02150 | 02230 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 01980 | SPCHA  | 01930 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 06440 | SQ     | 05840 | 05910 | 05920 | 05930 | 05950 | 06000 | 06000 | 06060 | 06070 |       |       |       |       |       |       |  |  |  |
| 06610 | SQ1    | 05860 | 06550 | 06590 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03430 | STATND | 01050 | 01640 | 01710 | 02480 | 02620 | 02840 | 02930 | 03240 | 03270 | 03500 | 03860 |       |       |       |       |  |  |  |
| 00114 | STER   | 00390 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07180 | STERR  | 00116 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 07100 | STN    | 05620 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03760 | STNAD  | 00260 | 03840 | 04390 | 05260 | 05290 | 05790 |       |       |       |       |       |       |       |       |       |  |  |  |
| 05790 | STND   | 05660 | 05720 | 06240 | 06450 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03120 | STOPIF | 03070 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04950 | SUB    | 04880 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04720 | SYMCK  | 03830 | 03860 | 03870 | 03910 | 04390 | 04410 | 04760 | 04800 | 04810 | 04830 | 04840 | 04950 | 04960 | 04980 | 05040 |  |  |  |
|       |        | 05070 | 05090 | 05100 | 05120 | 05260 | 05310 | 05370 | 05380 | 05390 | 05400 | 05420 | 05430 | 05450 | 05460 | 05490 |  |  |  |
|       |        | 05510 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04790 | S2     | 03840 | 04400 | 04720 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 04830 | TEST   | 04740 | 04990 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 02720 | TRA    | 02640 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 02420 | TRAC   | 02380 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 06200 | VA     | 06140 | 06210 | 06240 | 06270 | 06280 | 06320 | 06330 | 06370 | 06380 |       |       |       |       |       |       |  |  |  |
| 07300 | VAR    | 05180 | 05760 |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 03790 | VARAD  | 00280 | 04400 | 05120 | 05150 | 05240 | 05300 | 05570 | 05720 |       |       |       |       |       |       |       |  |  |  |
| 05690 | VAROT  | 05880 | 05900 | 06040 | 06670 | 06720 |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 05820 | VAROT1 | 05960 | 06060 | 06500 | 06520 | 06640 | 06690 |       |       |       |       |       |       |       |       |       |  |  |  |
| 06370 | VDEF   | 06230 | 06260 | 06300 |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 06040 | V1     | 05710 | 05880 | 05890 | 06420 |       |       |       |       |       |       |       |       |       |       |       |  |  |  |
| 00160 | ZEREND | 00150 |       |       |       |       |       |       |       |       |       |       |       |       |       |       |  |  |  |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM                         | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|------------------------------|----------------------|
|       |    |       |       | 00000 | *      | FORTRAN LABEL INDEXER        | 1/20/67              |
| 00404 |    |       |       | 00010 |        | DORG 404                     |                      |
| 00404 | 25 | 06578 | 00401 | 00012 |        | TD DCFS+1                    | ,401                 |
| 00416 | 49 | 18012 |       | 00014 |        | B7 18012                     |                      |
| 00069 |    | 00000 |       | 00016 | RCKT   | DS ,69                       |                      |
| 00424 | 16 | 00069 | 00299 | 00020 |        | TFM RCKT                     | ,299                 |
| 00436 | 27 | 00456 | 00455 | 00030 |        | BT ROCK                      | ,ROCK-1              |
| 00448 | 49 | 00632 |       | 00040 |        | B7 BEG                       | ,5                   |
| 00456 | 36 | 00044 | 00703 | 00050 | ROCK   | RN 44                        | ,703                 |
| 00468 | 47 | 00478 | 01942 | 00060 |        | BNI **10                     | ,1942                |
| 00480 | 43 | 00556 | 00069 | 00070 |        | BD ROCK1                     | ,RCKT ,11            |
| 00492 | 34 | 00000 | 00102 | 00100 | HDWRE  | RCTY                         |                      |
| 00504 | 39 | 06465 | 00100 | 00110 |        | WATY HDWR                    |                      |
| 00516 | 49 | 05726 |       | 00112 |        | B7 CALSYS                    |                      |
| 00524 | 34 | 00000 | 00102 | 00114 | STER   | RCTY                         |                      |
| 00536 | 39 | 06501 | 00100 | 00116 |        | WATY STERR                   |                      |
| 00548 | 49 | 05726 |       | 00118 |        | B7 CALSYS                    |                      |
| 00556 | 25 | 00068 | 00069 | 00121 | ROCK1  | TD RCKT-1                    | ,RCKT ,11            |
| 00568 | 46 | 00580 | 00600 | 00122 |        | BI **12                      | ,600                 |
| 00580 | 46 | 00592 | 01600 | 00123 |        | BI **12                      | ,1600                |
| 00592 | 46 | 00604 | 01700 | 00124 |        | BI **12                      | ,1700                |
| 00604 | 49 | 00000 | 00832 | 00125 |        | B                            | ,READ+32             |
| 00617 |    | 00002 |       | 00126 | DCF    | DC 2,0                       |                      |
| 00622 |    | 00005 |       | 00127 |        | DC 5,59998                   |                      |
| 00625 |    | 00003 |       | 00128 |        | DC 3,2                       |                      |
| 00630 |    | 00005 | 06132 | 00129 |        | DSA CHI-1                    |                      |
| 00631 |    | 00001 |       |       |        | DC 1,1                       |                      |
| 00632 | 32 | 05970 | 00000 | 00130 | BEG    | SF BLK1-1                    |                      |
| 00643 |    | 00000 |       | 00140 | MEM    | DS ,*                        |                      |
| 00644 | 25 | 00658 | 00400 | 00150 |        | TD ZEREND+2,400              |                      |
| 00656 | 26 | 39999 | 06019 | 00160 | ZEREND | TF 39999,8LK1+48             |                      |
| 00668 | 32 | 01228 | 00000 | 00170 |        | SF CONT                      |                      |
| 00680 | 25 | 00617 | 00402 | 00180 |        | TD DCF,402                   |                      |
|       |    |       |       | 00200 | *      | ADJUST FOR CORE SIZE         |                      |
| 00692 | 25 | 00639 | 00400 | 00210 |        | TD MEM-4,400                 |                      |
| 00704 | 11 | 00640 | 00010 | 00220 |        | AM MEM-3,10,10               |                      |
| 00716 | 26 | 03477 | 00643 | 00230 |        | TF OUTAD, MEM                |                      |
| 00728 | 12 | 00643 | 00085 | 00240 |        | SM MEM,5,10                  |                      |
| 00740 | 26 | 03489 | 00643 | 00250 |        | TF A+11, MEM                 |                      |
| 00752 | 26 | 03453 | 00643 | 00260 |        | TF STNAD, MEM                |                      |
| 00764 | 12 | 00643 | 00085 | 00270 |        | SM MEM,5,10                  |                      |
| 00776 | 26 | 03465 | 00643 | 00280 |        | TF VARAD, MEM                |                      |
|       |    |       |       | 00290 | *      | READ SOURCE CARD             |                      |
| 00788 | 31 | 00038 | 00611 | 00300 |        | TR 38                        | ,DCF-6               |
| 00800 | 15 | 00068 | 00009 | 00310 | READ   | TDM RCKT-1                   | ,9                   |
| 00812 | 11 | 00049 | 00082 | 00320 |        | AM 49                        | ,2 ,10               |
| 00824 | 49 | 00024 |       | 00330 |        | B7 24                        |                      |
| 00832 | 27 | 00456 | 00455 | 00340 |        | BT ROCK                      | ,ROCK-1              |
| 00844 | 44 | 00524 | 06234 | 00390 |        | BNF STER, CHI+101            |                      |
| 00856 | 32 | 00800 | 00000 | 00400 |        | SF READ                      |                      |
|       |    |       |       | 00410 | *      | CHECK FOR COMMENT CARD       |                      |
| 00868 | 14 | 06133 | 00043 | 00420 |        | CM CHI                       | ,43 ,10              |
| 00880 | 47 | 00952 | 01200 | 00430 |        | BNE SEQ                      |                      |
| 00892 | 44 | 00800 | 01228 | 00440 |        | BNF READ                     | ,CONT                |
|       |    |       |       | 00450 | *      | OUTPUT 1ST COMMENT           |                      |
| 00904 | 33 | 01228 | 00000 | 00460 |        | CF CONT                      |                      |
| 00916 | 31 | 06276 | 06114 | 00470 |        | TR CHI+143, BLK1+143         |                      |
| 00928 | 17 | 05786 | 00940 | 00480 |        | BTM OUTP, **12               |                      |
| 00940 | 17 | 05786 | 00800 | 00500 |        | BTM OUTP, READ               |                      |
| 00952 | 33 | 01229 | 00000 | 00510 | SEQ    | CF CONT+1                    |                      |
|       |    |       |       | 00520 | *      | SET SW. IF DIGIT IN COL. 6   |                      |
| 00964 | 14 | 06143 | 00080 | 00530 |        | CM CHI+10                    | , ,10                |
| 00976 | 46 | 01000 | 01200 | 00540 |        | BE BA2                       |                      |
| 00988 | 32 | 01229 | 00000 | 00550 |        | SF CONT+1                    |                      |
|       |    |       |       | 00560 | *      | PUT SEQUENCE NO. IN SEQN     |                      |
|       |    |       |       | 00570 | *      | PUT AVOID AT END             |                      |
| 01000 | 11 | 06280 | 05729 | 00580 | BA2    | AM CHI+147, CHI-404          |                      |
| 01012 | 16 | 06280 | 00080 | 00590 |        | TFM CHI+147                  | , ,610               |
| 01023 |    | 00001 |       | 00600 |        | DC 1                         | , ,*                 |
|       |    |       |       | 00610 | *      | FIND FIRST CHARC.            |                      |
| 01024 | 16 | 01047 | 06133 | 00620 | LEADBL | TFM **23                     | ,CHI                 |
| 01036 | 43 | 01088 | 00000 | 00630 |        | BD CLSCAN                    | ,                    |
| 01048 | 45 | 01068 | 06133 | 00640 |        | BNR **20                     | ,CHI                 |
|       |    |       |       | 00650 | *      | BRANCH TO READ IF BLANK CARD |                      |
| 01060 | 49 | 00800 | 00000 | 00660 |        | B READ                       |                      |
| 01068 |    |       |       | 00670 |        | DORG *-3                     |                      |
| 01068 | 11 | 01047 | 00082 | 00680 |        | AM LEADBL+23                 | ,2 ,10               |
| 01080 | 49 | 01036 | 00000 | 00690 |        | B LEADBL+12                  |                      |
| 01088 |    |       |       | 00700 |        | DORG *-3                     |                      |
| 01088 | 12 | 01047 | 00081 | 00710 | CLSCAN | SM LEADBL+23                 | ,1 ,10               |
|       |    |       |       | 00720 | *      | MOVE OUT LEAD BLANKS         |                      |
| 01100 | 31 | 06132 | 01047 | 00730 |        | TR CHI-1                     | ,LEADBL+23 ,11       |
|       |    |       |       | 00740 | *      | 1ST CHARC. A -D-             |                      |
| 01112 | 14 | 06133 | 00044 | 00750 |        | CM CHI                       | ,44 ,10              |
| 01124 | 47 | 01228 | 01200 | 00760 |        | BNE CONT                     |                      |
|       |    |       |       | 00770 | *      | GO CLEAR FLAGS FOR COMPARE   |                      |
| 01136 | 17 | 03982 | 00084 | 00780 |        | BTM CFLAG,4,10               |                      |
| 01148 | 44 | 01168 | 06140 | 00790 |        | BNF DATAK, CHI+7             |                      |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM      | OPERANDS                 | AND | REMARKS |
|-------|----|-------|-------|-------|--------|-----------|--------------------------|-----|---------|
| 01160 | 49 | 01216 | 00000 | 00800 |        | B         | NODATA                   |     |         |
| 01168 |    |       |       | 00810 |        | DORG      | *-3                      |     |         |
| 01168 | 24 | 06141 | 06355 | 00820 | DATA   | C         | CHI+8,DATASP             |     |         |
| 01180 | 47 | 01216 | 01200 | 00830 |        | BNE       | NODATA                   |     |         |
|       |    |       |       | 00840 | *      | RESTORE   | FLAGS                    |     |         |
| 01192 | 17 | 04018 | 00004 | 00850 |        | BTM       | RFLAG,4,10               |     |         |
| 01204 | 49 | 02072 | 00000 | 00860 |        | B         | DATA                     |     |         |
|       |    |       |       | 00870 | *      | NOT A     | DATA STATEMENT           |     |         |
| 01216 | 17 | 04018 | 00004 | 00880 | NODATA | BTM       | RFLAG,4,10               |     |         |
|       |    |       |       | 00890 | *      | IS IT     | A CONTINUATION CARD      |     |         |
| 01228 | 44 | 01296 | 01229 | 00900 | CONT   | BNF       | NUM ,CONT+1              |     |         |
|       |    |       |       | 00910 | *      | CONTINUE  |                          |     |         |
|       |    |       |       | 00920 | *      | IGNORE IF | CONT. OF FORMAT          |     |         |
| 01240 | 44 | 00800 | 01344 | 00930 |        | BNF       | READ ,FTEST              |     |         |
|       |    |       |       | 00940 | *      | MOVE      | CONT. DIGITS OUT (1-6)   |     |         |
| 01252 | 31 | 06132 | 06134 | 00950 |        | TR        | CHI-1 ,CHI+1             |     |         |
| 01264 | 14 | 06133 | 00070 | 00960 |        | CM        | CHI ,70                  |     | ,10     |
| 01276 | 46 | 01252 | 01300 | 00970 |        | BNL       | *-24                     |     |         |
| 01288 | 49 | 01848 | 00000 | 00980 |        | B         | RESTO                    |     |         |
| 01296 |    |       |       | 00990 |        | DORG      | *-3                      |     |         |
|       |    |       |       | 01000 | *      | IS THERE  | A ST. NO. 1ST            |     |         |
| 01296 | 14 | 06133 | 00070 | 01010 | NUM    | CM        | CHI ,70                  |     | ,10     |
| 01308 | 47 | 01504 | 01300 | 01020 |        | BL        | EQCHK                    |     |         |
| 01320 | 15 | 06451 | 00001 | 01030 |        | TDM       | REDEI ,1                 |     |         |
|       |    |       |       | 01040 | *      | PULL THE  | ST. NO.                  |     |         |
| 01332 | 17 | 03196 | 01344 | 01050 |        | BTM       | STATNO ,FTEST            |     |         |
| 01344 | 14 | 06133 | 00000 | 01060 | FTEST  | CM        | CHI,,10                  |     |         |
| 01356 | 47 | 01380 | 01200 | 01070 |        | BNE       | LARRY                    |     |         |
| 01368 | 31 | 06132 | 06134 | 01080 |        | TR        | CHI-1,CHI+1              |     |         |
| 01380 | 14 | 06133 | 00046 | 01090 | LARRY  | CM        | CHI,46,10                |     |         |
| 01392 | 47 | 01504 | 01200 | 01100 |        | BNE       | EQCHK                    |     |         |
|       |    |       |       | 01110 | *      | IS IT     | FORMAT                   |     |         |
| 01404 | 17 | 03982 | 00005 | 01120 |        | BTM       | CFLAG ,5                 |     | ,10     |
| 01416 | 44 | 01436 | 06142 | 01130 |        | BNF       | FRMTS ,CHI+9             |     |         |
| 01428 | 49 | 01492 | 00000 | 01140 |        | B         | NONFR                    |     |         |
| 01436 |    |       |       | 01150 |        | DORG      | *-3                      |     |         |
| 01436 | 24 | 06143 | 06345 | 01160 | FRMTS  | C         | CHI+10 ,FRMTSP           |     |         |
| 01448 | 47 | 01492 | 01200 | 01170 |        | BNE       | NONFR                    |     |         |
| 01460 | 17 | 04018 | 00005 | 01180 |        | BTM       | RFLAG ,5                 |     | ,10     |
| 01472 | 33 | 01344 | 00000 | 01190 |        | CF        | FTEST                    |     |         |
|       |    |       |       | 01200 | *      | IGNORE    | FORMAT                   |     |         |
| 01484 | 49 | 00800 | 00000 | 01210 |        | B         | READ                     |     |         |
| 01492 |    |       |       | 01220 |        | DORG      | *-3                      |     |         |
| 01492 | 17 | 04018 | 00005 | 01230 | NONFR  | BTM       | RFLAG ,5                 |     | ,10     |
|       |    |       |       | 01240 | *      |           |                          |     |         |
|       |    |       |       | 01250 | *      | CHECK     | TYPE OF STATEMENT        |     |         |
|       |    |       |       | 01260 | *      | BY        | SPECIAL CHARC.           |     |         |
| 01504 | 32 | 01344 | 00000 | 01270 | EQCHK  | SF        | FTEST                    |     |         |
| 01516 | 16 | 06446 | 06133 | 01280 |        | TFM       | ADR ,CHI                 |     |         |
| 01528 | 32 | 01616 | 00000 | 01290 |        | SF        | A2                       |     |         |
| 01540 | 45 | 01560 | 06446 | 01300 | A1     | BNR       | LPAR ,ADR                |     | ,11     |
|       |    |       |       | 01310 | *      | NO ,      | OR =                     |     |         |
| 01552 | 49 | 02292 | 00000 | 01320 |        | B         | ETEST                    |     |         |
| 01560 |    |       |       | 01330 |        | DORG      | *-3                      |     |         |
| 01560 | 14 | 06446 | 00024 | 01340 | LPAR   | CM        | ADR ,24                  |     | ,610    |
| 01572 | 47 | 01616 | 01200 | 01350 |        | BNE       | A2                       |     |         |
| 01584 | 33 | 01616 | 00000 | 01360 |        | CF        | A2                       |     |         |
| 01596 | 11 | 06446 | 00002 | 01370 | ADTO   | AM        | ADR ,2                   |     | ,10     |
| 01608 | 49 | 01540 | 00000 | 01380 |        | B         | A1                       |     |         |
| 01616 |    |       |       | 01390 |        | DORG      | *-3                      |     |         |
| 01616 | 44 | 01652 | 01616 | 01400 | A2     | BNF       | A3 ,A2                   |     |         |
| 01628 | 14 | 06446 | 00023 | 01410 |        | CM        | ADR ,23                  |     | ,610    |
|       |    |       |       | 01420 | *      | , 1ST -   | COMMON OR I/O            |     |         |
| 01640 | 46 | 01696 | 01200 | 01430 |        | BE        | COMIO                    |     |         |
| 01652 | 14 | 06446 | 00033 | 01440 | A3     | CM        | ADR ,33                  |     | ,610    |
| 01664 | 47 | 01596 | 01200 | 01450 |        | BNE       | ADTO                     |     |         |
|       |    |       |       | 01460 | *      | ( THEN =  | IS ARITHMETIC            |     |         |
| 01676 | 44 | 04142 | 01616 | 01470 |        | BNF       | ARITH ,A2                |     |         |
|       |    |       |       | 01480 | *      | = 1ST     | IS ARITH OR DO           |     |         |
| 01688 | 49 | 02396 | 00000 | 01490 |        | B         | DOTEST                   |     |         |
| 01696 |    |       |       | 01500 |        | DORG      | *-3                      |     |         |
|       |    |       |       | 01510 | *      |           |                          |     |         |
|       |    |       |       | 01520 | *      |           |                          |     |         |
| 01696 | 14 | 06133 | 00044 | 01530 | COMIO  | CM        | CHI ,44                  |     | ,10     |
|       |    |       |       | 01540 | *      | C -       | COMMON - IGNORE          |     |         |
| 01708 | 47 | 00800 | 01300 | 01550 |        | BL        | READ                     |     |         |
| 01720 | 14 | 06133 | 00059 | 01560 |        | CM        | CHI ,59                  |     | ,10     |
|       |    |       |       | 01570 | *      | R -       | READ                     |     |         |
| 01732 | 46 | 01812 | 01200 | 01580 |        | BE        | INPUT                    |     |         |
| 01744 | 14 | 06133 | 00062 | 01590 |        | CM        | CHI ,62                  |     | ,10     |
|       |    |       |       | 01600 | *      | S -       | SEGMENT                  |     |         |
| 01756 | 46 | 03064 | 01200 | 01610 |        | BE        | SEGLST                   |     |         |
|       |    |       |       | 01620 | *      | OTHERWISE | OUTPUT                   |     |         |
| 01768 | 15 | 06451 | 00000 | 01630 |        | TDM       | REDEI                    |     |         |
| 01780 | 17 | 03196 | 01792 | 01640 |        | BTM       | STATNO ,**12             |     |         |
|       |    |       |       | 01650 | *      | O IN      | REST SETS REF. AS NORMAL |     |         |
| 01792 | 15 | 01811 | 00000 | 01660 |        | TDM       | REST                     |     |         |
| 01804 | 49 | 01848 | 00000 | 01670 |        | B         | RESTO                    |     |         |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM          | OPERANDS          | AND  | REMARKS   |
|-------|----|-------|-------|-------|--------|---------------|-------------------|------|-----------|
| 01812 |    |       |       | 01680 |        | DORG          | *-3               |      |           |
| 01811 |    | 00000 |       | 01690 | REST   | DS            |                   | ,    | *         |
| 01812 | 15 | 06451 | 00000 | 01700 | INPUT  | TDM           | REDEI             |      |           |
| 01824 | 17 | 03196 | 01836 | 01710 |        | BTM           | STATNO            |      | ,**+12    |
|       |    |       |       | 01720 | *      | 1 IN          | REST SETS         | DEF. | AS NORMAL |
| 01836 | 15 | 01811 | 00001 | 01730 |        | TDM           | REST              |      | ,1        |
| 01848 | 25 | 06451 | 01811 | 01740 | RESTO  | TD            | REDEI             |      | ,REST     |
| 01860 | 17 | 03526 | 01872 | 01750 |        | BTM           | PUTTST            |      | ,**+12    |
| 01872 | 45 | 01892 | 06133 | 01760 |        | BNR           | COM               |      | ,CHI      |
| 01884 | 49 | 00800 | 00000 | 01770 |        | B             | READ              |      |           |
| 01892 |    |       |       | 01780 |        | DORG          | *-3               |      |           |
|       |    |       |       | 01790 | *      | NEXT          | SP. CHAC. A       |      | ,         |
| 01892 | 14 | 06133 | 00023 | 01800 | COM    | CM            | CHI               |      | ,23       |
| 01904 | 46 | 01860 | 01200 | 01810 |        | BE            | RESTO+12          |      | ,10       |
|       |    |       |       | 01820 | *      | IF LOW        | IT IS A RT. PAR.  |      |           |
| 01916 | 47 | 01936 | 01300 | 01830 |        | BL            | ECHK              |      |           |
|       |    |       |       | 01840 | *      | IF NOT LOW    | IT IS A LFT. PAR. |      |           |
|       |    |       |       | 01850 | *      | FOR SUBSCRIPT | BECAUSE IT IS     |      |           |
|       |    |       |       | 01860 | *      | FIRST SP.     | CHARAC.           |      |           |
| 01928 | 49 | 01860 | 00000 | 01870 |        | B             | RESTO+12          |      |           |
| 01936 |    |       |       | 01880 |        | DORG          | *-3               |      |           |
|       |    |       |       | 01890 | *      | SEE IF NEXT   | SP. CHAC.         |      |           |
|       |    |       |       | 01900 | *      | IS AN =       |                   |      |           |
| 01936 | 16 | 06446 | 06135 | 01910 | ECHK   | TFM           | ADR               |      | ,CHI+2    |
| 01948 | 11 | 06446 | 00002 | 01920 |        | AM            | ADR               |      | ,2        |
| 01960 | 45 | 02004 | 06446 | 01930 |        | BNR           | SPCHA             |      | ,ADR      |
| 01972 | 14 | 06446 | 06137 | 01940 |        | CM            | ADR               |      | ,CHI+4    |
| 01984 | 46 | 01848 | 01100 | 01950 |        | BP            | RESTO             |      |           |
| 01996 | 49 | 00800 | 00000 | 01960 |        | B             | READ              |      |           |
| 02004 |    |       |       | 01970 |        | DORG          | *-3               |      |           |
| 02004 | 14 | 06446 | 00041 | 01980 | SPCHA  | CM            | ADR               |      | ,41       |
| 02016 | 46 | 01948 | 01300 | 01990 |        | BNL           | ECHK+12           |      | ,610      |
| 02028 | 14 | 06446 | 00033 | 02000 |        | CM            | ADR               |      | ,33       |
| 02040 | 47 | 01848 | 01200 | 02010 |        | BNE           | RESTO             |      | ,610      |
|       |    |       |       | 02020 | *      | IF NEXT SP.   | CHAC. IS AN =     |      |           |
| 02052 | 15 | 06451 | 00001 | 02030 | *      | SET UP FOR    | DEF. OF INDEX     |      |           |
| 02064 | 49 | 01860 | 00000 | 02040 |        | TDM           | REDEI             |      | ,1        |
| 02072 |    |       |       | 02050 |        | B             | RESTO+12          |      |           |
|       |    |       |       | 02060 |        | DORG          | *-3               |      |           |
| 02072 | 15 | 06451 | 00001 | 02070 | *      | DATA          | STATEMENT         |      |           |
| 02084 | 31 | 06132 | 06142 | 02080 | DATA   | TDM           | REDEI             |      | ,1        |
|       |    |       |       | 02090 |        | TR            | CHI-1             |      | ,CHI+9    |
| 02096 | 17 | 03526 | 02108 | 02100 | *      | PULL          | VARIABLE NAME     |      |           |
|       |    |       |       | 02110 |        | BTM           | PUTTST            |      | ,**+12    |
|       |    |       |       | 02120 | *      | SKIP OVER     | SUBSCRIPT +       |      |           |
|       |    |       |       | 02130 | *      | DATA TO 2ND   | SLASH             |      |           |
| 02108 | 14 | 06133 | 00021 | 02140 |        | CM            | CHI               |      | ,21       |
| 02120 | 47 | 02272 | 01200 | 02150 |        | BNE           | SHIFT             |      | ,10       |
| 02132 | 44 | 02164 | 02072 | 02160 |        | BNF           | HTYP-36           |      | ,DATA     |
| 02144 | 33 | 02072 | 00000 | 02170 |        | CF            | DATA              |      |           |
| 02156 | 49 | 02096 | 00000 | 02180 |        | B             | DATA+24           |      |           |
| 02164 |    |       |       | 02190 |        | DORG          | *-3               |      |           |
| 02164 | 32 | 02072 | 00000 | 02200 |        | SF            | DATA              |      |           |
|       |    |       |       | 02210 | *      | IS IT         | H TYPE DATA       |      |           |
| 02176 | 14 | 06137 | 00048 | 02220 |        | CM            | CHI+4             |      | ,48       |
| 02188 | 47 | 02272 | 01200 | 02230 |        | BNE           | SHIFT             |      | ,10       |
|       |    |       |       | 02240 | *      | SKIP OVER     | H FIELD           |      |           |
| 02200 | 12 | 06135 | 00070 | 02250 | HTYP   | SM            | CHI+2             |      | ,70       |
| 02212 | 21 | 06135 | 06135 | 02260 |        | A             | CHI+2             |      | ,CHI+2    |
| 02224 | 11 | 06135 | 00003 | 02270 |        | AM            | CHI+2             |      | ,3        |
| 02236 | 16 | 02271 | 06133 | 02280 |        | TFM           | **+35             |      | ,CHI      |
| 02248 | 21 | 02271 | 06135 | 02290 |        | A             | **+23             |      | ,CHI+2    |
| 02260 | 31 | 06132 | 00000 | 02300 |        | TR            | CHI-1             |      | ,         |
| 02272 | 31 | 06132 | 06134 | 02310 | SHIFT  | TR            | CHI-1             |      | ,CHI+1    |
| 02284 | 49 | 02108 | 00000 | 02320 |        | B             | DATA+36           |      |           |
| 02292 |    |       |       | 02330 |        | DORG          | *-3               |      |           |
| 02292 | 14 | 06133 | 00045 | 02340 | ETEST  | CM            | CHI               |      | ,45       |
| 02304 | 47 | 02524 | 01300 | 02350 |        | BL            | CTST              |      | ,10       |
| 02316 | 46 | 02688 | 01100 | 02360 |        | BH            | ITEST             |      |           |
|       |    |       |       | 02370 | *      | E - END IF    | AVOID IN CHI+6    |      |           |
| 02328 | 45 | 02348 | 06139 | 02380 |        | BNR           | TRAC              |      | ,CHI+6    |
| 02340 | 49 | 04774 | 00000 | 02390 |        | B             | END               |      |           |
| 02348 |    |       |       | 02400 |        | DORG          | *-3               |      |           |
|       |    |       |       | 02410 | *      | END TRACE -   | IGNORE            |      |           |
| 02348 | 14 | 06139 | 00063 | 02420 | TRAC   | CM            | CHI+6             |      | ,63       |
| 02360 | 46 | 00800 | 01200 | 02430 |        | BE            | READ              |      | ,10       |
|       |    |       |       | 02440 | *      | OTHERWISE     | END SEGMENT       |      |           |
|       |    |       |       | 02450 | *      | OR EXECUTE    | PROCEDURE         |      |           |
|       |    |       |       | 02460 | *      | OR END        | PROCEDURE         |      |           |
| 02372 | 15 | 06451 | 00000 | 02470 | BTREF  | TDM           | REDEI             |      | ,0        |
| 02384 | 17 | 03196 | 00800 | 02480 |        | BTM           | STATNO            |      | ,READ     |
|       |    |       |       | 02490 | *      | IF D          | CHECK FOR DO      |      |           |
| 02396 | 14 | 06133 | 00044 | 02500 | DOTEST | CM            | CHI               |      | ,44       |
| 02408 | 47 | 04142 | 01200 | 02510 |        | BNE           | ARITH             |      | ,10       |
| 02420 | 11 | 06446 | 00002 | 02520 |        | AM            | ADR               |      | ,2        |
| 02432 | 45 | 02452 | 06446 | 02530 |        | BNR           | COMA              |      | ,ADR      |
| 02444 | 49 | 04142 | 00000 | 02540 |        | B             | ARITH             |      | ,11       |
| 02452 |    |       |       | 02550 |        | DORG          | *-3               |      |           |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM                        | OPERANDS AND REMARKS |
|-------|----|-------|-------|-------|--------|-----------------------------|----------------------|
|       |    |       |       | 02560 | *      | IF , BEFORE ( IT IS A DO    |                      |
| 02452 | 14 | 06446 | 00024 | 02570 | COMA   | CM                          | ADR ,24 ,610         |
| 02464 | 46 | 04142 | 01200 | 02580 |        | BE                          | ARITH                |
| 02476 | 14 | 06446 | 00023 | 02590 |        | CM                          | ADR ,23 ,610         |
| 02488 | 47 | 02420 | 01200 | 02600 |        | BNE                         | DOTEST+24            |
| 02500 | 15 | 06451 | 00000 | 02610 |        | TDM                         | REDEI ,0             |
| 02512 | 17 | 03196 | 04142 | 02620 |        | BTM                         | STATNO ,ARITH        |
| 02524 | 14 | 06133 | 00043 | 02630 | CTST   | CM                          | CHI ,43 ,10          |
| 02536 | 47 | 02580 | 01200 | 02640 |        | BNE                         | TRA                  |
| 02548 | 14 | 06135 | 00056 | 02650 |        | CM                          | CHI+2 ,56 ,10        |
|       |    |       |       | 02660 | *      | IGNORE CONTINUE OR CONTROL  |                      |
| 02560 | 46 | 00800 | 01200 | 02670 |        | BE                          | READ                 |
|       |    |       |       | 02680 | *      | OTHERWISE - CALL SEGMENT    |                      |
| 02572 | 49 | 02372 | 00000 | 02690 |        | B                           | BTREF                |
| 02580 |    |       |       | 02700 |        | DORG                        | *-3                  |
|       |    |       |       | 02710 | *      | IGNORE DIMENSION            |                      |
| 02580 | 46 | 00800 | 01100 | 02720 | TRA    | BH                          | READ                 |
| 02592 | 14 | 06133 | 00041 | 02730 |        | CM                          | CHI ,41 ,10          |
|       |    |       |       | 02740 | *      | ACCEPT WITH NO LIST         |                      |
| 02604 | 46 | 02372 | 01200 | 02750 |        | BE                          | BTREF                |
| 02616 | 14 | 06143 | 00063 | 02760 |        | CM                          | CHI+10 ,63 ,10       |
|       |    |       |       | 02770 | *      | BEGIN TRACE - IGNORE        |                      |
| 02628 | 46 | 00800 | 01200 | 02780 |        | BE                          | READ                 |
| 02640 | 14 | 06143 | 00057 | 02790 |        | CM                          | CHI+10 ,57 ,10       |
|       |    |       |       | 02800 | *      | BEGIN SEGMENT               |                      |
| 02652 | 47 | 02372 | 01200 | 02810 |        | BNE                         | BTREF                |
|       |    |       |       | 02820 | *      | BEGIN PROCEDURE             |                      |
| 02664 | 15 | 06451 | 00001 | 02830 |        | TDM                         | REDEI ,1             |
| 02676 | 17 | 03196 | 00800 | 02840 |        | BTM                         | STATNO ,READ         |
| 02688 | 14 | 06133 | 00049 | 02850 | ITEST  | CM                          | CHI ,49 ,10          |
| 02700 | 46 | 03088 | 01100 | 02860 |        | BH                          | RTEST                |
| 02712 | 46 | 02820 | 01200 | 02870 |        | BE                          | IF                   |
| 02724 | 14 | 06141 | 00024 | 02880 |        | CM                          | CHI+8 ,24 ,10        |
|       |    |       |       | 02890 | *      | GO TO S                     |                      |
| 02736 | 47 | 02372 | 01200 | 02900 |        | BNE                         | BTREF                |
|       |    |       |       | 02910 | *      | GO TO (S1,S2),N             |                      |
| 02748 | 15 | 06451 | 00000 | 02920 |        | TDM                         | REDEI                |
| 02760 | 17 | 03196 | 02772 | 02930 |        | BTM                         | STATNO ,**+12        |
| 02772 | 14 | 06133 | 00084 | 02940 |        | CM                          | CHI ,04 ,10          |
| 02784 | 47 | 02760 | 01200 | 02950 |        | BNE                         | *-24                 |
| 02796 | 15 | 06451 | 00000 | 02960 |        | TDM                         | REDEI                |
| 02808 | 17 | 03526 | 00800 | 02970 |        | BTM                         | PUTTST ,READ         |
| 02820 | 31 | 06132 | 06136 | 02980 | IF     | TR                          | CHI-1 ,CHI+3         |
| 02832 | 16 | 06448 | 00080 | 02990 |        | TFM                         | CNT ,10              |
| 02844 | 16 | 06446 | 06133 | 03000 |        | TFM                         | ADR ,CHI             |
| 02856 | 14 | 06446 | 00024 | 03010 |        | CM                          | ADR ,24 ,610         |
| 02868 | 47 | 02892 | 01200 | 03020 |        | BNE                         | *+24                 |
| 02880 | 11 | 06448 | 00081 | 03030 |        | AM                          | CNT ,1 ,10           |
| 02892 | 14 | 06446 | 00084 | 03040 |        | CM                          | ADR ,04 ,610         |
| 02904 | 47 | 02940 | 01200 | 03050 |        | BNE                         | *+36                 |
| 02916 | 12 | 06448 | 00081 | 03060 |        | SM                          | CNT ,1 ,10           |
| 02928 | 46 | 02960 | 01200 | 03070 |        | BE                          | STOPIF               |
| 02940 | 11 | 06446 | 00082 | 03080 |        | AM                          | ADR ,2 ,10           |
| 02952 | 49 | 02856 | 00000 | 03090 |        | B                           | IF+36                |
| 02960 |    |       |       | 03100 |        | DORG                        | *-3                  |
|       |    |       |       | 03110 | *      | PUT AVOID IN FOR CLOSING )  |                      |
| 02960 | 26 | 06446 | 01023 | 03120 | STOPIF | TF                          | ADR,BA2+23,6         |
| 02972 | 11 | 06446 | 00081 | 03130 |        | AM                          | ADR ,1 ,10           |
| 02984 | 26 | 03039 | 06446 | 03140 |        | TF                          | IFS-1 ,ADR           |
|       |    |       |       | 03150 | *      | ALTER PUTTST FOR RETURN     |                      |
| 02996 | 16 | 03568 | 03016 | 03160 |        | TFM                         | PUTTST+42 ,IFRET     |
| 03008 | 49 | 04166 | 00000 | 03170 |        | B                           | ARITH+24             |
| 03016 |    |       |       | 03180 |        | DORG                        | *-3                  |
|       |    |       |       | 03190 | *      | RESTORE PUTTST              |                      |
| 03016 | 16 | 03568 | 00800 | 03200 | IFRET  | TFM                         | PUTTST+42 ,READ      |
| 03028 | 31 | 06132 | 06134 | 03210 |        | TR                          | CHI-1 ,CHI+1         |
|       |    |       |       | 03220 | *      | PULLS STRING OF ST. NO.     |                      |
| 03040 | 15 | 06451 | 00000 | 03230 | IFS    | TDM                         | REDEI                |
| 03052 | 17 | 03196 | 03052 | 03240 |        | BTM                         | STATNO ,IFS+12       |
|       |    |       |       | 03250 | *      | PULLS STRING OF SEG. NO.    |                      |
| 03064 | 15 | 06451 | 00001 | 03260 | SEGLST | TDM                         | REDEI ,1             |
| 03076 | 17 | 03196 | 03052 | 03270 |        | BTM                         | STATNO ,IFS+12       |
| 03088 | 14 | 06133 | 00059 | 03280 | RTEST  | CM                          | CHI ,59 ,10          |
|       |    |       |       | 03290 | *      | READ WITH NO LIST           |                      |
| 03100 | 46 | 02372 | 01200 | 03300 |        | BE                          | BTREF                |
| 03112 | 14 | 06133 | 00057 | 03310 |        | CM                          | CHI ,57 ,10          |
|       |    |       |       | 03320 | *      | PRINT OR PUNCH WITH NO LIST |                      |
| 03124 | 46 | 02372 | 01200 | 03330 |        | BE                          | BTREF                |
| 03136 | 14 | 06133 | 00063 | 03340 |        | CM                          | CHI ,63 ,10          |
|       |    |       |       | 03350 | *      | TYPE WITH NO LIST           |                      |
| 03148 | 46 | 02372 | 01200 | 03360 |        | BE                          | BTREF                |
| 03160 | 14 | 06133 | 00062 | 03370 |        | CM                          | CHI,62,10            |
| 03172 | 46 | 03064 | 01200 | 03380 |        | BE                          | SEGLST               |
| 03184 | 49 | 00800 | 00000 | 03390 |        | B                           | READ                 |
|       |    |       |       | 03400 | *      |                             |                      |
|       |    |       |       | 03410 | *      | SUBROUTINE TO PULL ST. NO.  |                      |
|       |    |       |       | 03420 | *      |                             |                      |
| 03196 | 45 | 03216 | 06133 | 03430 | STATNO | BNR                         | CKNV ,CHI            |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM       | OPERANDS                                | AND REMARKS |
|-------|----|-------|-------|-------|--------|------------|-----------------------------------------|-------------|
| 03208 | 49 | 00800 | 00000 | 03440 |        | B          | READ                                    |             |
| 03216 |    |       |       | 03450 |        | DORG       | *-3                                     |             |
|       |    |       |       | 03460 | *      | SKIP       | OVER NON-NUMERICS                       |             |
| 03216 | 14 | 06133 | 00070 | 03470 | CKNV   | CM         | CHI                                     | ,70 ,10     |
| 03228 | 46 | 03270 | 01300 | 03480 |        | BNL        | INT                                     |             |
| 03240 | 31 | 06132 | 06134 | 03490 |        | TR         | CHI-1                                   | ,CHI+1      |
| 03252 | 49 | 03196 | 00000 | 03500 |        | B          | STATNO                                  |             |
| 03260 |    |       |       | 03510 |        | DORG       | *-3                                     |             |
|       |    |       |       | 03520 | *      | INITIALIZE |                                         |             |
| 03269 |    | 00010 |       | 03525 | NUMR   | DC         | 10                                      | ,0          |
| 03270 | 16 | 03356 | 03260 | 03530 | INT    | TFM        | FIF+6                                   | ,NUMR-9 ,10 |
| 03282 | 26 | 03269 | 05979 | 03540 |        | TF         | NUMR                                    | ,BLK        |
| 03294 | 26 | 06461 | 05979 | 03550 |        | TF         | SCAN                                    | ,BLK        |
| 03306 | 45 | 03326 | 06133 | 03560 |        | BNR        | FIF-24                                  | ,CHI        |
| 03318 | 49 | 03394 | 00000 | 03570 |        | B          | FINSH                                   |             |
| 03326 |    |       |       | 03580 |        | DORG       | *-3                                     |             |
| 03326 | 14 | 06133 | 00070 | 03590 |        | CM         | CHI                                     | ,70 ,10     |
| 03338 | 47 | 03394 | 01300 | 03600 |        | BL         | FINSH                                   |             |
|       |    |       |       | 03610 | *      | PUT        | ST. NO. IN 50                           |             |
| 03350 | 25 | 03260 | 06133 | 03620 | FIF    | TD         | NUMR-9                                  | ,CHI        |
| 03362 | 11 | 03356 | 00001 | 03630 |        | AM         | *-6                                     | ,1 ,10      |
| 03374 | 31 | 06132 | 06134 | 03640 |        | TR         | CHI-1                                   | ,CHI+1      |
| 03386 | 49 | 03306 | 00000 | 03650 |        | B          | INT+36                                  |             |
| 03394 |    |       |       | 03660 |        | DORG       | *-3                                     |             |
|       |    |       |       | 03670 | *      | PUT        | ST. NO. IN SCAN                         |             |
| 03394 | 32 | 03260 | 00000 | 03680 | FINSH  | TF         | NUMR-9                                  |             |
| 03406 | 26 | 06462 | 03356 | 03690 |        | SF         | SCAN+1                                  | ,FIF+6 ,11  |
| 03418 | 32 | 06458 | 00000 | 03700 |        | SF         | SCAN-3                                  | ,7          |
|       |    |       |       | 03710 | *      | ADDRESSES  | REFERENCE BOTTOM                        |             |
|       |    |       |       | 03720 | *      | OF         | TABLES                                  |             |
| 03430 | 33 | 06461 | 00000 | 03730 |        | CF         | SCAN                                    | , ,7        |
| 03442 | 33 | 06460 | 00000 | 03740 |        | CF         | SCAN-1                                  | , ,7        |
|       |    |       |       | 03750 | *      | ADDRESS    | OF ST. NO. TABLE                        |             |
| 03453 |    | 00005 |       | 03760 | STNAD  | DC         | 5                                       | ,38985 ,*   |
| 03454 | 33 | 06459 | 00000 | 03770 |        | CF         | SCAN-2                                  | , ,7        |
|       |    |       |       | 03780 | *      | ADDRESS    | OF VARIABLE TABLE                       |             |
| 03465 |    | 00005 |       | 03790 | VARAD  | DC         | 5                                       | ,38980 ,*   |
| 03466 | 33 | 06457 | 00000 | 03800 |        | CF         | SCAN-4                                  |             |
| 03477 |    | 00005 |       | 03810 | OUTAD  | DC         | 5                                       | ,39000 ,*   |
|       |    |       |       | 03820 | *      | SET        | RANGE TO BE CHECKED IN SYM. TAB. LOOKUP |             |
| 03478 | 16 | 04201 | 00000 | 03830 | A      | TFM        | SYMCK+11,                               |             |
| 03490 | 26 | 04221 | 03453 | 03840 |        | TF         | S2-1                                    | ,STNAD      |
|       |    |       |       | 03850 | *      | TRANSFER   | RETURN ADDRESS                          |             |
| 03502 | 26 | 04189 | 03195 | 03860 |        | TF         | SYMCK-1                                 | ,STATNO-1   |
| 03514 | 49 | 04190 | 00000 | 03870 |        | B          | SYMCK                                   |             |
|       |    |       |       | 03880 | *      |            |                                         |             |
|       |    |       |       | 03890 | *      | SUBROUTINE | TO PULL FX. PT., FLT. PT. + VARIABLES   |             |
|       |    |       |       | 03900 | *      |            |                                         |             |
| 03526 | 26 | 04189 | 03525 | 03910 | PUTTST | TF         | SYMCK-1                                 | ,PUTTST-1   |
| 03538 | 26 | 06461 | 05979 | 03920 |        | TF         | SCAN                                    | ,BLK        |
| 03550 | 45 | 03570 | 06133 | 03930 |        | BNR        | CKDEC-24                                | ,CHI        |
| 03562 | 49 | 00800 | 00000 | 03940 |        | B          | READ                                    |             |
| 03570 |    |       |       | 03950 |        | DORG       | *-3                                     |             |
| 03570 | 14 | 06133 | 00041 | 03960 |        | CM         | CHI                                     | ,41 ,10     |
| 03582 | 46 | 03750 | 01300 | 03970 |        | BNL        | CKNUM                                   |             |
|       |    |       |       | 03980 | *      | CHECK      | FOR DECIMAL                             |             |
| 03594 | 14 | 06133 | 00003 | 03990 | CKDEC  | CM         | CHI                                     | ,03 ,10     |
| 03606 | 31 | 06132 | 06134 | 04000 |        | TR         | CHI-1                                   | ,CHI+1      |
| 03618 | 47 | 03550 | 01200 | 04010 |        | BNE        | PUTTST+24                               |             |
|       |    |       |       | 04020 | *      | FLT.       | PT. NO. BECAUSE OF DECIMAL              |             |
| 03630 | 45 | 03650 | 06133 | 04030 | CNUM   | BNR        | CNUM1,CHI                               |             |
| 03642 | 49 | 03560 |       | 04040 |        | B7         | PUTTST+42,,6                            |             |
| 03650 | 14 | 06133 | 00070 | 04050 | CNUM1  | CM         | CHI,70,10                               |             |
| 03662 | 46 | 03718 | 01300 | 04060 |        | BNL        | NUMB                                    |             |
| 03674 | 14 | 06133 | 00045 | 04070 |        | CM         | CHI                                     | ,45 ,10     |
| 03686 | 47 | 03774 | 01200 | 04080 |        | BNE        | CKNUM+24                                |             |
| 03698 | 31 | 06132 | 06136 | 04090 |        | TR         | CHI-1                                   | ,CHI+3      |
| 03710 | 49 | 03550 | 00000 | 04100 |        | B          | PUTTST+24                               |             |
| 03718 |    |       |       | 04110 |        | DORG       | *-3                                     |             |
| 03730 | 31 | 06132 | 06134 | 04120 | NUMB   | TR         | CHI-1                                   | ,CHI+1      |
| 03742 | 49 | 03562 | 00000 | 04130 |        | BNR        | CNUM                                    | ,CHI        |
| 03750 |    |       |       | 04140 |        | B          | PUTTST+36                               |             |
|       |    |       |       | 04150 |        | DORG       | *-3                                     |             |
| 03750 | 14 | 06133 | 00070 | 04160 | CKNUM  | CM         | CHI                                     | ,70 ,10     |
|       |    |       |       | 04170 | *      | LETTER     | - GO TO PUT VARIABLE                    |             |
| 03762 | 47 | 03794 | 01300 | 04180 |        | BL         | PUTV                                    |             |
| 03774 | 31 | 06132 | 06134 | 04190 |        | TR         | CHI-1                                   | ,CHI+1      |
| 03786 | 49 | 03550 | 00000 | 04200 |        | B          | PUTTST+24                               |             |
| 03794 |    |       |       | 04210 |        | DORG       | *-3                                     |             |
|       |    |       |       | 04220 | *      |            |                                         |             |
|       |    |       |       | 04230 | *      | VARIABLE   |                                         |             |
| 03794 | 16 | 03812 | 06453 | 04240 | PUTV   | TFM        | *+18                                    | ,SCAN-8     |
| 03806 | 26 | 00000 | 06133 | 04250 |        | TF         |                                         | ,CHI        |
| 03818 | 12 | 03812 | 00001 | 04260 |        | SM         | *-6                                     | ,1 ,10      |
| 03830 | 33 | 03812 | 00000 | 04270 |        | CF         | *-18                                    | , ,6        |
| 03842 | 11 | 03812 | 00003 | 04280 |        | AM         | *-30                                    | ,3 ,10      |
| 03854 | 31 | 06132 | 06134 | 04290 |        | TR         | CHI-1                                   | ,CHI+1      |
| 03866 | 45 | 03886 | 06133 | 04300 |        | BNR        | AA                                      | ,CHI        |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL | MNEM                                      | OPERANDS                              | AND       | REMARKS |
|-------|----|-------|-------|-------|-------|-------------------------------------------|---------------------------------------|-----------|---------|
| 03878 | 49 | 03934 | 00000 | 04310 |       | B                                         | AA+48                                 |           |         |
| 03886 |    |       |       | 04320 |       | DORG                                      | *-3                                   |           |         |
| 03886 | 14 | 06133 | 00041 | 04330 | AA    | CM                                        | CHI                                   | ,41       | ,10     |
| 03898 | 46 | 03806 | 01300 | 04340 |       | BNL                                       | PUTV+12                               |           |         |
| 03910 | 14 | 06133 | 00000 | 04350 |       | CM                                        | CHI                                   | ,         | ,10     |
| 03922 | 46 | 03854 | 01200 | 04360 |       | BE                                        | PUTV+60                               |           |         |
| 03934 | 32 | 06452 | 00000 | 04370 |       | SF                                        | SCAN-9                                |           |         |
|       |    |       |       | 04380 | *     | SET                                       | RANGE FOR SYM. TAB. LOOKUP            |           |         |
| 03946 | 26 | 04201 | 03453 | 04390 |       | TF                                        | SYMCK+11                              | ,STNAD    |         |
| 03958 | 26 | 04221 | 03465 | 04400 |       | TF                                        | S2-1                                  | ,VARAD    |         |
| 03970 | 49 | 04190 | 00000 | 04410 |       | B                                         | SYMCK                                 |           |         |
|       |    |       |       | 04420 | *     |                                           |                                       |           |         |
|       |    |       |       | 04430 | *     | SUBROUTINE TO CLEAR FLAGS FOR COMPARE     |                                       |           |         |
| 03982 | 16 | 04043 | 00033 | 04440 | CFLAG | TFM                                       | FLAG+13                               | ,33       | ,10     |
| 03994 | 26 | 04017 | 03981 | 04450 |       | TF                                        | RFLAG-1                               | ,CFLAG-1  |         |
| 04006 | 49 | 04030 | 00000 | 04460 |       | B                                         | FLAG                                  |           |         |
|       |    |       |       | 04470 | *     |                                           |                                       |           |         |
|       |    |       |       | 04480 | *     | SUBROUTINE TO RESTORE FLAGS AFTER COMPARE |                                       |           |         |
| 04018 | 16 | 04043 | 00032 | 04490 | RFLAG | TFM                                       | FLAG+13                               | ,32       | ,10     |
| 04030 | 16 | 04048 | 06134 | 04500 | FLAG  | TFM                                       | *+18                                  | ,CHI+1    |         |
| 04042 | 41 | 00000 | 00000 | 04510 |       | NOP                                       |                                       |           |         |
| 04054 | 11 | 04048 | 00001 | 04520 |       | AM                                        | FLAG+18                               | ,1        | ,10     |
| 04066 | 45 | 04104 | 04048 | 04530 |       | BNR                                       | FIN                                   | ,FLAG+18  | ,11     |
| 04078 | 12 | 04048 | 00001 | 04540 |       | SM                                        | FLAG+18                               | ,1        | ,10     |
| 04090 | 32 | 04048 | 00000 | 04550 |       | SF                                        | FLAG+18                               | ,         | ,6      |
| 04102 | 42 | 00000 | 00000 | 04560 |       | BB                                        |                                       |           |         |
| 04104 |    |       |       | 04570 |       | DORG                                      | *-9                                   |           |         |
| 04104 | 11 | 04048 | 00001 | 04580 | FIN   | AM                                        | FLAG+18                               | ,1        | ,10     |
| 04116 | 12 | 04017 | 00001 | 04590 |       | SM                                        | RFLAG-1                               | ,1        | ,10     |
| 04128 | 46 | 04042 | 01100 | 04600 |       | BP                                        | FLAG+12                               |           |         |
| 04140 | 42 | 00000 | 00000 | 04610 |       | BB                                        |                                       |           |         |
| 04142 |    |       |       | 04620 |       | DORG                                      | *-9                                   |           |         |
|       |    |       |       | 04630 | *     | SET                                       | INDICATOR TO DEF. FOR LEFT OF =       |           |         |
| 04142 | 15 | 06451 | 00001 | 04640 | ARITH | TDM                                       | REDEI                                 | ,1        |         |
| 04154 | 17 | 03526 | 04166 | 04650 |       | BTM                                       | PUTTST                                | ,*+12     |         |
|       |    |       |       | 04660 | *     | SET                                       | INDICATOR TO REFERENCE FOR RIGHT OF = |           |         |
| 04166 | 15 | 06451 | 00000 | 04670 |       | TDM                                       | REDEI                                 |           |         |
| 04178 | 49 | 04154 | 00000 | 04680 |       | B                                         | *-24                                  |           |         |
|       |    |       |       | 04690 | *     |                                           |                                       |           |         |
|       |    |       |       | 04700 | *     | SUBROUTINE TO CHECK SYMBOL TABLE          |                                       |           |         |
|       |    |       |       | 04710 | *     | AND MAKE ENTRIES                          |                                       |           |         |
| 04190 | 44 | 04210 | 00000 | 04720 | SYMCK | BNF                                       | S2-12                                 |           |         |
|       |    |       |       | 04730 | *     | FLAG                                      | INDICATES LABEL ENTRY                 |           |         |
| 04202 | 49 | 04254 | 00000 | 04740 |       | B                                         | TEST                                  |           |         |
| 04210 |    |       |       | 04750 |       | DORG                                      | *-3                                   |           |         |
| 04210 | 14 | 04201 | 00000 | 04760 |       | CM                                        | SYMCK+11                              |           |         |
|       |    |       |       | 04770 | *     | CHECK                                     | FOR BOTTOM OF RANGE                   |           |         |
|       |    |       |       | 04780 | *     | IF THERE PUT IT IN TABLE                  |                                       |           |         |
| 04222 | 46 | 04354 | 01200 | 04790 | S2    | BE                                        | PUT                                   |           |         |
| 04234 | 12 | 04201 | 00005 | 04800 |       | SM                                        | SYMCK+11                              | ,5        | ,10     |
| 04246 | 49 | 04190 | 00000 | 04810 |       | B                                         | SYMCK                                 |           |         |
| 04254 |    |       |       | 04820 |       | DORG                                      | *-3                                   |           |         |
| 04254 | 11 | 04201 | 00009 | 04830 | TEST  | AM                                        | SYMCK+11                              | ,9        | ,10     |
| 04266 | 24 | 04201 | 06461 | 04840 |       | C                                         | SYMCK+11                              | ,SCAN     | ,6      |
|       |    |       |       | 04850 | *     | LABEL                                     | IN TABLE, ENTER SEQ. NO.              |           |         |
| 04278 | 46 | 04374 | 01200 | 04860 |       | BE                                        | PUT1                                  |           |         |
|       |    |       |       | 04870 | *     | CHECK                                     | MORE                                  |           |         |
| 04290 | 47 | 04334 | 01300 | 04880 |       | BN                                        | SUB                                   |           |         |
|       |    |       |       | 04890 | *     | BECAUSE OF ORDERING PUT LABEL IN HERE     |                                       |           |         |
| 04302 | 16 | 06450 | 00015 | 04900 |       | TFM                                       | DWN                                   | ,15       | ,10     |
|       |    |       |       | 04910 | *     | SET                                       | BRANCH FOR ENTRY OF LABEL + SEQ. NO.  |           |         |
| 04314 | 16 | 04632 | 04634 | 04920 |       | TFM                                       | PUT2+42                               | ,BRV      |         |
| 04326 | 49 | 04410 | 00000 | 04930 |       | B                                         | PUT3                                  |           |         |
| 04334 |    |       |       | 04940 |       | DORG                                      | *-3                                   |           |         |
| 04334 | 12 | 04201 | 00014 | 04950 | SUB   | SM                                        | SYMCK+11                              | ,14       | ,10     |
| 04346 | 49 | 04190 | 00000 | 04960 |       | B                                         | SYMCK                                 |           |         |
| 04354 |    |       |       | 04970 |       | DORG                                      | *-3                                   |           |         |
| 04354 | 12 | 04201 | 00001 | 04980 | PUT   | SM                                        | SYMCK+11                              | ,1        | ,10     |
| 04366 | 49 | 04302 | 00000 | 04990 |       | B                                         | TEST+48                               |           |         |
| 04374 |    |       |       | 05000 |       | DORG                                      | *-3                                   |           |         |
| 04374 | 16 | 04632 | 04682 | 05010 | PUT1  | TFM                                       | PUT2+42                               | ,BRS      |         |
|       |    |       |       | 05020 | *     | SET                                       | BRANCH FOR ENTRY OF SEQ. NO. ONLY     |           |         |
| 04386 | 16 | 06450 | 00005 | 05030 |       | TFM                                       | DWN                                   | ,5        | ,10     |
| 04398 | 12 | 04201 | 00010 | 05040 |       | SM                                        | SYMCK+11                              | ,10       |         |
|       |    |       |       | 05050 | *     |                                           |                                       |           |         |
|       |    |       |       | 05060 | *     | MOVE                                      | SYM. TAB. TO MAKE ROOM FOR ENTRY      |           |         |
| 04410 | 25 | 04053 | 04201 | 05070 | PUT3  | TD                                        | FLAG+23                               | ,SYMCK+11 | ,11     |
|       |    |       |       | 05080 | *     | PUT                                       | RECORD MARK IN FOR MOVE               |           |         |
| 04422 | 25 | 04201 | 01023 | 05090 |       | TD                                        | SYMCK+11                              | ,BA2+23,6 |         |
| 04434 | 11 | 04201 | 00001 | 05100 |       | AM                                        | SYMCK+11                              | ,1        | ,10     |
|       |    |       |       | 05110 | *     | IS IT                                     | ADDED AT BOTTOM OF VAR. TAB.          |           |         |
| 04446 | 24 | 04201 | 03465 | 05120 |       | C                                         | SYMCK+11                              | ,VARAD    |         |
|       |    |       |       | 05130 | *     | YES -                                     | EXTEND RANGE - NO MOVE                |           |         |
| 04458 | 46 | 04602 | 01200 | 05140 |       | BE                                        | PUT2+12                               |           |         |
| 04470 | 26 | 04560 | 03465 | 05150 |       | TF                                        | OK+6                                  | ,VARAD    |         |
| 04482 | 22 | 04560 | 06450 | 05160 |       | S                                         | OK+6                                  | ,DWN      |         |
|       |    |       |       | 05170 | *     | CHECK                                     | FOR OVERLAP                           |           |         |
| 04494 | 14 | 04560 | 06771 | 05180 |       | CM                                        | OK+6                                  | ,VAR+90   |         |

| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS                       |
|-------|----|-------|-------|-------|--------|------|--------------------------------------------|
| 04506 | 46 | 04554 | 01100 | 05190 |        | BP   | OK                                         |
| 04518 | 15 | 04743 | 00001 | 05200 |        | TDM  | BRS+61 ,1                                  |
| 04530 | 73 | 06151 | 06304 | 05210 |        | TNF  | OUT+18 ,SEQN                               |
| 04542 | 17 | 05786 | 04554 | 05220 |        | BTM  | OUTP ,**12                                 |
|       |    |       |       | 05230 | *      |      | MOVE SYM. TAB.                             |
| 04554 | 31 | 00000 | 03465 | 05240 |        | OK   | TR ,VARAD ,11                              |
|       |    |       |       | 05250 | *      |      | ADJUST PROPER SYM. TAB. ADDRESSES          |
| 04566 | 24 | 04201 | 03453 | 05260 |        | C    | SYMCK+11 ,STNAD                            |
| 04578 | 47 | 04602 | 01300 | 05270 |        | BN   | PUT2+12                                    |
|       |    |       |       | 05280 | *      |      | ACTUAL ADJUSTMENT                          |
| 04590 | 22 | 03453 | 06450 | 05290 | PUT2   | S    | STNAD ,DWN                                 |
| 04602 | 22 | 03465 | 06450 | 05300 |        | S    | VARAD ,DWN                                 |
| 04614 | 12 | 04201 | 00001 | 05310 |        | SM   | SYMCK+11 ,1 ,10                            |
|       |    |       |       | 05320 | *      |      | BR TO BRV - LABEL + SEQ. NO.               |
|       |    |       |       | 05330 | *      |      | BR TO BRS - SEQ. NO. ONLY                  |
| 04626 | 49 | 00000 | 00000 | 05340 |        | B    |                                            |
| 04634 |    |       |       | 05350 |        | DORG | **3                                        |
|       |    |       |       | 05360 | *      |      | ENTER LABEL                                |
| 04634 | 26 | 04201 | 06461 | 05370 | BRV    | TF   | SYMCK+11 ,SCAN ,6                          |
| 04646 | 12 | 04201 | 00009 | 05380 |        | SM   | SYMCK+11 ,9 ,10                            |
| 04658 | 32 | 04201 | 00000 | 05390 |        | SF   | SYMCK+11 , ,6                              |
| 04670 | 12 | 04201 | 00001 | 05400 |        | SM   | SYMCK+11 ,1 ,10                            |
|       |    |       |       | 05410 | *      |      | ENTER SEQ. NO.                             |
| 04682 | 26 | 04201 | 06304 | 05420 | BRS    | TF   | SYMCK+11 ,SEQN ,6                          |
| 04694 | 12 | 04201 | 00004 | 05430 |        | SM   | SYMCK+11 ,4 ,10                            |
|       |    |       |       | 05440 | *      |      | ENTER INDICATOR OF REFERENCE OR DEFINITION |
| 04706 | 25 | 04201 | 06451 | 05450 |        | TD   | SYMCK+11 ,REDEI ,6                         |
| 04718 | 12 | 04201 | 00001 | 05460 |        | SM   | SYMCK+11 ,1 ,10                            |
|       |    |       |       | 05470 | *      |      | RESTORE DIGIT COVERED BY                   |
|       |    |       |       | 05480 | *      |      | RECORD MARK FOR MOVING SYM. TAB.           |
| 04730 | 25 | 04201 | 04053 | 05490 |        | TD   | SYMCK+11 ,FLAG+23 ,6                       |
|       |    |       |       | 05500 | *      |      | BRANCH BACK (NOP IN CASE OF OVERLAP)       |
| 04742 | 49 | 04189 | 00000 | 05510 |        | B    | SYMCK-1 , ,6                               |
| 04754 | 25 | 04743 | 00009 | 05520 |        | TD   | BRS+61 ,9                                  |
| 04766 | 49 | 04798 | 00000 | 05530 |        | B    | END+24                                     |
| 04774 |    |       |       | 05540 |        | DORG | **3                                        |
| 04774 | 32 | 01228 | 00000 | 05550 | END    | SF   | CONT                                       |
|       |    |       |       | 05560 | *      |      | PUT BLANKS AT END OF SYM. TAB.             |
| 04786 | 26 | 04816 | 03465 | 05570 |        | TF   | **30 ,VARAD                                |
| 04798 | 12 | 04816 | 00001 | 05580 |        | SM   | **18 ,1 ,10                                |
| 04810 | 26 | 00000 | 05984 | 05590 |        | TF   | ,BLK+5                                     |
|       |    |       |       | 05600 | *      |      | BREAK PAGE                                 |
| 04822 | 31 | 06132 | 05970 | 05610 |        | TR   | CHI-1,BLK1-1                               |
| 04834 | 31 | 06132 | 06356 | 05620 |        | TR   | OUT-1 ,STN-1                               |
| 04846 | 17 | 05786 | 04858 | 05630 |        | BTM  | OUTP,**12                                  |
| 04858 | 12 | 03477 | 00005 | 05650 |        | SM   | OUTAD ,5 ,10                               |
| 04870 | 49 | 04974 | 00000 | 05660 |        | B    | STNO                                       |
| 04878 |    |       |       | 05670 |        | DORG | **3                                        |
|       |    |       |       | 05680 | *      |      | ADJUST FOR OUTPUT OF VARIABLES             |
| 04878 | 12 | 03477 | 00005 | 05690 | VAROT  | SM   | OUTAD ,5 ,10                               |
| 04890 | 17 | 05786 | 04902 | 05700 |        | BTM  | OUTP ,**12                                 |
| 04902 | 16 | 05251 | 00026 | 05710 |        | TFM  | V1+61 ,26 ,10                              |
| 04914 | 16 | 04985 | 03465 | 05720 |        | TFM  | STNO+11 ,VARAD                             |
| 04926 | 16 | 05725 | 05726 | 05730 |        | TFM  | EOUT+11 ,EOUT+12                           |
| 04938 | 17 | 05786 | 04950 | 05740 |        | BTM  | OUTP,**12                                  |
| 04950 | 31 | 06132 | 06680 | 05760 |        | TR   | OUT-1 ,VAR-1                               |
| 04962 | 17 | 05786 | 04974 | 05770 |        | BTM  | OUTP,**12                                  |
| 04974 | 24 | 03477 | 03453 | 05790 | STNO   | C    | OUTAD ,STNAD                               |
|       |    |       |       | 05800 | *      |      | END OF TABLE                               |
| 04986 | 47 | 05694 | 01100 | 05810 |        | BNP  | E                                          |
| 04998 | 12 | 03477 | 00010 | 05820 | VAROT1 | SM   | OUTAD ,10 ,10                              |
|       |    |       |       | 05830 | *      |      | NO FLAG IT IS A SEQ. NO.                   |
| 05010 | 44 | 05506 | 03477 | 05840 |        | BNF  | SQ ,OUTAD ,11                              |
| 05022 | 16 | 06448 | 00012 | 05850 |        | TFM  | CNT ,12 ,10                                |
| 05034 | 16 | 05656 | 06181 | 05860 |        | TFM  | SQ1+6 ,OUT+48                              |
|       |    |       |       | 05870 | *      |      | 1ST TIME ON LABEL GO TO V1                 |
| 05046 | 44 | 05190 | 04878 | 05880 |        | BNF  | V1 ,VAROT                                  |
| 05058 | 26 | 03477 | 05201 | 05890 |        | TF   | OUTAD ,V1+11                               |
| 05070 | 33 | 04878 | 00000 | 05900 |        | CF   | VAROT                                      |
| 05082 | 16 | 05560 | 05114 | 05910 |        | TFM  | SQ+54 ,LIN2                                |
| 05094 | 15 | 05567 | 00049 | 05920 |        | TDM  | SQ+61 ,49                                  |
| 05106 | 49 | 05506 | 00000 | 05930 |        | B    | SQ                                         |
| 05114 |    |       |       | 05940 |        | DORG | **3                                        |
| 05114 | 16 | 05560 | 05134 | 05950 | LIN2   | TFM  | SQ+54 ,LIN3                                |
| 05126 | 49 | 04998 | 00000 | 05960 |        | B    | VAROT1                                     |
| 05134 |    |       |       | 05970 |        | DORG | **3                                        |
| 05134 | 17 | 05786 | 05146 | 05980 | LIN3   | BTM  | OUTP ,**12                                 |
| 05146 | 16 | 06173 | 00014 | 05990 |        | TFM  | OUT+40 ,14 ,10                             |
| 05158 | 16 | 05560 | 05578 | 06000 |        | TFM  | SQ+54 ,SQ+72                               |
| 05170 | 11 | 03477 | 00004 | 06010 |        | AM   | OUTAD ,4 ,10                               |
| 05182 | 49 | 05626 | 00000 | 06020 |        | B    | LIN4+12                                    |
| 05190 |    |       |       | 06030 |        | DORG | **3                                        |
| 05190 | 32 | 04878 | 00000 | 06040 | V1     | SF   | VAROT                                      |
| 05202 | 17 | 05786 | 05214 | 06050 |        | BTM  | OUTP ,**12                                 |
| 05214 | 16 | 05560 | 04998 | 06060 |        | TFM  | SQ+54 ,VAROT1                              |
| 05226 | 15 | 05567 | 00041 | 06070 |        | TDM  | SQ+61 ,41                                  |
| 05238 | 11 | 03477 | 00009 | 06080 |        | AM   | OUTAD ,9 ,10                               |
|       |    |       |       | 06090 | *      |      | PUT LABEL IN OUTPUT AREA                   |

