INTERNAL TRANSLATOR

(I T)

A COMPILER FOR THE 650

by

A. J. Perlis

J. W. Smith

H. R. VanZoeren

Computation Center

Carnegie Institute of Technology

References to this program should include the above file number.
All other numbers in the body of the program write-up should be ignored.

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PROGRAM DECKS AND SAMPLE CASE
FOR
650 Library Program 2.1.001 - "IT" (Internal Translator)

The various card decks in this IT package are arranged as indicated below. In each deck the cards are end-printed serially beginning with 001.

Deck	Number of Cards
R1 reservation deck (SOAP cards)	22
R2 " " " "	26
R3 " " " "	24
R4 " " " "	28
Square root subroutine " "	41
Cosine " " "	80
Sine " " "	81
P1 package deck (five/card format)	56
P2 " " " "	79
P3 " " " "	80
P4 " " " "	103
SOAP deck (modified) (seven/card format)	137
IT system deck " "	255
IT statements for sample case (Simpson's Rule)	32
IT output " " " " "	209
SOAP " " " " " "	58
Data card " " " " "	1
Result cards " " " " "	11

ERRATA

650 Library Program - File No. 2.1.001

"Internal Translator (IT), A Compiler for the 650," By A.J.Perlis, J.W.Smith, and H.R.VanZoeren.

In the SOAP Listing of the Compiler

Card No.	Should read:							
1. 0341		SUP	A0001		1065	11	0383	1137
2. A0341		STU	NEWAB		1137	21	0845	0887
3. 0603	BS	LDD		DROPU	0987	69	0690	0893
4. A0603		RAL	NEWAB		0690	65	0845	0298
5. B0603		NZA	BSA		0298	45	0786	0640
6. 0606		STL	A0001	BSA	1485	20	0383	0786
7. 0607	BSA	RAU	N	BN1	0786	60	0484	1039
8. 0650		LDD		LDSR	1413	69	1377	1038
9. Delete cards 651,652,653,and 1692.								

The above changes are corrections to the compiler and do not represent misprints in the listing. Changes 1-7 are necessary since the compiler, as distributed, would incorrectly erase an entry in the abcon table every time a floating point constant with a negative exponent was compiled, regardless of whether the exponent had previously been stored as a constant. Changes 8 and 9 are necessary to make room for the insertions.

The above changes should be made in the seven per card deck which is in standard seven words per card form.

The Computation Center
Carnegie Institute of Technology

4/18/58

ERRATA

December 18,1957

650 Library Program-File No. 2.1.001

''Internal Translator (IT), A Compiler for 650'', By A.J.Perlis, J.W.Smith, and H.R.Van Zoeren

In the SOAP listing of the Compiler

Card No.		Should Read				
1. Correction:						
1442	STU	OPSGN	1334	21	0524	1902
2. Insertion:						
1442A	STD	V1	1902	24	0488	1384

The above changes are corrections to the compiler and do not represent misprints in the listing. The compiler as distributed would construct an incorrect translation of multiple parameter subroutines at least two of whose parameters are expressions.

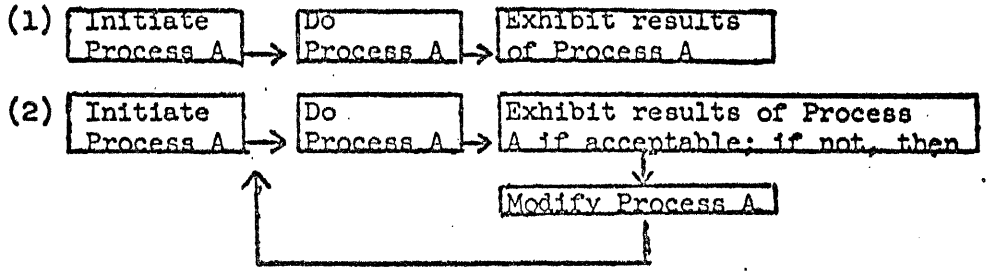
The above change should be made in the seven per card deck which is in standard seven words per card form.

TABLE OF CONTENTS

PART I - PROGRAMMER'S GUIDE

I. Introduction.

There exists a general class of problems -- which include most engineering and scientific problems -- whose solution has a prescription represented by one of the two following schemes:



Here A is a process - a finite sequence of arithmetic operations applied to a finite number of variables -- which operates on a set of input variables to produce a set of output variables, i.e., A is a function.

Scheme (1) is representative of those problems whose exact solutions can be obtained by a finite number of arithmetic operations applied in a sequence which is assigned a priori.

Scheme (2) represents, among others, those problems whose exact solutions can, in general, only be obtained by an infinite number of arithmetic operations applied in a sequence which is assigned a priori. Such problems are rephrased to require solutions which will, in some sense, approximate the exact solution. Such modified problems have solutions which can be obtained by a finite number of arithmetic operations applied in a sequence which may not be a priori determinate -- actually the sequence can be determined, but its enumeration is equivalent to solving the problem.

Problems of the first kind consist of a finite collection of processes, each of which has an a priori determinate (unique) successor.
Problems of the second kind consist of a finite collection of processes,

some of which may have more than one possible successor -- chosen from among a finite set -- with an associated set of rules which effects the unambiguous determination of successors. Problems of both classes can be represented as having solutions in the form of algorithms: A finite collection of distinguishable processes, together with a function -- the control function -- which unambiguously selects a successor for each process.

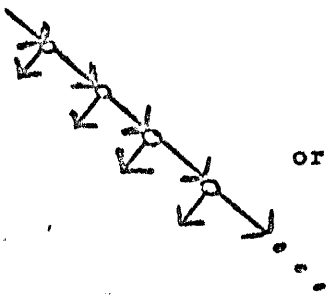
In general, the control function has no simple analytic form, nor is it unique. Its purpose is to choose an explicit ordering of the processes to be accomplished whenever the algorithm is to be applied. In problems of the second kind, the set of integral values taken on by the control function is not, in general, a priori determinate.

A computable algorithm is an algorithm for which no process is carried out more than a finite number of times. The only problems of interest, at least in terms of digital computation, are those whose solutions can be obtained from a computable algorithm. Indeed, every computable algorithm is the description of a special purpose digital computer. A computation of such an algorithm is a specification of values for certain problem variables together with a possible set of values of the control function which includes integers designating a first process and a (meaningful) final process.

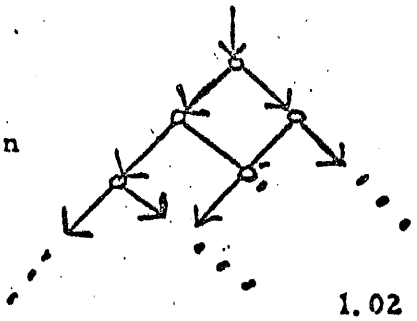
The control function is completely described by assigning to each process the designators of (integers which distinguish) all meaningful successors, and a rule by which the appropriate designator may be extracted whenever the rule is applied.

Such a rule which makes a determination from among n possible successors can always be replaced by a sequence of rules each of which makes a binary decision, viz:

becomes



or even



Hence only such rules or functions need be considered, i.e., the control function of any computable algorithm is a set of functions, finite in number, the range of each of which is the digits 0 and 1. These functions may be considered as propositions on the problem variables which, if true, take on the value 1 (the left branch at a node of the graph) and, if false, take on the value 0 (the right branch). Such propositions must involve only arithmetic operations on problem variables i.e., they must be processes which define problem variables. For example, a proposition may be taken as true if the defined variable is non-negative, otherwise false. Indeed, it is asked whether the defined variable is in some arithmetic relation to zero. Without loss or generality these relations may be limited to the following:

greater than

greater than or equal to

equal to

Such rules are arithmetic (binary) decision procedures and have the following explicit form:

Given: (i) A process (identified by the integer) k

(ii) Two possible successors designated by n and m

(iii) Two problem variables x and y

(iv) A relation σ

Choose n if x is in the relation σ to y : $x \sigma y$

Choose m if x is not in the relation σ to y : $x \not\sigma y$

In general most of the processes in an algorithm have unique successors which may be schematically represented as that process terminating an arrow symbol, $\longrightarrow$ (meaning "and then"), i.e., by propositions which are always true

It has been indicated that an algorithem can be represented by a graph of connected line segments whose nodes represent the processes while the

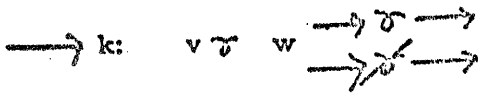
topology of its directed links gives the structure of the control function. Such graphs are commonly referred to as flow charts. Because of the flexibility of their form they are the most commonly used representation of computable algorithms. In general a computable algorithm may be represented by more than one flow chart.

Each process in the flow chart defines a variable as a rational function of initially, or previously defined, variables. Schematically, a process may be represented as:

$\longrightarrow$ k: $v = f(x_1, x_2, \ldots, x_n; c_1, c_2, \ldots, c_m) \longrightarrow$

Here the x's are variables, the c's constants, and k the (integral) designater for the process.

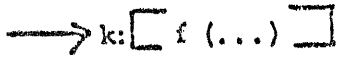
Binary decisions may be represented as:



To complete the schematic representation, a FINISH is adjoined:

There must be at least one process which is the direct successor of no other process. Such a process is an initial one in an algorithm. When the algorithm is defined in terms of some set of initial variables, a computation of the algorithm requires the assignment of values to these variables. Schematically, this assignment may be represented by a table which may be taken as the initial process.

It is clear that a flow chart is a representation of a function -- the computable algorithm. A flow chart may then be considered as a type of macro-process which itself may be a component process of some other flow chart. Such non-elementary processes may be represented as:



where f (...) is itself computable. Such computable functions, when

of wide utility, are usually called subroutines. Two classes of subroutines are identified: (i) Those of general utility, eg., (computable approximations of) sin x, e^x, $\sqrt{x}$, matrix inversion, etc.; (ii) Those of local utility, e.g., those which may frequently occur within one flow chart.

In the above representations equality signs (=) have been used in two different contexts -- as a relational identity in which a = b means that a - b is zero; and as a substitutional identity in which a = b means that the value of a becomes the value of b, e.g., n = n + 1 means the value of n is incremented by one. It is convenient to use an arrow (←) for this latter context and to reserve (=) for the first cited context.

As originally designed most computers accept and operate on (in this case decimal) numbers having a sign and a fixed number (in this case ten) of digits. All numbers are, in magnitude, consigned to a fixed interval, e.g., $0 \leq |x| < 1 \cdot 10^{10}$. This is called the fixed point representation of numbers. If the result of an arithmetic operation is outside the interval, special provision is required to prevent the stopping of the computer on overflow.

Since a priori scaling of a problem is often quite difficult the floating point representation of numbers has been established. In this form all numbers, X, are written as $X = 10^{-50}(Y \cdot 10^{Z})$ and are carried as a number pair (Y, Z) where $1. \leq |Y| < 10$ and $0 \leq Z \leq 99$. Y contains, in this instance, eight digits and the sign of X. Z consists of two decimal digits which specify the location of the decimal point and is called the machine power of the number. X = 0 is defined to be (0, 0). Numbers of the above form will be called allowable numbers. The extension of the interval in which X may lie makes overflow less likely to occur in the course of an extended computation. To cite an example, the eight digit real number + 1865.0076 would be represented as the pair

(+18650076, 53) and is then said to be in standard floating point form.

II. A Compiler For The 650.

A compiler may be defined as a program which satisfies the following four conditions:

1. It provides direct machine translation of flow charts into a code.

2. It has the ability to translate into some machine language any program which could have been coded in that language, i.e., it has the same scope as the machine in question.

3. It automatically allocates machine storage. Such allocation is almost independent of the logical structure of the problem.

4. It may extend its list of understandable symbols to include those identifying any particular flow chart when it is instructed to do so.

The motivations leading to the consideration of a compiler are obvious to anyone who has ever programmed. Nevertheless they may be summarized as follows:

1. Programming involves a large amount of repetitive labor and hence is worthy of automation.

2. Those who propose problems should program them, but should not be required to code them.

3. The ratio of time required to flow chart a problem to that for coding it should be much larger than one. Currently it is much smaller than one and, as the machines get larger, this ratio may tend to zero.

4. The structure of compilers may provide insight into the logical design requirements of future computers.

In the sequel a compiler for the IBM 650 is described which provides an automatic translation into 650 codes of those solutions of problems

expressed as computable algorithms, i.e., as flow charts.

A particular formal language, named IT, will be described in which processes and control functions must be couched in order that this translation may occur. Programs written in this language are called IT programs. Examples will be cited in III to show how certain, admittedly simple, flow charts may be described in this language.

1. IT's Characters.

The language as described is applicable to the IBM 650 which admits the digits 0 through 9 and the (Roman capital) letters A through Z. Thus certain standard symbols are represented by alphabetical characters. Except when it occurs in an ENGLISH word, each alphabetical character has one and only one meaning in this language.

1.1 Punctuation characters.

SYMBOL	NAME	REPRESENTATION
(	Left parenthesis	L
)	Right parenthesis	R
.	Decimal point	J
←	Substitution	Z
=	Relational equality	U
>	Greater than	V
≥	Greater than or equal	W

The following punctuation characters will be introduced as they arise;

,	Comma	K
"	Quotation marks	Q
	Type	T
	Finish	F
	Extension identifier	E

1.2 . Variable characters.

I

Y

C

1.3 . Digit characters.

The integers 0 through 9

B (see section 3.2.3)

In the sequel lower case letters, such as k,l,m, and n will be used to represent arbitrary positive integers.

1.4 . Operator characters.

SYMBOL	NAME	REPRESENTATION
Binary operators		
+	Addition	S
x	Multiplication	X
/	Division	D
exp	General exponentiation Viz: a Fb means a^b	P
Unary operators		
|...|	Absolute value	A
- ...	Negative of	M ...

2. IT's variables.

2.1 . Problem (fixed point) variables

In IIn IIIn For example I8 II36 III2

These variables take on integral values only and are used primarily as indices.

2.2 . Problem (floating point) variables

Yn	YIn	YIIn	Y3	YI47	YII21
Cn	CIn	CIIn	C3	CI0	CII7

For example:

Thus, if I21 = 10 and I10 = 20, then II21 is the variable I10 and YII21 is the variable Y20.

The C&Y classes of variables have the same logical significance in the language. They aid in the (external) differentiation between two classes of data or problem variables. The numerical value of any of these variables is always represented in floating point form.

2.3 . Composite variables

Y(...)		Y(I1 + 6)
I(...)	For example	I(II3 x I9)
C(...)		C(I (I1 + 2))

The parenthesized quantities must be fixed point expressions (see section 4.4).

2.4 . Matrix (floating point) variables

YN(..., ...)

CN(..., ...)

are general elements of the two matrices (listed row-wise) whose components are Y0, Y1, Y2, ... and C0, C1, C2, ... respectively.

The parenthesized quantities, which must be fixed point expressions, specify the row and column location, respectively, of the matrix variable.

The row dimensions of YN and CN, i.e., the number of columns in the matrices, must be specified by assigning them to I1 and I2 respectively. Thus, when using the matrices $\begin{Bmatrix} YN \\ CN \end{Bmatrix}$ of dimension, say $\begin{Bmatrix} k \\ j \end{Bmatrix}$, $\begin{Bmatrix} I1 \\ I2 \end{Bmatrix}$ must be assigned the (fixed point) value $\begin{Bmatrix} k \\ j \end{Bmatrix}$.

The row subscript and the column subscript always range from zero to their respective dimensions less one.

For example, a rectangular matrix, YN, of row dimension three and column dimension four would be:

Y0	Y1	Y2
Y3	Y4	Y5
Y6	Y7	Y8
Y9	Y10	Y11

Here, YN (0,0) is the variable Y0, while YN(1,2) is the variable Y5. I1 must be assigned the value three.

Another technique for handling matrices is described in part III.

Note: vn will designate an arbitrary variable and Δ an arbitrary admissible operator in the sequel.

3. Admissible constants.

3.1 . Fixed point constants (integers)

$n_1n_2...n_k$ $k \leq 10$ For example 1066 ; 10 ; 1292345566

However 123. is not such a constant since it contains a decimal point.

3.2 Floating Point Constants

3.2.1 $n_1n_2... n_i.n_{i+1} ... n_k$ $k \leq 8$

For example 14.92 ; .11 ; 13.

3.2.3 $n_1n_2 ... n_k$B m $k \leq 8$ which means

$n_1n_2... n_k \times 10^m$, where a) $n_1n_2 ... n_k$ is either a fixed or a floating point constant, and b) m must be either m_1m_2 or $-m_1m_2$, where m_1m_2 is a fixed point constant.

RULE: If m is of the form $-m_1m_2$ then the entire constant must be enclosed in parentheses.

For example 14.92 B 3; (1066 B-11); (-727B-3) mean 14.92×10^3; 1066×10^{-11}; and -727×10^{-3}, respectively.

Note: Floating point constants used within statements (see section 5) must be in the above form and not in standard floating point form. Thus 14.92 but not 1492000051.

4. IT's operands.

4.1 . Any variable or constant is an operand.

4.2 . If v1 and v2 are operands, then (v1 Δ v2) is an operand.

4.3. Subroutines, themselves functions of one or more operands, are operands. They are represented as " n E , v1 , v2 , ... , vj" which means the subroutine whose identification number is n and which is a function of the operands v1 , v2 , ... , vj. Here n must be a fixed point constant less than 626. For example, if the sine subroutine were subroutine number 22, then sin (Y1 + Y2) would be represented by "22 E , (Y1 + Y2)" while "1 E, "22 E ,(Y1+ Y2) "" would represent $\log_{10}$ (sin (Y1 + Y2)) if subroutine number 1 were the log routine.

4.4 . If v1 and v2 are operands, then v1 Δ v2 is an expression. Due to the method by which IT examines strings of symbols, some expressions will not be treated as operands. However all operands are expressions. The norm of an expression is the number of symbols, exclusive of spaces, making up the expression.

4.5 . If an operand is a variable or a constant its arithmetic (floating point or fixed point) is that of the variable or constant.

4.6 . If any operand, with the exception of subroutines (EXTENSIONS), is composite and at least one of its members is floating point, the arithmetic of the entire operand is floating point.

4.7 . The arithmetic of subroutines is determined by their extension number, according to the following:

$n < 500$ floating point ; $n \geq 500$ fixed point

5. IT's statements.

Each statement is identified by a non-negative integer $k \leq 626$. The execution sequence of a set of statements is not determined by this identifier, but rather by the physical ordering.

A natural correspondence exists between the types of processes

found in flow charts and the kinds of statements in the language. Statements may be considered as sentences -- correctly formed strings in the characters of the language. A description of the various statement forms follows.

5.1 . Substitution statement

k: v1 ← v2

where v1 is a variable, v2 is an expression and k is the statement identifier (number). The effect is to set the value of v1 equal to that of v2 in the arithmetic of v1. Thus,

7: YI2 ← I1 + I3 x Y3 - Y4

sets the value of YI2 equal to that of I1 + I3 x (Y3 - Y4) in statement 7.

5.2 . Unconditional linkage statement

Any of

k: G n

k: G I...I n

k: G (...)

where k is the statement number. The effect is to define an unconditional transfer, i.e., an interruption of the execution sequence to that statement whose identifier is n, or the value of I...In, or the value of the fixed point operand, whichever the case may be.

5.3 . Relational (conditional) linkage statement

Any of

k: G n
k: G I...In } IF v1 γ v2
k: G (...)

where v1 is an operand, v2 an expression, and γ is one of the three relations $=, >, \geq$. If v1 is in the relation γ to v2, the effect is that of the G portion of the statement; if not, the execution sequence is unaltered. Thus,

4: G I3 IF (Y1 + Y2) $\geq$ 9

effects the transfer of control to the statement having a number which is the value of I3 if Y1 + Y2 $\geq$ 9; otherwise the sequence is unaltered. Removing the parentheses would make the statement inadmissible since, in relational statements, when the left member is compound, it must be delimited by parentheses.

5.4 . Halt statement

k: H

The effect is to suspend computer operation. Pressing PROGRAM START will cause computation to resume with the next IT statement.

5.5 . Input statement

k: READ

The effect is to initiate the input of one or more data cards whose formats are described in section 14. As an aid in identification, any number of characters may preceed the word READ.

5.6 . Output statement

k: T v1 T v2 T v3 T v4

Theeffect is to punch a card, whose format is that of a type 1 (see Section 14) input card, containing the names and current values of v1, v2, ..., v4. Here the v's must be variables but neither constants nor matrix variables, and from one to four may be listed in the statement. If a variable is composite, say YI6, its current name is punched, e.g., if, at punching, the value of I6 is 4 then the value of Y4 will be punched together with the name Y4. The statement number is always punched on the card.

5.6. 1 Conditional Output statements, which have the same form as Output Statements except that the statement number must be zero. They provide output conditional on the sign storage entry switch during operation of the compiled program as follows: Storage entry switch set to minus (-) activates

output; positive (+) setting causes output to be bypassed.

5.7 . Iteration statement

k: j, v1, v2, v3, v4,

Here

j is an integer which must be positive

v1 is a variable

v2 is an expression

v3 is an expression

v4 is an expression which must not involve any of the operators: X, D, P.

The norm of each v must not exceed five.

The effect is to construct an iteration of the set of statements interposed between k and (including) j -- called the scope of the iteration statement -- on the variable v1 as it varies from v2 to v4 inclusive in increments of v3. Thus,

```
15:   I9, I1, I3 + 4, I4,  I5 + 1,
21:   Y5 ← CI1 + 2
19:   YI1 ← Y5 - 7
```

causes statements 21 and 19 to be executed sequentially for all values of I1 from I3 + 4 to I5 + 1 in steps of I4.

If v4 - v2 is not divisible by v3 the iteration stops before v1 assumes a value beyond v4.

If v3 is to represent an actual decrement it must be of the form -v, where v must be a constant or a variable which takes on only non-negative values.

Any of v2, v3, v4 can be of the form -v. In general, fixed point quantities should be used in iteration statements. If floating point quantities are used, great care should be taken to insure that the desired number of iteration cycles be executed.

A hierarchy of nesting of iterations is permitted, i.e., an iteration statement may be included within the scope of a prior iteration statement.

However, no particular nesting may exceed a depth of four. Any statement which immediately follows an iteration statement must have a unique non-zero statement number.

5.8 . Extension statement

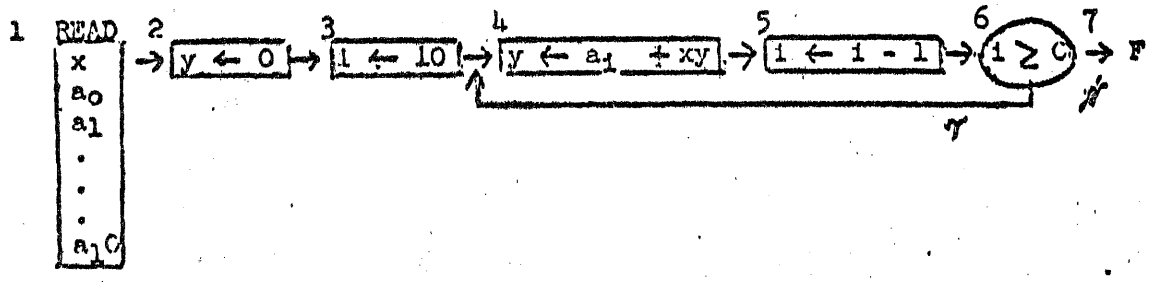
k: "n E , ..."

The effect is to accomplish the sub-routine before passing to the next statement in sequence. Such a statement is used wherever compound sequences of operations, not necessarily leading to the definition of a single variable, are required. Thus, that of sorting, solving a system of differential equations, packing and unpacking data, etc.

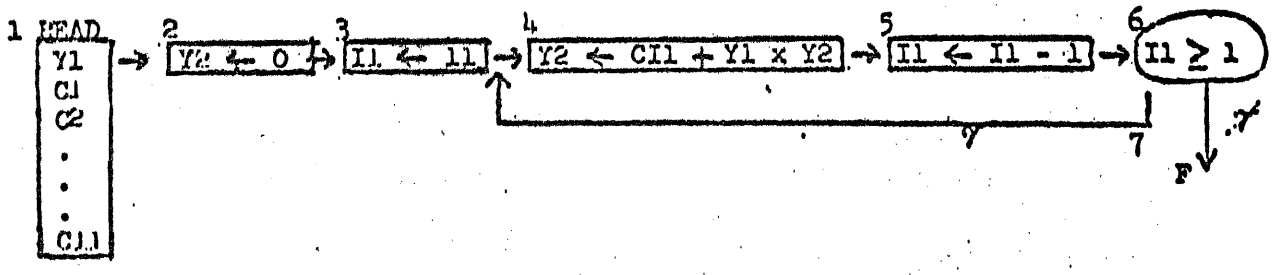
6. Example.

The following will indicate how a particular flow chart may be represented in compiler language.

The flow chart below evaluates the polynomial $y = \sum_{i=0}^{i=10} a_i x^i$



Using the notation for variables in the compiler language, the flow chart is simply:



7. The corresponding program in the compiler language is:

1: Y1, C1 through C11 READ

2: Y2 ← 0

(I)

```
3:    I1←I1
4:    Y2←CI1+Y1 x Y2
5:    I1←I1 - 1
6:    G 4 IF I1≥ 1
7:    H
```

or, using an iteration statement and letting the degree be variable by assigning it (plus one) to the variable I5:

(II)

```
1:    Y1, C1 through C11, I5 READ
2:    Y2←0
3:    4, I1, I5, -1, 1,
4:    Y2←CI1+Y1 x Y2
7:    H
```

Using the required representation for all symbols, the latter program for evaluating a polynomial of any degree becomes:

```
1:    Y1, C1 THROUGH CI1, I5 READ F DATA READ
2:    Y2  Z  OJ                    F SET P
3:    4K  I1K I5K  M1K  1K         F I LOOP
4:    Y2  Z  CI1+Y1 x Y2           F NEW P
7:    H                            FF STOP
```

The following remarks concerning the representation of the flow chart are pertinent:

Each process in the flow chart leads to one and only one statement in (I). However (II) encompasses in one statement, that numbered 3, the processes numbered 3, 5, and 6 in the flow chart.

These three processes are typical of certain iterations where a process f (...) is to be carried out for all $n_1 \leq i \leq n_2$, or for some subset for which $i_1 = n_1$, $i_{j+1} = i_j + m$, $i_p = n_2$. Process 3 sets the parameter; process 5

increments it; and process 6 determines whether its upper limit has been surpassed. These responsibilities are combined in the iteration statement.

Since Y1 is a floating point variable it is convenient, but not necessary, to use a zero which is a floating point constant, i.e. 0J.

The degree of the polynomial is, properly speaking, a problem variable. Treating it as such in (II) consequently makes for a more general program.

The F and the FF mark the statement end and program end respectively, and must be used.

8. The Process of Compilation

The compilation process is independant of the statement type. Statements are compiled in their order of entry into the computer, and the compilation of any single statement is independant of the nature or presence of other statements. Compilation within a statement is unidirectional from the end of the statement to the beginning (i.e., from right to left) and is completed in one pass. Within a statement, parentheses are ordered from the right.

Each of the four binary operators $[\Delta]$: + / X P has a left and right operand, $V_L(\Delta)$ and $V_R(\Delta)$ resp., which are expressions.

$V_R(\Delta)$ is the expression delimited on the left by Δ and on the right by the first comma or unmatched right parenthesis or right quotation, or - if none such occur - the end of the statement.

$V_L(\Delta)$ is the operand to the immediate left of Δ, i.e., the operand whose rightmost character is immediately to the left of Δ.

In the following examples the brackets delimit the right and left operands of the underlined binary operators:

Y1 ± Y2

Y1 ± Y2 / Y3

Y1 ± (Y2 / Y3) ± I4

Y1 ± "1E, Y4 ± Y7 " ± I4

The unary operators A and - have only a right operand which is that operand immediately to their right; for example,

A (--------)

A " -------- "

A Y1 + Y2 + Y3

The unary operator, MINUS, differs from the true unary operator A, in that it can be preceeded on the left by the following only:

(a) any operand; here the effect of MINUS is that of PLUS MINUS, e.g.:

Y2 - Y3 + (Y4 x Y5) - Y6 / Y7

means

Y2 + (-Y3) + (Y4 x Y5) + (-Y6) / Y7

(b) the substitution operator ←

e.g.: Y1 ← - Y2 Y1 ← (-Y2)

mean

Y1 ← - Y2 + Y3 Y1 ← ((-Y2) + Y3)

(c) the exponentiation operator P

e.g.: Y1P - Y2 Y1P (-Y2), i.e.: $Y1^{-Y2}$

mean

Y1P - Y2 + Y3 Y1P ((-Y2) + Y3)), i.e.: $Y1^{(Y3-Y2)}$

N.B. -Y1PY2 means (-Y1) PY2

(d) the punctuation character COMMA,

e.g.: ,-Y1 ,(-Y1)

mean

,-Y1 + Y2 ,((-Y1) + Y2)

(e) the character LEFT PARENTHESIS (

e.g.: (-Y1) (-Y1)

mean

(-Y1 + Y2) ((-Y1) + Y2)

(f) the symbol B; see Section 3.2.3

Briefly then, if v1 is an operand then -v1 will, when applicable, be treated as an operand which is the negative of v1.

The three relational operators = ; ≥ ; > have right operands as described above for binary operators. The left expression of the relation must be an operand, e.g.:

G k IF Y2 γ ---------

G k IF (-----) γ ---------

G k IF " ----- " γ ---------

but not

G k IF Y1 + Y2 γ ---------

The symbol pairs = - ; > - ; ≥ - ; are inadmissible.

In the above, the brackets delimit the left operand of the relation, Δ , which is one of = ; ≥ ; > .

Within a statement, binary and relational operations are completed in the order - from right to left - in which the leftmost character of their left operands are found. Unary operations are compiled from right to left as they occur. In the following example, the operations - together with their right and left operands - are listed in order of completion.

Y3 - Y1 + (Y2 X (2 + I4) / I1 + 1) - A Y2

Order	Left Operand	Operation	Right Operand
1	I1	+	1
2	2	+	I4
3	2 + I4	/	I1 + 1
4	Y2	X	(2 + I4) / I1 + 1
5	(Y2 X -------- I1)	+	(-A Y2)
6	(-Y1)	+	(Y2 X ------ I1) + (-AY2)
7	Y3	+	(-Y1) + (Y2 X ----- I1) + (-AY2)

This method of scanning statements does not conform to the standard hierarchal approach of decomposing arithmetic complexes. Thus, to the compiler, Y1 X Y2 + Y3 does not have the customary meaning of (Y1 X Y2) + Y3 but rather that of Y1 X (Y2 + Y3). Should the former meaning be the one desired, the expression must be written as (Y1 X Y2) + Y3. An arithmetic complex can be given any desired meaning by appropriately positioning parentheses. Any number of parentheses may be used within a statement subject only to the restriction that no single parenthesis nesting may exceed a depth of nine (9). The above remarks hold, without exception, for quotations and mixed nestings of parentheses and quotations.

Visualizing the statement as a string of symbols, scanning proceeds from right to left by examining successive symbol pairs (spaces being ignored). Each symbol pair has a unique effect on the compilation which is essentially independent of neighboring symbols. IT recognizes 34 distinct symbols (plus spaces). Of the 1156 possible symbols pairs, only 200 have meaning. Each meaningful, or admissible symbol pair is associated with a subprogram within the compiler, called the generator for that symbol pair. Of the 200 possible generators, only 64 are distinct. Entry to the generators is obtained through a table.

IT parallels - and intentionally so - the internal organization of a stored program digital computer in which the instructions are statements, the control register is the scanner, the order matrix is the symbol table, and the central and arithmetic controls are the set of generators. A list of the meaningful symbol pairs (spaces being ignored) follows. The presence of other symbol pairs within a statement will halt compilation (see section 11).

Permissible Symbol Pairs and Compiler Representation

AI	AI	FA	FA	.P	JP	(I	LI	P.	PJ
A(	AL	FC	FC	."	JQ	(.	LJ	P(	PL
A"	AQ	FF	FF	.)	JR	((	LL	P"	PQ
AY	AY	FI	FI	.+	JS	(-	LM	PY	PY
B-	BM	F.	FJ	.=	JU	("	LQ	Pn	Pn
Bn	Bn	F(	FL	.>	JV	(Y	LY	P-	PM
CI	CI	F"	FQ	.≥	JW	(n	Ln	"/	QD
C(	CL	Fn	Fn	.X	JX	-A	MA	"F	QF
CN	CN	GI	GI	.n	Jn	-C	MC	",	QK
Cn	Cn	G(	GL	,A	KA	-I	MI	"-	QM
/A	DA	Gn	Gn	,C	KC	-J	MJ	"P	QP
/C	DC	HF	HF	,I	KI	-(	ML	""	QQ
DF	DF	IF	IF	,.	KJ	N(	NL	")	QR
/I	DI	II	II	,(	KL	-"	MQ	"+	QS
/.	DJ	I(	IL	,-	KM	-Y	MY	"=	QU
/(	DL	In	In	,"	KQ	-n	Mn	">	QV
/"	DQ	./	JD	,Y	KY	,F	KF	"≥	QW
/Y	DY	.F	JF	,n	Kn	PA	PA	"X	QX
/n	Dn	.,	JK	(A	LA	PC	PC	"n	Qn
E,	EK	.-	JM	(C	LC	PI	PI	)/	RD

)F	RF	+Y	SY	>"	VQ	XY	XY	n/	nD
),	RK	+n	Sn	>Y	VY	Xn	Xn	nE	nE
)-	RM	TC	TC	>n	Vn	YI	YI	nF	nF
)P	RP	TI	TI	≥A	WA	Y(	YL	n.	nJ
)"	RQ	TY	TY	≥C	WC	YN	YN	nI	nI
))	RR	=A	UA	≥I	WI	)T	RT	n,	nK
)+	RS	=C	UC	≥.	WJ	Yn	Yn	n-	nM
)=	RU	=I	UI	≥(	WL	←A	ZA	nP	nP
)>	RV	=.	UJ	≥'	WQ	←C	ZC	nn	nn
)≥	RW	=(	UL	≥Y	WY	←I	ZI	n"	nQ
)X	RX	="	UQ	≥n	Wn	←.	ZJ	n)	nR
)←	RZ	=Y	UY	ȦA	XA	←(	ZL	n+	nS
+A	SA	=n	Un	T(	TL	←"	ZQ	nT	nT
+C	SC	>A	VA	XC	XC	←Y	ZY	n=	nU
+I	SI	>C	VC	XI	XI	←-	ZM	n>	nV
+.	SJ	>I	VI	X.	XJ	←n	Zn	n≥	nW
+(	SL	>.	VJ	X(	XL	)I	RI	nX	nX
+"	SQ	>(	VL	X"	XQ	nB	nB	n←	nZ

9. The Compiled Program

Compilation proceeds in two phases: 1) translation from an IT program into a symbolic program, PIT and 2) assembly from a PIT program into a specific machine coded program, SPIT.

The result of the translation phase is a symbolic (PIT) program in S.O.A.P. language; i.e., one instruction per card in standard alphanumeric SOAP format. For details concerning the nature and use of SOAP beyond those required to use the compiler, see 650 Programming Bulletin No. 1, I.B.M.

The PIT program (translation) consists of four (4) parts: 1) the main (symbolic) program; 2) the statement dictionary, to be described in the sequel; 3) the constants (abcons) used within statements; 4) ten (10) reservation cards.

The code for each statement is punched out as soon as the statement has been translated. A statement dictionary entry is the first card punched for each statement. This dictionary provides the linkages for transfer statements. In addition to the program and the statement dictionary, a list of constants (those found in the statements together with several required by the finished program and furnished by the compiler itself) is punched together with ten cards which reserve space in the machine for these constants, the statement dictionary, and the problem variables.

For the IT program (II) which evaluates the polynomial of degree 10, the corresponding PIT program would be:

1		S0001	00	0000	LAAAA	
2		LAAAA	LDD	LABAA	E00AQ	READ
3		S0002	00	0000	LABAA	
4		LABAA	RAL	A0007		Y2 Z OJ
5			STL	Y0002	LACAA	
6		S0003	00	0000	LACAA	
7		LACAA	RAL	I0005		I1 Z
8			STL	I0001	LADAA	I5
9		S0004	00	0000	LADAA	
10		LADAA	RAL	Y0002	LADAC	Y2 Z CI
11		LADAB	RAL	Y0001	LADAD	1 S Y1 X Y
12		LADAC	STL	ACC	LADAB	2 F
13		LADAD	LDD		E00AJ	
14			RAL	I0001		
15			SLT	I0003		
16			ALO		8002	
17			RAL	C		
18			LDD		E00AI	
19			STL	Y0002	LAEAA	
20		S0000	00	0000	LAEAA	
21		LAEAA	RAL	A0008		I1 Z
22			ALO	I0001		I1
23			STL	I0001	LAFAA	M1
24		S0000	00	0000	LAFAA	
25		LAFAA	RAL	A0008		G 0004
26			ALO	I0001		IFI1
27			BMI	LAGAA	S0004	W1
28		S0007	00	0000	LAGAA	
29		LAGAA	HLT	LAGAA	LAHAA	H
30		A	00	0000	0022	H
31		A0008	00	0000	0001 &	
32		A0007	00	0000		
33		A0006	00	0000	3000	
34		A0005	00	0000	2000	
35		A0004	00	0000	1000	
36		A0003	00	0000	0010	
37		A0002	00	0000	0007	
38		A0001	00	0000	0001	
39	4			I	U0001	
40	3			I0002	0006	
41	4			Y	U0007	
42	3			Y0008	0009	
43	4			C	U0010	
44	3			C0011	0021	
45	4			S	U0022	
46	3			S0023	0029	
47	4			A	U0030	
48	3			A0031	0038	

The following remarks concerning the translation produced are not germane to the construction of IT programs. They are pertinent only to the IT → PIT → SPIT translations.

(1) S0001 is the first location of the first entry in the statement dictionary and contains a link to the (symbolic) location given to the statement whose identifier is 1.

(2) Locations within statements are of the form L _ _ _ _ , e.g., LAAAC or LBCAA, which refer to the third instruction within the first statement and the first instruction within the 29th statement resp. The first instruction of each statement is always assigned a symbolic location.

(3) Symbolic locations of the form E _ _ _ _ refer to the entry locations of sub-routines (extensions). Those listed in the example are to floating point arithmetic sub-routines, e.g., E0QAI is the entry to the floating point addition routine.

(4) ACC is the floating point accumulator. W refers to a temporary storage location. The symbolic locations of the variables are their names.

(5) All constants appearing in a statement, after being converted into the appropriate fixed or floating point format, are assigned an absolute constant location. In addition, certain constants needed during program operation are assigned, as required, by IT. The same constant will never be assigned more than one symbolic location. After the last statement has been translated, these abcon locations with their respective values are punched out, one per card.

(6) Appearing as (SOAP) comments in the first and ensuing instructions of each statement is the original (IT) statement. A maximum of 10 contiguous characters of the original statement may appear as comments with a single SOAP instruction.

The following table gives the name and meaning of all symbolic addresses or locations which may be found in a PIT program.

NAME	MEANING
L α_1 α_2 β_1 β_2	An instruction location
I 0000 + n	A fixed point variable, In
Y 0000 + n	A floating point variable, Yn
C 0000 + n	A floating point variable, Cn
W 0000 + n ($0 \leq n \leq 9$)	Temporary storage required by parentheses and/or quotation nesting
A 0000 + n	An absolute constant
ACC	Floating point accumulator
P 0000 + n ($0 \leq n \leq 9$)	Parameter storage
E 00 α_1 α_2	Name of (entry to) a subroutine
S 0000 + n	Entry in the statement dictionary

P0 - P9 is a temporary storage block used only for temporary storage of parameters (including those used by TYPE statements). The floating point accumulator, ACC, is required for the floating point arithmetic subroutines. The first four abcons, A0 thru A3 will contain the machine locations of S0, I0, Y0, C0 respectively. Contiguous blocks of storage are assigned, in the order given, to:

a) variables (I, Y, C)

b) statement dictionary (S)

c) absolute constants (A)

d) the compiled program (L), including extensions (E).

The actual assignments are indicated on (SOAP) reservation cards, which are the last ten (10) cards punched during compilation. The first instruction of the first statement, LAAAA, always appears in 650 location 1999.

10. The Preparation of the Program

Each statement is limited to 112 characters, inclusive of spaces but exclusive of the statement number.

Each statement must be terminated by an F (FINISH).

The last statement to be compiled must be terminated by an FF (FINAL FINISH).

The format for a statement card is as follows:

Column 1 thru 4	Statement number as 0000-n
Column 5	12 punch
Column 43 thru 70	Up to 28 characters of the statement
Column 71 thru 72	Must be blank
Column 73 thru 80	Any desired comments

RULES:

1. Only one statement is permitted on a card.
2. The first character of any statement must appear in column 43.
3. The F, when it appears either as a FINISH or as the second character of a FINAL FINISH, must be in column 70.
4. If more than one card is required for a statement, columns 1 - 5 are duplicated on each card, with the F appearing in column 70 of the last card and the first character of the statement appearing in column 43 of the first card.

To facilitate punching, a master program card may be prepared, in an obvious manner, for the 026 key punch.

Because of storage limitation, IT requires the following information, which is to be provided by a header card preceeding the program:

1) The maximal subscript numbers - n_I, n_Y, n_C - of the variables.
2) The maximal statement number - n_S
3) The total number - n_E - of locations required by extensions (including certain basic packages to be described in section 12).

The format of the header card is as follows:

Column 1	12 punch
1 - 10	n_I as 000000 0000 + n_I
11 - 20	n_Y as 000000 0000 + n_Y
21 - 30	n_C as 000000 0000 + n_C
31 - 40	n_S as 000000 0000 + n_S
41 - 50	Zeroes
51 - 60	$N = 1999 - [(n_I + n_Y + n_C + n_E)]$ as 00 0000+N 0000
61 - 80	Zeroes

The header card for the sample polynomial evaluation would exhibit, if the degree of the polynomial were ten, the following values:

$n_I = 5$; $n_Y = 2$; $n_C = 11$

$n_S = 7$; $N = 1725$

The complete program deck for compilation consists of:

a) Header card

b) Blank card

c) Statements of the program

If the compiler is being loaded, the entry order is:

i) compiler

ii) complete program deck, and the console settings are

SWITCH	SETTING
Storage entry	70 1951 3000 +
Program	STOP
Half Cycle	RUN
Control	RUN
Display	UPPER
Overflow	SENSE
Error	STOP

The 533 BOARD is that labeled SOAP - IT.

To initiate compilation, press computer RESET, program START, and finally START (card reader).

If the compiler has been previously loaded, set the storage entry switches to 70 1999 3000 + and then proceed as above, disregarding 1).

When the card read hopper is emptied, the END FILE key must be pressed in order that the entire IT program be completely compiled.

The first and last cards punched are "blank" load cards which are to be discarded.

Any number of programs may be compiled without reloading the compiler.

11. Errors in Compilation

Since the computer has a finite storage capacity, restrictions must be placed on both the size of the compiled program and on the length of some of its parts. Compilation will halt whenever any of these restrictions is violated; in addition, compilation will halt whenever certain errors in language structure are sensed. Such halts are indicated by the following console displays.

Address Lights : 1234

Display Lights (Upper) : $D_1 \ldots D_{10}$ as follows

$D_1D_2D_3D_4 = 0000 + n$, where n is the number of the offending statement.

$D_5 = D_8 = 0$

(D_6D_7 , D_9D_{10}) = a four digit couple which serves as an error-type indicator whose meaning is given by the following table.

The error may arise from the statement currently in scanning

position in the 533 or from a previous iteration statement. To determine the offending statement:

1. Do not alter console status.
2. Remove all cards from 533 READ hopper.
3. Depress 533 READ start until all cards have been emitted.
4. The last three cards emitted have not yet been scanned.
5. The offending statement is then either on the fourth card (from the end) or, if that statement is admissible, then the error has occurred in a previously scanned iteration statement, in which case the statement number ($D_1D_2D_3D_4$) should be zero.

ERROR TYPE	D_6 thru D_{10}
1. Statement too long, or no F in column 70 terminating the statement:	00 0 00
2. The number of instructions compiled from a statement exceeds 93:	01 0 01
3. The entire compiled program, including all constants and extensions exceeds 2000 words:	02 0 02
4. The number of absolute constants thus far assigned exceeds 99:	05 0 05
5. The number of output variables in a TYPE statement exceeds four (4):	90 0 83
6. A subscript or an extension number $\geq$ 2000	03 0 03
7. An expression appearing in an iteration statement has a norm exceeding five (5):	72 0 66
8. The power of a floating point constant exceeds 50 :	03 0 03
9. A floating point exponent in a constant, e.g., 1.234 B 3.14	62 0 99 62 0 82

10. A subscript or extension number or connective number in floating point form:

63 0 73
63 0 99
65 0 99
67 0 99
69 0 73
69 0 99
88 0 73
88 0 99
62 0 73
62 0 99
63 0 99
63 0 69
69 0 69
88 0 69

11. The first character of a substitution statement is not an I, Y, or C and/or not in column 43:

50 0 50

12. An odd number of parentheses and/or quotations:

69 0 66
90 0 63
90 0 69
90 0 88
99 0 89
90 0 73
79 0 89
79 0 {84 / 85 / 86}
78 0 {84 / 85 / 86}
71 0 {84 / 85 / 86}
99 0 {84 / 85 / 86}

13. A parentheses and/or quotation nesting is greater than nine (9):

79 0 ?
78 0 ?

14. An inadmissible symbol pair (see Sect. 8), Alpha, Beta: Alpha ◊ Beta

Alpha, Beta: the standard two digit alphanumeric code assigned by the 650 with the exception that the integers (90 thru 99) are all shown as 99, while Alpha = 90 indicates that Beta is the first character of the statement. If BETA is 82 (8) it may refer to either an S or an M in the original statement.

If BETA is 73 (L) it may refer to any of L; IL; YL; CL; YN; ON; AL;

If BETA is any of:

I (69)		I ; AI
Y (88)	it may refer to:	Y ; AY
C (63)		C ; AC
Q (78)		Q ; AQ

A list of 650 assignments for alphabetic characters follows:

A	12-1	= 61	S	0-2	= 82
B	12-2	= 62	T	0-3	= 83
C	12-3	= 63	U	0-4	= 84
D	12-4	= 64	V	0-5	= 85
E	12-5	= 65	W	0-6	= 86
F	12-6	= 66	X	0-7	= 87
G	12-7	= 67	Y	0-8	= 88
H	12-8	= 68	Z	0-9	= 89
I	12-9	= 69	Zero	0	= 90
J	11-1	= 71	1	1	= 91
K	11-2	= 72	2	2	= 92
L	11-3	= 73	3	3	= 93
M	11-4	= 74	4	4	= 94
N	11-5	= 75	5	5	= 95
O	11-6	= 76	6	6	= 96
P	11-7	= 77	7	7	= 97
Q	11-8	= 78	8	8	= 98
R	11-9	= 79	9	9	= 99
			Blank		00

Except for cases where storage has been exceeded, the above (and other) errors may be removed by the correction of the offending statement.

If the offending statement is that in scanning position and <u>is not</u> the last statement in the program, proceed as follows:

1) Do not alter console status.

2) Place the uncompiled portion of the Program, commencing with the corrected statement, in the READ hopper.

3) Depress READ START.

4) Depress PROGRAM START.

If the offending statement is that in scanning position and is the last in the PROGRAM, proceed as follows:

1) Set STORAGE ENTRY SWITCH: 00 0000 1111 +

2) As above.

3) As above.

4) Depress COMPUTER RESET then PROGRAM START.

If storage has been exceeded, pressing PROGRAM START will cause the compiler to:

(i) punch a HALT instruction

(ii) punch the absolute constants and reservation cards.

If the flow of the entire program permits segmentation at this juncture, the partial program produced is an acceptable segment (see section 11.1).

If the offending statement is not one of the above, re-examine the program, find the error, and recompile the entire corrected program.

Several kinds of errors may require the introduction of additional statements, e.g., parentheses orquotation nesting greater than nine; number of instructions in a compiled statement exceeding 98; number of variables in a TYPE statement exceeding four.

An excess of abcons may be removed by introducing additional variables whose values may be entered as data via a READ statement.

11.1 Segmentation

Let an IT program, π, be segmented into k sub-programs: π^1, π^2, ..., π^k.

Adjoin to each π^i a HALT statement as its final statement, i.e., that statement at which computation within π^i halts.

Let $\bar{n}_I$, $\bar{n}_Y$, $\bar{n}_C$, be the maximal subscript numbers (see section 10) for the full program π.

Let n_S^i and n_E^i be the maximal statement number and total space for extensions, respectively, for π^i.

Set $N^i = 1999 - (\bar{n}_I + \bar{n}_Y + \bar{n}_C + n_E^i)$

Compile (section 10) and SOAP (section 13) each π^i separately, treating them as distinct programs and using the following information for the header card, h^i, associated with π^i:

$n_I^i = \bar{n}_I$; n_S^i

$n_Y^i = \bar{n}_Y$; n_E^i

$n_C^i = \bar{n}_C$; N^i

The effect of the above procedure is to preserve the values of all variables common to all the π^i, i.e: to π. Thus, although no π^i may refer to another, all π^i may refer to common variables. The HALT statement basically has the effect of: "computation on the present π^i is now finished; enter π^{i+1} as per section 15".

12. Optimized Operator Subroutines

IT assumes that the compiled program will be augmented by subroutines which extend the arithmetic, input, and output capabilities of the 650. These subroutines are available - for the convenience of compiler users - in four (4) gaily colored packages: P_1, P_2, P_3, P_4.

Their use is dictated by the following rules:

1) P_1 is to be used if exponentiation (P) is not used.

2) P_2 is to be used if exponentiation is used but only fixed point exponents occur.

3) P_3 is to be used if exponentiation is used but only floating point exponents occur.

4) P_4 (the family size package) is used otherwise or when in doubt as to the arithmetic of any exponent.

Associated with each of these packages is a "reservation deck" - R_1, R_2, R_3, R_4 - whose use will be described in section 13. The incorporation of the packages, P_i, into the program will be discussed in section 15.

12.1 Lengths of the Basic Packages

P_1	265 locations
P_2	379 locations
P_3	386 locations
P_4	500 locations

13. SOAPing of the PIT Program

The second, or assembly phase in the preparation of a 650 program is the SOAPing of the PIT program. The output of this phase is the desired machine program (SPIT) in 5 word/card output, with all symbolic addresses having been assigned machine addresses by SOAP.

The order of input for phase two is the following:

1) SOAP

2) The last ten (10) (reservation) cards of the output of phase one.

3) The appropriate "reservation deck", R_i, containing the reservation cards associated with the selected subroutine package, P_i.

4) Any extensions (in symbolic SOAP form) which were used in the original program, entered in arbitrary order.

Both P_3 and P_4 contain the 10^x and LOG_{10} subroutines. Hence if either of P_3 or P_4 is used, these subroutines need not be included.

5) The remainder of the output of phase one.

6) One (1) blank card.

Board, console settings, initiation and END FILE procedure are the same as those used with the compiler (see section 10). If SOAP has already been loaded, set storage entry switches to 00 0000 1000 + and proceed from step 2). Again, the first and last cards punched are to be discarded.

14. Data Preparation

All required data, other than abcons, enter the computer via a READ statement. During translation, a READ statement is translated into a sequence of instructions which, during program operation, activate the 650 read-in of an arbitrary number of (data) cards. Two types of input cards may be used.

In type 1, data is entered on the cards - in purely numeric form - as couples, each consisting of the name of a variable and its assigned value. Up to four pieces of data (couples) may be entered per card. The names of variables are designated by the code I → 1 ; Y → 2 ; C → 3 Each couple occupies two adjoining 10 column fields. The first, or name field is punched as follows:

$0\begin{Bmatrix}1\\2\\3\end{Bmatrix}0000+\ n\ \ d_7d_8d_9d_{10}$, where $\begin{Bmatrix}1\\2\\3\end{Bmatrix}$ is the variable's code number

n is the variable's subscript; d_7 thru d_{10} is an arbitrary numeric personal identification, which must be punched.

The second, or variable value field is punched as a standard signed floating point or fixed point number, with negative signs being indicated by an 11 overpunch in the last column of this field.

The values assigned to fixed point variables must be integers; those assigned to floating point variables must be in standard floating point form.

The card format, then, is as follows:

Column 3	12 punch
1 - 10	first name
11 - 20	first value
21 - 30	second name
.	.
.	.
.	.

If less than four variables are entered on a card, the ten digit field following the last entry must contain all zeroes; any remaining fields may be blank.

In type 2 cards the loading, on one card, of values for up to seven contiguous variables is permitted. If the set of variables to be loaded is $\left\{\begin{matrix}I\\Y\\C\end{matrix}\right\}$ n through $\left\{\begin{matrix}I\\Y\\C\end{matrix}\right\}$ n + (k-1) , $1 \leq k \leq 7$, then the card format is:

Col. 1-10 : $12\left\{\begin{matrix}1\\0\\2\\3\end{matrix}\right\}$ 0000-n 000k

Col. 11-20 : value of first variable

Col. 21-30 : value of second variable

....

As before, if more than one data card is to be read at the same time, the last card must contain an 11 over-punch in column 10.

Note: Both types of data cards may be arbitrarily intermixed.

For both types, reading and storing will continue until a card containing an 11 overpunch in column 10 is read. Following storage of the contents of this card, the program proceeds to the first instruction of the statement following the READ statement.

The output of a TYPE statement will have precisely the same form as that required of type 1 data cards by READ statements, with an 11 overpunch in column 10. Hence, a READ statement will read only one such card at a time.

15. Operating the Compiled Program

The complete program deck for operation consists of:

1) The appropriate subroutine package, P_1.

2) The entire output of phase two.

3) The data deck.

Board, console settings, initiation and END FILE procedure are as described in section 10 for compilation.

NOTES:

1) If the program contains more than one READ statement, or one such is to be executed more than once, the data cards must be loaded in the order in which they will be required.

2) The sign of the storage entry switches governs the output of Conditional Type statements as described in section 5.6.1.

3) To restart the program, if it has already been loaded, set storage entry switches to 00 0000 1999+ ; press COMP RESET then PROGRAM START.

16. Use of Extensions

Descriptions of extensions, filed lexicographically in the Extension Library, contain at least the following information:

Description	Example
Name and extension number	SIN 22
Length (Nr. of storage locations used)	84
Program representation	"22 E , v "
Class	Single valued function of a single variable (real)
Range and Accuracy	
Arithmetic of input output	Floating Point Floating Point
Error Stops and Indicators	
Duration	

Program decks, in SOAP symbolic form will be filed by extension number.

17. List of Currently Available Subroutines and Error Indicators

A list of currently available sub-routines follows. The subscript J = 1, 2, 3, 4, means that the sub-routine so indicated is in the package P_J.

Number	Effect	Arithmetic	SOAP Representation
$1_{3,4}$	$LOG_{10}X$	Floating Point	EOOAB
$2_{3,4}$	10^X	"	EOOAC
20	$\sqrt{X}$	"	EOOAU
21	COS X	"	EOOAV
22	SIN X	"	EOOAW

A description (contents) of the four packages follows. Here (L) and (ACC) refer to the contents of the lower accumulator and "floating point "accumulator", respectively.

P1 contains:

4	(L) Floating point ⟵ (L) Fixed point	EOOAE
5	(L) and (ACC) Floating point ⟵ (L) Fixed point	EOOAF
6	(L) and (ACC) ⟵ (L) / (ACC) Floating point	EOOAG
8	(L) and (ACC) ⟵ (L) (ACC) "	EOOAI
9	(L) and (ACC) ⟵ (L) x (ACC) "	EOOAJ
14	(L) and (ACC) ⟵ (ACC) / (L) "	EOOAO
16	READ	EOOAQ
17	PUNCH	EOOAR
501	(L) Fixed point ⟵ (L) Floating point	EOOTH

P2 contains P1 plus:

11	(L) ⟵ (L) (ACC) Fixed point	EOOAK
12	(L) ⟵ (ACC) (L) Fixed point	EOOAM
13	(L) and (ACC) ⟵ (L) Float (ACC) Fix Floating point	EOOAL
14	(L) and (ACC) ⟵ (ACC) Float (L) Fix "	EOOAN

P3 is P1 plus EOOAB and EOOAC

P4 is P2 plus EOOAB and EOOAC

Errors within subroutines will cause the computer to stop.

1) If the error cannot be corrected it will be revealed as a Storage Selection error; the address lights will contain 3 $k_1k_2k_3$. Where possible this indicates the k_3^{th} error in extension number k_1k_2. In the following listing, L and ACC, refer to the Lower accumulator and floating point accumulator respectively.

k_1k_2	FUNCTION	ARITH	ERROR TYPE	COMMENTS
01	$LOG_{10}L$	Float	Negative Argument	Argument in L
02	10^L	Float	Result $\geq 10^{50}$	
03	Fix L	Fix	Result $\geq 10^{11}$	
06	L/ACC	Float	Zero Divisor	
06	ACC/L	Float	Zero Divisor	
08	L - ACC	Float	Result $\geq 10^{50}$	Upper contains 1
08	ACC - L			
08	ACC L			
08	ACC X L			
08	L/ACC			
08	ACC/L			
10	L^{ACC}	Fix^{Fix}	Argument zero, exponent negative	
10	ACC^L	"	"	"
11	L^{ACC}	$Float^{Fix}$	"	"
11	ACC^L	"	"	"
20	$\sqrt{L}$	Float	Negative argument	Argument in L
21	COS L	Float	Argument $\geq 10^7$	
22	SIN L	"		

If the magnitude of a result of a floating point subroutine is less than 10^{50} the computer will halt and with 1942 in the address register. Pressing PROGRAM START will replace the result with zero and continue the computation.

18. Preparation of Subroutines to be used with the Compiler

1. Assignmant of Subroutine Number, n:

   a) Number must be an unassigned one

   b) If output of SR is a single floating point (fixed point) variable, n must be $<(\geq)$ 500.

   c) If b) does not hold, then n may be any unassigned number.

2. To obtain the alphabetic mnemonic for the SR, decompose the SR number, n, modulo 26, i.e.,

$$n = (26)j + k$$

Then the entry location of the SR is given the symbolic address E 00 α β, where a) β is the (k+1)st letter of the alphabet, and b) α is the (j+1)st letter of the alphabet.

All symbolic locations (other than the entry location) referred to within the SR are given symbolic locations $\alpha\beta$ m , where m is an integer which identifies the particular location.

3. All subroutines must be closed.

4. To determine the input parameters of the subroutine:

Let the SR be a function of the k variables v1, v2, ..., vk; i.e.:

" n E, vk, V(k-1), ..., V1"

Let (U), (L), (D) refer to the contents of the upper acc., lower acc., and distributer respectively.

Then entry conditions are as follows:

k $\leq$ 1: (L) = v1 ; (U) = zero ; (D) = Exit instruction

k > 1: (L) = vk ; (U) = zero ; (D) = 00 P 0000+j 0000 + m , and

contents of m = exit instruction

contents of P 0000 + j = v(k-1)

contents of P 0000 + j-1 = v(k-2)

.
.
.

5. Variables are assigned symbolic address according to their subscript number, k, and are written: $\left\{\begin{matrix} I \\ Y \\ C \end{matrix}\right\}$0000+k

6. If one of the input parameters is a fixed point variable which is to be used to generate a connection to some statement, the connection must be made via the Statement Dictionary using the symbolic address S 0000+k if the connection is to the kth statement.

III Techniques For Using The Language

In the following, several typical situations will be illustrated.

1. Extraction of the integral and fractional parts of a floating point variable, say Y1.

```
1:  I1 ← Y1
2:  Y2 ← I1
3:  Y3 ← Y1 - Y2
```

I1 is the integral part of Y1 in fixed point form.

Y2 is the integral part of Y1 in floating point form.

Y3 is the fractional part of Y1 in floating point form.

2. Representation of the eight (8) significant digits of a floating point variable, say Y1, as a fixed point integer.

```
1:  G 7 IF Y1 ≥ 1 B 8
2:  G 5 IF Y1 < 1 B 7
3:  I1 ← Y1
4:  H
5:  Y1 ← Y1 X 10.
6:  G 2
7:  Y1 ← Y1 / 10.
8:  G 1
```

3. Treatment of arrays.

a) Vectors:

(i) YI7 is a vector whose components are identified by the range of the variable I7, e.g., if the range of I7 is $18 \leq 18 + n - 1$, then the components of YI7 are Y18, Y19, Y20,..., Y(18 + n - 1).

(ii) Y(I7 + I1) is a vector whose components are identified by the range of I1 when I7 is fixed as the "storage base" of the vector.

For example, a program to add two vectors of dimension six (6) whose storage bases are I7 and I8 respectively is:

k, I1, 0, 1, 5,

k: Y(I9+I1) ⟵ Y(I8+I1)+Y(I7+I1)

where I9 is the storage base of the sum.

b) Matrices:

(i) Let I1 be the row dimension of the matrix A represented as the matrix YN.

Example: To carry out $B = A^2$

Program

1: 4, I2, 0, 1, I-1,

2: 4, I3, 0, 1, I1-1,

3: . CN (I2, I3) = 0

4: 4, I4, 0, 1, I1-1,

5: CN (I2, I3) ⟵ CN (I2, I3)+YN (I2, I4) x YN (I4, I3)

6: I2 ⟵ I1

7: H

The matrix B is represented as the matrix CN. If CN is to be used in further calculations its (row) dimension must be in I2. Statement 5 sets the correct dimension.

(ii) Let I1 be the dimension, I2 the base of the matrix A.

Then, if I3 and I4 are the row and column index respectively, (which range from 0 to their respective dimensions less one) of an element of A, the [I3, I4] element of A will be:

Y(I2+I4+I1 X I3) if A is listed row-wise, and

Y(I2+I3+I1 X I4) if A is listed column-wise.

Examples: To carry out C = AX B, where

I1 is the dimension of A, B, C.

I2, I3, I4 are the storage bases of A, B, C respectively.

Program (I)

```
1:  6, I5, 0, 1, I1 - 1,
2:  6, I6, 0, 1, I1 - 1,
3:  C1 ← 0.
4:  5, I7, 0, 1, I1 - 1,
5:  C1 ← C1 + Y(I2 + I7 + I1 x I5) X
                        Y(I3 + I6 + I1 x I7)
6:  Y(I4 + I6 + I1 x I5) ← C1
7:      H
```

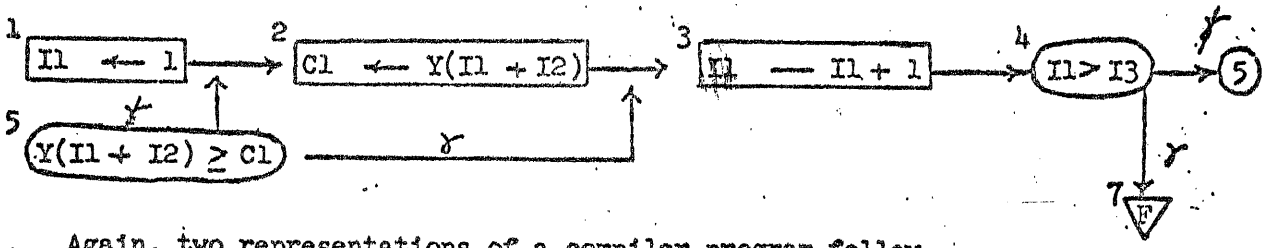
The above program minimizes, in a sense, the number of statements and the number of instructions compiled. The following program, on the other hand, will reduce the time of operation at the cost of a somewhat longer program.

Program (II)

```
0:  4, I5, 0, 1, I1 - 1,
1:  I8 ← I1 x I5
0:  4, I6, 0, 1, I1 - 1
0:  I9 ← I6 + I11
0:  I12 ← I3 + I6
0:  C1 ← 0.
0:  3, I7, 0, 1, I1 - 1,
3:  C1 ← C1 + Y(I12 + I1 x I7)
4:  YI9 ← C1
0:      H
```

NOTE: The number of entries in the Statement Dictionary can be greatly reduced by assigning a zero statement number (as above) to all statements not referred to within the program. However, any statement which immediately follows an iteration statement must have a unique, non-zero statement number.

4. A problem which is more representative of pure decision procedures is that of finding the minimum of a set of N numbers. A flow chart is:



Again, two representations of a compiler program follow.

Program (I)

0: I1 ← 1

1: C1 ← Y(I1 + I2)

2: I1 ← I1 + 1

0: G 7 IF $I_1 > I3 - 1$

0: G 2 IF Y(I1 + I2) ≥ C1

0: G 1

7: H

Program (II)

0: C1 ← Y12

0: 5, I1, 1, 1, I3 - 1,

3: G 5 IF Y(I1 + I2) ≥ C1

0: C1 ← Y(I1 + I2)

5: C1 ← C1

0: H

Note that, in the second program, it was necessary to add the "dummy" statement, 5, in order that the relational statement, 3, could be imbedded within the range of the iteration. Although (II) is a shorter program than (I), it turns out that the length and operation time of the compiled program will be equivalent.

IV Program Checking and Corrections

The program can only be checked at the compiler level by the liberal insertion of conditional TYPE statements to exhibit intermediate results, and thus, the flow.

Corrections should be made at the compiler level either by correcting statements and recompiling the entire program, or by recompiling only those offending statements in the following manner:

The correcting statement (or set of contiguous statements) is prefaced by a header card identical to that described in section 12 with the following exception. If k is the position of the statement (or that of the first of a contiguous set) being corrected, then columns 61 - 70 of the header card must contain 000000 0000 + k - 1 .

The procedure outlined in section 12 is then followed. Prior to RESOAPing the entire program, the compiled correction(s) either replaces the erroneous statement(s) or is appended at the end of the program.

NOTES: (1) Correcting statements must not involve any absolute constants. Any that are required may be assigned as variables whose values may be entered through a READ statement. This may demand an increase in the maximum index of the I, Y, or C variables previously assigned.

(2) No correcting statement may terminate with an FF .

NOTE: Portions of sections I and II are to appear as a contribution by the first two listed authors to the Proceedings of a Symposium on Automatic Programming issued by the Franklin Institute and based on paper presented at that symposium at the Franklin Institute January 25, 1957.