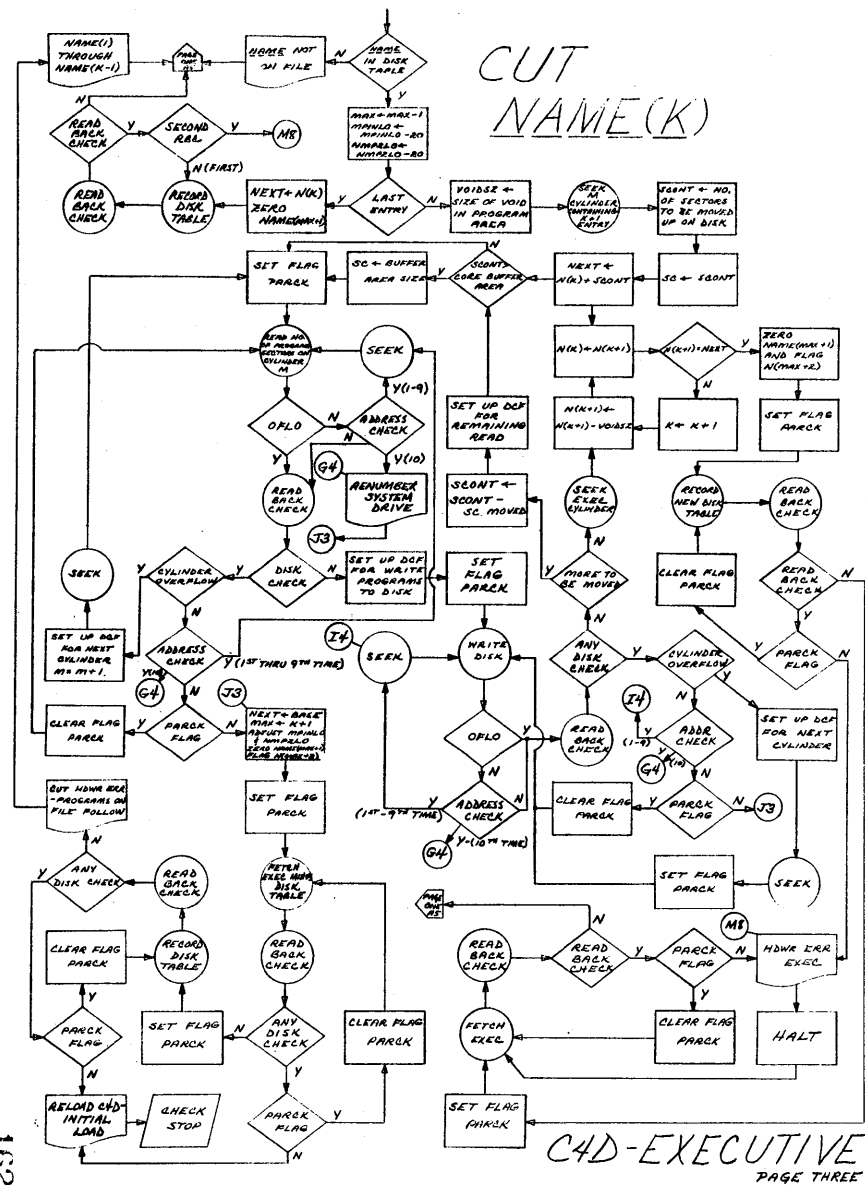
| LOCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM   | OPERANDS AND REMARKS           |
|-------|----|-------|-------|-------|--------|--------|--------------------------------|
| 05250 | 73 | 06161 | 03477 | 06100 |        | TNF    | OUT+28 ,OUTAD ,11              |
| 05262 | 16 | 06173 | 00000 | 06110 |        | TFM    | OUT+40                         |
| 05274 | 16 | 05297 | 06141 | 06120 |        | TFM    | **23 ,OUT+8                    |
|       |    |       |       | 06130 | *      | BLANK  | LEADING ZEROS                  |
| 05286 | 43 | 05346 | 00000 | 06140 |        | BD     | VA                             |
| 05298 | 16 | 05297 | 00000 | 06150 |        | TFM    | **1 , ,610                     |
| 05310 | 11 | 05297 | 00002 | 06160 |        | AM     | **13 ,2 ,10                    |
| 05322 | 14 | 05297 | 06161 | 06170 |        | CM     | **25 ,OUT+28                   |
| 05334 | 47 | 05286 | 01200 | 06180 |        | BNE    | **48                           |
|       |    |       |       | 06190 | *      | FIND   | FIRST DEFINITION IF ANY        |
| 05346 | 26 | 05381 | 03477 | 06200 | VA     | TF     | **35 ,OUTAD                    |
| 05358 | 12 | 05381 | 00014 | 06210 |        | SM     | VA+35 ,14 ,10                  |
|       |    |       |       | 06220 | *      | DIGIT  | - DEFINITION                   |
| 05370 | 43 | 05458 | 00000 | 06230 |        | BD     | VDEF                           |
| 05382 | 24 | 05381 | 04985 | 06240 |        | C      | VA+35 ,STNO+11 ,11             |
|       |    |       |       | 06250 | *      | NEG    | - NO DEFINITION (END OF TABLE) |
| 05394 | 47 | 05482 | 01100 | 06260 |        | BNP    | VDEF+24                        |
| 05406 | 12 | 05381 | 00010 | 06270 |        | SM     | VA+35 ,10 ,10                  |
| 05418 | 44 | 05438 | 05381 | 06280 |        | BNF    | AD5 ,VA+35 ,11                 |
|       |    |       |       | 06290 | *      | FLAG   | - NO DEFINITION (NEXT LABEL)   |
| 05430 | 49 | 05482 | 00000 | 06300 |        | B      | VDEF+24                        |
| 05438 |    |       |       | 06310 |        | DORG   | **3                            |
| 05438 | 11 | 05381 | 00005 | 06320 | AD5    | AM     | VA+35 ,5 ,10                   |
| 05450 | 49 | 05370 | 00000 | 06330 |        | B      | VA+24                          |
| 05458 |    |       |       | 06340 |        | DORG   | **3                            |
|       |    |       |       | 06350 | *      | PUT    | 1ST DEF. SEQ. NO. TO LEFT      |
|       |    |       |       | 06360 | *      | OF     | LABEL                          |
| 05458 | 11 | 05381 | 00004 | 06370 | VDEF   | AM     | VA+35 ,4 ,10                   |
| 05470 | 73 | 06139 | 05381 | 06380 |        | TNF    | OUT+6 ,VA+35 ,11               |
| 05482 | 12 | 03477 | 00019 | 06390 |        | SM     | OUTAD ,19 ,10                  |
|       |    |       |       | 06400 | *      | SAVE   | ADDRESS TO START LOOKING       |
|       |    |       |       | 06410 | *      | FOR    | MULTIPLE DEF.                  |
| 05494 | 26 | 05201 | 03477 | 06420 |        | TF     | V1+11 ,OUTAD ,                 |
|       |    |       |       | 06430 | *      | 1ST    | LOOK FOR REF. - 2ND MULT. DEF. |
| 05506 | 11 | 03477 | 00010 | 06440 | SQ     | AM     | OUTAD ,10 ,10                  |
| 05518 | 24 | 03477 | 04985 | 06450 |        | C      | OUTAD ,STNO+11 ,11             |
|       |    |       |       | 06460 | *      | NEG    | - END OF TABLE                 |
| 05530 | 47 | 05694 | 01100 | 06470 |        | BNP    | E                              |
| 05542 | 12 | 03477 | 00005 | 06480 |        | SM     | OUTAD ,5 ,10                   |
|       |    |       |       | 06490 | *      | 2ND    | TIME BD TO LIN2                |
| 05554 | 43 | 04998 | 03477 | 06500 |        | BD     | VAROT1 ,OUTAD ,11              |
|       |    |       |       | 06510 | *      | 2ND    | TIME BR TO VAROT1              |
| 05566 | 41 | 04998 | 00000 | 06520 |        | NOP    | VAROT1                         |
| 05578 | 11 | 03477 | 00004 | 06530 |        | AM     | OUTAD ,4 ,10                   |
| 05590 | 12 | 06448 | 00001 | 06540 |        | SM     | CNT ,1 ,10                     |
| 05602 | 47 | 05650 | 01200 | 06550 |        | BNE    | SQ1                            |
|       |    |       |       | 06560 | *      | LINE   | FULL OUTPUT IT                 |
| 05614 | 17 | 05786 | 05626 | 06570 | LIN4   | BTM    | OUTP ,**12                     |
| 05626 | 16 | 06448 | 00011 | 06580 |        | TFM    | CNT ,11 ,10                    |
| 05638 | 16 | 05656 | 06181 | 06590 |        | TFM    | SQ1+6 ,OUT+48                  |
|       |    |       |       | 06600 | *      | PUT    | SEQ. NO. IN OUTPUT AREA        |
| 05650 | 73 | 00000 | 03477 | 06610 | SQ1    | TNF    | OUTAD ,OUTAD ,11               |
| 05662 | 11 | 05656 | 00010 | 06620 |        | AM     | **6 ,10 ,10                    |
| 05674 | 12 | 03477 | 00004 | 06630 |        | SM     | OUTAD ,4 ,10                   |
| 05686 | 49 | 04998 | 00000 | 06640 |        | B      | VAROT1                         |
| 05694 |    |       |       | 06650 |        | DORG   | **3                            |
|       |    |       |       | 06660 | *      | 2ND    | TIME GO TO EOUT                |
| 05694 | 44 | 05714 | 04878 | 06670 | E      | BNF    | EOUT ,VAROT                    |
|       |    |       |       | 06680 | *      | 1ST    | TIME GO TO GET MULT. DEF.      |
| 05706 | 49 | 05022 | 00000 | 06690 |        | B      | VAROT1+24                      |
| 05714 |    |       |       | 06700 |        | DORG   | **3                            |
|       |    |       |       | 06710 | *      | FOR    | VARIABLE RETURN IS TO EOUT+12  |
| 05714 | 17 | 05786 | 04878 | 06720 | EOUT   | BTM    | OUTP ,VAROT                    |
|       |    |       |       | 06730 | *      | BREAK  | PAGE FOR NEXT PROG.            |
| 05726 | 17 | 05786 | 05738 | 06740 | CALSYS | BTM    | OUTP,**12                      |
| 05738 | 31 | 06132 | 06594 | 06750 |        | TR     | OUT-1,ASTMSG-1                 |
| 05750 | 17 | 05786 | 05762 | 06760 |        | BTM    | OUTP,**12                      |
| 05762 | 31 | 00038 | 06572 | 06770 |        | TR     | 38 ,DCFS-5                     |
| 05774 | 49 | 00000 | 00000 | 06780 |        | B      | 0                              |
|       |    |       |       | 06790 | *      | OUTPUT | SUBROUTINES                    |
| 05786 | 46 | 05818 | 00200 | 06800 | OUTP   | BC2    | PRINT                          |
| 05798 | 39 | 06133 | 00400 | 06810 |        | WACD   | OUT                            |
| 05810 | 49 | 05950 | 00000 | 06820 |        | B      | CLOUT                          |
| 05818 |    |       |       | 06830 |        | DORG   | **3                            |
| 05818 | 47 | 05842 | 03400 | 06840 | PRINT  | BNI    | PRI,03400                      |
| 05830 | 34 | 00000 | 00971 | 06850 |        | K      | ,00971                         |
|       |    |       |       | 06860 | *      | PUT    | RECORD MARK AFTER LAST CHARC.  |
| 05842 | 16 | 05865 | 06290 | 06870 | PRI    | TFM    | **23,OUT+157                   |
| 05854 | 43 | 05914 | 00000 | 06880 |        | BD     | **60                           |
| 05866 | 14 | 05865 | 06132 | 06890 |        | CM     | **1 ,OUT-1                     |
| 05878 | 46 | 05914 | 01200 | 06900 |        | BE     | **36                           |
| 05890 | 12 | 05865 | 00002 | 06910 |        | SM     | **25 ,2 ,10                    |
| 05902 | 49 | 05854 | 00000 | 06920 |        | B      | **48                           |
| 05914 | 11 | 05865 | 00003 | 06930 |        | AM     | **49 ,3 ,10                    |
| 05926 | 25 | 05865 | 01023 | 06940 |        | TD     | **61,BA2+23,6                  |
| 05938 | 39 | 06133 | 00900 | 06950 |        | WAPR   | OUT                            |
| 05950 | 31 | 06132 | 05970 | 06960 | CLOUT  | TR     | OUT-1,BLK1-1                   |
|       |    |       |       | 06970 | *      | RETURN |                                |

| LUCTN | OP | P/L   | Q     | PG/LN | LABEL  | MNEM | OPERANDS AND REMARKS                           |
|-------|----|-------|-------|-------|--------|------|------------------------------------------------|
| 05962 | 49 | 05785 | 00000 | 06980 |        | B    | OUTP-1 , ,6                                    |
| 05970 |    |       |       | 06990 |        | DDRG | *-3                                            |
| 05971 |    | 00050 | X2    | 07000 | BLK1   | DAC  | 50,                                            |
| 06071 |    | 00030 | X2    | 07010 |        | DAC  | 30,                                            |
| 06131 |    | 00001 | X2    | 07020 |        | DAC  | 1 ,'                                           |
| 05979 |    | 00010 |       | 07030 | BLK    | DS   | 10 ,BLK1+8                                     |
| 06133 |    | 00100 | X2    | 07040 | CHI    | DAS  | 100                                            |
| 06133 |    | 00000 |       | 07050 | OUT    | DS   | ,CHI                                           |
| 06304 |    | 00000 |       | 07060 | SEQN   | DS   | ,CHI+171                                       |
| 06333 |    | 00001 | X2    | 07070 |        | DAC  | 1 ,'                                           |
| 06345 |    | 00012 |       | 07080 | FRMTSP | DC   | 12 ,465659544163                               |
| 06355 |    | 00010 |       | 07090 | DATASP | DC   | 10,4441634123                                  |
| 06357 |    | 00043 | X2    | 07100 | STN    | DAC  | 43,CARD NO.- LABEL NO.-REFERENCE CARD NUMBERS' |
| 06446 |    | 00005 |       | 07110 | ADR    | DS   | 5                                              |
| 06448 |    | 00002 |       | 07120 | CNT    | DS   | 2                                              |
| 06450 |    | 00002 |       | 07130 | DWN    | DS   | 2 ,                                            |
| 06451 |    | 00001 |       | 07140 | REDEI  | DS   | 1                                              |
| 06461 |    | 00010 |       | 07150 | SCAN   | DS   | 10                                             |
| 06463 |    | 00002 |       | 07160 |        | DS   | 2                                              |
| 06465 |    | 00018 | X2    | 07170 | HDWR   | DAC  | 18,HDWR ERR LAB INDX'                          |
| 06501 |    | 00036 | X2    | 07180 | STERR  | DAC  | 36,NO INDEX, *HOLD SHOULD FOLLOW *CODE'        |
| 06576 |    | 00005 |       | 07230 |        | DC   | 5 , -12994                                     |
| 06577 |    | 00016 |       | 07240 | DCFS   | DSC  | 16 ,7980012900100'                             |
| 06595 |    | 00043 | X2    | 07290 | ASTMSG | DAC  | 43, * OTHER CARDS WHERE VARIABLES ARE DEFINED' |
| 06681 |    | 00043 | X2    | 07300 | VAR    | DAC  | 43,CARD NO.- VAR. NAME-REFERENCE CARD NUMBERS' |
| 00000 |    |       |       | 07310 |        | DEND |                                                |

PAGE ONE



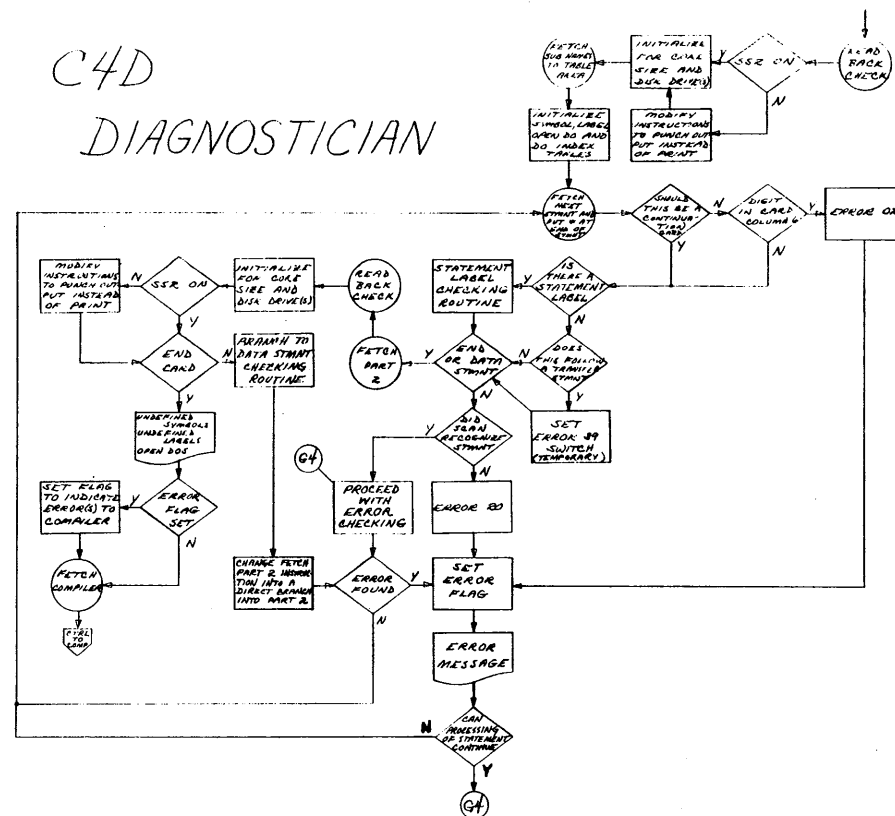
5111



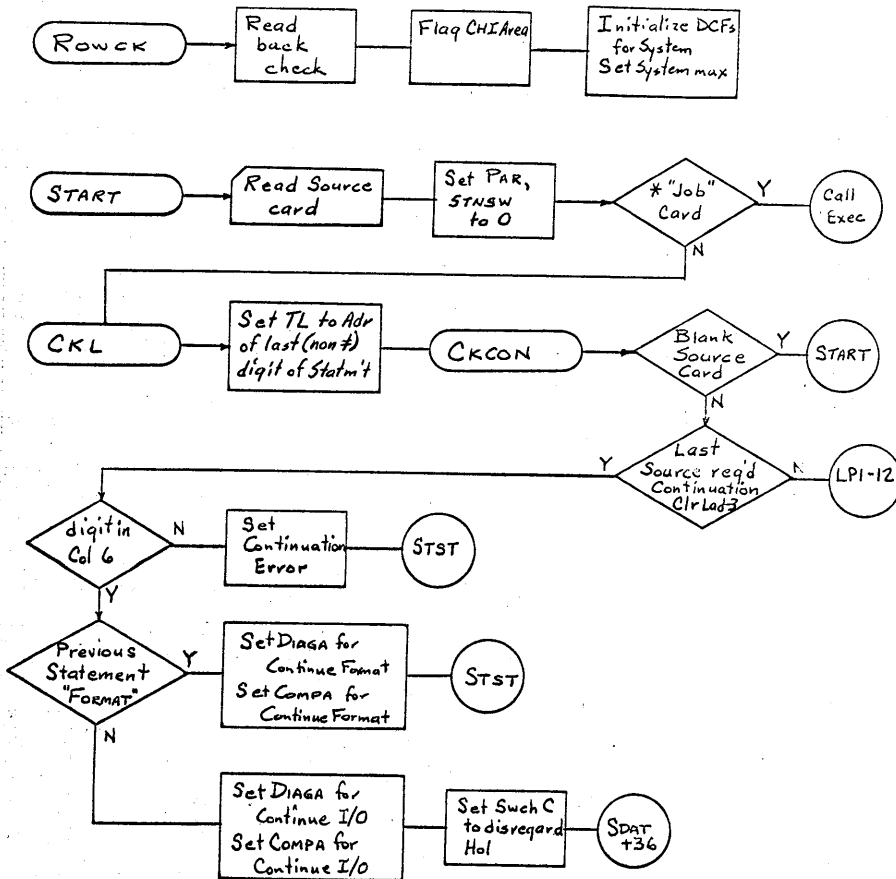
CUT  
NAME(K)

C4D-EXECUTIVE  
PAGE THREE

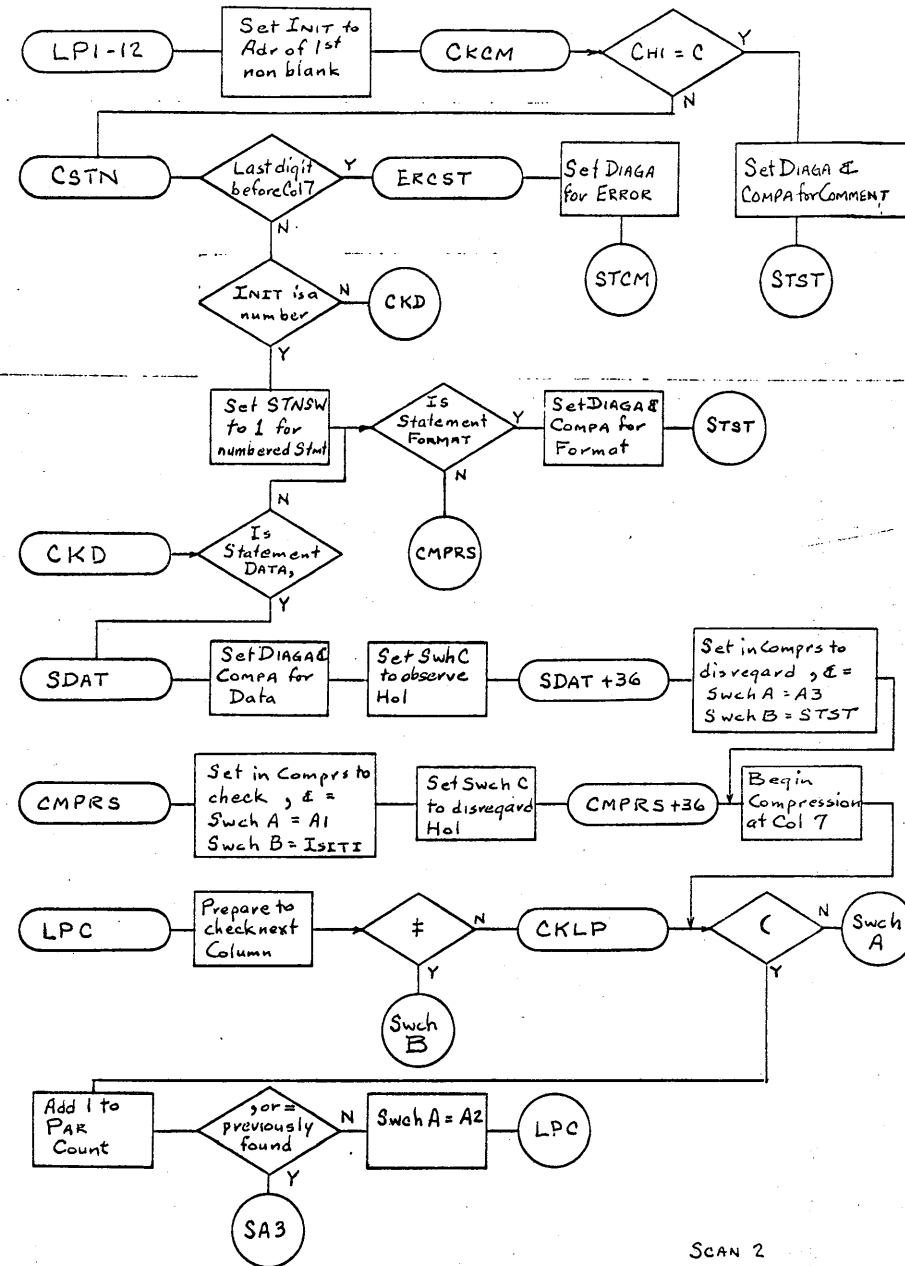
C4D  
DIAGNOSTICIAN



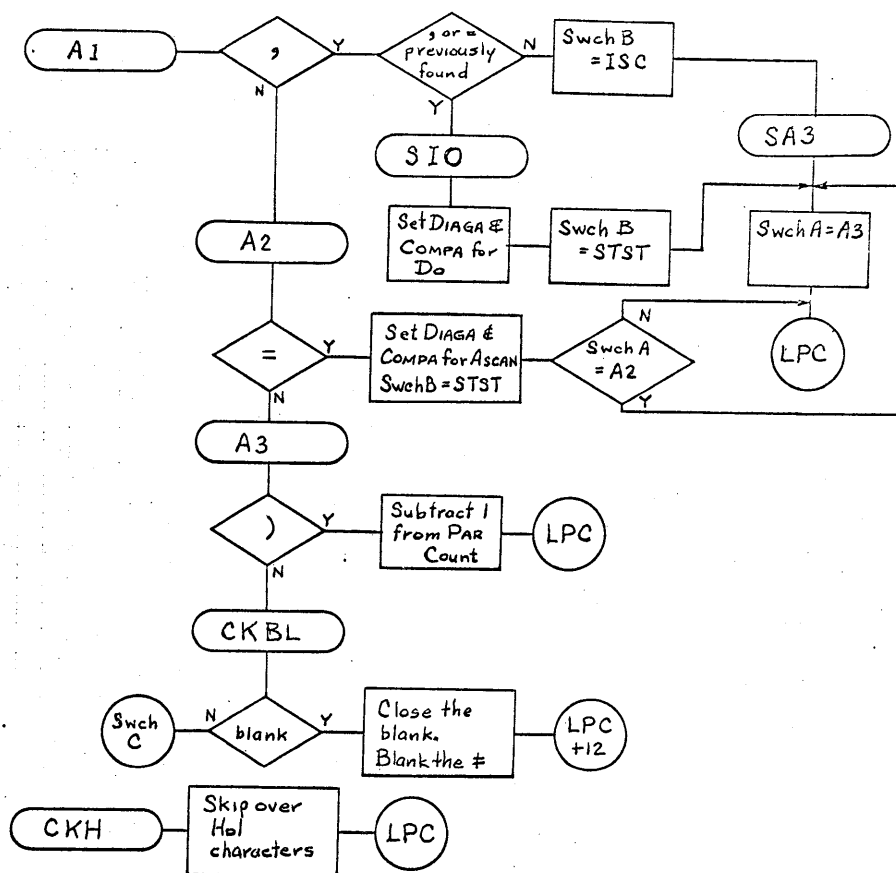
# SCAN



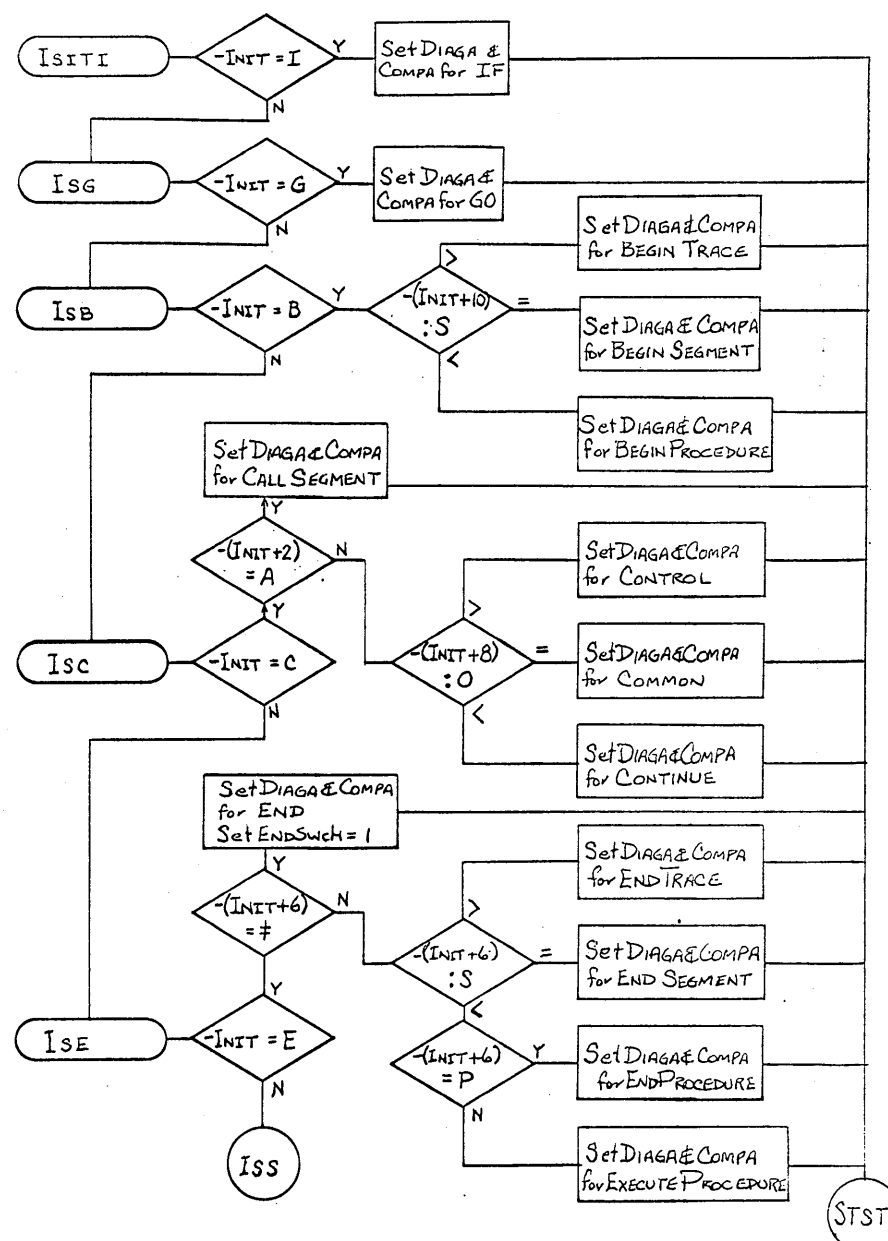
SCAN 1



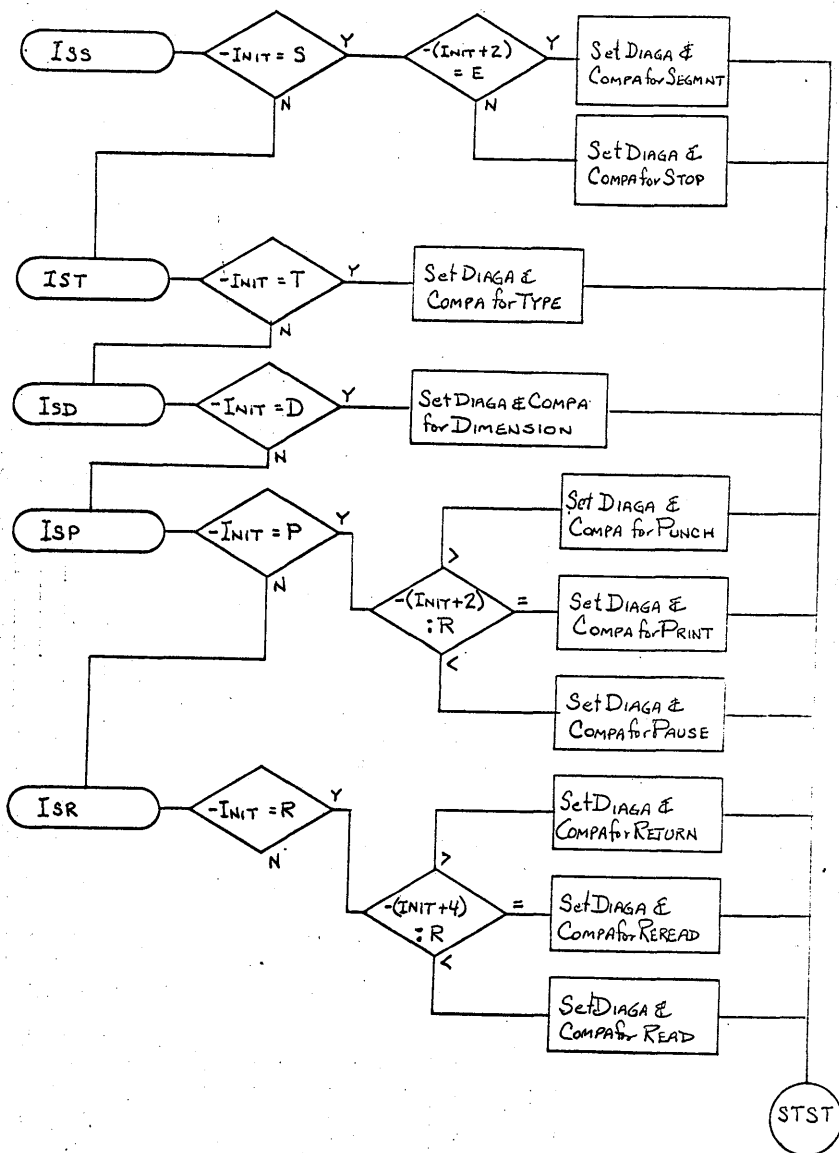
SCAN 2



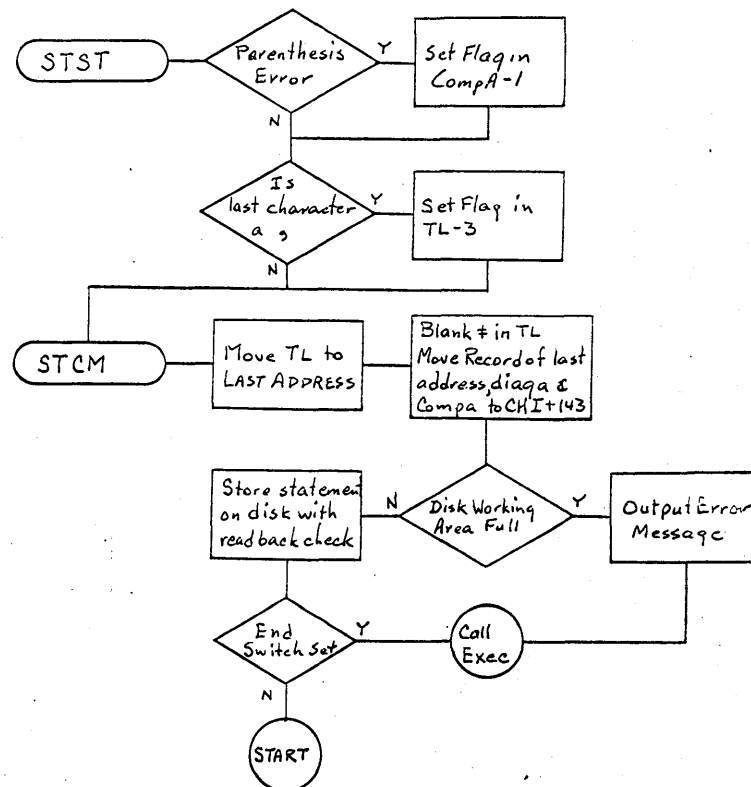
SCAN 3



SCAN 4

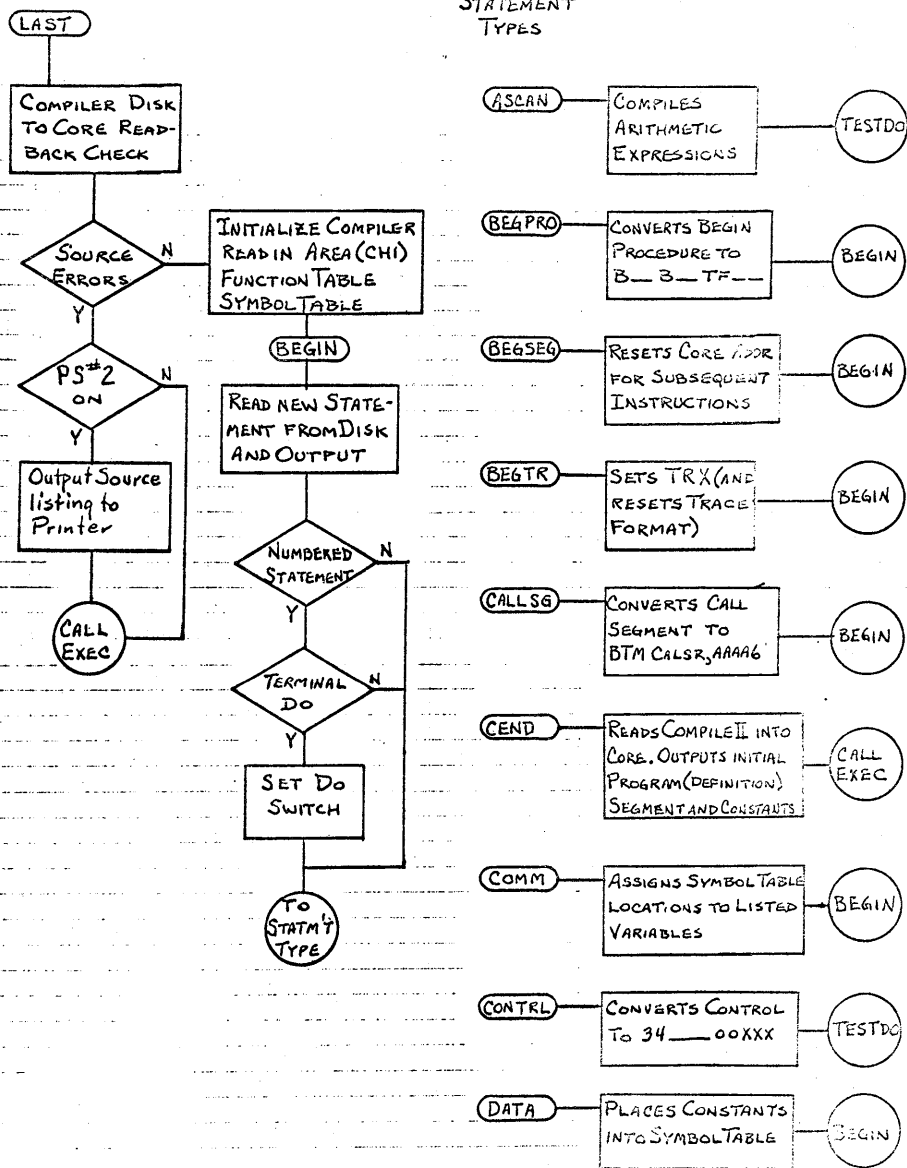


SCAN 5



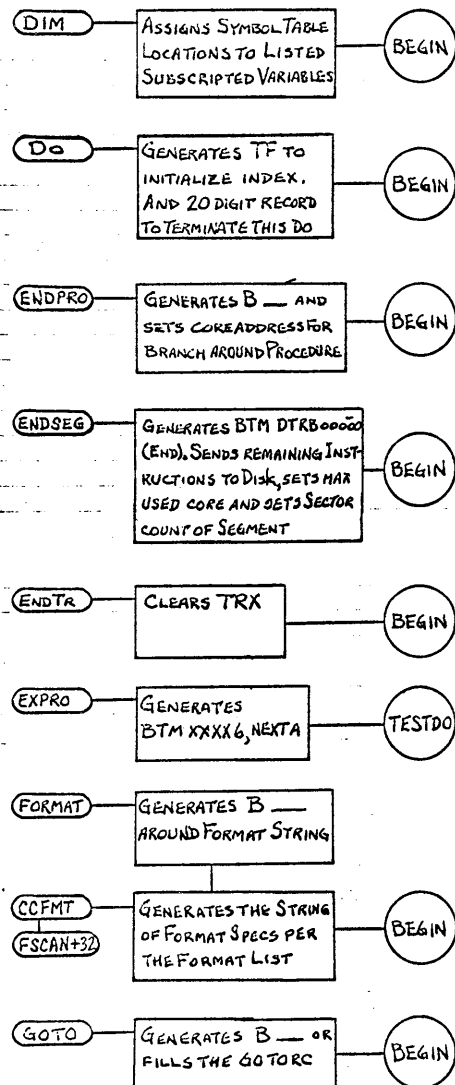
SCAN 6

# C4D COMPILER

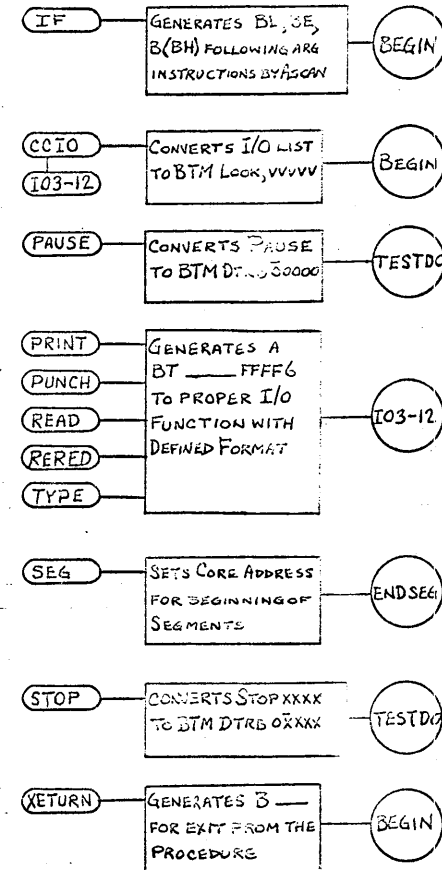


COMPILE 1

## STATEMENT TYPES

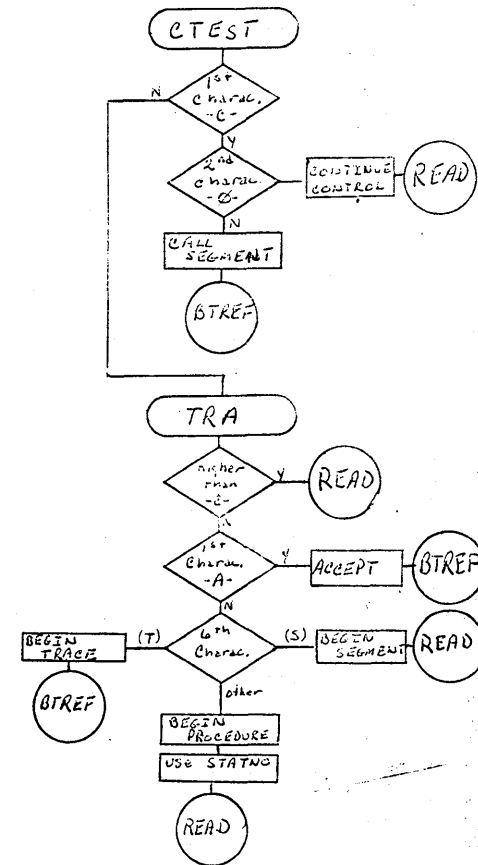
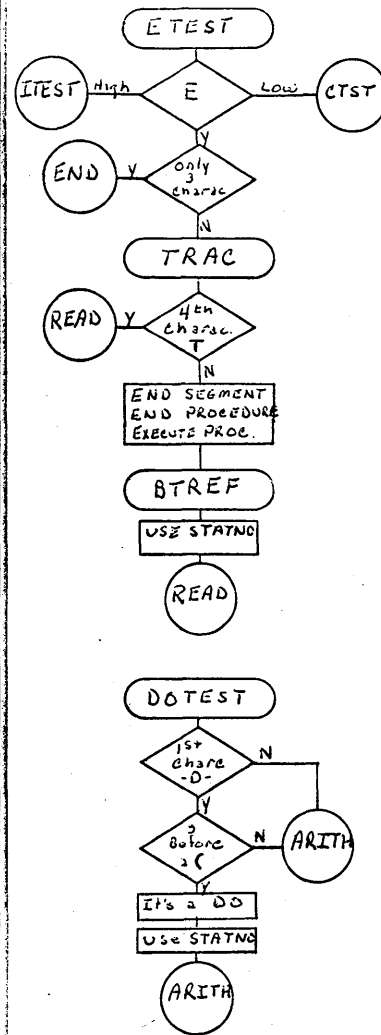
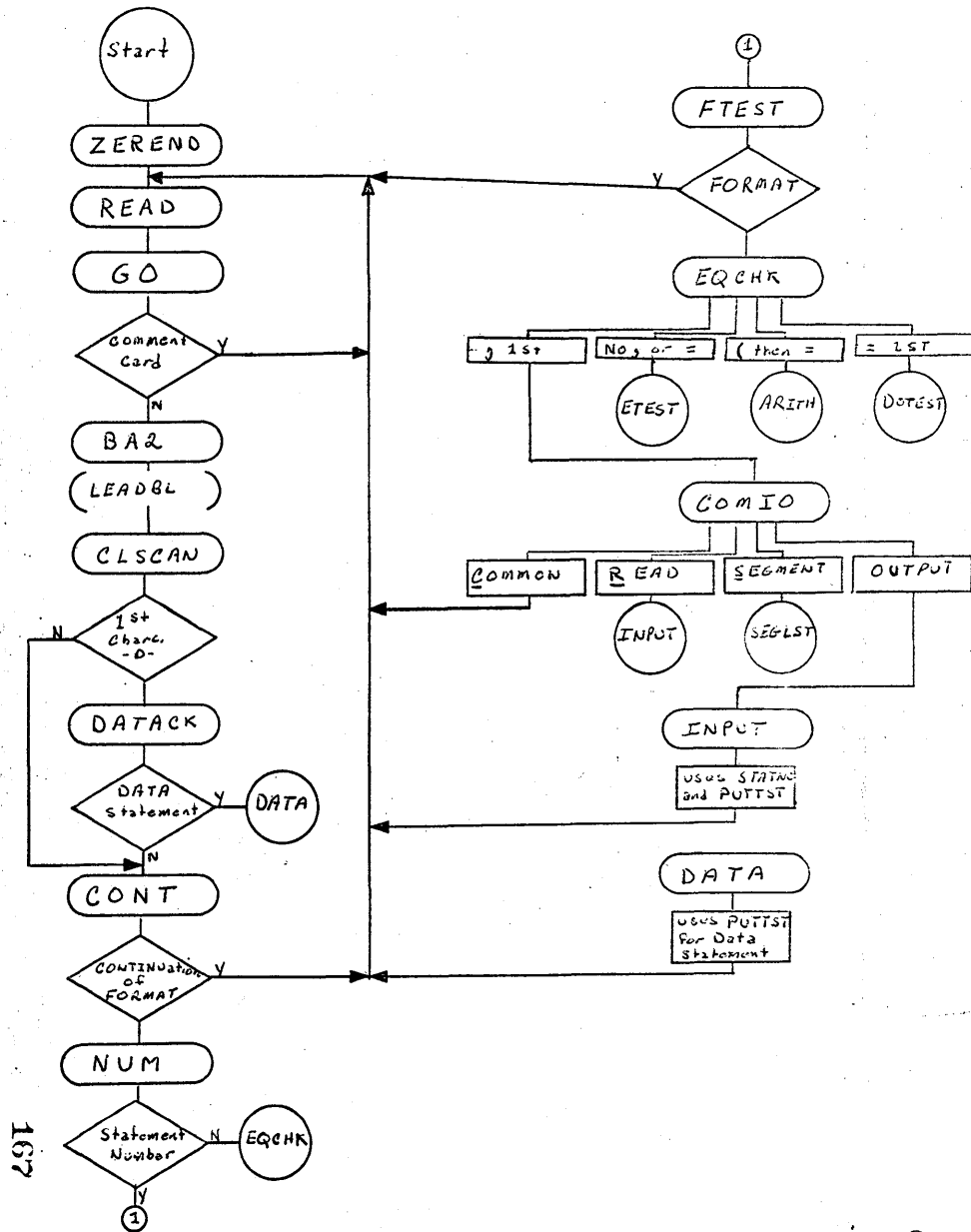


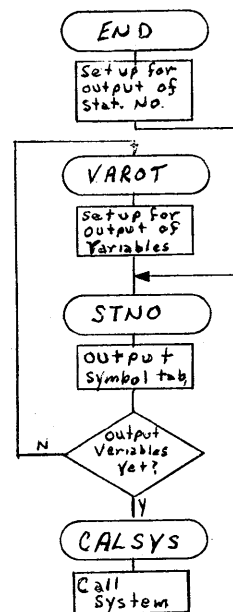
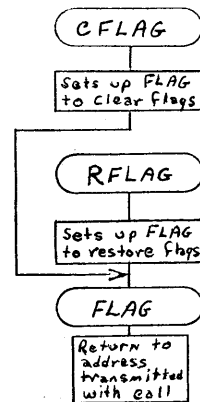
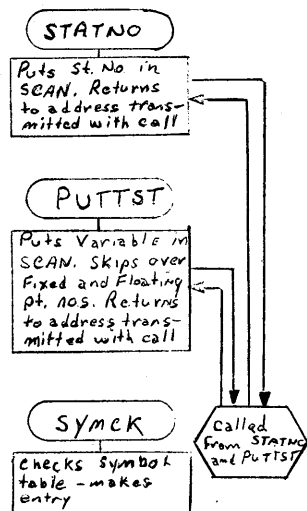
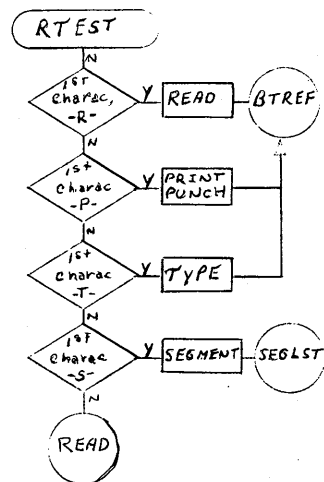
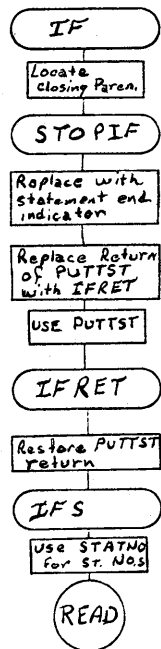
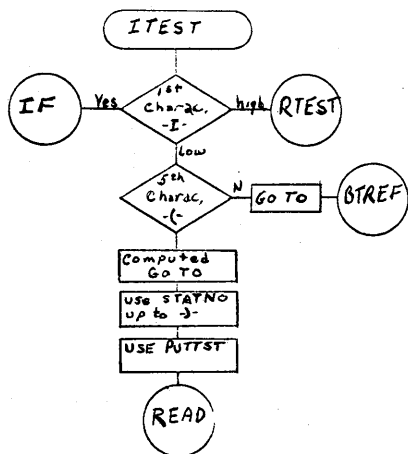
## STATEMENT TYPES



COMPILE 2

# FORTRAN LABEL INDEX







01059-79856047310659R34047260070126080430057022080430659R32080410000026047340804  
01060-8055333080410000026080670659R26005700449R2100570080431604739-9074240804308  
01061-81257894708164011002604734087893204493000001604724-86163100026047081600025  
01062-819500001649000120260057000000260057407581120057400-011608346-05801600585-0  
01063-82650202100580582192600580005851200580-000721083220058026-0020048411108322  
01064-8335-0020240000008322460831601300260058N0488015000250000626000570843116000  
01065-840542-8432490000P9844085045003600044007034708464039004908532015000250000  
01066-847581600042-850834M364630102490905203600044007034708584039004408564000003  
01067-8545300000000004900024039129030010049777703912829001003105022074444910314  
01068-86150460862801800320502400000270510805107360004400703460722803800270509605  
01069-86850952500690000924086250002546087680120031000500473226000490449R1500025  
01070-875500084900012044088960449330449300000220804304734260473108067210806704  
01071-8825734210473104734210449R047343208041000002604734080433308041000004908116  
01072-889503407758007012608962044992108974044992108979044991108962-0020220000007  
01073-896585531-000M-00161108974-00201108979-0020240896K00570470894401300260058N  
01074-9035048801600042-52922600057077714900012000240058-004254609130012002707500  
01075-9105074994405480000994910062044104140058N490548001612291000M01600070-02992  
01076-9175705096050954709210002003402596209713100404048303700405005001400405000J  
01077-92454470921001200490936201600070-02992705096050953300M64000001209296000-21  
01078-931540929600M06470929001200310056406503200416000001600405000L446094060020  
01079-938503105022074444909442031050220739234N9645509713900405004001705022-04054  
01080-94557094780010048M8565344004509502-0421150948R000001109489-00021409489-042  
01081-95255460954601100490947801609489-04212400413127014609902012001705022-45012  
01082-959560749900574260056304791240041305213470971001200140057400-0046100820120  
01083-966502400574099374710038013001705022J2663490921002400413094754609074012002  
01084-97354004110942547097660120049053702040041108495470981001200270750007499490  
01085-98057772024004131263146102420120024004110920546105580120024004110741146105  
01086-987538012001705022J26334909210031040502004163304534-0592320009900J993412702  
01087-9945007013812702007023612702007034710018039L74405156000993300099-000049099  
01088J00155001705022-45014909210027075000749944100820009926049290495349054920260  
01089J0085058-004252600099005801100099-0001310009R00564320058N0M0002600037047191  
01090J0155600042J018626000570777149000000270509605095150002500006260004209925260  
01091J0225005712728490000001605059000M13100448048747300447005741705022-044373004  
01092J029547005701705022-0439160758100-00240758100574461039401200110758100-01170  
01093J03655022-05951110373-0020491032601610373-05954909210026005700058N110057400  
01094J0435-01110058500-20110058000-20260058-048411600042J04944907892027050960509  
01095J05055310003812950150002500006490000003600000005004900000072004191070916107  
01096J0575450-0001410709000-04609210012002410709099854710650011001705022J2469490  
01097J0645921003404976007012600037047191600042J08262600057049893200045000-016116  
01098J071512J44121611624J440333116200-0001611636J44073311632000001611648J4007331  
01099J078516440-0003100404048301610009000-0491095004710858038001705022J256149092  
01100J08551002705096050952500069000092410709100094710926012003404990007014912118  
01101J092502100049107431611268J15383700405005001400405000J34611006012001705022J2  
01102J0995497490921001110009000-12611161107457200431107451310745000-543112060009  
01103J1065972004471079372004391137270042311137151112000001600415000-033004140-  
01104J11350004311250004063200408000002600413004154311226111121511112000014911138  
01105J120501705022J2595490921004311250004061705022J273114107450-0004611318012002  
01106J1275410141107454611338013001705022J2537490921001705022J244149092100161000  
01107J134500-003614920005001514984-000J111000700-0131149801492024113721000746113  
01108J14155001100461145801200451149414920111000700-012410793100074711606001100361  
01109J148549200050015149200000J251492H004003114920149254911434014111370-00046116  
01110J155506012002411161111374611606011001705022J2379490921002600000000492600000  
01111J1625111372600000107452600000004151611684J5000121116841074525150010449121116  
01112J1695481245911107450-0992600052107433000510000015000500000-140005200-00461  
01113J17650882012001611869J50001611941J50011611876J50021611948J50071611912J50061  
01114J1835611984J50111611881-001244119300000032000000000044119061191K32119170000  
01115J190501200000-5000331191700000441200200000320000000000441197811984321198900  
01116J19750001200000-50003311989000002411881111374600012013001111881-00121111889  
01117J2045-00121111941-00121111876-00121111948-00121111912-00121111984-001249118  
01118J21155802600057050032613997107091600042J21742514920004034900012027050960509  
01119J218552600057049641600042-91622514398046512514399004031211648-0005251164004  
01120J2255651490000003100300122841112291000K0M0003180000916-03690000490-3420000  
01121J232504912346060123460000\*310030012756150037000007490915000659565470045556  
01122J2346310000012756150037000007490915000659565470045556359680\*13000000000013  
01123J240213000000000013000000000013000000000010P162630062644200665956547004556  
01124J2468035656005441556800626442620\*J30043415944005556630049550057534143450\*02  
01125J2496J30043415944005556630049550057534143450\*02644200635656004249470\*026442  
01126J253602644200635656004249470\*026442004368530045674345454445440\*02644200644  
01127J2560026442004368530045674345454445440\*02644200564444005345554763480\*044962  
01128J259402644200564444005345554763480\*04496252H9556541534944001400434159440\*04  
01129J2624M4496252H9556541534944001400434159440\*0449625200634142534500466453530\*  
01130J2662H449625200634142534500466453530\*0441634507984400204500P960004400592002  
01131J2694M441634507984400204500P96000440059200264420055415445004559590\*01234567  
01132J27560123456789123456789-23456789-JK456789-JKL56789-JKL56789-JKL56789-JKL56789  
01133J2826\*0M36463004844665900455959205759564759415462005655004649534500466565353  
01134J28270M36463004844665900455959205759564759415462005655004649534500466565353  
01135J28976660\*H9455356414400437444204955496349415300535641440\*00424007912507500  
01136J2902N9455356414400437444204955496349415300535641440\*004240079125075004240  
01137J295000424007912507500424\*0000000000049122660-9162-926634000000010239137690  
01138J29710000000000049122660-9162-926634000000010239137690010036130020010043133  
01139J30418813002431328400182340000000102391359700100340000000102360056600100320  
01140J3111056600000140057001000461318001300340000000102391366700100491360000001  
01141J3181400570P900047132400110034000000010239137050010049130600000026131190057  
01142J32510121311900000260018513119491330801600570000001600185K00002500571044912  
01143J332160059000570160057400-00250057512826260060304841260022313767413680251  
01144J33913744004013613744007021218790000004613456012002600185187904913368016001  
01145J346185K00002508787004001208791-90741108788000J0250579900400251270200401250  
01146J353177580040125047260040125049760040125049900040125129560040149180000H5556  
01147J36013455900575956475941540062635659414745006263415963006245436356590\*03565  
01148J3666035656005356623006359680041474149550\*0356600484947482300635968004147  
01149J3704035656004849474823006359680041474149550\*07980400118700-412500500H55563  
01150J374407980400118700-412500500H555634559004449474963007000494600495549634941  
01151J381453005356414423007100494600534163455900535641440\*000000000000000000000