1	5			CARNEGIE TECH COMPILER		IT	0000	00	0000	0000
2	5			MARCH 15	1957		0000	00	0000	0000
3	1			0000	0024		0000	00	0000	0000
4	4			D	U0031		0000	00	0000	0000
5	3			D0032	0040		0000	00	0000	0000
6	3			T0042	0050		0000	00	0000	0000
7	1			0051	0143		0000	00	0000	0000
8	1			0150	0197		0000	00	0000	0000
9	1			0200	0247		0000	00	0000	0000
10	1			0250	0297		0000	00	0000	0000
11	1			0300	0329		0000	00	0000	0000
12	3			O0600	0623		0000	00	0000	0000
13	3			E0374	0382		0000	00	0000	0000
14	3			A0383	0482		0000	00	0000	0000
15	3			M0500	0503		0000	00	0000	0000
16	3			Q0550	0563		0000	00	0000	0000
17	3			N0568	0591		0000	00	0000	0000
18	1			1951	1960	RESRVE READ	0000	00	0000	0000
19	3			J1977	1986	J BAND	0000	00	0000	0000
20	3			W1977	1986	W BAND	0000	00	0000	0000
21	4			S	1957		0000	00	0000	0000
22	4			PC	1958		0000	00	0000	0000
23	4			FFBIT	1959		0000	00	0000	0000
24	4			TAU	1960		0000	00	0000	0000
25	4			PS	U1234		0000	00	0000	0000
26	4			READA	U1111		0000	00	0000	0000
27	4			START	U1999		0000	00	0000	0000
28		START	RDS	0051		READ	1999	70	0051	0351
29			RAU	CNTRL			0351	60	0354	0359
30			STU	W0010		HEADER CARD	0359	21	1986	0339
31			RAL	S			0339	65	1957	0361
32			LDD		SR3		0361	69	0364	0367
33			LDD		SR3ED		0364	69	0517	0370
34			RAU	SIX		ABSOLUTE	0517	60	0520	0025
35			STU	A0001	PSO	VALUE COUNT	0025	21	0383	0336
36		PSO	STL	PSI		CLEAR	0336	20	0041	0144
37			LDD	TAU1			0144	69	0147	0350
38			STD	TAU	PS		0350	24	1960	1234
39		PS	RAU	FFBIT		CHECK LAST	1234	60	1959	0363
40			NZU	END	READA	STATEMENT	0363	44	0567	1111
41		READA	RDS	0051		FIRST READ	1111	70	0051	0651
42			RAL	0057		STORE STMNT	0651	65	0057	0511
43			STL	0000		NUMBER	0511	20	0000	0353
44			RAL	ONET		TALLY AND	0353	65	0356	0661
45			STL	FLAG		FLAG SET TO	0661	20	0365	0368
46			STL	TALLY	PS1A	ONE	0368	20	0373	0026
47		PS1	RDS	0051	PS1A	NEXT READ	0650	70	0051	0026
48		PS1A	RAU	MAX		ALARM IF	0026	60	0029	0333
49			SUP	TALLY		TALLY IS	0333	11	0373	0027
50			NZU		LARM	MAXIMUM	0027	44	0331	0332
51			RAL	TALLY		KK XXXX YYYY	0331	65	0373	0527
52			ALO	STORE		IS	0527	15	0030	0335
53			LDD	PS2	SR1	0600510000	0335	69	0338	0341
54		PS2	RAL	TALLY		TALLY PLUS	0338	65	0373	0627
55			ALO	SIXT		SIX IS TALLY	0627	15	0330	0485
56			STL	TALLY		GAMMA EQUALS	0485	20	0373	0526
57			RAU	0056		WORD6 TIMES	0526	60	0056	0711
58			SRT	0002	PS2B	01	0711	30	0002	0667
59		PS2B	STU	GAMMA		L EQUALS END	0667	21	0372	0525
60			STL	L		SYMBOL	0525	20	0529	0532

2.01

```
           RAU   8002                              0532   60  8002  0491
           SUP   RSL              RECYCLE IF L     0491   11  0344  0149
           NZU   PS1              IS NOT F         0149   44  0650  0504
           RAL   FFTY1            INITIALIZE U     0504   65  0357  0761
           STL   U                IF L IS F        0761   20  0515  0518
           RAL   TALLY            TALLY MINUS      0518   65  0373  0677
           SLO   ONET             ONE              0677   16  0356  0811
           SLT   0004             TALLY IN DTA     0811   35  0004  0371
           STL   TALLY            QUOTA EQUALS     0371   20  0373  0626
           STL   QUOTA   PS2A     TALLY            0626   20  0531  0334
PS2A       STU   V1                                0334   21  0488  0541
           STU   K                PRESET ALL       0541   21  0146  0199
           STU   T0001            PERTINENT        0199   21  0042  0145
           STU   NU               COUNTERS         0145   21  0700  0653
           STU   J0001            TO ZERO          0653   21  1977  0530
           STU   N                                 0530   21  0484  0337
           STU   NBAR                              0337   21  0342  0345
           STU   MU                                0345   21  0750  0703
           STU   ARITH                             0703   21  0358  0861
           STU   ABVAL                             0861   21  0366  0369
           STU   OPSGN                             0369   21  0524  0727
           STU   RELAT                             0727   21  0632  0535
           STU   R       PS3      R EQUALS O       0535   21  0340  0343
PS3        RAU   GAMMA                             0343   60  0372  0777
           NZU           PS5      OUT IF GAMMA     0777   44  0631  0682
           SRT   0002             IS ZERO          0631   30  0002  0487
           STU   GAMMA            FETCH NEXT       0487   21  0372  0625
           RAU   8002             SYMBOL S         0625   60  8002  0483
           NZU           PS3      RECYCLE IF S     0483   44  0537  0343
           ALO   L                ZERO  IF NOT     0537   15  0529  0533
           STL   R       PS3D     R EQUALS L       0533   20  0340  0493
PS3D       STU   L       PS3A     L EQUAL S        0493   21  0529  0732
PS3A       RAL   8003             IF L EQUALS      0732   65  8003  0489
           SRT   0008              AN INTEGER      0489   30  0008  0507
           SLO   NINTY             SET INTGR       0507   16  0360  0565
           BMI   PS3G    PS3C     TO L AND L       0565   46  0668  0519
PS3G       RAU   L       PS3B     EQUAL TO 99      0668   60  0529  0633
PS3C       RAU   L                THEN RETURN      0519   60  0529  0683
           STU   INTGR             TO PS3B         0683   21  0538  0641
           RAU   NINTY                             0641   60  0360  0665
           SRT   0001                              0665   30  0001  0521
           AUP   NINTY   PS3BA                     0521   10  0360  0715
PS3B       SRT   0008              GENERATE        0633   30  0008  0701
           ALO   R                     ENTRY       0701   15  0340  0495
           SRT   0004              TO SYMBOL       0495   30  0004  0355
           STL   TEMP1            PAIR TABLE       0355   20  0509  0362
           RAL   PS4              FETCH SWITCH     0362   65  0765  0669
           LDD   TEMP1            FROM TABLE       0669   69  0509  0512
           TLU   0150    8002     IF SWITCH IS     0512   84  0150  8002
PS4        RAU   0000              ADMISSABLE      0765   60  0000  0505
           SUP   TEMP1              GO TO          0505   11  0509  0513
           SRT   0004              GENERATORS      0513   30  0004  0523
           NZU   ALARM            ALARM IF NOT     0523   44  0827  0028
           SLT   0004    8003                      0028   35  0004  8003
PS5        RAU   TALLY             DECREMENT       0682   60  0373  0877
           SUP   ONE     PS5A      TALLY IF        0877   11  0630  0635
PS5A       STU   TALLY             GAMMA ZERO      0635   21  0373  0676
           NZU           PS10     OUT IF TALLY     0676   44  0629  0680
           AUP   PS6     8003     IS ZERO  IF      0629   10  0782  8003
PS6        RAU   0000             NOT GAMMA IS     0782   60  0000  0655
```

2.02

```
        STU  GAMMA  PS3     NEXT WORD         0655  21  0372  0343
PS7     STD  PS8              STORE           0800  24  0753  0506
        BMI         PS7A     GENERATED        0506  46  0659  0510
        SLO  U      PS7B    INSTRUCTION       0659  16  0515  0719
PS7A    ALO  U      PS7B      AND             0510  15  0515  0719
PS7B    LDD  PS7C           INCREMENT U       0719  69  0522  0675
        SDA  PS7C    8001   BY ONE            0675  22  0522  8001
PS7C    STU   0000          AND RETURN        0522  21  0000  0803
        RAL  U              TO GENERATOR      0803  65  0515  0769
        ALO  ONE            IF STORAGE        0769  15  0630  0685
        STL  U              NOT EXCEEDED      0685  20  0515  0718
        SLO  MAXU            OTHERWISE        0718  16  0671  0725
        BMI  PS8             ALARM            0725  46  0753  0679
        RAL  OONE   LARM                      0679  65  0832  0332
PS8     HLT   0000  PS8                       0753  01  0000  0753
PS10    RAL  L              IF TALLY IS       0680  65  0529  0733
        STL  R              ZERO SET LR       0733  20  0340  0543
        RAU  NINTY  PS3BA   EQUAL TO 90L      0543  60  0360  0715
PS3BA   SLT   0008           AND ENTER        0715  35  0008  0783
        STU  L      PS3B     GEN TABLE        0783  21  0529  0633
PS12    RAU  TEMP9          FROM END OF       0850  60  0853  0657
        STU  W0004           STATEMENT        0657  21  1980  0833
        STL  W0005           GENERATORS       0833  20  1981  0534
        RAU   0000                            0534  60  0000  0705
        LDD         STNON     FORM ENTRY      0705  69  0508  0911
        AUP  D0004               FOR          0508  10  0035  0539
        STU  W0001           STATEMENT        0539  21  1977  0730
        RAL  NONO           DICTIONARY        0730  65  0883  0637
        SLT   0004                            0637  35  0004  0347
        STL  W0002                            0347  20  1978  0681
        RAU  NONON                            0681  60  0634  0639
        STL  W0006                            0639  20  1982  0735
        STU  W0003                            0735  21  1979  0882
        LDD         PS133                     0882  69  0785  0638
        RAU  TEMP9                            0785  60  0853  0707
        STU  W0001                            0707  21  1977  0780
        RAL  FFTY1          UBAR EQUALS       0780  65  0357  0961
        STL  UBAR           FIFTYONE          0961  20  0516  0819
        SLO  PC             ALARM IF          0819  16  1958  0663
        SLO  U                 STORAGE        0663  16  0515  0869
        SLO  A0001          EXCEEDED          0869  16  0383  0687
        ALO   1956              BUT           0687  15  1956  1011
        BMI         PS13C       WITH          1011  46  0815  0514
        RAU  00002          OPTION OF         0815  60  0601  0755
        SRT   0006              FINAL         0755  30  0006  0919
        STL  W0002          PRINTOUT          0919  20  1978  0731
        STL  FFBIT                            0731  20  1959  0662
        LDD         PS133                     0662  69  0865  0638
        RAL  OTWO   LARM                      0865  65  0768  0332
PS13C   RAL  TALLY                            0514  65  0373  0927
        SLO  QUOTA                            0927  16  0531  0835
        NZA         PS13A   STORE             0835  45  0688  0689
        ALO   8001          ORIGINAL          0688  15  8001  0545
        ALO  TWO            STATEMENT         0545  15  0148  0903
        STL  TALLY          AS                0903  20  0373  0726
        ALO  PS13B          COMMENTS          0726  15  0729  0933
        LDD  PS14   SR1                       0933  69  0486  0341
PS13A   STU  W0005                            0689  21  1981  0684
        STD  W0006  PS14                      0684  24  1982  0486
PS13B   01    9999  W0005                     0729  01  9999  1981
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      PS133   STD   FINI                            0638  24  0691  0494
              RAL   PC            INCREMENT         0494  65  1958  0713
              ALO   ONE           PROGRAM           0713  15  0630  0935
              STL   PC            COUNTER           0935  20  1958  1061
              STL   W0009                           1061  20  1985  0738
              PCH   W0001            AND            0738  71  1977  0977
              STU   W0001  FINI     PUNCH           0977  21  1977  0691
      PS14    RAU   UBAR          FETCH WORD        0486  60  0516  0721
              AUP   PS14A  8003    IN UBAR          0721  10  0624  8003
      PS14A   RAL    0000                           0624  65  0000  0805
              STL   TEMP3                           0805  20  0709  0712
              BMI          PS16   IF WORD IS        0712  46  0915  0566
              RAL   UBAR           NEGATIVE         0915  65  0516  0771
              SLO   FFTY1  PS15    ASSIGN IT        0771  16  0357  1161
      PS15    SRT    0004         A SYMBOLIC        1161  30  0004  0821
              LDD   PS15A  SR3     LOCATION         0821  69  0674  0367
      PS15A   AUP   TEMP9                           0674  10  0853  0757
              STU   W0001                           0757  21  1977  0830
              RAB   TEMP3  PS16                     0830  67  0709  0566
      PS16    SLT    0002                           0566  35  0002  0673
              STL   TEMP3          EXTRACT          0673  20  0709  0762
              RAU    8003         OPERATION         0762  60  8003  0969
              SLT    0006         FROM WORD         0969  35  0006  0983
              STU   TEMP4                           0983  21  0788  0741
              ALO   PS18          FETCH OP          0741  15  0544  0249
              STU   TEMP1         MNEMONIC          0249  21  0509  0812
              TLU   00001  8002    FROM TABLE       0812  84  0600  8002
      PS18    RAU    0000         AND CHECK         0544  60  0000  0855
              SUP   TEMP4         FOR ADMISS        0855  11  0788  0593
              SRT    0006         STORE OP IF       0593  30  0006  0807
              NZU   ALARM         ADMISSABLE        0807  44  0827  0862
              STL   W0002  PS27                     0862  20  1978  0781
      PS27    RAL   TEMP3          EXTRACT          0781  65  0709  0763
              SLT    0004         DATA ADDRESS      0763  35  0004  0723
              STL   TEMP3          FROM WORD        0723  20  0709  0912
              RAU    8003         OUT IF D IS       0912  60  8003  1019
              NZU          PS19   NEXT LOC          1019  44  0773  0724
              SRT    0001         OUT IF D IS       0773  30  0001  0779
              NZU   PS18A         NOT ACCUM         0779  44  1033  0734
              RAU   ACCUM  PS19                     0734  60  0737  0724
      PS18A   SRT    0002         OUT IF D NOT      1033  30  0002  0739
              NZU   PS20          ADDRSS WITHN      0739  44  0643  0594
              SRT    0003          STATEMENT        0594  30  0003  0953
              SLO   FFTY1         GENERATE          0953  16  0357  1211
              SRT    0004         MNEMONIC          1211  30  0004  0871
              LDD          SR3    IF D IS IN        0871  69  0774  0367
              AUP   TEMP9  PS19    STATEMENT        0774  10  0853  0724
      PS20    STL   TEMP1         GENERATE          0643  20  0509  0962
              RAU    8003          MNEMONIC IF      0962  60  8003  1069
              SLT    0004          D IS NEITHR      1069  35  0004  0829
              AUP   PS23   8003   NEXT NOR IN       0829  10  0932  8003
      PS23    RAU   D              STATEMENT        0932  60  0031  0985
              STU   TEMP2                           0985  21  0490  0693
              SUP   D0009         OUT IF D IS       0693  11  0040  0595
              NZU   PS23A          NOT EXTNSN       0595  44  0299  0900
              RAL   TEMP1         IF EXTENSION      0900  65  0509  0813
              SRT    0007         GENERATE          0813  30  0007  0879
              LDD          SR3     MNEMONIC         0879  69  0982  0367
              AUP   D0009  PS19                     0982  10  0040  0724
      PS23A   RAU   TEMP1                           0299  60  0509  0863
```

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241                SRT   0007                GEN NUMERIC     0863   30  0007  0929
242                LDD         PS100       TAG IF DATA     0929   69  1032  1035
243                NZA         PS23B         IS NOT        1032   45  0536  0787
244                AUP   NONON PS23B          EXTENSION    0536   10  0634  0787
245          PS23B AUP   TEMP2 PS19                         0787   10  0490  0724
246          PS19  STU   W0004                              0724   21  1980  1083
247                RSU   FLAG  PS25        NEGATIVE        1083   61  0365  1119
248          FLAG   10   0000  0000        FLAG IF DATA    0365   10  0000  0000
249          PS25  STU   FLAG              POSITIVE        1119   21  0365  0818
250                BMI         PS26        FLAG IF INST    0818   46  0921  0672
251                RAU   W0004              RECYCLE         0921   60  1980  1085
252                STU   W0003 PS27        IF D  IF NOT    1085   21  1979  0781
253          PS26  RAU   UBAR              PUNCH AND       0672   60  0516  0971
254                AUP   ONE                RECYCLE TO     0971   10  0630  1135
255                STU   UBAR               PS13C IF       1135   21  0516  1169
256                SUP   U                  UBAR NOT       1169   11  0515  1219
257                NZU         PS28         EQUAL TO       1219   44  0823  0824
258                LDD   PS13C PS133              U        0823   69  0514  0638
259          PS28  RAL   S                 S EQUALS S      0824   65  1957  1261
260                ALO   ONET              PLUS ONE        1261   15  0356  1311
261                STL   S                 AND FORM        1311   20  1957  0660
262                LDD         SR3         NEXT LOCATN     0660   69  0913  0367
263                LDD         SR3ED                       0913   69  0666  0370
264                RAU   W0003                             0666   60  1979  1133
265                NZU   PS30  PS29                        1133   44  0837  0838
266          PS30  RAU   W0004                             0837   60  1980  1185
267                NZU   PS32  PS31                        1185   44  0789  0540
268          PS32  LDD   TAU   PS133                       0789   69  1960  0638
269          PS29  RAU   TEMP9                           0838   60  0853  0857
270                STU   W0003 PS30                        0857   21  1979  0837
271          PS31  RAU   TEMP9                           0540   60  0853  0907
272                STU   W0004 PS32                      0907   21  1980  0789
273          TAU   NOP    0000 PS                        1960   00  0000  1234
274          TAU1  NOP    0000 PS                        0147   00  0000  1234
275          SR1   STD   EXIT  SR1E                      0341   24  0644  0497
276          SR1A  SLO   INCR  SR1E                      0950   16  1003  0497
277          SR1E  SLT    0002                           0497   35  0002  1053
278                NZU         EXIT                      1053   44  0957  0644
279                SLT    0002              SR1 BLOCKS    0957   35  0002  0963
280                LDD   SR1D               KK CONSEC     0963   69  0716  1269
281                SDA   SR1D               LOCATIONS     1269   22  0716  1319
282                SRT    0004              FROM XXXX TO  1319   30  0004  0979
283                LDD   SR1L               YYYY          0979   69  1082  1235
284                SDA   SR1L    8001                     1235   22  1082  8001
285          SR1D  STD    0000 SR1A                      0716   24  0000  0950
286          SR1L  LDD    0000 SR1D                      1082   69  0000  0716
287          INCR   00    9998  9999                     1003   00  9998  9999
288          SR3   STD   EXIT              SR3 CONVERTS  0367   24  0644  0547
289                DIV   TWSIX             THREE DIGIT   0547   14  1000  1050
290                STL   TEMP1             NUMBERS INTO  1050   20  0509  1012
291                LDD   SR3B   SR3A        TWO LETTER    1012   69  0965  0868
292          SR3A  STD   TEMP2             MNEMONICS     0868   24  0490  0743
293                AUP   ONET                            0743   10  0356  1361
294                SRT    0001                           1361   30  0001  0717
295                NZU         SR3A1                     0717   44  1021  0722
296                SLO   NINEQ                           1021   16  0874  1029
297                NZU         SR3A2                     1029   44  1183  0784
298                ALO   STL   SR3A2                     1183   15  0636  0784
299          SR3A1 SLT    0001                           0722   35  0001  1079
300                SUP    8001 TEMP2                     1079   11  8001  0490
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301          SR3A2   ALO   NINEO
302                  SLT   .0001   TEMP2
303          SR3B    SRT    0002
                     AUP   TEMP1
                     LDD   SR3C     SR3A
306          SR3C    SLT    0002    EXIT
307          SR3ED   STD   EXIT
308                  RAU    8003    GENERATE
309                  SLT    0004    SYMBOLIC
310                  AUP   LOCUS    LOCATION
311                  STU   TEMP9    FOR NEXT
312          SRN     STD   EXIT     STATEMENT
313                  RAL   ARITH    SRN FORMS
314                  NZA   SRN5      NUMBERS
315                  RAL   SRN2     OUT IF FLOAT
316                  SLO   MU       ING POINT
317                  AUP   N        FIX ASINTEG
318          SRN2    SRT    0010    ER IF FIXED    8002
319                  RAU    8003    POINT
320          SRN5    RAL   MU       SRN4
321                  ALO   FFTY1    FLOATING PT
322                  SRT    0004    EXPONENT IS
323                  ALO   NBAR      MU PLUS
324                  STL   TEMP1    FORTY NINE
325                  SLT    0008     PLUS NBAR
326                  NZU   SRN6
327                  RAL   N        MNTISA ALARM
328                  SRT    0002
329                  RAU    8002    AND MANTISSA
330                  NZU            IS          SRN4
331                  SCT    0000
332                  AUP   TEMP1     N TO 8 SIG
333                  SUP    8002    NIFICANT FIG
                     RAU    8003    URES        SRN4
335          SRN6    RAL   OTREY    LARM         ALARM
336          SRN4    STU   N        EXIT
337          SRAC    STD   EXIT
338                  RAU   FOUR     ABSOLUTE
339                  STU   JAY      CONSTANT
340          SRACR   RAU   JAY      SRACR        ROUTINE
341                  SUP   A0001
342                  NZU            SRAC3       OUT IF JAY
343                  RAL   JAY      EQUALS ABCNT
344                  ALO   ONE
345                  STL   JAY      INCRMNT JAY
346                  ALO   SRAC1     8002
347          SRAC1   RAL   A0001    SRAC2        FETCH JAYTH
348          SRAC2   SLO   N          CONSTANT
349                  NZA   SRACR    SRAC5       RECYCLE IF N
350          SRAC5   RAL   JAY      EQUALS JTH
351                  ALO   RAL        CONSTANT
352                  ALO   ABCON
353                  RAL    8002    EXIT
354          SRAC3   RAU   JAY
355                  AUP   ONE
356                  STU   A0001    N STORED AS
357                  STU   JAY
358                  SUP   ABCNT    NEW ABCON IF
359                  BMI            SRAC7        ABCNT  NOT
360                  AUP    8001      EXCEEDED
```

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0784  15  0874  1129
1129  35  0001  0490
0965  30  0002  1071
1071  10  0509  1013
1013  69  0766  0868
0766  35  0002  0644
0370  24  0644  0597
0597  60  8003  0905
0905  35  0004  1015
1015  10  0918  0873
0873  21  0853  0644
1100  24  0644  0647
0647  65  0358  1063
1063  45  0816  0767
0767  65  0670  0775
0775  16  0750  0955
0955  10  0484  8002
0670  30  0010  1027
1027  60  8003  1285
0816  65  0750  1005
1005  15  0357  1411
1411  30  0004  1121
1121  15  0342  0697
0697  20  0509  1062
1062  35  0008  0831
0831  44  1335  0686
0686  65  0484  0839
0839  30  0002  0645
0645  60  8002  1103
1103  44  1007  1285
1007  36  0000  1179
1179  10  0509  1113
1113  11  8002  1171
1171  60  8003  1285
1335  65  0888  0332
1285  21  0484  0644
1150  24  0644  0747
0747  60  1200  1055
1055  21  0710  1163
1163  60  0710  1065
1065  11  0383  0887
0887  44  0791  0492
0791  65  0710  1115
1115  15  0630  1385
1385  20  0710  1213
1213  15  0866  8002
0866  65  0383  0937
0937  16  0484  0889
0889  45  1163  0793
0793  65  0710  1165
1165  15  0968  0923
0923  15  0776  0881
0881  65  8002  0644
0492  60  0710  1215
1215  10  0630  1435
1435  21  0383  0736
0736  21  0710  1263
1263  11  0916  1221
1221  46  0924  0825
0924  10  8001  0931
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	AUP	SRAC6		NEW AB CONST	0931	10	0834	0939
	LDD	N	8003		0939	69	0484	8003
SRAC7	RAL	OFIVE	LARM	ALARM	0825	65	0528	0332
ABCNT	00	0099	0000	RAL A1 PLUS	0916	00	0099	0000
SRAC6	STD	A0001	SRAC5	JAY IN LOWER	0034	24	0383	0793
PS100	STD	FINI		INTERLACE	1035	24	0691	0694
	SRT	0003			0694	30	0003	1153
	SLO	8002		FOUR	1153	16	8002	1461
	SLT	0001			1461	35	0001	0817
	ALO	8001		DIGITS	0817	15	8001	0875
	SLT	0001			0875	35	0001	0981
	SLO	8002			0981	16	8002	0989
	SLT	0001		WITH	0989	35	0001	0695
	ALO	8001			0695	15	8001	1203
	SLT	0001			1203	35	0001	0759
	SLO	8002		ZEROES	0759	16	8002	0867
	SLT	0001			0867	35	0001	0973
	ALO	8001			0973	15	8001	1031
	SLT	0001	FINI		1031	35	0001	0691
D0001		I		SYMBOLS FOR	0032	69	0000	0000
D0002		Y		PROBLEM	0033	88	0000	0000
D0003		C		VARIABLES	0034	63	0000	0000
D0004		S			0035	82	0000	0000
D0005		A			0036	61	0000	0000
D0006		P			0037	77	0000	0000
D0007		W			0038	86	0000	0000
D0008	00	0800	0000		0039	00	0800	0000
D0009		E00AA			0040	65	9090	6161
00001	00	0075	7677	MNEMONICS	0600	00	0075	7677
00002	00	0168	7383	FOR	0601	00	0168	7383
00003	00	1061	8477	REQUIRED	0602	00	1061	8477
00004	00	1561	7376	OPERATIONS	0603	00	1561	7376
00005	00	1682	7376		0604	00	1682	7376
00006	00	1761	6162		0605	00	1761	6162
00007	00	1882	6162		0606	00	1882	6162
00008	00	1974	7788		0607	00	1974	7788
00009	00	2082	8373		0608	00	2082	8373
00010	00	2482	8364		0609	00	2482	8364
00011	00	3582	7383		0610	00	3582	7383
00012	00	4575	8961		0611	00	4575	8961
00013	00	4662	7469		0612	00	4662	7469
00014	00	6079	6184		0613	00	6079	6184
00015	00	6179	8284		0614	00	6179	8284
00016	00	6464	8579		0615	00	6464	8579
00017	00	6579	6173		0616	00	6579	6173
00018	00	6679	8273		0617	00	6679	8273
00019	00	6779	6162		0618	00	6779	6162
00020	00	6879	8262		0619	00	6879	8262
00021	00	6973	6464		0620	00	6973	6464
00022	00	7079	6482		0621	00	7079	6482
00023	00	7177	6368		0622	00	7177	6368
00024	00	9968	7383		0623	00	9968	7383
A0001	00	0006	0000	PRESET	0383	00	0006	0000
A0002	00	0000	0001	ABSOLUTE	0384	00	0000	0001
A0005	00	0000	1000	CONSTANTS	0387	00	0000	1000
A0006	00	0000	2000		0388	00	0000	2000
A0007	00	0000	3000		0389	00	0000	3000
0150	00	6163	AI	ABSOLUTE	0150	00	6163	1018
0151	00	6169	AI	VALUE	0151	00	6169	1018
0152	00	6173	AL		0152	00	6173	0628

421	0153	00	6178	AL		0153	00	6178	0628
422	0154	00	6188	AI		0154	00	6188	1018
423	0155	00	6282	BS	B MINUS	0155	00	6282	0987
424	0156	00	6299	BN		0156	00	6299	0654
425	0157	00	6369	CI	C	0157	00	6369	0974
426	0158	00	6373	CEEL		0158	00	6373	0678
427	0159	00	6375	CMTX		0159	00	6375	0880
428	0160	00	6399	CN		0160	00	6399	0704
429	0161	00	6463	WY	DIVIDE	0161	00	6463	1068
430	0162	00	6466	DF		0162	00	6466	1271
431	0163	00	6469	WY		0163	00	6469	1068
432	0164	00	6471	ZN		0164	00	6471	0826
433	0165	00	6473	WL		0165	00	6473	0728
434	0166	00	6478	WE		0166	00	6478	1233
435	0167	00	6488	WY		0167	00	6488	1068
436	0168	00	6499	ZN		0168	00	6499	0826
437	0169	00	6572	PS3		0169	00	6572	0343
438	0170	00	6663	WY	F	0170	00	6663	1068
439	0171	00	6666	FF	O	0171	00	6666	1321
440	0172	00	6669	WY	N	0172	00	6669	1068
441	0173	00	6671	ZN	L	0173	00	6671	0826
442	0174	00	6673	WL	E	0174	00	6673	0728
443	0175	00	6678	WE	F	0175	00	6678	1233
444	0176	00	6682	PS3	T	0176	00	6682	0343
445	0177	00	6688	WY		0177	00	6688	1068
446	0178	00	6699	ZN		0178	00	6699	0826
447	0179	00	6769	GI		0179	00	6769	1024
448	0180	00	6773	GL	GO	0180	00	6773	0778
449	0181	00	6799	GN		0181	00	6799	0754
450	0182	00	6866	PS3		0182	00	6866	0343
451	0183	00	6966	IF	HALT IF	0183	00	6966	1371
452	0184	00	6969	II	I	0184	00	6969	1074
453	0185	00	6973	IL		0185	00	6973	0828
454	0186	00	6999	IN		0186	00	6999	0804
455	0187	00	7164	PW		0187	00	7164	1369
456	0188	00	7166	PF	DECIMAL POINT	0188	00	7166	1421
457	0189	00	7172	PCMMA		0189	00	7172	1077
458	0190	00	7177	PW		0190	00	7177	1369
459	0191	00	7178	PF		0191	00	7178	1421
460	0192	00	7179	PF		0192	00	7179	1421
461	0193	00	7182	PW		0193	00	7182	1369
462	0194	00	7187	PW		0194	00	7187	1369
463	0195	00	7199	PN		0195	00	7199	0854
464	0196	00	7263	WY		0196	00	7263	1068
465	0197	00	7266	QF		0197	00	7266	1471
466	0200	00	7269	WY		0200	00	7269	1068
467	0201	00	7271	ZN		0201	00	7271	0826
468	0202	00	7273	WL	COMMA	0202	00	7273	0728
469	0203	00	7278	WE		0203	00	7278	1233
470	0204	00	7282	PS3	COMMA MINUS	0204	00	7282	0343
471	0205	00	7288	WY		0205	00	7288	1068
472	0206	00	7299	ZN		0206	00	7299	0826
473	0207	00	7363	WY		0207	00	7363	1068
474	0208	00	7369	WY		0208	00	7369	1068
475	0209	00	7371	ZN		0209	00	7371	0826
476	0210	00	7373	WL		0210	00	7373	0728
477	0211	00	7378	WE		0211	00	7378	1233
478	0212	00	7382	PS3	LEFT MINUS	0212	00	7382	0343
479	0213	00	7388	WY		0213	00	7388	1068
480	0214	00	7399	ZN		0214	00	7399	0026

481	0215	00	7463	MINI		0215	00	7463	1118
482	0216	00	7469	MINI	M L	0216	00	7469	1118
483	0217	00	7471	MINN	I O E	0217	00	7471	0876
484	0218	00	7473	MINL	N N F	0218	00	7473	0878
485	0219	00	7478	MINL	U T	0219	00	7478	0878
486	0220	00	7488	MINI	S	0220	00	7488	1118
487	0221	00	7499	MINN		0221	00	7499	0876
488	0222	00	7573	PS3		0222	00	7573	0343
489	0223	00	7763	WY		0223	00	7763	1068
490	0224	00	7769	WY		0224	00	7769	1068
491	0225	00	7771	ZN		0225	00	7771	0826
492	0226	00	7773	WL		0226	00	7773	0728
493	0227	00	7778	WE		0227	00	7778	1233
494	0228	00	7782	PS3	P MINUS	0228	00	7782	0343
495	0229	00	7788	WY	MATRIX	0229	00	7788	1068
496	0230	00	7799	ZN	POWER	0230	00	7799	0826
497	0231	00	7864	EW		0231	00	7864	1419
498	0232	00	7866	EE		0232	00	7866	1521
499	0233	00	7872	QCMMA		0233	00	7872	1127
500	0234	00	7877	EW		0234	00	7877	1419
501	0235	00	7878	EE		0235	00	7878	1521
502	0236	00	7879	EE		0236	00	7879	1521
503	0237	00	7882	EW		0237	00	7882	1419
504	0238	00	7887	EW	EXTENSIONS	0238	00	7887	1419
505	0239	00	7899	EN		0239	00	7899	0904
506	0240	00	7964	RW		0240	00	7964	1469
507	0241	00	7966	RR		0241	00	7966	1571
508	0242	00	7969	RR		0242	00	7969	1571
509	0243	00	7972	RCMMA		0243	00	7972	1177
510	0244	00	7977	RW		0244	00	7977	1469
511	0245	00	7978	RR		0245	00	7978	1571
512	0246	00	7979	RR		0246	00	7979	1571
513	0247	00	7982	RW		0247	00	7982	1469
514	0250	00	7983	RR		0250	00	7983	1571
515	0251	00	7987	RW		0251	00	7987	1469
516	0252	00	7989	RZ		0252	00	7989	0744
517	0253	00	8263	WY	RIGHT PAREN	0253	00	8263	1068
518	0254	00	8269	WY		0254	00	8269	1068
519	0255	00	8271	ZN		0255	00	8271	0826
520	0256	00	8273	WL		0256	00	8273	0728
521	0257	00	8278	WE		0257	00	8278	1233
522	0258	00	8288	WY		0258	00	8288	1068
523	0259	00	8299	ZN		0259	00	8299	0826
524	0260	00	8363	TC		0260	00	8363	1168
525	0261	00	8369	TI		0261	00	8369	1124
526	0262	00	8373	TL		0262	00	8373	0928
527	0263	00	8388	TY		0263	00	8388	0843
528	0264	00	8463	MY		0264	00	8463	1218
529	0265	00	8469	MY		0265	00	8469	1218
530	0266	00	8471	MN		0266	00	8471	0926
531	0267	00	8473	ML		0267	00	8473	0978
532	0268	00	8478	ME	SUM	0268	00	8478	1283
533	0269	00	8488	MY		0269	00	8488	1218
534	0270	00	8499	MN		0270	00	8499	0926
535	0271	00	8563	MY		0271	00	8563	1218
536	0272	00	8569	MY		0272	00	8569	1218
537	0273	00	8571	MN		0273	00	8571	0926
538	0274	00	8573	ML		0274	00	8573	0978
539	0275	00	8578	ME		0275	00	8578	1283
540	0276	00	8588	MY	TYPE	0276	00	8588	1218

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      0277  00  8599  MN                            0277  00  8599  0926
      0278  00  8663  MY                            0278  00  8663  1218
      0279  00  8669  MY                            0279  00  8669  1218
      0280  00  8671  MN       RELATIONS            0280  00  8671  0926
      0281  00  8673  ML                            0281  00  8673  0978
      0282  00  8678  ME                            0282  00  8678  1283
      0283  00  8688  MY                            0283  00  8688  1218
      0284  00  8699  MN                            0284  00  8699  0926
      0285  00  8763  WY                            0285  00  8763  1068
      0286  00  8769  WY                            0286  00  8769  1068
      0287  00  8771  ZN                            0287  00  8771  0826
      0288  00  8773  WL                            0288  00  8773  0728
      0289  00  8778  WE                            0289  00  8778  1233
      0290  00  8788  WY                            0290  00  8788  1068
      0291  00  8799  ZN                            0291  00  8799  0826
      0292  00  8869  YI                            0292  00  8869  1174
      0293  00  8873  YL                            0293  00  8873  1028
      0294  00  8875  YMTX                          0294  00  8875  0930
      0295  00  8899  YN                            0295  00  8899  0954
      0296  00  8963  WY                            0296  00  8963  1068
      0297  00  8969  WY                            0297  00  8969  1068
      0300  00  8971  ZN                            0300  00  8971  0826
      0301  00  8973  WL                            0301  00  8973  0728
      0302  00  8978  WE                            0302  00  8978  1233
      0303  00  8982  PS3                           0303  00  8982  0343
      0304  00  8988  WY                            0304  00  8988  1068
      0305  00  8999  ZN                            0305  00  8999  0826
      0306  00  9063  ENDY     TIMES                0306  00  9063  1268
      0307  00  9064  PS12                          0307  00  9064  0850
      0308  00  9067  ENDG                          0308  00  9067  0772
      0309  00  9068  ENDH                          0309  00  9068  1023
      0310  00  9069  ENDY                          0310  00  9069  1268
      0311  00  9073  ENDL                          0311  00  9073  1078
      0312  00  9078  PS12                          0312  00  9078  0850
      0313  00  9083  ENDT                          0313  00  9083  0938
      0314  00  9088  ENDY       Y                  0314  00  9088  1268
      0315  00  9962  NF                            0315  00  9962  0917
      0316  00  9964  NW                            0316  00  9964  1519
      0317  00  9965  NR       SUBSTITUTION         0317  00  9965  0720
      0318  00  9966  NF                            0318  00  9966  0917
      0319  00  9969  NR                            0319  00  9969  0720
      0320  00  9971  NF                            0320  00  9971  0917
      0321  00  9972  NCMMA                         0321  00  9972  1227
      0322  00  9977  NW                            0322  00  9977  1519
      0323  00  9978  NR                            0323  00  9978  0720
      0324  00  9979  NR                            0324  00  9979  0720
      0325  00  9982  NW                            0325  00  9982  1519
      0326  00  9983  NR           FIRST            0326  00  9983  0720
      0327  00  9987  NW       CHARACTERS           0327  00  9987  1519
      0328  00  9989  NZ                            0328  00  9989  0794
      0329  00  9999  NF                            0329  00  9999  0917
     AI     RAL  OTWO          RAL RSL              1018  65  0768  1073
            STL  TEMP4         BECOME               1073  20  0788  0841
            LDD  AI1   UCHGE    RAB RSB             0841  69  0844  0797
     AI1    LDD        SETEL   L IS R               0844  69  0847  1250
            STL  ABVAL PS3     ABVAL NONZRO         0847  20  0366  0343
     AL     LDD        STBTA   BETA IS U            0628  69  1081  0884
            STU  V1            V1 IS ZERO           1081  21  0488  0891
            RAL  RAB             COMPILE            0891  65  0894  0349
            ALO  LOW            RAB 8002            0349  15  0352  1057
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	LDD		OSGN1		1057	69	0760	1313
	STU	OPSGN	AI1	OPSGN ZERO	0760	21	0524	0844
BS	LDD		DROPU	DCRMNT U	0987	69	0640	0893
	RAL	A0001		ABCON COUNT	0640	65	0383	1037
	SLO	ONE		MINUS ONE	1037	16	0630	1485
	STL	A0001			1485	20	0383	0786
	RAU	N	BN1		0786	60	0484	1039
BN	LDD	BN1	SRN		0654	69	1039	1100
BN1	STU	NBAR		NBAR EQUALS	1039	21	0342	0745
	LDD		CHKAR	N	0745	69	0198	0751
	RAL	ONET		ARITH EQUALS	0198	65	0356	1511
	STU	N		ONE	1511	21	0484	1087
	STL	ARITH	NF2		1087	20	0358	1561
CEEL	RAL	THREE			0678	65	1131	1535
	LDD	CI	SETEL		1535	69	0974	1250
CI	RAL	C	CI1		0974	65	1277	1181
CI1	AUP	ONET	ADLOW		1181	10	0356	1611
ADLOW	STU	TEMP1		STORE V AND	1611	21	0509	1112
	STL	TEMP2		ARITH	1112	20	0490	0943
	LDD		CHKAR		0943	69	0346	0751
	RAL	SLTI3		COMPILE	0346	65	0499	1253
	LDD		OSGN1	SLT 0004 AND	1253	69	0656	1313
	STU	OPSGN			0656	21	0524	1327
	RAU	LOW1		ALO 8002	1327	60	0980	1585
	AUP	ALO			1585	10	0988	0993
	LDD		PS7	COMPILE	0993	69	0496	0800
	RAL	8003	VAR2	RALV0000	0496	65	8003	1303
CMTX	RAU	TWO	YMTX1	V IS TWO	0880	60	0148	1353
CN	RAL	C	CN1	V EQUALS C	0704	65	1277	1231
CN1	AUP	ONET	VAR	ARITH IS ONE	1231	10	0356	1661
VAR	STU	TEMP1		STORE V AND	1661	21	0509	1162
	STL	TEMP2		ARITH	1162	20	0490	1043
	LDD		CHKAR		1043	69	0546	0751
	LDD		STBTA		0546	69	0549	0884
	LDD		SRN	GENERATE N	0549	69	0652	1100
	LDD		CHKNN		0652	69	1105	0658
	SLT	0004	VAR2		1105	35	0004	1303
VAR2	ALO	RAL		COMPILE	1303	15	0968	1123
	ALO	TEMP2		RAL VN	1123	15	0490	0795
	LDD	VAR1	OSGN1		0795	69	0248	1313
VAR1	RAL	TEMP1		SET ARITH	0248	65	0509	1363
	STL	ARITH	EEC2		1363	20	0358	1711
DF	RAL	SXTNT		BEGIN READ	1271	65	1224	1229
	LDD	PS5A	LDSR		1229	69	0635	1038
EE	LDD	RR	NUINC		1521	69	1571	1274
EEC2	STU	OPSGN	PS3		1711	21	0524	0343
EN	LDD		CHKAR		0904	69	1107	0751
	LDD		SRN	GENERATE N	1107	69	0810	1100
	LDD		CHKNN		0810	69	1413	0658
	ALO	D0001		COMPILE	1413	15	0032	1137
	ALO	EXT		LDD0000EN	1137	15	0690	0845
	LDD		OSGN1		0845	69	0298	1313
	STU	OPSGN			0298	21	0524	1377
	RAL	NU			1377	65	0700	1155
	ALO	EN1			1155	15	0708	1463
	AUP	8002		IF JNU NOT	1463	10	8002	1621
	SLO	ONE		EQUAL JNU	1621	16	0630	1635
	LDD	EN4		PLUS ONE	1635	69	1088	0941
	SDA	EN4	8003	COMPILE	0941	22	1088	8003
EN1	RAL	J0001		NOPPHIJNU	0708	65	1977	1281

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              STL   TEMP2   EN4                          1281   20   0490   1088
      EN4     SLO   J0001                                1088   16   1977   1331
              NZA           EN3                          1331   45   0934   1685
              RAL   TEMP2                                0934   65   0490   0895
              SLO   ONET                                 0895   16   0356   1761
              SLT    0004                                1761   35   0004   1671
              ALO   PHI                                  1671   15   1324   1279
              LDD   EN3     OSGN1                        1279   69   1685   1313
      EN3     RAU   N               EXTENSION            1685   60   0484   1089
              SUP   MAXE            NUMBER               1089   11   0542   0897
              BMI           EN2A    SET ARITH            0897   46   1300   0801
              RAU   ONET    EN2                          1300   60   0356   1811
      EN2A    RAU    8002   EN2                          0801   60   8002   1811
      EN2     STU   ARITH           V1 TO ZERO           1811   21   0358   1861
              STL   V1      PS3                          1861   20   0488   0343
      EW      LDD   RW      NUINC                        1419   69   1469   1274
      ENDG    RAL   RELAT           END STMNT IF         0772   65   0632   1187
              NZA           PS12    RELAT ZERO           1187   45   0740   0850
              LDD   ENDG1           IF GO INTGR          0740   69   1093   0596
              SDA   ENDG1               THEN             0596   22   1093   0646
              LDD   ENDG3           INST OF              0646   69   0599   0702
              SDA   ENDG3           UMINUSTWO            0702   22   0599   0752
              RAL   U               SET TO DATA          0752   65   0515   1569
              SLO   TWO             OF UMINUS1           1569   16   0148   1403
              LDD   ENDGA                THEN            1403   69   0706   0809
              SDA   ENDGA           DECOMPILE            0809   22   0706   0859
              LDD   ENDGB                                0859   69   1212   1265
              SDA   ENDGB                IF              1265   22   1212   1315
              ALO            8002     GO I INTGR         1315   15   1318   8002
              RAL    0001                THEN            1318   65   0001   1205
              SLT    0002             ENDGR              1205   35   0002   1911
              NZU   ENDGR                                1911   44   1365   0966
              SRT    0002   ENDGA                        0966   30   0002   0706
      ENDGA   LDD    0000   ENDGB                        0706   69   0000   1212
      ENDGB   SIA    0000                                1212   23   0000   1453
              LDD           DROPU   IF RELAT             1453   69   0756   0893
              RAL   RELAT           NEG  THEN            0756   65   0632   1237
              BMI   ENDG2   ENDG5      ENDG2             1237   46   0790   0991
      ENDGR   RAL   RELAT           IF RELAT NEG         1365   65   0632   1287
              BMI   ENDG2   ENDG4   THEN ENDG2           1287   46   0790   1041
      ENDG2   RAB    8002           INST OF              0790   67   8002   0649
              STL   BETA            RELATMINUS1          0649   20   1503   0806
              LDD   ENDG4   BMONE   SET TO U             0806   69   1041   0944
      ENDG4   RAL   U       ENDG3   DATA OF              1041   65   0515   0599
      ENDG3   LDD    0000   ENDG1   RELAT SET            0599   69   0000   1093
      ENDG1   SDA    0000            TO U                1093   22   0000   1553
              RSU   U               COMPILE              1553   61   0515   1619
              LDD   ENDG5   PS7     NEG  NOP             1619   69   0991   0800
      ENDG5   STU   RELAT   PS12    RELAT ZERO           0991   21   0632   0850
      ENDH    RAU   U               COMPILE              1023   60   0515   1669
              AUP   OONE             HLT U 0000          1669   10   0832   1337
              LDD   PS12    PS7                          1337   69   0850   0800
      ENDL    LDD   ENDY    DROPK                        1078   69   1268   1721
      ENDT    RAL   FOURT           END PUNCH            0938   65   1091   0945
              SLO   J0001            GENERATOR           0945   16   1977   1381
              BMI   ALARM             COMPILES           1381   46   0827   1735
              RAL    8001            LDD PNCHSR          1735   65   8001   1143
              SLT    0004           IF NR OF             1143   35   0004   1603
              ALO    0000            VARIABLES           1603   15   0000   1255
              STL   N                LESS THAN           1255   20   0484   1387
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                LDD          SRAC      FIVE            1387  69  0840  1150
                LDD          OSGN1                     0840  69  1193  1313
                RAL   SVNTT                            1193  65  0696  0851
                LDD   PS12   LDSR                      0851  69  0850  1038
ENDY            LDD          CHKNK     IF U EQUALS     1268  69  1771  1374
                LDD          UBETA     BETA PLUS 1     1771  69  1424  1427
                NZA   ENDY1            RAL BECOMES     1424  45  1128  1329
                RSL   NZA              STL             1329  66  1132  1437
                STL   TEMP4            IN BETA         1437  20  0788  1141
                RAL   BETA                             1141  65  1503  1157
                LDD          CHGOP                     1157  69  0860  1513
                STL   TEMP1                            0860  20  0509  1262
                RAL   BETA                             1262  65  1503  1207
                SLO   ONE                              1207  16  0630  1785
                STL   TEMP4                            1785  20  0788  1191
                ALO   ENDY2  8002      SET CONTENTS    1191  15  0994  8002
ENDY2           RAL   0000             BETA MINUS      0994  65  0000  1305
                STL   TEMP2            ONE EQUAL       1305  20  0490  1243
                RAB   8002             TO CONTENTS     1243  67  8002  0901
                SLO   STLA1            BETA WITH       0901  16  1004  0909
                NZA   PS12             SIGN BETA       0909  45  0850  1563
                RAU   TEMP4            MINUS ONE       1563  60  0788  1293
                STU   U                IF BETA         1293  21  0515  1368
                RAU   TEMP2            MINUS ONE       1368  60  0490  0995
                BMI          ENDY3     CONTAINS        0995  46  0348  0699
                RSU   TEMP1  ENDY4     STL ACC         0348  61  0509  1613
ENDY3           RAU   TEMP1  ENDY4                     0699  60  0509  1613
ENDY4           LDD   PS12   PS7                       1613  69  0850  0800
ENDY1           RSL   FRONE            IF U NOT BTA    1128  66  1431  1835
                STL   TEMP4            PLUS ONE        1835  20  0788  1241
                LDD          UCHGE     RECOMPILE       1241  69  1044  0797
                RAL   U                RALYO 0000      1044  65  0515  1719
                SLO   TWO                              1719  16  0148  1653
                STL   U                TO              1653  20  0515  1418
                ALO   ENDY6  8002                      1418  15  1821  8002
ENDY6           RAU   0000             ALO U 0000      1821  60  0000  1355
                AUP   U                LDD ACC 8002    1355  10  0515  1769
                AUP   TWO              STDYO 0000      1769  10  0148  1703
                SRT   0004                             1703  30  0004  1663
                RAU   8003             WITH SGN OF     1663  60  8003  1871
                SLT   0004             LAST INST       1871  35  0004  1481
                LDD          PS7       NEGATIVE        1481  69  0984  0800
                RAL   U                                0984  65  0515  1819
                ALO   ENDY7  8002                      1819  15  0822  8002
ENDY7           RSL   0000                             0822  66  0000  1405
                STL   TEMP1                            1405  20  0509  1312
                RAU   LDAC                             1312  60  1415  1869
                LDD          PS7                       1869  69  0872  0800
                RAU   TEMP1                            0872  60  0509  1713
                LDD   PS12   PS7                       1713  69  0850  0800
FF              STU   FFBIT  PS3       FFBIT ON        1321  21  1959  0343
GI              RAL   ALO              COMPILE         1024  65  0988  1343
                ALO   ABCON            ALO A0 8002     1343  15  0776  1531
                ALO   LOW1             WHERE A0        1531  15  0980  1885
                LDD          OSGN1     WILL CONT       1885  69  1138  1313
                RAU   OONE   EEC2      SO ADDRSS       1138  60  0832  1711
GL              LDD   GI     CHKAR                     0778  69  1024  0751
GN              LDD          CHKAR                     0754  69  1257  0751
                LDD          SRN                       1257  69  0910  1100
                LDD          CHKNN     COMPILE         0910  69  1763  0658
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781		ALO	GO		NOP0000SN	1763	15	1016	1921
782		LDD	EEC2	OSGN1		1921	69	1711	1313
783	IF	LDD	NI	CHKNK		1371	69	1474	1374
784	II	RAL	I	ADLOW		1074	65	1477	1611
785	IL	RAL	ONE			0828	65	0630	1935
786		LDD	II	SETEL		1935	69	1074	1250
787	IN	RAL	I	VAR	V EQUALS I	0804	65	1477	1661
788	ME	LDD	ML	NUMIN	DCRMNT NU	1283	69	0978	1581
789	ML	RAU		STREL	RELAT IS L	0978	60	1631	0836
790		LDD		DROPK		1631	69	1034	1721
791		LDD		CHKTK	TO ML1 IF	1034	69	1487	0890
792		NZA		ML1	TK IS ZERO	1487	45	0940	1291
793		LDD	ML1	TKNZ1	TKNZ1AND ML1	0940	69	1291	1094
794	ML1	LDD		SETEK		1291	69	1752	1134
A794		LDD		NGLFT		1752	69	1144	0947
795		STU	ABVAL	PS3	ABVAL ZERO	1144	21	0366	0343
796	MY	RAU		STREL	RELAT IS L	1218	60	1971	0836
797		LDD		CHKTK	TO MINI IF	1971	69	1524	0890
798		NZA	MY1	MINI	TK IS ZERO	1524	45	1178	1118
799	MY1	LDD	ML1	TKNZ2		1178	69	1291	1194
800	MN	RAU		STREL	RELAT IS L	0926	60	1379	0836
801		LDD		CHKTK	TO MINN IF	1379	69	1182	0890
802		NZA		MINN	TK IS ZERO	1182	45	0886	0876
803		LDD		SRN	COMPILE	0886	69	1139	1100
804		LDD	MY1	GENN	RAL AJAY	1139	69	1178	1681
805	MINI	RAL	OONE		RAL RAB	1118	65	0832	1537
806		STL	TEMP4		BECOMES	1537	20	0788	1341
807		LDD		UCHGE	RSL RSB	1341	69	1244	0797
808		RAL	D0004		L IS S	1244	65	0035	1189
809		STL	L	PS3G	THEN PS3G	1189	20	0529	0668
810	MINL	LDD	PS3G	NGLFT		0878	69	0668	0947
811	MINN	LDD		SRN		0876	69	1429	1100
812		RSU	N		N IS MINUS N	1429	61	0484	1239
813		STU	N		COMPILE	1239	21	0484	1587
814		LDD		GENN	RAL AJAY	1587	69	0990	1681
815		RAL	D0004		L IS S	0990	65	0035	1289
816		STL	L	WY	THEN WY	1289	20	0529	1068
817	M0001	84	0000	IDEM	SWITCHING	0500	84	0000	1455
818	M0002	85	0000	GRTR	DICTIONARY	0501	85	0000	1505
819	M0003	86	0000	GRTRZ	FOR	0502	86	0000	1555
820	M0004	99	9999	ALARM	RELATIONS	0503	99	9999	0827
821	IDEM	RAL	U		COMPILE	1455	65	0515	1919
822		STL	RELAT		NZA0000NEXT	1919	20	0632	0936
823		RAL	NZA	GRTR1		0936	65	1132	1637
824	GRTRZ	RAL	U		V EQUALS U	1555	65	0515	1969
825		STL	RELAT	GRTZ1	COMPILE	1969	20	0632	0986
826	GRTZ1	RAL	BMI	GRTR1	BMI0000NEXT	0986	65	1339	1637
827	GRTR1	LDD	EEC2	OSGN1	OPSGN ZERO	1637	69	1711	1313
828	GRTR	RSL	U		V EQUALS U	1505	66	0515	0770
829		SLO	ONE		PLUS ONE	0770	16	0630	1036
830		STL	RELAT		COMPILE	1036	20	0632	1086
831		RAL	NZA		NZA0000NEXT	1086	65	1132	1687
832		LDD		OSGN1		1687	69	1040	1313
833		STU	OPSGN	GRTZ1		1040	21	0524	0986
834	NCMMA	LDD	NR	COMMA		1227	69	0720	1173
835	NF	RAU	INTGR		N EQUALS L	0917	60	0538	1393
836		SRT	0008		AND N	1393	30	0008	1961
837		ALO	N			1961	15	0484	1389
838		SRT	0001		MU EQUALS MU	1389	30	0001	1045
839		STL	N		PLUS ONE	1045	20	0484	1737

```
840                 RAU   MU
841                 AUP   ONE     NF2
842       NF2       STU   MU      PS3
843       NI        RAL   NI1
844                 LDD   RELAT             SWITCH TO
845                 TLU   M0001   8002       RELATION
846       NI1       RAU    0000               COMPILER
847                 SUP   RELAT   8003
848       NR        STL   NBAR              N NBAR MU
849                 STL   N                  DEL AND
850                 STL   MU                ARITH ZERO
851                 STL   ARITH   NF
852       NW        LDD   NR      TKOP       STORE OP
853       NZ        LDD   NR      NZ4
854       NZ4       STD   OUT
855                 LDD   NZ1     CHKNK
856       NZ1       RAL    0001              COMPILE
857                 SLT    0002               STL ACC
858                 SUP   SIXTR                 OR
859                 NZU           FLOTE        LDD FLOATK
860                 SUP   SIXT                  OR
861                 NZU           FIXVA        LDD FIX
862                 SUP   NNTEN                 OR
863                 NZU           FLOTE
864                 RAL   FIVEO   LARM          ALARM
865       NZ3       RAU   V1                  TO NZ2 IF
866                 NZU   OUT     NZ2          V1 ZERO
867       NZ2       RAL   STLA1
868                 LDD           OSGN1
869                 STU   OPSGN   FLOT1
870       FLOTE     RAU   ARITH                FLOAT IF
871                 NZU   NZ3
872                 RAL   FIVET                 Y AND FIX
873                 LDD   FLOT1   LDSR         C AND FIX
874       FLOT1     RAU    8003   OUT
875       FIXVA     RAU   ARITH
876                 NZU           NZ2
877                 RAL   FIXNR
878                 LDD   NZ2     LDSR
879       PCMMA     LDD   PF      COMMA
880       PF        STL   N                  N NBAR AND
881                 STL   NBAR                MU ZERO
882                 STL   MU      PN          THEN PN
883       PN        RAL   ONET               ARITH TO
884                 STL   ARITH   NF2          FLOATING
885       PW        LDD   PF      TKOP       TKOP AND PF
886       QCMMA     LDD   EE      COMMA
887       QF        RAU   TAU
888                 SUP   TAU5                 QUANT
889                 NZU   TF1
890                 LDD   TF1     STSMT        IF SO
891       STSMT     STD   FINI               STORE STMT
892                 RAL   FLOP1               NO OF STMT
893                 AUP    0000               FOLLOWING
894                 SLO   ONE                 QUANT
895                 ALO            8002
896                 STU   N0001   FINI
897       TF1       RAU   PSI                  IF NOT
898                 AUP   ONE                INCRMNT PSI
899                 STU   PSI                 AND SET
```

```
1737   60   0750   1605
1605   10   0630   1561
1561   21   0750   0343
1474   65   1527   1731
1731   69   0632   1136
1136   84   0500   8002
1527   60   0000   1655
1655   11   0632   8003
0720   20   0342   1095
1095   20   0484   1787
1787   20   0750   1753
1753   20   0358   0917
1519   69   0720   1223
0794   69   0720   1273
1273   24   0976   1479
1479   69   1232   1374
1232   65   0001   1705
1705   35   0002   1362
1362   11   1465   0820
0820   44   1323   1574
1323   11   0330   1186
1186   44   1439   1090
1439   11   0592   0997
0997   44   0951   1574
0951   65   1054   0332
1350   60   0488   1443
1443   44   0976   0498
0498   65   1004   0959
0959   69   1412   1313
1412   21   0524   1577
1574   60   0358   1813
1813   44   1350   1468
1468   65   0922   1627
1627   69   1577   1038
1577   60   8003   0976
1090   60   0358   1863
1863   44   0967   0498
0967   65   0870   0925
0925   69   0498   1038
1077   69   1421   1173
1421   20   0484   1837
1837   20   0342   1145
1145   20   0750   0854
0854   65   0356   1462
1462   20   0358   1561
1369   69   1421   1223
1127   69   1521   1173
1471   60   1960   1515
1515   11   1518   1373
1373   44   1677   1228
1228   69   1677   1030
1030   24   0691   1294
1294   65   1047   1001
1001   10   0000   1755
1755   16   0630   1236
1236   15   1489   8002
1489   21   0568   0691
1677   60   0041   1195
1195   10   0630   1286
1286   21   0041   1344
```

```
                MPY   SIXT                    COUNT          1344  19  0330  1336
901             STL   FLOP1                                  1336  20  1047  1400
902             RAL   ONE     TF2                            1400  65  0630  1386
903     QUA4    NZU           CURTN    IF TALLY              1450  44  1803  1104
904             AUP            8003     NON ZERO             1803  10  0856  8003
905             RAL    0000   QUA20    SEND NXT WRD          0856  65  0000  1805
906     QUA20   STL   GAMMA   QUA3     TO GAMMA              1805  20  0372  0975
907     QUA3    RAU   GAMMA                                  0975  60  0372  1727
908             NZU     .     QUA1                           1727  44  1781  1282
909             SRT    0002             EXTRACT              1781  30  0002  1887
910             STU   GAMMA             PEWTH                1887  21  0372  1025
911             RAU    8002             SYMBOL               1025  60  8002  1333
912             STU   TEMP1             IS                   1333  21  0509  1512
913             NZU   QUA2    QUA3      SYMBOL ZERO          1512  44  1565  0975
914     QUA1    RAU   TALLY              INCRMNT              1282  60  0373  1777
915             SUP   ONE                 TALLY               1777  11  0630  1436
916             STU   TALLY   QUA4                           1436  21  0373  1450
917     QUA2    SUP   SVTY2             IS SYMBOL K          1565  11  1568  1423
918             NZU   QUA5                                   1423  44  1827  1278
919             RAL   CHI               INCRMNT CHI          1278  65  1831  1486
920             ALO   ONE     TF2                            1486  15  0630  1386
921     TF2     STL   CHI                CLEAR L             1386  20  1831  1084
922             STU   STAR               AND STAR            1084  21  1188  1391
923             STU   EL      QUA3                           1391  21  0746  0975
924     QUA5    RAU   EL                                     1827  60  0746  1051
925             AUP   ONET              INCRMNT EL           1051  10  0356  1562
926             STU   EL                ALARM  IF            1562  21  0746  0749
927             SUP   SIXT               MORE THAN           0749  11  0330  1536
928             NZU   QUA7    QUA50      FIVE SYMBLS         1536  44  1539  1140
        QUA50   RAL   PSI                                    1140  65  0041  1245
930             SLO   ONE                                    1245  16  0630  1586
931             STL   PSI     ALARM                          1586  20  0041  0827
932     QUA7    RAU   STAR                                   1539  60  1188  1493
933             SRT    0002                                  1493  30  0002  0799
934             AUP   TEMP1                                  0799  10  0509  1913
935             ALO   FLOP1                                  1913  15  1047  1101
936             ALO   CHI                                    1101  15  1831  1636
937             SLO   SEVEN                                  1636  16  1589  1543
938             ALO            8002                          1543  15  0796  8002
939             STU   N0001                                  0796  21  0568  0972
940             STU   STAR    QUA3                           0972  21  1188  0975
941     CURTN   LDD           FLOP     STORE                1104  69  1307  0960
942             RAL   W0005   CURT1    CONVERT NO           1307  65  1981  1686
943     CURT1   SLT    0002             OF STATMNTS          1686  35  0002  1593
944             SUP   NINTY              BEING               1593  11  0360  1615
945             SUP    8003              QUANTIFIED          1615  11  8003  1473
946             NZA           CURT2       TO PURE            1473  45  1026  1877
947             AUP    8001   CURT1       NUMERIC            1026  10  8001  1686
948     CURT2   AUP    8001                                   1877  10  8001  1736
949             SRT    0002                                   1736  30  0002  1643
950             SLO    8002                                   1643  16  8002  1151
951             SRT    0001                                   1151  30  0001  1357
952             ALO    8001                                   1357  15  8001  1665
953             SLO    8002                                   1665  16  8002  1523
954             SRT    0001                                   1523  30  0001  1529
955             ALO    8001                                   1529  15  8001  1937
956             SLT    0002                                   1937  35  0002  1693
957             ALO   FLOP1                                  1693  15  1047  1201
        1       SLO   TWO                                    1201  16  0148  1853
959             ALO            8002                          1853  15  0906  8002
```

```
960                 STU   N0001
961                 LDD   W0004
962                 STD    0001
963                 LDD   Z
964                 STD    0002
965                 LDD   W0003
966                 STD    0003
967                 RAU   FIVET
968                 STL    0004
969                 ALO   TAU6      QUA9
970       QUA9      STU   TALLY
971                 STL   TAU
972                 RAL   RSL       PS2B
973       TAU6      RAL   TAU5      QUA11
974       QUA11     STL   TAU       TAU2
975       TAU5      LDD             STSMT
976                 RAL   TAU2      QUA11
977       TAU2      LDD   QUA21     DCRMT
978       QUA21     LDD             FLOP
979                 RAU   W0005
980                 NZU   PS        QUA10
981       QUA10     RAL   W0004
982                 STU    0000
983                 STL    0001
984                 STL    0003
985                 LDD   Z
986                 STD    0002
987                 RAL   W0002
988                 STL    0005
989                 SLO   M
990                 SLT    0002
991                 NZU             QUAMN
992                 RAU   D0004     QUAMN
993       QUAMN     STU    0004
994                 RAU   SEVNT
995                 STL    0006
996                 ALO   TAU3      QUA9
997       DCRMT     STD   FINI
998                 RAU   PSI
999                 STU   TEMP3     DCMT3
1000      DCMT3     RAU   TEMP3
1001                NZU             FINI
1002                SUP   ONE
1003                STU   TEMP3
1004                MPY   SIXT
1005                ALO   DCMT1
1006                LDD   DCMT2
1007                SDA   DCMT2     8002
1008      DCMT1     RAU   N0005
1009                SUP    0000
1010                NZU   DCMT3     DCMT2
1011      DCMT2     STU   N0005     DCMT3
1012      TAU3      LDD             FLOP
1013                LDD   RAB
1014                STD    0001
1015                RAU   W0006
1016                STL    0000
1017                STL    0007
1018                LDD             STNON
1019                STU    0002
```

```
                    VARIABLE
                    Z
                    LOWER
                    VARIABLE
                    RETURN TO
                     SCANNER
                    SET TAU
                     TO TAU5
                    NUMBER
                    STORE
                    QUANT VARBLE
                    Z
                     INCREMENT
                     IF MINUS
                     OTHERWISE
                     Z S INCRMNT
                    TO SCANNER
                    DECREMENT
                     QUANT COUNT
                     FOR ALL
                     PSI LESS
                     THAN OR
                     EQUAL TO
                     CURRENT
                     PSI
                    STORE
                    G
```

```
0906  21  0568  1022
1022  69  1980  1383
1383  24  0001  1154
1154  69  1407  1010
1010  24  0002  1855
1855  69  1979  1332
1332  24  0003  0956
0956  60  0922  1927
1927  20  0004  1457
1457  15  1060  1715
1715  21  0373  1076
1076  20  1960  1963
1963  65  0344  0667
1060  65  1518  1573
1573  20  1960  0564
1518  69  1072  1030
1072  65  0564  1573
0564  69  1017  0920
1017  69  0970  0960
0970  60  1981  1786
1786  44  1234  1190
1190  65  1980  1836
1836  21  0000  1903
1903  20  0001  1204
1204  20  0003  1006
1006  69  1407  1110
1110  24  0002  1905
1905  65  1978  1433
1433  20  0005  0758
0758  16  1612  1067
1067  25  0002  1623
1623  44  1328  1378
1328  60  0035  1378
1378  21  0004  1507
1507  60  1160  1765
1765  20  0006  1009
1009  15  1662  1715
0920  24  0691  1394
1394  60  0041  1295
1295  21  0709  1712
1712  60  0709  0664
0664  44  1117  0691
1117  11  0630  1886
1886  21  0709  1762
1762  19  0330  1936
1936  15  1639  1743
1743  69  0846  0849
0849  22  0846  8002
1639  60  0572  1428
1428  11  0000  1056
1056  44  1712  0846
0846  21  0572  1712
1662  69  1815  0960
1815  69  0894  1097
1097  24  0001  1254
1254  60  1982  1987
1987  20  0000  1304
1304  20  0007  1210
1210  69  0714  0911
0714  21  0002  1106
```

```
1020                LDD   WDIF
1021                STD    0003          IF
1022                LDD   D0007
1023                STD    0005            W
1024                RAL   W0002       CHECK FOR
1025                SLO   M            NEGATIVE
1026                SLT    0002        INCREMENT
1027                NZU   QUA30
1028                LDD   W0004
1029                STD    0004
1030                LDD   W0001  QUA31
1031      QUA30     LDD   W0001
1032                STD    0004       UPPER VARBLE
1033                LDD   W0004  QUA31
1034      QUA31     STD    0006       QUANT VARBLE
1035                RAU   NINET
1036                STL    0007
1037                STD    0008
1038                ALO   TAU4   QUA9    TO SCANNER
1039      TAU4      RAL   PSI
1040                SLO   ONE
1041                STL   PSI
1042                NZA   QUA22  PS0
1043      QUA22     RAL   TAU2
1044                STL   TAU    QUA21
1045      FLOP      STD   OUT
1046                RAU   PSI
1047                MPY   SIXT          STORE STATMT
1048                STL   FLOP1
1049                SLO   SIX
1050                ALO         FLOP3
1051                 06   N0001 W0001
1052      FLOP3     LDD   OUT   SR1
1053      RCMMA     LDD   RR    COMMA
1054      RR        RAL   K            K EQUALS K
1055                STU   V1
1056                ALO   ONE           PLUS ONE
1057                SLT    0005
1058                NZU   ALARM
1059                SRT    0005
1060                STL   K     RR2
1061      RR2       ALO   RR1    8002   TK EQUALS
1062      RR1       STU   T0001 PS3      ZERO
1063      RW        RAL   STL          COMPILE
1064                ALO   K             STL WK
1065                ALO   W
1066                LDD         OSGN1  OPSGN ZERO
1067                STU   OPSGN
1068                LDD         SETEK
1069                LDD   RR    TKOP
1070      RZ        LDD   RR    NZ4
1071      TI        RAL   ONE   TIFF   PUNCH
1072      TY        RAL   TWO   TIFF    GENERATORS
1073      TC        RAL   THREE TIFF
1074      TL        RAL   LDSR1 TIFF
1075      TIFF      ALO   AB3          COMPILES
1076                STL   TMBLE        PROGRAM
1077                LDD         UBETA   WHICH
1078                NZA         TI4    IDENTIFIES
1079                RAL   U             VARIABLES
```

```
1106  69  1059  1812
1812  24  0003  1156
1156  69  0038  1441
1441  24  0005  0808
0808  65  1978  1483
1483  16  1612  1167
1167  35  0002  1673
1673  44  1478  1528
1528  69  1980  1533
1533  24  0004  1557
1557  69  1977  1080
1478  69  1977  1130
1130  24  0004  1607
1607  69  1980  1080
1080  24  0006  1109
1109  60  1862  1217
1217  20  0007  1260
1260  24  0008  1912
1912  15  1865  1715
1865  65  0041  1345
1345  16  0630  1238
1238  20  0041  1444
1444  45  0548  0336
0548  65  0564  1020
1020  20  1960  1017
0960  24  0976  1579
1579  60  0041  1395
1395  19  0330  1288
1288  20  1047  1500
1500  16  0520  1075
1075  15  1578  1583
1578  06  0568  1977
1583  69  0976  0341
1177  69  1571  1173
1571  65  0146  1251
1251  21  0488  1491
1491  15  0630  1338
1338  35  0005  1301
1301  44  0827  1206
1206  30  0005  1070
1070  20  0146  0899
0899  15  0802  8002
0802  21  0042  0343
1469  65  0636  1541
1541  15  0146  1351
1351  15  1354  1159
1159  69  1962  1313
1962  21  0524  1628
1628  69  1881  1134
1881  69  1571  1223
0744  69  1571  1273
1124  65  0630  1388
0843  65  0148  1388
1168  65  1131  1388
0928  65  1931  1388
1388  15  1591  1445
1445  20  0949  0852
0852  69  1256  1427
1256  45  1310  0764
1310  65  0515  1120
```

```
1080                SLO   THREE                WHOSE VALUES
1081                STL   U                     ARE TO BE
1082                RAL   TMBLE  TI2             PUNCHED
1083          TI4   LDD         DROPU
1084                ALO          8002
1085                RAU    0000
1086                SLT    0002
1087                SRT    0006
1088                STU   N
1089                LDD   TI2    SRAC
1090          TI2   LDD         OSGN1
1091                LDD   PS3    COMMA
1092          AB3    15    5003   0000
1093          TMBLE  00    0000   0000
1094          WE    LDD   WL     NUMIN
1095          WL    LDD         DROPK          IS PREVIOUS
1096                LDD         CHKTK            OPERATION
1097                NZA   WL1    ALPHA            ZERO
1098          ALPHA LDD         SETEK          IF SO EK
1099                RAL   K                      IS ARITH AND
1100                STU   ABVAL  RR2            ABVAL ZERO
1101          WL1   LDD   ALPHA  TKNZ1            THEN
1102          TKNZ1 STD   OUT                    RETURN PS3
1103                STL   TEMP1                  IF NOT IS
1104                SLO   P                        OPN P
1105                NZA         PWRW           IF NOT IS
1106                LDD         GETEK          WK FXD OR FL
1107                NZA   FLTW1  NFLW1          IF FL IS ARI
1108          FLTW1 RAL   ARITH                  TH FIXED OR
1109                NZA   FLTW2  NFLW2             FLOATING
1110          FLTW2 RAL   V1     WL3A           IF V1 ZERO
1111          WL3A  LDD   GAMM   SWTCH            COMPILE
1112          SWTCH NZA   RALWK  STLAC          STL ACC
1113          STLAC STD   EXIT                     AND
1114                RAL   STLA1                  RAL WK
1115                LDD         OSGN1          IF NON ZERO
1116                STU   OPSGN  RALW1            COMPILE
1117          STLA1 STL    0001   0000          RAL WK
1118          RALWK STD   EXIT   RALW1
1119          RALW1 RAL   K                    SET OPSGN
1120                ALO   W                      TO ZERO
1121                ALO   RAL                    IN BOTH
1122                LDD         OSGN1            CASES
1123                STU   OPSGN  EXIT
1124          GAMM  RAU   OTWO   GAMM1         INCREMENT
1125          GAMM1 ALO   ONE    WL3C           OPN AND
1126          WL3C  AUP   TEMP1                 SET V1
1127                STU   TEMP1  NETTA         THEN GO TO
1128          NETTA STL   V1     FL1K           ARITH GEN
1129          NFLW2 RAL   FIVET                 COMPILE
1130                LDD         LDSR             LDD FLOATK
1131                STU   OPSGN                  AND MERGE
1132                RAL   ONET                    WITH FLOAT
1133                STL   ARITH  WL3A               FLOAT
1134          NFLW1 RAL   ARITH                  IF WK FIXED
1135                NZA   N1FW2  N1NW2            IS PRESENT
1136          N1FW2 RAL   V1                       FIXED
1137                LDD         SWTCH          TO SWITCH IF
1138                RAL   FOURT                   FLOAT THEN
1139                LDD   GAMM   LDSR             LDD FLOAT
```

```
1120   16   1131   1438
1438   20   0515   1618
1618   65   0949   1404
0764   69   1267   0893
1267   15   1170   8002
1170   60   0000   1306
1306   35   0002   0814
0814   30   0006   1629
1629   21   0484   1488
1488   69   1404   1150
1404   69   1657   1313
1657   69   0343   1173
1591   15   5003   0000
0949   00   0000   0000
1233   69   0728   1581
0728   69   1382   1721
1382   69   1538   0890
1538   45   0643   1793
1793   69   0896   1134
0896   65   0146   1401
1401   21   0366   0899
0642   69   1793   1094
1094   24   0976   1679
1679   20   0509   0864
0864   16   1317   1122
1122   45   1126   1678
1126   69   1729   1432
1729   45   1482   1633
1482   65   0358   0914
0914   45   1668   1220
1668   65   0488   1843
1843   69   0946   0999
0999   45   0902   1454
1454   24   0644   1147
1147   65   1004   1209
1209   69   0964   1313
0964   21   0524   1728
1004   20   0001   0000
0902   24   0644   1728
1728   65   0146   1451
1451   15   1354   1259
1259   15   0968   1723
1723   69   1176   1313
1176   21   0524   0644
0946   60   0768   1773
1773   15   0630   1588
1588   10   0509   1014
1014   21   0509   1064
1064   20   0488   1641
1220   65   0922   1778
1778   69   1532   1038
1532   21   0524   1828
1828   65   0356   1114
1114   20   0358   1843
1633   65   0358   1164
1164   45   1718   1270
1718   65   0488   1893
1893   69   0996   0999
0996   65   1091   1495
1495   69   0946   1038
```

```
1140          N1NW2   RAU   OONE    WL3C      FIX FIX          1270   60  0832  1588
1141          PWRW    LDD           GETEK     IS WK FIXED      1678   69  1582  1432
1142                  NZA           PWRP      IF NOT IS        1582   45  1638  1688
1143                  RAL   ARITH               PRESENT FLT      1638   65  0358  1214
1144                  NZA   PWRFL             IF NOT           1214   45  1768  1320
1145                  RAL   FOURT               COMPILE          1320   65  1091  1545
1146                  LDD   PWRFL   LDSR        LDD FLOAT        1545   69  1768  1038
1147          PWRFL   RAL   ONET              FLOAT FLOAT      1768   65  0356  1264
1148                  STL   ARITH               COMPILES         1264   20  0358  1314
1149                  LDD           LDSR        LDD LOG          1314   69  1367  1038
1150                  LDD   PWR1    STLAC       STL ACC          1367   69  1370  1454
1151          PWR1    RAU   OONE    GAMM1                        1370   60  0832  1773
1152          PWRP    RAL   V1                  RAL WK           1688   65  0488  1943
1153                  LDD           SWTCH       COMPILE          1943   69  1046  0999
1154                  RAL   ARITH               STL ACC          1046   65  0358  1364
1155                  STL   V1                  ANDOR            1364   20  0488  1691
1156                  ALO   TWLVT               RAL WK AND       1691   15  1494  1049
1157                  LDD   OUT     LDSR        POWER INVRT      1049   69  0976  1038
1158          WY      LDD           CHKTK     IS PREVIOUS        1068   69  1172  0890
1159                  NZA           ALPHA       OPN ZERO         1172   45  1226  1793
1160                  LDD   ALPHA   TKNZ2                       1226   69  1793  1194
1161          TKNZ2   STD   OUT                                  1194   24  0976  1779
1162                  STL   TEMP1               IF NOT IS        1779   20  0509  1414
1163                  SLO   P                   OPN P            1414   16  1317  1222
1164                  NZA           POWR      IF NOT IS        1222   45  1276  1878
1165                  LDD           GETEK       PREV FLOAT       1276   69  1829  1432
1166.                 NZA   FLT1    NFLT1       IF SO GO TO      1829   45  1632  1683
1167          FLT1    RAL   V1                ALTR IF PREV     1632   65  0488  1993
1168                  NZA   FLT2                NOT IN ACC       1993   45  1096  1197
1169                  LDD   FLT2    ALTR                       1197   69  1096  1099
1170          FLT2    RAL   ARITH             COMPILE          1096   65  0358  1464
1171                  NZA   NETTA               FLOAT IF         1464   45  1064  1420
1172                  RAL   FOURT               PRESENT          1420   65  1091  1595
1173                  LDD           LDSR          FIXED          1595   69  0598  1038
1174                  RAL   ONET                                 0598   65  0356  1514
1175                  STL   ARITH   NETTA                       1514   20  0358  1064
1176          NFLT1   RAL   ARITH             IF NOT FLOAT     1683   65  0358  1564
1177                  NZA   FX1F2               FIX GO TO        1564   45  1818  1470
1178                  RAU   OTREY   WL3C      WL3C     IF      1470   60  0888  1588
1179          FX1F2   LDD           BMONE     FLOAT FIX        1818   69  1272  0944
1180                  RSU   BETA                COMPILE NEG      1272   61  1503  1707
1181                  SUP   AR33              LDD BETA FTK     1707   11  1360  1915
1182                  LDD   AR34    PS7         TO ALTR3         1915   69  1868  0800
1183          AR33    LDD    0000    9005       AND THEN         1360   69  0000  9005
1184          AR34    LDD   NETTA                 NETTA          1868   69  1064  1417
1185                  STD   EXIT    ALTR3                      1417   24  0644  1247
1186          ALTR    STD   EXIT              ALTR PERFRMS     1099   24  0644  1297
1187                  LDD           BMONE       FOLLOWING        1297   69  1550  0944
1188                  LDD   ALTR3   STAC1     SEQUENTIALLY       1550   69  1247  1600
1189          BMONE   STD   FINI              BETA MINUS       0944   24  0691  1544
1190                  RAL   BETA                ONE TO           1544   65  1503  1757
1191                  SLO   ONE                 TEMP4            1757   16  0630  1738
1192                  STL   TEMP4   I4ZU1                      1738   20  0788  1741
1193          I4ZU1   RAL   TEMP4             INST OF          1741   65  0788  1594
1194                  ALO   I4ZU3               CONTENTS         1594   15  1347  1501
1195                  LDD   I4ZU2               OF TEMP4         1501   69  1504  1807
1196                  SDA   I4ZU2               EQUALS U         1807   22  1504  1857
1197                  RAU    8002   8003      IF NOT LDD        1857   60  8002  8003
1198          I4ZU3   LDD    0000                                1347   69  0000  1554
1199                  STD   TEMP2                                1554   24  0490  1644
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        RAB   8001           IF LDD SET      1644  67  8001  1551
        SLO   CKLDD           DATA OF        1551  16  1604  1309
        SLT   0002            CONTENTS       1309  35  0002  1965
        NZU          I4ZU4      OF           1965  44  1520  1570
        RAL   U                TEMP4 TO      1520  65  0515  1620
        SRT   0004               U           1620  30  0004  1682
        AUP   OONE   I4ZU5                   1682  10  0832  1788
I4ZU4   RAL   U      I4ZU5                   1570  65  0515  1788
I4ZU5   AUP   I4ZU2                          1788  10  1504  1359
        LDD   TEMP2  8003                    1359  69  0490  8003
I4ZU2   SDA   0000   FINI                    1504  22  0000  0691
STAC1   STD   FINI           COMPILE NEG     1600  24  0691  1694
        RSU   BETA            STL ACC BTA    1694  61  1503  1907
        SRT   0004                           1907  30  0004  1467
        SUP   STLA1                          1467  11  1004  1409
        LDD   FINI   PS7                     1409  69  0691  0800
ALTR3   LDD          IUM2U                   1247  69  1650  1654
        RAL   BETA                           1650  65  1503  0858
        STL   TEMP4                          0858  20  0788  1791
        LDD          BMIN1                   1791  69  1744  1397
        RAL   OONE                           1744  65  0832  1838
        STL   OPSGN  EXIT                    1838  20  0524  0644
IUM2U   STD   FINI           U MINUS TWO     1654  24  0691  1794
        RAL   U               TO TEMP4       1794  65  0515  1670
        SLO   TWO             THEN I4ZU1     1670  16  0148  1704
        STL   TEMP4  I4ZU1                   1704  20  0788  1741
BMIN1   STD   FINI           CONTENTS OF     1397  24  0691  1844
        RSU   TEMP4           CONTENTS OF    1844  61  0788  1894
        SUP   BMIN2  8003      TEMP4 MADE    1894  11  1447  8003
BMIN2   SAB   0000           NEGATIVE        1447  18  0000  1356
        RAU   8002                           1356  60  8002  1066
        SLO   TEMP4                          1066  16  0788  1944
        SLO   BMIN3  8002                    1944  16  1497  8002
BMIN3   21    0000   FINI                    1497  21  0000  0691
EXIT    HLT   EXIT   EXIT                    0644  01  0644  0644
FINI    HLT   FINI   FINI                    0691  01  0691  0691
OUT     HLT   OUT    OUT                     0976  01  0976  0976
OSGN1   STD   FINI   OSGN3   SET SIGN OF     1313  24  0691  1994
OSGN3   AUP   OPSGN           INSTRUCTION    1994  10  0524  1879
        AUP   OSGN2  8003      TO BE         1879  10  1732  8003
OSGN2   RAU   8002               COMPILED    1732  60  8002  1841
        LDD   FINI   PS7                     1841  69  0691  0800
UBETA   STD   FINI           IS U EQUAL      1427  24  0691  1645
        RAL   BETA            TO BETA        1645  65  1503  0908
        ALO   ONE             PLUS ONE       0908  15  0630  1888
        SLO   U      FINI                    1888  16  0515  0691
CHGOP   STD   FINI   CHGE1     OP  OF        1513  24  0691  1695
CHGE1   ALO   CHG1           CONTENTS OF     1695  15  0648  1754
        LDD   CHG2           LOWER           1754  69  0958  1614
        SDA   CHG2   8002     CHANGED BY     1614  22  0958  8002
CHG1    RAL   0000            CONTENTS OF    0648  65  0000  1406
        BMI          CHG3     TEMP4          1406  46  1459  1410
        SLO   TEMP4  CHG2                    1459  16  0788  0958
CHG3    ALO   TEMP4  CHG2                    1410  15  0788  0958
CHG2    STL   0000   FINI                    0958  20  0000  0691
POWR    LDD          GETEK   IS PREV FLT     1878  69  1782  1432
        NZA   POWR1  POWRF    IF SO IS       1782  45  1938  1988
POWR1   RAL   V1              PREV IN ACC    1938  65  0488  1745
        NZA   PCWR4           ALTR IF NOT    1745  45  0698  1149
        LDD   PCWR4  ALTR                    1149  69  0698  1099
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POWR4   RAL  ARITH           IF PRES FIX     0698  65  0358  1664
        NZA  POWR2            COMPILE        1664  45  1918  1720
        RAL  FOURT             FLOAT         1720  65  1091  1795
        LDD        LDSR       AND SET        1795  69  0748  1038
        RAL  ONET             OPSGN TO       0748  65  0356  1714
        STL  ARITH  POWR2        ONE         1714  20  0358  1918
POWR2   RAL  ONET            COMPILE         1918  65  0356  1764
        LDD  PWR1   LDSR      LDD LOG        1764  69  1370  1038
POWRF   LDD  POWR3  ALTR     IF PREV FIX     1988  69  1891  1099
POWR3   RAL  ARITH             ALTR          1891  65  0358  1814
        STL  V1               COMPILE        1814  20  0488  1941
        ALO  TENT   OPLD                     1941  15  1845  1199
OPLD    LDD  OUT    LDSR                     1199  69  0976  1038
OPWK    ALO  K               COMPILES        1700  15  0146  1601
        ALO  W      OPWK1     OPN WK NEXT    1601  15  1354  1509
OPWK1   LDD  OPWK2  OSGN1                    1509  69  1864  1313
OPWK2   STU  OPSGN  OUT                      1864  21  0524  0976
LDSR    STD  LDSR1           OPSGN ZERO      1038  24  1931  1184
        ALO  LDSR2           COMPILES        1184  15  1689  1895
        LDD         OSGN1     LDD0000LOWR    1895  69  0798  1313
        STU  OPSGN  LDSR1    PLUS 9000       0798  21  0524  1931
LDSR1   HLT  LDSR1  LDSR1                    1931  01  1931  1931
LDSR2   LDD  0000   9000                     1689  69  0000  9000
OPACC   ALO  ACC    OPWK1                    1750  15  1804  1509
FL1K    RAL  AR5             FETCH OPN       1641  65  1945  1249
        LDD  TEMP1            ENTRY FROM     1249  69  0509  1914
        TLU  Q0001  8002      SWITCHING      1914  84  0550  8002
AR5     RAU  0000              DICTIONARY    1945  60  0000  1456
        SUP  TEMP1           ALARM IF        1456  11  0509  1964
        SRT  0004             OPN IS         1964  30  0004  1125
        NZU  ALARM            INVALID        1125  44  0827  1180
        SLT  0004   8003     IF VALID GO     1180  35  0004  8003
Q0001   64   0000   FPDV     SWITCHING       0550  64  0000  1506
Q0002   65   0000   FPDV1    DICTIONARY      0551  65  0000  1556
Q0003   66   0000   FPDV2    FOR ARITHMTC    0552  66  0000  1606
Q0004   67   0000   FPDV3    SUBGENRATORS    0553  67  0000  1656
Q0005   78   0000   FPPWR                    0554  78  0000  1706
Q0006   82   0000   FPAD                     0555  82  0000  1756
Q0007   83   0000   FPAD1                    0556  83  0000  1806
Q0008   84   0000   FPAD                     0557  84  0000  1756
Q0009   85   0000   FPAD3                    0558  85  0000  1856
Q0010   87   0000   FPMU                     0559  87  0000  1906
Q0011   88   0000   FPMU1                    0560  88  0000  1008
Q0012   89   0000   FPMU                     0561  89  0000  1906
Q0013   90   0000   FPMU3                    0562  90  0000  1058
Q0014   99   0000   ALARM                    0563  99  0000  0827
FPAD    RAL  EIGTT  OPLD      TO ARITH       1756  65  1559  1199
FPAD1   RAL  ALO    OPWK      GENERATORS     1806  65  0988  1700
FPMU1   RAL  RAU             START OF        1008  65  1116  1322
        ALO  LOW              ARITHMETIC     1322  15  0352  1108
        LDD         OSGN1    SUBGENERATRS    1108  69  1166  1313
        STU  OPSGN                           1166  21  0524  1928
        RAL  MPY    OPWK                     1928  65  1832  1700
FPMU    RAL  NINET  OPLD                     1906  65  1862  1199
FPDV    RAL  SIXT   OPLD                     1506  65  0330  1199
FPDV1   RAL  DVR    OPWK                     1556  65  1609  1700
FPDV2   RAL  FRTNT  OPLD                     1606  65  1659  1199
FPPWR   RAL  NINET                           1706  65  1862  1517
        LDD         LDSR                     1517  69  1770  1038
        RAL  TWOT                            1770  65  1823  1929
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         LDD  NZ2    LDSR                    1929  69  0498  1038
FPAD3    LDD         UBETA  IS U EQUAL       1856  69  1709  1427
         NZA  ADD4           BETA PLUS 1     1709  45  1216  1266
         RSL  FIVEO  MULTN                   1266  66  1054  1759
ADD4     LDD         ALTR   ALTR AND         1216  69  1820  1099
         RAL  ALO    OPACC    ALO ACC        1820  65  0988  1750
FPDV3    LDD         ALTR   ALTR AND         1656  69  1809  1099
         RAL  DVR    OPACC    DVR ACC        1809  65  1609  1750
FPMU3    RAU  RAU                            1058  60  1116  1372
         STU  TEMP6                          1372  21  1326  1230
         RAL  U                              1230  65  0515  1870
         LDD         CHKOP                   1870  69  1873  1376
         STL  TEMP4                          1873  20  0788  1991
         SLO  BMI                            1991  16  1339  1995
         STL  TEMP5                          1995  20  1299  0952
         LDD         UBETA                   0952  69  1158  1427
         NZA         MULT1                   1158  45  1316  1366
         RAL  ABVAL                          1316  65  0366  1422
         NZA  MULT3                          1422  45  1426  1280
         RSL  OFIVE                          1280  66  0528  1733
         STL  TEMP4  MULT2                   1733  20  0788  0692
MULT3    RAL  RAU                            1426  65  1116  1472
         ALO  LOW                            1472  15  0352  1208
         LDD         OSGN1                   1208  69  1416  1313
         STU  OPSGN                          1416  21  0524  1330
         STU  ABVAL  MULT4                   1330  21  0366  1920
MULT2    RAL  U                              0692  65  0515  1970
         SLO  ONE                            1970  16  0630  1739
         LDD  MULT4  CHGOP                   1739  69  1920  1513
MULT4    LDD         ALTR                    1920  69  1923  1099
         RAL  MPY    OPACC                   1923  65  1832  1750
MULT1    RAL  ABVAL                          1366  65  0366  1522
         NZA  MULT3                          1522  45  1426  1380
         RAB  TEMP4                          1380  67  0788  1146
         ALO  TEMP6                          1146  15  1326  1882
         STL  TEMP6                          1882  20  1326  1430
         RAL  BETA                           1430  65  1503  1258
         LDD         CHKOP                   1258  69  1466  1376
         NZA         MLT7A                   1466  45  1572  1622
         ALO  OONE                           1572  15  0832  1789
         NZA  MULT6                          1789  45  0742  1196
         RSB  TEMP4  MLT7B                   1196  68  0788  1246
MLT7A    RAB  TEMP4  MLT7B                   1622  67  0788  1246
MLT7B    SLO  OFIVE                          1246  16  0528  1783
         STL  TEMP4  MULT7                   1783  20  0788  0792
MULT7    RAL  BETA                           0792  65  1503  1308
         SLO  ONE                            1308  16  0630  1839
         LDD         CHGOP                   1839  69  0842  1513
         RAL  TEMP5  MULTN                   0842  65  1299  1759
MULTN    STL  TEMP4                          1759  20  0788  0892
         RAL  BETA                           0892  65  1503  1358
         LDD  OPWK2  CHGOP                   1358  69  1864  1513
MULT8    RAL  BETA                           1800  65  1503  1408
         STL  U                              1408  20  0515  1968
         LDD         CHGOP                   1968  69  1672  1513
         STL  TEMP5                          1672  20  1299  1002
         BMI         MULT9                   1002  46  1458  1508
         RAU  OONE   MULT9                   1458  60  0832  1508
MULT9    STU  OPSGN                          1508  21  0524  1480
         RAL  TEMP6                          1480  65  1326  1932
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1380                ALO   LOW
1381                LDD           OSGN1
1382                STU   OPSGN
1383                RAB   TEMP5
1384                LDD   OUT     OSGN1
1385      MULT6     RAL   TEMP5
1386                STL   TEMP4   MULT8
1387      YI        RAL   Y       CI1
1388      YL        RAL   TWO
1389                LDD   YI      SETEL
1390      YMTX      RAU   ONE     YMTX1     V IS ONE
1391      YMTX1     AUP   RAL               COMPILE
1392                AUP   I                 RAL I 0000
1393                LDD           PS7       PLUS V
1394                RAL   U                 BETA IS U
1395                SLO   ONE               MINUS ONE
1396                STL   BETA
1397                STU   ABVAL             ABVAL ZERO
1398                LDD   YMTX2
1399                STD   OUT     FPMU3
1400      YMTX2     RSL   ONET              DECREMENT
1401                LDD           SETJN       JNU
1402                ALO   ALO               COMPILE
1403                ALO   PHI               ALO PHIJNU
1404                LDD           OSGN1
1405                RAL   M                 R EQUALS
1406                SLO   OONE              LEFT PAREN
1407                STL   R       PS3G      YL OR CL
1408      YN        RAL   Y       CN1       V EQUALS Y
1409      ZN        LDD           SRN       GENERATE N
1410                LDD   WY      GENN
1411      CHKAR     STD   OUT               ALARM IF
1412                RAL   ARITH               FLOATING
1413                NZA   ALARM   OUT
1414      CHKNK     STD   FINI              ALARM IF K
1415                RAU   NU                  AND NU
1416                AUP   K                   NON ZERO
1417                NZU   ALARM   FINI
1418      CHKNN     STD   EXIT              ALARM IF N
1419                SRT    0004             IS MORE
1420                ALO   TYPE3
1421                NZU   SRN6              THAN  2000
1422                SLO    8001
1423                SRT    0006   EXIT        DIGITS
1424      CHKOP     STD   FINI
1425                ALO             8002
1426                 67    9999
1427                SLT    0002
1428                SLO    8002
1429                SRT    0002
1430                ALO   RAL     FINI
1431      CHKTK     STD   OUT
1432                RAL   K                   FETCH TK
1433                ALO             8002
1434                RAL   T0001   OUT
1435      COMMA     STD   OUT               INCREMENT
1436                RAL   ONET                  JNU
1437                LDD           SETJN         THEN
1438                SLO   ONE                 COMPILE
1439                ALO   STL               STL PHIJNU
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1932    15  0352  1558
1558    69  1516  1313
1516    21  0524  1530
1530    67  1299  1854
1854    69  0976  1313
0742    65  1299  1904
1904    20  0788  1800
1174    65  1580  1181
1028    65  0148  1608
1608    69  1174  1250
0930    60  0630  1353
1353    10  0968  1973
1973    10  1477  1833
1833    69  1889  0800
1889    65  0515  1722
1722    16  0630  1939
1939    20  1503  1658
1658    21  0366  1772
1772    69  1175  1630
1630    24  0976  1058
1175    66  0356  1566
1566    69  1822  1225
1822    15  0988  1296
1296    15  1324  1680
1680    69  1883  1313
1883    65  1612  1567
1567    16  0832  1989
1989    20  0340  0668
0954    65  1580  1231
0826    69  1730  1100
1730    69  1068  1681
0751    24  0976  1780
1780    65  0358  1616
1616    45  0827  0976
1374    24  0691  1346
1346    60  0700  1708
1708    10  0146  1651
1651    44  0827  0691
0658    24  0644  1547
1547    30  0004  1758
1758    15  1666  1872
1872    44  1335  1476
1476    16  8001  1933
1933    30  0006  0644
1376    24  0691  1396
1396    15  1349  8002
1349    67  9999  1808
1808    35  0002  1716
1716    16  8002  1275
1275    30  0002  1284
1284    15  0968  0691
0890    24  0976  1830
1830    65  0146  1701
1701    15  1858  8002
1858    65  0042  0976
1173    24  0976  1880
1880    65  0356  1766
1766    69  1922  1225
1922    16  0630  1240
1240    15  0636  0942
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              ALO  PHI               MINUS ONE       0942  15  1324  1930
              LDD          OSGN1                     1930  69  1334  1313
              STU  OPSGN                             1334  21  0524  1384
              RAL   8003   OUT                       1384  65  8003  0976
       DROPK  STD  OUT               DECREMENT       1721  24  0976  1434
              RAL  K                     K           1434  65  0146  1751
              SLO  ONE                               1751  16  0630  1290
              STL  K       OUT                       1290  20  0146  0976
       DROPU  STD  EXIT              DECRMNT U       0893  24  0644  1597
              RAL  U                                 1597  65  0515  1972
              SLO  ONE                               1972  16  0630  1340
              STL  U       EXIT                      1340  20  0515  0644
       GENN   STD  OUT                               1681  24  0976  1484
              LDD          STBTA                     1484  69  1390  0884
              LDD          SRAC                      1390  69  1446  1150
              LDD          OSGN1                     1446  69  1399  1313
              STU  OPSGN   OUT                       1399  21  0524  0976
       GETEK  STD  EXIT              GET PRESENT     1432  24  0644  1647
              RAL  K                 EK VALUE        1647  65  0146  1801
              ALO           8002                     1801  15  1908  8002
              RAL  E0001   EXIT                      1908  65  0374  0644
       NGLFT  STD  OUT                               0947  24  0976  1534
              RAL  D0004                             1534  65  0035  1440
              STL  L                                 1440  20  0529  1584
              STU  V1                                1584  21  0488  0992
              RAL  ABVAL                             0992  65  0366  1624
              NZA          NGLNA                     1624  45  1634  1684
              RAL  U                                 1634  65  0515  1674
              LDD          CHKOP                     1674  69  1734  1376
              ALO  OTWO                              1734  15  0768  1724
              NZA  NGLNB                             1724  45  1784  1834
              RAL  OONE    NGLNB                     1834  65  0832  1784
       NGLNB  STL  TEMP4                             1784  20  0788  1042
              LDD  OUT     UCHGE                     1042  69  0976  0797
       NGLNA  LDD          STBTA                     1684  69  1490  0884
              RAL  RSL                               1490  65  0344  1449
              ALO  LOW                               1449  15  0352  1859
              LDD          OSGN1                     1859  69  1816  1313
              STU  OPSGN   OUT                       1816  21  0524  0976
       NUINC  STD  OUT                               1274  24  0976  1884
              RAL  NU                NU EQUALS NU    1884  65  0700  1909
              AUP   8002               PLUS ONE      1909  10  8002  1617
              AUP  ONE                   AND         1617  10  0630  1540
              STU  NU                JNU EQUALS      1540  21  0700  1460
              AUP  NU2                 JNUMINUSONE   1460  10  1866  1774
              ALO  NU1      8002                     1774  15  1934  8002
       NU1    LDD  J0001    8003                     1934  69  1977  8003
       NU2    STD  J0001   OUT                       1866  24  1977  0976
       NUMIN  STD  OUT                               1581  24  0976  1590
              RAL  NU                NU EQUALS NU    1590  65  0700  1510
              SLO  ONE                MINUS ONE      1510  16  0630  1640
              STL  NU      OUT                       1640  20  0700  0976
       SETEK  STD  EXIT              SET EK          1134  24  0644  1697
              RAU  ARITH             EQUAL TO        1697  60  0358  1916
              ALO  K                 ARITH           1916  15  0146  1851
              ALO           8002                     1851  15  1560  8002
              STU  E0001   EXIT                      1560  21  0374  0644
       SETEL  STD  EXIT              SET VARIABLE    1250  24  0644  1747
              STL  LDSR1                  TYPE       1747  20  1931  1690
              RAL  R                 SET L EQUAL     1690  65  0340  1496
```

```
         STL   L       EXIT     TO R            1496  20  0529  0644
SETJN    STD   EXIT              JNU EQUALS     1225  24  0644  1797
         STL   TEMP1            JNU  PLUS       1797  20  0509  1966
         RAL   NU                               1966  65  0700  1610
         ALO   STJN1             CONTENTS       1610  15  1667  1824
         LDD   STJN2                            1824  69  1740  1546
         SDA   STJN2   8002     OF LOWER        1546  22  1740  8002
STJN1    RAL   J0001                            1667  65  1977  1790
         ALO   TEMP1   STJN2                    1790  15  0509  1740
STJN2    STL   J0001                            1740  20  1977  1840
         SLT   0004    EXIT                     1840  35  0004  0644
STBTA    STD   EXIT                             0884  24  0644  1847
         RAL   U                                1847  65  0515  1874
         STL   BETA    EXIT                     1874  20  1503  0644
STNON    STD   EXIT                             0911  24  0644  1897
         LDD           PS100                    1897  69  1850  1035
         AUP   NONON   EXIT                     1850  10  0634  0644
STREL    LDD   L                SET RELATION    0836  69  0529  1890
         STD   RELAT   8003        TYPE         1890  24  0632  8003
TKOP     STD   FINI              STORE OPN      1223  24  0691  1596
         RAU   K                   IN TK        1596  60  0146  1901
         AUP   TKOP1                AND         1901  10  1660  1717
         LDD   R       8003      EXIT  FROM     1717  69  0340  8003
TKOP1    STD   T0001   FINI         FINI        1660  24  0042  0691
UCHGE    STD   FINI             U EQUALS U      0797  24  0691  1646
         RAL   U                MINUS ONE       1646  65  0515  1924
         SLO   ONE     CHGE1                    1924  16  0630  1695
LARM     STL   L                 SET ERROR      0332  20  0529  1940
         STL   R       ALARM     IDENTIFCTN     1940  20  0340  0827
ALARM    RAU   0000             ALARM           0827  60  0000  1710
         SLT   0001              SUBROUTINE     1710  35  0001  1767
         ALO   L                 DISPLAYS       1767  15  0529  1990
         SLT   0003              L R AND        1990  35  0003  1499
         ALO   R                 STATEMENT      1499  15  0340  1696
         SLT   0002                 NR          1696  35  0002  1760
         HLT   1234    PS                       1760  01  1234  1234
END      RAL   A0001            END AND FNLP    0567  65  0383  1092
         SRT   0004             PUNCHABCONS     1092  30  0004  1810
         STL   1955                 AND         1810  20  1955  1860
         RAU   1951             RESERVATION     1860  60  1951  1910
         AUP   A0002                CARDS       1910  10  0384  1142
         AUP   A0002                            1142  10  0384  1192
         STU   A0003                            1192  21  0385  1242
         AUP   1952                             1242  10  1952  1817
         AUP   A0002                            1817  10  0384  1292
         STU   A0004                            1292  21  0386  1342
         AUP   1953                             1342  10  1953  1867
         AUP   A0002                            1867  10  0384  1392
         LDD           STNON                    1392  69  1746  0911
         STU   W0004                            1746  21  1980  1442
         RAL   NONON                            1442  65  0634  1492
         STU   W0005                            1492  21  1981  1542
         STU   W0006                            1542  21  1982  1592
         STL   W0003                            1592  20  1979  1642
         RAU   NONO                             1642  60  0883  1692
         SLT   0004                             1692  35  0004  1917
         STU   W0002                            1917  21  1978  1742
         RAU   D0005                            1742  60  0036  1792
         STU   W0001                            1792  21  1977  1842
         LDD           PS133                    1842  69  1796  0638
```

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1560                RAU   A0001   APCH4
1561     APCH4      SRT    0004
1562                LDD            STNON
1563                AUP   D0005
1564                STU   W0001
1565                RAL   A0001
1566                ALO             8002
1567                RAL   A0001
1568                STL   TEMP1
1569                BMI   APCH1    APCH2
1570     APCH2      AUP   CNTRL
1571                STU   W0010    APCH3
1572     APCH1      RAU   D0008    APCH2
1573     APCH3      RAB   TEMP1    CKLDD
1574     CKLDD      LDD    8003
1575                SDA   TEMP1
1576                AUP    8003
1577                SIA   TEMP2
1578                SLT    0002
1579                RAU    8003
1580                LDD            PS100
1581                AUP   NONO
1582                SLT    0004
1583                STU   W0002
1584                RAU   TEMP1
1585                SRT    0004
1586                LDD            STNON
1587                STU   W0003
1588                RAU   TEMP2
1589                LDD            STNON
1590                STU   W0004
1591                STL   W0005
1592                LDD            PS133
1593                RAU   A0001
1594                SUP   ONE
1595                STU   A0001
1596                NZU   APCH4    FNLPC
1597     FNLPC      STU   W0001
1598                STU   W0002
1599                STU   K
1600                STU   JAY      FNL1
1601     FNL1       RAU   JAY      FNL2
1602     FNL2       AUP   ONET
1603                STU   GAMMA
1604                RAU   TYPE4
1605                STU   W0010
1606                RAL   FNL3
1607                ALO   K          8002
1608     FNL3       RAL   D0001
1609                STL   W0003
1610                STL   TEMP2
1611                RAU   GAMMA
1612                LDD            PS100
1613                AUP   YOU
1614                STU   W0004
1615                LDD            PS133
1616                RAL   FNL4
1617                ALO   K          8002
1618     FNL4       RAL    1951
1619                STL   TEMP1
```

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1796   60   0383   1892
1892   30   0004   1967
1967   69   1974   0911
1974   10   0036   1942
1942   21   1977   1992
1992   65   0383   1846
1846   15   1549   8002
1549   65   0383   1896
1896   20   0509   1325
1325   46   1946   1996
1996   10   0354   1375
1375   21   1986   1947
1946   60   0039   1996
1947   67   0509   1604
1604   69   8003   1425
1425   22   0509   1475
1475   10   8003   1997
1997   23   0490   0848
0848   35   0002   1525
1525   60   8003   0898
0898   69   1052   1035
1052   10   0883   0948
0948   35   0004   1575
1575   21   1978   0998
0998   60   0509   1625
1625   30   0004   1048
1048   69   1102   0911
1102   21   1979   1098
1098   60   0490   1148
1148   69   1152   0911
1152   21   1980   1198
1198   20   1981   1248
1248   69   1202   0638
1202   60   0383   1298
1298   11   0630   1348
1348   21   0383   1398
1398   44   1892   1252
1252   21   1977   1448
1448   21   1978   1498
1498   21   0146   1599
1599   21   0710   1675
1675   60   0710   1725
1725   10   0356   1775
1775   21   0372   1825
1825   60   1548   1875
1875   21   1986   1598
1598   65   1302   1925
1925   15   0146   8002
1302   65   0032   1648
1648   20   1979   1698
1698   20   0490   1748
1748   60   0372   1798
1798   69   1352   1035
1352   10   1975   1848
1848   21   1980   1898
1898   69   1402   0638
1402   65   1526   1948
1948   15   0146   8002
1526   65   1951   1576
1576   20   0509   1626
```

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1620                ALO   GAMMA
1621                STL   JAY
1622                SLO   GAMMA
1623                NZA   FNL5
1624                RAL    8001
1625                SLO   ONET
1626                STL   GAMMA   FNL5
1627          FNL6  PCH   W0001
1628                RAU   K
1629                AUP   ONE
1630                STU   K
1631                SUP   FIVE
1632                NZU   FNL1    9876      FINISH
1633          FNL5  RAU   TYPE3
1634                STU   W0010
1635                RAU   JAY
1636                LDD           STNON
1637                STU   W0004
1638                RAU   GAMMA
1639                AUP   ONET
1640                LDD           STNON
1641                AUP   TEMP2
1642                STU   W0003   FNL6
1643          ONET   00   0000    0001
1644          TWOT   00   0000    0002
1646          FOURT  00   0000    0004
1647          FIVET  00   0000    0005
1648          SIXT   00   0000    0006
1649          SEVNT  00   0000    0007
1650          EIGTT  00   0000    0008
1651          NINET  00   0000    0009
1652          TENT   00   0000    0010
1653          TWLVT  00   0000    0012
1654          FRTNT  00   0000    0014
1655          SXTNT  00   0000    0016
1656          SVNTT  00   0000    0017
1657          NNTEN  00   0000    0019
1658          TWSIX  00   0000    0026
1659          SIXTR  00   0000    0063
1660          NINTY  00   0000    0090
1661          ONE    00   0001    0000
1662          TWO    00   0002    0000
1663          THREE  00   0003    0000
1664          FOUR   00   0004    0000
1665          FIVE   00   0005    0000
1666          SIX    00   0006    0000
1667          SEVEN  00   0007    0000
1668          FFTY1  00   0051    0000
1669          OONE   01   0000    0000
1670          OTWO   02   0000    0000
1671          OTREY  03   0000    0000
1672          OFIVE  05   0000    0000
1673          FRONE  41   0000    0000
1674          FIVEO  50   0000    0000
1675          SVTY2  72   0000    0000
1676          NINEO  90   0000    0000
1677          ALO    15   0000    0000
1678          MPY    19   0000    0000
1679          STL    20   0000    0000
1680          NZA    45   0000    0000
```

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1626    15   0372   1998
1998    20   0710   1676
1676    16   0372   1649
1649    45   1452   1726
1726    65   8001   1699
1699    16   0356   1776
1776    20   0372   1452
1900    71   1977   1749
1749    60   0146   1502
1502    10   0630   1799
1799    21   0146   1849
1849    11   1552   1826
1826    44   1675   9876
1452    60   1666   1876
1876    21   1986   1899
1899    60   0710   1926
1926    69   1949   0911
1949    21   1980   1950
1950    60   0372   1602
1602    10   0356   1976
1976    69   1652   0911
1652    10   0490   1702
1702    21   1979   1900
0356    00   0000   0001
1823    00   0000   0002
1091    00   0000   0004
0922    00   0000   0005
0330    00   0000   0006
1160    00   0000   0007
1559    00   0000   0008
1862    00   0000   0009
1845    00   0000   0010
1494    00   0000   0012
1659    00   0000   0014
1224    00   0000   0016
0696    00   0000   0017
0592    00   0000   0019
1000    00   0000   0026
1465    00   0000   0063
0360    00   0000   0090
0630    00   0001   0000
0148    00   0002   0000
1131    00   0003   0000
1200    00   0004   0000
1552    00   0005   0000
0520    00   0006   0000
1589    00   0007   0000
0357    00   0051   0000
0832    01   0000   0000
0768    02   0000   0000
0888    03   0000   0000
0528    05   0000   0000
1431    41   0000   0000
1054    50   0000   0000
1568    72   0000   0000
0874    90   0000   0000
0988    15   0000   0000
1832    19   0000   0000
0636    20   0000   0000
1132    45   0000   0000
```

1681	BMI	46	0000	0000
1682	RAU	60	0000	0000
1683	DVR	64	0000	0000
1684	RAL	65	0000	0000
1685	RSL	66	0000	0000
1686	RAB	67	0000	0000
1687	ABCON	00	5000	0000
1688	ACC	00	0001	0000
1689	ACCUM		ACC	
1690	C	00	3000	0000
1691	CNTRL	00	0000	8000
1692	EXT	00	0000	9000
1693	FIXNR	00	0000	0501
1694	GO	00	4000	4000
1695	LDAC	LDD	0001	8002
1696	I	00	1000	0000
1697	LOCUS	73	6161	6161
1698	LOW	00	8002	0000
1699	LOW1	00	0000	8002
1700	M		M	
1701	MAX	00	0000	0025
1702	MAXE	00	0000	0500
1703	MAXU	00	0143	0000
1704	NONO	00	0000	9090
1705	NONON	00	9090	9090
1706	P		P	
1707	PHI	00	6000	0000
1708	SLTI3	35	1003	0000
1709	STLA1	STL	0001	0000
1710	STORE	06	0051	0000
1711	TEMP9	73	6161	6161
1712	TYPE3	80	0000	8000
1713	TYPE4	88	0000	8000
1714	W	00	7000	0000
1715	WDIF	69	6600	0000
1716	Y	00	2000	0000
1717	YOU		U0000	
1718	Z		Z	

1339	46	0000	0000
1116	60	0000	0000
1609	64	0000	0000
0968	65	0000	0000
0344	66	0000	0000
0894	67	0000	0000
0776	00	5000	0000
1804	00	0001	0000
0737	61	6363	0000
1277	00	3000	0000
0354	00	0000	8000
0690	00	0000	9000
0870	00	0000	0501
1016	00	4000	4000
1415	69	0001	8002
1477	00	1000	0000
0918	73	6161	6161
0352	00	8002	0000
0980	00	0000	8002
1612	74	0000	0000
0029	00	0000	0025
0542	00	0000	0500
0671	00	0143	0000
0883	00	0000	9090
0634	00	9090	9090
1317	77	0000	0000
1324	00	6000	0000
0499	35	1003	0000
1004	20	0001	0000
0030	06	0051	0000
0853	73	6161	6161
1666	80	0000	8000
1548	88	0000	8000
1354	00	7000	0000
1059	69	6600	0000
1580	00	2000	0000
1975	84	9090	9090
1407	89	0000	0000

```
5                    PACKAGE 1
5               CONTAINS FOLLOWING
5                    ROUTINES
5               E00AI  ADDITION
5               E00AJ  MULTIPLICATION
5               E00AG  DIVISION
5               E00AO  DIVIDE REVERSE
5               E00AF  FLOAT TO LOWER AND ACC
5               E00AE  FLOAT TO LOWER
5               E00AQ  READ
5               E00AR  PUNCH
5               E00TH  FIX TO LOWER
      E00AI  STD  ARTHX  AI1    ADD              1833  24  1786  1789
      AI1    STL  ARTHG                          1789  20  1794  1799
             LDD         ARTHB                   1799  69  1802  1805
             RAB   8002         STORE ACC        1802  67  8002  1767
             STL  ARTHF         POWER            1767  20  1772  1894
             SAB  ARTHE                          1894  18  1902  1759
             SLT   0001                          1759  35  0001  1766
             NZU  AI12          FIND MAX         1766  44  1773  1771
             LDD  AI3A                           1771  69  1774  1777
             SRT   0005         POWER            1777  30  0005  1790
             SDA  AI3           SET EXPNNTS      1790  22  1793  1796
             BMI         AI2    AND THEN         1796  46  1899  1754
             RAB  ARTHE           PERFORM        1899  67  1902  1817
             STL  ARTHF          ADDITION        1817  20  1772  1776
             RAL  ARTHH                          1776  65  1788  1943
             LDD  ARTHM  AI3                     1943  69  1824  1793
      AI3    SRT   0000  AI3B                    1793  30  0000  1811
      AI3A   SRT   0000  AI3B                    1774  30  0000  1811
      AI3B   ALO   8001  AI5                     1811  15  8001  1770
      AI2    RAL  ARTHM                          1754  65  1824  1779
             LDD  ARTHH  AI3                     1779  69  1788  1793
      AI5    RAU   8002         CLEAR ARTHE      1770  60  8002  1780
             STL  ARTHE  ARTHS  TO SCALE         1780  20  1902  1762
      AI12   BMI         AI13                    1773  46  1778  1828
             RAL  ARTHG  AI10                    1778  65  1794  1904
      AI13   RAL  ACC    ARTHX                   1828  65  0000  1786
      ARTHB  STD  ARTHY         BREAK UP EXP     1805  24  1808  1826
             SLT   0008         AND MANTISSA     1826  35  0008  1996
             STL  ARTHE         STORE POWER      1996  20  1902  1755
             RAU   8003         AND MANTISSA     1755  60  8003  1763
             SLT   0001         OF LOWER         1763  35  0001  1769
             STU  ARTHM                          1769  21  1824  1997
             RAU  ACC                            1997  60  0000  1855
             SRT   0002         STORE POWER      1855  30  0002  1761
             SLO   8002         AND MANTISSA     1761  16  8002  1819
             SLT   0001         OF ACC           1819  35  0001  1775
             ALO   8001                          1775  15  8001  1783
             STU  ARTHH  ARTHY                   1783  21  1788  1808
      ARTHS  SCT   0000         NORMALIZE        1762  36  0000  1782
             BOV  AI6           BRNCH IF ZRO     1782  47  1942  1787
             STL  ARTHG         SHIFT COUNT      1787  20  1794  1797
             RAL   8003         ROUND ON         1797  65  8003  1905
             SRD   0002         NINTH DIGIT      1905  31  0002  1813
             SLT   0002         CHECK FOR        1813  35  0002  1869
             STL  ARTHM         ROUNDOFF         1869  20  1824  1877
             NZU  AI7    AI8    OVERFLOW         1877  44  1831  1834
      AI8    RAB   8003            AND           1834  67  8003  1841
             SAB  ARTHG         CORRECT IF       1841  18  1794  1800
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	ALO	AJ2		NECESSARY	1800	15	1903	1822
	SLT	0008			1822	35	0008	1791
	RAL	8002			1791	65	8002	1849
	AAB	ARTHE			1849	17	1902	1757
	ALO	ARTHF			1757	15	1772	1827
	BMI	AI11A		PWR TOO SMAL	1827	46	1752	1781
	NZU	AI11		PWR TOO LRGE	1781	44	1785	1836
	SLT	0002			1836	35	0002	1893
	STU	ACC1			1893	21	1998	1901
	RAL	ARTHM			1901	65	1824	1829
	BMI		AI9	COMBINE	1829	46	1944	1995
	SLO	ACC1	AI10		1944	16	1998	1904
AI10	STL	ACC	ARTHX	AND	1904	20	0000	1786
AI9	ALO	ACC1	AI10		1995	15	1998	1904
AI7	SRT	0001		ADJUST	1831	30	0001	1792
	STL	ARTHM			1792	20	1824	1927
	SLT	0001	AI8		1927	35	0001	1834
AI6	RAL	8003	AI10		1942	65	8003	1904
E00AJ	STD	ARTHX		MULTIPLY	1832	24	1786	1839
	LDD		ARTHB		1839	69	1852	1805
	RAB	8002		ACC POWER	1852	67	8002	1867
	SLO	AJ1		MINUS 48	1867	16	1820	1825
	STL	ARTHF			1825	20	1772	1875
	RAU	ARTHH			1875	60	1788	1756
	MPY	ARTHM	ARTHS		1756	19	1824	1762
E00AG	STD	ARTHX	AG1	DIVIDE	1830	24	1786	1889
AG1	LDD		ARTHB	IS DIVISOR	1889	69	1842	1805
	NZU		AG3	ZERO	1842	44	1812	1846
	RSB	8002		DIVISOR	1812	68	8002	1821
	ALO	AG2		POWER MINUS	1821	15	1876	1895
	STL	ARTHF		49	1895	20	1772	1768
	RAU	ARTHM		SHIFT	1768	60	1824	1879
	SRT	0001		DIVIDEND	1879	30	0001	1885
	DVR	ARTHH		DO DIVIDE	1885	64	1788	1803
	RAU	8002	ARTHS		1803	60	8002	1762
E00AO	STD	ARTHX		DIV REVERSE	1882	24	1786	1989
	STL	ACC2			1989	20	1843	1896
	RAL	ACC			1896	65	0000	1810
	LDD	ACC2			1810	69	1843	1897
	STD	ACC	AG1		1897	24	0000	1889
E00AF	STD	ACC6		FLOAT TO LWR	1947	24	1858	1911
	LDD	AE4	E00AE	AND ACC	1911	69	1925	1928
AE4	STL	ACC	ACC6		1925	20	0000	1858
E00AE	STD	ARTHX		FLOAT TO LWR	1928	24	1786	1840
	RAU	8002		ONLY	1840	60	8002	1753
	SCT	0000		NORMALIZE	1753	36	0000	1975
	STL	ACC3			1975	20	1881	1784
	BOV	AD1		ZERO CHECK	1784	47	1851	1890
	RAL	8003			1890	65	8003	1798
	SRD	0002		ROUND FOR	1798	31	0002	1807
	SLT	0002		PLACING EXP	1807	35	0002	1764
	NZU		AE6	CHECK ROUND	1764	44	1818	1891
	LDD	8003		OVERFLOW	1818	69	8003	1874
	SRT	0001			1874	30	0001	1884
	ALO	8001	AE6		1884	15	8001	1891
AE6	BMI	AE2		INSERT	1891	46	1844	1845
	ALO	AJ3	AE5	EXPONENT	1845	15	1848	1804
AE2	SLO	AJ3	AE5		1844	16	1848	1804
AE5	SLO	ACC3	ARTHX		1804	16	1881	1786
E00TH	STD	ARTHX		FIX LOWER	1932	24	1786	1990

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                SLT   0008             TO LOWER         1990   35  0008  1859
                STU   ARTHM                             1859   21  1824  1878
                RAB   8002             TEST EXP         1878   67  8002  1887
                SLO   AJ5              STORE ZERO       1887   16  1940  1945
                BMI   AD1              IF LESS THAN     1945   46  1851  1850
                SLO   AJ4              50     ALARM     1850   16  1853  1758
                BMI          AD3       IF GRTR THAN     1758   46  1861  1862
                SRT   0004              59              1861   30  0004  1921
                ALO   AR7                               1921   15  1924  1929
                LDD   AD2A             MODIFY           1929   69  1835  1838
                SDA   AD2               SHIFT           1838   22  1991  1971
                RAL   ARTHM                             1971   65  1824  1930
                SLT   0002   AD2                        1930   35  0002  1991
        AD1     RAL   8003   ARTHX     STORE ZERO       1851   65  8003  1786
        AD2     SRT   0000   ARTHX     SHIFT CONST      1991   30  0000  1786
        AD2A    SRT   0000   ARTHX                      1835   30  0000  1786
        AD3     LDD   ARTHX   3031     FIX ALARM        1862   69  1786  3031
        AG3     LDD   ARTHX   3061     DIVIDE ALARM     1846   69  1786  3061
        AI11    LDD   ARTHX   3081     SCALE ALARM      1785   69  1786  3081
        AI11A   HLT   1081   AI6                        1752   01  1081  1942
        AG2      49   0000    0000                      1876   49  0000  0000
        AJ1      48   0000    0000                      1820   48  0000  0000
        AJ2      00   0000    0001                      1903   00  0000  0001
        AJ3      00   0000    0059                      1848   00  0000  0059
        AJ4      10   0000    0000                      1853   10  0000  0000
        AJ5      50   0000    0000                      1940   50  0000  0000
        E00AQ   STD   J0001  AQ1       READ             1974   24  1977  1880
        AQ1     RDS   1976   AQ3                        1880   70  1976  1898
        AQ3     RAB   P0001  AQ3A                       1898   67  1951  1806
        AQ3B    RAB   P0001  AQ3A      CHECK FOR        1892   67  1951  1806
        AQ3A    NZA          AQ8       LAST WORD        1806   45  1860  1837
                LDD   AQ5    AQ4       ON CARD          1860   69  1863  1816
        AQ4     STD   ACC4                              1816   24  1870  1873
                AUP   8003             READ IN          1873   10  8003  1931
                SRT   0004             LABEL FOR        1931   30  0004  1941
                SIA   ACC5              PRESENT         1941   23  1795  1948
                SLO   8001              VARIABLE        1948   16  8001  1856
                ALO           8002     GET I Y OR C     1856   15  1809  8002
                RAU   A0000            ADDRESS FROM     1809   00  0000  0000
                AUP   ACC5             ABCON DICT       1987   10  1795  1949
                SLT   0004   ACC4        GENERATE       1949   35  0004  1870
        AQ5     AUP   AQ7              INSTRUCTION      1863   10  1866  1857
                ALO   P0010                             1857   15  1960  1965
                ALO           8002     GET AND          1965   15  1968  8002
                LDD   P0002   8003     STORE WORD       1968   69  1952  8003
        AQ7     STD   0000                              1866   24  0000  1907
                RAL   P0010            INCREMENT        1907   65  1960  1915
                ALO   AQ9              WORD COUNT       1915   15  1918  1854
                STL   P0010                             1854   20  1960  1963
                ALO   AQ3B    8002                      1963   15  1892  8002
        AQ8     RAL   P0001            CHECK FOR        1837   65  1951  1765
                BMI   J0001  AQ1       LAST CARD        1765   46  1977  1880
        E00AR   STD   P0005            PUNCH OUT        1801   24  1955  1908
                STU   J0003                             1908   21  1979  1935
                SIA   P0008            STORE STMNT      1935   23  1958  1912
                STU   J0004            NUMBER           1912   21  1980  1886
                SDA   P0004            STORE WORD       1886   22  1954  1909
                SLO   8001             COUNT            1909   16  8001  1917
                NZA   AR10   AR9       TEST ZERO        1917   45  1920  1872
        AR10    STU   J0005            STMT NUMBER      1920   21  1981  1814
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169                 STD   J0006
170                 STD   J0007
171                 STD   J0008
172                 STD   P0010   AR3          SET COUNTER
173       AR3       RAL   P0004
174                 SLO   AR7
175                 BMI   AR8                  TEST WORD
176                 STL   P0004   AR4          COUNT
177       AR4       ALO   .        8002        GET WORD
178                 RAL   P0000                LABEL FROM
179                 AUP    8003                PUNCH CONSTS
180                 SLT    0001
181                 SDA   P0007                MODIFY LABEL
182                 SLO    8001
183                 SRT    0001
184                 ALO   P0007
185                 SLT    0004                INSERT STMNT
186                 ALO   P0008                NUMBER
187                 AUP   P0010
188                 AUP            8003
189                 STL   J0001                STORE LABEL
190                 RAL    8002                FOR PUNCHING
191                 LDD            AQ4         MODIFY LABEL
192                 AUP   AR6                  INTO DRUM
193                 ALO   P0010                LOC IN READ
194                 ALO            8003        GET WORD
195                 STD   J0002                STORE IN
196                 RAL   P0010                PUNCH BAND
197                 ALO   AQ9
198                 STL   P0010   AR3
199       AR6       LDD    0000    8002
200       AR7       00     0001    0000
201       AR8       PCH   J0001   P0005       PUNCH
202       AR9       RAL    8000                IF STMT NMBR
203                 BMI   AR10    P0005        ZRO PCH ONLY
204       AQ9        00    0002    0000        IF 8000 NEG
205       J0010      80    0000    8800        CONTROL CNST
206        1976     RAB    1951                  READ
207                 AUP    8003                 UP TO
208                 SLT    0004                  SEVEN
209                 SDA   P0009                CONTIGUOUS
210                 SRT    0004                VARIABLES
211                 LDD            AQ4         PER CARD
212                 RAL    8003
213                 AUP   P0009
214                 ALO    8001
215                 AUP   AQ9
216                 ALO   AQ10    AQ11
217       AQ11      SUP   AQ9
218                 NZU            AQ8
219                 AUP    8001
220                 SUP   AR7
221                 SLO    8001    8003
222       AQ9       LDD    1952    8002
223       AQ10      STD    0000    AQ11
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1814   24   1982   1972
1972   24   1983   1864
1864   24   1984   1888
1888   24   1960   1913
1913   65   1954   1910
1910   16   1924   1936
1936   46   1994   1992
1992   20   1954   1865
1865   15   1868   8002
1868   65   1950   1914
1914   10   8003   1922
1922   35   0001   1938
1938   22   1957   1961
1961   16   8001   1919
1919   30   0001   1926
1926   15   1957   1962
1962   35   0004   1923
1923   15   1958   1964
1964   10   1960   1916
1916   10   1969   8003
1969   20   1977   1988
1988   65   8002   1900
1900   69   1906   1816
1906   10   1966   1934
1934   15   1960   1967
1967   15   1970   8003
1970   24   1978   1993
1993   65   1960   1815
1815   15   1918   1973
1973   20   1960   1913
1966   69   0000   8002
1924   00   0001   0000
1994   71   1977   1955
1872   65   8000   1937
1937   46   1920   1955
1918   00   0002   0000
1986   80   0000   8800
1976   67   1951   1744
1744   10   8003   1741
1741   35   0004   1748
1748   22   1959   1737
1737   30   0004   1746
1746   69   1750   1816
1750   65   8003   1749
1749   10   1959   1740
1740   15   8001   1751
1751   10   1738   1742
1742   15   1745   1735
1735   11   1738   1743
1743   44   1747   1837
1747   10   8001   1736
1736   11   1924   1739
1739   16   8001   8003
1738   69   1952   8002
1745   24   0000   1735
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5                          PACKAGE 2
5                       CONTAINS PACKAGE 1
5                       PLUS THE FOLLOWING
5                          ROUTINES
5                       E00AK  POWER FIX FIX
5                       E00AM  POWER FIX FIX REVERSE
5                       E00AL  POWER FLOAT FIX
5                       E00AN  POWER FLOAT FIX REVERSE
     E00AI   STD  ARTHX  AI1    ADD              1833  24  1786  1789
     AI1     STL  ARTHG                          1789  20  1794  1799
             LDD         ARTHB                   1799  69  1802  1805
             RAB   8002         STORE ACC        1802  67  8002  1767
             STL  ARTHF         POWER            1767  20  1772  1894
             SAB  ARTHE                          1894  18  1902  1759
             SLT   0001                          1759  35  0001  1766
             NZU  AI12          FIND MAX         1766  44  1773  1771
             LDD  AI3A                           1771  69  1774  1777
             SRT   0005         POWER            1777  30  0005  1790
             SDA  AI3           SET EXPNNTS      1790  22  1793  1796
             BMI         AI2    AND THEN         1796  46  1899  1754
             RAB  ARTHE          PERFORM         1899  67  1902  1817
             STL  ARTHF          ADDITION        1817  20  1772  1776
             RAL  ARTHH                          1776  65  1788  1943
             LDD  ARTHM  AI3                     1943  69  1824  1793
     AI3     SRT   0000  AI3B                    1793  30  0000  1811
     AI3A    SRT   0000  AI3B                    1774  30  0000  1811
     AI3B    ALO   8001  AI5                     1811  15  8001  1770
     AI2     RAL  ARTHM                          1754  65  1824  1779
             LDD  ARTHH  AI3                     1779  69  1788  1793
     AI5     RAU   8002         CLEAR ARTHE      1770  60  8002  1780
             STL  ARTHE  ARTHS  TO SCALE         1780  20  1902  1762
     AI12    BMI         AI13                    1773  46  1778  1828
             RAL  ARTHG  AI10                    1778  65  1794  1904
     AI13    RAL  ACC    ARTHX                   1828  65  0000  1786
     ARTHB   STD  ARTHY         BREAK UP EXP     1805  24  1808  1826
             SLT   0008         AND MANTISSA     1826  35  0008  1996
             STL  ARTHE         STORE POWER      1996  20  1902  1755
             RAU   8003         AND MANTISSA     1755  60  8003  1763
             SLT   0001         OF LOWER         1763  35  0001  1769
             STU  ARTHM                          1769  21  1824  1997
             RAU  ACC                            1997  60  0000  1855
             SRT   0002         STORE POWER      1855  30  0002  1761
             SLO   8002         AND MANTISSA     1761  16  8002  1819
             SLT   0001         OF ACC           1819  35  0001  1775
             ALO   8001                          1775  15  8001  1783
             STU  ARTHH  ARTHY                   1783  21  1788  1808
     ARTHS   SCT   0000         NORMALIZE        1762  36  0000  1782
             BOV  AI6           BRNCH IF ZRO     1782  47  1942  1787
             STL  ARTHG         SHIFT COUNT      1787  20  1794  1797
             RAL   8003         ROUND ON         1797  65  8003  1905
             SRD   0002         NINTH DIGIT      1905  31  0002  1813
             SLT   0002         CHECK FOR        1813  35  0002  1869
             STL  ARTHM         ROUNDOFF         1869  20  1824  1877
             NZU  AI7    AI8    OVERFLOW         1877  44  1831  1834
     AI8     RAB   8003           AND            1834  67  8003  1841
             SAB  ARTHG         CORRECT IF       1841  18  1794  1800
             ALO  AJ2           NECESSARY        1800  15  1903  1822
             SLT   0008                          1822  35  0008  1791
             RAL   8002                          1791  65  8002  1849
             AAB  ARTHE                          1849  17  1902  1757
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               ALO  ARTHF                               1757  15  1772  1827
               BMI  AI11A              PWR TOO SMAL     1827  46  1752  1781
               NZU  AI11               PWR TOO LRGE     1781  44  1785  1836
               SLT  0002                                1836  35  0002  1893
               STU  ACC1                                1893  21  1998  1901
               RAL  ARTHM                               1901  65  1824  1829
               BMI            AI9      COMBINE          1829  46  1944  1995
               SLO  ACC1      AI10                      1944  16  1998  1904
       AI10    STL  ACC       ARTHX    AND              1904  20  0000  1786
       AI9     ALO  ACC1      AI10                      1995  15  1998  1904
       AI7     SRT  0001               ADJUST           1831  30  0001  1792
               STL  ARTHM                               1792  20  1824  1927
               SLT  0001      AI8                       1927  35  0001  1834
       AI6     RAL  8003      AI10                      1942  65  8003  1904
       E00AJ   STD  ARTHX              MULTIPLY         1832  24  1786  1839
               LDD            ARTHB                     1839  69  1852  1805
               RAB  8002               ACC POWER        1852  67  8002  1867
               SLO  AJ1                MINUS 48         1867  16  1820  1825
               STL  ARTHF                               1825  20  1772  1875
               RAU  ARTHH                               1875  60  1788  1756
               MPY  ARTHM     ARTHS                     1756  19  1824  1762
       E00AG   STD  ARTHX     AG1      DIVIDE           1830  24  1786  1889
       AG1     LDD            ARTHB    IS DIVISOR       1889  69  1842  1805
               NZU            AG3       ZERO            1842  44  1812  1846
               RSB  8002               DIVISOR          1812  68  8002  1821
               ALO  AG2                POWER MINUS      1821  15  1876  1895
               STL  ARTHF               49              1895  20  1772  1768
               RAU  ARTHM              SHIFT            1768  60  1824  1879
               SRT  0001               DIVIDEND         1879  30  0001  1885
               DVR  ARTHH              DO DIVIDE        1885  64  1788  1803
               RAU  8002      ARTHS                     1803  60  8002  1762
       E00AO   STD  ARTHX              DIV REVERSE      1882  24  1786  1989
               STL  ACC2                                1989  20  1843  1896
               RAL  ACC                                 1896  65  0000  1810
               LDD  ACC2                                1810  69  1843  1897
               STD  ACC       AG1                       1897  24  0000  1889
       E00AF   STD  ACC6               FLOAT TO LWR     1947  24  1858  1911
               LDD  AE4       E00AE     AND ACC         1911  69  1925  1928
       AE4     STL  ACC       ACC6                      1925  20  0000  1858
       E00AE   STD  ARTHX              FLOAT TO LWR     1928  24  1786  1840
               RAU  8002                ONLY            1840  60  8002  1753
               SCT  0000               NORMALIZE        1753  36  0000  1975
               STL  ACC3                                1975  20  1881  1784
               BOV  AD1                ZERO CHECK       1784  47  1851  1890
               RAL  8003                                1890  65  8003  1798
               SRD  0002               ROUND FOR        1798  31  0002  1807
               SLT  0002               PLACING EXP      1807  35  0002  1764
               NZU            AE6      CHECK ROUND      1764  44  1818  1891
               LDD  8003                OVERFLOW        1818  69  8003  1874
               SRT  0001                                1874  30  0001  1884
               ALO  8001      AE6                       1884  15  8001  1891
       AE6     BMI  AE2                INSERT           1891  46  1844  1845
               ALO  AJ3       AE5       EXPONENT        1845  15  1848  1804
       AE2     SLO  AJ3       AE5                       1844  16  1848  1804
       AE5     SLO  ACC3      ARTHX                     1804  16  1881  1786
       E00TH   STD  ARTHX              FIX LOWER        1932  24  1786  1990
               SLT  0008               TO LOWER         1990  35  0008  1859
               STU  ARTHM                               1859  21  1824  1878
               RAB  8002               TEST EXP         1878  67  8002  1887
               SLO  AJ5                STORE ZERO       1887  16  1940  1945
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              BMI   ADI                IF LESS THAN     1945   46   1851   1850
              SLO   AJ4                50      ALARM    1850   16   1853   1758
              BMI           AD3        IF GRTR THAN     1758   46   1861   1862
              SRT    0004               59              1861   30   0004   1921
              ALO   AR7                                 1921   15   1924   1929
              LDD   AD2A               MODIFY           1929   69   1835   1838
              SDA   AD2                 SHIFT           1838   22   1991   1971
              RAL   ARTHM                               1971   65   1824   1930
              SLT    0002   AD2                         1930   35   0002   1991
AD1           RAL    8003   ARTHX      STORE ZERO       1851   65   8003   1786
AD2           SRT    0000   ARTHX      SHIFT CONST      1991   30   0000   1786
AD2A          SRT    0000   ARTHX                       1835   30   0000   1786
AD3           LDD   ARTHX    3031      FIX ALARM        1862   69   1786   3031
AG3           LDD   ARTHX    3061      DIVIDE ALARM     1846   69   1786   3061
AI11          LDD   ARTHX    3081      SCALE ALARM      1785   69   1786   3081
AI11A         HLT    1081   AI6                         1752   01   1081   1942
AG2            49    0000    0000                       1876   49   0000   0000
AJ1            48    0000    0000                       1820   48   0000   0000
AJ2            00    0000    0001                       1903   00   0000   0001
AJ3            00    0000    0059                       1848   00   0000   0059
AJ4            10    0000    0000                       1853   10   0000   0000
AJ5            50    0000    0000                       1940   50   0000   0000
E00AQ         STD   J0001   AQ1        READ             1974   24   1977   1880
AQ1           RDS    1976   AQ3                         1880   70   1976   1898
AQ3           RAB   P0001   AQ3A                        1898   67   1951   1806
AQ3B          RAB   P0001   AQ3A       CHECK FOR        1892   67   1951   1806
AQ3A          NZA           AQ8        LAST WORD        1806   45   1860   1837
              LDD   AQ5     AQ4        ON CARD          1860   69   1863   1816
AQ4           STD   ACC4                                1816   24   1870   1873
              AUP    8003              READ IN          1873   10   8003   1931
              SRT    0004              LABEL FOR        1931   30   0004   1941
              SIA   ACC5                PRESENT         1941   23   1795   1948
              SLO    8001               VARIABLE        1948   16   8001   1856
              ALO            8002      GET I Y OR C     1856   15   1809   8002
              RAU   A0000              ADDRESS FROM     1809   00   0000   0000
              AUP   ACC5               ABCON DICT       1987   10   1795   1949
              SLT    0004   ACC4         GENERATE       1949   35   0004   1870
AQ5           AUP   AQ7                INSTRUCTION      1863   10   1866   1857
              ALO   P0010                               1857   15   1960   1965
              ALO            8002      GET AND          1965   15   1968   8002
              LDD   P0002    8003      STORE WORD       1968   69   1952   8003
AQ7           STD    0000                               1866   24   0000   1907
              RAL   P0010              INCREMENT        1907   65   1960   1915
              ALO   AQ9                WORD COUNT       1915   15   1918   1854
              STL   P0010                               1854   20   1960   1963
              ALO   AQ3B     8002                       1963   15   1892   8002
AQ8           RAL   P0001              CHECK FOR        1837   65   1951   1765
              BMI   J0001   AQ1        LAST CARD        1765   46   1977   1880
E00AR         STD   P0005              PUNCH OUT        1801   24   1955   1908
              STU   J0003                               1908   21   1979   1935
              SIA   P0008              STORE STMNT      1935   23   1958   1912
              STU   J0004              NUMBER           1912   21   1980   1886
              SDA   P0004              STORE WORD       1886   22   1954   1909
              SLO    8001              COUNT            1909   16   8001   1917
              NZA   AR10    AR9        TEST ZERO        1917   45   1920   1872
AR10          STU   J0005              STMT NUMBER      1920   21   1981   1814
              STD   J0006              SET PUNCH        1814   24   1982   1972
              STD   J0007              BAND TO          1972   24   1983   1864
              STD   J0008              ZEROES           1864   24   1984   1888
              STD   P0010   AR3        SET COUNTER      1888   24   1960   1913
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AR3     RAL  P0004                               1913  65  1954  1910
        SLO  AR7                                 1910  16  1924  1936
        BMI  AR8                TEST WORD        1936  46  1994  1992
        STL  P0004  AR4         COUNT            1992  20  1954  1865
AR4     ALO         8002        GET WORD         1865  15  1868  8002
        RAL  P0000              LABEL FROM       1868  65  1950  1914
        AUP  8003               PUNCH CONSTS     1914  10  8003  1922
        SLT  0001                                1922  35  0001  1938
        SDA  P0007              MODIFY LABEL     1938  22  1957  1961
        SLO  8001                                1961  16  8001  1919
        SRT  0001                                1919  30  0001  1926
        ALO  P0007                               1926  15  1957  1962
        SLT  0004               INSERT STMNT     1962  35  0004  1923
        ALO  P0008              NUMBER           1923  15  1958  1964
        AUP  P0010                               1964  10  1960  1916
        AUP         8003                         1916  10  1969  8003
        STL  J0001              STORE LABEL      1969  20  1977  1988
        RAL  8002               FOR PUNCHING     1988  65  8002  1900
        LDD         AQ4         MODIFY LABEL     1900  69  1906  1816
        AUP  AR6                INTO DRUM        1906  10  1966  1934
        ALO  P0010              LOC IN READ      1934  15  1960  1967
        ALO         8003        GET WORD         1967  15  1970  8003
        STD  J0002              STORE IN         1970  24  1978  1993
        RAL  P0010              PUNCH BAND       1993  65  1960  1815
        ALO  AQ9                                 1815  15  1918  1973
        STL  P0010  AR3                          1973  20  1960  1913
AR6     LDD  0000   8002                         1966  69  0000  8002
AR7     00   0001   0000                         1924  00  0001  0000
AR8     PCH  J0001  P0005       PUNCH            1994  71  1977  1955
AR9     RAL  8000               IF STMT NMBR     1872  65  8000  1937
        BMI  AR10   P0005       ZRO PCH ONLY     1937  46  1920  1955
AQ9     00   0002   0000        IF 8000 NEG      1918  00  0002  0000
J0010   80   0000   8800        CONTROL CNST     1986  80  0000  8800
E00AL   STD  ARTHY                               1654  24  1808  1732
        STL  ARTHH                               1732  20  1788  1694
        RAL  ACC    AL17A        IS POWER        1694  65  0000  1709
AL17A   STD  ACC4                  TWO           1709  24  1870  1723
        STD  ARTHX                IF SO          1723  24  1786  1739
        SLO  AL16                 MULTIPLY       1739  16  1686  1692
        NZA  AL18                                1692  45  1731  1751
        RAL  ARTHH                               1751  65  1788  1645
        STD  ACC                                 1645  24  0000  1655
        LDD  ARTHY  E00AJ                        1655  69  1808  1832
AL18    RAL  ARTHH  AL17                         1731  65  1788  1693
AL17    SLT  0008                                1693  35  0008  1661
        SLO  8002                                1661  16  8002  1720
        SLT  0002               Q EQUALS         1720  35  0002  1677
        ALO  8001                MANTISSA        1677  15  8001  1690
        STU  ARTHF               OF ARGUMENT     1690  21  1772  1675
        RAB  8002                                1675  67  8002  1683
        SLO  AL1                STORE EXPNNT     1683  16  1736  1691
        SLT  0002                OF ARGMNT       1691  35  0002  1698
        STU  ARTHE                               1698  21  1902  1706
        RAL  AL2                MANTISSA OF      1706  65  1660  1666
        STL  ARTHM               Z IS ONE        1666  20  1824  1678
        RAL  AL1                                 1678  65  1736  1695
        SLT  0002               EXP OF Z IS      1695  35  0002  1702
        STU  ARTHG  AL3            50            1702  21  1794  1747
AL3     RAU  ACC                K IS GRTST       1747  60  0000  1708
        MPY  AL1                 INTEGER IN      1708  19  1736  1738
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              STU   ACC                K OVER TWO       1738   21  0000  1658
              RAL    8002              IS REMAINDER     1658   65  8002  1667
              NZA          AL4          ZERO            1667   45  1670  1646
              RAU   ARTHM              IF NOT SET Z     1670   60  1824  1729
              LDD          AL5         EQUALS TO        1729   69  1682  1737
              ALO   ARTHG               Z TIMES Q       1682   15  1794  1715
              STL   ARTHG                VIA            1715   20  1794  1699
              RAL   ARTHD              SUBROUTINE       1699   65  1665  1669
              STL   ARTHM                               1669   20  1824  1638
              NZA   AL4    AL20                         1638   45  1646  1741
      AL4     RAU   ACC                IF K NONZERO     1646   60  0000  1712
              NZU          AL7          Q EQUALS        1712   44  1668  1721
              RAU   ARTHF                               1668   60  1772  1679
              LDD          AL5          VIA SUBRTNE     1679   69  1684  1737
              ALO   ARTHE                               1684   15  1902  1714
              STL   ARTHE                               1714   20  1902  1662
              RAL   ARTHD                               1662   65  1665  1719
              STL   ARTHF  AL3                          1719   20  1772  1747
      AL7     RAU   ARTHG              SET EXPONNTS     1721   60  1794  1700
              SRT    0002                 ARTHS         1700   30  0002  1663
              NZU   AI11               EXP OVERSCAL     1663   44  1785  1722
              STL   ARTHE                               1722   20  1902  1664
              STU   ARTHF                               1664   21  1772  1671
              RAU   ARTHM                               1671   60  1824  1680
              SRT    0001  AL20                         1680   30  0001  1741
      AL20    LDD   AL8                                 1741   69  1716  1724
              STD   ARTHX  ARTHS                        1724   24  1786  1762
      AL8     RAL   ACC4                                1716   65  1870  1648
              BMI   AL10                                1648   46  1701  1743
              RAL   ACC-   ARTHY                        1743   65  0000  1808
      AL10    RAL   ACC                Z EQUALS ONE     1701   65  0000  1672
              NZA          AL12         OVER Z IF       1672   45  1676  1681
              RAL   AL11               K NEG AND Z      1676   65  1685  1649
              LDD   ARTHY  E00AG        NON ZERO        1649   69  1808  1830
      AL12    LDD   ARTHY   3111       ALARM IF ZRO     1681   69  1808  3111
      AL5     STD   ARTHX                               1737   24  1786  1652
              MPY   ARTHF                               1652   19  1772  1673
              SRT    0009                               1673   30  0009  1644
              NZU   AL14                                1644   44  1650  1639
              STL   ARTHD                               1639   20  1665  1640
              RAL    8003  AL15                         1640   65  8003  1641
      AL15    ALO   ARTHE  ARTHX                        1641   15  1902  1786
      AL14    SRT    0001                               1650   30  0001  1643
              STL   ARTHD                               1643   20  1665  1642
              RAL   AJ2    AL15                         1642   65  1903  1641
      AL1      50    0000   0000                        1736   50  0000  0000
      AL2      10    0000   0000                        1660   10  0000  0000
      AL11     10    0000   0050                        1685   10  0000  0050
      AL16     00    0000   0002                        1686   00  0000  0002
      AJ2      00    0000   0001                        1903   00  0000  0001
      E00AN   STD   ARTHY                  POWER        1651   24  1808  1687
              LDD   ACC                FLOAT FIX        1687   69  0000  1674
              STD   ARTHH              REVERSE          1674   24  1788  1745
              STL   ACC    AL17A                        1745   20  0000  1709
      E00AK   STD   ARTHY              POWER FIXFIX     1704   24  1808  1711
              STL   ARTHG  AK1         Q IS ARGMNT      1711   20  1794  1647
      AK1     RAB   ACC                K EQUALS         1647   67  0000  1705
              STL   ARTHF                ABVAL POWER    1705   20  1772  1725
              RAL   AJ2                  Z EQUALS       1725   65  1903  1707
              STL   ARTHH  AK3              ONE         1707   20  1788  1718
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AK3     RAU   ARTHF          K IS GTST      1718  60  1772  1727
        MPY   AK4             INTGR IN      1727  19  1730  1717
        STU   ARTHF           K OVER TWO    1717  21  1772  1726
        RAL   8002           IS REMAINDER   1726  65  8002  1735
        NZA          AK5       ZERO         1735  45  1734  1742
        RAU   ARTHH          IF NOT Z IS    1734  60  1788  1688
        MPY   ARTHG           Z TIMES Q     1688  19  1794  1733
        STL   ARTHH  AK5                    1733  20  1788  1742
AK5     RAU   ARTHF                         1742  60  1772  1728
        NZU          AK6     IS K ZERO      1728  44  1740  1746
        RAU   ARTHG          IF NOT         1740  60  1794  1749
        MPY   8001            Q EQUALS      1749  19  8001  1689
        STL   ARTHG  AK3      Q SQUARED     1689  20  1794  1718
AK6     RAU   ACC            IS POWER NEG   1746  60  0000  1656
        BMI          AK7     IF SO IS Z     1656  46  1659  1713
        RAB   ARTHH             ZERO        1659  67  1788  1744
        NZA          AK8     IF NOT IS Z    1744  45  1748  1750
        SLO   AJ2                 ONE       1748  16  1903  1657
        NZA   AK10   AK7                    1657  45  1710  1713
AK7     RAL   ARTHH  ARTHY   EXHIBIT Z      1713  65  1788  1808
AK10    RAL   8003   ARTHY                  1710  65  8003  1808
AK8     LDD   ARTHY  3101    ALARM          1750  69  1808  3101
AK4     50    0000   0000                   1730  50  0000  0000
AJ2     00    0000   0001                   1903  00  0000  0001
E00AM   STD   ARTHY          INTERCHGE      1653  24  1808  1696
        LDD   ACC             ACC AND       1696  69  0000  1703
        STD   ARTHG            LOWER        1703  24  1794  1697
        STL   ACC    AK1     THEN E00AK     1697  20  0000  1647
  1976  RAB   1951                          1976  67  1951  1623
        AUP   8003                          1623  10  8003  1632
        SLT   0004                          1632  35  0004  1624
        SDA   P0009                         1624  22  1959  1626
        SRT   0004                          1626  30  0004  1637
        LDD          AQ4                    1637  69  1627  1816
        RAL   8003                          1627  65  8003  1636
        AUP   P0009                         1636  10  1959  1633
        ALO   8001                          1633  15  8001  1631
        AUP   AQ9                           1631  10  1625  1628
        ALO   AQ10   AQ11                   1628  15  1634  1622
AQ11    SUP   AQ9                           1622  11  1625  1630
        NZU          AQ8                    1630  44  1635  1837
        AUP   8001                          1635  10  8001  1621
        SUP   AR7                           1621  11  1924  1629
        SLO   8001   8003                   1629  16  8001  8003
AQ9     LDD   1952   8002                   1625  69  1952  8002
AQ10    STD   0000   AQ11                   1634  24  0000  1622
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5                    PACKAGE 3
5                 CONTAINS PACKAGE 1
5                 PLUS THE FOLLOWING
5                     ROUTINES
5                 E00AC  EXPONENTIAL SUBROUTINE
5                 E00AB  LOG SUBROUTINE
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1		E00AI	STD	ARTHX	AI1	ADD	1833	24	1786	1789
2		AI1	STL	ARTHG			1789	20	1794	1799
3			LDD	ARTHB			1799	69	1802	1805
4			RAB	8002		STORE ACC	1802	67	8002	1767
5			STL	ARTHF		POWER	1767	20	1772	1894
6			SAB	ARTHE			1894	18	1902	1759
7			SLT	0001			1759	35	0001	1766
8			NZU	AI12		FIND MAX	1766	44	1773	1771
9			LDD	AI3A			1771	69	1774	1777
10			SRT	0005		POWER	1777	30	0005	1790
11			SDA	AI3		SET EXPNNTS	1790	22	1793	1796
12			BMI		AI2	AND THEN	1796	46	1899	1754
13			RAB	ARTHG		PERFORM	1899	67	1902	1817
14			STL	ARTHF		ADDITION	1817	20	1772	1776
15			RAL	ARTHM			1776	65	1788	1943
16			LDD	ARTHM	AI3		1943	69	1824	1793
17		AI3	SRT	0000	AI3B		1793	30	0000	1811
18		AI3A	SRT	0000	AI3B		1774	30	0000	1811
19		AI3B	ALO	8001	AI5		1811	15	8001	1770
20		AI2	RAL	ARTHM			1754	65	1824	1779
21			LDD	ARTHH	AI3		1779	69	1788	1793
22		AI5	RAU	8002		CLEAR ARTHE	1770	60	8002	1780
23			STL	ARTHE	ARTHS	TO SCALE	1780	20	1902	1762
24		AI12	BMI		AI13		1773	46	1778	1828
25			RAL	ARTHG	AI10		1778	65	1794	1904
26		AI13	RAL	ACC	ARTHX		1828	65	0000	1786
27		ARTHB	STD	ARTHY		BREAK UP EXP	1805	24	1808	1826
28			SLT	0008		AND MANTISSA	1826	35	0008	1996
29			STL	ARTHE		STORE POWER	1996	20	1902	1755
30			RAU	8003		AND MANTISSA	1755	60	8003	1763
31			SLT	0001		OF LOWER	1763	35	0001	1769
32			STU	ARTHM			1769	21	1824	1997
33			RAU	ACC			1997	60	0000	1855
34			SRT	0002		STORE POWER	1855	30	0002	1761
35			SLO	8002		AND MANTISSA	1761	16	8002	1819
36			SLT	0001		OF ACC	1819	35	0001	1775
37			ALO	8001			1775	15	8001	1783
38			STU	ARTHH	ARTHY		1783	21	1788	1808
39		ARTHS	SCT	0000		NORMALIZE	1762	36	0000	1782
40			BOV	AI6		BRNCH IF ZRO	1782	47	1942	1787
41			STL	ARTHG		SHIFT COUNT	1787	20	1794	1797
42			RAL	8003		ROUND ON	1797	65	8003	1905
43			SRD	0002		NINTH DIGIT	1905	31	0002	1813
44			SLT	0002		CHECK FOR	1813	35	0002	1869
45			STL	ARTHM		ROUNDOFF	1869	20	1824	1877
46			NZU	AI7	AI8	OVERFLOW	1877	44	1831	1834
47		AI8	RAB	8003		AND	1834	67	8003	1841
48			SAB	ARTHG		CORRECT IF	1841	18	1794	1800
49			ALO	AJ2		NECESSARY	1800	15	1903	1822
50			SLT	0008			1822	35	0008	1791
51			RAL	8002			1791	65	8002	1849
52			AAB	ARTHE			1849	17	1902	1757
53			ALO	ARTHF			1757	15	1772	1827
54			BMI	AI11A		PWR TOO SMAL	1827	46	1752	1781