01152J80002500210004013200000000003800210007023600210007034718136039004418092000  
01153J8070003300000000004918024034000000010239181690010048000000000491811603100  
01154J81402001819225000800023149002000N3440048446659004559590360000000500310000  
01155J8192360000000500310000R000104900200#0000000000000000000000000000000000000000  
0199900200 79844085045004913000#  
02001-04042502696004002502720004002503016004002503028004002502046004012506517004  
02002-047401250203000401260106700185491800000000000000000000000000000000000000000000  
02003-0544000000360004400703490071002600700000231600820-503631000000061449000000  
02004-061426-0405000611100006000-21400006-0693470000001300M90P65000000-#00000000  
02005-06760000000000000000000000000000-11223344470057001900430076600299390074900100  
02006-074648M844455904901954025007320073L46007900060046008020160046008140170049  
02007-07584901954025007320073L46007900060046008020160046008140170049000000000000  
02008-08280000260089100831320089100000440089200831330089100000410000000000160657  
02009-08980-0891490653201501127000051601314-006124000520088346011640120046010080  
02010-096813002600831000602600060008912600891008312200883000521400883000-0470148  
02011-10388013002601211011633201207000002101211008832800891008914401116000993201  
02012-110821J0000015000610000528000600006044011640009932000010089226008310005216  
02013-117800052000-015008830000-21-0060-08912500099012001400060000-0260121101271  
02014-12484601376012003300000008914601284014004301396000524301440000533100061013  
02015-1318543100053000541200831000-146012960130#1603285-514849065880260006001868  
02016-13561603285-514849065880260006001868490148801100060000-5260060000059110083  
02017-14261000-1490128402600052008314606588014004401488000993200060000049014960  
02018-14964200000000001606570-1507490653202200060015074901488000000000001606570-  
02019-15661557490653202100060015574901488000000000001606570-16074906532023000600  
02020-1636160732000900000026000600009949014880000000000260171700060260006001681  
02021-17064100000000001606570-1717490653201401717000-046065880120028000990006029  
02022-1776000900171726000600008949014Q80440147600060330006000004901488M11000000  
02023-18460R9999999999-000000000000000000#-2302585093J0000000000000R9995-00R9950  
02024-1878-2302585093J000000000000000R9995-00R99500-OR950331-R5310180093147181M810  
02025-19480000061602028J299M310000001986490000003400044007013200000000036000440  
02026-20180702491299R0-79804125005000#--0000200000000000000000260212902069320212  
02027-2046--0000200000000000000000260212902069320212900004402118020693302129000  
02028-2116004100000000001606570-2129490653201402129000-0460303401200460249401100  
02029-21863302129000001601494-249426022301846410000000002602269000602600060022  
02030-225633410000000001606570-226949065320320005300000250236902262280009100060  
02031-23264302346022624906588032022620000025000920070029000910226946013760120025  
02032-239600099000912200052022614302462000833200084000001602753000N0490293402600  
02033-2466060000901602753000N1490294602602761000601601494-25181202129000-1460276  
02034-25362011001601494-1496420000000002602625025653202625000004402614025653302  
02035-260662500000410000000001606570-2625490653201102625000-0460303401200110006  
02036-27670000-04601376012002619929000601601494-2726491993002602761026251601494-  
02037-274630024100000000001606570-2761490653203200053000003202754000002300060027  
02038-2816614601376012004302910000841100093-000543029220008432000850000012000520  
02039-288600N1260006000092490294601100092--00051200052000N02600060000914602958014  
02040-29560021000520275330005300000460145201300490135601601494-1496261994900060  
02041-30264919950026000600184649014Q801400052000N8450308600060490657604606588011  
02042-3096004703130012001600052000-0490148802600891019531501127000001601494-3198  
02043-3166440092400060320089100000490092401601494-1496120005300N8149014080450325  
02044-323600006049065760160083100002800062000603300053-56801600052000-01601314-  
02045-330600631400062000-04901248000001603518R150-26033690333490338200000160351  
02046-33768N1500260336R000604703404004424403478041582604158040302604475035514703  
02047-34464660020015044750000R1604424-04051604121-336R3104761042334904122-4784R0  
02048-351650-R050--4226-3-3513-47280L900405004J3700405004#000000J603285-53744906  
02049-3564000000J603285-53744906588000004403626035921607597-57204906588044036580  
02050-363435901607597-51464906588047019540030048045546504200000045037100368R49  
02051-36824200000045037100368R49065760140368R000-04601496011001603285-5690490658  
02052-3752800000240368R037574603734011004200000J5035620000526035690379033040180  
02053-38220000160355400K37490403000000J60355400K4126035690385049040300000J50356  
02054-389220000J26035690388649040060000J5035620000J26035690392247039700002001503  
02055-39625620000R490400600000J503562000042603569039821603554000L93204018-350R16  
02056-403204564-40544404382041587104762040182604475035622604158035691604424-0405  
02057-4102160476100-00420000001604564-46461104157-0005260457600000J604615000L144  
02058-417204570045764405368041201604564-14964401496044664904406011041570--21204  
02059-4236-21204760000-146042860110046043180120026047600415P1104157000-526041570  
02060-4306415P490412201104157000-549041220470450203400340000009714904502044046  
02061-43766044661404424-04054604578012004404672044751600405000-#2504443044754904  
02062-443025044430447549044660000034-00-N0-J#23900405000002504491044754904338000  
02063-44652390040500000250449104475490433800000440452204466490454601400405000J44  
02064-453560196601200320476200000490466000004R00000#440467204475250460304475490  
02065-4578440467204475250460304475490463400000340000000102490466034000000095116  
02066-464804424-0405440412204761421604428000-01104424000-21404424-05674704672013  
02067-471800490446602604157038254404370041203204761-0000440149604466490438202603  
02068-4788825041574404816047624904122044044660446649041220000026020590483R260488  
02069-48587048391204886000-12602051-0000210205100700150073200009490504801600716-  
02070-49284940490071003202047000001302051000N02600090000951100090000-12100090000  
02071-4998902202051000922020570205126020510009234020460070136020460070036020460  
02072-506807014604920038004704920037001600716-51164900710026051340483R490483R016  
02073-513805267-51593304614000-04405244046151104157000-226053470415P440524404614  
02074-52081104157000-2440527604466260526704157440528804466260442F0000004905288026  
02075-52780415P0442M1104424000-21404424-06934603570011001205347000-1460519601100  
02076-534844056760461549041K2033045760000032045730000032045750000#31046150445544  
02077-540431046150445544066080446631000610187526000600412J4505472000604906576014  
02078-547404572000RR4606130012001404572000RM46059400110026054020005212054020000P  
02079-55444405568000601604617000K0160539200-031404572000RN4706382013003204616000  
02080-5614001605391000-02605347045742205347045761205347000-6460513601100260442M0  
02081-568446171104424000-21404424-06934603570011001205391000-1470588401300150005  
02082-575420000P33000530000004405828046192604617000533100053000541500062000004905  
02083-582467604405784046211105402000-14605784011001604617000P0490567604406070046  
02084-5894193304619000001604617000-326053910457649056760320005100000260442M00052  
02085-59641104424000-21404424-06934603570011003100051000531204574000-1470540012  
02086-603400424401376041211604121-3368490412204406038046183100059054011604574000  
02087-6104-3160442#000051104424000-216046190-0004406178000601604617000K03300600  
02088-617400004406222000#9310005300059160539200-23490633804406266000573100053000

02089-624457160539200-4L49063380260006500063160539200J03430633800053310005300054  
02090-63141205391000-14506290000562605347045741205347000-12205347053914905664026  
02091-638405391054024406418054021605391000-02605347045741205347000-2220534704576  
02092-6454220534705391470649801300320462100000490566401604576000-84905604-79591-  
02093-652409-5116445065520657-490657601106570000K14500000000601603285-3672310204  
02094-653245065520657-490657601106570000K14500000000601603285-367231020406051749  
02095-660204900031000400185931000580186016072330-0331404572000RJ4607442012002606  
02096-6672953067601404572000RR4606716012003206953000001607243-000016070370-04116  
02097-674206946-0050140442M110-3460737801200140442M000K0460725801200140442M000J0  
02098-6812460734601200140442M000M5460734601200140442M000P04706904011003206952000  
02099-688200320723200000490692804406964069524407422072321106946000-125000000442M  
02100-69521107035000-11104424000-21204574000-14606752011004407184069531406946-72  
02101-70224246035700110021070350694022070350457622070350723146070840140011070350  
02102-709200N04603570014004307140000511607035000-0490715204703570013002600050070  
02103-716235260006000058490722001406946-0060460357001100260006006940320005100000  
02104-723233000600000260412J000060424407326069521607037000K21606946-723915069520  
02105-7302000M440357006953490696401507233000024906964044069640695215070360000249  
02106-73720728201604576000-01406953000M1460357001200490729401107231000-149069640  
02107-74421604576000-622045760457431000510005326000600442M3300059000001104424000  
02108-7512-21204574000-14607466011001204576000-147072200110031000510005316000600  
02109-758200-033000590000049075380000045076300760R49065760110760R000-0420#000000  
0299900200 79929071005504900404#  
03001-040425044540040225044750040125044380040121040210018549180120000000000000000  
03002-04740000000000000000000000000000000000000000000000000000000000000000000000  
03003-05440000000000000000000000000000000000000000000000000000000000000000000000  
03004-0614031704174-002416-0405000-01100634000-244006280056226005630428937004050  
03005-0684051004900700000001400563000-047007560120016040090-0011600694-0788490080  
03006-0754001600694-0768720056304009490080001104009000-115046330000016038890-00-  
03007-08241400405000J44700880012001604473J299R1604240-4539490421001600903-054726  
03008-089400937000004300948009374300968009361200903000-2490089204500968009374900  
03009-096492801400903-04054700664013001100903000-2260090L00403450103600407490126  
03010-1034804401196046191400415000093304619000004601104011001604627-075849038540  
03011-11041404627-06181604627-06181604632-05864703854011001604627-06231604632-05  
03012-1174911602256-1902490186001601226-04031101226000-21401226000-0460120801200  
03013-12441400405000M34701300012001604627-06081604632-0576490395001400903-041946  
03014-131401344011001604627-07634903950014012200000947014480110015046330000J1602  
03015-1384256-15601601920-22381601932-1744260228501901160151000-9149022380160225  
03016-14546-146849013920140228N000M44701744012001602256-150426000910228M1015100  
03017-152400-221022850461743016160150849019140140228N000M64701744012002102285046  
03018-1594171602256-1504490191401601634-00923300000000001101634000-2430167201632  
03019-1664490162802404499000991604627-06131604632-058146038540120024045090009946  
03020-173401824012001601952-200216019320K4941602256-19021601920-19341601226-0417  
03021-1804260228501901490193401604627-06831604632-07261602256-23301601932-385416  
03022-187401952-219449017800-04160041721022850461745019340228N49000000140228N000  
03023-1944K44702002012001103888-00-144020940192916019520K11449019020140228N000K3  
03024-20144702114012004402058019291601932-2774490209401604627-06781604632-064616  
03025-208401932-38541601952-219449019020140228N000L34702194012001604627-06281604  
03026-2154632-05961601932-385444019020194949020940140228N000-4470223801200120388  
03027-22248000-149019020140228N000-04702330012001102285000-131000000000012022850  
03028-229400-1160090L000-01200903000-249019140140228N0-0M84701902012002602384022  
03029-2364801202384000-31400000000K14701902012001102384000-2140238#000P047019020  
03030-2434110025023390238M21002285046171202339000-1430245002339490190201401220000  
03031-2504M94702550012001604627-06331604632-0601490385401401220000#7470260601200  
03032-25741604627-07081604632-0676490385401401220000M24702774012001101226000J014  
03033-264401220000024602742011004602710012001604627-06481604632-0616490385401604  
03034-2714627-06431604632-0611490385401604627-06381604632-0606490385401401220000  
03035-2784M34703010012001101226000-21401220000M14702866012001604627-06541604632-  
03036-28540626490385401101226000-6140122000M64602978011004602546012001604627-06  
03037-2924631604632-0631490385401604627-06531604632-0621490385401604627-06681604  
03038-2994632-0636490385401401220000M54703290012001101226000-64503160201220160462  
03039-30647-06831604632-0651150415100014903854014012200000247032020150646031700  
03040-313412001604627-06881604632-0656490385401604627-06931604632-06614903854014  
03041-320401220000M74603258012001604627-07031604632-0671490385401604627-06981604  
03042-3274632-0666490385401401220000U24703414012001101226000-21401220000#5460338  
03043-33442012001604627-07481604632-0716490385401604627-07431604632-071149038540  
03044-34141401220000034703470012001604627-07531604632-0721490385401401220000-447  
03045-348403526012001604627-06731604632-0641490385401401220000M74703694012001101  
03046-3554226000-21401220000M94603662011004603630012001604627-07131604632-068149  
03047-36240385401604627-07181604632-0686490385401604627-07231604632-069149038540  
03048-36941401220000M94701324012001101226000-41401220000M94603830011004703798013  
03049-3764001604627-07331604632-0701490385401604627-07281604632-0696490385401604  
03050-3834627-07381604632-07061403888000-0460389001200320463100000260392000090312  
03051-390403920000-21400000000K34703950012003200900000002604622009031204622000-1  
03052-3974160090L000-031005480461816005760-0001404459M99984604198011001500022000  
03053-40440938044500702470409003600340445400701490404601704174-4046150002200009  
03054-41143604454007031704174-41141104459000-24900664000004904302000004704184019  
03055-41844243043220002L1604240-451146042540020034000000010239045630010049042660  
03056-4254390424-009004404290042374800-00000031044320446931000000439440000025  
03057-4324000220002L460434600600460435800700460437001600460438201700490417L00000  
03058-43943400044007013200000000003600044007024900764-07920016700604#-0000000020  
03059-4453-00000000200404#J299M-07980412500500#N659544163M441634123M44665900455  
03060-4469J299M-07980412500500#N659544163M441634123M4466590045595900624341550#M  
03061-4490N659544163M441634123M4466590045595900624341550#M556004555440043415944  
03062-4538N55600455544004341594400#0656595249554700626356594147450056654559465356  
03063-45620656595249554700626356594147450056654559465356660#K00000200000000000000  
03064-4612K0000200000000000000000000000000000000000000000000000000000000000000000  
0399900200 79600044005922500210004013400210007014900404#  
04001-058425008260040149180120-1234-3836-8710-8666J2394J4850-8742-8926-9082J5926  
04002-0654-9264-2534-J5858-2616-8590-9452-9380-9472-9540J5410-5694-5754-5754  
04003-0724-5734-5714-9572-9628J5366-3816-3572J48861600023-0299270088200881491668  
04004-0794800000000000-#0000000000-#J299M-07980312600400#455959000#0H84466590045  
04005-08080000000000-#J299M-07980312600400#455959000#0H8446659004559590044494147

04006-0820J299M-07980312600400#455959000#0M84466590045595900444941470#-036000440  
04007-0841455959000#0M84466590045595900444941470#-03600044007-347009040194243009  
04008-08510M84466590045595900444941470#-03600044007-347009040194243009620002L170  
04009-0880-03600044007-347009040194243009620002L1702578-085339008530010031000380  
04010-09500820490000025000220002L4600986006004600998016004601010017004900000027  
04011-1020008820088115J706500001101036-001014010361999547010300120015J783600000  
04012-10901101084-00101401084199964701078012002517826072462517056072462539995072  
04013-1160462517216072462517215072462517825072461601496000-031000380125326013810  
04014-1230057015000220000940002401274-00000000200404#27008940089371018740054971  
04015-12742700894008937101874005497101286005613200548000002602189005522602101005  
04016-134457260252100576310055K07233200557-00001100049000-226008050725614004050  
04017-141400M3460055P012001400405000-0470172601200440147404372490149804303572004  
04018-148414330196600-0043015980056344015461537844015660153433015340000033015660  
04019-155400049015780320156600000330161000000490055P04401622016101702132000K525  
04020-162400415072463100808004041500415000001400809000-0470174601200310080800810  
04021-1694450165800809260080507256490202201702132000J7490170601400809000P0460168  
04022-17642012001709936-08094401726099604401726099722607244099262600805099263207  
04023-183460200000170726219995440187407346490193001107285-0010330728N00000440191  
04024-1904807358490193001702132000-33201942000003207498000001707286J705644019860  
04025-19747346490202203201966000001201496000-14402054073704401546019664402110019  
04026-204442490154601207285-000124072440728N46019420120033019420000490194201702  
04027-2114132000-749015460003302166000002602143021314902190000260214302165320216  
04028-21846-00001102189-00012602220021891500000000001202222-000245022580222-4902  
04029-225421401202189-00011602300-05631602305-054726-0563-05471202300-0002120230  
04030-23245-00021402305-04034702294012004702378034003400000009713100404008413302  
04031-23941430000073004150214316004190-0347300571025213100572072333004050090032  
04032-24640116200000310040400420310218R07232600557021013200557-0000440256602166  
04033-253433153780000033086780000049034680420000000004702602034003400000097139  
04034-26040257P00900421602687000-11602670-04212609928072561602694-99201400000000  
04035-2674P04702756013-026000000267-1102670-00021102694-00021402694-993046027800  
04036-27441200490266401402694-99204702792012001702166000J03107235099191707262199  
04037-2814954402836073464902848044029520735831000590991926000990267045029720267-  
04038-28842709936000994402780099722607244099261707286J72164403016073464903028017  
04039-295402132000-949028480140267-000K14702780011001102670-00024902872012021320  
04040-302400J82600079099263207602000001707286J7826440326007346140993N000L3470278  
04041-30940012001109935-000227099360993544027800997244032040996045033040993N1402  
04042-3164687000-247027800130046033960120049034080260724409926320760200000320751  
04043-32340000001707286J7826490314801207285-0001330728N0000044030761613849027800  
04044-3304140993N000K34702780012001102687000-11402687000-44602780012001109935-00  
04045-33740245031120993N49027800260009907256320117400000331537800000440346801966  
04046-34441702132000-83301174000004403492015661702132000L93301186000003302166000  
04047-351400440353604372490123404403560012861702132000-54403628018741702132000-2  
04048-35843304372000003301874000003301286000-049058260440367601966130149600-1011  
04049-365400099J7216250009R072464401234011743301174000001607400-8290260724400079  
04050-37243207602000001707286J72163107235000593207602000001707286J70561101496000  
04051-3794-11607400-7974490123401609935-0425490576601603619000-02400805072564703  
04052-3864884012001702132000K93301286000001603938-04171604123-04181604118-041614  
04053-393400417000-04604112012001403930000K44604248012001403930000-4460426801200  
04054-40041403930000K84604144012001103938-00021104118-00021104123-00024503932039  
04055-40743Q1203938-00024504288039301702166000K831004160041849040640110457400-01  
04056-4144270442003938110457400-011304574000-22103930000992104118000992104123000  
04057-421499240393800552460410001100490406401103619000-1490402801203619000-14904  
04058-428402801403619000-04604324012003201286000001403930000-4460438401200140393  
04059-43540000K34704100012003204372000004404614086781609935-04174904662000001204  
04060-4424419-0002160457400-001604486-4574140441R000P047045640130025045740441R12  
04061-449404419-00021404419-04174704564013001204486-00011404486-4571470445601200  
04062-4564320457200000140457400-624710518011001702166000KR421609935-0429140993N0  
04063-463400K46704100012001109935-0002330483000000140993N000-4460557401200140993  
04064-4704N000K1460486201200140993N000K3460521001200140993N000K04604100012001409  
04065-477493N000K1460465001200140993N000P0470488201300320463000-001109935-000211  
04066-484404828-0001490479401109935-0002490554201404828000-347049180130017021320  
04067-491400M115048280000140993N000K8460510601200140993N000K6460524201200140993  
04068-4984N000M9460560601200140993N000K5460524201200140993N000074605662012001409  
04069-505493N000M1160540201200140993N000K447041000120049046500440460004830270442  
04070-51240099351104574000-11304574000-221099350009945051860993N49046000140993N0  
04071-519400K34704662012001109935-000245046620993N490253401109935-00022709936099  
04072-526435440410009960440529809972490410001209935-0002140993N000-3460410001200  
04073-53341109935-0002140993N000K34705494012001109935-000245047460993N4902534011  
04074-540409935-0004140993N000P04604600013001209935-0002140993N000P5460460001100  
04075-54741109935-000249053460140993N000K1460465001200140993N000-447046000120014  
04076-55440993N000K3470466201200490521001109935-000245055420993N490253401109935-  
04077-56140002270993609935440410009960440410009972490534601109935-00024404100048  
04078-56843049053460451488600427490253401609935-0429490577801609935-042549057780  
04079-57541609935-04273205766000003205778000001606317000-045059340993N1702166000  
04080-5824K144058460437249025340330577800000330576600001406317000-0470253401200  
04081-5894330128600000490253401702132000K349061180440601408678140993N000K4470616  
04082-59642012001106317000-11109935-000245059460993N49058140140993N000P047059140  
04083-603413002709936099354405914099604405914099721716582-608645061180993N440581  
04084-610440577849058260140993N000K34606482012001702132000K64905982070993609935  
04085-6174440655809960490581402607244099264406230100201109935-000245062500993N49  
04086-6244062740140993N000L34606670012004406294100204906430044063740576632076020  
04087-631400-0320751000001707286J7826440630161141702132000L1490643003207602000  
04088-6384001707286J78264406418161144906354044064500734645065260993N490582601207  
04089-6454285-0001330728N00000490643001109935-000245059460993N320437200000490582  
04090-652460140993N000K3460648201200490581404406194100561702132000M140993N000-4  
04091-65944606638012001109935-000245065820993N490582601109935-000245065260993N49  
04092-66640582601406317000-14706818012003207602000001707286J78264406762073461707  
04093-6734286J7216440679407346490680601207285-0001330728N00000490673001702132000  
04094-6804J84406838100201702166000K8490582604406818099721606961000-01109935-0002  
04095-68742709936099354406906100204906818044068180997244069380996049069860260724  
04096-69444099263207602000003207510000001707286J78261106961000-145070500993N4906  
04097-701481801109935-000245068740993N49065060140993N000K34607018012001406961000  
04098-7084-24707122013001406961000-34707134011001702132000K8140993N000-446071900

04099-7154120049068180140993N000-44706526012001206317000-11109935-00024507166099  
04100-72243N4905826-#-0000000000#-00000000000002607285072613207274000001607304-  
04101-7235-0000000000#-00000000000002607285072613207274000001607304-7237330000000001107304  
04102-7246#-00000000000002607285072613207274000001607304-7237330000000001107304  
04103-7247-00000000000002607285072613207274000001607304-7237330000000001107304  
04104-7317-00021407304-724547072980120032073460000033073580000033073700000033161  
04105-7387140000045079740728N440785407602440748607346490755404407486161381207285  
04106-7457-0002320728N000001107285-000233076020000033074980000033075100000033161  
04107-75273800000330727400000420000004407578072741207285-00181107285-00094507610  
04108-75970728N490848204407774072741107285-0009330723500000260728N072441207285-0  
04109-7667011330728N000001107285-0002320728N000001107285-00093307235000004407846  
04110-773707510320728N000001207285-0010490748601107285-0001260728N07245440743807  
04111-78075101207285-0001320728N000001107285-00014907486044074860749844078860734  
04112-78776490748602607960072851207960-001045079540728N250796-072463207370000004  
04113-7947907486031000000728N490748604407998072741207285-00091107285-00012407236  
04114-80170728N4708334012001107285-000744082180728N330728N000001107285-000124072  
04115-8087440728N4708174012001207285-0001320728N000001107285-0002330734600000321  
04116-8157611400000490740601207285-0001320728N000001107285-0002490739401107285-0  
04117-822700144083780728N330728N0000024072440728N320728N000004608402012004408314  
04118-8297072741207285-00111107285-0001490739404408358072741207285-00111107285-0  
04119-83670094907394072440728N47082900120033073460000044084380728N32073580000  
04120-843704408462072741207285-00111107285-0001490740604407486026523302652000001  
04121-8507602131000L21502567000091602572-855049021320150256700002490748608634-0P  
04122-85779380020J2394#310125300038310003808569150002200009490000002700882008813  
04123-85903101253000383100038085691500022000094900000027008820088131000380125349  
04124-86601303401609935-041732086780000033043720000049058020330437200000032086780  
04125-8730000049038840330156600000450877400437490253401400437000M546025340120014  
04126-880000437000M64602534012001702166000J949025340000045088700993N1702166000J5  
04127-887027099360993545088580993N440885809960440885809972490884N024099160725647  
04128-894009602012001609935-04411708846-8974260991609926260724409926170726219995  
04129-90104409042073461702132000-449025340440253407358490902201702132000-1490253  
04130-9080403301566000002409262072564709062012001609935-04451708846-914226072440  
04131-91509926260926209926320760200000170726219995440921007346490253401107285-00  
04132-922010330728N000004409888073584902534-00000000003209264000001609935-043917  
04133-929008846-9300260724409926320760200000320751000000170726219995441536609540  
04134-936033095400000049025340320161000001609935-04371708846-941624099160992647  
04135-9430090620120026099160725633015660000490253401609935-04411708846-94962409  
04136-9500262099264709062012002609926207256490945201609935-0449320954000000490928  
04137-9570801609935-04291708846-959624092620992647090620120049025340330156600000  
04138-9640260991607256320161000000440902209264450969600431490885801609935-043127  
04139-97100993609935440885809960440885809972260724409926320760200000170726219995  
04140-978044098440734645098120993N490253401109935-000245097080993N49025340110728  
04141-98505-0010330728N0000044098880735849097201702132000-34909792-0000000000-00  
04142-920000000000#-00002609928072561609971000-13309960000-03309972000-033098  
04143-9930-000002609928072561609971000-13309960000-03309972000-03309984000-03309  
04144J0000996000003310678000003310020000033122580000033100440000033100560000045  
04145J0070101000993N1602165000J249021660140993N000P0461026001300140993N000-34610  
04146J014024801200140993N000M5461027201100140993N000M9461022801300140993N000L447  
04147J0210100800110049102720320997200000491027203209984000003209960000001610290  
04148J0280991826000000993N1109935-000245106060993N441034009960491036401409971000  
04149J0350-64610080013001409971000-146105860120044104320996044104200998449104320  
04150J04203209972000001610450-99193300000000001110450-00021410450-99294710444012  
04151J0490000441050609960424410520106784232105200000491201803310520000044105660  
04152J05607346421602165000M04902166044103880998449107220140993N000L3461089801100  
04153J0630140993N000-3461071001200140993N000K44710786012003210678000004411066099  
04154J070060491072204410742099841602165000J1490216603209984000004410080099604410  
04155J07709981004449102960140993N000J0461086601200140993N000K0461086601200140993  
04156J08400N000J34710320012004910080044103200999633099960000049107660140993N000P0  
04157J0910461076601300441099809960140993N000M54710722012004410978099964910722032  
04158J09800999600000491076601109971000-11409971000-64612362011001110290-00022610  
04159J105029-0993N491029601607285J7826250992707246310723509917150754700009160755  
04160J11202J1994490728601611940J120249112260441227816114321002000000321117800000  
04161J11901609983000-04410320111783311226000001609995000-02607244072561611456-72  
04162J1260363311286000001109935-000245113180993N1602165000J349021660140993N000P0  
04163J1330461138601300140993N000L3471157401100441145011286491129601409995000-046  
04164J14001143001200441145011286491147403211286000004911474026000000993N1111456-  
04165J14700002110995000-14411530112861409995000-4461129801100491155401409995000  
04166J1540-546112980110033112260000049112740140993N000K3461175001200140993N000-0  
04167J1610461173801200140993N000J0461167001200140993N000K04711298012001109935-04  
04168J168002140993N000P04711298013001209935-00024411942112264911298033117800000  
04169J17501109983000-11409983000-2461197401100441180611286491193401407236000M546  
04170J182011298011001407236000M94711298013001507547000091607552J1922320760200000  
04171J18903207510000001607285J78264907286015075470000249112020321122600000161194  
04172J19600J1134491178601602165000J649021660150754700002441115407346260724409926  
04173J20301612060-72431612072-724432-72430000014-7244000-04712122012001212072-00  
04174J2100021212060-000249120540141207K000M6471215801200161207K000-0150754700009  
04175J21701607552J22021607285J66764907286015075470000244122341052049105400441234  
04176J224020734644122781596232122580000491038801602131000K71602572J23215025670  
04177J23100009490213201502567000024911166032100560000049103880441008009960321004  
04178J23804000004910296033124420-0-01400417000P04712442013001702166000L-14004170  
04179J245000M14712430013001709936-04174412622100561702132000M032124M200000321251  
04180J25204000004412862125141109935-00022709936099354412582099604912502044126021  
04181J2590005649125020441264210020491250204412738100204912526045126660993N170216  
04182J26606000L-140993N000K3461275001200140993N000-44612726012001702166000L-1109  
04183J2730935-00023312514000002607244099263207602000001707286J782644128101611417  
04184J280002132000L1441283007346491252601207285-0001330728N000004912526044128861  
04185J287000201109935-0002140993N000L34712430012001613840J2430331292200000321293  
04186J29404000003312946000053312526000001612525-00001612957-00003312521000003312  
04187J3010953000001612405000-01613309J25261109935-00021613236J295845130860993N49  
04188J3080124300140993N000M0461325001100140993N000-3461325001200140993N000J04613  
04189J315004201200140993N000K0461304201200140993N000K44712430012004413042129222  
04190J32201323612405110000000-1491304202709936099354413318129464413362129344414  
04191J3290086099724414098000004911100321294600000441411009972321252600000491411

04192J3360003212934000004413418099721213309-0001321330R000004914110044134421330R  
04193J34301702132000L31213309-0001491411004413506100201109935-000244135061244249  
04194J3500125020441352609960491361802607244099263207602000003207510000001707286J  
04195J35707826441359410020491361804413618161141702132000L12213236124054513650099  
04196J36403N49025340441372212922431372132301113309-00011212405000-1461380201200  
04197J37101113236-0001140993N000-44713822012003213782000004413782129221213230000  
04198J3780-11109935-00024913630033129220000049137220140993N000K4612430011004413  
04199J38508821378233137820000461243001200140993N000J4461396201200140993N000K346  
04200J39201243001200140993N000-3461243001200491304201109935-000245139940993N4912  
04201J39904300140993N000J4471305401200321292200000331293400000112405000-1141240  
04202J40605000-54612430011004913042044141101330R1702132000L344134621005616124030  
04203J413000-11614176J36183212514000001109935-000244136181251445142020993N491243  
04204J420000140993N000K44714246012001112403000-149141580140993N000K0461415801200  
04205J4270140993N000J04614158012002709936099354414326129224914350044143820997244  
04206J4340143941330R3312922000004414414100564914146044143501330R1702132000L34914  
04207J441035000414458100201109935-00024414458124424912502045144780993N4912430014  
04208J44800993N000K3461468601200140993N000-4461480601200140993N000K4461243001300  
04209J4550140993N000-3461243001200140993N000J44714686012001109935-00024514630099  
04210J46203N49124300140993N000J4471467401200321292200000491468601209935-00024414  
04211J469070609960491415802607244099263207602000003207510000001707286J7826441477  
04212J4760410020491415804414158161141702132000L1491415801212403000-1471442601200  
04213J4830331251400000491468601615261000-01609935-042545149060993N1702166000K-49  
04214J4900012340140993N000-44715042012001109935-000245149620993N49148860140993N0  
04215J497000P0461534201300140993N000M34714874012003201534000001109935-0002491529  
04216J5040401109935-000249148740140993N000M34715118012003201534000001109935-0002  
04217J5110491519002709936099354415354099604415354099721409971000-446153540110017  
04218J518016582J519045152700993N1415261000-24715354013001613840J53661609935-0421  
04219J52503312442000-0491292201415261000-2461535401300140993N000K347153540120011  
04220J532015261000-11109935-000245150620993N1702166000L63215378000004402546001966  
04221J53901702166000-8490254601609935-042545154660993N1702166000-633154340000049  
04222J5460153660140993N000K44715514012003215434000001109935-00022709936099354415  
04223J5530434099604415434099721409971000-44615434011001716582J558644158381543445  
04224J5600156180993N49154340140993N000K3461550201200140993N000-44715434012003315  
04225J5670434000001109935-000245157100993N49154340140993N000K3471543401200110993  
04226J57405-00022709936099354415434099724415790099604915434026072440992632076020  
04227J581000003207510000001707286J782645154340993N491544601400419000N64602780012  
04228J5880001609935-04351615917000-03215906000-0491596201609935-0429441609401186  
04229J595032159500000032159620000045160060993N1702132000L749163020140993N000K447  
04230J60201605001200491598601109935-00022709936099354416546100561702132000M04916  
04231J609018601702132000K2491596202607244099263207602000007116138122581707286J78  
04232J6160264416558073464416370106783216186000001109935-000249159740441611416186  
04233J62304416290099604416290099721115917000-11415917000-24716390011001702166000  
04234J6300J433159060000033161860000033159620000044034921595033159500000049035040  
04235J63704416390159064915986045164100993N49163020140993N000-4471648201200441598  
04236J64406161861615917000-03316186000001109935-000245165020993N49163020140993N0  
04237J651000K34715986012001109935-0002491597404416218100201702132000L84916302-00  
04238J6580002607244099263207602000003207510000001707262L9995240724400805471658J0  
04239J665012001702132000J6491658J00027008820088147169320020025012590040225169170  
04240J67200401250857500401250106100400250110900400250115200400250184900400250281  
04241J67901004002516625004002509005004002509185004002509343004002509775004003201  
04242J686018600000320265200000310003816911150002200009490000001018-0P9582005J667  
04243J69304\*1602355000M11602367000M11502459000041600919000M149167000000000000000  
04244J69321602355000M11602367000M11502459000041600919000M14916700\*0000000000000000  
0499900200 79200L67006042500210004013400210007014900584\*  
05001J239400000026-0413072561112406-00101412406-05734712400013001612406-04133100  
05002J24645640723344125401333433124840000026004171348932011620000049129400321248  
05003J25344000001112399-00092609926123984412744099264412848130084412788127642600  
05004J2604425134753201162000004912940026-0563072561212638-00101412638-0403471263  
05005J26742012001612638-0563441276413344412528124844912848044125400727494125520  
05006J27444412788130084912848044128481276433127640000033099260000026130310992611  
05007J281413031-00201413031-05734612940012004412880072741212399-0010491289201112  
05008J2884399-000145127241239R1413031-04134613008012001612994J29561613031-041347  
05009J29541297603400340000000971390040500900491263201612994J26323315008000003307  
05010J3024274-04134225134390040125131730040025132290040047134940020014004170005  
05011J3094471353801200J4-0419000554715538012004513538004234413166019661702132000  
05012J3164-8451318639995491323403212764000003213008000003207274000001712400L596  
05013J32344513254178264913314032130080000032127640000026134691349333134660000017  
05014J330412400J7826451333417056491335803213334000001712400J70563100038134331600  
05015J3374068-029926005700138144134140116249000000320003900000490000000760-0P840  
05016J34440160005720455444546005341425362N657455500445602541612953000M115129850  
05017J34540455444546005341425362N657455500445602541612953000M1151298500004161296  
05018J35245000M1491308201609935-04253213550000001109935-000245136180993N44136541  
05019J359435501601596J3082490123404413926135502709936099354413674099601702132000  
05020J3664L549135980711367409972441381810678441371810056491422604414316112861109  
05021J3734935-000233135500000049149000140993N000K14713654012001109935-0002451361  
05022J380480993N491358602607244099261707286J782644138621611449142460441388207346  
05023J3874491374201207285-0001330728N000001107285-000149137420261397609935111397  
05024J39446-000245139701397049136540140000000M8471411001200140993N000P546142660  
05025J401411001614089000-025140890993N114089000-2131408900-02210993500099321355  
05026J40840000-045137620993N49136540140993N000J0461365401200140993N000K047141700  
05027J415412001109935-0002270993609935441365409960441428609972441429813674491407  
05028J4224801702132000M0491359801702132000L1491359801702132000L44913598044140781  
05029J429436741702132000L3491359801702132000K44913730\*0000000000000000000000000000  
0599900200 79380020123944918000\*  
06001-0404250657800401491801201600069-029927004560045549006L20360004400703470047  
06002-047480194240505560006R3400000001023906465001004905726034000000010239065010  
06003-0544010049057260250006R4600580006004600592016004600604017004900000008  
06004-061432-0N9998-02-6132\*3205970000002500658004002639999060193201228000002500  
06005-0632205970000002500658004002639999060193201228000002500617004022500639004  
06006-0702001100640000J02603477006431200643000-526034890064326034530064312006430  
06007-077200-52603465006433100038006111500068000091100049000-2490002402700456004  
06008-084255440524062343200800000001406133000M347009520120044008000122833012280  
06009-091200003106276061141705786-09401705786-08003301229000001406143000-0460100

06010-09820012003201229000001106280-5729160628-000-#1601047-61334301088000004501  
06011-10241601047-6133430108800000450106806133490080001101047000-249010360120104  
06012-10947000-131061320104P1406133000M44701228012001703982000-44401168061404901  
06013-116421602406141063554701216012001704018000-44902072000001704018000-4440129  
06014-1234612294400800013443106132061341406133000P04601252013004901848014061330  
06015-130400P04701504013001506451000011703196-13441406133000-0470138001200310613  
06016-13742061341406133000M64701504012001703982000-54401436061424901492024061430  
06017-144463454701492012001704018000-5330134400000490080001704018000-53201344000  
06018-1514001606446-613320161600000450156006440490229201406440000K4470161601200  
06019-15843301616000001106446000-2490154004401652016161406440000K346016960120014  
06020-165406440000L3470159601200440414201616490239601406133000M44700800013001406  
06021-1724133000N94601812012001406133000024603064012001506451000001703196-179215  
06022-17940181100000490184801506451000001703196-18361501811000012506451018111703  
06023-1864526-1872450189206133490080001406133000K3460186001200470193601300490186  
06024-1934001606446-61351106446000-24502004064401406446-613746018480110049008000  
06025-20041406440000M14601948013001406440000L34701848012001506451000014901860015  
06026-207406451000013106132061421703526-21081406133000K1470227201200440216402072  
06027-214330207200000490209603202072000001406137000M84702272012001206135000P021  
06028-221406135061351106135000-31602271-6133210227106135310613200000310613206134  
06029-2284490210801406133000M547025240160646026880110045023480613949047740140613  
06030-23549000034600800012001506451000001703196-08001406133000M44704142012001106  
06031-2424446000-2450245206440490414201406440000K44604142012001406440000K3470242  
06032-24940012001506451000001703196-41421406133000M34702580012001406135000N64600  
06033-256480001200490237204600800011001406133000M1460237201200140614300003460080  
06034-26340012001406143000N74702372012001506451000011703196-08001406133000M94603  
06035-2704088011004602820012001406141000K44702372012001506451000001703196-277214  
06036-277406133000-44702760012001506451000001703526-08003106132061361606448000-0  
06037-28441606446-61331406440000K44702892012001106448000-11406440000-44702940012  
06038-2914001206448000-14602960012001106446000-2490285602606440010231106446000-1  
06039-29842603039064461603568-3016490416601603568-080031061320613415064510000017  
06040-305403196-30521506451000011703196-30521406133000N94602372012001406133000N7  
06041-3124460237201200140613300003460237201200140613300002460306401200490080000  
06042-319400450321606133490080001406133000P046032700130031061320613449031960-000  
06043-32640000001603356032002603269059792606461059794503326061334903394014061330  
06044-333400P04703394013002503260061331103356000-131061320613449033060320620000  
06045-3404002606462033503206458-00003306461-00003306460L89853306459L89803306457L  
06046-347490001604201-0000260422103453260418903195490419000000260418903525260646  
06047-3544105979450357006133490080001406133000M14603750013001406133000-331061320  
06048-36146134470355001200450365006133490356001406133000P04603718013001406133000  
06049-3684M547037740120031061320613649035500310613206134450363006133490356201406  
06050-3754133000P0470379401300310613206134490355001603812-6453260000006133120381  
06051-38242000-1330381K000001103812000-33106132061344503886061334903934014061330  
06052-389400M14603806013001406133000-0460385401200320645200000260420103453260422  
06053-39641034654904190000001604043000L32604017039814904030000001604043000L21604  
06054-4034048-61344100000000001104048000-14504104040401204048000-132040400000042  
06055-41041104048000-11204017000-1460404201100421506451000011703526-416615064510  
06056-41740000490415400000440421000000490425401404201-00004604354012001204201000  
06057-4244-5490419001104201000-9240420J064614604374012004704334013001606450000J5  
06058-43141604632-463449044100120420100J4490419001204201000-1490430201604632-46  
06059-4384821606450000-51204201-001025040530420J250420J010231104201000-124042010  
06060-445434654604602012002604560034652204560064501404560-6771460455401100150474  
06061-45243000017306151063041705786-455431000000346N2404201034534704602013002203  
06062-4594453064502203465064501204201000-149000000260420J064611204201000-9320420  
06063-4664J000001204201000-1260420J063041204201000-4250420J064511204201000-12504  
06064-473420J04053490418R00000025047430000949047980320122800000260481603465120481  
06065-48046000-12600000059843106132059703106132063561705786-48581203477000-54904  
06066-487497401203477000-51705786-49021605251000K61604985-34651605725-5726170573  
06067-49446-49503106132066801705786-49742403477034534705694011001203477000J04405  
06068-50145060347P1606448000J21605656-618144051900487826034770520133048780000016  
06069-508405560-5114150556700049490550601605560-5134490499801705786-514616061730  
06070-515400J41605560-55781103477000-4490562603204878000001705786-52141605560-49  
06071-5224981505567000411103477000-973061610347P1606173-00001605297-614143053460  
06072-52940000160529P000-01105297000-21405297-6161470528601200260538103477120538  
06073-53641000J443054580000024053810498N4705482011001205381000J044054380538J4905  
06074-543448201105381000-5490537001105381000-473061390538J1203477000J92605201034  
06075-5504771103477000J024034770498N4705694011001203477000-543404980347P410498N4  
06076-557400001103477000-41206448000-14705650012001705786-56261606448000J1160565  
06077-56446-618173000000347P1105656000J01203477000-44904998044057140487849050220  
06078-57141705786-48781705786-57383106132065941705786-57623100038065724900000000  
06079-578400460581800200390613300400490595004705842034003400000009711605865-6290  
06080-58544305914000001405865-61324605914012001205865000-24905854000001105865000  
06081-5924-3250586N0102339061330090310613205970490578N0-000000000000000000000000  
06082-59940000000000000000000000000000000000000000000000000000000000000000000000  
06083-6064000000-0000000000000000000000000000000000000000000000000000000000000  
06084-61320000000000000000000000000000000000000000000000000000000000000000000000  
06085-62020000000000000000000000000000000000000000000000000000000000000000000000  
06086-62720000000000000000000000000000000000000000000000000000000000000000000000  
06087-6334M656595441634123M34159440055560320005341424553005556032059454645  
06088-6404594554435004341594400556454424559620#000000000000000000000000000000000000  
06089-64420000000000000000000000000000000000000000000000000000000000000000000000  
06090-6500N556004955444567230014485653440062485664534400465653535666001443564445  
06091-65700#J299M007980012900100#0-0140056634845590043415944620066448455945006541  
06092-6572J299M007980012900100#0-014005663484559004341594462006644845594500654159  
06093-65930-014005663484559004341594462006644845594500654159494142534562004159450  
06094-6663044456464955440#M3415944005560320006541590300554154452059454645594555  
06095-6680M34159440055603200065415903005541544520594546455945554345004341594400  
06096-6750556454424559620#000000000000000000000000000000000000000000000000000000  
0699900200 79125075004242500210004013400210007014900404#  
07001-04042505552004014918012000000000000000000000000000000000000000000000000000  
07002-04740000000000000000000000000000000000000000000000000000000000000000000000  
07003-05440000000000000000000000000000000000000000000000000000000000000000000000  
07004-0614732-9022-6874-6274-6142-9054-8536-8950-8516-6934-5836-5568-7190-6036-9  
07005-0684570-9550-9518-9466-5848-6954-6068-9498-89620N665455953415700-000000000

07006-07540000001600070-029936000440070347158980190043008160007-4905134025000690  
07007-0824007-460084000600460085201600460086401700490000000000151591800000260090  
07008-0894607868260000078511200906000J04500900159181515918000002608890009061107  
07009-0964719000-11605085000-11407856R999947010560110044010560104426007610172317  
07010-103405332-07291301044000002605258066611604586-78841604776-83321107733000-2  
07011-11041505132000093607728007024701160036003407728007014901104036077280070317  
07012-117405110-1116730075507856110090800L56260133000908460125200200390074500400  
07013-1244490130001605237-074573009110093226009130172327052880528733009170000032  
07014-131400918000003100900Q17201400918-0580460091Q012001400918-059J460091Q01200  
07015-138443014160076131007600076249013840440091Q009191702486-144026014620277844  
07016-1454015200000515052570000P260654302778260657307856260656702778490091Q02601  
07017-1524537027782600040785649009JQ01601607-767849015Q401601607-76983100000066  
07018-1594663100060000002601638016071101638000J11600000-006043017000007243017000  
07019-166400731602133000J2310000000604902134044016680007233000730L0-#1300073000  
07020-17241300073000J51601771-83332201771000993100081000002600047000714401808021  
07021-1794422600047000664501936000902600059000893100000000362600006078561100006-  
07022-186400354401892021421200006000-52600018000061200018000-11602133000L6490213  
07023-193440440195600094490182001602133000P2210004207856210005407856260000600094  
07024-20042600011000842600035000894402064021421200042000-51200054000-54402134000  
07025-2074351200042-00121200054-001231000240003616021330000049021340003302134000  
07026-21440026021670213349021920003202134000002500012017231202167000-14602218013  
07027-221400421402284-784246023340130044022780213425000000787231078720787325-774  
07028-228420000310000000001107856000-1102284000-1490219201407719P91254607600-110  
07029-23541300150513200009380771400702470241403600340771400701490237003607714007  
07030-2424031605109-23704605122019001107719000-11602284-774249022420000016083390  
07031-2494-0001602528-83391102528000-1250834000761310076000762450256600761490261  
07032-2564401400761000-046025340120014007610000946025100110026026370252826083430  
07033-263400003208340000001602919-8350440268802484421602919-83512603123-24852602  
07034-270482707862260277807861490276801202826000-11202778000-1330291R00000260835  
07035-27743000094402828083492602826083521508349000004902732R99994502908083534507  
07036-28444820835226028690277826000090834326009950282743090860525549050300440273  
07037-29142000002408353083434702732012003108345046092402779078684705006011002503  
07038-2984002028264303016002001102826000-11603070-752926030630282632030620000011  
07039-305403070-0000150752900001150282700001600761000M61603123J3358490504200000  
07040-31241400761000-31503159000004603536012001400761000P04603536013001400761000  
07041-3194H8460321601100490325201400761000N54603252011001503159000021603282-8335  
07042-3264260834406663260835007613100760007621103282000-21400761000M04604276013  
07043-3334003308342000003308340000003308338000003308336000001602919-834444027000  
07044-34043320310331203428490351201400761000M046042760130#1503159000022608333066  
07045-34521503159000022608333066542603490037622608344000003208334000003208343000  
07046-3522004903384000002608343066541603535-38881603762-83341400761000P047038040  
07047-35921200310076000762490357201400761000M84703708012002503693083343103312036  
07048-3662843100760007624903252012036930-0-146032760110#140076100009470345201100  
07049-37081400761000094703452011001403762-83434603768011002500000007613100760007  
07050-3778621103762-0001J108333000-11400761000-347036160120026039900376214083330  
07051-384800N14603876012001603535-39962603930035351208333000-1310076000762140076  
07052-39181000P06400000012004704016011001603930-39961403990-83434603996011002500  
07053-3988000007611103990-0001490390001400761000H5470420801200260420603602140076  
07054-40583000K04704100013004704112012001504197000023100760007622504207007633100  
07055-41287600076414007610000947041960110022042060420725042070076131007600076211  
07056-419808333-000026083430834115031590000032083430000043035240#3361608335000-0  
07057-4268490352401403282-834547032760120049118400150525400002310459904608260460  
07058-433800328271104602000-12604390027781204390000-12600004000041704794-44043100  
07059-4408005052642204602049971400761000K346046180120044047100000931007600076215  
07060-447805254000002504606031594305074052561104586000J8240458604776470456801100  
07061-4548260539305381491074201204586000-9310000004599490312L000000000-00000000#0  
07062-461701704794-4630310001005264230000404997320009600000220460200009210460200  
07063-4687004440471000014490445201105085000-12604605050851305085000J51604776-833  
07064-4757322047760009931000000001490446400001504987000031605268-000-16049970-  
07065-48270003100760007621400761000094604962011001703252000-22605268028271400761  
07066-4897000J04604950012001400761000K047049980120015049870000231007600076217024  
07067-496786000-026049970834330499700000490479L01400761000K4460430R012424305028  
07068-503705254310459904608260460302827490448803204606000-0150525600000490451200  
07069-51070004705120019424305166002991705238-548148000H9092904907642025051320513  
07070-5177L460519000600460520200700460521401600460522601700490510R000000460528800  
07071-52472003400000001023400000#0102390523P00100H2390523P0090047053240340034000  
07072-52700102390523P00100H2390523P00900470532403400340000000971420000026052370  
07073-53405331460528800200390523P004002H.95653496263H656595441630063565600535655  
07074-5410470#-0-0-0-0U208N4-003M1M2-0H6U4N3M3-#N556005956565400565500464953450#  
07075-5414-0-0-0-0U208N4-003M1M2-0H6U4N3M3-#N556005956565400565500464953450#0444  
07076-5448N556005956565400565500464953450#H84466590045595900435654570#3400044007  
07077-5480H84466590045595900435654570#340004400701320000000000360004400702491299  
07078-5508340004400701320000000000360004400702491299H0-P980412500500#01705640-55  
07079-556701705640-55803100000067692600005028262100011078561702134000J2490627400  
07080-56370003100760007621400761000094705640011001702486-56882605717027781205717  
07081-5707000-12600009083434900563R01705640-5744310000006728210000502826170213400  
07082-57770J62605797027782600004078562100006078562600010028264905616032058480000  
07083-584701705640-58603100000067362605894027782100006000041702134000-8440097205  
07084-59178483305848000002605949057172600004078564900972-681703690-003-170375800  
07085-5987-001300009000-41100099-0067K6000650009R4900000-#01607689-0000260768506  
07086-603501607689-0000260768506135490625003100760007682607685061351702486000-04  
07087-6105906238047-002400200-00#J703594-00-0-#3100760007741607679000L4170248600  
07088-6128J703594-00-0-#3100760007741607679000L41702486000-014083430-90047062380  
07089-61423100760007741607679000L41702486000-014083430-9004706238013003107698061  
07090-62121210770407856270157201571260768908343310769007840727015520155144009720  
07091-628252573100000065821208890-0020260633308890310006400000260635206333150000  
07092-635200000#1106352-00102606388063522600000078511106388-00102606424063882600  
07093-63581106352-00102606388063522600000078511106388-0010260642406388260000078  
07094-6428512600011008326000180006826000230008326000420006826000350007826000470  
07095-64980078260005400073170213400000411014600001100005000-1470628601300160000  
07096-65684-000049009720JP0761000000KJ-000000000JP0761000000K4000000000H7000000  
07097-66381100#N10000000000-00000000J013-0000-000032000960000021-0099-000016-007  
07098-6643N10000000000-00000000J013-0000-000032000960000021-0099-000016-0071-000



O



201072596439N4041950027M6364760900L8050637711K9145679448J973#1-1-5756-5816 -0709  
 9555985-9966865249-0000000000# 1-1-5816-5845 -0710  
 0500705031#  
 \$DRH 0127012800030004  
 M505024198294906576000002800060198291400052000N0470137601100#0-1-5000-5060 -0711  
 1400052000N8460146401300J605114-0003K10511400052310000001869#0-1-5060-5120 -0712  
 490146400000# 0-1-5120-5132 -0713  
 0500705031#  
 \$NPR 0188020800050006  
 MM0510805023L3050230000-M505048198094906576000001319809000-5#0-1-5000-5060 -0714  
 M305084000991119809000-1K60520619809L3052020000KL0519605206#0-1-5060-5120 -0715  
 320009000000K605206000992600060000941600055-0000330005600000#0-1-5120-5180 -0716  
 490148800000# 0-1-5180-5192 -0717  
 Q212890627-0000000000# 1-1-5187-5207 -0718  
 05031050500507405091#  
 \$MOVE 0974099400180019  
 M50502419789490657600000MM05108-5031L30503100000K10522700879#0-1-5000-5060 -0719  
 K10529900879K10538300879K10544300879K10563500879MN051320522P#0-1-5060-5120 -0720  
 490657600000MN051560538L490657600000M5051800087R490657600000#0-1-5120-5180 -0721  
 MN052040529R490657600000K00597305993K205973-002-M70528801100#0-1-5180-5240 -0722  
 M90526400000J6059770M449100328505974490658800000K105973-003-#0-1-5240-5300 -0723  
 M70526401100K3059730087RM705264011003200096-0000140009800K00#0-1-5300-5360 -0724  
 M60526401100K605965-001-KK059650529RM70526401300M3052640087R#0-1-5360-5420 -0725  
 K60596800098K30538L-000J240009901067M60526401100KL0544L05965#0-1-5420-5480 -0726  
 320009500000K605965000099J10596500000K50596000402M30556419789#0-1-5480-5540 -0727  
 L40596000701490137600000K00549105965J305965000N0110009500-01#0-1-5540-5600 -0728  
 K60534500095K10534500095J605973-003RKK0597105968M70526401100#0-1-5600-5660 -0729  
 K40597300855M705264011001600099000--M40573219789L60596000702#0-1-5660-5720 -0730  
 M90575600000L80596000702L60596000703M60578003900490137600000#0-1-5720-5780 -0731  
 M70584003600M40525200099330009900000L40596000701M90569600000#0-1-5780-5840 -0732  
 M70588803700M40525200098330009800000M90569600000K00596505347#0-1-5840-5900 -0733  
 KK0549105347L20548900000KJ0596805491KK0597105491M90581600000#0-1-5900-5960 -0734  
 Q34162520# 1-1-5974-5984 -0735  
 -000000001# 1-1-5984-5994 -0736  
 050070553505703#  
 \$MOD 0014001400010001  
 260006000099420000000000# 0-1-5000-5024 -0737  
 \$SAVE 0134029600050006  
 M50502419749490657600000M40508419749L3-503800000260056504429#0-1-5000-5060 -0738  
 L10513400404420000000000MM0512005038100328505074490658800000#0-1-5060-5120 -0739  
 3J0040405134420000000000# 0-1-5120-5144 -0740  
 -# 1-1-5294-5296 -0741  
 Q24165450# 1-1-5074-5084 -0742  
 0500705031#  
 \$LINK 0080008000020003  
 M5050241972949065760000032020200000260042519729160203800-73#0-1-5000-5060 -0743  
 1602028-4650490196600000# 0-1-5060-5084 -0744  
 0500705043#  
 \$NFIL 0222022200060007  
 M505024197094906576000001419704-0000M605204011003219705-0000#0-1-5000-5060 -0745  
 K605059197097L1970905059M305144197-115197-000000J105095000-2#0-1-5060-5120 -0746  
 J105102000-2ML0508405102321970000000260006019709J605095197-1#0-1-5120-5180 -0747  
 J605102197-0420000000000# 0-1-5180-5204 -0748  
 N54649530# 1-1-5194-5204 -0749  
 1003285-5194490658800000# 0-1-5204-5228 -0750  
 0500705026050500506705074050910509805146051630517505187#  
 \$NUPL 0160017000060007  
 M50502419689490657600000M30507219689M305120196881003285-5160#0-1-5000-5060 -0751  
 490658800000M4050981968915043390000742000000000# 0-1-5060-5108 -0752  
 150433900009420000000000# 0-1-5098-5122 -0753  
 M40514619689150447700000420000000000# 0-1-5120-5156 -0754  
 150447700001420000000000# 0-1-5146-5170 -0755  
 N56457530# 1-1-5160-5170 -0756  
 0500705031050430507905127#

## C4D TEST DECK

THE TEST DECK WAS DESIGNED TO ILLUSTRATE MOST OF THE FEATURES OF C4D. THE PROGRAMS DIAGS, FMTLG AND UDV ARE EXAMPLES OF DIAGNOSTICS IN THE PRE-COMPILE, COMPILE, AND RUN PHASES, RESPECTIVELY. TEST1 AND TEST 2 MAKE USE OF THE RELOCATABLE SUBROUTINES AND TEST INTEGER AND FLOATING POINT ARITHMETIC. TEST1 IS SEGMENTED SO THAT IT WILL FIT IN A 20K MACHINE.

C4D TEST DECK JANUARY 20, 1967

```

*CODE TEST1#
COMMON NWORD,MAXNR,NFST,NLAST,NBUF(10),XBUF(10),NAMET
DIMENSION AMULT(5,5),BMULT(5,5),YINV(5,5),CNV(5),NAME(5)
CONTROL102
TYPE 12
READ 6,K
REREAD 2,I,X
PRINT 9,I,X,J
CALL SEGMENT 9000
1 FORMAT(5F15.8)
2 FORMAT(115,F15.8,115)
6 FORMAT (115)
8 FORMAT(5E15.8)
9 FORMAT(5HHD ,3A5)
10 FORMAT(5(15,F5.1)/5(15,F5.1))
12 FORMAT(41HTURN SENSE SWITCH 4 ON FOR TRACE IN TEST2)
SEGMENT 9000,9100,9150,9200
BEGIN SEGMENT 9000
PRINT 9005
NWORD =10
MAXNR=2
NFST=1
NLAST=2
9001 N=MOVE(0)
DO 9002 I=1,10
NBUF(I) =I
9002 XBUF(I)=I
N=MOVE(1)
DO 9003 I=1,10
NBUF(I)=0
9003 XBUF(I)=0.
K=MOVE(-1)
9004 PRINT 10,(NBUF(I),XBUF(I),I=1,10)
DO 9101 I=1,NNV
DO 9101 J=1,NNV
XI=I
XJ=J
YINV(I,J)=1./(XI+XJ-1.)
9101 BMULT(I,J)=YINV(I,J)
CALL SEGMENT 9100
9005 FORMAT(/52HSEGMENT 9000 TESTS DISK DATA STORAGE UNDER THE MOVE ,
1 7HROUTINE/)
END SEGMENT 9000
BEGIN SEGMENT 9100
PRINT 9102
EXECUTE PROCEDURE 5100
CALL SEGMENT 9150
BEGIN PROCEDURE 5100
C INVERTS MATRIX -YINV- OF ORDER -NNV- IF -YINV- IS SINGULAR THE
C ERROR MESSAGE INVERT IS PRINTED AND THE VARIABLE -NOSOL- IS
C SET TO ZERO OTHERWISE -NOSOL- IS SET TO ONE AND THE INVERSE
C IS STORED IN -YINV- MAIN PROGRAM MUST DIMENSION CNV(NNV)
C YINV(NNV,NNV) AND NAME(NNV)
NOSOL=1
DO 5101 INV=1,NNV
5101 NAME(INV)=INV
DO 5113 INV=1,NNV
CMAX=0.
JNV=INV
DO 5103 KNV=INV,NNV
IF (ABSF(CMAX)-ABSF(YINV(INV,KNV))) C,5103,5103
JNV=KNV
CMAX=YINV(INV,KNV)
5103 CONTINUE
IF (CMAX) 5106, C,5106
PRINT 5105
NOSOL=0
RETURN 5100
5105 FORMAT (6HINVERT)
5106 IF (INV-JNV) C,5109,C
KNV=NAME(INV)
NAME(INV)=NAME(JNV)
NAME(JNV)=KNV
DO 5108 LNV=1,NNV
TNV=YINV(LNV,INV)
YINV(LNV,INV)=YINV(LNV,JNV)
5108 YINV(LNV,JNV)=TNV
5109 YINV(INV,INV)=1.
DO 5110 JNV=1,NNV
5110 YINV(INV,JNV)=YINV(INV,JNV)/CMAX
DO 5113 JNV=1,NNV

```

```

 IF (INV-JNV) C,5113,C
 TNV=YNV(JNV,INV)
 YNV(JNV,INV)=0.
 DO 5112 KNV=1,NNV
5112 YNV(JNV,KNV)=YNV(JNV,KNV)-TNV*YNV(INV,KNV)
5113 CONTINUE
 DO 5119 MNV=1,NNV
 IF (NAME(MNV)-MNV) C,5119,C
5114 DO 5115 JNV=1,NNV
5115 CNV(JNV)=YNV(MNV,JNV)
 JJNV=MNV+1
 DO 5116 JNV=JJNV,NNV
 IF (NAME(JNV)-MNV) 5116,5117,5116
5116 CONTINUE
5117 NAME(JNV)=NAME(MNV)
 DO 5118 KNV=1,NNV
 YNV(MNV,KNV)=YNV(JNV,KNV)
5118 YNV(JNV,KNV)=CNV(KNV)
5119 NAME(MNV)=MNV
 END PROCEDURE 5100
9102 FORMAT(/43HSEGMENT 9100 INVERTS A NEAR-SINGULAR MATRIX/)
 END SEGMENT 9100
 BEGIN SEGMENT 9150
 PRINT 9152
 MMULT = NNV
 KMULT = NNV
 NMULT = NNV
 EXECUTE PROCEDURE 5200
 DO 9151 I=1,NNV
9151 PRINT 1,(AMULT(I,J),J=1,NNV)
 CALL SEGMENT 9200
 BEGIN PROCEDURE 5200
 MULTIPLIES MATRIX -BMULT- BY MATRIX -YNV- AND STORES PRODUCT
 IN -AMULT-. SIZE OF BMULT IS -MMULT*-KMULT- AND SIZE OF
 CMULT IS -KMULT*-NMULT-. MAIN PROGRAM MUST DEFINE VALUES
 OF -MMULT-, -KMULT-, -NMULT-, AND DIMENSION MATRICES AS
 FOLLOWS- AMULT(MMULT,NMULT), BMULT(MMULT,KMULT),AND
 CMULT(KMULT,NMULT). THE USE OF THE VECTOR FORM OF
 THESE ARRAYS IN THE PROCEDURE IS PERMISSIBLE IN C4D
 MN = MMULT * NMULT
 MK = MMULT * KMULT
 DO 5202 IMULT = 1,MMULT
 KJ = 1
 DO 5202 IJ = IMULT,MN,MMULT
 SMULT = 0.
 DO 5201 IK = IMULT,MK,MMULT
 SMULT = SMULT + BMULT(IK)* YNV(KJ)
5201 KJ = KJ + 1
5202 AMULT(IJ) = SMULT
 END PROCEDURE 5200
9152 FORMAT(/54HSEGMENT 9150 MULTIPLIES THE MATRIX BY ITS INVERSE AND ,
 1 19HDISPLAYS THE RESULT/35HNOTE THE ERROR FROM PROPAGATION OF ,
 2 9HROUND OFF/)
 END SEGMENT 9150
 BEGIN SEGMENT 9200
 PRINT 9202
 DO 9201 I=1,10
 EXECUTE PROCEDURE 6000
9201 XBUF(I)=SND
 PRINT 8,(XBUF(I),I=1,10)
 N=LINK(NAMET)
 BEGIN PROCEDURE 6000
 C GENERATES A STANDARD NORMAL DEVIATE -SND-
 SUSND=0
 DO 6001 J=1,12
 SNDX=NPRF(IBEG)
6001 SUSND=SUSND+SNDX
 SND = 0.00001*SUSND - 5.99994
 END PROCEDURE 6000
9202 FORMAT(/51HSEGMENT 9200 GENERATES STANDARD NORMAL DEVIATES BY ,
 1 23HSUMMING RANDOM INTEGERS/)
 END SEGMENT 9200
 DATA,NNV/5/ NAMET/5HTEST2/ IBEG/4321/J/2HHO/
 END
*HOLD TEST1#
*CODE TEST2#
 COMMON NWORD,MAXNR,NFST,NLAST,NBUF(10),XBUF(10),NAMET
 DIMENSION E(10),F(10),G(10),FUNCT(10)
 DIMENSION VALUE(10),ARG(10)
 DIMENSION CNT(4)
 1 FORMAT(5F15.8)
 2 FORMAT(I15,F15.8,I15)
 3 FORMAT(5I15)
 4 FORMAT(/5A5/)
 5 FORMAT(/,,
 0 10X,1HX,10X,6HSIN(X),10X,6HCOS(X),10X,6HTAN(X)/10X,1HX,10X,
 1 6HEXP(X),10X,7HEXP(-X)/10X,1HX,10X,6HLOG(X),9X,8HLOG10(X)/10X,
 2 1HX,10X,7HSQRT(X)/10X,1HX,10X,7HATAN(X),7X,13HLOG10(TAN(X)))
 7 FORMAT(/13H THIS IS THE ,A3,25H OF THE 4 LOOPS OF DO 130/)
 8 FORMAT(5E15.8)
 CONTROL 971
 PRINT 9301,NAMET
9301 FORMAT(A5, 18H TESTS SUBROUTINES/)