	NZU	AI11		PWR TOO LRGE	1781	44	1785	1836
	SLT	0002			1836	35	0002	1893
	STU	ACC1			1893	21	1998	1901
	RAL	ARTHM			1901	65	1824	1829
	BMI		AI9	COMBINE	1829	46	1944	1995
	SLO	ACC1	AI10		1944	16	1998	1904
AI10	STL	ACC	ARTHX	AND	1904	20	0000	1786
AI9	ALO	ACC1	AI10		1995	15	1998	1904
AI7	SRT	0001		ADJUST	1831	30	0001	1792
	STL	ARTHM			1792	20	1824	1927
	SLT	0001	AI8		1927	35	0001	1834
AI6	RAL	8003	AI10		1942	65	8003	1904
E00AJ	STD	ARTHX		MULTIPLY	1832	24	1786	1839
	LDD		ARTHB		1839	69	1852	1805
	RAB	8002		ACC POWER	1852	67	8002	1867
	SLO	AJ1		MINUS 48	1867	16	1820	1825
	STL	ARTHF			1825	20	1772	1875
	RAU	ARTHH			1875	60	1788	1756
	MPY	ARTHM	ARTHS		1756	19	1824	1762
E00AG	STD	ARTHX	AG1	DIVIDE	1830	24	1786	1889
AG1	LDD		ARTHB	IS DIVISOR	1889	69	1842	1805
	NZU		AG3	ZERO	1842	44	1812	1846
	RSB	8002		DIVISOR	1812	68	8002	1821
	ALO	AG2		POWER MINUS	1821	15	1876	1895
	STL	ARTHF		49	1895	20	1772	1768
	RAU	ARTHM		SHIFT	1768	60	1824	1879
	SRT	0001		DIVIDEND	1879	30	0001	1885
	DVR	ARTHH		DO DIVIDE	1885	64	1788	1803
	RAU	8002	ARTHS		1803	60	8002	1762
E00AO	STD	ARTHX		DIV REVERSE	1882	24	1786	1989
	STL	ACC2			1989	20	1843	1896
	RAL	ACC			1896	65	0000	1810
	LDD	ACC2			1810	69	1843	1897
	STD	ACC	AG1		1897	24	0000	1889
E00AF	STD	ACC6		FLOAT TO LWR	1947	24	1858	1911
	LDD	AE4	E00AE	AND ACC	1911	69	1925	1928
AE4	STL	ACC	ACC6		1925	20	0000	1858
E00AE	STD	ARTHX		FLOAT TO LWR	1928	24	1786	1840
	RAU	8002		ONLY	1840	60	8002	1753
	SCT	0000		NORMALIZE	1753	36	0000	1975
	STL	ACC3			1975	20	1881	1784
	BOV	AD1		ZERO CHECK	1784	47	1851	1890
	RAL	8003			1890	65	8003	1798
	SRD	0002		ROUND FOR	1798	31	0002	1807
	SLT	0002		PLACING EXP	1807	35	0002	1764
	NZU		AE6	CHECK ROUND	1764	44	1818	1891
	LDD	8003		OVERFLOW	1818	69	8003	1874
	SRT	0001			1874	30	0001	1884
	ALO	8001	AE6		1884	15	8001	1891
AE6	BMI	AE2		INSERT	1891	46	1844	1845
	ALO	AJ3	AE5	EXPONENT	1845	15	1848	1804
AE2	SLO	AJ3	AE5		1844	16	1848	1804
AE5	SLO	ACC3	ARTHX		1804	16	1881	1786
E00TH	STD	ARTHX		FIX LOWER	1932	24	1786	1990
	SLT	0008		TO LOWER	1990	35	0008	1859
	STU	ARTHM			1859	21	1824	1878
	RAB	8002		TEST EXP	1878	67	8002	1887
	SLO	AJ5		STORE ZERO	1887	16	1940	1945
	BMI	AD1		IF LESS THAN	1945	46	1851	1850
	SLO	AJ4		50 ALARM	1850	16	1853	1758

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        BMI         AD3     IF GRTR THAN     1758  46  1861  1862
        SRT  0004            59              1861  30  0004  1921
        ALO  AR7                             1921  15  1924  1929
        LDD  AD2A           MODIFY           1929  69  1835  1838
        SDA  AD2             SHIFT           1838  22  1991  1971
        RAL  ARTHM                           1971  65  1824  1930
        SLT  0002   AD2                      1930  35  0002  1991
AD1     RAL  8003   ARTHX   STORE ZERO       1851  65  8003  1786
AD2     SRT  0000   ARTHX   SHIFT CONST      1991  30  0000  1786
AD2A    SRT  0000   ARTHX                    1835  30  0000  1786
AD3     LDD  ARTHX  3031    FIX ALARM        1862  69  1786  3031
AG3     LDD  ARTHX  3061    DIVIDE ALARM     1846  69  1786  3061
AI11    LDD  ARTHX  3081    SCALE ALARM      1785  69  1786  3081
AI11A   HLT  1081   AI6                      1752  01  1081  1942
AG2     49   0000   0000                     1876  49  0000  0000
AJ1     48   0000   0000                     1820  48  0000  0000
AJ2     00   0000   0001                     1903  00  0000  0001
AJ3     00   0000   0059                     1848  00  0000  0059
AJ4     10   0000   0000                     1853  10  0000  0000
AJ5     50   0000   0000                     1940  50  0000  0000
E00AQ   STD  J0001  AQ1     READ             1974  24  1977  1880
AQ1     RDS  1976   AQ3                      1880  70  1976  1898
AQ3     RAB  P0001  AQ3A                     1898  67  1951  1806
AQ3B    RAB  P0001  AQ3A    CHECK FOR        1892  67  1951  1806
AQ3A    NZA         AQ8     LAST WORD        1806  45  1860  1837
        LDD  AQ5    AQ4     ON CARD          1860  69  1863  1816
AQ4     STD  ACC4                            1816  24  1870  1873
        AUP  8003           READ IN          1873  10  8003  1931
        SRT  0004           LABEL FOR        1931  30  0004  1941
        SIA  ACC5            PRESENT         1941  23  1795  1948
        SLO  8001            VARIABLE        1948  16  8001  1856
        ALO         8002    GET I Y OR C     1856  15  1809  8002
        RAU  A0000          ADDRESS FROM     1809  00  0000  0000
        AUP  ACC5           ABCON DICT       1987  10  1795  1949
        SLT  0004   ACC4      GENERATE       1949  35  0004  1870
AQ5     AUP  AQ7            INSTRUCTION      1863  10  1866  1857
        ALO  P0010                           1857  15  1960  1965
        ALO         8002    GET AND          1965  15  1968  8002
        LDD  P0002  8003    STORE WORD       1968  69  1952  8003
AQ7     STD  0000                            1866  24  0000  1907
        RAL  P0010          INCREMENT        1907  65  1960  1915
        ALO  AQ9            WORD COUNT       1915  15  1918  1854
        STL  P0010                           1854  20  1960  1963
        ALO  AQ3B   8002                     1963  15  1892  8002
AQ8     RAL  P0001          CHECK FOR        1837  65  1951  1765
        BMI  J0001  AQ1     LAST CARD        1765  46  1977  1880
E00AR   STD  P0005          PUNCH OUT        1801  24  1955  1908
        STU  J0003                           1908  21  1979  1935
        SIA  P0008          STORE STMNT      1935  23  1958  1912
        STU  J0004          NUMBER           1912  21  1980  1886
        SDA  P0004          STORE WORD       1886  22  1954  1909
        SLO  8001           COUNT            1909  16  8001  1917
        NZA  AR10   AR9     TEST ZERO        1917  45  1920  1872
AR10    STU  J0005          STMT NUMBER      1920  21  1981  1814
        STD  J0006          SET PUNCH        1814  24  1982  1972
        STD  J0007          BAND TO          1972  24  1983  1864
        STD  J0008          ZEROES           1864  24  1984  1888
        STD  P0010  AR3     SET COUNTER      1888  24  1960  1913
AR3     RAL  P0004                           1913  65  1954  1910
        SLO  AR7                             1910  16  1924  1936
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                BMI   AR8                 TEST WORD       1936   46  1994  1992
                STL   P0004   AR4         COUNT           1992   20  1954  1865
      AR4       ALO           8002        GET WORD        1865   15  1868  8002
                RAL   P0000               LABEL FROM      1868   65  1950  1914
                AUP   8003                PUNCH CONSTS    1914   10  8003  1922
                SLT   0001                                1922   35  0001  1938
                SDA   P0007               MODIFY LABEL    1938   22  1957  1961
                SLO   8001                                1961   16  8001  1919
                SRT   0001                                1919   30  0001  1926
                ALO   P0007                               1926   15  1957  1962
                SLT   0004                INSERT STMNT    1962   35  0004  1923
                ALO   P0008               NUMBER          1923   15  1958  1964
                AUP   P0010                               1964   10  1960  1916
                AUP           8003                        1916   10  1969  8003
                STL   J0001               STORE LABEL     1969   20  1977  1988
                RAL   8002                FOR PUNCHING    1988   65  8002  1900
                LDD           AQ4         MODIFY LABEL    1900   69  1906  1816
                AUP   AR6                 INTO DRUM       1906   10  1966  1934
                ALO   P0010               LOC IN READ     1934   15  1960  1967
                ALO           8003        GET WORD        1967   15  1970  8003
                STD   J0002               STORE IN        1970   24  1978  1993
                RAL   P0010               PUNCH BAND      1993   65  1960  1815
                ALO   AQ9                                 1815   15  1918  1973
                STL   P0010   AR3                         1973   20  1960  1913
      AR6       LDD   0000    8002                        1966   69  0000  8002
      AR7       00    0001    0000                        1924   00  0001  0000
      AR8       PCH   J0001   P0005       PUNCH           1994   71  1977  1955
      AR9       RAL   8000                IF STMT NMBR    1872   65  8000  1937
                BMI   AR10    P0005       ZRO PCH ONLY    1937   46  1920  1955
      AQ9       00    0002    0000        IF 8000 NEG     1918   00  0002  0000
      J0010     80    0000    8800        CONTROL CNST    1986   80  0000  8800
       1976     RAB   1951                  READ          1976   67  1951  1744
                AUP   8003                 UP TO          1744   10  8003  1741
                SLT   0004                  SEVEN         1741   35  0004  1748
                SDA   P0009               CONTIGUOUS      1748   22  1959  1737
                SRT   0004                VARIABLES       1737   30  0004  1746
                LDD           AQ4         PER CARD        1746   69  1750  1816
                RAL   8003                                1750   65  8003  1749
                AUP   P0009                               1749   10  1959  1740
                ALO   8001                                1740   15  8001  1751
                AUP   AQ9                                 1751   10  1738  1742
                ALO   AQ10    AQ11                        1742   15  1745  1735
      AQ11      SUP   AQ9                                 1735   11  1738  1743
                NZU           AQ8                         1743   44  1747  1837
                AUP   8001                                1747   10  8001  1736
                SUP   AR7                                 1736   11  1924  1739
                SLO   8001    8003                        1739   16  8001  8003
      AQ9       LDD   1952    8002                        1738   69  1952  8002
      AQ10      STD   0000    AQ11                        1745   24  0000  1735
      E00AC     STD   ACC6                EXPONENTIAL     1705   24  1858  1711
                NZA           AC5         IS ARGUMENT     1711   45  1715  1710
                SLT   0008                  ZERO          1715   35  0008  1683
                STU   ARTHH               IF NOT LET      1683   21  1788  1692
                RSB   8002                 N BE MANTSA    1692   68  8002  1701
                ALO   AC3                  X BE POWER     1701   15  1704  1709
                BMI   AC4                 IS X GRTR       1709   46  1663  1713
                SLT   0001                 THAN TWO       1713   35  0001  1719
                NZU   AC5                 OR LESS THAN    1719   44  1710  1724
                SRT   0005                 MINUS EIGHT    1724   30  0005  1687
                ALO   AC6                 IF X WITHIN     1687   15  1690  1695
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235		STL	ARTHD		BOUNDS GEN	1695	20	1665	1718
236		RAU	ARTHH		INT AND	1718	60	1788	1693
237		SRT	0006	ARTHD	FRACT PARTS	1693	30	0006	1665
238	AC3	51	0000	0000	OF ARGUMENT	1704	51	0000	0000
239	AC6	SRT	0000		IS ARG NEG	1690	30	0000	1684
240		BMI	AC8		IF SO INT IS	1684	46	1689	1702
241		STU	ARTHD	AC1	INT MINUS 1	1702	21	1665	1685
242	AC8	SUP	AC10		AND FRACT IS	1689	11	1903	1707
243		STU	ARTHD		FRACT PLUS 1	1707	21	1665	1668
244		RAL	8002			1668	65	8002	1677
245		ALO	AC2	AC1		1677	15	1680	1685
246	AC2	99	9999	9999		1680	99	9999	9999
247	AC1	STL	ARTHH			1685	20	1788	1694
248		RAU	8002			1694	60	8002	1703
249		MPY	AC18		GENERATE	1703	19	1706	1708
250		RAU	8003			1708	60	8003	1716
251		AUP	AC17		POLYNOMIAL	1716	10	1720	1686
252		MPY	ARTHH			1686	19	1788	1691
253		RAU	8003		APPROXIM	1691	60	8003	1661
254		AUP	AC16		ATION	1661	10	1666	1682
255		MPY	ARTHH			1682	19	1788	1696
256		RAU	8003		FOR	1696	60	8003	1712
257		AUP	AC15			1712	10	1717	1678
258		MPY	ARTHH		EXPONENTIAL	1678	19	1788	1650
259		RAU	8003			1650	60	8003	1714
260		AUP	AC14			1714	10	1667	1679
261		MPY	ARTHH			1679	19	1788	1698
262		RAU	8003			1698	60	8003	1655
263		AUP	AC13			1655	10	1660	1676
264		MPY	ARTHH			1676	19	1788	1652
265		RAU	8003			1652	60	8003	1659
266		AUP	AC12			1659	10	1664	1672
267		MPY	ARTHH		SQUARE	1672	19	1788	1673
268		RAU	8003		RESULT	1673	60	8003	1700
269		AUP	AC11		SCALE AND	1700	10	1853	1671
270		MPY	8003		FLOAT THEN	1671	19	8003	1657
271		SRT	0001		EXIT	1657	30	0001	1688
272		STU	ACC2			1688	21	1843	1697
273		RAU	AC19			1697	60	1651	1656
274		AUP	ARTHD			1656	10	1665	1933
A274		BMI	ACC6			1933	46	1858	1669
275		SRT	0002			1669	30	0002	1675
276		NZU	AC21			1675	44	1674	1681
277		AUP	ACC2			1681	10	1843	1699
278		SRT	0008	ACC6		1699	30	0008	1858
279	AC4	RAL	ARTHH			1663	65	1788	1653
280		BMI		AC21		1653	46	1625	1674
281		RAL	8003	ACC6		1625	65	8003	1858
282	AC5	RAL	AC20	ACC6	ARGMNT ZERO	1710	65	1627	1858
283	AC21	LDD	ACC6	3021	ALARM STOP	1674	69	1858	3021
284	AC10	00	0000	0001		1903	00	0000	0001
285	AC11	10	0000	0000		1853	10	0000	0000
286	AC12	11	5129	2776		1664	11	5129	2776
287	AC13	06	6273	0884		1660	06	6273	0884
288	AC14	02	5439	3575		1667	02	5439	3575
289	AC15	00	7295	1737		1717	00	7295	1737
290	AC16	00	1742	1120		1666	00	1742	1120
291	AC17	00	0255	4918		1720	00	0255	4918
292	AC18	00	0093	2643		1706	00	0093	2643
293	AC19	00	0000	0050		1651	00	0000	0050

AC20	10	0000	0050		1627	10	0000	0050
E00AB	NZA		AB10	IS ARG ZERO	1638	45	1662	1632
	STD	ARTHD			1662	24	1665	1670
	BMI	AB10		IS ARG NEG	1670	46	1632	1624
	SLT	0008			1624	35	0008	1643
	STL	ARTHE		STORE POWER	1643	20	1902	1658
	RAU	8003		FORM Z	1658	60	8003	1615
	AUP	AB1		EQUAL ARG	1615	10	1618	1623
	STU	ACC3		MINUS ROOT	1623	21	1881	1635
	SUP	AB2		TEN OVER ARG	1635	11	1723	1728
	DVR	ACC3		PLUS ROOT	1728	64	1881	1731
	STL	ARTHY		TEN	1731	20	1786	1639
	RAU	8002			1639	60	8002	1647
	MPY	8001		Z SQUARE	1647	19	8001	1721
	STU	ACC3			1721	21	1881	1636
	RAU	8003		GENERATE	1636	60	8003	1644
	MPY	AB7			1644	19	1648	1654
	RAU	8003		POLYNOMIAL	1654	60	8003	1614
	AUP	AB6			1614	10	1617	1726
	MPY	ACC3		APPROXIMATN	1726	19	1881	1730
	RAU	8003			1730	60	8003	1640
	AUP	AB5			1640	10	1649	1727
	MPY	ACC3			1727	19	1881	1613
	RAU	8003			1613	60	8003	1616
	AUP	AB4			1616	10	1619	1628
	MPY	ACC3			1628	19	1881	1633
	RAU	8003			1633	60	8003	1641
	AUP	AB3			1641	10	1645	1733
	MPY	ARTHY			1733	19	1786	1722
	RAL	8003			1722	65	8003	1729
	ALO	AB8			1729	15	1732	1637
	SRT	0002			1637	30	0002	1646
	ALO	ARTHE		ADD POWER	1646	15	1902	1725
	SLO	AB8			1725	16	1732	1642
	SRD	0002		ROUND	1642	31	0002	1620
	RAU	8002			1620	60	8002	1734
	SCT	0000		NORMALIZE	1734	36	0000	1621
	BOV	AB12			1621	47	1631	1626
	BMI		AB13		1626	46	1629	1630
	SUP	AB9	AB11	ADJUST	1629	11	1634	1622
AB11	SUP	8002	AB12	POWER	1622	11	8002	1631
AB12	RAL	8003	ARTHD		1631	65	8003	1665
AB13	AUP	AB9	AB11		1630	10	1634	1622
AB10	LDD	ARTHD	3011	ALARM	1632	69	1665	3011
AB1	00	3162	2780		1618	00	3162	2780
AB2	00	6324	5560		1723	00	6324	5560
AB3	86	8591	7180		1645	86	8591	7180
AB4	28	9335	5240		1619	28	9335	5240
AB5	17	7522	0710		1649	17	7522	0710
AB6	09	4376	4760		1617	09	4376	4760
AB7	19	1337	7140		1648	19	1337	7140
AB8	50	0000	0000		1732	50	0000	0000
AB9	00	0000	0053		1634	00	0000	0053

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5                         PACKAGE 4   IS
5                         PACKAGE 2
5                              PLUS
5                   LOG AND EXPONENTIAL
5                        SUBROUTINES
      E00AI   STD  ARTHX  AI1     ADD              1833   24  1786  1789
      AI1     STL  ARTHG                           1789   20  1794  1799
              LDD         ARTHB                    1799   69  1802  1805
              RAB   8002          STORE ACC        1802   67  8002  1767
              STL  ARTHF          POWER            1767   20  1772  1894
              SAB  ARTHE                           1894   18  1902  1759
              SLT   0001                           1759   35  0001  1766
              NZU  AI12           FIND MAX         1766   44  1773  1771
              LDD  AI3A                            1771   69  1774  1777
              SRT   0005          POWER            1777   30  0005  1790
              SDA  AI3            SET EXPNNTS      1790   22  1793  1796
              BMI         AI2     AND THEN         1796   46  1899  1754
              RAB  ARTHE            PERFORM        1899   67  1902  1817
              STL  ARTHF           ADDITION        1817   20  1772  1776
              RAL  ARTHH                           1776   65  1788  1943
              LDD  ARTHM  AI3                      1943   69  1824  1793
      AI3     SRT   0000  AI3B                     1793   30  0000  1811
      AI3A    SRT   0000  AI3B                     1774   30  0000  1811
      AI3B    ALO   8001  AI5                      1811   15  8001  1770
      AI2     RAL  ARTHM                           1754   65  1824  1779
              LDD  ARTHH  AI3                      1779   69  1788  1793
      AI5     RAU   8002          CLEAR ARTHE      1770   60  8002  1780
              STL  ARTHE  ARTHS   TO SCALE         1780   20  1902  1762
      AI12    BMI         AI13                     1773   46  1778  1828
              RAL  ARTHG  AI10                     1778   65  1794  1904
      AI13    RAL  ACC    ARTHX                    1828   65  0000  1786
      ARTHB   STD  ARTHY          BREAK UP EXP     1805   24  1808  1826
              SLT   0008          AND MANTISSA     1826   35  0008  1996
              STL  ARTHE          STORE POWER      1996   20  1902  1755
              RAU   8003          AND MANTISSA     1755   60  8003  1763
              SLT   0001          OF LOWER         1763   35  0001  1769
              STU  ARTHM                           1769   21  1824  1997
              RAU  ACC                             1997   60  0000  1855
              SRT   0002          STORE POWER      1855   30  0002  1761
              SLO   8002          AND MANTISSA     1761   16  8002  1819
              SLT   0001          OF ACC           1819   35  0001  1775
              ALO   8001                           1775   15  8001  1783
              STU  ARTHH  ARTHY                    1783   21  1788  1808
      ARTHS   SCT   0000          NORMALIZE        1762   36  0000  1782
              BOV  AI6            BRNCH IF ZRO     1782   47  1942  1787
              STL  ARTHG          SHIFT COUNT      1787   20  1794  1797
              RAL   8003          ROUND ON         1797   65  8003  1905
              SRD   0002          NINTH DIGIT      1905   31  0002  1813
              SLT   0002          CHECK FOR        1813   35  0002  1869
              STL  ARTHM          ROUNDOFF         1869   20  1824  1877
              NZU  AI7    AI8     OVERFLOW--       1877   44  1831  1834
      AI8     RAB   8003            AND            1834   67  8003  1841
              SAB  ARTHG          CORRECT IF       1841   18  1794  1800
              ALO  AJ2            NECESSARY        1800   15  1903  1822
              SLT   0008                           1822   35  0008  1791
              RAL   8002                           1791   65  8002  1849
              AAB  ARTHE                           1849   17  1902  1757
              ALO  ARTHF                           1757   15  1772  1827
              BMI  AI11A          PWR TOO SMAL     1827   46  1752  1781
              NZU  AI11           PWR TOO LRGE     1781   44  1785  1836
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61                  SLT   0002                          1836  35  0002  1893
62                  STU   ACC1                          1893  21  1998  1901
63                  RAL   ARTHM                         1901  65  1824  1829
64                  BMI         AI9     COMBINE         1829  46  1944  1995
65                  SLO   ACC1  AI10                    1944  16  1998  1904
66        AI10      STL   ACC   ARTHX   AND             1904  20  0000  1786
67        AI9       ALO   ACC1  AI10                    1995  15  1998  1904
68        AI7       SRT   0001        ADJUST            1831  30  0001  1792
69                  STL   ARTHM                         1792  20  1824  1927
70                  SLT   0001  AI8                     1927  35  0001  1834
71        AI6       RAL   8003  AI10                    1942  65  8003  1904
72        E00AJ     STD   ARTHX       MULTIPLY          1832  24  1786  1839
73                  LDD         ARTHB                   1839  69  1852  1805
74                  RAB   8002        ACC POWER         1852  67  8002  1867
75                  SLO   AJ1         MINUS 48          1867  16  1820  1825
76                  STL   ARTHF                         1825  20  1772  1875
77                  RAU   ARTHH                         1875  60  1788  1756
78                  MPY   ARTHM ARTHS                   1756  19  1824  1762
79        E00AG     STD   ARTHX AG1   DIVIDE            1830  24  1786  1889
80        AG1       LDD         ARTHB IS DIVISOR        1889  69  1842  1805
81                  NZU         AG3     ZERO            1842  44  1812  1846
82                  RSB   8002        DIVISOR           1812  68  8002  1821
83                  ALO   AG2         POWER MINUS       1821  15  1876  1895
84                  STL   ARTHF         49              1895  20  1772  1768
85                  RAU   ARTHM       SHIFT             1768  60  1824  1879
86                  SRT   0001        DIVIDEND          1879  30  0001  1885
87                  DVR   ARTHH       DO DIVIDE         1885  64  1788  1803
88                  RAU   8002  ARTHS                   1803  60  8002  1762
89        E00AO     STD   ARTHX       DIV REVERSE       1882  24  1786  1989
90                  STL   ACC2                          1989  20  1843  1896
91                  RAL   ACC                           1896  65  0000  1810
92                  LDD   ACC2                          1810  69  1843  1897
93                  STD   ACC   AG1                     1897  24  0000  1889
94        E00AF     STD   ACC6        FLOAT TO LWR      1947  24  1858  1911
95                  LDD   AE4   E00AE   AND ACC         1911  69  1925  1928
96        AE4       STL   ACC   ACC6                    1925  20  0000  1858
97        E00AE     STD   ARTHX       FLOAT TO LWR      1928  24  1786  1840
98                  RAU   8002        ONLY              1840  60  8002  1753
99                  SCT   0000        NORMALIZE         1753  36  0000  1975
100                 STL   ACC3                          1975  20  1881  1784
101                 BOV   AD1         ZERO CHECK        1784  47  1851  1890
102                 RAL   8003                          1890  65  8003  1798
103                 SRD   0002        ROUND FOR         1798  31  0002  1807
104                 SLT   0002        PLACING EXP       1807  35  0002  1764
105                 NZU         AE6   CHECK ROUND       1764  44  1818  1891
106                 LDD   8003          OVERFLOW        1818  69  8003  1874
107                 SRT   0001                          1874  30  0001  1884
108                 ALO   8001  AE6                     1884  15  8001  1891
109       AE6       BMI   AE2         INSERT            1891  46  1844  1845
110                 ALO   AJ3   AE5     EXPONENT        1845  15  1848  1804
111       AE2       SLO   AJ3   AE5                     1844  16  1848  1804
112       AE5       SLO   ACC3  ARTHX                   1804  16  1881  1786
113       E00TH     STD   ARTHX       FIX LOWER         1932  24  1786  1990
114                 SLT   0008        TO LOWER          1990  35  0008  1859
115                 STU   ARTHM                         1859  21  1824  1878
116                 RAB   8002        TEST EXP          1878  67  8002  1887
117                 SLO   AJ5         STORE ZERO        1887  16  1940  1945
118                 BMI   AD1         IF LESS THAN      1945  46  1851  1850
119                 SLO   AJ4         50      ALARM     1850  16  1853  1758
120                 BMI         AD3   IF GRTR THAN      1758  46  1861  1862
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	SRT	0004		59	1861	30	0004	1921
	ALO	AR7			1921	15	1924	1929
	LDD	AD2A		MODIFY	1929	69	1835	1838
	SDA	AD2		SHIFT	1838	22	1991	1971
	RAL	ARTHM			1971	65	1824	1930
	SLT	0002	AD2		1930	35	0002	1991
AD1	RAL	8003	ARTHX	STORE ZERO	1851	65	8003	1786
AD2	SRT	0000	ARTHX	SHIFT CONST	1991	30	0000	1786
AD2A	SRT	0000	ARTHX		1835	30	0000	1786
AD3	LDD	ARTHX	3031	FIX ALARM	1862	69	1786	3031
AG3	LDD	ARTHX	3061	DIVIDE ALARM	1846	69	1786	3061
AI11	LDD	ARTHX	3081	SCALE ALARM	1785	69	1786	3081
AI11A	HLT	1081	AI6		1752	01	1081	1942
AG2	49	0000	0000		1876	49	0000	0000
AJ1	48	0000	0000		1820	48	0000	0000
AJ2	00	0000	0001		1903	00	0000	0001
AJ3	00	0000	0059		1848	00	0000	0059
AJ4	10	0000	0000		1853	10	0000	0000
AJ5	50	0000	0000		1940	50	0000	0000
E00AQ	STD	J0001	AQ1	READ	1974	24	1977	1880
AQ1	RDS	1976	AQ3		1880	70	1976	1898
AQ3	RAB	P0001	AQ3A		1898	67	1951	1806
AQ3B	RAB	P0001	AQ3A	CHECK FOR	1892	67	1951	1806
AQ3A	NZA		AQ8	LAST WORD	1806	45	1860	1837
	LDD	AQ5	AQ4	ON CARD	1860	69	1863	1816
AQ4	STD	ACC4			1816	24	1870	1873
	AUP	8003		READ IN	1873	10	8003	1931
	SRT	0004		LABEL FOR	1931	30	0004	1941
	SIA	ACC5		PRESENT	1941	23	1795	1948
	SLO	8001		VARIABLE	1948	16	8001	1856
	ALO		8002	GET I Y OR C	1856	15	1809	8002
	RAU	A0000		ADDRESS FROM	1809	00	0000	0000
	AUP	ACC5		ABCON DICT	1987	10	1795	1949
	SLT	0004	ACC4	GENERATE	1949	35	0004	1870
AQ5	AUP	AQ7		INSTRUCTION	1863	10	1866	1857
	ALO	P0010			1857	15	1960	1965
	ALO		8002	GET AND	1965	15	1968	8002
	LDD	P0002	8003	STORE WORD	1968	69	1952	8003
AQ7	STD	0000			1866	24	0000	1907
	RAL	P0010		INCREMENT	1907	65	1960	1915
	ALO	AQ9		WORD COUNT	1915	15	1918	1854
	STL	P0010			1854	20	1960	1963
	ALO	AQ3B	8002		1963	15	1892	8002
AQ8	RAL	P0001		CHECK FOR	1837	65	1951	1765
	BMI	J0001	AQ1	LAST CARD	1765	46	1977	1880
E00AR	STD	P0005		PUNCH OUT	1801	24	1955	1908
	STU	J0003			1908	21	1979	1935
	SIA	P0008		STORE STMNT	1935	23	1958	1912
	STU	J0004		NUMBER	1912	21	1980	1886
	SDA	P0004		STORE WORD	1886	22	1954	1909
	SLO	8001		COUNT	1909	16	8001	1917
	NZA	AR10	AR9	TEST ZERO	1917	45	1920	1872
AR10	STU	J0005		STMT NUMBER	1920	21	1981	1814
	STD	J0006		SET PUNCH	1814	24	1982	1972
	STD	J0007		BAND TO	1972	24	1983	1864
	STD	J0008		ZEROES	1864	24	1984	1888
	STD	P0010	AR3	SET COUNTER	1888	24	1960	1913
AR3	RAL	P0004			1913	65	1954	1910
	SLO	AR7			1910	16	1924	1936
	BMI	AR8		TEST WORD	1936	46	1994	1992

	STL	P0004	AR4	COUNT	1992	20	1954	1865
AR4	ALO		8002	GET WORD	1865	15	1868	8002
	RAL	P0000		LABEL FROM	1868	65	1950	1914
	AUP	8003		PUNCH CONSTS	1914	10	8003	1922
	SLT	0001			1922	35	0001	1938
	SDA	P0007		MODIFY LABEL	1938	22	1957	1961
	SLO	8001			1961	16	8001	1919
	SRT	0001			1919	30	0001	1926
	ALO	P0007			1926	15	1957	1962
	SLT	0004		INSERT STMNT	1962	35	0004	1923
	ALO	P0008		NUMBER	1923	15	1958	1964
	AUP	P0010			1964	10	1960	1916
	AUP		8003		1916	10	1969	8003
	STL	J0001		STORE LABEL	1969	20	1977	1988
	RAL	8002		FOR PUNCHING	1988	65	8002	1900
	LDD		AQ4	MODIFY LABEL	1900	69	1906	1816
	AUP	AR6		INTO DRUM	1906	10	1966	1934
	ALO	P0010		LOC IN READ	1934	15	1960	1967
	ALO		8003	GET WORD	1967	15	1970	8003
	STD	J0002		STORE IN	1970	24	1978	1993
	RAL	P0010		PUNCH BAND	1993	65	1960	1815
	ALO	AQ9			1815	15	1918	1973
	STL	P0010	AR3		1973	20	1960	1913
AR6	LDD	0000	8002		1966	69	0000	8002
AR7	00	0001	0000		1924	00	0001	0000
AR8	PCH	J0001	P0005	PUNCH	1994	71	1977	1955
AR9	RAL	8000		IF STMT NMBR	1872	65	8000	1937
	BMI	AR10	P0005	ZRO PCH ONLY	1937	46	1920	1955
AQ9	00	0002	0000	IF 8000 NEG	1918	00	0002	0000
J0010	80	0000	8800	CONTROL CNST	1986	80	0000	8800
E00AL	STD	ARTHY			1654	24	1808	1732
	STL	ARTHH			1732	20	1788	1694
	RAL	ACC	AL17A	IS POWER	1694	65	0000	1709
AL17A	STD	ACC4		TWO	1709	24	1870	1723
	STD	ARTHX		IF SO	1723	24	1786	1739
	SLO	AL16		MULTIPLY	1739	16	1686	1692
	NZA	AL18			1692	45	1731	1751
	RAL	ARTHH			1751	65	1788	1645
	STD	ACC			1645	24	0000	1655
	LDD	ARTHY	E00AJ		1655	69	1808	1832
AL18	RAL	ARTHH	AL17		1731	65	1788	1693
AL17	SLT	0008			1693	35	0008	1661
	SLO	8002			1661	16	8002	1720
	SLT	0002		Q EQUALS	1720	35	0002	1677
	ALO	8001		MANTISSA	1677	15	8001	1690
	STU	ARTHF		OF ARGUMENT	1690	21	1772	1675
	RAB	8002			1675	67	8002	1683
	SLO	AL1		STORE EXPNNT	1683	16	1736	1691
	SLT	0002		OF ARGMNT	1691	35	0002	1698
	STU	ARTHE			1698	21	1902	1706
	RAL	AL2		MANTISSA OF	1706	65	1660	1666
	STL	ARTHM		Z IS ONE	1666	20	1824	1678
	RAL	AL1			1678	65	1736	1695
	SLT	0002		EXP OF Z IS	1695	35	0002	1702
	STU	ARTHG	AL3	50	1702	21	1794	1747
AL3	RAU	ACC		K IS GRTST	1747	60	0000	1708
	MPY	AL1		INTEGER IN	1708	19	1736	1738
	STU	ACC		K OVER TWO	1738	21	0000	1658
	RAL	8002		IS REMAINDER	1658	65	8002	1667
	NZA		AL4	ZERO	1667	45	1670	1646

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               RAU   ARTHM              IF NOT SET Z     1670   60  1824  1729
               LDD          AL5         EQUALS TO        1729   69  1682  1737
               ALO   ARTHG               Z TIMES Q       1682   15  1794  1715
               STL   ARTHG                VIA            1715   20  1794  1699
               RAL   ARTHD              SUBROUTINE       1699   65  1665  1669
               STL   ARTHM                               1669   20  1824  1638
               NZA   AL4    AL20                         1638   45  1646  1741
        AL4    RAU   ACC                IF K NONZERO     1646   60  0000  1712
               NZU   .      AL7          Q EQUALS        1712   44  1668  1721
               RAU   ARTHF                               1668   60  1772  1679
               LDD          AL5          VIA SUBRTNE     1679   69  1684  1737
               ALO   ARTHE                               1684   15  1902  1714
               STL   ARTHE                               1714   20  1902  1662
               RAL   ARTHD                               1662   65  1665  1719
               STL   ARTHF  AL3                          1719   20  1772  1747
        AL7    RAU   ARTHG              SET EXPONNTS     1721   60  1794  1700
               SRT    0002                 ARTHS         1700   30  0002  1663
               NZU   AI11               EXP OVERSCAL     1663   44  1785  1722
               STL   ARTHE                               1722   20  1902  1664
               STU   ARTHF                               1664   21  1772  1671
               RAU   ARTHM                               1671   60  1824  1680
               SRT    0001  AL20                         1680   30  0001  1741
        AL20   LDD   AL8                                 1741   69  1716  1724
               STD   ARTHX  ARTHS                        1724   24  1786  1762
        AL8    RAL   ACC4                                1716   65  1870  1648
               BMI   AL10                                1648   46  1701  1743
               RAL   ACC    ARTHY                        1743   65  0000  1808
        AL10   RAL   ACC                Z EQUALS ONE     1701   65  0000  1672
               NZA          AL12         OVER Z IF       1672   45  1676  1681
               RAL   AL11               K NEG AND Z      1676   65  1685  1649
               LDD   ARTHY  E00AG        NON ZERO        1649   69  1808  1830
        AL12   LDD   ARTHY   3111       ALARM IF ZRO     1681   69  1808  3111
        AL5    STD   ARTHX                               1737   24  1786  1652
               MPY   ARTHF                               1652   19  1772  1673
               SRT    0009                               1673   30  0009  1644
               NZU   AL14                                1644   44  1650  1639
               STL   ARTHD                               1639   20  1665  1640
               RAL    8003  AL15                         1640   65  8003  1641
        AL15   ALO   ARTHE  ARTHX                        1641   15  1902  1786
        AL14   SRT    0001                               1650   30  0001  1643
               STL   ARTHD                               1643   20  1665  1642
               RAL   AJ2    AL15                         1642   65  1903  1641
        AL1     50    0000   0000                        1736   50  0000  0000
        AL2     10    0000   0000                        1660   10  0000  0000
        AL11    10    0000   0050                        1685   10  0000  0050
        AL16    00    0000   0002                        1686   00  0000  0002
        AJ2     00    0000   0001                        1903   00  0000  0001
        E00AN  STD   ARTHY                 POWER         1651   24  1808  1687
               LDD   ACC                 FLOAT FIX       1687   69  0000  1674
               STD   ARTHH               REVERSE         1674   24  1788  1745
               STL   ACC    AL17A                        1745   20  0000  1709
        E00AK  STD   ARTHY               POWER FIXFIX    1704   24  1808  1711
               STL   ARTHG  AK1          Q IS ARGMNT     1711   20  1794  1647
        AK1    RAB   ACC                 K EQUALS        1647   67  0000  1705
               STL   ARTHF                ABVAL POWER    1705   20  1772  1725
               RAL   AJ2                  Z EQUALS       1725   65  1903  1707
               STL   ARTHH  AK3              ONE         1707   20  1788  1718
        AK3    RAU   ARTHF               K IS GTST       1718   60  1772  1727
               MPY   AK4                  INTGR IN       1727   19  1730  1717
               STU   ARTHF                K OVER TWO     1717   21  1772  1726
```

```
              RAL   8002              IS REMAINDER     1726  65  8002  1735
              NZA          AK5         ZERO            1735  45  1734  1742
              RAU   ARTHH             IF NOT Z IS      1734  60  1788  1688
              MPY   ARTHG              Z TIMES Q       1688  19  1794  1733
              STL   ARTHH  AK5                         1733  20  1788  1742
AK5           RAU   ARTHF                              1742  60  1772  1728
              NZU          AK6        IS K ZERO        1728  44  1740  1746
              RAU   ARTHG             IF NOT           1740  60  1794  1749
              MPY   8001               Q EQUALS        1749  19  8001  1689
              STL   ARTHG  AK3         Q SQUARED       1689  20  1794  1718
AK6           RAU   ACC               IS POWER NEG     1746  60  0000  1656
              BMI          AK7        IF SO IS Z       1656  46  1659  1713
              RAB   ARTHH               ZERO           1659  67  1788  1744
              NZA          AK8        IF NOT IS Z      1744  45  1748  1750
              SLO   AJ2                   ONE          1748  16  1903  1657
              NZA   AK10   AK7                         1657  45  1710  1713
AK7           RAL   ARTHH  ARTHY      EXHIBIT Z        1713  65  1788  1808
AK10          RAL   8003   ARTHY                       1710  65  8003  1808
AK8           LDD   ARTHY  3101       ALARM            1750  69  1808  3101
AK4            50   0000   0000                        1730  50  0000  0000
AJ2            00   0000   0001                        1903  00  0000  0001
E00AM         STD   ARTHY             INTERCHGE        1653  24  1808  1696
              LDD   ACC                ACC AND         1696  69  0000  1703
              STD   ARTHG               LOWER          1703  24  1794  1697
              STL   ACC    AK1        THEN E00AK       1697  20  0000  1647
1976          RAB   1951                               1976  67  1951  1623
              AUP   8003                               1623  10  8003  1632
              SLT   0004                               1632  35  0004  1624
              SDA   P0009                              1624  22  1959  1626
              SRT   0004                               1626  30  0004  1637
              LDD          AQ4                         1637  69  1627  1816
              RAL   8003                               1627  65  8003  1636
              AUP   P0009                              1636  10  1959  1633
              ALO   8001                               1633  15  8001  1631
              AUP   AQ9                                1631  10  1625  1628
              ALO   AQ10   AQ11                        1628  15  1634  1622
AQ11          SUP   AQ9                                1622  11  1625  1630
              NZU          AQ8                         1630  44  1635  1837
              AUP   8001                               1635  10  8001  1621
              SUP   AR7                                1621  11  1924  1629
              SLO   8001   8003                        1629  16  8001  8003
AQ9           LDD   1952   8002                        1625  69  1952  8002
AQ10          STD   0000   AQ11                        1634  24  0000  1622
E00AC         STD   ACC6              EXPONENTIAL      1605  24  1858  1611
              NZA          AC5        IS ARGUMENT      1611  45  1615  1504
              SLT   0008                ZERO           1615  35  0008  1583
              STU   ARTHH             IF NOT LET       1583  21  1788  1592
              RSB   8002               N BE MANTSA     1592  68  8002  1601
              ALO   AC3                X BE POWER      1601  15  1604  1609
              BMI   AC4               IS X GRTR        1609  46  1513  1613
              SLT   0001               THAN TWO        1613  35  0001  1619
              NZU   AC5               OR LESS THAN     1619  44  1504  1574
              SRT   0005               MINUS EIGHT     1574  30  0005  1587
              ALO   AC6               IF X WITHIN      1587  15  1590  1595
              STL   ARTHD              BOUNDS GEN      1595  20  1665  1618
              RAU   ARTHH               INT AND        1618  60  1788  1593
              SRT   0006   ARTHD      FRACT PARTS      1593  30  0006  1665
AC3            51   0000   0000        OF ARGUMENT     1604  51  0000  0000
AC6           SRT   0000              IS ARG NEG       1590  30  0000  1504
              BMI   AC8               IF SO INT IS     1584  46  1509  1602
```

361		STU	ARTHD	AC1	INT MINUS 1	1602	21	1665	1585
362	AC8	SUP	AC10		AND FRACT IS	1589	11	1903	1607
363		STU	ARTHD		FRACT PLUS 1	1607	21	1665	1568
364		RAL	8002			1568	65	8002	1577
365		ALO	AC2	AC1		1577	15	1580	1585
366	AC2	99	9999	9999		1580	99	9999	9999
367	AC1	STL	ARTHH			1585	20	1788	1594
368		RAU	8002			1594	60	8002	1603
369		MPY	AC18		GENERATE	1603	19	1606	1608
370		RAU	8003			1608	60	8003	1616
371		AUP	AC17		POLYNOMIAL	1616	10	1620	1586
372		MPY	ARTHH			1586	19	1788	1591
373		RAU	8003		APPROXIM	1591	60	8003	1561
374		AUP	AC16		ATION	1561	10	1566	1582
375		MPY	ARTHH			1582	19	1788	1596
376		RAU	8003		FOR	1596	60	8003	1612
377		AUP	AC15			1612	10	1617	1578
378		MPY	ARTHH		EXPONENTIAL	1578	19	1788	1550
379		RAU	8003			1550	60	8003	1614
380		AUP	AC14			1614	10	1567	1579
381		MPY	ARTHH			1579	19	1788	1598
382		RAU	8003			1598	60	8003	1555
383		AUP	AC13			1555	10	1560	1576
384		MPY	ARTHH			1576	19	1788	1552
385		RAU	8003			1552	60	8003	1559
386		AUP	AC12			1559	10	1564	1572
387		MPY	ARTHH		SQUARE	1572	19	1788	1573
388		RAU	8003		RESULT	1573	60	8003	1600
389		AUP	AC11		SCALE AND	1600	10	1853	1571
390		MPY	8003		FLOAT THEN	1571	19	8003	1557
391		SRT	0001		EXIT	1557	30	0001	1588
392		STU	ACC2			1588	21	1843	1597
393		RAU	AC19			1597	60	1551	1556
394		AUP	ARTHD			1556	10	1665	1933
A394		BMI	ACC6			1933	46	1858	1569
395		SRT	0002			1569	30	0002	1575
396		NZU	AC21			1575	44	1514	1581
397		AUP	ACC2			1581	10	1843	1599
398		SRT	0008	ACC6		1599	30	0008	1858
399	AC4	RAL	ARTHH			1513	65	1788	1503
400		BMI		AC21		1503	46	1510	1514
401		RAL	8003	ACC6		1510	65	8003	1858
402	AC5	RAL	AC20	ACC6	ARGMNT ZERO .	1504	65	1565	1858
403	AC21	LDD	ACC6	3021	ALARM STOP	1514	69	1858	3021
404	AC10	00	0000	0001		1903	00	0000	0001
405	AC11	10	0000	0000		1853	10	0000	0000
406	AC12	11	5129	2776		1564	11	5129	2776
407	AC13	06	6273	0884		1560	06	6273	0884
408	AC14	02	5439	3575		1567	02	5439	3575
409	AC15	00	7295	1737		1617	00	7295	1737
410	AC16	00	1742	1120		1566	00	1742	1120
411	AC17	00	0255	4918		1620	00	0255	4918
412	AC18	00	0093	2643		1606	00	0093	2643
413	AC19	00	0000	0050		1551	00	0000	0050
414	AC20	10	0000	0050		1565	10	0000	0050
415	E00AB	NZA		AB10	IS ARG ZERO	1507	45	1562	1505
416		STD	ARTHD			1562	24	1665	1570
417		BMI	AB10		IS ARG NEG	1570	46	1505	1524
418		SLT	0008			1524	35	0008	1543
419		STL	ARTHE		STORE POWER	1543	20	1902	1558

```
420                 RAU   8003
421                 AUP   AB1
422                 STU   ACC3
423                 SUP   AB2
424                 DVR   ACC3
425                 STL   ARTHY
426                 RAU   8002
427                 MPY   8001
428                 STU   ACC3
429                 RAU   8003
430                 MPY   AB7
431                 RAU   8003
432                 AUP   AB6
433                 MPY   ACC3
434                 RAU   8003
435                 AUP   AB5
436                 MPY   ACC3
437                 RAU   8003
438                 AUP   AB4
439                 MPY   ACC3
440                 RAU   8003
441                 AUP   AB3
442                 MPY   ARTHY
443                 RAL   8003
444                 ALO   AB8
445                 SRT   0002
446                 ALO   ARTHE
447                 SLO   AB8
448                 SRD   0002
449                 RAU   8002
450                 SCT   0000
451                 BOV   AB12
452                 BMI           AB13
453                 SUP   AB9     AB11
454       AB11      SUP   8002    AB12
455       AB12      RAL   8003    ARTHD
456       AB13      AUP   AB9     AB11
457       AB10      LDD   ARTHD    3011
458       AB1       00    3162    2780
459       AB2       00    6324    5560
460       AB3       86    8591    7180
461       AB4       28    9335    5240
462       AB5       17    7522    0710
463       AB6       09    4376    4760
464       AB7       19    1337    7140
465       AB8       50    0000    0000
466       AB9       00    0000    0053
```

```
FORM  Z          1558   60   8003   1515
EQUAL ARG        1515   10   1518   1523
MINUS ROOT       1523   21   1881   1535
TEN OVER ARG     1535   11   1553   1563
PLUS ROOT        1563   64   1881   1500
     TEN         1500   20   1808   1511
                 1511   60   8002   1519
  Z SQUARE       1519   19   8001   1521
                 1521   21   1881   1536
  GENERATE       1536   60   8003   1544
                 1544   19   1548   1554
POLYNOMIAL       1554   60   8003   1512
                 1512   10   1516   1526
APPROXIMATN      1526   19   1881   1531
                 1531   60   8003   1540
                 1540   10   1549   1527
                 1527   19   1881   1538
                 1538   60   8003   1502
                 1502   10   1610   1528
                 1528   19   1881   1533
                 1533   60   8003   1541
                 1541   10   1545   1501
                 1501   19   1808   1508
                 1508   65   8003   1517
                 1517   15   1520   1525
                 1525   30   0002   1532
ADD POWER        1532   15   1902   1509
                 1509   16   1520   1529
  ROUND          1529   31   0002   1537
                 1537   60   8002   1546
NORMALIZE        1546   36   0000   1522
                 1522   47   1506   1530
                 1530   46   1534   1539
 ADJUST          1534   11   1542   1547
  POWER          1547   11   8002   1506
                 1506   65   8003   1665
                 1539   10   1542   1547
  ALARM          1505   69   1665   3011
                 1518   00   3162   2780
                 1553   00   6324   5560
                 1545   86   8591   7180
                 1610   28   9335   5240
                 1549   17   7522   0710
                 1516   09   4376   4760
                 1548   19   1337   7140
                 1520   50   0000   0000
                 1542   00   0000   0053
```

```
5                RESERVATION PACKAGE   R1
5                RESERVATION PACKAGE   R1
4                  LAAAA  U1999      INITIAL LOCN
4                  ACC    U0000      RESERVE ACC
4                  P       1950      RESERVE FOR
3                  P1951   1960      PUNCH CONSTS
4                  W       1977      RESERVE W
3                  W1978   1986      STORAGE BAND
3                  J1977   1986      PUNCH BAND
1                   1735   1950      RESERVE
1                   1961   1976        FOR
1                   1987   1998        SUBROUTINES
4                  E00TH   1932      FIX ENTRY
4                  E00AE   1928      FLOAT TO LWR
4                  E00AF   1947      FLOAT TO ACC
4                  E00AG   1830      DIVIDE ENTRY
4                  E00AI   1833      ADD ENTRY
4                  E00AJ   1832      MULTIPLY
4                  E00AO   1882      REV DIVIDE
4                  E00AQ   1974      READ ENTRY
4                  E00AR   1801      PUNCH ENTRY
4        1809  RAU  A0000   1987      GET A0000
5                LAST CARD OF R1
```

```
5                RESERVATION PACKAGE    R2
5                RESERVATION PACKAGE    R2
4                  LAAAA  U1999     INITIAL LOCN
4                  ACC    U0000     RESERVE ACC
4                  P        1950    RESERVE FOR
3                  P1951    1960    PUNCH CONSTS
4                  W        1977    RESERVE W
3                  W1978    1986    STORAGE BAND
3                  J1977    1986    PUNCH BAND
1                   1621    1950    RESERVE
1                   1961    1976     FOR
1                   1987    1998     SUBROUTINES
4                  E00TH    1932    FIX ENTRY
4                  E00AE    1928    FLOAT TO LWR
4                  E00AF    1947    FLOAT TO ACC
4                  E00AG    1830    DIVIDE ENTRY
4                  E00AI    1833    ADD ENTRY
4                  E00AK    1704    FIX FIX POWR
4                  E00AL    1654    FLT FIX POWR
4                  E00AM    1653    RV FX FX PWR
4                  E00AN    1651    RV FL FX PWR
4                  E00AJ    1832    MULTIPLY
4                  E00AO    1882    REV DIVIDE
4                  E00AQ    1974    READ ENTRY
4                  E00AR    1801    PUNCH ENTRY
      1009   RAU   A0000    1987    GET A0000
5                LAST CARD OF R2
```

```
5                RESERVATION PACKAGE   R3
5                RESERVATION PACKAGE   R3
4                  LAAAA  U1999     INITIAL LOCN
4                  ACC    U0000     RESERVE ACC
4                  P       1950     RESERVE FOR
3                  P1951   1960     PUNCH CONSTS
4                  W       1977     RESERVE W
3                  W1978   1986     STORAGE BAND
3                  J1977   1986     PUNCH BAND
1                   1613   1950     RESERVE
1                   1961   1976      FOR
1                   1987   1998      SUBROUTINES
4                  E00AB   1638     LOGARITHM
4                  E00AC   1705     EXPONENTIAL
4                  E00TH   1932     FIX ENTRY
4                  E00AE   1928     FLOAT TO LWR
4                  E00AF   1947     FLOAT TO ACC
4                  E00AG   1830     DIVIDE ENTRY
4                  E00AI   1833     ADD ENTRY
4                  E00AJ   1832     MULTIPLY
4                  E00AO   1882     REV DIVIDE
4                  E00AQ   1974     READ ENTRY
4                  E00AR   1801     PUNCH ENTRY
      1809    RAU  A0000   1987     GET A0000
5                LAST CARD OF R3
```

```
5                RESERVATION PACKAGE    R4
5                RESERVATION PACKAGE    R4
4                  LAAAA  U1999     INITIAL LOCN
4                  ACC    U0000     RESERVE ACC
4                  P        1950    RESERVE FOR
3                  P1951    1960    PUNCH CONSTS
4                  W        1977    RESERVE W
3                  W1978    1986    STORAGE BAND
3                  J1977.   1986    PUNCH BAND
1                   1500    1950    RESERVE
1                   1961    1976     FOR
1                   1987    1998     SUBROUTINES
4                  E00AB    1507    LOGARITHM
4                  E00AC    1605    EXPONENTIAL
4                  E00TH    1932    FIX ENTRY
4                  E00AE    1928    FLOAT TO LWR
4                  E00AF    1947    FLOAT TO ACC
4                  E00AG    1830    DIVIDE ENTRY
4                  E00AI    1833    ADD ENTRY
4                  E00AJ    1832    MULTIPLY
4                  E00AK    1704    FIX FIX POWR
4                  E00AL    1654    FLT FIX POWR
4                  E00AM    1653    RV FX FX PWR
4                  E00AN    1651    RV FL FX PWR
4                  E00AO    1882    REV DIVIDE
4                  E00AQ    1974    READ ENTRY
4                  E00AR    1801    PUNCH ENTRY
         1809   RAU  A0000    1987    GET A0000
5                LAST CARD OF R4
```

```
5                    SUBROUTINE 22  SINE
     E00AW    STD   ARTHX              BEGIN SINE
              STL   ARTHE               SUBROUTINE
              SLT    0008               STORE
              STU   ARTHF               ARGUMENT
              RSB    8002              IS POWER
              ALO   AW1                  OVERSCALE
              BMI   AW2                 IF SO ALARM
              SLO   AW3                 IS POWER
              BMI          AW4           UNDERSCALE
              SRT    0004               IF SO SINX
              ALO   AW5                  EQUALS X
              STL   AW6
              RAU   ARTHF               FORM FRACTL
              MPY   AW7     AW6          PART
     AW6      HLT   AW6     AW23
     AW23     STL   ARTHG
              RAU    8003               IS INTGRAL
              MPY   AW8                  PART ODD
              RAL    8002
              NZA          AW9           IF SO FLIP
              RSL   ARTHE               SGN OF X
              STL   ARTHE   AW9
     AW9      RSB   ARTHG                FORM S AS 2
              SAB    8001               MINUS 2 ALPH
              NZU          AW10          IF 2 ALPH
              AUP   AW11                GRTG 1 OR 2
              NZU   AW17    AW10        ALPH OTHER
     AW10     RAB    8002               WISE
              STL   ARTHF               FORM SINE
              RAU    8002                POLYNOMIAL
              MPY    8001
              STU   ARTHG               APPROXIMATOR
              RAU   AW16
              MPY   ARTHG
              RAU    8003
              AUP   AW15
              MPY   ARTHG
              RAU    8003
              AUP   AW14
              MPY   ARTHG
              RAU    8003
              AUP   AW13
              MPY   ARTHG
              SRT    0001
              RAU    8003
              AUP   AW12
              MPY   ARTHF
              SCT    0000
              BOV   AW19
              STL   ARTHF                SINE TO 0
              RAL    8003
              SRT    0002               ROUND
              STL   ARTHG
              RSU   ARTHF
              SRT    0002               ADJUST POWER
              BMI          AW25
              SUP    8003
              ALO   AW8     AW24
     AW24     AUP   ARTHG
```

```
                SLT    0002   AW22
AW25            SUP    8003
                SLO    AW8    AW24
AW22            STU    ARTHF                DETERMINE
                RAL    ARTHE                 PROPER SIGN
                BMI           AW20           OF RESULT
                RSL    ARTHF  ARTHX            EXIT
AW20            RAL    ARTHF  ARTHX            EXIT
AW4             RAL    ARTHE  ARTHX         SINX IS X
AW17            RAU    AW21   AW22          SINX IS ONE
AW19            RAL     8002                SINX IS ZERO
                SLO     8001   ARTHX
AW1              57     0000    0000        CONSTANTS
AW3              09     0000    0000
AW5             SRT     0009   AW23
AW7              31     8309    8862
AW8              50     0000    0000
AW11             00     0000    0002
AW12             15     7079    6318
AW13      -      64     5963    7111
AW14             07     9689    6793
AW15      -      00     4673    7656
AW16             00     0151    4842
AW21             10     0000    0050
AW2             RAL    ARTHE                ALARM FOR
                LDD    ARTHX    3221        SINE
5                    LAST CARD SUBROUTINE 22
```

```
5                    SUBROUTINE 21      COSINE
      E00AV    STD   ARTHX              BEGIN COSINE
               SLT    0008                ARGUMENT
               STU   ARTHF              ALARM IF PWR
               RSB    8002                OVERSCALE
               ALO   AV1                COSX EQUALS
               BMI   AV2                 ONE IF PWR
               SLO   AV3                 UNDERSCALE
               BMI          AV4
               SRT    0004
               ALO   AV5
               STL   AV6
               RAU   ARTHF              FORM
               MPY   AV7      AV6         FRACTIONAL
      AV6      HLT   AV6      AV23        AND INTGRL
      AV23     STL   ARTHG                 PARTS
               RAU    8003
               MPY   AV8                FORM S AS
               STL   ARTHE                ONE MINUS
               RSB   ARTHG                TWICE ABVAL
               SAB    8001                OF FRACTNL
               ALO   AV9                    PART
               RAU    8002
               STU   ARTHF
               MPY    8001              FORM SINE
               STU   ARTHG
               RAU   AV16               POLYNOMIAL
               MPY   ARTHG
               RAU    8003              APPROXIMATOR
               AUP   AV15
               MPY   ARTHG
               RAU    8003
               AUP   AV14
               MPY   ARTHG
               RAU    8003
               AUP   AV13
               MPY   ARTHG
               SRT    0001
               RAU    8003
               AUP   AV12
               MPY   ARTHF              EQUALS ONE
               SCT    0000
               BOV   AV19
               STL   ARTHF
               RAL    8003              ROUND
               SRT    0002              AND
               STL   ARTHG              ADJUST
               RSU   ARTHF               POWER
               SRT    0002
               BMI          AV25
               SUP    8003
               ALO   AV8      AV24
      AV24     AUP   ARTHG
               SLT    0002   AV22
      AV22     STU   ARTHF              DETERMINE
               RAU   ARTHE               SIGN OF
               NZU          AV20           RESULT
               RSL   ARTHF  ARTHX
      AV20     RAL   ARTHF  ARTHX
      AV25     SUP    8003
```

```
          SLO   AV8     AV24
AV2       RAL   ARTHE              OVERSCALE
          LDD   ARTHX    3211        DISPLAY
AV4       RAL   AV21    ARTHX      COSX IS ONE
AV19      RAL    8002               COSX IS ZERO
          SLO    8001   ARTHX
AV17      RAU   AV21    AV22       COSX IS PLUS
AV1        57    0000    0000       OR MINUS 1
AV3        11    0000   .0000
AV5       SRD    0011   AV23
AV7        31    8309    8862
AV8        50    0000    0000
AV9        99    9999    9999
AV12       15    7079    6318
AV13       64    5963    7111
AV14       07    9689    6793
AV15       00    4673    7656
AV16       00    0151    4842
AV21       10    0000    0050
5                 LAST CARD SUBROUTINE 21
```