```

```

 BEGIN TRACE F15.3
 N = 19
 DO11I=2,6
 K = MOD(N/I)
11 X = K * 1
 END TRACE
20 READ1,XZERO,XMAX,DELX
 PRINT 5
200 X=XZERO
30 X1=SIN(X)
 X2=COSF(-X)
 X3=SIN(X)/(COS(X))
 X4=EXP(X)
 X5=EXP(-X)
 X6 =ALOGF(X)
 X7=X6/A
 X8=SQRT(X)
 X9=ATAN(X)
 X10=ALOG(X3)/A
 PRINT1,X,X1,X2,X3
 PRINT1,X,X4,X5
 PRINT1,X,X6,X7
 PRINT1,X,X8
 PRINT1,X,X9,X10
 IF(X-XMAX) 40,50,50
40 X=X+DELX
 GO TO 30
50 READ1,A,B,C,D
 READ 4,NLH1,NLH2,NLH3,NLH4,NLH5
 PRINT4,NLH1,NLH2,NLH3,NLH4,NLH5
 A1=A+B-C+D
 A2=A*B*C*D
 A3=A/B
 A4=A**(-B)
 A5=A/(-B)
 A6=A** (B+2.)*C
 A7=(A*B)/(C*D)
 A8=A/C*B/D
 PRINT1,A1,A2,A3,A4
 PRINT1,A5,A6,A7,A8
 D6=A**(I1)
 D7=A**(-I1)
 Z=Z**0.5
 PRINT1,D6,D7,Z
 DO 60 I=1,10,5
 READ 8,F(I),F(I+1),F(I+2),F(I+3),F(I+4)
60 CONTINUE
 DU 29 J=1,10,2
 READ1,G(J),G(J+1)
29 CONTINUE
 DO 61 I=1,10,5
 E(I)=(SIN(F(I))**2)+(COS(F(I))**2)
 DO 55 J=1,10,3
 F(I)=J
 PRINT1,F(I)
 K=G(J)
 PRINT1,E(I)
 PRINT 2,J,G(J),K
55 CONTINUE
61 CONTINUE
 DU 47 J=1,10,2
 READ1,ARG(J),ARG(J+1)
47 CONTINUE
 DO 48 L=1,10,5
 READ1,VALUE(L),VALUE(L+1),VALUE(L+2),
 1VALUE(L+3),VALUE(L+4)
48 CONTINUE
 DU 49 L=1,10,5
 READ1,FUNCT(L),FUNCT(L+1),FUNCT(L+2),FUNCT(L+3),FUNCT(L+4)
49 CONTINUE
 DU 63 J=1,10
 DO 70 L=1,10
 IF(ARG(J)-VALUE(L)) 70,65,70
65 PRINT1,ARG(J),FUNCT(L)
70 CONTINUE
63 CONTINUE
 CONTROL 953
 DO 130 M=1,4
 PRINT7,CNT(M)
 GO TO (90,100,110,120),M
90 D1=SIN(A)*COS(B)
100 D2=SIN(A)**(COS(B))
110 D3=SQRTF((SINF(A)**2.)+(COSF(A)**2.))
120 PRINT1,A,B,D1,D2,D3
 EXECUTE PROCEDURE 300
130 CONTINUE
 READ 4,NXH1,NXH2
 CONTROL102
 PRINT4,NXH1,NXH2,NLH4,NLH5
 READ3,I2,I3,I4
 I5=I2+I3+I4
 I6=I5-I4
 I7=I2*I3

```

```

 I8=I2*I3*I4
 I9=I4/I3
C NOTE -I- IS DEFINED BY DO 61 I=1,10,5
 J1=I2+I3+(I3*I4)/I
 PRINT3,I2,I3,I4
 PRINT3,I5,I6,I7,I8,I9,J1
 STOP555
 BEGIN PROCEDURE 300
C A TO NEAREST 1/16, B TO NEAREST INTEGER, D2 TO NEAREST 0.0001
 A1=0.0625*DRH(A*16.+.5)
 A2=DRH(B+.5)
 D2=0.0001*DRH(D2*10000.+.5)
 PRINT1,A1,A2,D1,D2
 END PROCEDURE 300
 DATA,I1/2/2/0./CNT(1)/3H1ST /CNT(2)/3H2ND /CNT(3)/3H3RD/
 DATA,CNT(4)/3H4TH /A/2.3025851/X/0./
 END
*HOLD TEST2#
*CODE DIAGS#
 COMMON A,A
 DIMENSION Y(2)
 RETURN 3
 END SEGMENT 1
 ICONTINUATION CARD FIRST CARD OF STATEMENT
 DO 12 J=1,
 STOP
 A=COS(1)
 B=NABS(J)
 3 READ 4,A,B,C,D,E
 3 F=E
 BEGIN SEGMENT 5
 I=J+1)
 GO TO 1212121
 2 GO TO J
118 I=1
 DO 18 I=1,2
 DO 19 J=1,3
 18 CONTINUE
 DO 123 JK=1,4
123 GO TO 3
 8 DO 8 JL=1,5
 DO 1,I=1,2
 A=1..2
 NOW = JEANNIE
 DIMENSION ZX(12)
 ZX(6)=0.
 DIMENSION P(1,2,3)
 DIMENSION R(K)
 EQUIVALENCE (A,B)
 CALL BAA(A)-B
 1 GO TO 1
 9 I=1
 C=1
 DO 4 I=1,N
 BEGIN TRACE A3.2
 BEGIN TRACE 15.7
 N=2*I
 4 CONTINUE
 ACCEPT 3,A
 READ 3,(ZX(I)I=1,3)
 COMMON X
 PRINT J,K
 END SEGMENT 5
 11 FORMAT(I5)
 DO 22 M=1,KQ
 L(L)=A
 READ 3,(ZX(N),N=1,8*)
7878 FORMAT (I3)I4
279 FORMAT (3H I3)
 EXECUTE PROCEDURE 3000
 CALL SEGMENT 8000
 IT=A-B
 A=A--B**C+()
 Y=10.
 A=B-J
4533 IF(GARBAGEPAILISQUITEFULL)4,5
 DIMENSION DD((2))
 DIMENSION Y(3)
 GO TO 4
 J=1
 DIMENSION COSF (20)
 ABSF(5)=2.
100 FORMAT(100F2.0)
 DATA,A/1/
 DATA,A/6HABCDEF/
 DATA,X/1.
 DATA,I/1HAB/
 DATA,Y(I)/3.0/
 DATA,A/
 END
*RUN DIAGS#
*CODE UDV 217 #
 I=I+1

```

```

END
*RUN UDV 217 #
*CODE FMTLG#
 READ 1,I
 1 FORMAT(50H
 1 50H
 2 50H
 3 50H
 4 50H
 END
*RUN TEST1#
 4856000000 .00560000
 .40000000 .80000000
 1.11100000 2.22200000 3.33300000 4.44400000

```

# FLOATING POINT ARITHMETIC

|               |               |               |               |               |
|---------------|---------------|---------------|---------------|---------------|
| .11000000E 01 | .22000000E 01 | .33000000E 01 | .14000000E 01 | .15000000E 01 |
| .00000000E-50 | .17000000E 01 | .18000000E 01 | .19000000E 01 | .20000000E 01 |
| 2.10000000    | 2.20000000    |               |               |               |
| 3.30000000    | 2.40000000    |               |               |               |
| 2.50000000    | 2.60000000    |               |               |               |
| 2.70000000    | 2.80000000    |               |               |               |
| 2.90000000    | 3.00000000    |               |               |               |
| 5.00000000    | 10.00000000   |               |               |               |
| 24.00000000   | 11.00000000   |               |               |               |
| 39.00000000   | 17.00000000   |               |               |               |
| 44.00000000   | 41.00000000   |               |               |               |
| 50.00000000   | 1.00000000    |               |               |               |
| 1.00000000    | 2.00000000    | 3.00000000    | 4.00000000    | 5.00000000    |
| 6.00000000    | 7.00000000    | 8.00000000    | 9.00000000    | 10.00000000   |
| 1.10000000    | 2.10000000    | 3.10000000    | 4.10000000    | 5.10000000    |
| 6.10000000    | 7.10000000    | 8.10000000    | 9.10000000    | 10.10000000   |

# INTEGER

```

 22 11 33
* CUT TEST1#
* CUT TEST2#
* DISK #
* CODE MLM
 DIMENSION A(10),B(50),C(100),M(100),G(200,20)
 I=1
 J=2
 END

```

'DATE SYSTEM LOAD  
SYSTEM LOAD

This is the output obtained by running the  
Test Deck with output to the Printer.

'DISK  
SYSTEM LOAD  
000  
64000

'CODE TEST1  
SYSTEM LOAD

|       |                                                                       |      |
|-------|-----------------------------------------------------------------------|------|
| 07650 | COMMONNWORD,MAXNR,NFST,NLAST,NBUF(10),XBUF(10),NAMET                  | 0001 |
| 07650 | DIMENSIONAMULT(5,5),BMULT(5,5),YINV(5,5),CNV(5),NAME(5)               | 0002 |
| 07650 | CONTROL102                                                            | 0003 |
| 07662 | TYPE12                                                                | 0004 |
| 07686 | READ6,K                                                               | 0005 |
| 07722 | REREAD2,I,X                                                           | 0006 |
| 07770 | PRINT9,I,X,J                                                          | 0007 |
| 07830 | CALLSEGMENT9000                                                       | 0008 |
| 07842 | 1 FORMAT(5F15.8)                                                      | 0009 |
| 07884 | 2 FORMAT(I15,F15.8,I15)                                               | 0010 |
| 07916 | 6 FORMAT(I15)                                                         | 0011 |
| 07938 | 8 FORMAT(5E15.8)                                                      | 0012 |
| 07980 | 9 FORMAT(5HHU,3A5)                                                    | 0013 |
| 08030 | 10 FORMAT(5(I5,F5.1)/5(I5,F5.1))                                      | 0014 |
| 08096 | 12 FORMAT(41HTURN SENSE SWITCH 4 ON FOR TRACE IN TEST2)               | 0015 |
| 08202 | SEGMENT9000,9100,9150,9200                                            | 0016 |
|       | BEGINSEGMENT9000                                                      | 0017 |
| 08216 | PRINT9005                                                             | 0018 |
| 08240 | NWORD=10                                                              | 0019 |
| 08252 | MAXNR=2                                                               | 0020 |
| 08264 | NFST=1                                                                | 0021 |
| 08276 | NLAST=2                                                               | 0022 |
| 08288 | 9001 N=MOVE(0)                                                        | 0023 |
| 08312 | DO9002I=1,10                                                          | 0024 |
| 08336 | NBUF(I)=I                                                             | 0025 |
| 08372 | 9002 XBUF(I)=I                                                        | 0026 |
| 08492 | N=MOVE(1)                                                             | 0027 |
| 08516 | DO9003I=1,10                                                          | 0028 |
| 08540 | NBUF(I)=0                                                             | 0029 |
| 08576 | 9003 XBUF(I)=0                                                        | 0030 |
| 08672 | K=MOVE(-1)                                                            | 0031 |
| 08720 | 9004 PRINT10,(NBUF(I),XBUF(I),I=1,10)                                 | 0032 |
| 08900 | DO9101I=1,NNV                                                         | 0033 |
| 08924 | DO9101J=1,NNV                                                         | 0034 |
| 08948 | XI=I                                                                  | 0035 |
| 08984 | XJ=J                                                                  | 0036 |
| 09020 | YINV(I,J)=1./(XI+XJ-1.)                                               | 0037 |
| 09140 | 9101 BMULT(I,J)=YINV(I,J)                                             | 0038 |
| 09404 | CALLSEGMENT9100                                                       | 0039 |
| 09416 | 9005 FORMAT(/52HSEGMENT 9000 TESTS DISK DATA STORAGE UNDER THE MOVE , | 0040 |
| 09416 | 1 THROUTINE/)                                                         | 0041 |
| 09576 | ENDSEGMENT9000                                                        | 0042 |
|       | BEGINSEGMENT9100                                                      | 0043 |
| 08216 | PRINT9102                                                             | 0044 |
| 08240 | EXECUTEPROCEDURE5100                                                  | 0045 |
| 08252 | CALLSEGMENT9150                                                       | 0046 |
| 08264 | BEGINPROCEDURE5100                                                    | 0047 |
| 08292 | INVERTS MATRIX -YINV- OF ORDER -NNV- IF -YINV- IS SINGULAR THE        | 0048 |
| 08292 | C ERROR MESSAGE INVERT IS PRINTED AND THE VARIABLE -NOSOL- IS         | 0049 |
| 08292 | C SET TO ZERO OTHERWISE -NOSOL- IS SET TO ONE AND THE INVERSE         | 0050 |
| 08292 | C IS STORED IN -YINV- MAIN PROGRAM MUST DIMENSION CNV(NNV)            | 0051 |
| 08292 | C YINV(NNV,NNV) AND NAME(NNV)                                         | 0052 |
| 08292 | NOSOL=1                                                               | 0053 |
| 08304 | DO5101INV=1,NNV                                                       | 0054 |
| 08328 | NAME(INV)=INV                                                         | 0055 |
| 08424 | DO5113INV=1,NNV                                                       | 0056 |
| 08448 | CMAX=0.                                                               | 0057 |
| 08460 | JNV=INV                                                               | 0058 |
| 08472 | DO5103KNV=INV,NNV                                                     | 0059 |
| 08496 | IF(ABSF(CMAX)-ABSF(YINV(INV,KNV)))C,5103,5103                         | 0060 |

```

08652 JNV=KNV 0061
08664 CMAX=YNV(INV,KNV) 0062
08736 CONTINUE 0063
08796 5103 IF(CMAX)5106,C,5106 0064
08844 PRINT5105 0065
08868 NOSOL=0 0066
08880 RETURN5100 0067
08888 5105 FORMAT(6HINVERT) 0068
08924 5106 IF(INV-JNV)C,5109,C 0069
08972 KNV=NAME(INV) 0070
09008 NAME(INV)=NAME(JNV) 0071
09080 NAME(JNV)=KNV 0072
09116 DO5108LNV=1,NNV 0073
09140 TNV=YNV(LNV,INV) 0074
09212 YNV(LNV,INV)=YNV(LNV,JNV) 0075
09356 5108 YNV(LNV,JNV)=TNV 0076
09488 5109 YNV(INV,INV)=1. 0077
09560 DO5110JNV=1,NNV 0078
09584 5110 YNV(INV,JNV)=YNV(INV,JNV)/CMAX 0079
09800 DO5113JNV=1,NNV 0080
09824 IF(INV-JNV)C,5113,C 0081
09872 TNV=YNV(JNV,INV) 0082
09944 YNV(JNV,INV)=0. 0083
10016 DO5112KNV=1,NNV 0084
10040 5112 YNV(JNV,KNV)=YNV(JNV,KNV)-TNV*YNV(INV,KNV) 0085
10340 5113 CONTINUE 0086
10460 DO5119MNV=1,NNV 0087
10484 IF(NAME(MNV)-MNV)C,5119,C 0088
10556 5114 DO5115JNV=1,NNV 0089
10580 5115 CNV(JNV)=YNV(MNV,JNV) 0090
10748 JJNV=MNV+1 0091
10784 DO5116JNV=JJNV,NNV 0092
10808 IF(NAME(JNV)-MNV)5116,5117,5116 0093
10900 CONTINUE 0094
10960 5116 NAME(JNV)=NAME(MNV) 0095
11032 5117 DO5118KNV=1,NNV 0096
11056 YNV(MNV,KNV)=YNV(JNV,KNV) 0097
11200 5118 YNV(JNV,KNV)=CNV(KNV) 0098
11368 5119 NAME(MNV)=MNV 0099
11464 ENDPROCEDURE5100 0100
11472 9102 FORMAT(/43HSEGMENT 9100 INVERTS A NEAR-SINGULAR MATRIX/) 0101
11592 BEGINSEGMENT9100 0102
PRINT9152 0103
MMULT=NNV 0104
KMULT=NNV 0105
NMULT=NNV 0106
EXECUTEPROCEDURE5200 0107
DO9151I=1,NNV 0108
9151 PRINT1,(AMULT(I,J),J=1,NNV) 0109
CALLSEGMENT9200 0110
BEGINPROCEDURE5200 0111
MULTIPLIES MATRIX -BMULT- BY MATRIX -YNV- AND STORES PRODUCT 0112
IN -AMULT-. SIZE OF BMULT IS -MMULT-*KMULT- AND SIZE OF 0113
CMULT IS -KMULT-*NMULT-. MAIN PROGRAM MUST DEFINE VAL0114
OF -MMULT-,-KMULT-,-NMULT-, AND DIMENSION MATRICES AS 0115
FOLLOWS- AMULT(MMULT,NMULT), BMULT(MMULT,KMULT),AND 0116
CMULT(KMULT,NMULT). THE USE OF THE VECTOR FORM OF 0117
THESE ARRAYS IN THE PROCEDURE IS PERMISSIBLE IN C4D0118
MN=MMULT*NMULT 0119
MK=MMULT*KMULT 0120
DO5202IMULT=1,MMULT 0121
KJ=1 0122
DO5202IJ=IMULT,MN,MMULT 0123
0124

```

```

08724 SMULT=0. 0125
08736 DO5201IK=IMULT,MK,MMULT 0126
08760 SMULT=SMULT+BMULT(IK)*YNV(KJ) 0127
08856 5201 KJ=KJ+1 0128
08952 5202 AMULT(IJ)=SMULT 0129
09108 ENDPROCEDURE5200 0130
09116 9152 FORMAT(/54HSEGMENT 9150 MULTIPLIES THE MATRIX BY ITS INVERSE AND , 0131
09116 1 19HDISPLAYS THE RESULT/35HNOTE THE ERROR FROM PROPAGATION OF , 0132
09116 2 9HROUND OFF/) 0133
09410 ENDSEGMENT9150 0134
BEGINSEGMENT9200 0135
PRINT9202 0136
DO9201I=1,10 0137
EXECUTEPROCEDURE6000 0138
9201 XBUF(I)=SND 0139
PRINT8,(XBUF(I),I=1,10) 0140
N=LINK(NAMET) 0141
BEGINPROCEDURE6000 0142
C GENERATES A STANDARD NORMAL DEViate -SND- 0143
SUSND=0 0144
DO6001J=1,12 0145
SNDX=NPRF(1BEG) 0146
6001 SUSND=SUSND+SNDX 0147
SND=0.00001*SUSND-5.99994 0148
ENDPROCEDURE6000 0149
9202 FORMAT(/51HSEGMENT 9200 GENERATES STANDARD NORMAL DEVIATES BY , 0150
1 23HSUMMING RANDOM INTEGERS/) 0151
ENDSEGMENT9200 0152
DATA,NNV/5/NAMET/5HTEST2/1BEG/4321/J/2HHO/ 0153
END 0154

```

|                   |                  |                  |                   |
|-------------------|------------------|------------------|-------------------|
| 39999 COS         | 39989 COSF       | 39979 SIN        | 39969 SINF        |
| 39959 EXP         | 39949 EXPF       | 39939 ALOG       | 39929 ALOGF       |
| 39919 SQRT        | 39909 SQRTF      | 39899 ABS        | 39889 ABSF        |
| 39879 NABS        | 39869 NABSF      | 39859 ATAN       | 39849 ATANF       |
| 39839 DRH         | 39829 DRHF       | 39819 NPR        | 39809 NPRF        |
| 39799 MOVE        | 39789 MOVEF      | 39779 MOD        | 39769 MODF        |
| 39759 SAVE        | 39749 SAVEF      | 39739 LINK       | 39729 LINKF       |
| 39719 NFIL        | 39709 NFILF      | 39699 NUPL       | 39689 NUPLF       |
| 39679 NWORD       | 39669 MAXNR      | 39659 NFST       | 39649 NLAST       |
| 39639 NBUF 39549  | 39539 XBUF 39449 | 39439 NAMET      | 39429 AMULT 39189 |
| 39179 BMULT 38939 | 38929 YNV 38689  | 38679 CNV 38639  | 38629 NAME 38589  |
| 38579 FM 0012     | 38569 FM 0006    | 38559 K          | 38549 FM 0002     |
| 38539 I           | 38529 X          | 38519 FM 0009    | 38509 J           |
| 38489 SG 9000     | 38479 FM 0001    | 38469 FM 0008    | 38459 FM 0010     |
| 38439 SG 9100     | 38419 SG 9150    | 38399 SG 9200    | 38389 FM 9005     |
| 38379 0000000010  | 38369 0000000002 | 38359 0000000001 | 38349 SN 9001     |
| 38339 N           | 38329 0000000000 | 38319 000        | 38309 SN 9002     |
| 38299 SN 9003     | 38289 SN 9004    | 38279 SN 9101    | 38269 NNV         |
| 38259 XI          | 38249 XJ         | 38239 5110000000 | 38229 001         |
| 38219 FM 9102     | 38199 PR 5100    | 38189 NOSOL      | 38179 SN 5101     |
| 38169 INV         | 38159 SN 5113    | 38149 CMAX       | 38139 JNV         |
| 38129 SN 5103     | 38119 KNV        | 38109 SN 5106    | 38099 FM 5105     |
| 38089 SN 5109     | 38079 SN 5108    | 38069 LNV        | 38059 TNV         |
| 38049 SN 5110     | 38039 SN 5112    | 38029 SN 5119    | 38019 MNV         |
| 38009 SN 5114     | 37999 SN 5115    | 37989 JJNV       | 37979 SN 5116     |
| 37969 SN 5117     | 37959 SN 5118    | 37949 FM 9152    | 37939 MMULT       |
| 37929 KMULT       | 37919 NMULT      | 37899 PR 5200    | 37889 SN 9151     |
| 37879 MN          | 37869 MK         | 37859 SN 5202    | 37849 IMULT       |
| 37839 KJ          | 37829 IJ         | 37819 SMULT      | 37809 SN 5201     |
| 37799 IK          | 37789 FM 9202    | 37779 SN 9201    | 37759 PR 6000     |
| 37749 SND         | 37739 SUSND      | 37729 SN 6001    | 37719 0000000012  |
| 37709 SNDX        | 37699 1BEG       | 37689 4610000000 | 37679 5159999400  |

'HOLD TEST1

SYSTEM LOAD

C INVERTS MATRIX -YINV- OF ORDER -NNV- IF -YINV- IS SINGULAR THE

CARD NO.- LABEL NO.-REFERENCE CARD NUMBERS

|      |      |                |
|------|------|----------------|
| 0009 | 1    | 0110           |
| 0010 | 2    | 0006           |
| 0011 | 6    | 0005           |
| 0012 | 8    | 0140           |
| 0013 | 9    | 0007           |
| 0014 | 10   | 0032           |
| 0015 | 12   | 0004           |
| 0047 | 5100 | 0100 0067 0045 |
| 0055 | 5101 | 0054           |
| 0053 | 5102 | 0060 0060 0059 |
| 0068 | 5103 | 0065           |
| 0069 | 5106 | 0064 0064      |
| 0076 | 5108 | 0073           |
| 0077 | 5109 | 0069           |
| 0079 | 5110 | 0078           |
| 0085 | 5112 | 0084           |
| 0086 | 5113 | 0081 0080 0056 |
| 0089 | 5114 |                |
| 0090 | 5115 | 0089           |
| 0094 | 5116 | 0093 0093 0092 |
| 0095 | 5117 | 0093           |
| 0098 | 5118 | 0096           |
| 0099 | 5119 | 0088 0087      |
| 0112 | 5200 | 0130 0108      |
| 0128 | 5201 | 0126           |
| 0129 | 5202 | 0124 0122      |
| 0142 | 6000 | 0149 0138      |
| 0147 | 6001 | 0145           |
| 0016 | 9000 | 0042 0017 0008 |
| 0023 | 9001 |                |
| 0026 | 9002 | 0024           |
| 0030 | 9003 | 0028           |
| 0032 | 9004 |                |
| 0040 | 9005 | 0018           |
| 0016 | 9100 | 0102 0043 0039 |
| 0038 | 9101 | 0034 0033      |
| 0101 | 9102 | 0044           |
| 0016 | 9150 | 0134 0103 0046 |
| 0110 | 9151 | 0109           |
| 0131 | 9152 | 0104           |
| 0016 | 9200 | 0152 0135 0111 |
| 0139 | 9201 | 0137           |
| 0150 | 9202 | 0136           |

CARD NO.- VAR. NAME-REFERENCE CARD NUMBERS

|      |       |                                                        |
|------|-------|--------------------------------------------------------|
| 0129 | ABSF  | 0060 0060                                              |
| 0038 | AMULT | 0110                                                   |
| 0062 | BMULT | 0127                                                   |
|      | CMAX  | 0079 0064 0060                                         |
|      |       | *0057                                                  |
| 0090 | CNV   | 0098                                                   |
| 0140 | I     | 0140 0139 0110 0038 0038 0037 0035 0032 0032 0030 0029 |
|      |       | 0026 0026 0025 0025 0007                               |
|      |       | *0137 0109 0033 0032 0028 0024 0006                    |

|      |       |                                                        |
|------|-------|--------------------------------------------------------|
| 0153 | IBEG  | 0146                                                   |
| 0124 | IJ    | 0129                                                   |
| 0126 | IK    | 0127                                                   |
| 0122 | IMULT | 0126 0124                                              |
| 0056 | INV   | 0085 0083 0082 0081 0079 0079 0077 0077 0075 0074 0071 |
|      |       | 0070 0069 0062 0060 0059 0058 0055 0055                |
|      |       | *0054                                                  |
| 0153 | J     | 0110 0038 0038 0037 0036 0007                          |
|      |       | *0145 0110 0034                                        |
| 0091 | JJNV  | 0092                                                   |
| 0092 | JNV   | 0098 0097 0095 0093 0090 0090 0085 0085 0083 0082 0081 |
|      |       | 0079 0079 0076 0075 0072 0071 0069                     |
|      |       | *0089 0080 0078 0061 0058                              |
| 0031 | K     | *0005                                                  |
| 0128 | KJ    | 0128 0127                                              |
|      |       | *0123                                                  |
| 0106 | KMULT | 0121                                                   |
| 0096 | KNV   | 0098 0098 0097 0097 0085 0085 0085 0072 0062 0061 0060 |
|      |       | *0084 0070 0059                                        |
|      | LINK  | 0141                                                   |
| 0073 | LNV   | 0076 0075 0075 0074                                    |
| 0020 | MAXNR |                                                        |
| 0121 | MK    | 0126                                                   |
| 0105 | MMULT | 0126 0124 0122 0121 0120                               |
| 0120 | MN    | 0124                                                   |
| 0087 | MNV   | 0099 0099 0097 0095 0093 0091 0090 0088 0088           |
|      | MUVE  | 0031 0027 0023                                         |
| 0141 | N     |                                                        |
|      |       | *0027 0023                                             |
| 0099 | NAME  | 0095 0093 0088 0071 0070                               |
|      |       | *0095 0072 0071 0055                                   |
| 0153 | NAMET | 0141                                                   |
| 0029 | NBUF  | 0032                                                   |
|      |       | *0025                                                  |
| 0021 | NFST  |                                                        |
| 0022 | NLAST |                                                        |
| 0107 | NMULT | 0120                                                   |
| 0153 | NNV   | 0109 0107 0106 0105 0096 0092 0089 0087 0084 0080 0078 |
|      |       | 0073 0059 0056 0054 0034 0033                          |
|      |       | *0110                                                  |
| 0066 | NOSOL |                                                        |
|      |       | *0053                                                  |
|      | NPRF  | 0146                                                   |
| 0019 | NWORD |                                                        |
| 0127 | SMULT | 0129 0127                                              |
|      |       | *0125                                                  |
| 0148 | SND   | 0139                                                   |
| 0146 | SNDX  | 0147                                                   |
| 0147 | SUSND | 0148 0147                                              |
|      |       | *0144                                                  |
| 0082 | TNV   | 0085 0076                                              |
|      |       | *0074                                                  |
| 0006 | X     | 0007                                                   |
| 0139 | XBUF  | 0140 0032                                              |
|      |       | *0030 0026                                             |
| 0035 | XI    | 0037                                                   |
| 0036 | XJ    | 0037                                                   |
| 0098 | YINV  | 0127 0097 0090 0085 0085 0082 0079 0075 0074 0062 0060 |
|      |       | 0038                                                   |
|      |       | *0097 0085 0083 0079 0077 0076 0075 0037               |