```
5                    SUBROUTINE 20  SQUARE RT
      E00AU    STD   ARTHX           SQUARE ROOT
               BMI   AU1             ALARM IF NEG
               SLT    0008
               NZU          AU2      TEST FOR ZRO
               STL   ARTHF           BREAK UP EXP
               RAL    8003           AND MANTISSA
               SLT    0002           CALCULATE
               STL   ARTHE            INITIAL X
               AUP   AU8    AU3
      AU4      RAU   ARTHE           CALCULATE
               DVR   ARTHG            NEXT X
               SLO    8001            VALUE
               NZA          AU5
               BMI          AU5      TEST FOR END
               ALO    8001
               ALO    8001   AU3
      AU3      DVR   AU9             RECYCLE
               STL   ARTHG   AU4
      AU5      RAL   ARTHF           MODIFY
               ALO   AU10             EXPONENT
               SRT    0008
               DIV   AU9
               ALO    8003
               STL   ARTHF           TEST EVEN OR
               NZU          AU6       ODD EXP
               RAU   ARTHG           EXP ODD
               SRT    0001
               MPY   AU11             MPY BY SQRT
               SRD    0010   AU7       OF 10
      AU7      SLT    0002
               ALO   ARTHF  ARTHX     GO TO EXIT
      AU6      RAL   ARTHG           EXP EVEN
               SRD    0002   AU7
      AU2      RAL    8003   ARTHX    STORE ZERO
      AU1      LDD   ARTHX    3201    SQRT ALARM
      AU8       00    0000    0001    CONSTANTS
      AU9       00    0000    0002
      AU10      49    0000    0000
      AU11      03    1622    7766
5                  LAST CARD SUBROUTINE 20
```

MODIFIED
INSTRUCTIONS
IN IT
SOAP DECK

AVAILABILITY	0959	69	1956	8002
READ CHANGES	1052	69	1952	8002
WORDS	0992	65	1697	0970
CHANGED IN	0970	21	1977	0981
AVAILABILITY	0981	24	1984	1560
TABLE PUNCH	1042	24	1983	0990
OUT ROUTINE	0990	22	1982	1138
FOR COMPILER	1138	10	1141	8002
SOAP DECK	1124	00	0000	8808
	1039	24	1982	1947
	1141	24	1978	1947
	1252	10	1983	1152
CHANGES IN	1990	65	1986	0940
PUNCH OUT	0940	92	1950	0900
ROUTINE	0900	35	0004	0918
FOR FIVE	0918	65	8002	1526
PER CARD	1526	35	0002	1180
PUNCH OUT	1180	44	1950	0985
	0985	95	1242	0950
	1242	66	1983	0908
	0950	65	1983	0908
	0908	20	0928	1930
	1930	65	1978	1933
	1933	10	1979	1383
	1383	45	1536	0917
BLANK CARD	1536	65	1984	0943
I E BLANK	0943	35	0002	0901
OP AND DATA	0901	21	0934	0926
CODE CAUSES	0926	20	0933	0938
TRANSFER	0944	30	0002	0925
INSTRUCTION	0925	15	0933	0926
TO BE	0945	35	0004	0923
INSERTED	0923	10	0933	0912
AND CAUSES	0912	21	0933	0911
LAST CARD	0911	20	0934	0938
TO BE	0946	15	0934	0911
PUNCHED OUT	0947	30	0004	0919
	0919	15	0934	0949
TRANSFER	0949	20	0934	0902
INSTRUCTION	0902	69	0909	1382
TRANSFERS	1382	24	0938	0915
FROM 5 PER	0915	65	0927	1183
CARD	0937	24	0908	0982
LOADING	0906	69	0920	0937
ROUTINE	1183	15	1522	0910
INTO	0910	20	0927	1532
COMPILED	0982	69	0914	0924
PROGRAM	0924	24	1536	1950
I E 1999	1532	71	0927	0906
	0920	20	0928	1930
	0914	65	1984	0943
	0938	65	1536	0907
	0907	15	1522	1428
	1428	20	1536	0941
	0941	65	0908	0913

	0913	15	1290	0922
	0922	20	0908	1950
TYPE 6 CARD	1906	65	1953	1464
WITH WORD	1464	16	1167	1225
ONE	1225	45	1332	1156
IN DATA	1156	69	1414	1524
CAUSES ONE	1524	24	1990	8001
PER CARD	1332	69	1485	1516
NORMAL SOAP	1516	24	1990	1950
OUTPUT	1167	76	7565	0000
ANY OTHER	1414	71	1977	0906
TYPE 6 CARD	1485	65	1986	0940
RESTORES	0917	69	0921	1429
FIVE PER	1429	24	1984	1250
CARD OUTPUT	1250	69	0902	0916
	0916	24	0938	1992
	1992	69	1648	1358
	1358	24	1532	0905
	0905	65	1568	0935
	0935	24	1978	0908
	1648	69	1913	1267
	1267	24	1532	1914
	1914	71	0927	5678
	1913	71	0927	1950
	0921	00	1998	0000
	1568	00	0000	1999
	0909	65	1536	0907
	0936	00	0800	8800
	0927	88	8888	0000
CHANGED	1948	65	1911	1916
STORAGE	1916	10	1931	8002
TRANSFER	1934	15	1290	1949
ROUTINE	1949	10	8001	1912
WITHIN SOAP	1912	11	1915	1932
	1932	44	1998	1935
	1911	69	1951	8003
	1931	24	1977	1934
	1915	24	1983	1934
CHANGED	1186	15	1522	1344
CONSTANT	1187	15	1522	1006
LOCATIONS	1292	10	1522	1165
WITHIN	1344	15	1522	1187
SOAP	1105	14	1468	1224
	1455	14	1468	1410
	1088	10	1290	0998
	1939	15	1290	1647
	0953	15	1290	1221
	1056	15	1290	1127
	1243	10	1290	1322
	1364	15	1290	1371
	1947	15	1290	1075
CHG INIT RTN	1273	24	1586	0906
7 PER CARD	1984	70	1985	9999
LOADING	1985	65	1951	0055
ROUTINE FOR	0055	69	0008	0054
IT	0054	22	0008	0058
	0058	35	0004	0006
	0006	15	8001	0056
USES 2	0056	22	0009	0052
LOCATIONS	0052	65	0057	0053

1 TO 9
51 TO 58
11 1984
AND 1985

5 PER CARD
LOADING
ROUTINE FOR
IT
SUBROUTINE
PACKAGES

USES 28
LOCATIONS
1977 TO 1985
1772 1786
1788 1794
1795 18 8
1824 1843
1858 187
1881 19 2
1998 176
1823 1847
1883 1939
AND 1946
ALL ARE
TEMPORARY
STORAGE
LOCATIONS
IN PACKAGES
P1 THRU P4

```
0053  10  0008  8002
0002  10  0005  0011
0011  15  8001  0004
0004  11  0009  0003
0003  44  0007  1984
1984  10  8001  8002
0008  24  0000  0002
0057  69  1952  8003
0005  00  0001  0000
0007  10  8001  8002
1998  70  1977  3000
1977  65  1958  1786
1786  35  0004  1794
1794  69  1980  1795
1795  22  1980  1824
1824  69  1956  1980
1980  24  0000  1808
1808  30  0004  1843
1843  10  1957  1870
1870  69  1981  1858
1858  22  1981  1902
1902  69  1955  1981
1981  24  0000  1881
1881  30  0004  1760
1760  69  1982  1847
1847  22  1982  1978
1978  69  1954  1982
1982  24  0000  1946
1946  30  0004  1823
1823  69  1983  1979
1979  22  1983  1985
1985  69  1953  1983
1983  24  0000  1883
1883  30  0004  1939
1939  69  1984  1772
1772  22  1984  1788
1788  69  1952  1984
1984  24  0000  1998
```

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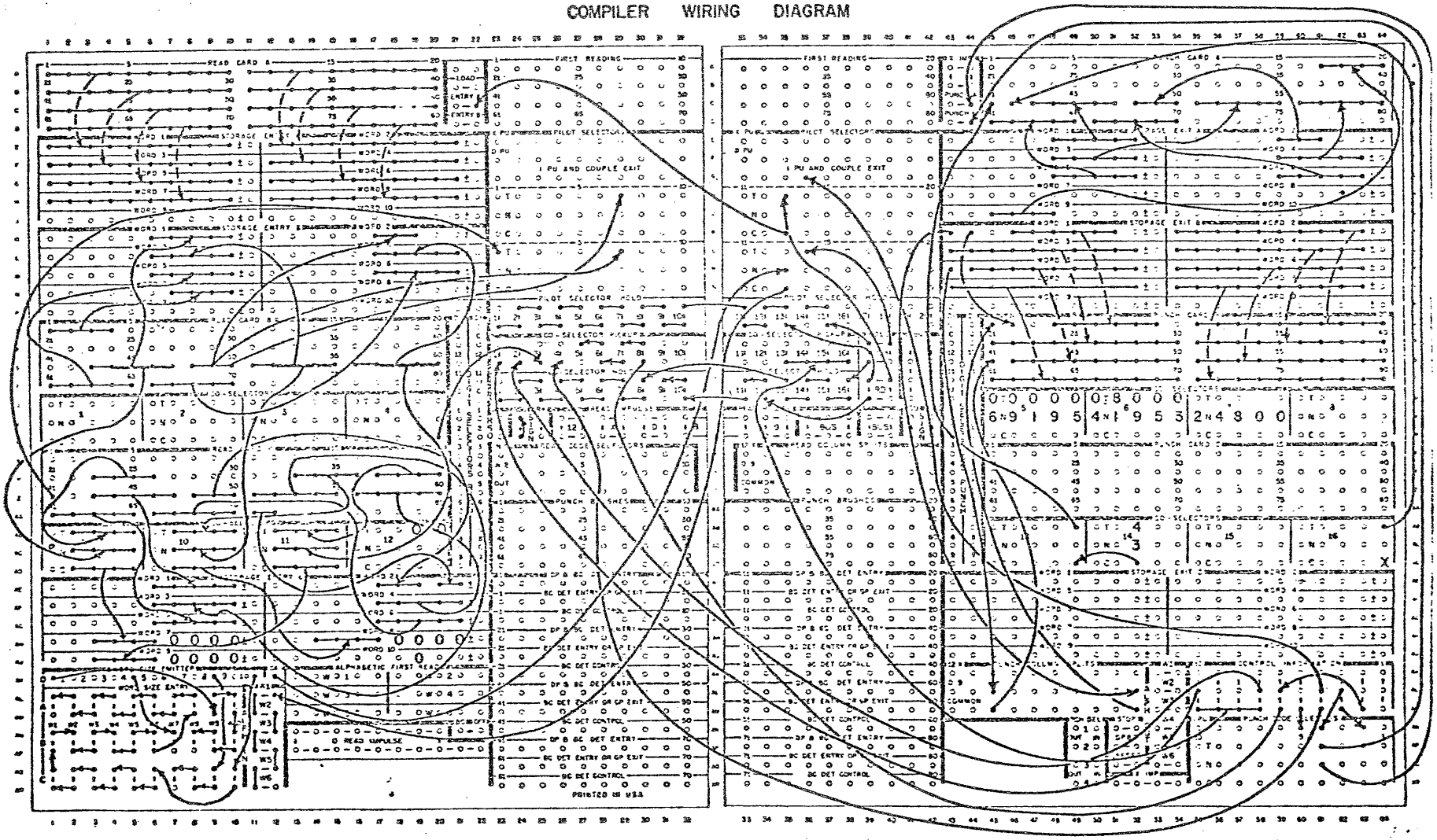
INTERNATIONAL BUSINESS MACHINES CORPORATION

Form No. 22-4707-1
Printed in U.S.A.

READ-PUNCH UNIT, 533 CONTROL PANEL
(USED WITH 650 MAGNETIC-DRUM DATA-PROCESSING MACHINE)

COMPILER WIRING DIAGRAM



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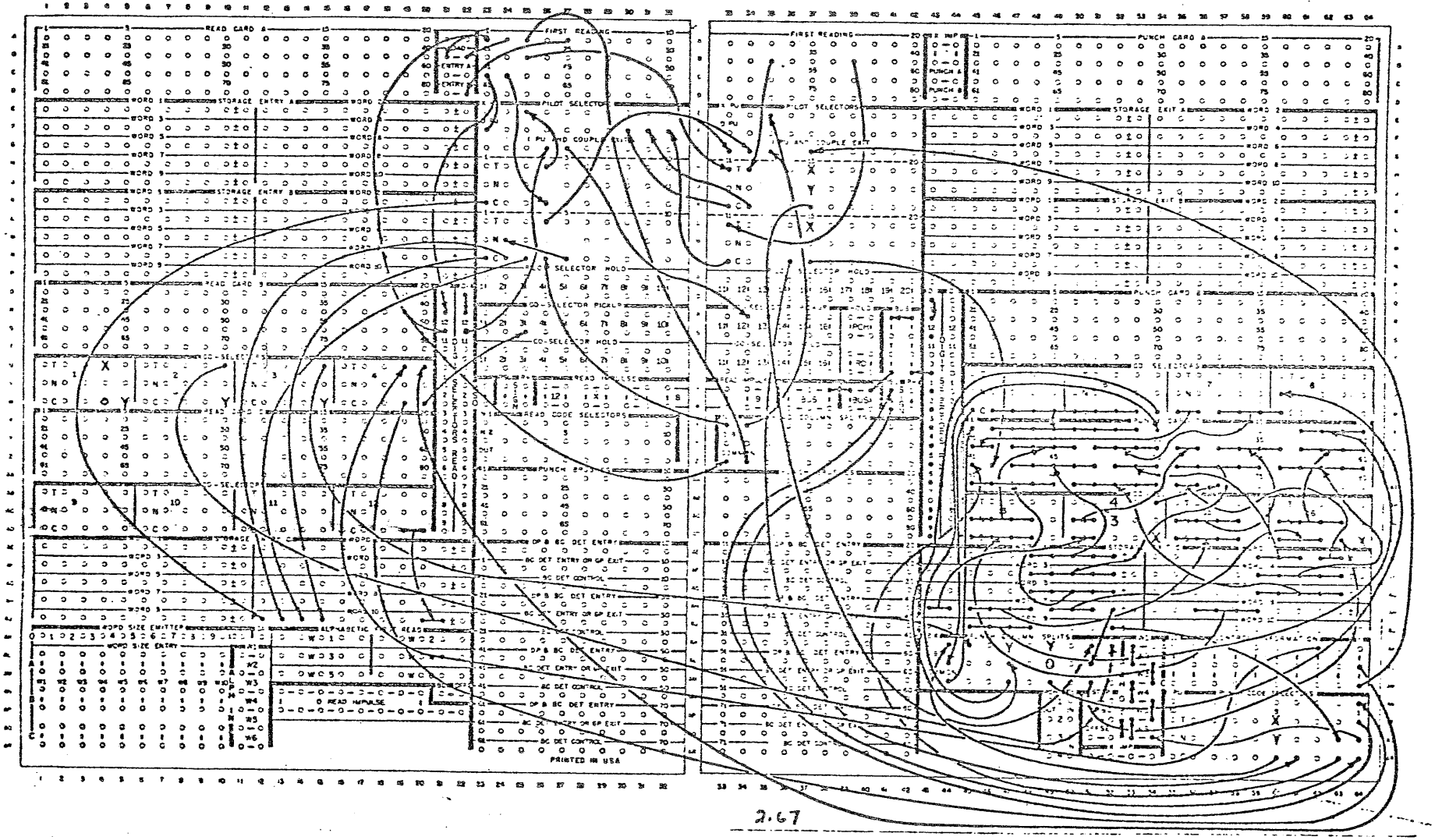
INTERNATIONAL BUSINESS MACHINES CORPORATION

READ-PUNCH UNIT, 533 CONTROL PANEL
(USED WITH 650 MAGNETIC-DRUM DATA-PROCESSING MACHINE)

Form No. 22-6207-1
Printed in U.S.A.

COMPILER WIRING DIAGRAM

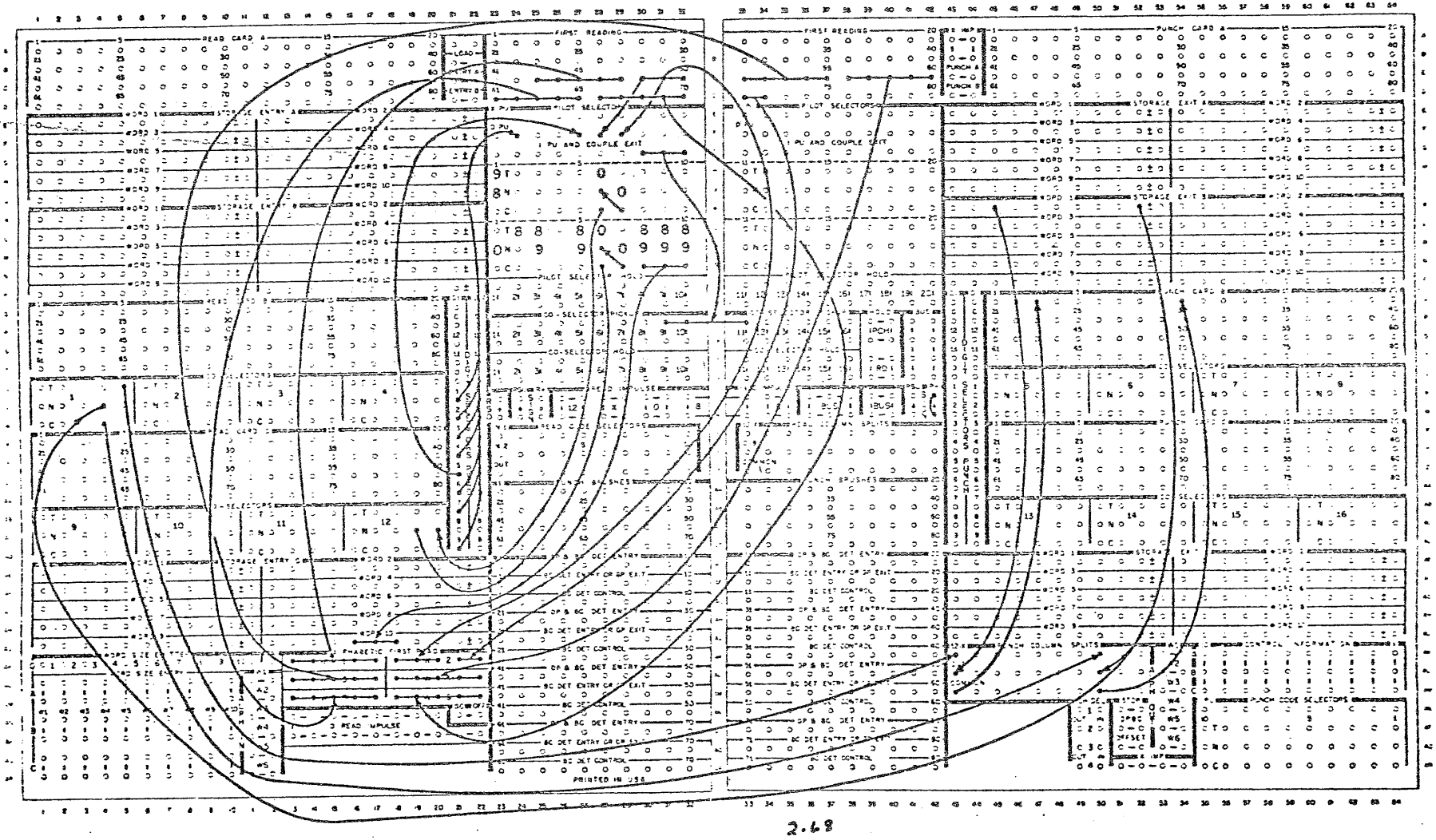


2.67

INTERNATIONAL BUSINESS MACHINES CORPORATION

READ-PUNCH UNIT, 533 CONTROL PANEL
(USED WITH 650 MAGNETIC-DRUM DATA-PROCESSING MACHINE)

COMPILER WIRING DIAGRAM



ADDENDA

Sample Problem for the IT Compiler

This program utilizes Simpson's Rule to evaluate

$$\int_a^b f(x)\,dx.$$

The sample problem is concerned with computing

$$I(p) = \int_0^{\pi} \sin (2p+1)\, x\, dx$$

for p = 0(1) 100. The value of I(P) is 2/(2p+1).

The program uses the following data:

1. Range

a	C1	0000 0000	00
b	C2	3141 5900	50

2. Tolerance:

δ	C3	5000 0000	45

3. The number of the first statement of the routine providing f(x) for a given x

	I1	0000 0000	09

The function routine computes

Y1 ← f (Y5)

and terminates with

GI2

to return control to the Simpson's Rule routine.

The integration routine computes approximations on successively finer meshes until two successive approximations differ in absolute value by less than δ. However f(x) is never computed more than once for any x. This is done by using the following recurrence scheme:

$$h_1 = (b-a)/2$$

$$J_1 = h_1 [\, f(a) + f(b) \,]$$

$$\left.\begin{aligned} I_n &= J_n + 4\, h_n \sum_{1}^{2^{n-1}} f(a + (2m-1)h_n) \\ J_{n+1} &= 1/4\, (I_n + J_n) \\ h_{n+1} &= h_n/2 \end{aligned}\right\} \quad n = 1,2,\ldots,$$

Iteration ceases for the least n. for which

$|I_n - I_{n+1}| \leq \delta$. The value of the integral is I_{n4}.

The routine punches, for each p,

p	I(p)	δ	h_n

represented as

I3	Y4	C3	Y2 .

IT Program

```
            100 00000   00                             20

SIMPS ONS  RULE
C1    C2                                   RANGE AB
C3                                         ERROR
I1             R EAD                   F   LINK
4K  I 3K   OK   1K 10   O K            F
G5                                     F   GET END        2
Y1 Z  Q22 E K Y 5 X     1S2XI3Q        F   FUNCTION       9
G I2                                   F   RETURN
TI3 T  Y4   T C 3  T    Y2             F                  4
H                                      F   STOP
Y6 Z  OJ                               F   CLEAREND       5
Y2 Z  LC2 MC1RD 2J                     F   SET H
8K  I 4K   1K1K 2K                     F   END ITER
Y5  Z   C I4                           F   SET P          3
I2 Z  8                                F   SET LINK
G I1                                   F   TO FNCTN
Y6 ZY 6 S  Y1 X  Y      2              F   COMP END       8
Y4    ZY6                              F   INIT INT
Y3 Z  OJ                               F                  1
Y7 Z  C2  M Y2D 2J                     F
6  K  Y5K  C1SY 2K 2J  XY2K Y7K        F   INNERSUM
I2 Z  6                                F   SET LINK      11
GI1                                    F   TO FNCTN       7
Y3 Z  Y3  S Y1                         F   NEXT DEL       6
Y7 Z  Y6  S Y2  X 4J   X Y3            F   NEW INT
G10   IF  C3 W  ALY7   M Y4 R          F   CHCK END
Y4 Z  Y7                               F
Y6 Z  J25  X Y4  S Y6                  F   NEXT G
```

```
Y2 Z   Y2D 2J                    F   NEXT H
G 1                              F   TO SET P
Y4 ZY 4 D   3J                   F   INTEGRAL    10
G4                              FF   TO MASTR
```

PIT Program

```
S0000   00    0000   LAAAA
LAAAA  LDD   LABAA   EOOAQ
S0000   00    0000   LABAA
LABAA  RAL   A0007
       STL   I0003   LACAA
S0002   00    0000   LACAA
LACAA  NOP   S       S0005
S0009   00    0000   LADAA
LADAA  RAU   I0003
       MPY   A0008
       ALO   A0009   LADAE
LADAD  RAL   Y0005   LADAF
LADAE  LDD   LADAD   EOOAF
LADAF  LDD           EOOAJ
       LDD           EOOAW
       STL   Y0001   LAEAA
S0000   00    0000   LAEAA
LAEAA  RAL   I0002
       ALO   A        8002
S0004   00    0000   LAFAA
LAFAA  RAL   A0010
       STL   P
       RAL   A0011
       STL   P0001
       RAL   A0012
       STL   P0002
       RAL   A0013
       STL   P0003
       RAL   A0014
       LDD   LAGAA   EOOAR
S0000   00    0000   LAGAA
LAGAA  RAL   A0009
       ALO   I0003
       STL   I0003   LAHAA
S0000   00    0000   LAHAA
LAHAA  RSL   I0003
       ALO   A0015
       BMI   LAIAA   S0002
S0000   00    0000   LAIAA
LAIAA  HLT   LAIAA   LAJAA
S0005   00    0000   LAJAA
LAJAA  RAL   A0007
       STL   Y0006   LAKAA
S0000   00    0000   LAKAA
LAKAA  RAL   A0016
       STL   W
       RSL   C0001   LAKAE
LAKAD  RAL   C0002   LAKAF
LAKAE  STL   ACC     LAKAD
LAKAF  LDD           EOOAI
       RAL   W
       LDD           EOOAO
       STL   Y0002   LALAA
S0000   00    0000   LALAA
LALAA  RAL   A0009
       STL   I0004   LAMAA
S0003   00    0000   LAMAA
```

```
SIMPSONS
I3    Z
0
G5
Y1  Z  Q22
E  K  Y5  X
1S2XI3Q   F
G  I2
T I3  T  Y4
   T  C3   T
Y2        F
G       0002
IF     100
W      I3
H
Y6  Z  0J
Y2  Z  LC2
MC1RD2J
                F
I4     Z
1
```

3.05

```
LAMAA  RAL  I0004              Y5   Z   C
       SLT  I0003              I4
       ALO         8002                  F
       RAL  C
       STL  Y0005  LANAA
S0000  00   0000   LANAA
LANAA  RAL  A0017              I2  Z  8
       STL  I0002  LAOAA
S0000  00   0000   LAOAA
LAOAA  RAL  I0001              G  I1
       ALO  A      8002
S0008  00   0000   LAPAA
LAPAA  RAL  Y0002  LAPAC       Y6  ZY6  S
LAPAB  RAL  Y0001  LAPAD        Y1  X  Y
LAPAC  STL  ACC    LAPAB       2         F
LAPAD  LDD         EOOAJ
       RAL  Y0006
       LDD         EOOAI
       STL  Y0006  LAQAA
S0000  00   0000   LAQAA
LAQAA  RAL  A0009              I4    Z
       ALO  I0004              I4    S
       STL  I0004  LARAA       1
S0000  00   0000   LARAA
LARAA  RSL  I0004              G       0003
       ALO  A0008              IF    2
       BMI  LASAA  S0003       W     I4
S0000  00   0000   LASAA
LASAA  RAL  Y0006              Y4    ZY6
       STL  Y0004  LATAA
S0001  00   0000   LATAA
LATAA  RAL  A0007              Y3  Z  OJ
       STL  Y0003  LAUAA
S0000  00   0000   LAUAA
LAUAA  RAL  A0016  LAUAC       Y7  Z  C2
LAUAB  RSL  Y0002  LAUAD       M  Y2D2J
LAUAC  STL  ACC    LAUAB                 F
LAUAD  LDD         EOOAG
       RAL  C0002
       LDD         EOOAI
       STL  Y0007  LAVAA
S0000  00   0000   LAVAA
LAVAA  RAL  Y0002  LAVAC       Y5     Z
LAVAB  RAL  C0001  LAVAD       C1SY2
LAVAC  STL  ACC    LAVAB
LAVAD  LDD         EOOAI
       STL  Y0005  LAWAA
S0011  00   0000   LAWAA
LAWAA  RAL  A0018              I2  Z  6
       STL  I0002  LAXAA
S0007  00   0000   LAXAA
LAXAA  RAL  I0001              GI1
       ALO  A      8002
S0006  00   0000   LAYAA
LAYAA  RAL  Y0001  LAYAC       Y3  Z  Y3
LAYAB  RAL  Y0003  LAYAD       S  Y1
LAYAC  STL  ACC    LAYAB                 F
LAYAD  LDD         EOOAI
       STL  Y0003  LAZAA
```

```
S0000    00    0000   LAZAA
LAZAA   RAL   Y0002   LAZAC   Y5  .  Z
LAZAB   RAL   A0016   LAZAD   Y5     S
LAZAC   STL   ACC     LAZAB   2JXY2
LAZAD   LDD           EOOAJ
        RAL   Y0005
        LDD           EOOAI
        STL   Y0005   LBAAA
S0000    00    0000   LBAAA
LBAAA   RSL   Y0005   LBAAC   G        0011
LBAAB   RAL   Y0007   LBAAD   IF      Y7
LBAAC   STL   ACC     LBAAB   W       Y5
LBAAD   LDD           EOOAI
        BMI   LBBAA   S0011
S0000    00    0000   LBBAA
LBBAA   RAL   Y0003   LBBAC   Y7  Z  Y6
LBBAB   RAL   A0019   LBBAD   S  Y2  X  4J
LBBAC   STL   ACC     LBBAB   X  Y3          F
LBBAD   LDD           EOOAJ
        RAL   Y0002
        LDD           EOOAJ
        RAL   Y0006
        LDD           EOOAI
        STL   Y0007   LBCAA
S0000    00    0000   LBCAA
LBCAA   RSL   Y0004   LBCAC   G10    IF
LBCAB   RAL   Y0007   LBCAD   C3  W  ALY7
LBCAC   STL   ACC     LBCAB   M  Y4  R      F
LBCAD   LDD           EOOAI
        RSB    8002   LBCAG
LBCAF   RAL   C0003   LBCAH
LBCAG   STL   ACC     LBCAF
LBCAH   LDD           EOOAI
        BMI   LBDAA   S0010
S0000    00    0000   LBDAA
LBDAA   RAL   Y0007           Y4  Z  Y7
        STL   Y0004   LBEAA
S0000    00    0000   LBEAA
LBEAA   RAL   Y0006   LBEAC   Y6  Z  J25
LBEAB   RAL   Y0004   LBEAD    X  Y4  S  Y6
LBEAC   STL   ACC     LBEAB                 F
LBEAD   LDD           EOOAI
        RAL   A0020
        LDD           EOOAJ
        STL   Y0006   LBFAA
S0000    00    0000   LBFAA
LBFAA   RAL   A0016   LBFAC   Y2  Z  Y20
LBFAB   RAL   Y0002   LBFAD   2J
LBFAC   STL   ACC     LBFAB                 F
LBEAD   LDD           EOOAG
        STL   Y0002   LBGAA
S0000    00    0000   LBGAA
LBGAA   NOP   8       S0001   G  1
S0010    00    0000   LBHAA
LBHAA   RAL   A0021   LBHAC   Y4  ZY4  D
LBHAB   RAL   Y0004   LBHAD    3J
LBHAC   STL   ACC     LBHAB                 F
LBHAD   LDD           EOOAG
        STL   Y0004   LBIAA
```

```
S0000   00   0000  LBIAA                176
LBIAA   NOP  S     S0004   G4           177
A       00   0000  0047                 178
A0021   30   0000  0050                 179
A0020   25   0000  0049                 180
A0019   40   0000  0050                 181
A0018   00   0000  0006                 182
A0017   00   0000  0008                 183
A0016   20   0000  0050                 184
A0015   00   0000  0100                 185
A0014   00   0004  0004                 186
A0013   00   0000  1003                 187
A0012   00   0000  2004                 188
A0011   00   0000  3003                 189
A0010   00   0000  2002                 190
A0009   00   0000  0001                 191
A0008   00   0000  0002                 192
A0007   00   0000                       193
A0006   00   0000  3000                 194
A0005   00   0000  2000                 195
A0004   00   0000  1000                 196
A0003   00   0000  0041                 197
A0002   00   0000  0020                 198
A0001   00   0000  0001                 199
             I     U0001                200  4
             I0002  0019                200  3
             Y     U0020                201  4
             Y0021  0040                201  3
             C     U0041                202  4
             C0042  0046                202  3
             S     U0047                203  4
             S0048  0067                203  3
             A     U0068                204  4
             A0069  0089                204  3
```

3.08

SPIT Simpson's Rule

1809 6000681987 0100 2401030106 0106 2001110114 0114 3500080133 0133 2101380091
0091 6880020099 0099 1501020107 0107 4601100161 0161 1601640119 0119 4601220183
0122 3000040183 0183 1501360141 0141 2000950098 0098 6001380093 0093 1900950095
0095 100950149 0149 2001530156 0156 6080030113 0113 1901160121 0121 6580020182
0129 4501320233 0132 6601110115 0115 2001110233 0233 6801530157 0157 1880010165
0165 4401690120 0169 1001720127 0127 4401310120 0120 6780020179 0179 2001380191
0191 6080020199 0199 1980010207 0207 2101530206 0206 6001090163 0163 1901530257
0257 6080030215 0215 1001180173 0173 1901530307 0307 6080030265 0265 1001680223
0223 1901530357 0357 6080030315 0315 1002180273 0273 1901530407 0407 3000010213
0213 6080030171 0171 1001240229 0229 1901380143 0143 3600000365 0365 4702680170
0170 2001380241 0241 6580030249 0249 3000020105 0105 2001530256 0256 6101380193
0193 3000020299 0299 4601520203 0152 1180030159 0159 1501160221 0221 1001530457
0457 3500020263 0203 1180030211 0211 1601160221 0263 2101380291 0291 6501110415
0415 4603180219 0318 6601380103 0219 6501380103 0123 6501110103 0131 6001340263
0268 6580020177 0177 1680010103 0102 5700000000 0164 9000000000 0136 3000090149
0096 3183098862 0116 5000000000 0172 2 0124 1570796318 0218 6459637111*
0168 796896793 0118 467376568 0109 1514842 0134 1000000050 0110 6501110465
0465 6901033221 0047 1999 1999 6902021974 0047 202 0202 6500750279
0279 2000040507 0049 507 0507 470052 0056 155 0155 6000040209
0209 1900760181 0181 1500770231 0150 6500250329 0231 6901501947 0329 6901821832
0182 6901350100 0135 2000210174 0047 174 0174 6500030557 0557 1500688002
0051 205 0205 6500780283 0283 2019500253 0253 6500790333 0333 2019510104
0104 6500800185 0185 2019520255 0255 6500810235 0235 2019530306 0306 6500820137
0137 6900901801 0047 90 0090 6500770281 0281 1500040259 0259 2000040607
0047 607 0607 6600040309 0309 1500830187 0187 4601400049 0047 140
0140 101400094 0052 94 0094 6500750379 0379 2000260429 0047 429
0429 6500840139 0139 2019770130 0130 6600420097 0200 6500430147 0097 2000000200
0147 6902501833 0250 6519770331 0331 6901841882 0184 2000220125 0047 125
0125 6500770381 0381 2000050108 0050 108 0108 6500050359 0359 3500040269

3.09

30	0269	1502228002	0222	6500410145	0145	2000250128	0047	128	0128	5500250139
31	0189	2000030356	0047	356	0356	6500020657	0657	1500688002	0055	305
32	0305	6500220227	0300	6500210175	0227	2000000300	0175	6901781832	0178	6500260431
33	0431	6902341833	0234	2000260479	0047	479	0479	6500770481	0481	1500050409
34	0409	2000050158	0047	158	0158	6600050459	0459	1500760531	0531	4602840050
35	0047	284	0284	6500260581	0581	2000240277	0048	277	0277	6500750329
36	0529	2000230126	0047	126	0126	6500840239	0350	6600220327	0239	2000000350
37	0327	6901801830	0180	6500430197	0197	6904001833	0400	2000270230	0047	230
38	0230	6500220377	0450	6500420247	0377	2000000450	0247	6905001833	0500	2000250228
39	0058	228	0228	6500860341	0341	2000030406	0054	406	0406	6500020707
40	0707	1500688002	0053	355	0355	6500210225	0550	6500230427	0225	2000000550
41	0427	6902801833	0280	2000230176	0047	176	0176	6500220477	0600	6500840289
42	0477	2000000600	0289	6900921832	0092	6500250579	0579	6902321833	0232	2000250278
43	0047	278	0278	6600250629	0650	6500270631	0629	2000000650	0631	6903341833
44	0334	4602370058	0047	237	0237	6500230527	0700	6500870391	0527	2000000700
45	0391	6901441832	0144	6500220577	0577	6903301832	0330	6500260681	0681	6903841833
46	0384	2000270380	0047	380	0380	6600240679	0750	6500270731	0679	2000000750
47	0731	6904341833	0434	6880020243	0800	6500440349	0243	2000000800	0349	6902521833
48	0252	4604050057	0047	405	0405	6500270781	0781	2000240627	0047	627
49	0627	6500260831	0850	6500240729	0831	2000000850	0729	6902821833	0282	6500880293
50	0293	6901461832	0146	2000260779	0047	779	0779	6500840339	0900	6500220677
51	0339	2000000900	0677	6904301830	0430	2000220275	0047	275	0275	470048
52	0057	455	0455	6500890343	0950	6500240829	0343	2000000950	0829	6903321830
53	0332	2000240727	0047	727	0727	470051	0068	47	0089	3000000050
54	0088	2500000049	0087	4000000050	0086	6	0085	8	0084	2000000050
55	0083	100	0082	40004	0081	1003	0080	2004	0079	3003
56	0078	2002	0077	1	0076	2	0075		0074	3000
57	0073	2000	0072	1000	0071	41	0070	20	0069	1
58	1998	1999	0000	1000	0000	41	0000	20	0000	1

Results of the SPIT Program

1000300048		200040004 2000016550	300030004 5000000045	200020004 [illegible]
1000300048	1	200040004 6666684349	300030004 5000000045	200020004 [illegible]
1000300048	2	200040004 4000081749	300030004 5000000045	200020004 [illegible]
1000300048	3	200040004 2857158149	300030004 5000000045	200020004 [illegible]
1000300048	4	200040004 2222251949	300030004 5000000045	200020004 [illegible]
1000300048	5	200040004 1818237249	300030004 5000000045	200020004 [illegible]
1000300048	6	200040004 1538549749	300030004 5000000045	200020004 [illegible]
1000300048	7	200040004 1333472649	300030004 5000000045	200020004 [illegible]
1000300048	8	200040004 1176483449	300030004 5000000045	200020004 [illegible]
1000300048	9	200040004 1052648449	300030004 5000000045	200020004 [illegible]
1000300048	10	200040004 9524043348	300030004 5000000045	200020004 [illegible]
1000300048	100	200040004 9958681047	300030004 5000000045	200020004 [illegible]

FLOW CHARTS FOR IT

Flow charts for the IT Compiler are not included in this edition of the write-up as they are not yet available for reproduction. It is expected that the flow charts will be reproduced in the near future and will be available upon request from Mr. F. E. Ross, Applied Programming Publications, IBM Corporation, 590 Madison Avenue, New York 22, N. Y.

Notice of the availability of the IT flow charts will be given in an IBM 650 Bulletin as soon as possible subsequent to reproduction.

ERRATA

2.1.001 IT Compiler

1. SOAP listing of the Compiler

Card No.		Should read:						
793		LDD	ML1A	TKNZ1	0940	69	1802	1094
799	MY1	LDD	ML1A	TKNZ2	1178	69	1802	1194
A793	ML1A	SLO	8002		1802	16	8002	1852
B793		STL	ABVAL	ML1	1852	20	0366	1291

The above changes are corrections to the compiler and do not represent misprints in the listing. The compiler as distributed would construct a incorrect translation of Relational statements where the right hand members were of the form:

$$\ldots \begin{matrix} U \\ V \\ W \end{matrix} \quad A\ V_1 \cap V_2$$

where V_1 and V_2 are operands and $\cap$ an operation.

The above 4 changes should be made in the 7 per card deck which is in standard 7 words per card form.

4.00

2. Errata in the Description

1) Page 1.41 : 2nd line after subroutine error listing should read

" than 10^{-50} the computer....."

2) Page 1.44 ; Program and remarks under b), (i) should read:

1: I2 ← I1

2: 6, I5, 0, 1, I1-1,

3: 6, I3, 0, 1, I1-1,

4: CN (I5, I3) ← 0

5: 6, I4, 0, 1, I1-1,

6: CN (I5,I3) ← CN (I5,I3) + YN (I2, I4) x YN (I4,I3)

7: H

The matrix B is represented as the matrix CN, whose (row) dimension must be specified. Statement 1 sets the correct dimension.

3) Page 1.45 : Program (II)

4th statement : I11 should read "III"

5th " : I12 " " "II2"

8th " : I12 " " "II2"

4) Page 1.46 ; Program (II)

1st statement should read:

" 0 : C1 ← YI2"

ERRATA III

650 Library Program-File No. 2.1.001

"Internal Translator (IT), A Compiler for the 650." By A.J.Perlis J.W.Smith, and H.R. Van Zoeren.

In the SOAP listing of the Compiler,

Card No.	Should read:						
804		LDD	1971	GENN	1139	69	1971	1681

The above changes are corrections to the compiler and do not represent misprints in the listing. The compiler as distributed would construct an incorrect translation of Relational statements where the right hand members were of the form:

$$\begin{matrix} U \\ \ldots V \\ W \end{matrix} \qquad V_1 \ \Omega \ V_2$$

where V_1 is a numerical constant.

The above change should be made in the seven per card deck which is in standard seven words per card form.

4.03

PROGRAM FOR FORTRAN

STATEMENTS TO IT STATEMENTS

```
1  1                    PROGRAM FOR FORTRAN
2  1                 STATEMENTS TO IT STATEMENTS
3                  BLR    1000    1010
4                  BLR    1150    1171      FUNCTIONS
5                  BLR    1200    1210      NONARITH T
6                  BLR    1450    1454      EQU VAR TA
7                  BLR    1500    1519      JIBASE TBL
8                  BLR    1600    1699      VARBL TABL
9                  BLR    1821    1830      STARTNARIT
10                 BLR    1900    1930      PACK BAND
11                 BLR    1948    1949
12                 REG   R1951    1960      READ BAND
13                 REG   P1977    1986      PUNCH BAND
14                 BLR    1990    1998      COMP GO TA
15                 SYN   START    1999
16                 SYN   RESET    0228
17                 SYN   STORG    1961
18                 SYN   SUBSC    1962
19           START RCD    1952    RESET     READ FIRST      1999  70  1952  0228
20           RESET RAL    1960                 CARD         0228  65  1960  0015
21                 SLT    0001              TEST FOR        0015  35  0001  0021
22                 NZU   START                               0021  44  1999  0026
23                 STU   IAD                 SUB A           0026  21  0030  0033
24                 STD   SW4                    SUB  A       0033  24  0036  0039
25                 STD   SW5                    SUB  A       0039  24  0042  0045
26                 STD   CTVAR                               0045  24  0048  0001
27                 LDD   EGHTS                               0001  69  0004  0007
28                 STD   P0010                               0007  24  1986  0089
29                 LDD   CNPKA                               0089  69  0092  0095
30                 STD   SWPKA   PACK                        0095  24  0098  0051
31           CNPKA STL   TESTA   SUBA1     SWITCH PKA      0092  20  0047  0000
32           READ  RAL   IAC                 IS WD END       0050  65  0003  0057
33                 NZE   AREAD              FRST WD IN      0057  45  0010  0011
34                 RAL   TEMAE              PACK BAND       0011  65  0014  0019
35                 SLO   ENDCN                IF NO RD      0019  16  0022  0027
36                 NZE   AREAD   1830       NEXT CARD       0027  45  0010  1830
37           ENDCN   00    6575   6400                      0022  00  6575  6400
38           AREAD RCD    1951                 IF YES        0010  70  1951  0101
39                 RAL   1960              PUNCH HEDR      0101  65  1960  0065
40                 SLT    0001             CARD AND        0065  35  0001  0071
41                 NZU   READ              REINITIA        0071  44  0050  0076
42                 SLT    0001             LIZE            0076  35  0001  0083
43                 NZU   PACK                              0083  44  0051  0038
44                 LDD   CNPKA             PACK SW A1      0038  69  0092  0145
45                 STD   SWPKA   SWT                       0145  24  0098  0151
46           SWT   LDD   IN2     TR CA     SUBA            0151  69  0054  0107
47           TR CA STD   SW 59                             0107  24  0060  0013
48                 RAL   TEMAE                             0013  65  0014  0069
49                 STU   TESTA                             0069  21  0047  0100
50                 NZE   NZT5    IN2                       0100  45  0104  0054
51           NZT5  SLT    0002                            0104  35  0002  0061
52                 NZU   NZT 4   NZT5                      0061  44  0115  0104
53           PACK  RAL   LTR F                            0051  65  0154  0009
54                 LDD                   TR UC             0009  69  0012  0165
55                 STD   TEMPH                             0012  24  0215  0018
56                 STL   P0006                             0018  20  1982  0035
57                 AUP   PACKA                             0035  10  0088  0043
58                 LDD   TJASW   SUB X                     0043  69  0046  0049
59           SUBA1 LDD   CNPKB               PACK SW A2    0000  69  0053  0006
60                 STD   SWPKA                             0006  24  0098  0201
61                 LDD   PACKA                             0201  69  0088  0041
62                 STD   SW 59                             0041  24  0060  0063
63                 LDD   SWH                 SWITCH 3      0063  69  0016  0119
64                 STD   SW 60                             0119  24  0072  0025
65                 RAU    1960             STATEMENT       0025  60  1960  0265
66                 STD   P0008                             0265  24  1984  0037
67                 STL   IAC                               0037  20  0003  0056
68                 STU   P0009   TRA1B                     0056  21  1985  0138
69           TRA1B RAL   TESTA   TR AA                     0138  65  0047  0251
70           CNPKB STL   TESTA   SUBA2                     0053  20  0047  0150
71           SUBA2 ALO   TEMAE   TR AA                     0150  15  0014  0251
72           TR AA SLT    0002                            0251  35  0002  0157
73                 NZU   NZT 4               TO TEMP       0157  44  0115  0062
74                 STL   TEMAE   SUB A     TEST 5 CHA      0062  20  0014  0017
75           NZT 4 SRT    0002              FIVE CHAR       0115  30  0002  0121
76                 STU   TEMAE                             0121  21  0014  0067
77                 AUP   IAC                 INDEX         0067  10  0003  0207
78                 SUP   CNBK8                             0207  11  0110  0315
79                 NZU                 STP R               0315  44  0169  0020
80                 AUP   CNBI8                             0169  10  0122  0077
81                 STU   IAC                 STORE         0077  21  0003  0106
82                 AUP   CN F1    8003      WORD          0106  10  0059  8003
83           CN F1 STL    1899    SUB A                     0059  20  1899  0017
84           SUB A RAL   TESTA               LT PARNT      0017  65  0047  0301
85                 SLO   PARNL                             0301  16  0204  0109
86                 NZE   NZT7                              0109  45  0112  0113
87                 RAL   ONE     TR  L       ADD TO COU    0113  65  0066  0171
88           TR  L ALO   IAD                               0171  15  0030  0085
89                 STL   IAD     TR  M                     0085  20  0030  0133
90           NZT7  ALO   PLUS                              0112  15  0365  0219
91                 NZE   SW 60                             0219  45  0072  0023
92                 RSL   ONE     TR  L       SUB TO COU    0023  66  0066  0171
93           TR  M NZE   NZT9A               SET SW 3      0133  45  0086  0087
```

```
         LDD   SWH     TR  N     ON          0087  69  0016  0269
NZT9A    LDD   SW 59   TR  N     OFF         0086  69  0060  0269
TR  N    STD   SW 60   SW 59                 0269  24  0072  0060
TR  O    NZE   NZT10            SW B ON      0200  45  0254  0005
         LDD   ONE              EQUAL OUT    0005  69  0066  0319
         STD   SW4     SW 59                 0319  24  0036  0060
NZT10    ALO   CN A5                         0254  15  0257  0111
         NZE   SW 59                         0111  45  0060  0415
         LDD   ONE              COMMA OUT    0415  69  0066  0369
         STD   SW5     SW 59                 0369  24  0042  0060
SWH      SLO   MULT    TR  O    SUBA         0016  16  0419  0200
IN2      RAL   IAD     TR ML    PARN COUNT   0054  65  0030  0135
TR ML    STU   IAD              ZERO IAD     0135  21  0030  0183
         NZE   STOPA              TEST       0183  45  0136  0137
         RAL   SW4              TEST TYPE    0137  65  0036  0091
         STU   SW4              RESET EQUA   0091  21  0036  0139
         NZE           IN3                   0139  45  0142  0093
         RAL   SW5                           0142  65  0042  0097
         NZE   IN3     IN4      OUT          0097  45  0093  0351
IN3      RAL    1900                         0093  65  1900  0055
         STU   SW5                           0055  21  0042  0195
         SRT    0006              LOOK UP    0195  30  0006  0159
         SLT    0006              FOR        0159  35  0006  0073
         STL   TEMAA                         0073  20  0127  0080
         RAL   CN J1              NON        0080  65  0233  0187
         LDD   TEMAA                         0187  69  0127  0130
         TLU    1200    8002      STATEMEN   0130  84  1200  8002
TR  P    SLO   TEMAA                         0250  16  0127  0031
         SLT    0004              LOOK UP    0031  35  0004  0141
         NZU   STOPB            NZ IS ERRO   0141  44  0245  0096
         SRT    0004    8002    ZT IS OK     0096  30  0004  8002
CN J1    RAL    0000   TR  P    SUBA         0233  65  0000  0250
SCAN     STL   TEMAE                         0300  20  0014  0117
         STD    1992                         0117  24  1992  0295
         LDD   NNAL1                         0295  69  0148  0401
         STD   NN L1                         0401  24  0304  0307
         LDD   SWBA1                         0307  69  0160  0163
         STD   SW BA                         0163  24  0116  0469
         LDD   TJ108                         0469  69  0172  0075
         STD   TJ 10                         0075  24  0028  0081
         LDD   NZU2A                         0081  69  0034  0237
         STD   NZU2                          0237  24  0040  0143
         LDD   SW OA   TR MT                 0143  69  0146  0099
TR MT    STD   SW 56                         0099  24  0002  0105
         RAU   IAC                           0105  60  0003  0357
         STL   F3                            0357  20  0161  0064
         STD   TFMAC                         0064  24  0167  0070
         LDD   SW BH   TR TN                 0070  69  0123  0126
SW BH    NZU   TR RN   ZT H4                 0123  44  0177  0078
TR RN    ALO   F3                            0177  15  0161  0465
         ALO   ONE                           0465  15  0066  0221
         STL   F3                            0221  20  0161  0114
         RAU    8003   SW 56                 0114  60  8003  0002
SW OA    SUP   DECPT                         0146  11  0149  0103
         NZU           ZT G8                 0103  44  0407  0008
         SUP   TWO 1                         0407  11  0210  0515
         NZU           ZT G9                 0515  44  0519  0120
         SUP   NINE                          0519  11  0222  0227
         NZU           ZT H1                 0227  44  0131  0032
         SUP   ONE 1                         0131  11  0084  0189
         NZU           ZT H2                 0189  44  0193  0044
         SUP   ONE 1                         0193  11  0084  0239
         NZU           ZT N8                 0239  44  0243  0094
         SUP   EIGHT                         0243  11  0196  0451
         NZU           ZT H3                 0451  44  0155  0156
         AUP   PARNL   TR HV                 0155  10  0204  0209
TR HV    STU   TEMAF   TR HW                 0209  21  0164  0217
TR HW    RAL   TEMAC                         0217  65  0167  0271
         SLT    0002                         0271  35  0002  0277
         ALO   TEMAF                         0277  15  0164  0569
         STL   TEMAC   NZTB2                 0569  20  0167  0170
ZT H4    RAL   TEMPF                         0078  65  0181  0185
         SLO   ONE     TR RJ                 0185  16  0066  0321
TR RJ    STL   TEMPF                         0321  20  0181  0134
         STU   TEMAC                         0134  21  0167  0220
         NZE   TX DG                         0220  45  0024  0125
         LDD    1991                         0125  69  1991  0144
         BD1   FLO2    ARITH                 0144  91  0147  0199
ZT H2    RAU   MINUS   TR PN                 0044  60  0197  0501
TR PN    LDD   F3                            0501  69  0161  0214
         STD   OUTP                          0214  24  0267  0270
         LDD   SW PA   TR RP                 0270  69  0173  0176
TR RP    STD   SW 59                         0176  24  0060  0213
         ALO   TEMAA                         0213  15  0127  0231
         SRT    0002                         0231  30  0002  0287
         STL   TEMAA   TR RH                 0287  20  0127  0180
TR RH    RAL   NXTWD                         0180  65  0283  0337
         SLO   ONE                           0337  16  0066  0371
         LDD   NN M1                         0371  69  0074  0327
         SDA   NXTWD   TR PR                 0327  22  0283  0186
TR PR    RAU   TEMAC                         0186  60  0167  0421
         NZU           TR NK                 0421  44  0175  0226
         SRT    0002                         0175  30  0002  0281
```

```
187                 STU   TEMAC
188                 RAL    8002
189                 SLT    0002     SW 59
190       TR NK     STU   TEMAA     NXTWD
191       NN M1     RAL    0000
192                 STL   TEMAC     TR RM
193       ZT G9     RAU   PLUS      TR PN
194       SW PA     SUP   PARNR
195                 NZU   NZTI4     ZT I4
196       ZT I4     AUP    8001
197                 LDD   OUT1S     TR PS
198       TR PS     STD   F8
199                 ALO   TEMAA
200                 SRT    0002
201                 STL   TEMAA
202                 RAL   F3
203                 SLO   ONE
204                 STL   F3        F8
205       OUT1S     RAL   ONE       TR PU
206       TR PU     ALO   SW 61
207                 STL   SW 61     TR PR
208       NZTI4     SUP   ONE 1
209                 NZU   NZTI5
210                 RAU   PLUS      TR PV
211       TR PV     LDD             TR PS
212                 RSL   SW 61     TR UX
213       TR UX     BMI   TR PR     ZT L3
214       NZTI5     SUP   NINE
215                 NZU   NZTI7
216                 RAU   MULT
217                 LDD             TR PS
218                 RSL   SW 61
219                 NZE   TR UX     NZTI8
220       NZTI7     SUP   ONE 1
221                 NZU   NZTQ5
222                 RAU   MINUS     TR PV
223       NZTQ5     SUP   ONE 1
224                 NZU   NZTJ5
225                 RAU   DIVID     TR PV
226       NZTJ5     SUP   SEVEN
227                 NZU   NZTJ6
228                 RAU   COMMA     TR PV
229       NZTJ6     SUP   ONE 1
230                 NZU   NZTJ7     ZT J7
231       ZT J7     RAU   PARNL
232                 LDD             TR PS
233                 RSL   ONE       TR PU
234       NZTJ7     SUP   NINE
235                 NZU   NZTJ8     ZT J8
236       NZTJ8     AUP   EQUAL
237                 LDD   TR PR     TR PS
238       ZT J8     RAU   EQUAL
239                 LDD   ZT L3     TR PS
240       NZTI8     LDD   SW PC
241                 STD   SW 59     TR PR
242       SW PC     SUP   PARNR
243                 NZU             ZT I4
244                 SUP   ONE 1
245                 NZU   NZTK3
246                 RAU   PLUS      TR PY
247       TR PY     LDD             TR PS
248                 RSU   SW 61
249                 BMI   TR PR     ZT K4
250       NZTK3     SUP   CN A5
251                 NZU   NZTK4
252                 RAU   MINUS     TR PY
253       NZTK4     SUP   EIGHT
254                 NZU   NZTK5
255                 RAU   COMMA     TR PY
256       NZTK5     SUP   ONE 1
257                 NZU   NZTO3
258                 RSL   SW 61
259                 BMI   ZT J7
260                 LDD   SW PD
261                 STD   SW 59     ZT J7
262       SW PD     SUP   LTR F
263                 NZU             ZT O2
264                 AUP    8001
265                 LDD   SW PH
266                 STD   SW 59      8001
267       ZT O2     AUP    8001     TR SB
268       NZTO3     SUP   NINE
269                 NZU   NZTJ8
270                 RAU   EQUAL     TR SB
271       TR SB     SRT    0002
272                 AUP   TEMAC
273                 SLT    0002
274                 STU   TEMAC     TR QC
275       ZT K4     LDD   OUT4V
276                 STD   TESTO     TR QA
277       OUT4V     RAL   F3
278                 ALO   ONE
279                 STL   F3        TR QC
```

```
0281  21  0167  0320
0320  65  8002  0029
0029  35  0002  0060
0226  21  0127  0283
0074  65  0000  0205
0205  20  0167  0180
0120  60  0365  0501
0173  11  0276  0331
0331  44  0235  0236
0236  10  8001  0293
0293  69  0246  0249
0249  24  0052  0255
0255  15  0127  0381
0381  30  0002  0387
0387  20  0127  0230
0230  65  0161  0565
0565  16  0066  0471
0471  20  0161  0052
0246  65  0066  0521
0521  15  0124  0079
0079  20  0124  0186
0235  11  0084  0289
0289  44  0343  0194
0194  60  0365  0619
0619  69  0272  0249
0272  66  0124  0129
0129  46  0186  0333
0343  11  0222  0377
0377  44  0431  0082
0082  60  0419  0223
0223  69  0326  0249
0326  66  0124  0179
0179  45  0129  0383
0431  11  0084  0339
0339  44  0393  0244
0244  60  0197  0619
0393  11  0084  0389
0389  44  0443  0294
0294  60  0247  0619
0443  11  0296  0551
0551  44  0305  0206
0206  60  0259  0619
0305  11  0084  0439
0439  44  0493  0344
0344  60  0204  0309
0309  69  0162  0249
0162  66  0066  0521
0493  11  0222  0427
0427  44  0481  0132
0481  10  0184  0489
0489  69  0186  0249
0132  60  0184  0539
0539  69  0333  0249
0383  69  0286  0589
0589  24  0060  0186
0286  11  0276  0531
0531  44  0285  0236
0285  11  0084  0639
0639  44  0543  0394
0394  60  0365  0669
0669  69  0322  0249
0322  61  0124  0229
0229  46  0186  0433
0543  11  0257  0211
0211  44  0615  0166
0166  60  0197  0669
0615  11  0196  0601
0601  44  0355  0256
0256  60  0259  0669
0355  11  0084  0689
0689  44  0593  0444
0444  66  0124  0279
0279  46  0344  0483
0483  69  0336  0739
0739  24  0060  0344
0336  11  0154  0359
0359  44  0263  0264
0263  10  8001  0719
0719  69  0372  0225
0225  24  0060  8001
0264  10  8001  0571
0593  11  0222  0477
0477  44  0481  0182
0182  60  0184  0571
0571  30  0002  0527
0527  10  0167  0621
0621  35  0002  0577
0577  21  0167  0370
0433  69  0386  0789
0789  24  0192  0345
0386  65  0161  0665
0665  15  0066  0671
0671  20  0161  0370
```

```
280         TR QC   RAL   OUTP
281                 ALO   ONE
282                 STL   OUTP
283                 RAL   NN M3
284                 ALO   IAC
285                 STL   F4        8001
286         NN M3   RAU    1899
287                 SRT    0004
288                 RAL    8002
289                 NZE           ZT K8
290                 RAL   F4
291                 ALO   ONE
292                 LDD   NN M4
293                 SDA   F4
294                 RAL   NN N6
295                 SLO   F4
296                 NZE    8001   STOPC
297         NN M4   STU    0000   TR TZ
298         TR TZ   RAL   IAC
299                 ALO   ONE
300                 STL   IAC      ZT K8
301         ZT K8   RAL   NXTWD
302                 ALO   ONE
303                 LDD   NN M7
304                 SDA   NXTWD
305                 LDD   NN M8
306                 SDA   STORE
307                 RAU   PARNL
308                 ALO   TEMAA
309                 SRT    0002   TR QD
310         TR QD   STL   TEMAA
311                 LDD   OUT1V
312                 STD   TESTO    TR RG
313         SUB V   RAL   TEMAC
314                 SLT    0002
315                 NZU           TR QA
316                 SRT    0002   STORE
317         TR QA   RAU   TEMAC
318                 ALO   TEMAA
319                 SLT    0002
320                 STU   TEMAC
321                 STL   TEMAA    TESTO
322         OUT1V   RAL   F3
323                 ALO   ONE
324                 STL   F3
325                 SLO   OUTP
326                 NZE   TR RG    SW QA
327         NN M8   STL    0000   TR QE
328         TR QE   STU   TEMAC
329                 RAL   NXTWD
330                 ALO   ONE
331                 STL   NXTWD
332                 LDD   STORE
333                 SDA   STORE    TR RG
334         TR RG   RAL   TEMAA
335                 NZE   SUB V    NXTWD
336         SW QA   RAL   OUTP
337                 ALO   ONE
338                 STL   OUTP
339                 RAL   NXTWD
340                 LDD    8003
341                 SDA   F7
342                 LDD   NNM16
343                 SDA   NXTWD
344                 LDD   NNM13
345                 SDA   STORE
346                 RAL   F4
347                 LDD   STORE
348                 SDA   F4
349                 SLO   F7
350                 SDA   F7
351                 LDD   OUT5V
352                 STD   TESTO
353                 RAL   TEMAA
354                 NZE   NZTO5    ZT O5
355         NZTO5   AUP   PARNR
356                 SRT    0002
357                 STD    1993   TR SK
358         ZT O5   RAL    1992
359                 NZE           NZTO5
360                 RSL    8002
361                 STL   F7
362                 RAL   TEMAA
363                 STD    1992   NZTO5
364         NNM13   STL    0000
365                 RAL    1993
366                 NZE           ZT O6
367                 RAL   F7
368                 STU    1993
369                 SLO   ONE
370                 STL   F7       ZT O6
371         ZT O6   RAL   F4
372                 SLO   STORE

0370   65  0267  0721
0721   15  0066  0771
0771   20  0267  0420
0420   65  0273  0627
0627   15  0003  0457
0457   20  0261  8001
0273   60  1899  0153
0153   30  0004  0313
0313   65  8002  0821
0821   45  0174  0275
0174   65  0261  0715
0715   15  0066  0871
0871   69  0224  0677
0677   22  0261  0314
0314   65  0317  0921
0921   16  0261  0765
0765   45  8001  0769
0224   21  0000  0203
0203   65  0003  0507
0507   15  0066  0971
0971   20  0003  0275
0275   65  0283  0437
0437   15  0066  1021
1021   69  0274  0727
0727   22  0283  0436
0436   69  0839  0242
0242   22  0395  0198
0198   60  0204  0409
0409   15  0127  0581
0581   30  0002  0487
0487   20  0127  0280
0280   69  0533  0486
0486   24  0192  0445
0350   65  0167  1071
1071   35  0002  0777
0777   44  0631  0345
0631   30  0002  0395
0345   60  0167  1121
1121   15  0127  0681
0681   35  0002  0537
0537   21  0167  0470
0470   20  0127  0192
0533   65  0161  0815
0815   15  0066  1221
1221   20  0161  0364
0364   16  0267  1271
1271   45  0445  0325
0839   20  0000  0253
0253   21  0167  0520
0520   65  0283  0587
0587   15  0066  1321
1321   20  0283  0536
0536   69  0395  0248
0248   22  0395  0445
0445   65  0127  0731
0731   45  0350  0283
0325   65  0267  1371
1371   15  0066  1421
1421   20  0267  0570
0570   65  0283  0637
0637   69  8003  0494
0494   22  0297  0400
0400   69  0303  0306
0306   22  0283  0586
0586   69  0889  0292
0292   22  0395  0298
0298   65  0261  0865
0865   69  0395  0348
0348   22  0261  0414
0414   16  0297  0651
0651   22  0297  0450
0450   69  0353  0356
0356   24  0192  0495
0495   65  0127  0781
0781   45  0234  0335
0234   10  0276  0831
0831   30  0002  0687
0687   24  1993  0346
0335   65  1992  0347
0347   45  0500  0234
0500   66  8002  0459
0459   20  0297  0550
0550   65  0127  0881
0881   24  1992  0234
0889   20  0000  0403
0403   65  1993  0397
0397   45  0600  0701
0600   65  0297  0751
0751   21  1993  0396
0396   16  0066  1471
1471   20  0297  0701
0701   65  0261  0915
0915   16  0395  0299
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                NZE   TR QE   ZT L3      0299   45   0253   0333
      NNM16     RAL    0000   TR SK      0303   65   0000   0346
      TR SK     STL   TEMAA   SUB V      0346   20   0127   0350
      ZT L3     RAL   TEMAE              0333   65   0014   0819
                NZE           TR RV      0819   45   0422   0323
                STD   OUTP               0422   24   0267   0620
                STU   TEMAE   TR RV      0620   21   0014   0323
      TR RV     RAL   OUTP               0323   65   0267   1521
                LDD   TR MW   TR UD      1521   69   0217   0670
      TR UD     STD   F1                 0670   24   0373   0376
                STL   OUT Q              0376   20   0931   0284
                LDD           TR MT      0284   69   0737   0099
                STU   TEMAF              0737   21   0164   0367
                RAL   F3                 0367   65   0161   0965
                SLO   OUT Q              0965   16   0931   0385
                NZE   TR MW              0385   45   0217   0939
                LDD   SW OA              0939   69   0146   0349
                STD   SW 56   F1         0349   24   0002   0373
      OUT5V     RAL   TEMAA              0353   65   0127   0981
                NZE   SUB V              0981   45   0350   0435
                STD    1993              0435   24   1993   0446
                RAL   F7                 0446   65   0297   0801
                BMI   TR RM              0801   46   0354   0405
                SLO   ONE                0405   16   0066   1571
                STL   F7      NXTWD      1571   20   0297   0283
      TR RM     RAU   TEMAC              0354   60   0167   1721
                SCT    0000              1721   36   0000   0643
                RAL    8003   STORE      0643   65   8003   0395
      ZT H3     RAU   TEMAF              0156   60   0164   0869
                SUP   LTR F              0869   11   0154   0509
                NZU           TR NF      0509   44   0363   0464
                AUP   SEVEN              0363   10   0296   0851
                BMI   TR NF              0851   46   0464   0455
                LDD   SW OE              0455   69   0058   0311
                STD   SW 56   TR NF      0311   24   0002   0464
      TR NF     RAU   PARNL   TR MV      0464   60   0204   0209
      SW OE     SUP   PARNR              0058   11   0276   1031
                NZU   NZTH6   TR SQ      1031   44   0485   0636
      NZTH6     AUP    8001   TR MV      0485   10   8001   0209
      TR SQ     AUP    8001              0636   10   8001   0693
                ALO   SW OA   TR SR      0693   15   0146   0901
      TR SR     STL   SW 56   TR MV      0901   20   0002   0209
      ZT H1     RAU   MULT               0032   60   0419   0423
                ALO           TR RO      0423   15   0426   1081
                SUP   MULT               0426   11   0419   0473
                NZU   TR MZ   TR SF      0473   44   0827   0128
      TR MZ     AUP    8001              0827   10   8001   0583
                LDD   SW OA   TR SC      0583   69   0146   0399
      TR SC     STD   SW 56    8001      0399   24   0002   8001
      TR SF     RAL   F3      TR SA      0128   65   0161   1015
      TR SA     ALO   ONE                1015   15   0066   1771
                STL   TEMAE              1771   20   0014   0417
                LDD   SW BL              0417   69   0720   0523
                STD   SW 50   TR SO      0523   24   0476   0329
      TR SO     LDD   SW OI   TR SN      0329   69   0232   0535
      TR SN     STD   SW 56   NZTB2      0535   24   0002   0170
      TR RO     LDD   F3                 1081   69   0161   0514
                STD   F6      TR SR      0514   24   0467   0901
      ZT G8     AUP    8001              0008   10   8001   1065
                ALO           TR RO      1065   15   0068   1081
                SUP   LTR A              0068   11   1871   0375
                BMI   TR MZ              0375   46   0827   0379
                AUP    8001              0379   10   8001   0585
                SUP   LTR E              0585   11   0188   0743
                NZU   NZTH6              0743   44   0485   0398
                AUP    8001              0398   10   8001   0505
                ALO           TR SR      0505   15   0108   0901
                SUP   LTR A              0108   11   1871   0425
                BMI   TR SF   TR SQ      0425   46   0128   0636
      SW BL     NZU   TR RN              0720   44   0177   0324
                RAL   TEMPF              0324   65   0181   0635
                SLO   ONE                0635   16   0066   1971
                NZE   TR RJ              1971   45   0321   0475
                RAL   ONE                0475   65   0066   0472
                STD    1992   TR RU      0472   24   1992   0545
      TR RU     ALO   F3      TR SL      0545   15   0161   1115
      TR SL     STL   OUTP               1115   20   0267   0770
                RAL   F6                 0770   65   0467   0522
                LDD           TR UD      0522   69   0525   0670
                RAU   TEMAF              0525   60   0164   0919
                LDD   SW PH   TR RP      0919   69   0372   0176
      SW PH     SUP   MULT               0372   11   0419   0573
                NZU           ZT N7      0573   44   0877   0178
                AUP    8001              0877   10   8001   0633
                SUP   DIVID              0633   11   0247   0951
                NZU           ZT N7      0951   44   0555   0178
                AUP    8001   SW PC      0555   10   8001   0286
      ZT N7     AUP    8001   TR PY      0178   10   8001   0669
      ZT N8     RAL   F3                 0094   65   0161   1215
                STD   F6      TR SA      1215   24   0467   1015
      SW OI     SUP   EQUAL              0232   11   0186   0989
                BMI           NZTB2      0989   46   0342   0170
                AUP   MULT               0342   10   0419   [illegible]
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466                 NZU     ZT N6
467                 SUP     CN A5
468                 NZU     ZT Q4
469                 SUP      8001
470                 NZU     ZT N5
471                 AUP     ONE 1
472                 NZU     ZT Q4
473                 AUP     PLUS
474                 NZU     ZT Q4     ZT O1
475     ZT Q4       RAL     F3        TR UY
476     TR UY       SUP     SW 61
477                 BMI     NZTB2     TR SL
478     ZT O1       LDD               TR SN
479                 SUP     LTR A
480                 BMI     TR RY
481                 AUP      8001
482                 SUP     LTR E
483                 NZU     NZTB2
484                 LDD     TR SO     TR SN
485     TR RY       AUP      8001     TR SM
486     TR SM       LDD     SW O1     TR SC
487     ZT N6       LDD     SW JA
488                 STD     SW 56
489                 RSL     ONE       TR SP
490     TR SP       ALO     SW 61
491                 STL     SW 61     NZTB2
492     SW JA       SUP     LTR A
493                 BMI     TR RY     ZT Q4
494     ZT N5       RAL     ONE       TR SP
495     ZT Q4       LDD               TR SN
496                 STU     TEMAF
497                 SUP     MULT
498                 NZU               TR UV
499                 RSL     SW 61
500                 BMI               TR SD
501                 RAU     TEMAF     TR SM
502     TR UV       RAL     SW 61
503                 BMI     TR SD     TR SO
504     TR SD       RSL     ONE       TR RU
505     NN M7       RAL      0000     TR QD
506     NN N6       STU      1931     TR TZ
507     IN4         LDD     NINE      TR SM
508     TR SH       STD      1991     SCAN
509     ARITH       RAL     FIVE      RITH1
510     RITH1       STU     TEMAB
511                 AUP     TX DB
512                 LDD     ZT C5     FLO 1
513     FLO 1       STD     SW 62
514                 STL     IAE
515                 STU     SW 39
516                 LDD     TX DE
517                 STD     SW 60
518                 LDD     SW FA
519                 STD     SW 54
520                 RAU     FOUR
521                 STL     IAI
522                 ALO     TX DL
523                 LDD     SW BA     TR TN
524     TR TN       STD     SW 50
525                 STL     SW 61
526                 STU     TEMPF
527                 LDD     NN L1
528                 STD     NXTWD     TX DG
529     TX DG       RAL     NXTWD
530                 ALO     ONE
531                 STL     NXTWD      8002
532     TR JM       SLT      0002
533                 STL     TEMAA
534                 RAU      8003     SW 50
535     NZTA7       SUP     COMMA
536                 NZU               TX DM
537                 AUP     PLUS
538                 NZU               TX DA
539                 SUP     ONE 1
540                 NZU               SW 59
541                 SUP     ONE 1
542                 NZU               TX DJ
543                 SUP     NINE
544                 NZU               TX DC
545                 SUP     ONE 1
546                 NZU               TX DK
547                 SUP     ONE 1
548                 NZU               TX DD
549                 SUP     EIGHT
550                 NZU               SW 60
551                 SUP     NINE
552                 NZU               TX DF
553                 AUP     EQUAL     TR MA
554     TR MA       STU     TEMAC
555                 RAL     TEMAB
556                 SLT      0002
557                 NZU     STOPM
558                 ALO     TEMAC
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0623    44  0927  0278
0927    11  0257  0361
0361    44  1265  0216
1265    11  8001  0572
0572    44  0575  0526
0575    10  0084  1039
1039    44  0793  0544
0793    10  0365  0969
0969    44  0544  0374
0544    65  0161  1315
1315    11  0124  0429
0429    46  0170  1115
0374    69  0977  0535
0977    11  1871  0625
0625    46  0328  0479
0479    10  8001  0685
0685    11  0188  0843
0843    44  0170  0448
0448    69  0329  0535
0328    10  8001  0735
0735    69  0232  0399
0278    69  1131  0334
0334    24  0002  0605
0605    66  0066  0622
0622    15  0124  0529
0529    20  0124  0170
1131    11  1871  0675
0675    46  0328  0544
0526    65  0066  0622
0216    69  1019  0535
1019    21  0164  0517
0517    11  0419  0673
0673    44  1027  0378
1027    66  0124  0579
0579    46  0282  0683
0282    60  0164  0735
0378    65  0124  0629
0629    46  0683  0329
0683    66  0066  0545
0274    65  0000  0487
0317    21  1931  0203
0351    69  0222  0725
0725    24  1991  0300
0199    65  0102  0557
0557    21  0212  1365
1365    10  0118  0723
0723    69  0576  0679
0679    24  0332  0785
0785    20  1089  0392
0392    21  0060  0413
0413    69  0266  1069
1069    24  0072  0775
0775    69  0428  1181
1181    24  0384  0787
0787    60  0090  0595
0595    20  0449  0152
0152    15  0655  0559
0559    69  0116  0126
0126    24  0476  0729
0729    20  0124  1077
1077    21  0181  0434
0434    69  0304  0607
0607    24  0283  0024
0024    65  0283  0837    WORD TO AC
0837    15  0066  0672    MODIFY NEX
0672    20  0283  8002      WORD ADDR
0650    35  0002  0657
0657    20  0127  0330
0330    60  8003  0476
0700    11  0259  0463    TEST FOR
0463    44  0567  0168      COMMA
0567    10  0365  1119    TEST FOR
1119    44  0773  0424      DECIMAL P
0773    11  0084  1139    TEST FOR
1139    44  0893  0060      RIGHT PAR
0893    11  0084  1189    TEST FOR
1189    44  0943  0594      PLUS SIGN
0943    11  0222  1127    TEST FOR
1127    44  1231  0382      MULT SIGN
1231    11  0084  1239    TEST FOR
1239    44  0993  0644      MINUS SIG
0993    11  0084  1289    TEST FOR
1289    44  1043  0694      DIVIDE SI
1043    11  0196  1051    TEST FOR
1051    44  0705  0072      LEFT PARE
0705    11  0222  1177    TEST FOR
1177    44  1281  0432      EQUAL SIG
1281    10  0184  1339    RESTORE
1339    21  0167  0820
0820    65  0212  0617
0617    35  0002  0823
0823    44  1227  0478    TEST TEN A
0478    15  0167  0722
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559                SLT   0002
560                NZU   NZTC8     ZT C8
561     ZT C8      SRT   0002
562                STL   TEMAB     TR HB     STORE TEM
563     TR HB      RAL   IAE       TR JL     DECR SHIFT
564     TR JL      SLO   ONE                  COUNT
565                STL   IAE                  STORE
566                NZE   NZTB2     ZT B2     TEST
567     NZTB2      RAL   TEMAA     TR JM     TEMAA TO A
568     ZT B2      LDD   FIVE                 RESET SHIF
569                STD   IAE                  COUNT
570                RAL   IAC                  DECR WORD
571                SLO   ONE                  COUNT
572                STL   IAC                  STORE
573                NZE   TX DG     TX DH     TEST WORD
574     NZTC8      SUP   ZEROL                TEST TEM A
575                BMI             ABNUM      FOR NUMER
576                AUP   ZEROL     ZT C8
577     ABNUM      LDD   TR HB
578                STD   OUTP      TR HC
579     TR HC      AUP   ZEROL     TR JN     RESTORE
580     TR JN      SRT   0002      TR JO
581     TR JO      STL   TEMAB     SW 54
582     TR HE      STD   IAF
583                LDD   NN L2                NEXT PCH
584                STD   TX DI                 WORD INST
585        *       LDD   NN L3                PUNCH STOR
586                STD   STORE                 INSTR
587                LDD             TR UC
588                STD   P0006                 PUNCH BAN
589                LDD   SW FB
590                STD   SW 54     8001
591     TR HN      SLT   0002      STORE
592     TR HO      STL   TEMAB                LA TO TEM
593                RAU   IAF                  DECR SHIFT
594                SUP   ONE                   COUNT
595                STU   IAF                  STORE
596                NZU   NZTB3
597                RAL   P0006
598                NZE   ZT B4
599                LDD   FIVE      TR MR
600     TR MR      STD   IAF       TR KA
601     NZTB3      RAL   TEMAB                TEM AB TO
602                NZE   SW 54     OUTP       ANY MORE
603     ZT B4      PCH    1977     TR HP
604     TR KA      RAL   TX DI
605                ALO   ONE                  MODIFY NEX
606                STL   TX DI                 PCH WD IN
607                LDD   STORE                MODIFY PUN
608                SDA   STORE     NZTB3       STORE INS
609     TR HP      RAL   TEMPF
610                SLO   ONE                   COUNT
611                STL   TEMPF
612                NZE   NZTB6                TEST
613                LDD   STOPN     TR LG      SET SW 54
614     TR LG      STD   SW 54     NZTB3       ERROR STO
615     NZTB6      LDD   SW FA     TR LG
616     TX DH      LDD   OUT 1     TR IS
617     TR HK      RAL   TEMAB                TEM AB TO
618                NZE   NZTB7     OUTP       TEST
619     NZTB7      SLT   0002                 TEM AB TO
620                NZU             NZTB7       HIGH ORDE
621                SUP   ZEROL                TEST FOR
622                BMI   TR HF     TR HC       NUMERIC
623     TR HD      SCT   0000
624                STU   P0001
625                RAL   P0006     TJ SW       INSERT F
626     TJASW      SLT   0002                 IN LAST WD
627                NZU   TR RF     TR EX      OF PUNCH
628     TR EX      ALO   LAST      TR SG      STATEMENT
629     TJBSW      SLT   0004                 OUTPUT
630                NZU             TR EX
631                SRT   0002                  INSERT OF
632                NZU   TR RF                IN LAST WD
633                PCH    1977                OF READ
634                RAL   TEMPF                STATEMENT
635                SLO   ONE                  OUTPUT
636                STL   TEMPF
637                NZE   TR RF     STOPN
638     TR SG      STL   P0006
639                LDD    1991
640                BD1             PUNCH
641                PCH    1977     OUT19
642     TR RF      RAL   SW 54
643                SLO   STOPN
644                NZE              8001
645                RAL   LAST
646                LDD   TR SG     TR UC
647     TR UC      STD   OUT Q
648                STU   P0001
649                STD   P0002
650                STD   P0003
651                STD   P0004
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0722   35  0002  0779
0779   44  0733  0484
0484   30  0002  0191
0191   20  0212  1415
1415   65  1089  1093
1093   16  0066  0772
0772   20  1089  0442
0442   45  0170  0447
0170   65  0127  0650
0447   69  0102  0755
0755   24  1089  0492
0492   65  0003  0707
0707   16  0066  0822
0822   20  0003  0406
0406   45  0024  0411
0733   11  0686  0241
0241   46  0744  0645
0744   10  0686  0484
0645   69  1415  0218
0218   24  0267  0870
0870   10  0686  0291
0291   30  0002  0497
0497   20  0212  0384
0750   24  0453  0456
0456   69  0609  0262
0262   24  1465  0268
0268   69  0872  0825
0825   24  0395  0498
0498   69  1101  0165
1101   24  1982  0835
0835   69  0238  0341
0341   24  0384  8001
0800   35  0002  0395
0850   20  0212  1565
1565   60  0453  0757
0757   11  0066  0922
0922   21  0453  0506
0506   44  0659  0260
0260   65  1982  0887
0887   45  0140  0391
0391   69  0102  0805
0805   24  0453  0556
0659   65  0212  0667
0667   45  0384  0267
0140   71  1977  1277
0556   65  1465  1219
1219   15  0066  0972
0972   20  1465  0318
0318   69  0395  0548
0548   22  0395  0659
1277   65  0181  0885
0885   16  0066  1022
1022   20  0181  0534
0534   45  0288  1389
1389   69  0542  0695
0695   24  0384  0659
0288   69  0428  0695
0411   69  0564  0717
0900   65  0212  0767
0767   45  0920  0267
0920   35  0002  1327
1327   44  1331  0920
1331   11  0686  0441
0441   46  0794  0870
0950   36  0000  0873
0873   21  1977  0380
0380   65  1982  0937
0046   35  0002  0503
0503   44  0807  0158
0158   15  0461  1715
1050   35  0004  0511
0511   44  1765  0158
1765   30  0002  1072
1072   44  0807  0626
0626   71  1977  1377
1377   65  0181  0935
0935   16  0066  1122
1122   20  0181  0584
0584   45  0807  0542
1715   20  1982  0985
0985   69  1991  0844
0844   91  0547  0499
0547   71  1977  1427
0807   65  0384  1439
1439   16  0542  0597
0597   45  1100  8001
1100   65  0461  1815
1815   69  1715  0165
0165   24  0931  0634
0634   21  1977  0430
0430   24  1978  1381
1381   24  1979  0482
0482   24  1980  0783
```

```
652                 STD   P0005   OUT Q
653          TR HF  RAU   TEMAB   TJ 10
654          TJ 10  LDD   TR JO   SUBJ
655          TJ 10  LDD   TSTPR   SUBJ
656          TJ10A  LDD   TSTPR   SUBJ
657          TJ10B  LDD   TR JO   SUBJ
658          TSTPR  NZU           TJ 20
659                 STU   TEMAC
660                 SUP    8001
661                 RAL   LTR T
662                 LDD   OUT30  TR KK
663          OUT30  RAU   PRODT
664                 LDD           SUBE
665                 LDD   OUT31  TR KK
666          OUT31  RAU   TEMAC
667                 SRT    0004
668                 SUP    8003
669                 AUP   NINE
670                 SLT    0004
671                 LDD           SUBE
672                 SLT    0002
673                 LDD   OUT 1  TR KK
674          TJ 20  SLT    0002
675                 SUP    8003
676                 SRT    0002
677                 ALO   LTR T  TR JO
678          TX DF  RAU   LTR Z
679                 LDD    1991
680                 BD1   TR UO  TR HL
681          TR UO  STU   TEMAC
682                 LDD   OUT 3  TR JZ
683          TR HL  STU   TEMAC
684                 LDD   OUT 3  TR IS
685          TR IS  STD   OUTP    TR HK
686          TR HR  STD   TEMAB   TR JP
687          TR JP  LDD   TR HB   TR JZ
688          TR JZ  STD   OUTP    SW 54
689          TX DD  RAU   LTR D   TR HL
690          TX DJ  RAU   LTR S   TR HL
691          TX DK  RAU   LTR M   TR HL
692          TX DB  RAU   LTR R   TR HL
693          TX DM  RAU   LTRKM   TR HL
694          TX DC  LDD   SW BB   TR LI
695          TR LI  STD   SW 50
696                 LDD   TR HB   TR IS
697          TR HM  NZU   NZTC1
698                 LDD   SW BA
699                 STD   SW 50
700                 RAL   LTR P   TR JO
701          TR LD  LDD   SW BF
702                 STD   SW 50   TR MO
703          TR MO  AUP   LTR E   TR MA
704          TR MP  NZU           ZT G5
705                 BMI   TR KP   TR MO
706          ZT G5  RAU   LTR B   TR PI
707          NZTC1  AUP   MULT
708                 ALO   TEMAA
709                 SRT    0002
710                 STL   TEMAA
711                 RAL   IAE
712                 ALO   ONE
713                 STL   IAE
714                 LDD   LTR X   TR JP
715          TX DA  RAU   LTR J
716                 LDD   SW BG   TR PJ
717          TR HU  NZU           ZT C2
718                 BMI   TR KP   TR LD
719          TR KP  AUP    8001
720                 LDD   SW BA
721                 STD   SW 50   NZTA7
722          ZT C2  RAU   ZROB    TR PI
723          TR PI  LDD   SW BA   TR PJ
724          TR PJ  STD   SW 50   TR HL
725          TX DE  RAU   TEMAB   TR KH
726          TR KH  NZU   NZTC5   SW 62
727          ZT C5  LDD   LTR L   TR HR
728          NZTC5  SRT    0002
729                 RAL    8002
730                 SLO   LTRFM
731                 NZE           SW 61
732                 RSU   TEMAB
733                 LDD   NZU2   SUBJ
734          NZU2   NZU   TJ 8A   STOPF
735          NZU2   STU   TEMAC   TJ 5A
736          NZU2A  NZU   TJ 8A   STOPF
737          TJ 8A  STL   TEMAB
738                 STU   TEMAC   TJ 8
739          TJ 8   LDD   OUT 4   TR JZ
740          TR IB  SLO   ONE 1
741                 LDD    8003
742                 SIA   TEMAE
743                 SLT    0003
744                 STU   TEMAF

                                  0783  24  1981  0931
                                  0794  60  0212  0028
                                  0028  69  0497  1250
                                  0028  69  1431  1250
                                  1300  69  1431  1250
                                  0172  69  0497  1250
                    PRECEDE       1431  44  1035  0736
                    LOCATION      1035  21  0167  0970
                    NUMBER OF     0970  11  8001  1477
                    LAST VARI     1477  65  0480  1085
                    ABLE IN       1085  69  0338  0491
                    READ OR       0338  60  0541  0745
                    PUNCH         0745  69  0598  1251
                    STATEMENT     0598  69  1301  0491
                    BY T          1301  60  0167  1172
                     EXIT TO      1172  30  0004  0833
                    PUNCH OUT     0833  11  8003  0591
                    PUT AND       0591  10  0222  1527
                    CONTINUE      1527  35  0004  0987
                    PROCESSING    0987  69  0190  1251
                    STATEMENTS    0190  35  0002  0647
                                  0647  69  0564  0491
                                  0736  35  0002  1143
                                  1143  11  8003  1351
                                  1351  30  0002  0857
                                  0857  15  0480  0497
                                  0432  60  1135  1489
                                  1489  69  1991  0894
                                  0894  91  0697  0549
                                  0697  21  0167  1020
                                  1020  69  0923  0676
                    SIGN          0549  21  0167  1070
                                  1070  69  0923  0717
                                  0717  24  0267  0900
                                  1350  24  0212  1865
                                  1865  69  1415  0676
                                  0676  24  0267  0384
                    STORE DIVI    0694  60  0747  0549
                    STORE PLUS    0594  60  0797  0549
                    STORE MINU    0644  60  0847  0549
                    STOR RTPA     0118  60  1222  0549
                    STOR COMMA    0168  60  1272  0549
                                  0382  69  1185  0388
                                  0388  24  0476  0829
                                  0829  69  1415  0717
                                  1400  44  0553  0404
                                  0404  69  0116  1269
                                  1269  24  0476  0879
                                  0879  65  0532  0497
                                  1550  69  0603  0606
                                  0606  24  0476  0929
                                  0929  10  0188  1339
                                  1700  44  0653  0454
                                  0653  46  0656  0929
                                  0454  60  0907  0561
                                  0553  10  0419  0973
                                  0973  15  0127  1481
                                  1481  30  0002  1037
                                  1037  20  0127  0530
                                  0530  65  1089  1193
                                  1193  15  0066  1322
                                  1322  20  1089  0592
                                  0592  69  0795  0648
                                  0424  60  1577  1531
                                  1531  69  0684  1087
                                  1750  44  0703  0504
                                  0703  46  0656  1550
                                  0656  10  8001  0513
                                  0513  69  0116  1319
                                  1319  24  0476  0700
                                  0504  60  0957  0561
                                  0561  69  0116  1087
                                  1087  24  0476  0549
                                  0266  60  0212  0817
                                  0817  44  1372  0332
                                  0576  69  0979  1350
                                  1372  30  0002  1029
                                  1029  65  8002  1137
                                  1137  16  0240  0845
                                  0845  45  0698  0124
                                  0698  61  0212  0867
                                  0867  69  0040  1250
                                  0040  44  1243  0944
                                  0040  21  0167  1120
                                  0034  44  1243  0944
                                  1243  20  0212  1965
                                  1965  21  0167  1220
                                  1220  69  1023  0676
                                  1800  16  0084  1539
                                  1539  69  8003  0496
                                  0496  23  0014  0917
                                  0917  35  0003  0875
                                  0875  21  0164  0967
```

```
745                NZU          ZT D1
746                RAL    8002
747                SLT    0003
748                STU    TEMAF
749                RSL    8003
750                ALO    TEMAE
751                STL    TEMAE
752                LDD    SW HB      TR IF
753     TR IF      STD    SW 56      OUT 5
754     ZT D1      LDD    SW HA      TR IF
755     TR IK      STD    SW 50
756                SLO    8002
757                STL    F6
758                STD    F7
759                STD    F8
760                STD    F9
761                LDD    ONE 1      TR KN
762     TR KN      STD    DIM I
763                STL    F1
764                STD    F3
765                STD    F4
766                STD    F5
767                LDD    SW IA      TR KI
768     TR KI      STD    SW 57      TR HB
769     TR IL      BMI    NZTD4
770                AUP    8001
771                STU    TEMAC      SW 57
772     TR IM      SLT    0002
773                NZU    STOPO
774                ALO    TEMAC
775                STL    F1         TR HB
776     NZTD4      AUP    MULT
777                BMI    NZTD6
778                AUP    LTR A
779                STU    TEMAC      SW IB
780     TR IN      SLT    0002
781                NZU    STOPO
782                ALO    TEMAC
783                STL    F3         TR IG
784     TR IG      LDD    SW IB      TR KI
785     NZTD6      AUP    DIVID
786                NZU          ZT E1
787                AUP    ONE 1
788                NZU          TR IG
789                AUP    NINE
790                NZU    NZTE1      TR IP
791     TR IP      LDD    SW IC      TR KI
792     TR IO      SLT    0002
793                NZU    STOPO
794                ALO    TEMAC
795                STL    F5         TR HB
796     ZT E1      LDD    ONE 1
797                STD    F4         TR IP
798     NZTE1      RAL    F7
799                STD    F9
800                STU    F7
801                LDD    F6
802                STD    F8
803                STU    F6
804                RAL    F5
805                NZE          ZT E5
806                LDD    OUTQ1      TR LH
807     TR LH      STD    OUT Q      SUB Q
808     TR JR      RAL    F4
809                NZE    NZTJ2
810                RAL    F5         TR JT
811     NZTJ2      RSL    F5         TR JT
812     TR JT      ALO    TEMAE
813                STL    TEMAE      ZT E5
814     ZT E5      RAL    F1
815                NZE    NZTE6      NZTE7
816     SUB Q      STU    TEMAC      ZT F4
817     ZT F4      SLT    0001
818                NZU          ZT F4
819                SUP    NINE
820                AUP    TEMAC
821                SLT    0001
822                STU    TEMAC
823                RAL    8002
824                NZE    ZT F4
825                RAU    TEMAC
826                MPY    DIM I      OUT Q
827     NZTE6      LDD    OUTQ2      TR LH
828     TR JV      RAU    F3
829                NZE    NZTE7
830                RAL    TEMAE
831                ALO    F6
832                STL    TEMAE
833                STU    F6
834                LDD    OUT12
835                STD    SW 58      SW 56
836     NZTE7      LDD    OUT 6
837                STD    SW 58

0967   44   1422   1472
1422   65   8002   1581
1581   35   0003   1589
1589   21   0164   1017
1017   66   8003   0925
0925   15   0014   1369
1369   20   0014   1067
1067   69   1270   1073
1073   24   0002   0855
1472   69   0975   1073
1850   24   0476   1079
1079   16   8002   1187
1187   20   0467   1320
1320   24   0297   1950
1950   24   0052   0905
0905   24   0208   0611
0611   69   0084   1237
1237   24   0290   1293
1293   20   0373   0726
0726   24   0161   0614
0614   24   0261   0664
0664   24   1117   1370
1370   69   1123   0776
0776   24   1129   1415
1401   46   0554   0955
0955   10   8001   0661
0661   21   0167   1129
1551   35   0002   1057
1057   44   0711   0312
0312   15   0167   1522
1522   20   0373   1415
0554   10   0419   1173
1173   46   0826   1727
1727   10   1871   1025
1025   21   0167   1420
1701   35   0002   1107
1107   44   0711   0362
0362   15   0167   1572
1572   20   0161   0714
0714   69   1420   0776
0826   10   0247   1751
1751   44   1055   0706
1055   10   0084   1739
1739   44   1343   0714
1343   10   0222   1777
1777   44   1731   0582
0582   69   1235   0776
1801   35   0002   1257
1257   44   0711   0412
0412   15   0167   1722
1722   20   1117   1415
0706   69   0084   1287
1287   24   0261   0582
1731   65   0297   1851
1851   24   0208   0761
0761   21   0297   0202
0202   69   0467   1470
1470   24   0052   1105
1105   21   0467   1520
1520   65   1117   1772
1772   45   0876   1877
0876   69   1179   0632
0632   24   0931   0734
0252   65   0261   0316
0316   45   1570   1872
1872   65   1117   1972
1570   66   1117   1972
1972   15   0014   1419
1419   20   0014   1877
1877   65   0373   0528
0528   45   0682   0883
0734   21   0167   1720
1720   35   0001   0578
0578   44   1781   1720
1781   11   0222   0628
0628   10   0167   1223
1223   35   0001   1229
1229   21   0167   1770
1770   65   8002   1279
1279   45   1720   0933
0933   60   0167   1273
1273   19   0290   0931
0682   69   1285   0632
0302   60   0161   0366
0366   45   0883   1323
1323   65   0014   1469
1469   15   0467   1373
1373   20   0014   1217
1217   21   0467   1820
1820   69   1123   0926
0926   24   1329   0002
0883   69   0786   1789
1789   24   1329   0732
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838                 RAU   F3
839                 LDD   TR IR     SUBJ
840   TR IR         STL   F7        SW 56
841   SW 56         RAU   SW HA     TR IT
842   SW 56         RAL   F7        JTEST
843   JTEST         NZE   JSTOR     JZERO
844   JSTOR         RAL   LTR L
845                 LDD             TR KK
846                 RAL   TEMAE
847                 BMI   TR IX     TR IU
848   JZERO         RAL   F9
849                 NZE   JSTOR
850                 RAU   TEMAE
851                 LDD             SUBF
852                 STL   TEMAB     TRAJK
853   TR IT         STD   SW 56
854                 LDD   TEMAF     TR KN
855   TR IU         LDD   SW 58     TR IV
856   TR IV         STD   OUTP
857                 NZE   TR IZ     TR HC
858   TR IZ         LDD   TR JO     TR UN
859   TR UN         SLT    0004     SUBE1
860   TR IX         RAL   LMCOM
861                 LDD   OUT 7     TR KK
862   TR IY         STD   OUTP
863                 RAM   TEMAE     TR IZ
864   TR JA         LDD   OUT 8     TR KK
865   TR KK         STD   OUTP      TR JO
866   TR JB         LDD   SW 58     TR KK
867   TR JC         NZE   NZTE9     ZT E9
868   NZTE9         LDD   OUT10     TR IV
869   TR JD         LDD   OUT11     TR KK
870   TR JF         LDD   OUT 9     TR KK
871   TR JS         LDD   OUT12     TR KK
872   ZT E9         RAL   F7
873                 NZE             OUT12
874                 RAL   TEMAF
875                 NZE   NZTE9     OUT11
876   TR JG         NZE             ZT F2
877                 RAL   LTR S
878                 LDD   OUT13     TR KK
879   TR JH         LDD   OUT14     TR IV
880   TR JI         LDD   OUT15     TR KK
881   TR JJ         LDD   OUT16     TR KK
882   ZT F2         RAL   F9
883                 NZE             OUT16
884                 RAL   LTR S     TR JI
885   TR JK         STD   TEMAB     TRAJK
886   TRAJK         LDD   SW BA
887                 STD   SW 50     TR JP
888   FLO           STL   TEMAB
889                 RAU   NINE
890                       SLT    0004
891                       AUP    1900
892                       STU    1900
893                 LDD   EIGHT     TR SH
894   FLO2          LDD   IAC
895                 STD   IAFI
896                 LDD   ONE
897                 STD   TEMPH
898                 RAL    1900
899                       SLT    0004
900                       STL    1900
901                 RAL   THREE
902                 AUP   SW KA
903                 LDD   SW LB     FLO 1
904   SW KA         RAL   TR UA
905                 SUP   ONE       TR UW
906   TR UA         NZU   TX DB     ZT F6
907   TR LP         AUP   IAI
908                 STU   IAI        8002
909   ZT F6         LDD   SW BE     TR LI
910   TR KF         SRT    0002
911                 STL   TEMAF
912                 RAL   IAC
913                 SLO   ONE
914                 LDD   IAFI
915                 STD   IAC
916                 STL   IAFI      OUT 1
917   SW LB         RAL   ZT C5
918                 AUP   ONE       TR UW
919   TR UW         AUP   TEMPH
920                 STU   TEMPH      8002
921   TR KD         AUP   ONE       TR LP
922   TX DL         RAL   TR UB
923                 STU    1990     TR KD
924   TR UB         LDD   TR LQ
925                 STD   TEST
926                 RAL   SW KB
927                 AUP   SW MA
928                 LDD   SW NA     TR QX
929   TR QX         STD   SW 62
930                 STL   SW 59
```

SWITCH 56 BYPASS INSERTION OF L AND R FOR SPECIFIC VARIABLE OF ARRAY

```
0732  60  0161  0416
0416  69  1569  1250
1569  20  0297  0002
0002  60  0975  1379
0002  65  0297  0352
0352  45  0756  1307
0756  65  0979  0983
0983  69  0836  0491
0836  65  0014  1719
1719  46  1473  1523
1307  65  0208  0563
0563  45  0756  1267
1267  60  0014  1769
1769  69  1573  1251
1573  20  0212  0466
1379  24  0002  1255
1255  69  0164  1237
1523  69  1329  0782
0782  24  0267  1870
1870  45  0474  0870
0474  69  0497  0402
0402  35  0004  0613
1473  65  0976  1831
1831  69  0784  0491
0452  24  0267  1970
1970  67  0014  0474
0502  69  1305  0491
0491  24  0267  0497
0552  69  1329  0491
0602  45  0806  1357
0806  69  0709  0782
0652  69  1355  0491
0702  69  1405  0491
0752  69  1423  0491
1357  65  0297  0802
0802  45  0856  1423
0856  65  0164  1819
1819  45  0806  1355
0852  45  0906  1407
0906  65  0797  0902
0902  69  1455  0491
0952  69  1555  0782
1052  69  1705  0491
1102  69  1755  0491
1407  65  0208  0663
0663  45  0516  1755
0516  65  0797  1052
0648  24  0212  0466
0466  69  0116  1869
1869  24  0476  1865
1252  20  0212  0566
0566  60  0222  0678
0678  35  0004  1839
1839  10  1900  1805
1805  21  1900  0753
0753  69  0196  0725
0147  69  0003  0956
0956  24  0759  0462
0462  69  0066  1969
1969  24  0215  0368
0368  65  1900  1855
1855  35  0004  0616
0616  20  1900  0803
0803  65  1056  0811
0811  10  0764  1723
1723  69  1026  0679
0764  65  1317  1773
1773  11  0066  1873
1317  44  0118  1973
1302  10  0449  0853
0853  21  0449  8002
1973  69  1076  0388
1352  30  0002  0809
0809  20  0164  1367
1367  65  0003  1457
1457  16  0066  0524
0524  69  0759  0512
0512  24  0003  1106
1106  20  0759  0564
1026  65  0576  1881
1881  10  0066  1873
1873  10  0215  0574
0574  21  0215  8002
1402  10  0066  1302
0655  65  0258  0713
0713  21  1990  1402
0258  69  0861  0814
0814  24  1417  0624
0624  65  0728  1033
1033  10  0886  0641
0641  69  0994  0897
0897  24  0332  1335
1335  20  0060  0763
```

```
                    STU   SW 61    TEST
          TR LQ     RAL   MASK1
                    LDD   TEMAB
                    TLU    1161
                    LDD   MASK2
                    SDA   TESTO
                    SLO   CNA18     8002
          MASK1     RAL    0000
                    SLO   TEMAB
                    NZE    1171
                    LDD   LTR Q
                    STD   TEMAB     TESTO
          MASK2     RAU    0000     TR UO
          TR LN     SLO   ONE
                    STL   IAI
                    NZE   TR LO
                    RAU   TX DL
                    LDD   TR LO
                    STD   TEST
                    LDD    1991
                    RD1             TR SE
                    ALO   SW KA
                    LDD   SW LB     TR QX
          TR SE     ALO   TX DB
                    LDD   ZT C5     TR QX
          TR LO     RAU   LTR Q     TR HL
          TR LZ     NZE             ZT G3
                    SLO   ONE
                    STL    1990     TX DB
          SW NA     RAL    1990
                    ALO   ONE
                    STL    1990     ZT C5
          ZT G3     RAL   IAI       TR LN
           1160      99    9999     9999     END OF TAB
          SWBA1     NZU   NZTA7     TX DH
          SW BB     SUP   MULT      TR HM     FOR
          SW BD     SUP   ZEROL     TR IL     50
          SW BE     ALO   TEMAA     TR KF
          SW BF     SUP   LTR E     TR MP
          SW BG     SUP   LTR E     TR HU
          SW FA     RAL   FIVE      TR HE     SETTINGS F
          SW FB     RAL   TEMAB     TX DI      SWITCH 54
          SW HA     RAL   F7        JTEST     SETTINGS F
          SW HB     RAU   SW HA     TR IT      SWITCH 56
          SW IA     RAL   F1        TR IM     SETTINGS
          SW IB     RAL   F3        TR IN      FOR
          SW IC     RAL   F5        TR IO      SWITCH 57
          SW KB     RAL    1990     TR LZ
          SW MA     RAL   TR LQ     TR KD
          NNAL1     RAL    1899     TR JM
          NN L1     RAL    1899     TR JM     NXT WD INS
          NN L2     AUP    1977     TR HN     TO TX DI
          NN L3     STU    1977     TR HO     STORE PCM
          OUT 1     RAU   P0001     TR HD
          OUT 3     LDD   TEMAC     TR HR      EXITS
          OUT 4     RAL   TEMAC     TR IB      FROM
          OUT 6     RAL   SLCOM     TR JA
          OUT 5     LDD   SW BD     TR IK      STORE
          OUT 7     LDD   OUT17     TR IY
          OUT 8     RAL   F6        TR JC      SUBROUTIN
          OUT 9     RAL   LTR R     TR JS
          OUT10     RAL   LTR X     TR JD
          OUT11     RAL   F7        TR JF
          OUT12     RAL   F8        TR JG
          OUT13     RAL   F8        TR JH
          OUT14     RAL   LTR X     TR JI
          OUT15     RAL   F9        TR JJ
          OUT16     LDD   LTR R     TR JK
          OUT17     RAL   LTR R     TR JB
          OUT19     RAL   SW AB     IN10
          OUTQ1     STL   F5        TR JR
          OUTQ2     STL   F6        TR JV

1 1
1 1                 INSERT VARIABLES IN TABLE AND
1 1                 ASSIGN I OR Y VALUE DEPENDING
1 1                 IF VARIABLE IS FIXED POINT OR
1 1                 FLOATING POINT
          SUBJ      STD   OUT       SUBJ1
          SUBJ1     SCT    0000
                    STU   TEST
                    RAU   CTVAR
                    STL   SUBSC
                    STD   STORG
                    NZE   J101      INSVR
          INSVR     AUP   ONE
                    ALO   ONE 1
                    STU   CTVAR
                    STL   STORG
                    AUP             J1
                    STD    1599     J2
          J1        LDD   TEST       8003
          J2        RAL    8001
                    BMI             J48

          0763  21  0124  1417
          0861  65  0864  0674
          0674  69  0212  0666
          0666  84  1161  1467
          1467  69  0724  0778
          0778  22  0192  0895
          0895  16  0748  8002
          0864  65  0000  1256
          1256  16  0212  1567
          1567  45  1171  0774
          0774  69  0828  1931
          1931  24  0212  0192
          0724  60  0000  0697
          1552  16  0066  0824
          0824  20  0449  1702
          1702  45  1306  1557
          1557  60  0655  0859
          0859  69  1306  0909
          0909  24  1417  0874
          0874  69  1991  1044
          1044  91  0947  0599
          0947  15  0764  0924
          0924  69  1026  0897
          0599  15  0118  0974
          0974  69  0576  0897
          1306  60  0828  0549
          1752  45  1356  1707
          1356  16  0066  1024
          1024  20  1990  0118
          0994  65  1990  0945
          0945  15  0066  1074
          1074  20  1990  0576
          1707  65  0449  1552
          1160  99  9999  9999
          0160  44  0700  0411
          1185  11  0419  1400
          1802  11  0686  1401
          1076  15  0127  1352
          0603  11  0188  1700
          0684  11  0188  1750
          0428  65  0102  0750
          0238  65  0212  1465
          0975  65  0297  0352
          1270  60  0975  1379
          1123  65  0373  1551
          1420  65  0161  1701
          1235  65  1117  1801
          0728  65  1990  1752
          0886  65  0861  1402
          0148  65  1899  0650
          0304  65  1899  0650
          0609  10  1977  0800
          0872  21  1977  0850
          0964  60  1977  0950
          0923  69  0167  1350
          1023  65  0167  1800
          0786  65  1889  0502
          0855  69  1802  1850
          0784  69  1337  0452
          1305  65  0467  0602
          1405  65  1222  0752
          0709  65  0795  0652
          1355  65  0297  0702
          1423  65  0052  0852
          1455  65  0052  0952
          1555  65  0795  1052
          1705  65  0208  1102
          1755  69  1222  0648
          1337  65  1222  0552
          1427  65  0580  1385
          1179  20  1117  0252
          1285  20  0467  0302

          1250  24  0903  1406     STORE
          1406  36  0000  1429     SIGNED VAR
          1429  21  1417  1124     IN TEMPLOC
          1124  60  0048  0953      ZERO
          0953  20  1962  0716     TEMPORARY
          0716  24  1961  0914     COUNTERS
          0914  45  0418  1174
          1174  10  0065  1224
          1224  15  0084  1939
          1939  21  0041  1852      STORE
          1852  20  1913  0964     MNEMONIC
          0964  10  1717  1274     IN VARIABL
          1717  24  1591  1053     TABLE
          1274  69  1413  8003
          1053  65  8003  0959      TEST IF
          0959  46  0913  0813     SUBSC OR
```

```
1024                RAU   SUBSC
1025                SUP   20D
1026                NZU   J2A       STP N
1027    STP N       HLT    0002     PACK
1028    J2A         AUP   21D
1029                STU   SUBSC
1030                RAU   TESTO
1031                SRT    0003
1032                STL   OUTE
1033                RAU   TESTN
1034                SLT    0004
1035                AUP   OUTE
1036                AUP   STORG
1037                ALO   SUBSC
1038                ALO             J3
1039                STU    1499     J4
1040    J3          LDD   SETA
1041                SDA   SWCHA
1042                LDD   SETA1
1043                SDA   SWHA1      8002
1044    J4          RAU   TESTO
1045                NZU   NZMPY
1046                ALO   TESTN      J4A
1047    NZMPY       MPY   TESTN      J4A
1048    J4A         ALO   STORG
1049                SLO   ONE 1
1050                STL   STORG
1051                STD   TOTLC      FXFLT
1052    FXFLT       RAM   TEST
1053                SLT    0002
1054                RAU    8003
1055                SUP   LTRNI
1056                BMI   SWCHA
1057                SUP   SEVEN
1058                BMI   SWHA1      SWCHA
1059    SETA        RAM    1499
1060                RAU    8002     J6
1061    NORMA       RAU   STORG      J7
1062    SETA1       RAM    1499
1063                RAU    8002     J8
1064    NRMA1       RAU   STORG      J9
1065    J6          ALO   LTR Y      OUT
1066    J7          LDD    J6        SUBE2
1067    J8          ALO   LTR I      OUT
1068    J9          LDD    J8        SUBE2
1069    J4B         LDD   STORG
1070                STD   TOTLC      NOSUB
1071    NOSUB       LDD   NORMA
1072                STD   SWCHA
1073                LDD   NRMA1
1074                STD   SWHA1      FXFLT
1075    SUBE2       STD   OUTE2
1076                LDD   DONE1      SUBE
1077    SUBE1       SLT    0006     SUBE
1078    SUBE        STD   OUTE       LOPFF
1079    LOPFF       NZU              OUTE
1080                SRT    0001
1081                STU   TESTE
1082                SUP    8001
1083                SRT    0001
1084                ALO   AZERO
1085                AUP   TESTE      LOPFF
1086    DONE1       SRT    0002     OUTE2
1087    J101        SUP   HNDRD
1088                NZE              STP N
1089                AUP    8001     NXTVR
1090    NXTVR       ALO   ONE
1091                STL   MCHCT
1092                ALO             J101A
1093                RAM    1599     J101B
1094    J101A       LDD   TSVAR
1095                SDA   TSVAR      8002
1096    J101B       SML   TEST
1097                NZE   J102       MATCH
1098    J102        LDD   NORMB
1099                STD   SWCHB
1100                STD   SWCHC
1101                LDD   NORMD
1102                STD   SWCHD      TSVAR
1103    TSVAR       RAL    0000
1104                BMI              PLSAD
1105                RAL   SUBSC
1106                ALO   ONE
1107                STL   SUBSC
1108                ALO             J103
1109                RAM    1499     J104
1110    J103        LDD   SETA
1111                SDA   SWCHA
1112                LDD   SETA1
1113                SDA   SWHA1      8002
1114    J104        SLT    0003
1115                NZU   J105
1116                SLT    0003
```

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NONSUBSC        0562  60  1962  1767
 HALT OVER      1767  11  1324  1479
20 SUBSC        1479  44  1083  0834
VARIABLES       0834  01  0002  0051
 INCREMENT      1083  10  0936  0691
SUBSC CTR       0691  21  1962  0766
                0766  60  0192  0997
 SET UP         0997  30  0003  1456
J I BASE        1456  20  0911  1014
WORD AND        1014  60  1817  1374
STORE IN        1374  35  0004  1435
SUBSCRPT        1435  10  0911  0816
TABLE           0816  10  1961  0866
                0866  15  1962  1867
                1867  15  1424  1529
 SET SWCHS      1424  21  1499  1103
A AND A1        1529  69  0832  1485
FOR FIX         1485  22  1989  0642
FLT TEST        0642  69  0995  0798
IF SUBS VR      0798  22  1253  8002
 INCREMENT      1103  60  0192  1047
STORG CTR       1047  44  1303  1353
BY I TIMES      1353  15  1817  1474
                1303  19  1817  1474
                1474  15  1961  0916
J MINUS 1       0916  16  0084  0340
                0340  20  1961  1064
                1064  24  1967  1524
 TEST VAR       1524  67  1417  1574
FOR FIX OR      1574  35  0002  0882
FLT PT          0882  60  8003  0390
                0390  11  1393  1097
 BRCH'FLT       1097  46  1989  1403
                1403  11  0296  1553
 BRCH FIX       1553  46  1253  1989
 SW A SET       0832  67  1499  1703
                1703  60  8002  0961
 SW A NORM      1753  60  1961  0966
                0995  67  1499  1803
 SW A1 SET      1803  60  8002  1011
 SWA1 NORM      1853  60  1961  1016
                0961  15  1114  0903
                0966  69  0961  1214
                1011  15  1264  0903
                1016  69  1011  1214
                0813  69  1961  1314
                1314  24  1967  1724
 SWS A AND      1724  69  1753  1556
A1 NORM 4       1556  24  1989  0692
FIX FLT IF      0692  69  1853  1706
NONSUBS VR      1706  24  1253  1524
                1214  24  0468  1774
                1774  69  0878  1251
                0613  35  0006  1251
 SET UP         1251  24  0911  1364
DOUBL DIGT      1364  44  0518  0911
LOCATION        0518  30  0001  1075
NUMBER FOR      1075  21  0630  1133
NONSUBSC        1133  11  8001  0440
VARIABLES       0440  30  0001  1147
                1147  15  0604  1059
                1059  10  0630  1364
                0878  30  0002  0468
 HALT OVER      0418  11  1874  1579
100 VARS        1579  45  0932  0834
 TEST           0932  10  8001  0490
                0490  15  0066  1974
VARIABLE        1974  20  1729  0982
FOR TABLE       0982  15  1535  0540
MATCH           1535  67  1599  0654
                0540  69  1443  0546
                0546  22  1443  8002
                0654  18  1417  1125
                1125  45  0928  1779
 SWS B C        0928  69  1032  1585
AND D NORM      1585  24  0438  0741
TO REPEAT       0741  24  1094  1197
TABLE           1197  69  0704  1757
SEARCH          1757  24  0310  1443
 INCREMENT      1443  65  0000  1756
STORG AND       1756  46  1109  0360
SUBSC CTRS      1109  65  1962  0568
AS NEEDED       0568  15  0066  1175
BEFORE          1175  20  1962  1066
CONTINUING      1066  15  1225  1879
SEARCH OR       1225  67  1499  0754
EXITING         1879  69  0832  1735
 SET FIX        1735  22  1989  0742
FLT SIGN        0742  69  0995  0848
SW FOR MCH      0848  22  1253  8002
                0754  35  0003  0863
                0863  44  0611  0668
                0668  35  0000  0978
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                RAL   8003    J106                    0978  65  8003  1785
       J105     STU   OUTE1                           0618  21  1275  1028
                SUP   8003                            1028  11  8003  1835
                SLT   0003                            1835  35  0003  1493
                RAU   8003                            1493  60  8003  0804
                MPY   OUTE1   J106                    0804  19  1275  1785
       J106     STL   PRODT   J107                    1785  20  0541  1144
       J106A    STL   PRODT   J107                    0854  20  0541  1144
       J107     RAL   SUPSC                           1144  65  1962  0718
                ALO           8002                    0718  15  1325  8002
                RAL   1499    SWCHD                   1325  65  1499  0310
       NORMD    BMI   PROC    J107A                   0704  46  1807  0308
       SETD     BMI   FXFLT   J107A                   0904  46  1524  0308
       J107A    RAL   PRODT                           0308  65  0541  1045
                ALO   STORG   SWCHB                   1045  15  1961  0438
       SWCHB    STL   STORG   PROC      SERCH OVR     0438  20  1961  1807
       SWCHB    STL   STORG   FXFLT     YES MATCH     0438  20  1961  1524
       PROC     RAL   MCHCT             IF NO         1807  65  1729  1183
                SLO   CTVAR            MATCH          1183  16  0048  0954
                NZE   J108             INSERT         0954  45  0358  1259
                RAU   8001             VARIABLE       1259  60  8001  1116
                ALO   STORG   INSVR    IN TABLE       1116  15  1961  1174
       J108     ALO   8001    NXTVR     SERCH OVR     0358  15  8001  0490
       PLSAD    RAL   STORG                           0360  65  1961  1216
                ALO   ONE 1   SWCHC                   1216  15  0084  1094
       SWCHC    STL   STORG   PROC      SERCH OVR     1094  20  1961  1807
       SWCHC    STL   STORG   NOSUB     YES MATCH     1094  20  1961  1724
       MATCH    LDD   SETB              SWS B C       1779  69  1082  1885
                STD   SWCHB            AND D SET      1885  24  0438  0791
                LDD   SETC             IF MATCH       0791  69  1194  1247
                STD   SWCHC            FOUND          1247  24  1094  1297
                LDD   SETD                            1297  69  0904  1857
                STD   SWCHD   TSVAR                   1857  24  0310  1443
   1
   1                  SUBROUTINE CONSTANTS
       20D      00    0020    0000                    1324  00  0020  0000
       21D      00    0021    0000                    0936  00  0021  0000
       ONE      00    0001    0000                    0066  00  0001  0000
       ONE 1    00    0000    0001                    0084  00  0000  0001
       SETB     STL   STORG   FXFLT                   1082  20  1961  1524
       NORMB    STL   STORG   PROC                    1032  20  1961  1807
       SETC     STL   STORG   NOSUB                   1194  20  1961  1724
         1200   63    7600    1821     CONTINUE       1200  63  7600  1821
         1201   64    6900    1822     DIMENSION      1201  64  6900  1822
         1202   64    7600    1823     DO             1202  64  7600  1823
         1203   65    7800    1824     EQUIVALNCE     1203  65  7800  1824
         1204   67    7600    1825     GO TO          1204  67  7600  1825
         1205   69    6600    1826     IF             1205  69  6600  1826
         1206   77    6100    1827     PAUSE          1206  77  6100  1827
         1207   77    8400    1828     PUNCH          1207  77  8400  1828
         1208   79    6500    1829     READ           1208  79  6500  1829
         1209   82    8300    1827     STOP           1209  82  8300  1827
         1210   99    9999    9999     END OF TAB     1210  99  9999  9999
       SUBF2    STD   LAST    SUBF3                   1054  24  0461  1414
       SUBF3    STU   TEMAF   SUBF1                   1414  21  0164  0768
       SUBF1    STL   NEXT    SUB F                   0768  20  1375  1078
       SUB F    RAL   TEMAF   LP F1                   1078  65  0164  1425
       LP F1    NZE           ZT F1                   1425  45  1128  0680
                SLT   0002             NEXT CHAR      1128  35  0002  1935
                STL   TEMAF                           1935  20  0164  0818
                RAU   8003    NEXT                    0818  60  8003  1375
       ZT F1    RAL   IAFI             DEC IAFI       0680  65  0759  0913
                NZE           LAST     FINAL CHAR     0913  45  1266  0461
                SLO   ONE                             1266  16  0066  1475
                STL   IAFI                            1475  20  0759  0612
                RSL   8002                            0612  66  8002  1525
                ALO   IAC                             1525  15  0003  0408
                ALO   CNFF1   8002                    0408  15  1061  8002
       CNFF1    RAL   1899    LP F1    SUB F          1061  65  1899  1425
       SUBK1    AUP   8001    SUB K                   1104  10  8001  1111
       SUBK2    AUP   COMMA   SUB K    RESTOR COM     1254  10  0259  1111
       SUB K    RAL   8003    TRSK1                   1111  65  8003  1575
       TRSK1    ALO   TEMPH                           1575  15  0215  1725
                SLT   0002                            1725  35  0002  1132
                NZU   SW6     ZT 30                   1132  44  0986  1036
       ZT 30    LDD   SWV     TR CC                   1036  69  0590  1543
       TR AS    LDD   STOPM   TR CC                   1304  69  1227  1543
       TR CC    STD   SW6     TR OR                   1543  24  0986  0640
       TR OR    STL   TEMPH   SUB F                   0640  20  0215  1078
       SWV      SRT   0002    TR AS    SUB K          0590  30  0002  1304
       PCH C    STL   P0001   PUNCH                   1354  20  1977  0499
       PUNCH    PCH   1977    PACK     END CONTIN     0499  71  1977  0051
       PCH B    PCH   1977    SUB F    DO PCH IF      1404  71  1977  1078
       HEADR    RAL   TOTLC            STATMNT NO     1554  65  1967  1775
                STL   P0004            PCH 37 40      1775  20  1980  1233
                STU   P0006                           1233  21  1982  1086
                STU   P0007               61 70       1086  21  1983  1136
                STD   P0008             71  80        1136  24  1984  1387
                STD   P0001                           1387  24  1977  0730
                LDD   LOW88            SET CONTRO     0730  69  1283  1186
                STD   P0010                           1186  24  1986  0690
                PCH   1977    START                   0690  71  1977  1999
          1822  LDD   TR UH   TR UG    DIMENSION      1822  69  1875  1178
```

```
1210          TR UG   STD   OUT Q
1211                  RAL   IAC
1212                  SLO   TWO                    WORD COU
1213                  STL   IAFI
1214                  RAU    1901   OUT Q
1215          TR UH   SLT    0008
1216                  ALO   SWDMA
1217                  LDD   TRDME   SUBF2
1218          TRDMA   NZU   SUBK1
1219                  RAL   TEMPH                  PROCESS V
1220                  STU   TEMPH
1221                  STL   TEST
1222                  STU   TESTO                  ZERO V J
1223                  STU   TESTN
1224                  RAL   SWDMB   SUBF1
1225          TRDMB   NZU           ZTDMC          COMMA TEST
1226                  AUP   PARNR
1227                  NZU           ZTDMD          PARENR TES
1228                  AUP   PARNR                  2PAR Z COM
1229                  SRT    0001                  COLLECT SU
1230                  SUP   NINE                    CHARATER
1231                  BMI   STOPF                  N
1232                  AUP   TESTO
1233                  SLT    0001   TRDMG
1234          ZTDMC   RAL   TESTO                  SUBSCRIPT
1235                  STL   TESTN   TRDMG
1236          TRDMG   STU   TESTO   SUB F          ZE
1237          ZTDMD   LDD   TRDMC
1238                  STD   NEXT
1239                  RAL   TESTN                  AT COMMA
1240                  NZE   SUB F   ZTDMC          OVER 2 SUB
1241          TRDMC   LDD   SWDMA   TRDMH          SUPPARLTRD
1242          TRDMH   STD   NEXT    TRDMD
1243          TRDMD   LDD   NZU3    TRDMF
1244          TRDME   LDD   NZU1    TRDMF
1245          TRDMF   STD   OUT
1246                  RSU   TEST    SUBJ1
1247          NZU1    NZU   PACK    STOPF
1248          NZU3    NZU   SUB F   STOPF
1249          SWDMA   SUP   PARNL   TRDMA          NEXT 1
1250          SWDMB   SUP   COMMA   TRDMB          NEXT 2
1251           1823   LDD   TR UE   TR BD          DO STATMNT
1252          TR BD   STD   OUT Q
1253                  RAL   IAC
1254                  SLO   ONE
1255                  STL   IAFI
1256                  RAU    1900                  SHIFT OFF
1257                  SLT    0004   OUT Q
1258          TR UE   ALO   SWDOA
1259                  LDD   CN 84   SUBF2
1260          SWDOA   SUP   ZEROL   TR  C
1261          TR  C   BMI           SUBK1
1262                  AUP   ZEROL
1263                  SLT    0002
1264                  ALO   TEMPH
1265                  STU   TEMPH
1266                  STL   TEST    TR  B
1267          TR  B   ALO   LTR K                  ADD COMMA
1268                  STD   P0003                  PUNCH WOR
1269                  STD   P0005                  PUNCH WOR
1270                  STL   P0001
1271                  RAL   SWD08   SUBF1
1272          TR  D   NZU   SUBK1   ZT5
1273          ZT5     RAU   TEMPH
1274                  STL   TEMPH
1275                  LDD   TR  F   SUBJ
1276          TR  F   STL   P0002                  PUNCH 2
1277                  LDD   SWDOD                  STLP0004TR
1278                  STD   SW 59
1279                  RAL   SWDOC   SUBF1
1280          TR  G   NZU   SUBK2   ZT7
1281          ZT7     RAL   TEMPH
1282                  STL   TEST                   TEST B
1283                  STU   TEMPH   TX  E
1284          TX  E   SLT    0002                  TO HIGH
1285                  NZU           TX  E          ORDER
1286                  SUP   ZEROL
1287                  BMI   NZT9
1288                  RAL   TEST    SW 59
1289          NZT9    RAU   TEST
1290                  LDD   SW 59   SUBJ
1291          TR  H   STU   P0006
1292                  PCH    1977                  PCH CARD O
1293                  STU   P0001                  ZERO PUNCH
1294                  STU   P0002                  WORDS FOR
1295                  STD   P0004
1296                  LDD   SWDOE   TR QQ
1297          TR  I   LDD   SWDOF   TR QQ
1298          TR QQ   STD   SW 59   SUB F
1299          TR  K   LDD   LTR F                  F IN WORD
1300                  STD   P0006   PUNCH            SIX
1301          TR  J   NZE   ZT7                    T STORE M
1302                  LDD   SWDOG                  STLP0004TR
```

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1178   24  0931  0884
0884   65  0003  0458
0458   16  1211  1316
1316   20  0759  0662
0662   60  1901  0931
1875   35  0008  1593
1593   15  0596  1704
1704   69  0508  1054
1754   44  1104  0558
0558   65  0215  1975
1975   21  0215  0868
0868   20  1417  1126
1126   21  0192  1095
1095   21  1817  1176
1176   65  0780  0768
1804   44  0608  0658
0608   10  0276  1182
1182   44  1236  1286
1236   10  0276  1232
1232   30  0001  0740
0740   11  0222  1228
1228   46  0944  1282
1282   10  0192  1347
1347   35  0001  1854
0658   65  0192  1397
1397   20  1817  1854
1854   21  0192  1078
1286   69  0790  1743
1743   24  1375  1278
1278   65  1817  1226
1226   45  1078  0658
0790   69  0596  0649
0649   24  1375  1328
1328   69  1332  1336
0508   69  1261  1336
1336   24  0903  1806
1806   61  1417  1406
1261   44  0051  0944
1332   44  1078  0944
0596   11  0204  1754
0780   11  0259  1804
1823   69  1276  0830
0830   24  0931  0934
0934   65  0003  0708
0708   16  0066  1326
1326   20  0759  0712
0712   60  1900  1856
1856   35  0004  0931
1276   15  0880  1386
1386   69  0840  1054
0880   11  0686  0841
0841   46  1244  1104
1244   10  0686  0891
0891   35  0002  1447
1447   15  0215  1376
1376   21  0215  0918
0918   20  1417  1426
1426   15  0930  1436
1436   24  1979  1382
1382   24  1981  0984
0984   20  1977  0980
0980   65  1333  0768
0758   44  1104  0762
0762   60  0215  1476
1476   20  0215  0968
0968   69  1526  1250
1526   20  1978  1432
1432   69  1486  0890
0890   24  0060  0963
0963   65  1366  0768
0808   44  1254  0812
0812   65  0215  1576
1576   20  1417  1726
1726   21  0215  1018
1018   35  0002  1776
1776   44  1000  1018
1030   11  0676  0941
0941   46  1244  1145
1145   65  1417  0060
1294   60  1417  1876
1876   69  0000  1250
0858   21  1182  1536
1536   71  1177  1378
1378   21  1177  1080
1080   21  1178  1482
1482   24  1180  1383
1383   69  1186  0940
0908   69  1111  0940
0940   24  0160  1078
0958   69  0954  1058
1058   24  1182  0499
1108   45  0112  1013
1013   69  1116  1976
```

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1303                STD   SW 59
1304                LDD   AONE
1305                STD   P0002     ZT7
1306     CN B4      RAL   P0004     TR  J
1307     SWDOB      SUP   EQUAL     TR  D
1308     SWDOC      SUP   COMMA     TR  G
1309     SWDOD      STL   P0004     TR  H
1310     SWDOE      STL   P0004     TR  I
1311     SWDOF      STL   P0002     TR  K
1312     SWDOG      STL   P0004     TR  K
1313      1826      RAU   CN IF6
1314                LDD   TRAEA     SUBJ
1315     TRAEA      STL   TEMPG     FLO
1316     IN10       LDD   LTR F
1317                STD   P0006
1318                STL   SW 59
1319                RAL   SW AA
1320                LDD   ZT 95     TR UI
1321     TR DM      NZU   SUBK2     ZT 95
1322     ZT 95      RAL   TEMPH
1323                STU   TEMPH
1324                SRT    0002
1325                ALO   LTR G
1326                STL   P0001     SW 59
1327     SW AB      LDD   ZROJO
1328                STD   P0003
1329                LDD   IF
1330                STD   P0002
1331                STU   P0009
1332                RAL   LTR V
1333                AUP   TEMPG
1334                LDD                TRADP
1335                LDD   TEMPG
1336                STD   P0003
1337                RAL   LTR U
1338                AUP   ZROJO
1339                LDD   SW AD     TRADP
1340     TRADP      STD   SW 59
1341                STL   P0004
1342                STU   P0005     PCH B
1343     TR DS      STD   P0004     PUNCH
1344     SW AA      SUP   COMMA     TR DM      IF
1345     SW AD      LDD   LTR V     TR DS      IF
1346      1829      STU   IAW       GO TO      1825
1347                LDD                TR BD
1348                SLT    0004
1349                ALO   CN A7
1350                LDD                SUBF2
1351                RAL   TEMPH     IN5
1352     CN A7      SUP   PARNL
1353                NZU   SUBK1     IN7
1354     IN5        SRT    0002
1355                ALO   LTR G     PCH C
1356     IN7        RAL   CN F2
1357                LDD   CNAF1     TR UI
1358     TR UI      STD   LAST      SUBF1
1359     TR  S      NZU                TR  U
1360                SUP   PARNR
1361                NZU   SUBK2     TR  U
1362     TR  U      RAL   TEMPH
1363                STU   TEMPH                ZERO TEMPH
1364                NZE   LOOPR     SUB F
1365     LOOPR      AUP   IAW
1366                SUP   CNAK8
1367                NZU                STP N
1368                AUP   CNA18
1369                STU   IAW
1370                AUP   CN F5      8003      STL1149SUB
1371     CN F5      STL    1989     SUB F      COMPUTED
1372     TR  X      STD   P0002
1373                LDD   LTR U
1374                STD   P0004
1375                RAU   TEMPH
1376                LDD   TR  Y     SUBJ
1377     TR  Y      STL   P0003
1378                RAL   IAW       TRGOG
1379     LOOPT      NZE              PUNCH
1380                PCH    1977
1381                STU   P0009
1382                STL   IAW       TRGOG
1383     TRGOG      LDD                SUBE1
1384                STL   P0005
1385                RAL   IAW
1386                ALO   CN F6      8002      LDD1149SUB
1387     CN F6      RAL    1989     TR  Z      COMPUTED G
1388     TR  Z      SRT    0002
1389                ALO   LTR G
1390                STL   P0001
1391                RAL   IAW
1392                SLO   ONE       LOOPT
1393     CNAF1      LDD   IF        TR  X      COMPUTED G
1394     CN F2      SUP   PARNR     TR  S      COMPUTED G
1395   1
```

```
                    0000 0  91
                    ONE FOR M3
                    LAST
                    NEXT B
                    NEXT C
                    SWDO2  1
                    SWDO2  2
                    SWDO2  3
                    SWDO2  4
                    IF STATMNT
```