\* OTHER CARDS WHERE VARIABLES ARE DEFINED

## SYSTEM LOAD

|       |                                                                 |      |
|-------|-----------------------------------------------------------------|------|
| 07650 | COMMONWORD,MAXNR,NFST,NLAST,NBUF(10),XBUF(10),NAMET             | 0001 |
| 07650 | DIMENSIONONE(10),F(10),G(10),FUNCT(10)                          | 0002 |
| 07650 | DIMENSIONVALUE(10),ARG(10)                                      | 0003 |
| 07650 | DIMENSIONCNT(4)                                                 | 0004 |
| 1     | FORMAT(5F15.8)                                                  | 0005 |
| 2     | FORMAT(11F15.8,I15)                                             | 0006 |
| 3     | FORMAT(5I15)                                                    | 0007 |
| 4     | FORMAT(/5A5/)                                                   | 0008 |
| 5     | FORMAT(/,/)                                                     | 0009 |
| 0     | 10X,1HX,10X,6HSIN(X),10X,6HCOS(X),10X,6HTAN(X)/10X,1HX,10X,     | 0010 |
| 07818 | 1 6HEXP(X),10X,7HEXP(-X)/10X,1HX,10X,6HLOG(X),9X,8HLOG10(X)/10X | 0011 |
| 07818 | 2 1HX,10X,7HSQRT(X)/10X,1HX,10X,7HATAN(X),7X,13HLOG10(TAN(X))// | 0012 |
| 08240 | 7 FORMAT(/13H THIS IS THE ,A3,25H OF THE 4 LOOPS OF DO 130//)   | 0013 |
| 08362 | 8 FORMAT(5E15.8)                                                | 0014 |
| 08404 | CONTROL971                                                      | 0015 |
| 08428 | PRINT9301,NAMET                                                 | 0016 |
| 08464 | 9301 FORMAT(A5, 18H TESTS SUBROUTINES/)                         | 0017 |
| 08534 | BEGINTRACEF15.3                                                 | 0018 |
| 08546 | N=19                                                            | 0019 |
| 08558 | DO11I=2,6                                                       | 0020 |
| 08582 | K=MOD(N/I)                                                      | 0021 |
| 08630 | 11 X=K*1                                                        | 0022 |
| 08738 | ENDTRACE                                                        | 0023 |
| 08738 | 20 READ1,XZERO,XMAX,DELX                                        | 0024 |
| 08798 | PRINT5                                                          | 0025 |
| 08822 | 200 X=XZERO                                                     | 0026 |
| 08824 | 30 X1=SIN(X)                                                    | 0027 |
| 08898 | X2=COSE(-X)                                                     | 0028 |
| 08906 | X3=SIN(X)/(COS(X))                                              | 0029 |
| 08966 | X4=EXP(X)                                                       | 0030 |
| 08990 | X5=EXP(-X)                                                      | 0031 |
| 09038 | X6=ALOGF(X)                                                     | 0032 |
| 09062 | X7=X6/A                                                         | 0033 |
| 09098 | X8=SQRT(X)                                                      | 0034 |
| 09122 | X9=ATAN(X)                                                      | 0035 |
| 09146 | X10=ALOG(X3)/A                                                  | 0036 |
| 09182 | PRINT1,X,X1,X2,X3                                               | 0037 |
| 09254 | PRINT1,X,X4,X5                                                  | 0038 |
| 09314 | PRINT1,X,X6,X7                                                  | 0039 |
| 09374 | PRINT1,X,X8                                                     | 0040 |
| 09422 | PRINT1,X,X9,X10                                                 | 0041 |
| 09482 | IF (X-XMAX)40,50,50                                             | 0042 |
| 09550 | 40 X=X+DELX                                                     | 0043 |
| 09586 | GOTO30                                                          | 0044 |
| 09594 | 50 READ1,A,B,C,D                                                | 0045 |
| 09666 | READ4,NLH1,NLH2,NLH3,NLH4,NLH5                                  | 0046 |
| 09750 | PRINT4,NLH1,NLH2,NLH3,NLH4,NLH5                                 | 0047 |
| 09834 | A1=A*B-C*D                                                      | 0048 |
| 09894 | A2=A*B*C*D                                                      | 0049 |
| 09954 | A3=A/B                                                          | 0050 |
| 10026 | A4=A**(-B)                                                      | 0051 |
| 10074 | A5=A/(-B)                                                       | 0052 |
| 10158 | A6=A**((B+2.)*C                                                 | 0053 |
| 10242 | A7=(A*B)/(C*D)                                                  | 0054 |
| 10302 | A8=A/C*B/D                                                      | 0055 |
| 10374 | PRINT1,A1,A2,A3,A4                                              | 0056 |
| 10446 | PRINT1,A5,A6,A7,A8                                              | 0057 |
| 10482 | D6=A**( I )                                                     | 0058 |
| 10518 | D7=A**(- I )                                                    | 0059 |
|       | Z=Z**0.5                                                        | 0060 |

|       |     |                                                               |      |
|-------|-----|---------------------------------------------------------------|------|
| 10554 |     | PRINT1,D6,D7,Z                                                | 0061 |
| 10614 |     | DO60I=1,10,5                                                  | 0062 |
| 10618 |     | READ3,F(I),F(I+1),F(I+2),F(I+3),F(I+4)                        | 0063 |
| 10842 | 60  | CONTINUE                                                      | 0064 |
| 10902 |     | DO29J=1,10,2                                                  | 0065 |
| 10926 |     | READ1,G(J),G(J+1)                                             | 0066 |
| 11022 | 29  | CONTINUE                                                      | 0067 |
| 11082 |     | DO61I=1,10,5                                                  | 0068 |
| 11106 |     | F(I)=(SIN(F(I))*2)+(COS(F(I))*2)                              | 0069 |
| 11262 |     | DO55J=1,10,3                                                  | 0070 |
| 11286 |     | F(I)=J                                                        | 0071 |
| 11346 |     | PRINT1,F(I)                                                   | 0072 |
| 11406 |     | K=G(J)                                                        | 0073 |
| 11466 |     | PRINT1,E(I)                                                   | 0074 |
| 11526 |     | PRINT2,J,G(J),K                                               | 0075 |
| 11610 | 55  | CONTINUE                                                      | 0076 |
| 11670 | 61  | CONTINUE                                                      | 0077 |
| 11730 |     | DO47J=1,10,2                                                  | 0078 |
| 11754 |     | READ1,ARG(J),ARG(J+1)                                         | 0079 |
| 11850 | 47  | CONTINUE                                                      | 0080 |
| 11910 |     | DO48L=1,10,5                                                  | 0081 |
| 11934 |     | READ1,VALUE(L),VALUE(L+1),VALUE(L+2),                         | 0082 |
| 12054 |     | VALUE(L+3),VALUE(L+4)                                         | 0083 |
| 12138 | 48  | CONTINUE                                                      | 0084 |
| 12198 |     | DO49L=1,10,5                                                  | 0085 |
| 12222 |     | READ1,FUNCT(L),FUNCT(L+1),FUNCT(L+2),FUNCT(L+3),FUNCT(L+4)    | 0086 |
| 12426 | 49  | CONTINUE                                                      | 0087 |
| 12486 |     | DO63J=1,10                                                    | 0088 |
| 12510 |     | DO70L=1,10                                                    | 0089 |
| 12534 |     | IF (ARG(J)-VALUE(L))70,65,70                                  | 0090 |
| 12650 | 65  | PRINT1,ARG(J),FUNCT(L)                                        | 0091 |
| 12746 | 70  | CONTINUE                                                      | 0092 |
| 12806 | 63  | CONTINUE                                                      | 0093 |
| 12866 |     | CONTROL953                                                    | 0094 |
| 12890 |     | DO130M=1,4                                                    | 0095 |
| 12914 |     | PRINT7,CNT(M)                                                 | 0096 |
| 12974 |     | GOTO(90,100,110,120),M                                        | 0097 |
| 13058 | 90  | D1=SIN(A)*COS(B)                                              | 0098 |
| 13118 | 100 | D2=SIN(A)**(COS(B))                                           | 0099 |
| 13202 | 110 | D3=SQRTF((SINF(A)**2.)+(COSF(A)**2.))                         | 0100 |
| 13298 | 120 | PRINT1,A,B,D1,D2,D3                                           | 0101 |
| 13382 |     | EXECUTEPROCEDURE300                                           | 0102 |
| 13394 | 130 | CONTINUE                                                      | 0103 |
| 13454 |     | READ4,NXH1,NXH2                                               | 0104 |
| 13502 |     | CONTROL102                                                    | 0105 |
| 13514 |     | PRINT4,NXH1,NXH2,NLH4,NLH5                                    | 0106 |
| 13586 |     | READ3,I2,I3,I4                                                | 0107 |
| 13646 |     | I5=I2+I3+I4                                                   | 0108 |
| 13694 |     | I6=I5-I4                                                      | 0109 |
| 13730 |     | I7=I2*I3                                                      | 0110 |
| 13766 |     | I8=I2*I3*I4                                                   | 0111 |
| 13814 |     | I9=I4/I3                                                      | 0112 |
| 13850 | C   | NOTE -I- IS DEFINED BY DU 61 I=1,10,5                         | 0113 |
| 13850 |     | J1=I2+I3+(I3*I4)/I                                            | 0114 |
| 13946 |     | PRINT3,I2,I3,I4                                               | 0115 |
| 14006 |     | PRINT3,I5,I6,I7,I8,I9,J1                                      | 0116 |
| 14102 |     | STOP555                                                       | 0117 |
| 14114 |     | BEGINPROCEDURE300                                             | 0118 |
| 14142 | C   | A TO NEAREST 1/16, B TO NEAREST INTEGER, D2 TO NEAREST 0.0001 | 0119 |
| 14142 |     | A1=0.0625*DRH(A*16.+5)                                        | 0120 |
| 14214 |     | A2=DRH(B+.5)                                                  | 0121 |
| 14262 |     | D2=0.0001*DRH(D2*10000.+5)                                    | 0122 |
| 14334 |     | PRINT1,A1,A2,D1,D2                                            | 0123 |
| 14406 |     | ENDPROCEDURE300                                               | 0124 |

0125  
0126  
0127

|      |             |            |      |             |       |      |             |       |      |            |
|------|-------------|------------|------|-------------|-------|------|-------------|-------|------|------------|
| 9999 | COS         |            | 3998 | COSF        |       | 3997 | SIN         |       | 3996 | SINF       |
| 9995 | EXP         |            | 3994 | EXPF        |       | 3993 | ALOG        |       | 3992 | ALOGF      |
| 9991 | SQRT        |            | 3990 | SQRTF       |       | 3989 | ABS         |       | 3988 | ABSF       |
| 9987 | NABS        |            | 3986 | NABSF       |       | 3985 | ATAN        |       | 3984 | ATANF      |
| 9983 | DRH         |            | 3982 | DRHF        |       | 3981 | NPR         |       | 3980 | NPRF       |
| 9979 | MOVE        |            | 3978 | MOVEF       |       | 3977 | MOD         |       | 3976 | MODF       |
| 9975 | SAVE        |            | 3974 | SAVEF       |       | 3973 | LINK        |       | 3972 | LINKF      |
| 9971 | NFIL        |            | 3970 | NFILF       |       | 3969 | NUPL        |       | 3968 | NUPLF      |
| 9967 | NWORD       |            | 3966 | MAXNR       |       | 3965 | NFST        |       | 3964 | NLAST      |
| 3963 | NBUF        | 39549      | 3953 | XBUF        | 39449 | 3943 | NAMET       |       | 3942 | E          |
| 3932 | F           | 39239      | 3922 | G           | 39139 | 3912 | FUNCT       | 39039 | 3902 | VALUE      |
| 3892 | ARG         | 38839      | 3882 | CNT         | 38799 | 3878 | FM          | 0001  | 3877 | FM         |
| 3876 | FM          | 0003       | 3875 | FM          | 0004  | 3874 | FM          | 0005  | 3873 | FM         |
| 3872 | FM          | 0008       | 3871 | FM          | 9301  | 3870 | N           |       | 3869 | 0000000019 |
| 3868 | SN          | 0011       | 3867 | I           |       | 3866 | 00000000001 |       | 3865 | 0000000002 |
| 3863 | 00000000006 |            | 3863 | XZERO       |       | 3862 | 000         |       | 3861 | X          |
| 3860 | SN          | 0020       | 3859 | SN          | 0030  | 3858 | XMAX        |       | 3857 | DELX       |
| 3856 | SN          | 0200       | 3855 | SN          | 002   | 3854 | X1          |       | 3853 | X2         |
| 3852 | X3          |            | 3851 | X2          |       | 3850 | X4          |       | 3849 | X5         |
| 3848 | X6          |            | 3847 | X7          |       | 3846 | A           |       | 3845 | X8         |
| 3844 | X9          |            | 3843 | X10         |       | 3842 | SN          | 0040  | 3841 | SN         |
| 3840 | B           |            | 3839 | C           |       | 3838 | D           |       | 3837 | NLH1       |
| 3836 | NLH2        |            | 3835 | NLH3        |       | 3834 | NLH4        |       | 3833 | NLH5       |
| 3832 | A1          |            | 3831 | A2          |       | 3830 | A3          |       | 3829 | A4         |
| 3828 |             |            | 3827 | A5          |       | 3826 | A6          |       | 3825 | 5120000000 |
| 3824 | A7          |            | 3823 |             | 003   | 3822 | A8          |       | 3821 | D6         |
| 3820 | I1          |            | 3819 | D7          |       | 3818 | Z           |       | 3817 | 5050000000 |
| 3816 | SN          | 0060       | 3815 | 00000000010 |       | 3814 | 0000000005  |       | 3813 | SN         |
| 3812 | J           |            | 3811 | SN          | 0061  | 3810 | SN          | 0055  | 3809 | 0000000063 |
| 3808 | SN          | 0047       | 3807 | SN          | 0048  | 3806 | L           |       | 3805 | SN         |
| 3804 | SN          | 0063       | 3803 | SN          | 0070  | 3802 | SN          | 0065  | 3801 | SN         |
| 3800 | M           |            | 3800 | 00000000004 |       | 3799 | SN          | 0090  | 3798 | SN         |
| 3796 | SN          | 0110       | 3795 | SN          | 0120  | 3794 | D1          |       | 3793 | D2         |
| 3792 | D3          |            | 3790 | PR          | 0300  | 3789 | NXH1        |       | 3788 | NXH2       |
| 3787 | I2          |            | 3786 | I3          |       | 3785 | I4          |       | 3784 | I5         |
| 3783 | I6          |            | 3782 | I7          |       | 3781 | I8          |       | 3780 | I9         |
| 3779 | J1          |            | 3778 | 4962500000  |       | 3777 | 5216000000  |       | 3776 | 4710000000 |
| 3775 |             | 5510000000 |      |             |       |      |             |       |      |            |

[illegible]

|      |       |                                                         |
|------|-------|---------------------------------------------------------|
| 0045 | C     | 0055 0054 0053 0049 0048                                |
| 0126 | CNT   | 0096                                                    |
|      | COS   | *0125 0125 0125                                         |
|      | COSF  | 0099 0098 0069 0029                                     |
| 0045 | D     | 0100 0028                                               |
| 0024 | DELX  | 0055 0054 0049 0048                                     |
|      | DRH   | 0043                                                    |
| 0098 | D1    | 0122 0121 0120                                          |
| 0122 | D2    | 0123 0101                                               |
|      |       | 0123 0122 0101                                          |
| 0100 | D3    | *0099                                                   |
| 0058 | D6    | 0101                                                    |
| 0059 | D7    | 0061                                                    |
| 0069 | E     | 0061                                                    |
|      | EXP   | 0074                                                    |
| 0071 | F     | 0031 0030                                               |
|      |       | 0072 0069 0069                                          |
| 0086 | FUNCT | *0063 0063 0063 0063 0063                               |
|      |       | 0091                                                    |
| 0066 | G     | *0086 0086 0086 0086                                    |
|      |       | 0075 0073                                               |
| 0068 | I     | *0066                                                   |
|      |       | 0114 0074 0072 0071 0069 0069 0069 0021                 |
| 0125 | I1    | *0063 0063 0063 0063 0063 0062 0020                     |
| 0107 | I2    | 0059 0058                                               |
| 0107 | I3    | 0115 0114 0111 0110 0108                                |
| 0107 | I4    | 0115 0114 0114 0112 0111 0110 0108                      |
| 0108 | I5    | 0115 0114 0112 0111 0109 0108                           |
| 0109 | I6    | 0116 0109                                               |
| 0110 | I7    | 0116                                                    |
| 0111 | I8    | 0116                                                    |
| 0112 | I9    | 0116                                                    |
| 0088 | J     | 0091 0090 0075 0075 0073 0071                           |
| 0114 | J1    | *0079 0079 0078 0070 0066 0066 0065                     |
| 0073 | K     | 0116                                                    |
|      |       | 0075 0022                                               |
| 0089 | L     | *0021                                                   |
|      |       | 0091 0090                                               |
|      |       | *0086 0086 0086 0086 0086 0085 0083 0083 0082 0082 0082 |
| 0095 | M     | 0081                                                    |
|      |       | 0097 0096                                               |
| 0019 | MOD   | 0021                                                    |
|      | N     | 0021                                                    |
|      | NAMET | 0016                                                    |
| 0046 | NLH1  | 0047                                                    |
| 0046 | NLH2  | 0047                                                    |
| 0046 | NLH3  | 0047                                                    |
| 0046 | NLH4  | 0106 0047                                               |
| 0046 | NLH5  | 0106 0047                                               |
| 0104 | NXH1  | 0106                                                    |
| 0104 | NXH2  | 0106                                                    |
|      | SIN   | 0099 0098 0069 0029 0027                                |
|      | SINF  | 0100                                                    |
|      | SQRT  | 0034                                                    |
|      | SQRTF | 0100                                                    |
| 0083 | VALUE | 0090                                                    |
| 0126 | X     | *0083 0082 0082 0082                                    |
|      |       | 0043 0042 0041 0040 0039 0038 0037 0035 0034 0032 0031  |
|      |       | 0030 0029 0029 0028 0027                                |
| 0024 | XMAX  | *0043 0026 0022                                         |
| 0024 | XZERO | 0042                                                    |
| 0027 | X1    | 0026                                                    |
|      |       | 0037                                                    |
| 0036 | X10   | 0041                                                    |
| 0028 | X2    | 0037                                                    |
| 0029 | X3    | 0037 0036                                               |
| 0030 | X4    | 0038                                                    |
| 0031 | X5    | 0038                                                    |
| 0032 | X6    | 0039                                                    |
| 0033 | X7    | 0039                                                    |
| 0034 | X8    | 0040                                                    |
| 0035 | X9    | 0041                                                    |
| 0125 | Z     | 0061 0060                                               |
|      |       | *0060                                                   |

\* OTHER CARDS WHERE VARIABLES ARE DEFINED

'CODE DIAGS

SYSTEM LOAD

```

ERR 38 : COMMON,A 0001
ERR 01 : RETURN3 0003
ERR 01 : ENDSEGMENT1 0004
ERR 02 : 1CONTINUATIONCARDFIRSTCARDOFSTATEMENT 0005
ERR 10 : DO12J=1, 0006
ERR 02 : DO12J=1, 0006
ERR 02 : STOP 0007
ERR 33 : A=cos(1) 0008
ERR 03 : 3 F=E 0011
ERR 04 : BEGINSEGMENT5 0012
ERR 05 : I=J+1) 0013
ERR 06 : GOTO1212121 0014
ERR 06 : 2 GOTOJ 0015
ERR 07 : 18 CONTINUE 0019
ERR 08 : 123 GOTO3 0021
ERR 09 : 8 DO8JL=1,5 0022
ERR 10 : DO1,I=1,2 0023
ERR 11 : A=1..2 0024
ERR 12 : NOW=JEANNIE 0025
ERR 13 : ZX(B)=0. 0027
ERR 14 : DIMENSIONP(1,2,3) 0028
ERR 14 : DIMENSIONR(K) 0029
ERR 15 : EQUIVALENCE(A,B) 0030
ERR 15 : CALLBAA(A)-B 0031
ERR 16 : 1 GOTO1 0032
ERR 17 : C=1 0034
ERR 18 : DO4I=1,N 0036
ERR 19 : BEGINTRACEA3.2 0037
ERR 20 : BEGINTRACE15.7 0040
ERR 21 : ACCEPT3,A 0041
ERR 22 : READ3,(ZX(I)I=1,3) 0042
ERR 14 : COMMONX 0042
ERR 23 : PRINTJ,K 0043
ERR 26 : PRINTJ,K 0043
ERR 12 : PRINTJ,K 0043
ERR 25 : 11 FORMAT(I5) 0045
ERR 30 : L(L)=A 0047
ERR 28 : READ3,(ZX(N),N=1,8*) 0048
ERR 29 : 7878 FORMAT(I3)I4 0049
ERR 29 : 279 FORMAT(3H I3) 0050
ERR 30 : IT=A-B 0053
ERR 30 : A=A--B**C+() 0054
ERR 31 : Y=10. 0055
ERR 33 : A=B-J 0056
ERR 36 : 4533 IF(GARBAGEPAILISQUITEFULL)4,5 0057
ERR 14 : DIMENSIONDD((2)) 0058
ERR 38 : DIMENSIONY(3) 0059
ERR 39 : J=1 0061
ERR 40 : DIMENSIONCUSF(20) 0062
ERR 40 : ABSF(5)=2. 0063
ERR 12 : ABSF(5)=2. 0063
ERR 41 : 100 FORMAT(100F2.0) 0064
ERR 33 : DATA,A/1/ 0065
ERR 34 : DATA,A/6HABCDEF/ 0066
ERR 35 : DATA,X/1. 0067
ERR 35 : DATA,I/1HAB/ 0068
ERR 24 : DATA,Y(I)/3.0/ 0069
ERR 35 : DATA,A/ 0070
UNDEF LABLS

```

```

3000 8000 5
UNDEF SMBS
KQ
OPEN DO 8 22
19

```

|                                       |      |
|---------------------------------------|------|
| COMMONA,A                             | 0001 |
| DIMENSIONY(2)                         | 0002 |
| RETURN3                               | 0003 |
| ENDSEGMENT1                           | 0004 |
| 1CONTINUATIONCARDFIRSTCARDOFSTATEMENT | 0005 |
| DO12J=1,                              | 0006 |
| STOP                                  | 0007 |
| A=COS(1)                              | 0008 |
| B=NABS(J)                             | 0009 |
| 3 READ4,A,B,C,D,E                     | 0010 |
| 3 F=E                                 | 0011 |
| BEGINSEGMENT5                         | 0012 |
| I=J+1)                                | 0013 |
| GOTO1212121                           | 0014 |
| 2 GOTOJ                               | 0015 |
| 118 I=1                               | 0016 |
| DO18I=1,2                             | 0017 |
| DO19J=1,3                             | 0018 |
| 18 CONTINUE                           | 0019 |
| DO123JK=1,4                           | 0020 |
| 123 GOTO3                             | 0021 |
| 8 DO8JL=1,5                           | 0022 |
| DO1,I=1,2                             | 0023 |
| A=1..2                                | 0024 |
| NOW=JEANNIE                           | 0025 |
| DIMENSIONZX(12)                       | 0026 |
| ZX(B)=0.                              | 0027 |
| DIMENSIONP(1,2,3)                     | 0028 |
| DIMENSIONR(K)                         | 0029 |
| EQUIVALENCE(A,B)                      | 0030 |
| CALLBAA(A)-B                          | 0031 |
| 1 GOTO1                               | 0032 |
| 9 I=1                                 | 0033 |
| /                                     |      |
| C=1                                   | 0034 |
| DO4I=1,N                              | 0035 |
| BEGINTRACEA3.2                        | 0036 |
| BEGINTRACE15.7                        | 0037 |
| N=2*I                                 | 0038 |
| 4 CONTINUE                            | 0039 |
| ACCEPT3,A                             | 0040 |
| READ3,(ZX(I))I=1,3)                   | 0041 |
| COMMONX                               | 0042 |
| PRINTJ,K                              | 0043 |
| ENDSEGMENT5                           | 0044 |
| 11 FORMAT(15)                         | 0045 |
| DO22M=1,KQ                            | 0046 |
| L(L)=A                                | 0047 |
| READ3,(ZX(N),N=1,8*)                  | 0048 |
| 7878 FORMAT (13)14                    | 0049 |
| 279 FORMAT (3H 13)                    | 0050 |
| EXECUTEPROCEDURE3000                  | 0051 |
| CALLSEGMENT8000                       | 0052 |
| 1T=A-B                                | 0053 |
| A=A--B**C+()                          | 0054 |
| Y=10.                                 | 0055 |
| A=B-J                                 | 0056 |
| 4533 IF (GARBAGEPAILISQUITEFULL)4,5   | 0057 |
| DIMENSIONDD((2))                      | 0058 |
| DIMENSIONY(3)                         | 0059 |
| GOTO4                                 | 0060 |
| J=1                                   | 0061 |
| DIMENSIONCUSF(20)                     | 0062 |
| ABSF(5)=2.                            | 0063 |
| 100 FORMAT(100F2.0)                   | 0064 |
| DATA,A/1/                             | 0065 |

DATA,A/6HABCDEF/  
DATA,X/1.  
DATA,I/1HAB/  
DATA,Y(I)/3.0/  
DATA,A/  
END

0066  
0067  
0068  
0069  
0070  
0071

'RUN DIAGS  
SYSTEM LOAD  
DIAGS NOT ON FILE

SYSTEM LOAD

```
07650 I=I+1
07686 END
```

0001  
0002

SYSTEM LOAD

39900''''02585963-#02585963-#M1535647-#M1535647-#M5675746-#M5675700-#02495546-#02495500-#M3566246-#M3566200  
39800''''N5575946-#N5575900-#M4594846-#M4594800-#M1634155-#M1634155-#N5414262-#N5414262-#M1426246-#M1426200  
39700''''N5464953-#N5464953-#N3495552-#N3495552-#02416545-#02416545-#N4564446-#N4564400-#N4566545-#N4566545  
39600''''-0000000#-0000000#-0000000#-0000000#-000000R99-000000-#-000000001M9000000-#N5645753-#N5645753

'CODE FMTLG  
SYSTEM LOAD

07650 READ1,I  
07686 1 FORMAT(50H  
07686 1 50H  
07686 2 50H  
07686 3 50H  
07686 4 50H  
FORMAT TOO LONG 4 50H

0001  
0002  
0003  
0004  
0005  
0006  
,I16) 0006  
,I16)

'RUN TEST1

SYSTEM LOAD

HO HO HO HO

SEGMENT 9000 TESTS DISK DATA STORAGE UNDER THE MOVE ROUTINE

|   |     |   |     |   |     |   |     |    |      |
|---|-----|---|-----|---|-----|---|-----|----|------|
| 1 | 1.0 | 2 | 2.0 | 3 | 3.0 | 4 | 4.0 | 5  | 5.0  |
| 6 | 6.0 | 7 | 7.0 | 8 | 8.0 | 9 | 9.0 | 10 | 10.0 |

SEGMENT 9100 INVERTS A NEAR-SINGULAR MATRIX

SEGMENT 9150 MULTIPLIES THE MATRIX BY ITS INVERSE AND DISPLAYS THE RESULT  
NOTE THE ERROR FROM PROPAGATION OF ROUND OFF

|            |            |            |            |            |
|------------|------------|------------|------------|------------|
| .99998000  | .00030000  | -.00100000 | .00400000  | -.00140000 |
| -.00001000 | .99990000  | -.00050000 | .00200000  | .00010000  |
| -.00000900 | -.00010000 | .99970000  | .00200000  | .00060000  |
| -.00000400 | .00000000  | -.00070000 | 1.00300000 | -.00020000 |
| .00000800  | .00000000  | -.00080000 | .00110000  | .99960000  |

SEGMENT 9200 GENERATES STANDARD NORMAL DEVIATES BY SUMMING RANDOM INTEGERS

|                |                |                |                |                |
|----------------|----------------|----------------|----------------|----------------|
| -.87734000E 00 | -.59061000E 00 | -.83801000E 00 | -.18343800E 01 | -.59712000E 00 |
| .57057000E 00  | .89262000E 00  | .13486900E 01  | -.16082000E 00 | .20585000E 00  |

## TEST2 TESTS SUBROUTINES

1 3863  
3 3863  
1 3863

1.000 3861  
3.000 3861  
1.000 3861

1 3863  
4 3863

1.000 3861  
4.000 3861

| X         | SIN(X)     | COS(X)        | TAN(X)     |
|-----------|------------|---------------|------------|
| X         | EXP(X)     | EXP(-X)       |            |
| X         | LOG(X)     | LOG10(X)      |            |
| X         | SQRT(X)    | LOG10(TAN(X)) |            |
| X         | ATAN(X)    |               |            |
| .40000000 | .38941834  | .92106099     | .42279322  |
| .40000000 | 1.49182470 | .67032004     |            |
| .40000000 | -.91629073 | -.39794000    |            |
| .40000000 | .63245553  |               |            |
| .40000000 | .38050637  | -.37387198    |            |
| .60000000 | .56464247  | .82533561     | .68413681  |
| .60000000 | 1.82211880 | .54881163     |            |
| .60000000 | -.51082562 | -.22184874    |            |
| .60000000 | .77459667  |               |            |
| .60000000 | .54041950  | -.16485704    |            |
| .80000000 | .71735609  | .69670670     | 1.02963850 |
| .80000000 | 2.22554090 | .44932896     |            |
| .80000000 | -.22314355 | -.09691001    |            |
| .80000000 | .89442719  |               |            |
| .80000000 | .67474094  | .01268477     |            |

## FLOATING POINT ARITHMETIC

|             |             |           |           |
|-------------|-------------|-----------|-----------|
| 4.44400000  | 36.56516000 | .50000000 | .79144978 |
| -.50000000  | 5.19804550  | .16666666 | .16666666 |
| 1.23432100  | .81016201   | .00000000 |           |
| 1.00000000  |             |           |           |
| 1.00000000  |             |           |           |
| 4.00000000  | 2.10000000  | 2         |           |
| 1.00000000  |             |           |           |
| 7.00000000  | 2.40000000  | 2         |           |
| 1.00000000  |             |           |           |
| 10.00000000 | 2.70000000  | 2         |           |
| 1.00000000  |             |           |           |
| 1.00000000  | 3.00000000  | 3         |           |
| 1.00000000  |             |           |           |
| 4.00000000  | 2.10000000  | 2         |           |
| 1.00000000  |             |           |           |
| 7.00000000  | 2.40000000  | 2         |           |
| 1.00000000  |             |           |           |
| 10.00000000 | 2.70000000  | 2         |           |
| 1.00000000  |             |           |           |
| 5.00000000  | 3.00000000  | 3         |           |
| 10.00000000 | 5.10000000  |           |           |
| 1.00000000  | 10.10000000 |           |           |
| 1.00000000  | 1.10000000  |           |           |

THIS IS THE 1ST OF THE 4 LOOPS OF DO 130

|            |            |            |            |            |
|------------|------------|------------|------------|------------|
| 1.11100000 | 2.22200000 | -.54319181 | 1.06872570 | 1.00000000 |
| 1.12500000 | 2.00000000 | -.54319181 | 1.06870000 |            |

THIS IS THE 2ND OF THE 4 LOOPS OF DO 130

|            |            |            |            |            |
|------------|------------|------------|------------|------------|
| 1.11100000 | 2.22200000 | -.54319181 | 1.06872570 | 1.00000000 |
| 1.12500000 | 2.00000000 | -.54319181 | 1.06870000 |            |

THIS IS THE 3RD OF THE 4 LOOPS OF DO 130

|            |            |            |            |            |
|------------|------------|------------|------------|------------|
| 1.11100000 | 2.22200000 | -.54319181 | 1.06870000 | 1.00000000 |
| 1.12500000 | 2.00000000 | -.54319181 | 1.06870000 |            |

THIS IS THE 4TH OF THE 4 LOOPS OF DO 130

|            |            |            |            |            |
|------------|------------|------------|------------|------------|
| 1.11100000 | 2.22200000 | -.54319181 | 1.06870000 | 1.00000000 |
| 1.12500000 | 2.00000000 | -.54319181 | 1.06870000 |            |

INTEGER ARITHMETIC

|    |    |     |      |   |
|----|----|-----|------|---|
| 22 | 11 | 33  |      |   |
| 66 | 33 | 242 | 7986 | 3 |
| 66 |    |     |      |   |

STOP 0555

'CUT TEST1  
SYSTEM LOAD

'CUT TEST2  
SYSTEM LOAD

'DISK  
SYSTEM LOAD  
000  
64000

'CODE MLM  
SYSTEM LOAD  
07650      DIMENSIONA(10),B(50),C(100),M(100),G(200,20)  
SYM TAB FULL

0001