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1976    24   0060   1063
1063    69   1466   1428
1428    24   1978   0812
0840    65   1980   1108
1333    11   0184   0758
1366    11   0259   0808
1486    20   1980   0858
1586    20   1980   0908
1311    20   1978   0958
1416    20   1980   0958
1826    60   1130   1736
1736    69   0990   1250
0990    20   1195   1252
1385    69   0154   1258
1258    24   1982   1786
1786    20   0060   1113
1113    65   1566   1478
1478    69   1532   1836
1308    44   1254   1532
1532    65   0215   1528
1528    21   0215   1068
1068    30   0002   1578
1578    15   1582   1437
1437    20   1977   0060
0580    69   1433   1886
1886    24   1979   1732
1732    69   1936   1040
1040    24   1978   1782
1782    21   1985   0488
0488    65   0991   1245
1245    10   1195   0699
0699    69   1358   1361
1358    69   1195   0898
0898    24   1979   1832
1832    65   1487   1041
1041    10   1433   1537
1537    69   1090   1361
1361    24   0060   1213
1213    20   1980   1483
1483    21   1981   1404
1408    24   1980   0499
1566    11   0259   1308
1090    69   0991   1408
1825    21   1180   1533
1533    69   1587   0830
1587    35   0004   1497
1497    15   1458   1263
1263    69   1716   1054
1716    65   0215   1728
1458    11   0204   1309
1309    44   1104   1464
1728    30   0002   1737
1737    15   1582   1354
1464    65   1118   1778
1778    69   1882   1836
1836    24   0461   0768
1558    44   1411   0862
1411    11   0276   1932
1932    44   1254   0862
0862    65   0215   1878
1878    21   0215   1218
1218    45   1230   1078
1230    10   1180   1787
1787    11   1140   1295
1295    44   0749   0834
0749    10   0748   1708
1708    21   1180   1583
1583    10   1837   8003
1837    20   1989   1078
1758    24   1978   1733
1733    69   1487   1190
1190    24   1980   1783
1783    60   0215   1280
1280    69   1833   1250
1833    20   1979   1883
1883    65   1180   1887
1808    45   0912   0499
0912    71   1977   1330
1330    21   1985   0538
0538    20   1180   1887
1887    69   1240   0613
1240    20   1981   1034
1034    65   1181   1937
1937    15   1291   8002
1290    65   1981   1793
1793    30   0000   0799
0799    15   1581   1987
1987    20   1977   1380
1380    65   1181   0588
0588    16   0061   1808
1882    69   1931   1756
1118    11   0271   1558
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 1                                 CHANGES FOR PUNCH ROUTINE
          1828     RAL   NNAL1                SET SW 50     1828   65  0148  1858
                   ALO   ONE                 NXTWD AND      1858   15  0066  1430
                   AUP   SWBA2               1991 FOR       1430   10  1933  0638
                   LDD          TM RA        PROCESSING     0638   69  1091  1344
                   RAL   IAC                 PUNCH          1091   65  0003  1359
                   SLO   ONE                 STATEMENTS     1359   16  0066  1480
                   STL   IAC    ARITH                       1480   20  0003  0199
         SWBA2     SUP   COMMA                BYPASS        1933   11  0259  1313
                   NZU   TR HB               N COMMA        1313   44  1415  1268
                   LDD   TJ10A               AND RESET      1268   69  1300  1409
                   STD   TJ 10               SW 50 TO       1409   24  0028  1084
                   LDD   SWBA3               PROCESS        1084   69  0688  1141
                   STD   SW BA  TR LI        STATEMENT      1141   24  0116  0388
         SWBA3     NZU          TX DH         IF PARNL      0688   44  1191  0411
                   SUP   PARNL               WANT ELEM      1191   11  0204  1459
                   NZU          TJ 5         OF ARRAY       1459   44  1363  1564
                   AUP   ONE 1                IF COMMA      1363   10  0084  1340
                   NZU          TJ 3         VAR ASMBLD     1340   44  1843  1394
                   AUP   COMMA  TR HA        TO PROCESS     1843   10  0259  1339
         TJ 3      RAU   TEMAB                              1394   60  0212  1318
                   NZU          TR HB                       1318   44  1530  1415
                   LDD   STRUP  SUBJ                        1530   69  1134  1250
         STRUP     STU   TEMAC                PRECEDE       1134   21  0167  1580
                   SUP    8001               VAR LOC        1580   11  8001  0738
                   SLT    0002               NUMBER BY      0738   35  0002  1345
                   SUP    8003               T FOR READ     1345   11  8003  1559
                   SRT    0002               AND PUNCH      1559   30  0002  1766
                   ALO   LTR T               STATEMENTS     1766   15  0480  0788
                   LDD   OUT21  TR KK                       0788   69  1241  0491
         OUT21     RAU   TEMAC                IF WHOLE      1241   60  0167  1730
                   NZU   OUT22  TR HB        ARRAY          1730   44  1184  1415
         OUT22     RAU   PRODT               SPECIFIED      1184   60  0541  1395
                   LDD          SUBE         BY PUNCH       1395   69  0948  1251
                   LDD   OUT23               STATEMENT      0948   69  1709  0962
                   STD   OUTP   TR JO        PROCESS IJ     0962   24  0267  0497
         OUT23     RAU   TEMAC               PRODUCT        1709   60  0167  1780
                   SRT    0004               FOLLOWED       1780   30  0004  1291
                   SUP    8003               BY BASE        1291   11  8003  0849
                   AUP   NINE                               0849   10  0222  1880
                   SLT    0004                              1880   35  0004  1341
                   LDD          SUBE                        1341   69  1444  1251
                   SLT    0002                              1444   35  0002  1759
                   STL   TEMAB  TR JP                       1759   20  0212  1865
         TJ 5      LDD   NZU2B                              1564   69  1368  1234
                   STD   NZU2   TX DE                       1234   24  0040  0266
         NZU2B     STU   TEMAC  TJ 5A         PRECD LOC     1368   21  0167  1120
         TJ 5A     RAL   LTR T               NUM BY T       1120   65  0480  0838
                   STL   TEMAB  TJ 8                        0838   20  0212  1220
 1
 1                                 CHANGES FOR READ STATEMENTS
          1829     RAL   NNAL1                SET SW 50     1829   65  0148  1809
                   AUP   SWBA2               NXTWD AND      1809   10  1933  0888
                   LDD          TM RA        1991 FOR       0888   69  1391  1344
                   RAU    1900               READ STATE     1391   60  1900  1859
                   SRT    0002               MENTS          1859   30  0002  1816
                   STL    1900                BYPASS WD     1816   20  1900  0410
                   RAU   TR RD               READ           0410   60  1413  1418
                   ALO   LTRDF                STORE DF      1418   15  1284  1390
                   LDD   TJBSW  SUB X                       1390   69  1050  0049
         TR RD     RAL   ONE    RITH1                       1413   65  0066  0557
         TM RA     STD   OUTE                               1344   24  0911  1714
                   LDD   NINE                               1714   69  0222  1334
                   STD    1991                              1334   24  1991  1494
                   STU   SW BA                              1494   21  0116  1384
                   STL   NN L1  OUTE                        1384   20  0304  0911
         SUB X     STD   TJ SW                              0049   24  0937  1440
                   STL   LAST    8003                       1440   20  0461  8003
          1821     RAL   CCN01  PCH C        CONTINUE       1821   65  1434  1354
          1830     RAL   LTRFF               END            1830   65  1484  1490
                   LDD          TR UC                       1490   69  1893  0165
                   STL   P0006                              1893   20  1982  0938
                   PCH    1977  HEADR                       0938   71  1977  1554
          1827     RAL   CST01  PCH C        PAUSE STOP     1827   65  1534  1354
         ONE 1      00   0000   0001         ONE 1          0084   00  0000  0001
         TWO 1      00   0000   0002                        0210   00  0000  0002
         SEVEN      00   0000   0007                        0296   00  0000  0007
         EIGHT      00   0000   0008                        0196   00  0000  0008
         NINE       00   0000   0009         NINE IN 10     0222   00  0000  0009
         CN A5      00   0000   0010         EQUL H COM     0257   00  0000  0010
         DECPT      00   0000   0018         DECIMAL PT     0149   00  0000  0018
         PARNR      00   0000   0019                        0276   00  0000  0019
         PLUS       00   0000   0020         PLUS SIGN      0365   00  0000  0020
         MULT       00   0000   0029         MULT SIGN      0419   00  0000  0029
         MINUS      00   0000   0030         MINUS SIGN     0197   00  0000  0030
         DIVID      00   0000   0031                        0247   00  0000  0031
         COMMA      00   0000   0038                        0259   00  0000  0038
         PARNL      00   0000   0039                        0204   00  0000  0039
         EQUAL      00   0000   0048         EQUAL SIGN     0184   00  0000  0048
         LTR A      00   0000   0061                        1871   00  0000  0061
         LTR E      00   0000   0065                        0188   00  0000  0065
         LTR F      00   0000   0066                        0154   00  0000  0066
         LTRNI      00   0000   0069                        1393   00  0000  0069
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        LTR K    00    0000   0072                  0930   00  0000  0072
        EGTON    00    0000   0081                  0460   00  0000  0081
        LOW88    00    0000   0088                  1283   00  0000  0088
        ZEROL    00    0000   0090   ALPHA 0 LO     0686   00  0000  0090
        AONE     00    0000   0091   ALPHA ONE      1466   00  0000  0091
        LTRFF    00    0000   6666                  1484   00  0000  6666
        IF       00    0000   6966                  1936   00  0000  6966
        ONE      00    0001   0000   ONE IN FIF     0066   00  0001  0000
        TWO      00    0002   0000   TWO IN FIF     1211   00  0002  0000
        THREE    00    0003   0000   THREE IN 5     1056   00  0003  0000
        FOUR     00    0004   0000   FOUR IN 5T     0090   00  0004  0000
        FIVE     00    0005   0000   FIVE IN 5T     0102   00  0005  0000
        SIX      00    0006   0000                  0510   00  0006  0000
        CNAK8    00    0010   0000                  1140   00  0010  0000
        CNAI8    00    0011   0000                  0748   00  0011  0000
        CNBK8    00    0025   0000                  0110   00  0025  0000
        CNBI8    00    0026   0000                  0122   00  0026  0000
        CNIF6    00    0091   6966                  1130   00  0091  6966
        HNDRD    00    0100   0000   TABLE CNST     1874   00  0100  0000
        LTR B    62    0000   0000                  0907   62  0000  0000
        LTR D    64    0000   0000                  0747   64  0000  0000
        LTRFH    66    0000   0000   F IN HOP       0240   66  0000  0000
        LTR G    67    0000   0000                  1582   67  0000  0000
        CST01    68    0000   0000   WORD HALT      1534   68  0000  0000
        LTR I    69    0000   0000                  1264   69  0000  0000
        LTR J    71    0000   0000                  1577   71  0000  0000
        LTR L    73    0000   0000                  0979   73  0000  0000
        LTR M    74    0000   0000                  0847   74  0000  0000
        LTR P    77    0000   0000                  0532   77  0000  0000
        LTR Q    78    0000   0000                  0828   78  0000  0000
        LTR R    79    0000   0000                  1222   79  0000  0000
        LTR S    82    0000   0000                  0797   82  0000  0000
        LTR T    83    0000   0000                  0480   83  0000  0000
        LTR U    84    0000   0000                  1487   84  0000  0000
        LTR V    85    0000   0000                  0991   85  0000  0000
        LTR X    87    0000   0000                  0795   87  0000  0000
        LTR Y    88    0000   0000                  1114   88  0000  0000
        LTR Z    89    0000   0000                  1135   89  0000  0000
        LTRDF    00    0000   6466                  1284   00  0000  6466
        LTRKH    72    0000   0000   K IN HOP       1272   72  0000  0000
        AZFRO    90    0000   0000                  0604   90  0000  0000
        ZROB     90    6200   0000                  0957   90  6200  0000
        CCN01    88    9189   8891   CONT CONST     1434   88  9189  8891
        LMCOM    73    7400   0000                  0976   73  7400  0000
        SLCOM    82    7300   0000                  1889   82  7300  0000
        STOPA    HLT   0010   PACK   NZ PARN CO     0136   01  0010  0051
        STOPB    HLT   0001   PACK   TLU ERROR      0245   01  0001  0051
        STOPF    HLT   0400   PACK   NOT INTEGE     0944   01  0400  0051
        STOPH    HLT   0020   PACK   PACK ERROR     0560   01  0020  0051
        STP N    HLT   0002   PACK   TABLE OVFL     0834   01  0002  0051
        STP R    HLT   0003   PACK                  0020   01  0003  0051
        STOPM    HLT   0004   PACK   VARIABLE O     1227   01  0004  0051
        STOPN    HLT   0300   PACK   TRANSLTN O     0542   01  0300  0051
        STOPO    HLT   0100   PACK   SUBSCRPT O     0711   01  0100  0051
         1171    HLT   0030   PACK   FUNCTION N     1171   01  0030  0051
        STOPC    HLT   0005   PACK   SCAN OVRFL     0769   01  0005  0051
        EGHTS    00    0800   8080                  0004   00  0800  8080
        ZROJO    90    7190   0000   IF CONSTAN     1433   90  7190  0000
  1                    PROCESS EQUIVALENCE STATEMENT
         1824    RAL   IAC             INITIALZE    1824   65  0003  0610
                 SLO   THREE          WORD COUNT    0610   16  1056  1461
                 STL   IAFI           PARN COUNT    1461   20  0759  1012
                 STU   TEMAA                        1012   21  0127  1584
                 RAU    1902                        1584   60  1902  0660
                 SLT    0002           IS CHARAC    0660   35  0002  1468
                 ALO   EQSW1  SUBF3    IS CHARAC    1468   15  1734  1414
        EQSW1    SUP   PARNL          LEFT PAREN    1734   11  0204  0710
                 NZU          EQ1     COMMA OR      0710   44  1463  1764
                 AUP   ONE 1          RGHT PAREN    1463   10  0084  1540
                 NZU          EQ2      IF NO        1540   44  1943  1544
                 AUP   PARNR          RESTOR VAR    1943   10  0276  1784
                 NZU   SUBK1  EQ3                   1784   44  1104  0988
        EQ1      RAL   TEMAA           YES LEFT     1764   65  0127  1834
                 ALO   ONE            PAREN         1834   15  0066  1884
                 STU   F1              INCREMENT    1884   21  0373  1934
                 STD   F3             PARN COUNT    1934   24  0161  1814
                 STD   TEMAB                        1814   24  0212  1866
                 STD   F9              INITIALZE    1866   24  0208  1561
                 STL   TEMAA  SUB F   FOR NEW       1561   20  0127  1078
  1                                   EQUIVL SET
        EQ2      RAU   TEMAA           YES COMMA    154    60  0127  1038
                 NZU   EQ2A   EQOUT    PRNCT ZRO    103    44  1441  0792
        EQ2A     RAU   TEMPH          START NEW     144    60  0215  1088
                 STL   TEMPH          EQUIV SET     108    20  0215  1568
                 LDD   OUTEQ  SUBJ                  156    69  1138  1250
        OUTEQ    RAU    8003           NOT ZERO     113    60  8003  1445
          .      SRT    0004          PROCES VAR    1445   30  0004  0760
                 SUP    8003           IS BASE      0760   11  8003  1718
                 SRT    0006          OF NEW VAR    1718   30  0006  1188
                 STL   OUT Q          LESS THAN -   1188   20  0931  1238
                 AUP   F1             BASE OF       1238   10  0373  1288
                 NZU          EQ2AA   PREVIOUS      1288   44  1491  0842
                 SUP    8002          VARIABLE      1491   11  8002  0899
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         BMI  EQ2B   EQ2AA               0899  46  0810  0842
EQ2AA    STL  F1     EQ2B    SAVE LOW    0842  20  0373  0810
EQ2B     RAL  PRODT          BASE        0810  65  0541  1495
         SLO  F3              IS JI      1495  16  0161  1966
         BMI  EQ2C           PROD OF     1966  46  1338  1388
         ALO  8001           NEW VAR     1388  15  8001  1545
         STL  F3             GREATER     1545  20  0161  1864
         LDD  EQ2BA          THAN PROD   1864  69  1768  1438
         STD  EQSW2          OF PREVIOS  1438  24  1541  1594
         LDD  OUT Q          VARIABLE    1594  69  0931  1488
         STD  TEMAE  TREQ1    SAVE BSE   1488  24  0014  1818
TREQ1    RAU  F9             OF LRG ARY  1818  60  0208  1563
         SUP  FIVE                       1563  11  0102  0860
         NZU         STP N    SAVE LRGE  0860  44  1713  0834
         AUP  SIX            PRODUCT     1713  10  0510  1868
         STU  F9              STORE      1868  21  0208  1711
         STD  F6             SUBSC TABL  1711  24  0467  1538
         ALO  SUBSC          LOCAT IN    1538  15  1962  1968
         AUP         8003    EQU VAR TA  1968  10  1588  8003
         STL  1449   EQSW2    HALT IF    1588  20  1449  1541
EQ2BA    ALO  EQ2B1          MORE        1768  15  1738  1744
         LDD  EQSW3  EQ2BB    THAN       1744  69  1547  0910
EQ2BB    STD  SW 50  EQ2BE    FIVE       0910  24  0476  1788
EQ2BE    LDD  EQ2B2  EQ2BC    VARIABLES  1788  69  1591  1794
EQ2BC    SDA  F8             IN EQU SET  1794  22  0052  0960
         STL  F7                         0960  20  0297  1060
         RSL  F1     F7       READ EQU   1060  66  0373  0297
EQ2B1    LDD  1499   F8      VAR TABLE   1738  69  1499  0052
EQ2B2    SIA  0000   EQ2BD   TO INSERT   1591  23  0000  1110
EQ2BD    RAU  F6             LOW BASE    1110  60  0467  1838
         SUP  ONE            IN 15XX     1838  11  0066  1888
         NZU         SUB F               1888  44  1741  1078
         STU  F6              IF IJ      1741  21  0467  1938
         AUP         8003    PRODT OF    1938  10  1791  8003
         RAL  1449   SW 50               1791  65  1449  0476
EQSW3    ALO  EQ2B3  EQ2BE               1547  15  1260  1788
EQ2B3    SUP  1499           EQUIV SET   1260  11  1499  1310
         BMI         EQ2BD   CHNGE 15XX  1310  46  1763  1110
         LDD  8003   F8      TO MINUS    1763  69  8003  0052
EQ2C     LDD  EQ2CA          IN SUBSC    1336  69  1841  1844
         STD  EQSW2  TREQ1   TABLE       1844  24  1541  1818
EQ2CA    ALO  EQ2B3                      1841  15  1260  1988
         LDD  EQSW4  EQ2BB               1988  69  1891  0910
EQSW4    ALO  EQ2B1  EQ2BE               1891  15  1738  1788
EQ3      RAL  TEMAA           YES RGHT   0988  65  0127  1590
         SLO  ONE            PAREN       1590  16  0066  1740
         STL  TEMAA           DECREMENT  1740  20  0127  1790
         LDD  EQOUT          PAREN       1790  69  0792  1595
         STD  LAST   EQ2A    COUNT       1595  24  0461  1441
EQOUT    RAL  EQ3A1  EQ3A     PREPAR TO  0792  65  1745  0949
EQ3A     SLO  EQ3A2          SCAN SUBSC  0949  16  1360  1840
         NZE         EQ3D    TABLE AND   1840  45  1894  1795
         ALO  EQ3B           ADJUST      1894  15  1597  1410
         LDD  EQ3C1          BASES       1410  69  1813  1890
         SDA  F4                         1890  22  0261  1964
         LDD  EQ3C2                      1964  69  1940  1944
         SDA  F5                         1944  22  1117  1941
         STL  TEMAC  8001                1941  20  0167  8001
EQ3A1    RAL  1499   EQ3BA               1745  65  1499  1460
EQ3A2    RAL  1519   EQ3BA               1360  65  1519  1460
EQ3B     RAL  1520   EQ3BA               1597  65  1520  1460
EQ3BA    BMI         EQ3BB               1460  46  1863  0892
         LDD  SETM   STORM               1863  69  0942  1845
EQ3BB    LDD  EQ3BC  STORM               0892  69  1895  1845
STORM    STD  SWCHM           COMPARE    1845  24  0998  1560
         RSM  8002           BASE OF     1560  68  8002  0992
         SLT  0006           15XX WITH   0992  35  0006  1710
         STU  OUTP           BSE OF EQV  1710  21  0267  1042
         SUP  8003           SET         1042  11  8003  0999
         SLT  0004            IF LESS    0999  35  0004  1760
         AUP  F1             CONTINUE    1760  10  0373  1092
         BMI  EQ3C           SCAN        1092  46  1945  0646
         NZU  EQ3BC  SWCHM    IF EQUAL   0646  44  1895  0998
EQ3BC    RAL  TEMAC  EQ3A    ADJUST LOC  1895  65  0167  0949
SETM     RAM  OUTP           COUNT       0942  67  0267  1142
         SLT  0004            IF GRTER   1142  35  0004  1810
         LDD  EQ3BD          COMPARE     1810  69  1963  1192
         STD  J106   J104    WITH ORIG   1192  24  1785  0754
EQ3BD    ALO  TEMAB          BSE OF      1963  15  0212  1242
         LDD  J106A          LRGST ARAY  1242  69  0854  1860
         STD  J106            DECREASE   1860  24  1785  1292
         STL  TEMAB  EQ3BC   OR INCRESE  1292  20  0212  1895
EQ3C     SUP  8001           BASE OF     1945  11  8001  1761
         AUP  TEMAE          15XX AS     1761  10  0014  1342
         BMI  EQ3CB          NEEDED      1342  46  0696  0746
         SUP  8001                       0746  11  8001  1811
         RAM  8003                       1811  67  8003  1392
         ALO  F3     EQ3CA               1392  15  0161  1442
EQ3CA    SLO  TEMAB  F4                  1442  16  0212  0261
EQ3C1    LDD  0000   F5                  1813  69  0000  1117
EQ3C2    SIA  0000   EQ3BC               1940  23  0000  1895
EQ3CB    SUP  8001                       0696  11  8001  1861
         RAM  8003   EQ3CA               1861  67  8003  1442
```

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1675        EQ3D    LDD   PACK
1676                STD   LAST    SUB F
1677                PAT
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1795    69  0051  1062
1062    24  0461  107#
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```
                    EQU   MINUS    0197
                    EQU   SWPKA    0098
                    EQU   READ     0050
                    EQU   PACKA    0088
1                         PACK
1                   FOR TRANSIT I S  AND II  S
                    BLA    1000    1010
                    REG   R1951    1960      READ BAND
        PACKA       RAL   R0001                          0088   65  1951  1005
                    NZE                ZTPK1             1005   45  1008  1009
                    SLT    0002                           1008   35  0002  1492
                    STL   R0001                           1492   20  1951  1004
                    RAL    8003                           1004   65  8003  1112
                    NZE   SWPKT   PACKA                   1112   45  1542  0088
        ZTPK1       RAL   R0002                          1009   65  1952  1007
                    NZE                ZTPK2             1007   45  1010  1212
                    SLT    0002                           1010   35  0002  1592
                    STL   R0002                           1592   20  1952  1006
                    RAL    8003                           1006   65  8003  1742
                    NZE   SWPKT   ZTPK1                   1742   45  1542  1009
        ZTPK2       RAL   R0003                          1212   65  1953  1262
                    NZE                ZTPK3             1262   45  1792  1842
                    SLT    0002                           1792   35  0002  1049
                    STL   R0003                           1049   20  1953  1312
                    RAL    8003                           1312   65  8003  1892
                    NZE   SWPKT   ZTPK2                   1892   45  1542  1212
        ZTPK3       RAL   R0004                          1842   65  1954  1362
                    NZE                ZTPK4             1362   45  1942  0796
                    SLT    0002                           1942   35  0002  1099
                    STL   R0004                           1099   20  1954  1412
                    RAL    8003                           1412   65  8003  0846
                    NZE   SWPKT   ZTPK3                   0846   45  1542  1842
        ZTPK4       RAL   R0005                          0796   65  1955  1462
                    NZE                ZTPK5             1462   45  0896  0946
                    SLT    0002                           0896   35  0002  1003
                    STL   R0005                           1003   20  1955  1562
                    RAL    8003                           1562   65  8003  0996
                    NZE   SWPKT   ZTPK4                   0996   45  1542  0796
        ZTPK5       RAL   R0006                          0946   65  1956  1712
                    NZE                READ              1712   45  1046  0050
                    SLT    0002                           1046   35  0002  1762
                    STL   R0006                           1762   20  1956  1812
                    RAL    8003                           1812   65  8003  1096
                    NZE   SWPKT   ZTPK5                   1096   45  1542  0946
        SWPKT       SLO    491                            1542   16  1146  1001
                    NZE   NZK1                            1001   45  1862  1196
                    RAL   MINUS   SWPKA                   1196   65  0197  0098
        NZK1        ALO    8001   SWPKA                   1862   15  8001  0098
        491          00    0000    0049                   1146   00  0000  0049
                    PAT
                    PST
```

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1                      PACK
1.                   FOR TRANSIT I AND II
         PACKA    RAL   R0001             CHARACTER     0088   65  1951  1112
                  NZE             PACKB    FROM WORD    1112   45  1492  1542
                  SLT    0002               1 2 3 4     1492   35  0002  1049
                  SUP   NINE                TO TEMAA    1049   11  0222  1592
                  STL   R0001               AND DROP    1592   20  1951  1212
                  STU   TEMAA               THE FOUR    1212   21  0127  1742
                  RAL   R0004             CHARACTER     1742   65  1954  1262
                  NZE             ZTPKB    FROM WORD    1262   45  1792  1842
                  RAL   R0007               7 5 OR 6    1792   65  1957  1312
                  SLT    0001     TRPKC     TO TEMAB    1312   35  0001  1892
         ZTPKB    RAL   R0007               SECT 1 X    1842   65  1957  1362
                  SLT    0002     TRPKC     SECT 2 XX   1362   35  0002  1892
         TRPKC    STL   R0007                           1892   20  1957  1412
                  STU   TEMAB                           1412   21  0212  1942
                  RAL   R0008             CHARACTER     1942   65  1958  0796
                  SLT    0001              FROM WD      0796   35  0001  1462
                  STL   R0008              8 OR 9 TO    1462   20  1958  1562
                  STU   TEMAC     PACKC    TEMAC        1562   21  0167  0846
         PACKB    RAL   R0002                           1542   65  1952  1712
                  NZE             ZTPKC                 1712   45  0896  0946
                  STD   R0001             WD 2 TO WD    0896   24  1951  1762
                  STU   R0002             ZERO WD 2     1762   21  1952  1812
                  RAL   R0004                           1812   65  1954  1862
                  NZE   PACKA                           1862   45  0088  0996
                  LDD   R0006                           0996   69  1956  1046
                  STD   R0007     PACKA                 1046   24  1957  0088
         ZTPKC    RAL   R0004             TEST FOR      0946   65  1954  1096
                  NZE             READ     1ST OR 2N    1096   45  1146  0050
                  STD   R0002             WD4 TO WD2    1146   24  1952  1196
                  LDD   R0003                           1196   69  1953  1246
                  STD   R0001             WD3 TO WD1    1246   24  1951  1296
                  LDD   R0005                           1296   69  1955  1346
                  STD   R0007             WD5 TO WD7    1346   24  1957  1396
                  LDD   R0009                           1396   69  1959  1446
                  STD   R0008             WD9 TO WD8    1446   24  1958  1496
                  STU   R0004     PACKA   ZERO WD 4     1496   21  1954  0088
         PACKC    RAL   R0004             SECT 1 OR     0846   65  1954  1546
                  NZE   PACKD                           1546   45  1596  1746
                  RAL   TEMAB             SECT 2        1746   65  0212  1796
                  NZE             ZTPKG    TEST FOR     1796   45  1846  1896
                  SLO   ZEROL     TRPKA     NINTY       1846   16  0686  1946
         TRPKA    STL   TEMAB     PACKD    XN TEMAB     1946   20  0212  1596
         ZTPKG    RAL   NINE      TRPKA   IS ZERO       1896   65  0222  1946
         PACKD    RAL   TEMAC             TEST TEMAC    1596   65  0167  1747
                  NZE   NZPKI              FOR ZERO     1747   45  1797  1847
                  RAL   TEMAB             TEMAC IS 0    1847   65  0212  1897
                  SLO  -NINE              TEST TEMAB    1897   16  0222  1947
                  NZE   NZPKJ     PKTLU    FOR 90       1947   45  1048  1098
         NZPKJ    RAL   TEMAA             TEMAB NOT     1048   65  0127  1148
                  ALO   TEMAB              ARGUMENT     1148   15  0212  1198
                  SLO   EGTON             TEST FOR 8    1198   16  0460  1248
                  NZE             ZTPKK                 1248   45  1298  1348
                  ALO    8001     SWPKA                 1298   15  8001  0098
         ZTPKK    RAL   DIVID     SWPKA   MAKE 31       1348   65  0247  0098
         NZPKI    RAL   TEMAB             TEST FOR 9    1797   65  0212  1398
                  SLO   NINE                            1398   16  0222  1448
                  NZE  _PKTLU                           1448   45  1098  1498
                  LDD   TEMAC             IS 90         1498   69  0167  1548
                  STD   TEMAB     NZPKJ                 1548   24  0212  1048
         PKTLU    RAU   TEMAA             BUILD         1098   60  0127  1598
                  AUP   TEMAB              ARGUMENT     1598   10  0212  1748
                  SLT    0001              AA AB AC     1748   35  0001  1798
                  AUP   TEMAC                           1798   10  0167  1848
                  SLT    0007                           1848   35  0007  1898
                  STU   TEMAA                           1898   21  0127  1099
                  TLU    1000             TABLE AT      1099   84  1000  1149
                  ALO             8002     1000         1149   15  1199  8002
                  RAL    0000                           1199   65  0000  1249
                  SLO   TEMAA                           1249   16  0127  1299
                  NZE             PACKA   PACKA FOR     1299   45  1349  0088
                  SLT    0004                           1349   35  0004  1399
                  NZU   STOPH                           1399   44  0560  1449
                  SRT    0008     SWPKA                 1449   30  0008  0098
          1000     63    8018     0000                  1000   63  8018  0000
          1001     64    8019     0000                  1001   64  8019  0000
          1002     69    0020     0000                  1002   69  0020  0000
          1003     74    8029     0000                  1003   74  8029  0000
          1004     79    0030     0000                  1004   79  0030  0000
          1005     83    8038     0000                  1005   83  8038  0000
          1006     84    8039     0000                  1006   84  8039  0000
          1007     89    0090     0000                  1007   89  0090  0000
          1008     93    8048     0000                  1008   93  8048  0000
          1009     94    8030     0000                  1009   94  8030  0000
          1010     99    0000     0000                  1010   99  0000  0000
                  PAT
                  PST
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1T
Compiler
FORTRANSIT II, IIs

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 1          BLR     0000    0024
 2          BLR     0051    0143
 3          BLR     1951    1962
 4          BLR     0161    0199
 5          BLR     0172    0172
 6          BLR     0212    0249
 7          BLR     0222    0222
 8          BLR     0264    0264
 9          BLR     0266    0266
10          BLR     0269    0269
11          BLR     0271    0271
12          BLR     0272    0272
13          BLR     0273    0273
14          BLR     0278    0278
15          BLR     0282    0282
16          BLR     0288    0288
17          BLR     0299    0299
18          BLR     0316    0316
19          BLR     0319    0319
20          BLR     0321    0321
21          BLR     0323    0323
22          BLR     0328    0328
23          BLR     0332    0332
24          BLR     0338    0338
25          BLR     0349    0349
26          BLR     0366    0366
27          BLR     0369    0369
28          BLR     0371    0371
29          BLR     0373    0373
30          BLR     0378    0378
31          BLR     0382    0382
32          BLR     0388    0388
33          BLR     0399    0399
34          BLR     0419    0419
35          BLR     0423    0423
36          BLR     0428    0428
37          BLR     0438    0438
38          BLR     0449    0449
39          BLR     0469    0469
40          BLR     0473    0473
41          BLR     0488    0488
42          BLR     0499    0499
43          BLR     0549    0549
44          BLR     0599    0599
45          BLR     0649    0649
46          REG     T0032   0050
47          REG     E0700   0718
48          REG     D0719   0727
49          REG     X1000   1003
50          REG     00600   0628
51          SYN     NINEO   1003
52          REG     R0536   0539
53          REG     Q0550   0562
54          REG     M0568   0591
55          REG     J1977   1986    J BAND
56          REG     W1977   1986      W BAND
57          REG     A1849   1900
58          SYN     ACC     0434
59          SYN     ONE     0434
60          EQU     D       0718
61          SYN     S       1957
62          SYN     PC      1958
63          SYN     TAU     1960
64          SYN     PS      1234
65          SYN     READA   1234
66          SYN     START   1999
67          SYN     STRTA   1998
68          SYN     V1      1961
69          SYN     NU      1962
70          SYN     MU      1951
71          SYN     ARINC   1952
72          SYN     XST     1953
73          SYN     ARITH   1954
74          SYN     UBAR    1955
75          SYN     JAY     1956
76          SYN     QUOTA   1972
77          SYN     INTGR   1973
78          SYN     GAMMA   1974
79          SYN     OPSGN   1975
80          SYN     TALLY   1976
81          SYN     L       1987
82          SYN     R       1988
83          SYN     N       1989
84          SYN     K       1990
85          SYN     U       1991
86          SYN     TEMP1   1992
87          SYN     TEMP2   1993
88          SYN     TEMP3   1994
89          SYN     TEMP4   1995
90          SYN     TEMP5   1996
91          SYN     TEMP6   1997
92          SYN     WL      0163
93          SYN     HR      0170
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                SYN   ENDT    0174
                SYN   ENDL    0175
                SYN   ENDY    0176
                SYN   ENDH    0180
                SYN   ENDG    0181
                SYN   YN      0184
                SYN   YL      0185
                SYN   MY      0186
                SYN   TN      0190
                SYN   TL      0247
                SYN   RZ      0192
                SYN   PS3     0193
                SYN   NZ      0194
                SYN   RR      0195
                SYN   RW      0196
                SYN   EN      0197
                SYN   PCMMA   0207
                SYN   QCMMA   0208
                SYN   RCMMA   0209
                SYN   NCMMA   0210
                SYN   MINN    0211
                SYN   EE      0198
                SYN   PS12    0212
                SYN   NW      0213
                SYN   FW      0215
                SYN   NF      0217
                SYN   WY      0218
                SYN   MINL    0220
                SYN   MINI    0224
                SYN   KQ      0225
                SYN   ZN      0226
                SYN   QF      0230
                SYN   PN      0231
                SYN   WE      0253
                SYN   PF      0234
                SYN   PW      0235
                SYN   IN      0236
                SYN   IL      0239
                SYN   FI      0240
                SYN   GN      0241
                SYN   FF      0242
                SYN   DF      0243
                SYN   BN      0244
                SYN   BS      0245
                SYN   MN      0161
                SYN   NOPR    0201
                SYN   NEXT    0200
                SYN   UN      0191
     0162  -  57   9900   0000     T  L      0162  -  57   9900   0000
     0164     53   9936   7900     TABLE     0164     53   9936   7900
     0214     75   7155   7800     TABLE     0214     75   7155   7800
     0264  -  52   9000   0000     TABLE     0264  -  52   9000   0000
     0165  -  10   9900   0000     TABLE     0165  -  10   9900   0000
     0166     57   9935   7900     TABLE     0166     57   9935   7900
     0216     74   7170   7200     TABLE     0216     74   7170   7200
     0266     33   6982   6600               0266     33   6982   6600
     0316     33   6838   7800     TABLE     0316     33   6838   7800
     0366  -  83   6400   0000     TABLE     0366  -  83   6400   0000
     0167  -  21   9000   0000     TABLE     0167  -  21   9000   0000
     0168  -  20   9000   0000     TABLE     0168  -  20   9000   0000
     0169     58   8258   8700     TABLE     0169     58   8258   8700
     0219     58   7358   8900     TABLE     0219     58   7358   8900
     0269     64   7458   6400     TABLE     0269     64   7458   6400
     0319     58   7210   9900     TABLE     0319     58   7210   9900
     0369     58   7700   0000               0369     58   7700   0000
     0419     16   9058   7200               0419     16   9058   7200
     0469  -  80   6600   0000               0469  -  80   6600   0000
     0171     57   9966   8200     TABLE     0171     57   9966   8200
A    0221     51   7466   7300     TABLE     0221     51   7466   7300
     0271     66   6466   8700               0271     66   6466   8700
     0321     66   8966   7700     TABLE     0321     66   8966   7700
     0371  -  66   7200   0000               0371  -  66   7200   0000
     0172     47   7748   7800               0172     47   7748   7800
     0222     49   7950   9900               0222     49   7950   9900
A    0272  -  33   6547   7100               0272  -  33   6547   7100
     0173     03   8203   8700     TABLE     0173     03   8203   8700
     0223     60   7403   8900     TABLE     0223     60   7403   8900
     0273     25   8803   7300     TABLE     0273     25   8803   7300
     0323     03   6479   6900     TABLE     0323     03   6479   6900
     0373     03   7203   7700     TABLE     0373     03   7203   7700
     0423     15   9087   8300               0423     15   9087   8300
     0473  -  03   7200   0000               0473  -  03   7200   0000
     0177     53   9936   7900     TABLE     0177     53   9936   7900
     0227  -  75   7155   7800     TABLE     0227  -  75   7155   7800
     0178     35   7910   9900     TABLE     0178     35   7910   9900
     0228     93   8260   7400               0228     93   8260   7400
     0278     93   8793   7300               0278     93   8793   7300
     0328     93   6474   7100               0328     93   6474   7100
     0378     93   7793   7200               0378     93   7793   7200
     0428  -  93   8938   7800               0428  -  93   8938   7800
     0179     10   9974   7100     TABLE     0179     10   9974   7100
     0229  -  35   7938   7800     TABLE     0229  -  35   7938   7800
     0182     53   9936   7900     TABLE     0182     53   9936   7900
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	187	0232		33	8975	7100	TABLE	0232		33	8975	7100
	188	0282		33	7355	7800	TABLE	0282		33	7355	7800
	189	0332		33	7233	7700	TABLE	0332		33	7233	7700
	190	0382	-	85	6233	7200		0382	-	85	6233	7200
	191	0183		10	9914	9000	0	0183		10	9914	9000
	192	0233	-	35	7900	0000		0233	-	35	7900	0000
	193	0187		53	9936	7900	TABLE	0187		53	9936	7900
	194	0237	-	75	7155	7800	TABLE	0237	-	75	7155	7800
	195	0188		58	8264	7400	TABLE	0188		58	8264	7400
	196	0238		58	7358	6400	TABLE	0238		58	7358	6400
	197	0288		58	8758	8900	TABLE	0288		58	8758	8900
	198	0338		26	8500	0000		0338		26	8500	0000
	199	0388		58	7758	7200	TABLE	0388		58	7758	7200
	200	0438		33	6616	9000		0438		33	6616	9000
	201	0488	-	58	7200	0000		0488	-	58	7200	0000
	202	0189	-	34	9932	7900	TABLE	0189	-	34	9932	7900
	203	0249		66	8251	7400		0249		66	8251	7400
	204	0199		57	9971	7100	TABLE	0199		57	9971	7100
	205	0299		66	7376	6900	TABLE	0299		66	7376	6900
	206	0349		24	8866	8700	TABLE	0349		24	8866	8700
	207	0399		66	6466	8900	TABLE	0399		66	6466	8900
	208	0449		66	7231	8400		0449		66	7231	8400
	209	0499		01	8537	7800	TABLE	0499		01	8537	7800
	210	0549		66	7781	6700	TABLE	0549		66	7781	6700
	211	0599		33	6684	6200		0599		33	6684	6200
	212	0649	-	30	8366	7200		0649	-	30	8366	7200
	213	START		RD1	STRTA	9999		1999		70	1998	9999
A	214	STRTA		RAL	1951			1998		65	1951	1938
B	214			NZE	1952			1938		45	1952	1542
C	214			RAL	YCNST			1542		65	0151	0155
	215			STL	W0002			0155		20	1978	0031
	216			RAU	1954			0031		60	1954	0159
	217			AUP	ONET			0159		10	0262	0267
	218			LDD		STNON		0267		69	0270	0523
	219			STU	W0003			0270		21	1979	0432
	220			RAL	REG			0432		65	0285	0289
	221			STL	W0004			0289		20	1980	0283
	222			STU	W0001			0283		21	1977	0030
	223			STU	W0005			0030		21	1981	0284
	224			STU	W0006			0284		21	1982	0335
	225			RAU	LOCUS			0335		60	0638	0293
	226			STU	TEMP9			0293		21	0148	0251
	227			LDD		PS133		0251		69	0154	0157
	228			RAL	C985			0154		65	0257	0261
	229			STU	A0001			0261		21	1849	0152
	230			STL	X0001			0152		20	1000	0153
	231			ALO	ONET			0153		15	0262	0317
	232			STL	X0002			0317		20	1001	0204
	233			ALO	ONET			0204		15	0262	0367
	234			STL	X0003	PS0		0367		20	1002	0205
	235	C985		90	0000	8005		0257		90	0000	8005
	236	PS0		STU	PS1			0205		21	0160	0263
	237			LDD	TAU1	PSS		0263		69	0416	0519
	238	PSS		STD	TAU	PS		0519		24	1960	1234
	239	READA		RCD	0051		FIRST READ	1234		70	0051	0301
	240			RAL	0057		STORE STMN	0301		65	0057	0311
	241			STL	0000			0311		20	0000	0203
	242			RAL	ONET			0203		65	0262	0417
	243			STL	FLAG		FLAG SET	0417		20	0421	0274
	244			STL	TALLY	PS1A	ONE	0274		20	1976	0029
	245	PS1		RCD	0051	PS1A	NEXT READ	0150		70	0051	0029
	246	PS1A		RAU	MAX		ALARM IF	0029		60	0482	0287
	247			SUP	TALLY		TALLY IS	0287		11	1976	0281
	248			NZU		LARM	MAXIMUM	0281		44	0385	0286
	249			RAL	TALLY		KK XXXX YY	0385		65	1976	0331
	250			ALO	STORE		IS	0331		15	0334	0339
	251			LDD	PS2	SR1	0600510000	0339		69	0292	0145
	252	PS2		RAL	TALLY		TALLY PLUS	0292		65	1976	0381
	253			ALO	SIXT		SIX IS TAL	0381		15	0384	0389
	254			STL	TALLY		GAMMA EQUA	0389		20	1976	0279
	255			RAU	0056		WORD6 TIME	0279		60	0056	0361
	256			SRT	0002	PS2B	01	0361		30	0002	0467
	257	PS2B		STU	GAMMA		L EQUALS E	0467		21	1974	0027
	258			STL	L		SYMBOL	0027		20	1987	0290
	259			RAU	8002			0290		60	8002	0149
	260			SUP	RSL		RECYCLE IF	0149		11	0202	0307
	261			NZU	PS1		IS NOT F	0307		44	0150	0312
	262			RAL	FFTY1		INITIALIZE	0312		65	0265	0669
	263			STL	U		IF L IS F	0669		20	1991	0144
	264			RAU	NZZZ			0144		60	0147	0351
	265			SLT	0004			0351		35	0004	0411
	266			STU	NZCT			0411		21	0466	0769
	267			RAL	TALLY		TALLY MINU	0769		65	1976	0431
	268			SLO	ONET		ONE	0431		16	0262	0517
	269			SLT	0004		TALLY IN D	0517		35	0004	0277
	270			STL	TALLY			0277		20	1976	0329
	271			STL	QUOTA	PS2A	TALLY	0329		20	1972	0025
	272	PS2A		STU	V1			0025		21	1961	0314
	273			STU	K		PRESET ALL	0314		21	1990	0343
	274			STU	T0001		PERTINENT	0343		21	0032	0435
	275			STU	NU		COUNTERS	0435		21	1962	0315
	276			STU	J0001		TO ZERO	0315		21	1977	0280
	277			STU	N			0280		21	1989	0342

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278                 STU   NBAR                                  0342  21  0146  0699
279                 STU   MU                                    0699  21  1951  0254
280                 STU   ARITH                                 0254  21  1954  0357
281                 STU   PORR                                  0357  21  0362  0365
282                 STU   EL                                    0365  21  0320  0673
283                 STU   OPSGN   PS3                           0673  21  1975  0193
284           PS3   RAU   GAMMA                                 0193  60  1974  0379
285                 NZU           PS5       OUT IF GAM        0379  44  0333  0484
286                 SRT    0002             IS ZERO           0333  30  0002  0439
287                 STU   GAMMA              FETCH NEXT        0439  21  1974  0327
288                 RAU    8002             SYMBOL S          0327  60  8002  0485
289                 NZU           PS3       RECYCLE IF        0485  44  0489  0193
290                 ALO   L                  ZERO  IF N        0489  15  1987  0291
291                 STL   R                                     0291  20  1988  0341
292                 STU   L                                     0341  21  1987  0340
293                 SUP   NINEO                                 0340  11  1003  0407
294                 BMI   PS3B    PS3C                          0407  46  0260  0461
295           PS3C  RAU   L                  THEN RETUR        0461  60  1987  0391
296                 STU   INTGR               TO PS3B           0391  21  1973  0026
297                 RAU   NININ   PS3BA                         0026  60  0429  0383
298           PS3B  RAL   R                                     0260  65  1988  0393
299                 SRT    0004                                 0393  30  0004  0303
300                 ALO   HNDRD                                 0303  15  0156  0511
301                 LDD   BASE                                  0511  69  0364  0567
302                 SDA   BASE     8001                         0567  22  0364  8001
303           NEXT  SLT    0004                                 0200  35  0004  0661
304                 SLO    8002                                 0661  16  8002  0819
305                 STD   TEMP1                                 0819  24  1992  0295
306                 SRT    0002                                 0295  30  0002  0401
307                 SUP    8003                                 0401  11  8003  0259
308                 STD   TEMP2   TEST                          0259  24  1993  0296
309           TEST  NZE           CHNGB                         0296  45  0250  0451
310                 RAM    8002   VALID                         0250  67  8002  0309
311          CHNGB  RAL   BASE                                  0451  65  0364  0869
312                 ALO   ONET     8002                         0869  15  0262  8002
313          NOPR   BMI   ALARM   NXTWD                         0201  46  0304  0255
314          NXTWD  RAL   BASE                                  0255  65  0364  0919
315                 ALO   FIFTY                                 0919  15  0322  0377
316                 STL   BASE     8001                         0377  20  0364  8001
317          VALID  SLO   L                                     0309  16  1987  0441
318                 NZE           MATCH                         0441  45  0294  0345
319                 RAL   TEMP1   NEXT                          0294  65  1992  0200
320          MATCH  RAM   TEMP2                                 0345  67  1993  0297
321                 ALO   GOTO                                  0297  15  0300  0305
322                 RAU    8002    8003                        0305  60  8002  8003
323          BASE   RAL    0000   NEXT                         0364  65  0000  0200
324          PS5    RAU   TALLY                 DECREMENT       0484  60  1976  0481
325                 SUP   ONE     PS5A          TALLY IF        0481  11  0434  0639
326          PS5A   STU   TALLY                 GAMMA ZER       0639  21  1976  0479
327                 NZU           PS10        OUT IF TAL        0479  44  0433  0534
328                 AUP   PS6      8003       IS ZERO  I        0433  10  0336  8003
329          PS6    RAU    0000               NOT GAMMA         0336  60  0000  0355
330                 STU   GAMMA   PS3         NEXT WORD         0355  21  1974  0193
331          PS7    STD   PS8                   STORE           0350  24  0353  0206
332                 BMI           PS7A        GENERATED         0206  46  0359  0310
333                 SLO   U       PS7B        INSTRUCTIO        0359  16  1991  0395
334          PS7A   ALO   U       PS7B          AND             0310  15  1991  0395
335          PS7B   LDD   PS7C                INCREMENT         0395  69  0298  0501
336                 SDA   PS7C     8001       BY ONE            0501  22  0298  8001
337          PS7C   STU    0000               AND RETURN        0298  21  0000  0403
338                 RAL   U                   TO GENERAT        0403  65  1991  0445
339                 ALO   ONE                 IF STORAGE        0445  15  0434  0689
340                 STL   U                   NOT EXCEED        0689  20  1991  0344
341                 SLO   MAXU                                  0344  16  0347  0651
342                 BMI   PS8                   ALARM           0651  46  0353  0405
343                 RAL   OONE    LARM                         0405  65  0158  0286
344          PS8    HLT    0000   PS8                          0353  01  0000  0353
345          PS10   RAL   L                                     0534  65  1987  0491
346                 STL   R                                     0491  20  1988  0541
347                 RAU   NINEO   PS3BA                        0541  60  1003  0383
348          PS3BA  STU   L       PS3B                         0383  21  1987  0260
349          PS12   RAU    0000                                 0212  60  0000  0455
350                 LDD   PS12C   PS12A                        0455  69  0258  0761
351          PS12A  STD   OUT                                   0761  24  0414  0667
352                 LDD           STNON         FORM ENT      0667  69  0370  0523
353                 AUP   D0004                   FOR           0370  10  0722  0427
354                 STU   W0001                 STATEMENT       0427  21  1977  0330
355                 STU   TEMP1                                 0330  21  1992  0495
356                 RAU   TEMP9                                 0495  60  0148  0453
357                 STU   W0003                                 0453  21  1979  0532
358                 STL   W0005                 GENERATOR       0532  20  1981  0634
359                 RAU    0000                                 0634  60  0000  0505
360                 RAL   NONO                  DICTIONARY      0505  65  0308  0313
361                 SLT    0004                                 0313  35  0004  0773
362                 STL   W0004                                 0773  20  1980  0483
363                 RAU   NONON                                 0483  60  0386  0641
364                 STL   W0006                                 0641  20  1982  0535
365                 STU   W0002                                 0535  21  1978  0531
366                 LDD   OUT     PS133                        0531  69  0414  0137
367          PS12C  RAU   TEMP9                                 0258  60  0148  0503
368                 STU   W0001                                 0503  21  1977  0380
369                 RAL   FFTY1                 UBAR EQUAL      0380  65  0265  0969
370                 STL   UBAR    PS13C                        0969  20  1955  0108
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PS13C  RAL  TALLY                         0358  65  1976  0631
       SLO  QUOTA                         0631  16  1972  0477
       NZE         PS13A   STORE          0477  45  0430  0681
       ALO   8001          ORIGINAL       0430  15  8001  0337
       ALO  TWO            STATEMENT      0337  15  0390  0545
       STL  TALLY          AS             0545  20  1976  0529
       ALO  PS13B          COMMENTS       0529  15  0632  0387
       LDD  PS14   SR1                    0387  69  0440  0145
PS13A  STU  W0005                         0681  21  1981  0684
       STD  W0006  PS14                   0684  24  1982  0440
PS13B   01   9999  W0005                  0632  01  9999  1981
PS133  STD  ABEX3                         0157  24  0360  0363
       RAL  PC             INCREMENT      0363  65  1958  0413
       ALO  ONET                          0413  15  0262  0767
       STL  PC                            0767  20  1958  0811
       STL  W0009                         0811  20  1985  0688
       PCH  W0001            AND          0688  71  1977  0527
       STU  W0001  ABEX3                  0527  21  1977  0360
PS14   RAU  UBAR           FETCH WORD     0440  60  1955  0409
       AUP  PS14A   8003    IN UBAR       0409  10  0412  8003
PS14A  RAL   0000                         0412  65  0000  0655
       STL  TEMP3                         0655  20  1994  0397
       BMI         PS16    IF WORD IS     0397  46  0400  0751
       RAL  UBAR            NEGATIVE      0400  65  1955  0459
       SLO  FFTY1  PS15     ASSIGN IT     0459  16  0265  1019
PS15   SRT   0004          A SYMBOLIC     1019  30  0004  0629
       LDD  PS15A  SR3      LOCATION      0629  69  0682  0635
PS15A  AUP  TEMP9                         0682  10  0148  0653
       STU  W0001                         0653  21  1977  0480
       RAM  TEMP3  PS16                   0480  67  1994  0751
PS16   SLT   0002                         0751  35  0002  0457
       STL  TEMP3           EXTRACT       0457  20  1994  0447
       RAU   8003          OPERATION      0447  60  8003  0755
       SLT   0006          FROM WORD      0755  35  0006  1069
       STU  TEMP4                         1069  21  1995  0348
       ALO  PS18           FETCH OP       0348  15  0801  0805
       STU  TEMP1          MNEMONIC       0805  21  1992  0595
       TLU  00001   8002    FROM TABL     0595  84  0600  8002
PS18   RAU   0000          AND CHECK      0801  60  0000  0855
       SUP  TEMP4          FOR ADMISS     0855  11  1995  0749
       SRT   0006          STORE OP I     0749  30  0006  0463
       NZU  ALARM          ADMISSABLE     0463  44  0304  0268
       STL  W0004  PS27                   0268  20  1980  0533
PS27   RAL  TEMP3           EXTRACT       0533  65  1994  0799
       SLT   0004          DATA ADDRE     0799  35  0004  0509
       STL  TEMP3           FROM WORD     0509  20  1994  0497
       RAU   8003          OUT IF D I     0497  60  8003  0905
       STU  TEMP1                         0905  21  1992  0645
       SUP  NZZZ                          0645  11  0147  0851
       NZU  PS27D  DOLNK                  0851  44  0955  0256
NNNZ   ALF     9V  SOAP2                  0450  00  0000  9985
DOLNK  RAU  N      PS19                   0256  60  1989  0443
PS27D  AUP  FRTNT                         0955  10  0408  0513
       BMI         PS27A                  0513  46  0516  0817
       AUP  NNNZ   PS27C                  0516  10  0450  1005
PS27A  RAU  TEMP1                         0817  60  1992  0547
       SLT   0004                         0547  35  0004  0507
       AUP          8003                  0507  10  0410  8003
        59   0144  PS19                   0410  59  0144  0443
PS27C  NZU         PS19                   1005  44  0659  0443
       SRT   0001          OUT IF D I     0659  30  0001  0415
       NZU  PS18A          NOT ACCUM      0415  44  1119  0420
       RAU  ACCUM  PS19                   0420  60  0823  0443
PS18A  SRT   0002          OUT IF D N     1119  30  0002  0275
       NZU  PS20           ADDRSS WIT     0275  44  0679  0530
       SRT   0003           STATEMENT     0530  30  0003  0739
       SLO  FFTY1          GENFRATE       0739  16  0265  1169
       SRT   0004          MNEMONIC       1169  30  0004  0729
       LDD         SR3     IF D IS IN     0729  69  0732  0635
       AUP  TEMP9  PS19     STATEMENT     0732  10  0148  0443
PS20   STL  TEMP1          GENERATE       0679  20  1992  0695
       RAU   8003           MNEMONIC      0695  60  8003  0753
       SLT   0004           D IS NEIT     0753  35  0004  0563
       AUP  PS23    8003   NEXT NOR I     0563  10  0566  8003
PS23   RAU  D               STATEMENT     0566  60  0718  0873
       STU  TEMP2                         0873  21  1993  0346
       SUP  D0009          OUT IF D I     0346  11  0727  0731
       NZU  PS23A           NOT EXTNS     0731  44  0685  0436
       RAL  TEMP1          IF EXTENSI     0436  65  1992  0597
       SRT   0007          GENERATE       0597  30  0007  0663
       LDD         SR3      MNEMONIC      0663  69  0666  0635
       AUP  D0009  PS19                   0666  10  0727  0443
PS23A  RAU  TEMP1                         0685  60  1992  0647
       SRT   0007          GEN NUMERI     0647  30  0007  0763
       LDD  PS23B  STNON                  0763  69  0766  0523
PS23B  AUP  TEMP2  PS19                   0766  10  1993  0443
PS19   STU  W0003                         0443  21  1979  0782
       RSU  FLAG   PS25    NEGATIVE       0782  61  0421  0325
FLAG    10   0000   0000   FLAG IF DA     0421  10  0000  0000
PS25   STU  FLAG           POSITIVE       0325  21  0421  0324
       BMI         PS26    FLAG IF IN     0324  46  0677  0028
       RAU  W0003                         0677  60  1979  0633
       STU  W0002  PS27                   0633  21  1978  0533
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464          PS26    TAU   UBAR
465                  AUP   ONE
466                  STU   UBAR
467                  SUP   U
468                  NZU           PS28
469                  LDD   PS13C   PS133
470          PS2     RAL   S
471                  ALO   ONET
472                  STL   S
473                  LDD           SR3
474                  LDD           SR3ED
475                  RAU   W0002
476                  NZU   PS30    PS29
477          PS30    RAU   W0003
478                  NZU   PS32    PS31
479          PS32    LDD   TAU     PS133
480          PS29    RAU   TEMP9
481                  STU   W0002   PS30
482          PS31    RAU   TEMP9
483                  STU   W0003   PS32
484          TAU1    NOP    0000   PS
485          SR1     STD   EXIT    SR1E
486          SR1A    SLO   INCR    SR1E
487          SR1E    SLT    0002
488                  NZU           EXIT
489                  SLT    0002   SR1F
490          SR1F    LDD   SR1D
491                  SDA   SR1D
492                  SRT    0004
493                  LDD   SR1L
494                  SDA   SR1L     8001
495          SR1D    STD    0000   SR1A
496          SR1L    LDD    0000   SR1D
497          INCR    00     9998   9999
498          SR3     STD   EXIT
499                  DIV   TWSIX
500                  STL   TEMP1
501                  LDD   SR3B    SR3A
502          SR3A    STD   TEMP2
503                  AUP   ONET
504                  SRT    0001
505                  NZU           SR3A1
506                  SLO   NINEO
507                  NZU           SR3A2
508                  ALO   STL     SR3A2
509          SR3A1   SLT    0001
510                  SUP    8001   TEMP2
511          SR3A2   ALO   NINEO
512                  SLT    0001   TEMP2
513          SR3B    SRT    0002
514                  AUP   TEMP1
515                  LDD   SR3C    SR3A
516          SR3C    SLT    0002   EXIT
517          SR3ED   STD   EXIT
518                  RAU    8003
519                  SLT    0004
520                  AUP   LOCUS
521                  STU   TEMP9   EXIT
522          SRN     STD   EXIT
523                  RAL   ARITH
524                  NZE   SRN5
525                  RAL   SRN2
526                  SLO   MU
527                  AUP   N       8002
528          SRN2    SRT    0010
529                  RAU    8003   SRN4
530          SRN5    RAL   MU
531                  ALO   FIFTY
532                  SRT    0004
533                  ALO   NBAR
534                  STL   TEMP1
535                  SLT    0008
536                  NZU   SRN6
537                  BMI   SRN6
538                  RAL   N
539                  SRT    0002
540                  RAU    8002
541                  NZU           SRN4
542                  SCT    0000
543                  AUP   TEMP1
544                  SUP    8002
545                  AUP   TWOT
546                  RAU    8003   SRN4
547          SRN6    RAL   OTREY   LARM
548          SRN4    STU   N       EXIT
549          SRAC    STD   EXIT    SRACA
550          SRACA   RAL    8002
551                  STU   JAY     SRACR
552          SRACR   RAU   JAY
553                  SUP   A0001
554                  STU   NEWCT
555                  NZU           SRAC3
556                  RAL   JAY

PUNCH AND      0028   60  1955  0759
 RECYCLE T     0759   10  0434  0789
 PS13C IF      0789   21  1955  0458
 UBAR NOT      0458   11  1991  0745
 EQUAL TO      0745   44  0849  0500
       U       0849   69  0358  0157
S EQUALS S     0500   65  1957  0861
PLUS ONE       0861   15  0262  0867
AND FORM       0867   20  1957  0460
NEXT LOCAT     0460   69  0813  0635
               0813   69  0816  1219
               0816   60  1978  0683
               0683   44  0437  0738
               0437   60  1979  0733
               0733   44  0487  0788
               0487   69  1960  0157
               0738   60  0148  0803
               0803   21  1978  0437
               0788   60  0148  0853
               0853   21  1979  0487
               0416   00  0000  1234
               0145   24  0398  0901
               0650   16  0903  0901
               0901   35  0002  0657
               0657   44  0911  0398
               0911   35  0002  0917
               0917   69  0470  0923
LOCATIONS      0923   22  0470  0973
FROM XXXX      0973   30  0004  0783
YYYY           0783   69  0486  0839
               0839   22  0486  8001
               0470   24  0000  0650
               0486   69  0000  0470
               0903   00  9998  9999
SR3 CONVER     0635   24  0398  0951
THREE DIGI     0951   14  0354  0465
NUMBERS IN     0465   20  1992  0795
TWO LETTER     0795   69  0448  1051
MNEMONICS      1051   24  1993  0396
               0396   10  0262  0967
               0967   30  0001  1023
               1023   44  0777  0478
               0777   16  1003  0757
               0757   44  0961  0462
               0961   15  0464  0462
               0478   35  0001  0735
               0735   11  8001  1993
               0462   15  1003  0807
               0807   35  0001  1993
               0448   30  0002  1055
               1055   10  1992  0697
               0697   69  0750  1051
               0750   35  0002  0398
GENERATE       1219   24  0398  1101
SYMBOLIC       1101   60  8003  0809
LOCATION       0809   35  0004  1269
FOR NEXT       1269   10  0638  0493
STATEMENT      0493   21  0148  0398
SRN FORMS      0800   24  0398  1151
 NUMBERS       1151   65  1954  0859
OUT IF FLO     0859   45  0512  0863
ING POINT      0863   65  0866  0471
FIX ASINTE     0471   16  1951  1105
ER IF FIXE     1105   10  1989  8002
POINT          0866   30  0010  0889
               0889   60  8003  0747
FLOATING P     0512   65  1951  1155
               1155   15  0322  0827
  MU PLUS      0827   30  0004  0637
FORTY NINE     0637   15  0146  1201
 PLUS NBAR     1201   20  1992  0845
               0845   35  0008  0913
               0913   44  1017  0318
               0318   46  1017  0372
               0372   65  1989  0543
AND MANTIS     0543   30  0002  0899
    IS         0899   60  8002  0857
               0857   44  1011  0747
  N TO 8 S     1011   36  0000  0833
NIFICANT F     0833   10  1992  0797
               0797   11  8002  1205
               1205   10  0508  0963
               0963   60  8003  0747
ALARM          1017   65  0520  0286
               0747   21  1989  0398
               0850   24  0398  1251
               1251   65  8002  0909
  ROUTINE      0909   21  1956  0959
               0959   60  1956  1061
               1061   11  1849  0953
               0953   21  0658  1111
EQUALS ABC     1111   44  0515  0916
               0515   65  1956  1161
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         ALO   ONE               INCRMNT JA   1161  15  0434  0939
         STL   JAY                            0939  20  1956  1009
         ALO   SRAC1   8002      FETCH JAYT   1009  15  0662  8002
SRAC1    RAL   A0001   SRAC2       CONSTANT   0662  65  1849  1053
SRAC2    SLO   N                 RECYCLE IF   1053  16  1989  0593
         NZE   SRACR   SRAC5     EQUALS JTH   0593  45  0959  0847
SRAC9    RAU   ARITH                          0847  60  1954  1059
         NZU           SRBC5                  1059  44  1013  0514
         SLO   OFIVE   SRBC5                  1013  16  0966  0514
SRBC5    ALO   JAY                            0514  15  1956  1211
         ALO   RAL                            1211  15  0564  1319
         ALO   ABINC                          1319  15  1952  0907
         ALO   ABCON                          0907  15  0510  0565
         RAL    8002   EXIT                   0565  65  8002  0398
SRAC3    RAU   JAY                            0916  60  1956  1261
         AUP   ONE                            1261  10  0434  0989
         STU   JAY                            0989  21  1956  1109
         SUP   ABCNT             NEW ABCON    1109  11  0762  1067
         BMI           SRAC7      ABCNT  NO   1067  46  0670  0521
         AUP    8001               EXCEEDED   0670  10  8001  0877
         STU   A0001             N STORED A   0877  21  1849  0252
         AUP   SRAC6             NEW AB CON   0252  10  1255  1159
         LDD   N        8003                  1159  69  1989  8003
SRAC7    LDD           ABPUN                  0521  69  0374  0927
         RAL   ABINC                          0374  65  1952  0957
         SLO   ONE                            0957  16  0434  1039
         ALO   ABCNT                          1039  15  0762  1117
         STL   ABINC                          1117  20  1952  1305
         STU   A0001   SRACA                  1305  21  1849  1251
ABCNT     00    0051    0000                  0762  00  0051  0000
SRAC6    STD   A0001   SRAC5     JAY IN LOW   1255  24  1849  0847
PS100    STD   ABEX3                          0900  24  0360  1063
         SRT    0003                          1063  30  0003  0671
         LDD           PS101                  0671  69  0424  0977
         LDD           PS101                  0424  69  1027  0977
         LDD   ABEX3   PS101                  1027  69  0360  0977
PS101    STD   EXIT1                          0977  24  0630  0883
         SLO    8002                          0883  16  8002  0691
         SLT    0001                          0691  35  0001  0897
         ALO    8001                          0897  15  8001  1103
         SLT    0001   EXIT1                  1103  35  0001  0630
D0001    ALF   Y       SOAP2                  0719  88  0000  0000
D0002     88    0100    0000                  0720  88  0100  0000
D0003    ALF   I       SOAP2                  0721  69  0000  0000
D0004     64    9200    0000                  0722  64  9200  0000
D0005     64    9900    0000                  0723  64  9900  0000
D0006    ALF   P       SOAP2                  0724  77  0000  0000
D0007    ALF   W       SOAP2                  0725  86  0000  0000
D0008     00    0800    0000                  0726  00  0800  0000
D0009    ALF   E00AA   SOAP2                  0727  65  9090  6161
00001     00    0075    7677     MNEMONICS    0600  00  0075  7677
00002     00    0168    7383       FOR        0601  00  0168  7383
00003     00    1061    8477     REQUIRED     0602  00  1061  8477
00004     00    1561    7376      OPERATION   0603  00  1561  7376
00005     00    1682    7376                  0604  00  1682  7376
00006     00    1974    7788                  0605  00  1974  7788
00007     00    2082    8373                  0606  00  2082  8373
00008     00    2182    8384                  0607  00  2182  8384
00009     00    2482    8364                  0608  00  2482  8364
00010     00    3266    6164                  0609  00  3266  6164
00011     00    3366    8262                  0610  00  3366  8262
00012     00    3466    6485                  0611  00  3466  6485
00013     00    3582    7383                  0612  00  3582  7383
00014     00    3966    7477                  0613  00  3966  7477
00015     00    4575    8965                  0614  00  4575  8965
00016     00    4662    7469                  0615  00  4662  7469
00017     00    6079    6184                  0616  00  6079  6184
00018     00    6179    8284                  0617  00  6179  8284
00019     00    6464    8579                  0618  00  6464  8579
00020     00    6579    6173                  0619  00  6579  6173
00021     00    6679    8273                  0620  00  6679  8273
00022     00    6973    6464                  0621  00  6973  6464
00023     00    8179    6161                  0622  00  8179  6161
00024     00    8279    6162                  0623  00  8279  6162
00025     00    8379    6163                  0624  00  8379  6163
00026     00    8461    8761                  0625  00  8461  8761
00027     00    8561    8762                  0626  00  8561  8762
00028     00    8661    8763                  0627  00  8661  8763
00029     00    9968   -7383                  0628  00  9968  7383
BS       LDD           DROPU                  0245  69  0498  1301
         RAL   NEWCT                          0498  65  0658  1113
         NZE   BSA                            1113  45  1016  1167
         LDD   BSA     ABMIN                  1167  69  1016  1369
BSA      RAL   U                              1016  65  1991  0895
         ALO   ONE                            0895  15  0434  1089
         LDD           CHKOP                  1089  69  0392  0945
         NZE           BSB                    0392  45  0446  0947
         RSU   N       BN1                    0446  61  1989  0643
BSB      RAU   N       BN1                    0947  60  1989  0643
BN       LDD   BN1     SRN                    0244  69  0643  0800
BN1      STU   NBAR              NBAR EQUAL   0643  21  0146  0949
         LDD   PN1     CHKAR         N        0949  69  0302  1355
YL1      AUP   ONET    ADLOW                  0950  10  0262  1217
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  650   ADLOW  STU  TEMP1            STORE V AN  1217  21  1992  0995
  651          STL  TEMP2              ARITH     0995  20  1993  0496
  652          LDD         CHKAR                 0496  69  0999  1355
  653          RAL  U                            0999  65  1991  1544
A 653          SLO  ONE                          1544  16  0434  0352
  654          LDD         CHKOP                 0352  69  1405  0945
  655          NZE         VEC                   1405  45  0758  1209
  656          RAL  U                            0758  65  1991  1045
  657          ALO          8002                 1045  15  0548  8002
  658           66   9995                        0548  66  9995  1007
  659          AUP  U                            1007  10  1991  1095
  660          ALO          8002                 1095  15  0598  8002
  661           10   9998                        0598  10  9998  1153
  662          SUP  OFIVE                        1153  11  0966  0771
  663          NZU  RETA                         0771  44  0375  0276
  664          RSL  FOUR                         0276  66  0779  0933
  665          LDD         SUBM                  0933  69  0636  1139
  666          RAL  U                            0636  65  1991  1145
  667          SLO  THREE                        1145  16  0648  1594
A 667          STD  BETA                         1594  24  1651  1203
  668          STL  U                            1203  20  1991  0394
  669          SRT   0004                        0394  30  0004  1455
  670          AUP          8003                 1095  10  0598  8003
  671           17   9998                        0598  17  9998  1644
A 671          RAU   8002                        1644  60  8002  1153
  672           01   9999   9998                 0664  01  9999  9998
  673   UBSR   LDD         SR1                   1419  69  0422  0145
  674          RAU  TEMP5                        0422  60  1996  1351
  675          NZU         RET                   1351  44  1505  0306
  676          LDD  RETC   PS7                   1505  69  0808  0350
  677   VEC    LDD         SUBM                  1209  69  0812  1139
  678          RAL  TEMP5                        0812  65  1996  1401
  679          NZE  RETC                         1401  45  0808  1555
  680          LDD         DROPK                 1555  69  0858  1361
  681          LDD         DROPU                 0858  69  1411  1301
  682          ALO          8002                 1411  15  0764  8002
  683           59   9999                        0764  59  9999  1073
  684          SUP  K                            1073  11  1990  1195
  685          SUP  W                            1195  11  0698  1253
  686          SLT   0002                        1253  35  0002  1259
  687          NZU  VECB                         1259  44  1163  0814
  688          LDD  VECB   DROPU                 0814  69  1163  1301
  689   VECB   LDD  VAR5   STBTA                 1163  69  1066  1469
  690   RETC   RAL  TEMP4                        0808  65  1995  1049
  691          ALO  I      RETB                  1049  15  0402  1057
  692   SUBM   STD  FINI                         1139  24  0442  1245
  693          ALO  U                            1245  15  1991  1295
  694          ALO          8002                 1295  15  0748  8002
  695           64   9998                        0748  64  9998  1309
  696          SLO  RAL                          1309  16  0564  1519
  697          SLT   0002                        1519  35  0002  0425
  698          NZU  RETA                         0425  44  0375  0680
  699          SLO  EIGTO                        0680  16  0983  0687
  700          BMI  GETAD                        0687  46  0490  0741
  701          STU  TEMP5                        0741  21  1996  1099
  702          SLT   0004                        1099  35  0004  1359
  703          MPY  Y                            1359  19  0862  1033
  704          SLO  LACC                         1033  16  0686  0791
  705          SRT   0004                        0791  30  0004  1451
  706          STL  TEMP6                        1451  20  1997  1050
  707          LDD  GETAC  GETAB                 1050  69  1303  0356
  708   GETAD  ALO   8001                        0490  15  8001  0997
  709          SRT   0002                        0997  30  0002  1353
  710          ALO  ALO                          1353  15  0406  1461
  711          STL  TEMP5                        1461  20  1996  1149
  712          LDD         GETAB                 1149  69  0452  0356
  713          SLT   0004  GETEF                 0452  35  0004  1213
  714   GETEF  STU  TEMP4  FINI                  1213  21  1995  0442
  715   GETAB  STD  OUT                          0356  24  0414  1267
  716          RAL  NEWCT                        1267  65  0658  1263
  717          NZE  GETAE                        1263  45  1116  1317
  718          LDD  GETAE  ABMIN                 1317  69  1116  1369
A 719   GETAE  LDD         DROPU                 1116  69  1345  1301
  720          ALO          8002                 1345  15  0798  8002
  721          RAL   0000                        0798  65  0000  1605
  722          SLO  ABINC                        1605  16  1952  1107
  723          ALO  VEA     8002                 1107  15  0660  8002
  724   VEA     44   6849  OUT                   0660  44  6849  0414
  725   GETAC  AUP  TEMP6                        1303  10  1997  1501
  726          AUP  ONET                         1501  10  0262  1367
  727          LDD         STNON                 1367  69  0770  0523
  728          ALO  NZCT                         0770  15  0466  0821
  729          SLO  ONE                          0821  16  0434  1189
  730          STL  NZCT                         1189  20  0466  1569
  731          ALO          8002                 1569  15  0472  8002
  732           20   0144                        0472  20  0144  104
  733          RAU  NZCT   GETEF                 1047  60  0466  121
  734   RETA   RAL  I      RETB                  0375  65  0402  105
  735   RETB   STL  TEMP4  RET                   1057  20  1995  030
  736   RET    RAL  R                            0306  65  1988  069
  737          STL  L                            0693  20  1987  054
  738          RAL  SLTI3                        0540  65  0743  109
  739          LDD         BEF                   1097  69  1150  1403
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           RAU   LOW1                 ALO 8002    1150    60  1453  1157
           AUP   ALO                              1157    10  0406  1511
           LDD          PS7           COMPILE     1511    69  0864  0350
           RAL   TEMP4  VAR2                      0864    65  1995  1199
     YN1   AUP   ONET   VAR                       1200    10  0262  1417
     VAR   STU   TEMP1                STORE V AN  1417    21  1992  1395
           STL   TEMP2                 ARITH      1395    20  1993  0546
           LDD          CHKAR                     0546    69  1249  1355
           LDD          STBTA                     1249    69  0502  1469
           LDD          SRN           GENERATE N  0502    69  1655  0800
           LDD          CHKNN                     1655    69  0908  1561
           SLT    0004                            0908    35  0004  1619
           ALO   I                                1619    15  0402  1207
           STL   W0007                            1207    20  1983  0736
           LDD   VAR2   ZWU                       0736    69  1199  0652
     ZWU   STD   EXIT                             0652    24  0398  1551
           RAM   TEMP2                            1551    67  1993  1147
           SLO   I                                1147    16  0402  1257
           NZE   XXT    ZWUA                      1257    45  0760  1611
     ZWUA  RAL   X0001                            1611    65  1000  1705
           LDD          SUBTX                     1705    69  0958  1661
           NZU          ATIN                      0958    44  1711  0912
           RAL   X0002                            1711    65  1001  1755
           LDD          SUBTX                     1755    69  1008  1661
           NZU          ATIN                      1008    44  1761  0912
           RAL   X0003                            1761    65  1002  1307
           LDD          SUBTX                     1307    69  0810  1661
           NZU   XXT    ATIN                      0810    44  0760  0912
     ATIN  SLT    0004  EXIT                      0912    35  0004  0398
     XXT   RAL   W0007  EXIT                      0760    65  1983  0398
     SUBTX STD   FINI                             1661    24  0442  1445
           SLO   W0007                            1445    16  1983  0737
           LDD   ONE                              0737    69  0434  0787
           SDA   W0008                            0787    22  1984  0837
           AUP    8001  FINI                      0837    10  8001  0442
     VAR2  STL   TEMP4  VAR5                      1199    20  1995  1066
     VAR5  RAU   TEMP1                            1066    60  1992  1197
           NZU          VAR4                      1197    44  1601  0752
           RSL   OFIVE  VAR4                      1601    66  0966  0752
     VAR4  ALO   TEMP4                            0752    15  1995  1299
           ALO   RAL                              1299    15  0564  1669
           LDD   VAR1   OSGN1                     1669    69  0522  0475
     VAR1  RAL   TEMP1  VAR3                      0522    65  1992  1247
     VAR3  STL   ARITH  EEC2                      1247    20  1954  1357
     DF    RAL   R                                0243    65  1988  0793
           STL   L                                0793    20  1987  0640
           STL   PORR   PS3                       0640    20  0362  0193
     ENDT  RAL   PORR                             0174    65  0362  1467
           NZE          ENDTA                     1467    45  0820  0871
           LDD          ENDTB                     0820    69  1123  0326
           RAL   SXTNT  ENDTC                     1123    65  0376  0781
     ENDTC LDD   PS12   LDSR                      0781    69  0212  0665
     ENDTA LDD          ENDTB                     0871    69  0474  0326
           RAL   SVNTT  ENDTC                     0474    65  1077  0781
     ENDTB STD   OUT                              0326    24  0414  1517
           RAL   TEN                              1517    65  0870  0525
           SLO   EL                               0525    16  0320  0675
           BMI   ALARM                            0675    46  0304  0829
           RAL    8001                            0829    65  8001  0785
           ALO    0000                            0785    15  0000  1805
           STL   N      GEN2                      1805    20  1989  0492
     EE    LDD   RR     NUINC                     0198    69  0195  0848
     EEC2  STU   OPSGN  PS3                       1357    21  1975  0193
     EN    LDD          CHKAR                     0197    69  1250  1355
           LDD          SRN                       1250    69  1503  0800
           LDD          CHKNN                     1503    69  0456  1561
           LDD          LDSR                      0456    69  1409  0665
           RAL   NU                               1409    65  1962  1567
           ALO   EN1                              1567    15  0920  0775
           AUP    8002                            0775    10  8002  1083
           SLO   ONE                              1083    16  0434  1239
           LDD   EN4                              1239    69  0542  1495
           SDA   EN4     8003                     1495    22  0542  8003
     EN1   RAL   J0001                            0920    65  1977  0831
           STL   TEMP2  EN4                       0831    20  1993  0542
     EN4   SLO   J0001                            0542    16  1977  0881
           NZE          EN3                       0881    45  0734  0835
           RAL   TEMP2                            0734    65  1993  1297
           SLO   ONET                             1297    16  0262  1617
           SLT    0004                            1617    35  0004  1127
           ALO   PHI                              1127    15  0730  0885
           LDD   EN3    OSGN1                     0885    69  0835  0475
     EN3   RAL   N                                0835    65  1989  0843
           STU   V1                               0843    21  1961  0914
           SLO   MAXE                             0914    16  1567  0921
           BMI          ENA                       0921    46  [illegible]  0825
           RAL   ONET   VAR3                      0524    65  0262  1247
     ENA   RAU    8003  VAR3                      0825    60  8003  1247
     EW    LDD   RW     NUINC                     0215    69  0176  0848
     ENDH  RAU   U                    COMPILE     0180    60  [illegible]  1545
           AUP   OONE   ENDY4                     1545    10  [illegible]  1313
     ENDL  LDD   ENDY   DROPK                     0175    69  [illegible]  1361
     ENDY  LDD          CHKNK         IF U EQUAL  0176    69  0179  0832
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                LDD             UBETA
                NZE     ENDY1
                RAL     ARITH
                NZE             ENDY8
                RSL     FMP     ENDY9
ENDY8           RSL     NZA     ENDY9
ENDY9           STL     TEMP4
                RAL     BETA
                LDD             CHGOP
                STL     TEMP1
                RAL     BETA
                SLO     ONE
                STL     TEMP4
                ALO     ENDY2    8002
ENDY2           RAL      0000
                STL     TEMP2
                RAM      8002
                SLO     STLA1
                NZE             END10
                SLO     OONE
                NZE     PS12    END10
END10           RAU     TEMP4
                STU     U
                RAU     TEMP2
                BMI             ENDY3
                RSU     TEMP1   ENDY4
ENDY3           RAU     TEMP1   ENDY4
ENDY4           LDD     PS12    PS7
ENDY1           RAL     ARITH
                NZE             END11
                RAL     OFIVE   END11
END11           SLO     FRONE
                STL     TEMP4
                LDD             UCHGE
                RAU     U
                SUP     TWO
                STU     U
                AUP     TWO
                AUP     ALO
                LDD             PS7
                RAU     U
                AUP     ENDY7    8003
ENDY7           RSL      0000
                STL     TEMP1
                RAU     LDAC
                LDD     ENDY3   PS7
GN              LDD             CHKAR
                LDD             SRN
                LDD             CHKNN
                ALO     LOCS    GNA
GNA             LDD     PS3     BEF
IL              RAL     I       ADLOW
IN              RAL     I       VAR
MINI            RAL     OONE
                STL     TEMP4
                LDD     MINC    UCHGE
MINC            RAL     SCON    MINB
MINB            STL     L       PS38
MINL            RAU     ARITH
                STL     V1
                NZE             NGA
                RAL     U
                LDD             CHKOP
                SLO     OFIVE
                NZE             MINI
                RAL     RSUUP   NGB
NGA             RAL     RSL
                ALO     LOW     NGB
NGB             LDD     MINC    BEF
MINN            RAU     D0003
                STU     R
                LDD             SRN
                LDD     MINI    GENN
MY              RAL     ONE     MYA
MYA             STL     W0008
                RAL     AXO
                STL     L       PS3
UN              RAU     N
                NZU     MINN
                RAL     TWO     MYA
MN              RAL     THREE   MYA
FI              RAL     FOUR
                STL     W0008   WY
ENDG            RAU     W0008
                ALO      0052
                SUP     ONE
                NZU             ENDGA
                SUP      8001
                NZU             ENDGB
                SUP      8001
                NZU             ENDGC
                SUP      8001
                NZU     PS12    ENDGD
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BETA PLUS       0879    69  0882  0935
RAL BECOM       0882    45  0786  0887
                0887    65  1954  1459
                1459    45  0962  1363
                0962    66  0765  1719
                1363    66  1166  1719
                1719    20  1995  0898
                0898    65  1651  1905
                1905    69  1058  1811
                1058    20  1992  1595
                1595    65  1651  0506
                0506    16  0434  1289
                1289    20  1995  0948
SET CONTEN      0948    15  1701  8002
                1701    65  0000  0656
ONE EQUAL       0656    20  1993  0596
TO CONTEN       0596    67  8002  0756
BETA WITH       0756    16  1509  1413
                1413    45  1216  1717
                1216    16  0158  1463
                1463    45  0212  1717
                1717    60  1995  1349
IF BETA         1349    21  1991  0444
MINUS ONE       0444    60  1993  1347
CONTAINS        1347    46  1300  1751
STL ACC         1300    61  1992  1313
                1751    60  1992  1313
                1313    69  0212  0350
                0786    65  1954  1559
                1559    45  1012  1513
                1012    65  0966  1513
                1513    16  1266  0971
PLUS ONE        0971    20  1995  0998
RECOMPILE       0998    69  1801  0404
                1801    60  1991  1645
                1645    11  0390  1695
                1695    21  1991  0494
                0494    10  0390  1745
                1745    10  0406  1911
NEGATIVE        1911    69  0964  0350
                0964    60  1991  1795
                1795    10  1048  8003
                1048    66  0000  0806
                0806    20  1992  1845
                1845    60  1098  1553
                1553    69  1751  0350
                0241    69  0544  1355
                0544    69  1397  0800
COMPILE         1397    69  1350  1561
                1350    15  1603  1407
                1407    69  0193  1403
                0239    65  0402  1217
V EQUALS I      0236    65  0402  1417
RAL  RAB        0224    65  0158  1563
BECOMES         1563    20  1995  1148
                1148    69  1901  0404
                1901    65  0454  1609
                1609    20  1987  0260
                0220    60  1954  1659
                1659    20  1961  1014
                1014    45  0368  1769
                0368    65  1991  1945
                1945    69  1198  0945
                1198    16  0966  1021
                1021    45  0674  0224
                0674    65  1177  0931
                1769    65  0202  1457
                1457    15  0860  0931
                0931    69  1901  1403
                0211    60  0721  0875
                0875    21  1988  0841
                0841    69  0594  0800
                0594    69  0224  1227
                0186    65  0434  1339
                1339    20  1984  0838
                0838    65  0891  0646
                0646    20  1987  0193
                0191    60  1989  0893
                0893    44  0211  1248
                1248    65  0390  1339
                0161    65  0648  1339
                0240    65  0779  1133
                1133    20  1984  0218
                0181    60  1984  1389
                1389    15  0052  1507
                1507    11  0434  1439
                1439    44  0943  0644
                0943    11  8001  1399
                1399    44  1653  0504
                1653    11  8001  1709
                1709    44  1613  1064
                1064    11  8001  1819
                1819    44  0212  0774
```

```
ENDGA   STL   W0002   READA                   0644  20  1978  1234
ENDGB   STL   W0003   READA                   0504  20  1979  1234
ENDGC   AUP   W0002                           1064  10  1978  1183
        SLT    0004                           1183  35  0004  0993
        ALO   W0003                           0993  15  1979  1233
        ALO   NZA                             1233  15  1166  1071
        AUP   BMI                             1071  10  0824  0929
        STU    0051                           0929  21  0051  0654
        STL    0052   PS12                    0654  20  0052  0212
ENDGD   RAL   NZA                             0774  65  1166  1121
        STL   TEMP4                           1121  20  1995  1298
        LDD   PS12    UCHGE                   1298  69  0212  0404
NF      RAU   INTGR           N EQUALS L      0217  60  1973  1277
        SRT    0008            AND N          1277  30  0008  0696
        ALO   N                               0696  15  1989  1043
        SRT    0001           MU EQUALS       1043  30  0001  1449
        STL   N                 PLUS ONE      1449  20  1989  0592
        RAU   MU                              0592  60  1951  0856
        AUP   ONE     NF2                     0856  10  0434  1489
NF2     STU   MU    0 PS3                     1489  21  1951  0193
NR      STL   NBAR            N NBAR MU       0170  20  0146  1499
        STL   N                DEL AND        1499  20  1989  0642
        STL   MU              ARITH ZERO      0642  20  1951  0754
        STL   ARITH   NF                      0754  20  1954  0217
NW      LDD   NR      TKOP    STORE OP        0213  69  0170  1173
NZ      LDD   NR      NZ4                     0194  69  0170  1223
NZ4     STD   OUT                             1223  24  0414  1767
        LDD   NZ1     CHKNK                   1767  69  0970  0832
NZ1     RAL    0001           COMPILE         0970  65  0001  0906
        SLT    0002   NZ6                     0906  35  0002  1663
NZ6     SUP   SIXNI                           1663  11  1316  1171
        NZU           FIXVA    LDD FIX        1171  44  0925  0426
        SUP   NNTEN               OR          0925  11  0528  1283
        NZU           FLOTE                   1283  44  0937  0888
        RAL   FIVEO   LARM      ALARM         0937  65  0690  0286
NZ3     RAU   V1              TO NZ2 IF       1400  60  1961  0815
        NZU   OUT     NZ5                     0815  44  0414  1020
NZ2     RAU   V1                              1450  60  1961  0865
        NZU   FLOT1                           0865  44  1919  1070
        RAL   STLA1   NZ7                     1070  65  1509  1713
NZ5     RAL   STUA1   NZ7                     1020  65  1273  1713
NZ7     LDD   FLOT1   BEF                     1713  69  1919  1403
NZ8     RAU   U                               1500  60  1991  0746
        SUP   FFTY2                           0746  11  1549  1703
        NZU           NZ3                     1703  44  1557  1400
        RAU    8000                           1557  60  8000  0915
        BMI   NZ3                             0915  46  1400  1969
        RAU    8002                           1969  60  8002  1327
        LDD   NZ3     LDSR                    1327  69  1400  0665
FLOTE   RAU   ARITH             FLOAT IF      0888  60  1954  1759
        NZU   NZ8                             1759  44  1500  1114
        RAL   FIVET             Y AND FIX     1114  65  1817  1221
        LDD   FLOT1   LDSR    C AND FIX       1221  69  1919  0665
FLOT1   RAU    8003   OUT                     1919  60  8003  0414
FIXVA   RAU   ARITH                           0426  60  1954  1809
        NZU           NZ2                     1809  44  1763  1450
        RAL   FIXNR                           1763  65  1366  1271
        LDD   NZ2     LDSR                    1271  69  1450  0665
PF      STL   NBAR    PN1     N NBAR AND      0234  20  0146  0302
PN1     STL   N       PN       MU ZERO        0302  20  1989  0231
PN      RAL   ONET            ARITH TO        0231  65  0262  1917
        STL   ARITH   NF2      FLOATING       1917  20  1954  1489
PW      LDD   PF      TKOP    TKOP AND P      0235  69  0234  1173
QF      RAU   PSI                             0230  60  0160  0965
        AUP   ONE             INCRMNT PS      0965  10  0434  1539
        STU   PSI              AND SET        1539  21  0160  1813
        RAL    8002   TF2                     1813  65  8002  1321
TF2     STL   K                               1321  20  1990  1093
        STU   NU                              1093  21  1962  1015
        STU   MU      QUA3                    1015  21  1951  0804
QUA3    RAU   GAMMA                           0804  60  1974  0979
        NZU           QUA1                    0979  44  1333  0784
        SRT    0002           EXTRACT         1333  30  0002  1589
        STU   GAMMA                           1589  21  1974  1377
        RAU    8002           SYMBOL          1377  60  8002  0985
        STU   TEMP1           IS              0985  21  1992  0796
        NZU   QUA2    QUA3    SYMBOL ZER      0796  44  1599  0804
QUA2    SUP   SVTY2           IS SYMBOL       1599  11  0802  1607
        NZU   QUA5                            1607  44  1062  1112
        RAL   K                               1112  65  1990  0846
        ALO   ONE     TF2                     0846  15  0434  1321
QUA5    RAU   MU                              1062  60  1951  0956
        AUP   ONET            INCRMNT EL      0956  10  0262  1967
        STU   MU                              1967  21  1951  0854
        SUP   SIXT             MORE THAN      0854  11  0384  1639
        NZU   QUA7    ALARM                   1639  44  1143  0304
QUA7    RAU   NU                              1143  60  1962  0418
        SRT    0002                           0418  30  0002  0975
        AUP   TEMP1                           0975  10  1992  1447
        ALO   K                               1447  15  1990  0896
        ALO            8002                   0896  15  1649  8002
        STU   W0001                           1649  21  1977  0780
        STU   NU      QUA3                    0780  21  1962  0804
```

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1021  QUA1    RAU   TALLY
1022          SUP   ONE
1023          STU   TALLY      QUA4
1024  QUA4    NZU             CURTN
1025          AUP               8003
1026          RAL     0000    QUA20
1027  QUA20   STL    GAMMA    QUA3
1028  CURTN   RAU    W0004
1029          SLT     0002
1030          RAL     8003
1031          LDD             CURT1
1032          ALO    1
1033          ALO    NINEO
1034          STL    W0004
1035          RAL    ACU1
1036          LDD    NINEO
1037          TLU    X0001    ACU2
1038  ACU1    RAL     9999    ACU8
1039  ACU2    LDD    ACU4
1040          SDA    ACU4      8002
1041  ACU8    SLO    NINEO
1042          NZE             SHCUA
1043          ALO    NINEO
1044          ALO    W0004    ACU4
1045  ACU4    STL     9999    BCU4
1046  SHCUA   RAL    XST
1047          NZE    SRN6
1048          LDD    X0001
1049          STD    XST
1050          RAL    W0004
1051          ALO    C985
1052          STL    X0001    BCU4
1053  BCU4    STL    W0004    SHCU
1054  SHCU    RAL    W0002
1055          STU    TEMP4
1056          LDD             STS
1057          STL    W0002
1058          RAL    W0003
1059          LDD             STS
1060          STL    W0003
1061          RAL    W0001
A 1062        LDD    OONE
B 1062        STD    TEMP4
1063          LDD             STS
1064          STL    W0001
1065          RAL    W0005
1066          LDD             CURT1
1067          STL    W0005
1068          LDD    TAU61    FLOPR
1069  TAU61   LDD    TAU5
1070          STD    TAU
1071          RAU    W0003
1072          BMI    AT10
1073          AUP    D0003
1074          LDD             PS7
1075          RAU    W0004
1076          SLT     0008
1077          AUP    RAODS    AT40
1078  RAODS    76     8001     0000
1079  AT30    ALO    RAO
1080          RAU     8002
1081          LDD             PS7
1082          RAL    W0004
1083          SLT     0004
1084          LDD    D0003
1085          SDA    TEMP6
1086          RAU     8001    AT40
1087  AT40    LDD             PS7
1088          RAL    W0004
1089          LDD    STDAC
1090          SDA    TEMP6
1091          RAU     8001    ENDY4
1092  AT10    RAU    W0004
1093          SRT     0002
1094          SLO    W0003    AT30
1095  RAO      76     0000     0000
1096  TAU5    RAU    PC
1097          AUP    THOUS
1098          LDD             PS12A
1099          LDD             FLOP
1100          LDD    TEMP1
1101          STD    W0006
1102          LDD             FLOPR
1103          LDD    TAU2     PSS
1104  TAU2    LDD    QUA21    DCRMT
1105  DCRMT   STD    FINI
1106          RAU    PSI
1107          STU    TEMP3    DCMT3
1108  DCMT3   RAU    TEMP3
1109          NZU             FINI
1110          SUP    ONE
1111          STU    TEMP3
1112          MPY    SIXT
```

```
INCRMNT TALLY

IF TALLY NON ZERO SEND NXT W TO GAMMA

DECREMENT QUANT COU FOR ALL PSI LESS THAN OR EQUAL TO CURRENT PSI

0784  60  1976  0981
0981  11  0434  1689
1689  21  1976  1029
1029  44  1383  0834
1383  10  0836  8003
0836  65  0000  1006
1006  20  1974  0804
0834  60  1980  1035
1035  35  0002  0941
0941  65  8003  1699
1699  69  0852  1056
0852  15  0402  1657
1657  15  1003  1707
1707  20  1980  1433
1433  65  0886  0991
0991  69  1003  1106
1106  84  1000  1156
0886  65  9999  1753
1156  69  1909  1162
1162  22  1909  8002
1753  16  1003  1757
1757  45  0910  1212
0910  15  1003  1807
1807  15  1980  1909
1909  20  9999  0902
1212  65  1953  1907
1907  45  1017  1262
1262  69  1000  1803
1803  24  1953  1206
1206  65  1980  1085
1085  15  0257  1312
1312  20  1000  0902
0902  20  1980  1483
1483  65  1978  1533
1533  21  1995  1348
1348  69  0952  1256
0952  20  1978  1031
1031  65  1979  1583
1583  69  0936  1256
0936  20  1979  0932
0932  65  1977  1081
1081  69  0158  1942
1942  24  1995  1398
1398  69  1052  1256
1052  20  1977  0830
0830  65  1981  1135
1135  69  0938  1056
0938  20  1981  0884
0884  69  0987  0740
0987  69  0790  1193
1193  24  1960  1913
1913  60  1979  1633
1633  46  0986  1037
1037  10  0721  1025
1025  69  0678  0350
0678  60  1980  1185
1185  35  0008  1903
1903  10  1306  1362
1306  76  8001  0000
1550  15  0904  0960
0960  60  8002  1120
1120  69  1323  0350
1323  65  1980  1235
1235  35  0004  0946
0946  69  0721  0874
0874  22  1997  1600
1600  60  8001  1362
1362  69  1065  0350
1065  65  1980  1285
1285  69  0988  1041
1041  22  1997  1650
1650  60  8001  1313
0986  60  1980  1335
1335  30  0002  1091
1091  16  1979  1550
0904  76  0000  0000
0790  60  1958  1963
1963  10  1416  1371
1371  69  0924  0761
0924  69  1427  0880
1427  69  1992  0996
0996  24  1982  1385
1385  69  1038  0740
1038  69  1141  0519
1141  69  0694  1497
1497  24  0442  1046
1046  60  0160  1115
1115  21  1994  1547
1547  60  1994  1749
1749  44  0954  0442
0954  11  0434  1739
1739  21  1994  1597
1597  19  0384  1356
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1113                ALO   DCMT1
1114                LDD   DCMT2
1115                SDA   DCMT2     8002
1116   DCMT1        RAU   N0005
1117                SRT    0004
1118                SUP    0000
1119                NZU   DCMT3    DCMT2
1120   DCMT2        STU   N0005    DCMT3
1121   QUA21        LDD           FLOP
1122                RAU   W0005
1123                NZU   PS       TAU3
1124   TAU3         RAU   TAU4
1125                STU   TAU
1126                STL    0000
1127                LDD   FFTY1
1128                STD   U
1129                RAL   W0004    ATU1
1130   ATU8         AUP   RSL
1131                LDD   ATU4     PS7
1132   ATU1         SLT    0008
1133                STL   TEMP6
1134                RAU   W0002
1135                PMI   ATU2
1136                AUP   RAL
1137                LDD           PS7
1138                RAU   LOW      ATU7
1139   ATU7         AUP   TEMP6
1140                AUP   AXO
1141                LDD   ATU3     PS7
1142   ATU2         RSU    8003    ATU7
1143   ATU3         RAL   X0001
1144                LDD           SUBTA
1145                STL   X0001
1146                RAL   X0002
1147                LDD           SUBTA
1148                STL   X0002
1149                RAL   X0003
1150                LDD           SUBTA
1151                STL   X0003    ATU35
1152   SUBTA        STD   OUT
1153                SLO   W0004
1154                NZE   SUB1
1155                ALO    8001
1156                LDD   NINEO
1157                SIA   TEMP5
1158                RAL    8001    OUT
1159   SUB1         ALO    8001    OUT
1160   ATU35        RAU   TEMP6
1161                SRT    0004
1162                AUP   LACC     ATU8
1163   ATU4         RAL   W0004
1164                LDD   STDAC
1165                SDA   TEMP5
1166                RAU    8001
1167                LDD           PS7
1168                RAU   ALO
1169                AUP   W0001
1170                LDD           PS7
1171                RAU   W0006
1172                STU   N
1173                RAU   NZZZ
1174                AUP   BNI
1175                LDD           PS7
1176                RAL   PSI
1177                SLO   FOUR
1178                NZE   PS12
1179                RAL   XST
1180                STU   XST
1181                STL   X0001
A  1182             LDD   00003
A  1183             SDA   TEMP4
A  1184             RAU    8001
A  1184             LDD           PS7
B  1184             RAU           ENDV4
C  1184               81    8001    0000
A  1185               79    0000    0000
   1186   AXO         00    0000    4000
   1187   LOCS        00    8000    0000
   1188   LACC
   1189   TAU4     RAL   PSI
   1190            SLO   ONE
   1191            STL   PSI
   1192            NZE   QUA22     PS0
   1193   QUA22    RAL   TAU2
   1194            STL   TAU       QUA21
   1195   FLOP     STD   OUT
   1196            RAU   PSI
   1197            MPY   SIXT
   1198            SLO   SIX
   1199            ALO           FLOP3
   1200              06    0D001   0D001
   1201   FLOP3    LDD   OUT      SR1
   1202   CURT1    STD   EXIT     CURTS
   1203   CURTS    SLT    0002
```

```
1356   15  1010  1165
1165   69  0468  1421
1421   22  0468  8002
1010   60  0572  1477
1477   30  0004  1087
1087   11  0000  1406
1406   44  1547  0468
0468   21  0572  1547
0694   69  1647  0880
1647   60  1981  1435
1435   44  1234  0840
0840   60  1243  1697
1697   21  1960  1164
1164   20  0000  1004
1004   69  0265  0518
0518   24  1991  0744
0744   65  1980  1485
1700   10  0202  1108
1108   69  1412  0350
1485   35  0008  1054
1054   20  1997  1750
1750   60  1978  1683
1683   46  1036  1137
1137   10  0564  1170
1170   69  1373  0350
1373   60  0860  1215
1215   10  1997  1102
1102   10  0891  1096
1096   69  1799  0350
1036   61  8003  1215
1799   65  1000  1456
1456   69  1060  1214
1060   20  1000  1104
1104   65  1001  1506
1506   69  1110  1214
1110   20  1001  1154
1154   65  1002  1158
1158   69  1462  1214
1462   20  1002  1556
1214   24  0414  0668
0668   16  1980  1535
1535   45  1088  1789
1789   15  8001  1146
1146   69  1003  1606
1606   23  1996  1949
1949   65  8001  0414
1088   15  8001  0414
1556   60  1997  1152
1152   30  0004  1264
1264   10  0686  1700
1412   65  1980  1585
1585   69  0988  1191
1191   22  1996  1800
1800   60  8001  1208
1208   69  1512  0350
1512   60  0406  1562
1562   10  1977  1131
1131   69  0934  0350
0934   60  1982  1187
1187   21  1989  0692
0692   60  0147  1202
1202   10  0824  1079
1079   69  0982  0350
0982   65  0160  1265
1265   16  0779  1733
1733   45  0212  1237
1237   65  1953  1258
1258   21  1953  1656
1656   20  1000  1204
1204   69  0721  1612
1612   22  1995  1448
1448   60  8001  1592
1592   69  1642  0350
1642   60  1308  1313
1308   81  8001  0000
0891   79  0000  0000
1603   00  0000  4000
0686   00  8000  0000
1243   65  0160  1315
1315   16  0434  1839
1839   20  0160  1314
1314   45  0768  0205
0768   65  1141  1196
1196   20  1960  0694
0880   24  0414  0818
0818   60  0160  1365
1365   19  0384  1423
1423   16  0848  1706
1706   15  1168  1415
1168   06  0568  1977
1415   69  0414  8145
1854   24  0358  1252
1252   35  00C2  1230
```

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1204                SUP   NINTY
1205                SUP    8003
1206                NZE           CURT2
1207                AUP    8001   CURTS
1208   CURT2        AUP    8001
1209                LDD           SUBC
1210                LDD           SUBC
1211                LDD           SUBC
1212                SRT     0003  EXIT
1213   SUBC         STD    FINI
1214                SRT     0001
1215                SLO     8002
1216                SRT     0001
1217                ALO     8001  FINI
1218   STS          STD    OUT
1219                STL    TEMP6
1220                SLO    D0003
1221                SLT     0002
1222                NZU    OK
1223                AUP    I
1224                STU    TEMP2  OK1
1225   OK           RAL    TEMP6  OK1
1226   OK1          STU    TEMP6
1227                RAL     8002
1228                LDD           CURT1
1229                ALO    TEMP6
1230                AUP     8001
1231                NZU    ZWH
1232                NZE           OK6
1233                AUP    TEMP4
1234                NZU    OK2
1235                ALO    I
1236                SLO    ONE
1237                RSL     8002  OUT
1238   OK6          RSL    ONE    OUT
1239   OK2          SLT     0006
1240                STU    N
1241                LDD           SRAC
1242                SLO    RAL    OUT
1243   ZWH          STL    W0007
1244                LDD    OUT    ZWU
1245   FLOPR        STD    OUT
1246                RAU    PSI
1247                MPY    SIXT
1248                SLO    SIX
1249                SRT     0004
1250                ALO           FLOP3
1251                 06    W0001  N0001
1252   RR           LDD           ADDK
1253                STU    V1     RR2
1254   ADDK         STD    OUT
1255                RAL    K
1256                ALO    ONE
1257                SLO    NINTN
1258                BMI           ALARM
1259                ALO     8001  STK
1260   STK          STL    K      OUT
1261   RR2          ALO    RR1     8002   TK EQUALS
1262   RR1          STU    T0001  PS3       ZERO
1263   RW           LDD           SETEK
1264                NZU           RW1
1265                RAL    STU    RW2
1266   RW1          RAL    STL    RW2
1267   RW2          ALO    K
1268                ALO    W
1269                LDD           BEF
1270                LDD    RR     TKOP
1271   RZ           LDD    RR     NZ4
1272   WE           LDD    WL     NUMIN
1273   WL           LDD           DROPK      IS PREVIOU
1274                LDD           CHKTK        OPERATIO
1275                NZE    WL1    ALPHA        ZERO
1276   ALPHA        LDD           SETEK    IF SO EK
1277                RAL    K      RR2
1278   WL1          LDD    ALPHA  TKNZ1      THEN
1279   TKNZ1        STD    OUT               RETURN PS
1280                STL    TEMP1             IF NOT IS
1281                SLO    D0006
1282                NZE           PWRW     IF NOT IS
1283                LDD           GETEK    WK FXD OR
1284                NZE           FXW1
1285                RAL    ARITH
1286                NZE    FLFLW  FXFLW
1287   FXFLW        RAL    FOURT
1288                LDD    FLAR   LDSR
1289   FLAR         RAL    ONET
1290                STL    ARITH  FLFLW
1291   FLFLW        RAU    OTWO   WL3C
1292   FXW1         RAL    ARITH
1293                NZE    FLFXW  FXFXW
1294   FXFXW        RAU    OONE   WL3C
1295   STUAC        STD    EXIT
1296                RAL    STUA1  STL8C
```

```
1210  11  1364  1220
1220  11  8003  1527
1527  45  0930  1181
0930  10  8001  1252
1181  10  8001  1287
1287  69  0890  1293
0890  69  1343  1293
1343  69  1246  1293
1246  30  0003  0398
1293  24  0442  1296
1296  30  0001  1254
1254  16  8002  1414
1414  30  0001  1471
1471  15  8001  0442
1256  24  0414  0918
0918  20  1997  1950
1950  16  0721  1075
1075  35  0002  1231
1231  44  1635  1086
1086  10  0402  1358
1358  21  1993  1346
1635  65  1997  1346
1346  21  1997  1302
1302  65  8002  1662
1662  69  1465  1056
1465  15  1997  1352
1352  10  8001  1260
1260  44  1464  1514
1514  45  0968  1270
0968  10  1995  1402
1402  44  1756  1806
1806  15  0402  1408
1408  16  0434  1939
1939  66  8002  0414
1270  66  0434  0414
1756  35  0006  1521
1521  21  1989  0742
0742  69  1396  0850
1396  16  0564  0414
1464  20  1983  1136
1136  69  0414  0652
0740  24  0414  1018
1018  60  0160  1515
1515  19  0384  1906
1906  16  0868  1473
1473  30  0004  1783
1783  15  1186  1415
1186  06  1977  0568
0195  69  1498  1452
1498  21  1961  1564
1452  24  0414  1068
1068  65  1990  1446
1446  15  0434  0940
0940  16  1393  1747
1747  46  1502  0304
1502  15  8001  1310
1310  20  1990  0414
1564  15  1118  8002
1118  21  0032  0193
0196  69  1552  1458
1552  44  1508  1558
1508  65  1712  1168
1558  65  0464  1168
1168  15  1990  1496
1496  15  0698  1304
1304  69  1608  1403
1608  69  0195  1173
0192  69  0195  1223
0253  69  0163  1466
0163  69  1516  1361
1516  69  1320  1523
1320  45  0974  1125
1125  69  0728  1458
0728  65  1990  1564
0974  69  1125  0778
0778  24  0414  1218
1218  20  1992  1546
1546  16  0724  1129
1129  45  1032  1833
1032  69  1685  1138
1685  45  1188  0990
1188  65  1954  1360
1360  45  1614  1565
1565  65  1268  1573
1573  69  0476  0665
0476  65  0262  1318
1318  20  0954  1614
1614  60  0368  1623
0990  65  0954  1410
1410  45  0664  1615
1615  60  0158  1623
1602  24  0398  1652
1652  65  0273  1577
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```
1297  STUA1  STU   0001  0000
1298  FLFXW  LDD               STUAC
1299         RAL   FOURT
1300         LDD               LDSR
1301         RAU   TEMP1
1302         SUP   DVR
1303         NZU   NETTA
1304         RAU   W
1305         AUP   K
1306         AUP   STU
1307         LDD               PS7
1308         RAU   ACC
1309         AUP   RAU
1310         LDD   FLFLW  PS7
1311  STLAC  STD   EXIT          AND
1312         RAL   STLA1  STLBC
1313  STLBC  LDD   RALW1  BEF
1314  STLA1  STL    0001   0000      RAL WK
1315  RALWK  STD   EXIT    RALW1
1316  RALW1  RAL   K                 SET OPSGN
1317         ALO   W                   TO ZERO
1318         ALO   RAL                 IN BOTH
1319         LDD   EXIT   BEF
1320  WL3C   AUP   TEMP1               SET V1
1321         STU   TEMP1  NETTA      THEN GO TO
1322  NETTA  STL   V1     FLIK       ARITH GEN
1323  PWRW   LDD               GETEK
1324         NZE               FXEX
1325         RAL   ARITH
1326         NZE   FLAR   FXBEX
1327  FXBEX  RAL   FOURT
1328         LDD   FLAR   LDSR
1329  FXEX   LDD   POWR3  LDSD
1330  WY     LDD               CHKTK    IS PREVIOU
1331         NZE               ALPHA     OPN ZERO
1332         LDD   ALPHA  TKNZ2
1333  TKNZ2  STD   OUT
1334         STL   TEMP1            IF NOT IS
1335         SLO   D0006
1336         NZE               POWR     IF NOT IS
1337         LDD               GETEK     PREV FLOA
1338         NZE   FLT1   NFLT1          IF SO GO
1339  FLT1   RAL   ARITH
1340         NZE               FLT3
1341         LDD               UBETA
1342         NZE   FLT2
1343         RAL   TEMP1
1344         SLO   SCON
1345         NZE               FADSB
1346         SLO   OFIVE
1347         NZE   FLT2
1348         RAL   U
1349         LDD   FLT5   CHKOP
1350  FLT5   SLO   OFOUR
1351         STL   TEMP5
1352         SLO   TWTWO
1353         STL   TEMP4
1354         RAL   BETA
1355         LDD   FLT7   CHGOP
1356  FLT7   RAL   TEMP5
1357         NZE   FLT6
1358         RAU   RSUUP
1359         LDD   FLT6   PS7
1360  FLT6   STU   V1     OUT
1361  FLT2   RAL   V1
1362         NZE   FLT4   FLT8
1363  FLT8   LDD   FLT4   ALTR
1364  FLT3   RAL   FOURT
1365         LDD               LDSR
1366         RAL   ONET
1367         STL   ARITH  FLT8
1368  FLT4   RAU   FLT4   NETTA
1369  FADSB  SLO   OTWO   FLT5
1370  NFLT1  RAL   ARITH          IF NOT FLO
1371         NZE   FX1F2          FIX GO TO
1372         RAU   OTREY  WL3C    WL3C    IF
1373  FX1F2  LDD               BMONE  FLOAT FIX
1374         RSU   BETA           COMPILE N
1375         SUP   AR33           LDD BETA F
1376         LDD   AR34   PS7      TO ALTR3
1377  AR33   LDD    0000   9005    AND THEN
1378  AR34   LDD   NETTA             NETTA
1379         STD   EXIT   ALTR3
1380  ALTR   STD   EXIT          ALTR PERFR
1381         LDD               BMONE  FOLLOWING
1382         LDD   ALTR3  STAC1  SEQUENTIAL
1383  BMONE  STD   FINI         BETA MINUS
1384         RAL   BETA            ONE TO
1385         SLO   ONE    EN14Z
1386  I4ZU1  RAL   TEMP4          INST OF
1387         ALO   I4ZU3            CONTENTS
1388         LDD   I4ZU2            OF TEMP4
1389         SDA   I4ZU2            EQUALS U
```

```
1273  21  C001  0000
1664  69  1418  1602
1418  65  1268  1673
1673  69  0526  0665
0526  60  1992  1797
1797  11  1702  1658
1658  44  1762  1812
1812  60  0698  1354
1354  10  1990  1596
1596  10  1712  1468
1468  69  1571  0350
1571  60  0434  1040
1040  10  1443  1847
1847  69  1614  0350
1752  24  0398  1802
1802  65  1509  1577
1577  69  0980  1403
1509  20  0001  0000
1902  24  0398  0980
0980  65  1990  1646
1646  15  0698  1404
1404  15  0564  1370
1370  69  0398  1403
1623  10  1992  1947
1947  21  1992  1762
1762  20  1961  1714
1833  69  1236  1138
1236  45  1090  1241
1090  65  1954  1460
1460  45  0476  1665
1665  65  1268  1723
1723  69  0476  0665
1241  69  0794  1548
0218  69  1621  1523
1621  45  1024  1125
1024  69  1125  0828
0828  24  0414  1518
1518  20  1992  1696
1696  16  0724  1179
1179  45  1082  1933
1082  69  1735  1138
1735  45  1238  1140
1238  65  1954  1510
1510  45  1764  1715
1764  69  1568  0935
1568  45  0672  1773
1773  65  1992  1598
1598  16  0454  1560
1560  45  1814  1765
1814  16  0966  1671
1671  45  0672  1175
1175  65  1991  1746
1746  69  1454  0945
1454  16  1708  1914
1914  20  1996  1504
1504  16  1758  1964
1964  20  1995  1648
1648  65  1651  1808
1808  69  1912  1811
1912  65  1996  1554
1554  45  1908  1610
1610  60  1177  1281
1281  69  1908  0350
1908  21  1961  0414
0672  65  1961  1815
1815  45  1618  1420
1420  69  1618  1721
1715  65  1268  1823
1823  69  0676  0665
0676  65  0262  1668
1668  20  1954  1420
1618  60  1618  1762
1765  16  1368  1454
1140  65  1954  1660
1660  45  1915  1965
1965  60  0520  1623
1915  69  1718  1771
1718  61  1651  1710
1710  11  1566  1821
1821  69  1074  0350
1566  69  0000  9005
1074  69  1762  1616
1616  24  0398  1604
1721  24  0398  1654
1654  69  1760  1771
1760  69  1604  1810
1771  24  0442  1796
1796  65  1651  1910
1910  16  0434  1190
1704  65  1995  1754
1754  15  1666  1921
1921  69  1124  1627
1627  22  1124  1677
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         RAU   8002    8003     IF NOT LDD   1677  60  8002  8003
I4ZU3    LDD   0000                          1666  69  0000  1804
         STD   TEMP2                         1804  24  1993  1846
         RAM   8001             IF LDD SET   1846  67  8001  1904
         SLO   CKLDD             DATA OF     1904  16  1716  1971
         SLT   0002              CONTENTS    1971  35  0002  1727
         NZU           I4ZU4      OF         1727  44  1331  1132
         RAL   U                  TEMP4 TO   1331  65  1991  1946
         SRT   0004                 U        1946  30  0004  1766
         AUP   OONE    I4ZU5                 1766  10  0158  1816
I4ZU4    RAL   U       I4ZU5                 1132  65  1991  1816
I4ZU5    AUP   I4ZU2                         1816  10  1124  1229
         LDD   TEMP2   8003                  1229  69  1993  8003
I4ZU2    SDA   0000    FINI                  1124  22  0000  0442
STAC1    STD   FINI             COMPILE NE   1810  24  0442  1698
         LDD           GETEK                 1698  69  1916  1138
         NZE           STAC2                 1916  45  1470  0772
         RSL   OONE    STAC2                 1470  66  0158  0772
STAC2    SLO   STLA1                         0772  16  1509  1966
         SLT   0004                          1966  35  0004  1777
         SLO   BETA                          1777  16  1651  1768
         SLT   0006    OSGN4                 1768  35  0006  0984
ALTR3    LDD           IUM2U                 1604  69  1818  0822
         RAL   BETA                          1818  65  1651  1918
         STL   TEMP4                         1918  20  1995  1748
         LDD           BMIN1                 1748  69  1968  0872
         RAU   OONE                          1968  60  0158  1520
         STU   OPSGN   EXIT                  1520  21  1975  0398
IUM2U    STD   FINI             U MINUS TW   0822  24  0442  1798
         RAL   U                 TO TEMP4    1798  65  1991  1848
         SLO   TWO     ENI4Z                 1848  16  0390  1190
ENI4Z    STL   TEMP4   I4ZU1                 1190  20  1995  1704
BMIN1    STD   FINI             CONTENTS O   0872  24  0442  1948
         RSU   TEMP4             CONTENTS    1948  61  1995  1570
         SUP   BMIN2   8003       TEMP4 MA   1570  11  1923  8003
BMIN2    SML   0000              NEGATIVE    1923  18  0000  1620
         RAU   8002                          1620  60  8002  1279
         SLO   TEMP4                         1279  16  1995  1670
         SLO   BMIN3   8002                  1670  16  1174  8002
BMIN3    21    0000    FINI                  1174  21  0000  0442
EXIT     HLT   EXIT    EXIT                  0398  01  0398  0398
FINI     HLT   FINI    FINI                  0442  01  0442  0442
OUT      HLT   OUT     OUT                   0414  01  0414  0414
OSGN1    STD   FINI    OSGN3    SET SIGN O   0475  24  0442  1720
OSGN3    AUP   OPSGN             INSTRUCTI   1720  10  1975  1329
         AUP   OSGN2   8003      TO BE       1329  10  1182  8003
OSGN4    LDD   FINI    PS7                   0984  69  0442  0350
OSGN2    RAU   8002    OSGN4                 1182  60  8002  0984
UBETA    STD   FINI             IS U EQUAL   0935  24  0442  1770
         RAL   BETA              TO BETA     1770  65  1651  1820
         ALO   ONE               PLUS ONE    1820  15  0434  1240
         SLO   U       FINI                  1240  16  1991  0442
CHGOP    STD   FINI    CHGE1     OP  OF      1811  24  0442  1920
CHGE1    ALO   CHG1             CONTENTS O   1920  15  1224  1379
         LDD   CHG2             LOWER        1379  69  1232  1785
         SDA   CHG2    8002      CHANGED     1785  22  1232  8002
CHG1     RAL   0000              CONTENTS    1224  65  0000  1970
         BMI           CHG3      TEMP4       1970  46  1274  1324
         SLO   TEMP4   CHG2                  1274  16  1995  1232
CHG3     ALO   TEMP4   CHG2                  1324  15  1995  1232
CHG2     STL   0000    FINI                  1232  20  0000  0442
POWR     LDD           GETEK    IS PREV FL   1933  69  1286  1138
         NZE   POWR1   POWRF     IF SO IS    1286  45  1290  1291
POWR1    RAL   V1                PREV IN A   1290  65  1961  0922
         NZE   POWR4             ALTR IF N   0922  45  0776  1827
         LDD   POWR4   ALTR                  1827  69  0776  1721
POWR4    RAL   ARITH            IF PRES FI   0776  65  1954  0972
         NZE   FXFXW                         0972  45  1615  1927
         RAL   FOURT               FLOAT     1927  65  1268  1374
         LDD           LDSR      AND SET     1374  69  0878  0665
         RAL   ONET              OPSGN TO    0878  65  0262  1022
         STL   ARITH   FXFXW                 1022  20  1954  1615
POWRF    LDD   POWR3   ALTR                  1291  69  0794  1721
POWR3    RAL   ARITH               ALTR      0794  65  1954  1072
         ALO   TENT    POWRH                 1072  15  1225  1429
OPLD     LDD   OUT     LDSR                  1122  69  0414  0665
OPWK     ALO   K                COMPILES     1172  15  1990  1222
         ALO   W       OPWK1     OPN WK NE   1222  15  0698  1272
OPWK1    LDD   OPWK2   OSGN1                 1272  69  1275  0475
OPWK2    STU   OPSGN   OUT                   1275  21  1975  0414
LDSR     STD   LDSR1            OPSGN ZERO   0665  24  1322  1325
         ALO   LDSR2            COMPILES     1325  15  0928  1034
         LDD   LDSR1   BEF                   1034  69  1322  1403
LDSR1    HLT   LDSR1   LDSR1                 1322  01  1322  1322
LDSR2    LDD   0000    9000                  0928  69  0000  9000
OPACC    ALO   ACC     OPWK1                 1372  15  0434  1272
FLIK     RAL   TEMP1                         1714  65  1992  1422
         SLT   0006                          1422  35  0006  1337
         AUP           8003                  1337  10  1340  8003
         RAU   0472    8003                  1340  60  0472  8003
R0001    RAL   FDV     OPACC                 0536  65  1390  1372
R0002    RAL   DVR     OPWK                  0537  65  1702  1172
R0003    RAL   FDV     OPWK                  0538  65  1390  1172
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1483          R0004   LDD   FPAD4   ALTR
1484          Q0001   RAL   CN302   POWRH
1485          Q0002   LDD   Q0001   LDSD
1486          LDSD    STD   EXIT
1487                  RAL   W       Q0003
1488          Q0003   ALO   K        0553
1489          Q0004   ALO   D0003   PWRV2
1490          Q0005   RAL   FAD     CPACC
1491          Q0006   RAL   ALO     OPWK
1492          Q0007   RAL   FAD     OPWK
1493          Q0008   LDD   Q0009   UBETA
1494          Q0009   NZE   ADD4    FPAB3
1495          Q0010   RAL   FMP     OPACC
1496          Q0011   RAL   LOINU   FPM11
1497          Q0012   RAL   FMP     OPWK
1498          Q0013   RAU   RAU     FPM13
1499          FPM11   LDD           BEF
1500                  RAL   MPY     OPWK
1501          POWRH   LDD   ONET
1502                  STD   V1      OPLD
1503          PWRV2   LDD           BEF
1504                  RAL   STDAC
1505                  LDD   EXIT    BEF
1506          FPAB3   RSL   FIVEO   MULTN
1507          ADD4    LDD           ALTR      ALTR AND
1508                  RAL   ALO     OPACC       ALO ACC
1509          FPAD4   RAL   DVR     OPACC
1510          FPM13   STU   TEMP6
1511                  RAL   U
1512                  LDD           CHKOP
1513                  STL   TEMP4
1514                  SLO   BMI
1515                  STL   TEMP5
1516                  LDD           UBETA
1517                  NZE           MULT1
1518                  RSL   OFIVE
1519                  STL   TEMP4   MULT2
1520          MULT2   RAL   U
1521                  SLO   ONE
1522                  LDD   MULT4   CHGOP
1523          MULT4   LDD           ALTR
1524                  RAL   MPY     OPACC
1525          MULT1   RAM   TEMP4
1526                  ALO   TEMP6
1527                  STL   TEMP6
1528                  RAL   BETA
1529                  LDD           CHKOP
1530                  NZE           MLT7A
1531                  ALO   OONE
1532                  NZE   MULT6
1533                  RSM   TEMP4   MLT7B
1534          MLT7A   RAM   TEMP4   MLT7B
1535          MLT7B   SLO   OFIVE
1536                  STL   TEMP4   MULT7
1537          MULT7   RAL   BETA
1538                  SLO   ONE
1539                  LDD           CHGOP
1540                  RAL   TEMP5   MULTN
1541          MULTN   STL   TEMP4
1542                  RAL   BETA
1543                  LDD   OPWK2   CHGOP
1544          MULT8   RAL   BETA
1545                  STL   U
1546                  LDD           CHGOP
1547                  STL   TEMP5
1548                  BMI           MULT9
1549                  RAU   OONE    MULT9
1550          MULT9   STU   OPSGN
1551                  RAL   TEMP6
1552                  ALO   LOW
1553                  LDD           BEF
1554                  RAM   TEMP5
1555                  LDD   OUT     OSGN1
1556          MULT6   RAL   TEMP5
1557                  STL   TEMP4   MULT8
1558          YL      RAL   Y       YL1
1559          YN      RAL   Y       YN1
1560          ZN      LDD           SRN       GENERATE N
1561                  LDD   WY      GENN
1562          CHKAR   STD   OUT
1563                  RAL   ARITH               ALARM IF
1564                  NZE   ALARM   OUT          FLOATING
1565          CHKNK   STD   FINI
1566                  RAU   NU                  ALARM IF K
1567                  AUP   K                    AND NU
1568                  NZU   ALARM   FINI         NON ZERO
1569          CHKNN   STD   EXIT
1570                  SRT    0004               ALARM IF N
1571                  ALO   EIGTO                IS MORE
1572                  NZU   SRN6
1573                  SLO    8001               THAN  2000
1574                  SRT    0006   EXIT
1575          CHKOP   STD   FINI                 DIGITS
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0539   69   0792   1721
0550   65   1472   1429
0551   69   0550   1548
1548   24   0398   1522
1522   65   0698   0552
0552   15   1990   0553
0553   15   0721   1375
0554   65   1572   1372
0555   65   0406   1172
0556   65   1572   1172
0557   69   0558   0935
0558   45   1622   1672
0559   65   0765   1372
0560   65   1722   0978
0561   65   0765   1172
0562   60   1443   1772
0978   69   1381   1403
1381   65   1084   1172
1429   69   0262   1822
1822   24   1961   1122
1375   69   1028   1403
1028   65   0988   1493
1493   69   0398   1403
1672   66   0690   1922
1622   69   1425   1721
1425   65   0406   1372
0792   65   1702   1372
1772   21   1997   1424
1424   65   1991   1474
1474   69   1078   0945
1078   20   1995   1524
1524   16   0824   1479
1479   20   1996   1574
1574   69   1128   0935
1128   45   1282   1134
1282   66   0966   1624
1624   20   1995   1674
1674   65   1991   1724
1724   16   0434   1440
1440   69   1543   1811
1543   69   1774   1721
1774   65   1084   1372
1134   67   1995   1824
1824   15   1997   1924
1924   20   1997   1475
1475   65   1651   1525
1525   69   1178   0945
1178   45   1332   1184
1332   15   0158   1575
1575   45   1228   1529
1529   68   1995   1625
1184   67   1995   1625
1625   16   0966   1675
1675   20   1995   1725
1725   65   1651   1775
1775   16   0434   1490
1490   69   1593   1811
1593   65   1996   1922
1922   20   1995   1825
1825   65   1651   1925
1925   69   1275   1811
0826   65   1651   0876
0876   20   1991   0844
0844   69   0926   1811
0926   20   1996   0976
0976   46   1579   1030
1579   60   0158   1030
1030   21   1975   1278
1278   65   1997   1026
1026   15   0860   1076
1076   69   1629   1403
1629   67   1996   1126
1126   69   0414   0475
1228   65   1996   1176
1176   20   1995   0826
0185   65   0862   0950
0184   65   0862   1200
0226   69   1679   0800
1679   69   0218   1227
1355   24   0414   1226
1226   65   1954   1276
1276   45   C304   0414
0832   24   0442   1326
1326   60   1962   1376
1376   10   1990   1426
1426   44   0304   0442
1561   24   0398   1476
1476   30   0004   1387
1387   15   0983   1437
1437   44   1017   0842
0842   16   8001   1526
1526   30   0006   0398
0945   24   0442   1576
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	ALO		8002		1576	15	1729	8002
	67	9999			1729	67	9999	1626
	SLT	0002			1626	35	0002	1284
	SLO	8002			1284	16	8002	1643
	SRT	0002			1643	30	0002	1676
	ALO	RAL	FINI		1676	15	0564	0442
CHKTK	STD	OUT			1523	24	0414	1726
	RAL	K		FETCH TK	1726	65	1990	1776
	ALO		8002		1776	15	1779	8002
	RAL	T0001	OUT		1779	65	0032	0414
DROPK	STD	OUT		DECREMENT	1361	24	0414	1826
	RAL	K		K	1826	65	1990	1926
	SLO	ONE	STK		1926	16	0434	1310
DROPU	STD	EXIT			1301	24	0398	1328
	RAL	U			1328	65	1991	1378
	SLO	ONE			1378	16	0434	1540
	STL	U	EXIT		1540	20	1991	0398
GENN	STD	OUT			1227	24	0414	1428
	LDD	GEN2	STBTA		1428	69	0492	1469
GEN2	LDD	GEN1	SRAC		0492	69	1478	0850
GEN1	LDD	OUT	BEF		1478	69	0414	1403
GETEK	STD	EXIT1			1138	24	0630	1334
	RAL	K		EK VALUE	1334	65	1990	1528
	ALO		8002		1528	15	1431	8002
	RAL	E0001	EXIT1		1431	65	0700	0630
TNA	RAL	EL			1578	65	0320	1628
	ALO	ONE			1628	15	0434	1590
	STL	EL			1590	20	0320	1678
	ALO	COM1	GNA		1678	15	1481	1407
PCMMA	LDD	PF	COMMA		0207	69	0234	1487
NCMMA	LDD	NR	COMMA		0210	69	0170	1487
QCMMA	LDD	EE	COMMA		0208	69	0198	1487
RCMMA	LDD	RR	COMMA		0209	69	0195	1487
COMMA	STD	OUT			1487	24	0414	1728
	RAL	ONET			1728	65	0262	1778
	LDD		SETJN		1778	69	1531	1384
	SLO	ONE			1531	16	0434	1640
	ALO	STL			1640	15	0464	1828
	ALO	PHI			1828	15	0730	1835
	STL	TEMP4			1835	20	1995	1928
	LDD		GETEK		1928	69	1581	1138
	NZE		COMB		1581	45	1434	1935
	RAL	OONE	COMB		1434	65	0158	1935
COMB	ALO	TEMP4			1935	15	1995	1829
	LDD		BEF		1829	69	1382	1403
	RAL	8003	OUT		1382	65	8003	0414
NUINC	STD	OUT			0848	24	0414	1929
	RAL	NU		NU EQUALS	1929	65	1962	1080
	AUP	8002		PLUS ONE	1080	10	8002	1690
	AUP	ONE		AND	1690	10	0434	1740
	STU	NU		JNU EQUALS	1740	21	1962	1130
	AUP	NU2		JNUMINUSO	1130	10	1484	1790
	ALO	NU1	8002		1790	15	1693	8002
NU1	LDD	J0001	8003		1693	69	1977	8003
NU2	STD	J0001	OUT		1484	24	1977	0414
SETJN	STD	EXIT		JNU EQUAL	1384	24	0398	1180
	STL	TEMP1		JNU PLUS	1180	20	1992	1230
	RAL	NU			1230	65	1962	1280
	ALO	STJN1		CONTENTS	1280	15	1534	1840
	LDD	STJN2			1840	69	1743	1330
	SDA	STJN2	8002		1330	22	1743	8002
STJN1	RAL	J0001			1534	65	1977	1631
	ALO	TEMP1	STJN2		1631	15	1992	1743
STJN2	STL	J0001			1743	20	1977	1380
	SLT	0004	EXIT		1380	35	0004	0398
NUMIN	STD	OUT			1466	24	0414	1430
	RAL	NU			1430	65	1962	1480
	SLO	ONE			1480	16	0434	1940
	STL	NU	OUT		1940	20	1962	0414
SETEK	STD	EXIT		SET EK	1458	24	0398	1530
	RAU	ARITH		EQUAL TO	1530	60	1954	1580
	ALO	K		ARITH	1580	15	1990	1630
	ALO		8002		1630	15	1584	8002
	STU	E0001	EXIT		1584	21	0700	0398
BEF	STD	EXIT1			1403	24	0630	1634
	LDD	BEF1	OSGN1		1634	69	1537	0475
BEF1	STU	OPSGN	EXIT1		1537	21	1975	0630
STBTA	STD	EXIT			1469	24	0398	1680
	RAL	U			1680	65	1991	1730
	STL	BETA	EXIT		1730	20	1651	0398
STNON	STD	ABEX2			0523	24	1780	1684
	LDD		PS100		1684	69	1587	0900
	AUP	NONON	ABEX2		1587	10	0386	1780
TKOP	STD	FINI		STORE OPN	1173	24	0442	1830
	RAU	K		IN TK	1830	60	1990	1930
	AUP	TKOP1		AND	1930	10	1734	1341
	LDD	R	8003	EXIT FRO	1341	69	1988	8003
TKOP1	STD	T0001	FINI	FINI	1734	24	0032	0442
UCHGE	STD	FINI		U EQUALS U	0404	24	0442	1681
	RAL	U		MINUS ONE	1681	65	1991	1731
	SLO	ONE	CHGE1		1731	16	0434	1920
LARM	STL	L		SET ERROR	0286	20	1987	1391
	STL	R	ALARM	IDENTIFCT	1391	20	1988	0304

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1669          ALARM   RAU    0000
1670                  SLT    0001
1671                  ALO    L
1672                  SLT    0003
1673                  ALO    R
1674                  SLT    0002
1675                  MLT    1234     PS
1676          END     LDD    FFA      ABPUN
1677          ABPUN   STD    ABEX1    ENDA
1678          ENDA    RAU    A0001
1679                  NZE              ABEX1
1680                  AUP    ABINC
1681                  SRT    0004
1682                  LDD              STNON
1683                  AUP    D0005
1684                  STU    W0001
1685                  RAL    A0001
1686                  ALO             8002
1687                  RAL    A0001     CKLDD
1688          CKLDD   LDD    8003
1689                  SDA    TEMP1
1690                  AUP    8003
1691                  STA    TEMP2
1692                  SLT    0002
1693                  RAU    8003
1694                  LDD              PS100
1695                  AUP    NONO
1696                  SLT    0004
1697                  STU    W0004
1698                  RAU    TEMP1
1699                  SRT    0004
1700                  LDD              STNON
1701                  STU    W0002
1702                  RAU    TEMP2
1703                  LDD              STNON
1704                  STU    W0003
1705                  STL    W0005
1705                  STD    W0006
1706                  LDD              PS133
1707                  LDD    ENDA      ABMIN
1708          ABMIN   STD    ABEX4
1709                  RSU    ONE
1710                  AUP    A0001
1711                  STU    A0001     ABEX4
1712          FF      RAU    CONSO
1713                  LDD              PS7
1714                  RAU    END
1715                  STU    TAU       PS12
1716          FFA     STU    W0001
1717                  STU    W0002
1718                  STU    W0003
1719                  RAU    BOP
1720                  STU    W0004
1721                  LDD    START     PS133
1722          TN      LDD              SRN
1723                  LDD    TNA       GENN
1724          TL      LDD    TNA       DROPK
1725          ONET    00     0000      0001
1726          TWOT    00     0000      0002
1727          FOURT   00     0000      0004
1728          FIVET   00     0000      0005
1729          SIXT    00     0000      0006
1730          EIGTT   00     0000      0008
1731          NINET   00     0000      0009
1732          TENT    00     0000      0010
1733          TWLVT   00     0000      0012
1734          FRTNT   00     0000      0014
1735          SXTNT   00     0000      0016
1736          SVNTT   00     0000      0017
1737          NNTEN   00     0000      0019
1738          TWSIX   00     0000      0026
1739          NINTY   00     0000      0090
1740          ONE     00     0001      0000
1741          TWO     00     0002      0000
1742          THREE   00     0003      0000
1743          FOUR    00     0004      0000
1744          FIVE    00     0005      0000
1745          SIX     00     0006      0000
1746          FFTY1   00     0051      0000
1747          OONE    01     0000      0000
1748          OTWO    02     0000      0000
1749          OTREY   03     0000      0000
1750          OFIVE   05     0000      0000
1751          FRONE   41     0000      0000
1752          FIVEO   50     0000      0000
1753          SVTY2   72     0000      0000
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1755          ALO     15     0000      0000
1756          MPY     19     0000      0000
1757          STL     20     0000      0000
1758          NZA     45     0000      0000
1759          BMI     46     0000      0000
1760          RAU     60     0000      0000
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ALARM
 SUBROUTIN
 DISPLAYS
 L R AND
 STATEMENT
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1781    35  0001  1637
1637    15  1987  1441
1441    35  0003  1831
1831    15  1988  1793
1793    35  0002  1931
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1582    30  0004  1843
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1682    21  1977  1732
1732    65  1849  1782
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1486    65  1849  1716
1716    69  8003  1832
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1491    23  1993  1784
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1586    60  1992  1636
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1100    24  1982  1936
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1691    69  1386  1369
1369    24  1737  1741
1741    61  0434  1791
1791    10  1849  1787
1787    21  1849  1737
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0508    00  0000  0002
1268    00  0000  0004
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0408    00  0000  0014
0376    00  0000  0016
1077    00  0000  0017
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0354    00  0000  0026
1364    00  0000  0090
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0390    00  0002  0000
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0779    00  0004  0000
1688    00  0005  0000
0868    00  0006  0000
0265    00  0051  0000
0158    01  0000  0000
1368    02  0000  0000
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0966    05  0000  0000
1266    41  0000  0000
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0406    15  0000  0000
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046.    20  0000  0000
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0824    46  0000  0000
1443    60  0000  0000
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1764	ABCON	00	5000	0000
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1766	ACCUM	ALF	ACC	SOAP2
1767	FIXNR	00	0000	0501
1768	LDAC	LDD	0001	8002
1769	I	00	1000	0000
1770	LOCUS	73	6161	6161
1771	LOW	00	8002	0000
1772	LOW1	00	0000	8002
1773	MAX	00	0000	0025
1774	MAXE	00	0000	0500
1775	MAXU	00	0143	0000
1776	NONO	00	0000	9090
1777	NONON	00	9090	9090
1778	PHI	00	6000	0000
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1780	STORE	06	0051	0000
1781	TEMP9	73	6161	6161
1782	W	00	7000	0000
1783	Y	00	2000	0000
1784	REG	79	6567	0000
1785	FFTY2	00	0052	0000
1786	GOTO	00	0000	0160
1787	FIFTY	00	0050	0000
1788	HNDRD	00	0100	0000
1789	RSUUP	RSU	8003	0000
1790	UINLO	65	8003	0000
1791	LOINU	60	8002	0000
1792	YU	04	8000	0000
1793	STU	21	0000	0000
1794	FAD	32	0000	0000
1795	FDV	34	0000	0000
1796	FMP	39	0000	0000
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1798	TWTWO	22	0000	0000
1799	COM1	20	7001	0000
1800	OFOUR	04	0000	0000
1801	NININ	99	0000	0000
1802	SCON	ALF	S	SOAP2
1803	ICNST	69	9090	9092
1804	YCNST	88	9090	9092
1805	STDAC	STD	0001	0000
1806	CN302	00	0000	0302
1807	THOUS	00	0000	1000
1808	NZZZ	ALF	99	SOAP2
1809	BOP	ALF	BOP	SOAP2
1810	CONSO	NOP	8000	8000
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1812	TEN	00	0010	0000
1813	EIGTO	80	0000	0000
1814	W0010	00	0800	0080

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0202	66	0000	0000	
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0434	00	0001	0000	
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1366	00	0000	0501	
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0482	00	0000	0025	
1667	00	0000	0500	
0347	00	0143	0000	
0308	00	0000	9090	
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0730	00	6000	0000	
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0862	00	2000	0000	
0285	79	6567	0000	
1549	00	0052	0000	
0300	00	0000	0160	
0322	00	0050	0000	
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1177	61	8003	0000	
1738	65	8003	0000	
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1712	21	0000	0000	
1572	32	0000	0000	
1390	34	0000	0000	
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1481	20	7001	0000	
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0429	99	0000	0000	
0454	82	0000	0000	
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0151	88	9090	9092	
0988	24	0001	0000	
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1416	00	0000	1000	
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1941	62	7677	0000	
1837	00	8000	8000	
1393	00	0019	0000	
0870	00	0010	0000	
0983	80	0000	0000	
1986	00	0800	0080	
1864	70	1998	9999	NOTE 1

IT
Compiler
FORTRANSIT I, I s

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4	BLR	0161	0199	
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8	BLR	0264	0264	
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12	BLR	0272	0272	
13	BLR	0273	0273	
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46	BLR	0699	0699	
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49	REG	D0719	0727	
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52	REG	00550	0562	
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66	SYN	STRTA	1998	
67	SYN	V1	1961	
68	SYN	NU	1962	
69	SYN	MU	1951	
70	SYN	ARINC	1952	
71	SYN	NRAR	1953	
72	SYN	ARITH	1954	
73	SYN	URAR	1955	
74	SYN	JAY	1956	
75	SYN	QUOTA	1972	
76	SYN	INTGR	1973	
77	SYN	GAMMA	1974	
78	SYN	OPSGN	1975	
79	SYN	TALLY	1976	
80	SYN	L	1987	
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84	SYN	U	1991	
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87	SYN	TEMP3	1994	
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                SYN   NW      0213
                SYN   FW      0215
                SYN   NF      0217
                SYN   WY      0218
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                SYN   PN      0231
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                SYN   RF      0234
                SYN   RW      0238
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                SYN   FF      0242
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          0214      75   7155  7800
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          0228      93   8260  7400
          0278      93   8793  7300
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          0428  -  93   8938  7800
          0179      10   9974  7100
          0229  -  35   7938  7800
          0182      53   9936  7900

T  L      0162  -  57   9900  0000
TABLE     0164      53   9936  7900
TABLE     0214      75   7155  7800
TABLE     0264  -  52   9000  0000
TABLE     0165  -  10   9900  0000
TABLE     0166      57   9935  7900
TABLE     0216      74   7170  7200
          0266      33   6982  6600
TABLE     0316      88   6838  7800
TABLE     0366  -  83   6400  0000
TABLE     0167  -  21   9000  0000
TABLE     0168  -  20   9000  0000
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TABLE     0219      58   7358  8900
TABLE     0269      64   7458  6400
TABLE     0319      58   7210  9900
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          0419      16   9080  8600
          0469  -  58   6658  7200
TABLE     0171      57   9966  8200
TABLE     0221      51   7466  7300
          0271      66   6466  8700
TABLE     0321      66   8966  7700
          0371  -  66   7200  0000
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          0222      49   7950  9900
          0272  -  33   6547  7100
TABLE     0173      03   8203  8700
TABLE     0223      60   7403  8900
TABLE     0273      25   8803  7300
TABLE     0323      03   6479  6900
TABLE     0373      03   7203  7700
          0423      15   9087  8300
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TABLE     0177      99   9936  7900
TABLE     0227  -  75   7155  7800
TABLE     0178      35   7910  9900
          0228      93   8260  7400
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          0328      93   6474  7100
          0378      93   7293  7700
          0428  -  93   8938  7800
TABLE     0179      10   9974  7100
TABLE     0229  -  35   7938  7800
TABLE     0182      53   9936  7900
```

```
0232      33   8975   7100
0282      33   7355   7800
0332      33   7233   7700
0382   -  85   6233   7200
0183      10   9914   9000
0233   -  35   7900   0000
0187      53   9936   7900
0237   -  75   7155   7800
0188      58   8264   7400
0238      58   7358   6400
0288      58   8758   8900
0338      26   8500   0000
0388      58   7758   7200
0438      33   6616   9000
0488   -  58   7200   0000
0189   -  34   9932   7900
0199      57   9971   7100
0249      66   8251   7400
0299      66   7376   6900
0349      24   8866   8700
0399      66   6466   8900
0449      66   7231   8400
0499      01   8537   7800
0549      66   7781   6700
0599      44   6684   6200
0649      30   8300   0000
0699   -  66   7200   0000
START     RD1  STPTA  9999
STPTA     RAL  1951
          NZE  1952
          RAL  YCNST
          STL  W0002
          RAU  1954
          AUP  ONET
          LDD         STNON
          STU  W0003
          RAL  PFG
          STL  W0004
          STU  W0001
          STU  W0005
          STU  W0006
          RAU  LOCUS
          STU  TEMP9
          STL  A0001
          LDD  PS0    PS133
PS0       STU  PS1
          LDD  TAU1   PS5
PS5       STD  TAU    PS
READA     RCD  0051
          RAL  0057
          STL  0000
          RAL  ONET
          STL  FLAG
          STL  TALLY  PS1A
PS1       RCD  0051   PS1A
PS1A      RAU  MAX
          SUP  TALLY
          NZU         LARM
          RAL  TALLY
          ALO  STORE
          LDD  PS2    SR1
PS2       RAL  TALLY
          ALO  SIXT
          STL  TALLY
          RAU  0056
          SRT  0002   PS2B
PS2B      STU  GAMMA
          STL  L
          RAU  8002
          SUP  RSL
          NZU  PS1
          RAL  FFTY1
          STL  U
          RAL  TALLY
          SLO  ONET
          SLT  0004
          STL  TALLY
          STL  QUOTA  PS2A
PS2A      STU  V1
          STU  K
          STU  T0001
          STU  NU
          STU  J0001
          STU  N
          STU  NPAR
          STU  MU
          STU  ARITH
          STU  PORP
          STU  EL
          STU  OPSGN  PS3
PS3       RAU  GAMMA
          NZU         PS5
          SRT  0002
```

```
TABLE           0232      33   8975   7100
TABLE           0282      33   7355   7800
TABLE           0332      33   7233   7700
                0382   -  85   6233   7200
                0183      10   9914   9000
                0233   -  35   7900   0000
TABLE           0187      53   9936   7900
TABLE           0237   -  75   7155   7800
TABLE           0188      58   8264   7400
TABLE           0238      58   7358   6400
TABLE           0288      58   8758   8900
                0338      26   8500   0000
TABLE           0388      58   7758   7200
                0438      33   6616   9000
                0488   -  58   7200   0000
TABLE           0189   -  34   9932   7900
TABLE           0199      57   9971   7100
                0249      66   8251   7400
TABLE           0299      66   7376   6900
TABLE           0349      24   8866   8700
TABLE           0399      66   6466   8900
                0449      66   7231   8400
TABLE           0499      01   8537   7800
TABLE           0549      66   7781   6700
                0599      44   6684   6200
                0649      30   8300   0000
                0699   -  66   7200   0000
                1999      70   1998   9999
                1998      65   1951   1916
                1916      45   1952   1966
                1966      65   0151   0155
                0155      20   1978   0031
                0031      69   1954   0159
                0159      10   0262   0267
                0267      69   0270   0523
                0270      21   1979   0432
                0432      65   0285   0289
                0289      20   1980   0283
                0283      21   1977   0030
                0030      21   1981   0284
                0284      21   1982   0335
                0335      60   0638   0293
                0293      21   0148   0251
                0251      20   1860   0152
                0152      69   0205   0158
                0205      21   0160   0263
                0263      69   0416   0519
                0519      24   1960   1234
FIRST READ      1234      70   0051   0301
STORE STMN      0301      65   0057   0261
                0761      20   0000   0153
                0153      65   0262   0317
 FLAG SET       0317      20   0421   0274
ONE             0274      20   1976   0029
 NEXT READ      0150      70   0051   0029
                0029      60   0482   0287
TALLY IS        0287      11   1976   0281
MAXIMUM         0281      44   0385   0286
KK XXXX YY      0385      65   1976   0331
  IS            0331      15   0334   0339
0600510000      0339      69   0292   0145
TALLY PLUS      0292      65   1976   0381
SIX IS TAL      0381      15   0384   0389
GAMMA EQUA      0389      20   1976   0279
WORD6 TIME      0279      60   0056   0311
 01             0311      30   0002   0367
L EQUALS E      0367      21   1974   0027
SYMBOL          0027      20   1987   0290
                0290      60   8002   0149
RECYCLE IF      0149      11   0202   0157
IS NOT F        0157      44   015    0312
INITIALIZE      0312      65   026    0619
IF L IS F       0619      20   199    0144
TALLY MINU      0144      65   197    0431
ONE             0431      16   076    0417
TALLY IN D      0417      35   0004   0277
                0277      20   1976   0329
TALLY           0329      20   197    0025
                0025      21   196    0314
PRESET ALL      0314      21   1990   0343
PERTINENT       0343      21   0032   0435
COUNTERS        0435      21   1962   0315
TO ZERO         0315      21   1977   0280
                0280      21   198    0342
                0342      21   195    0156
                0156      21   1951   0154
                0154      21   1954   0257
                0257      21   0362   0365
                0365      21   0320   0623
                0623      21   1975   0193
                0193      60   1974   0379
OUT IF GAM      0379      44   0333   0484
IS ZERO         0333      30   0002   0439
```

```
                STU   GAMMA
                RAU   8002
                NZU           PS3
                ALO   L
                STL   R
                STU   L
                SUB   NINFO
                RMI   PS3R    PS3C
PS3C            RAU   L
                STU   INTGR
                RAU   NININ   PS3RA
PS3R            RAL   R
                SRT   0004
                ALO   HNORD
                LDD   BASE
                SDA   BASE    8001
NEXT            SLT   0006
                SLO   8002
                STD   TEMP1
                SPT   0002
                SUP   8003
                STD   TEMP2   TEST
                NZE           CHNGR
TEST            RAM   *8002   VALID
                RAL   BASE
CHNGR           ALO   ONET    8002
                RMI   ALARM   NXTWD
NOPR            RAL   BASE
NXTWD           ALO   FIFTY
                STL   BASE    8001
                SLO   L
VALID           NZE           MATCH
                RAL   TEMP1   NEXT
                RAM   TEMP2
MATCH           ALO   GOTO
                RAU   8002    8003
                RAL   0000    NEXT
BASE            RAU   TALLY
PS5             SUB   ONE     PS5A
                STU   TALLY
PS5A            NZU           PS10
                AUP   PS6     8003
                RAU   0000
PS6             STU   GAMMA   PS3
                STD   PS8
PS7             RMI           PS7A
                SLO   U       PS7B
PS7A            ALO   U       PS7B
PS7B            LDD   PS7C
                SDA   PS7C    8001
PS7C            STU   0000
                RAL   U
                ALO   ONE
                STL   U
                SLO   MAXU
                RMI   PS8
                RAL   ONE     LARM
PS8             MLT   0000    PS8
PS10            RAL   L
                STL   R
                RAU   NINFO   PS3RA
PS3RA           STU   L       PS3R
PS12            RAU   0000
                LDD   PS12C   PS12A
PS12A           STD   OUT
                LDD           STNON
                AUP   00004
                STU   W0001
                STU   LINK
                RAU   TEMP9
                STU   W0003
                STL   W0005
                RAU   0000
                RAL   NONO
                SLT   0004
                STL   W0004
                RAU   NONON
                STL   W0006
                STU   W0002
                LDD   OUT     PS133
PS12C           RAU   TEMP9
                STU   W0001
                RAL   FFTY1
                STL   UBAR    PS13C
PS13C           RAL   TALLY
                SLO   QUOTA
                NZE           PS13A
                ALO   8001
                ALO   TWO
                STL   TALLY
                ALO   PS13P
                LDD   PS14    SR1
PS13A           STU   W0005
```

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FETCH NEXT      0439  21  1974  0327
SYMBOL S        0327  66  8002  0485
RECYCLE IF      0485  66  0480  0193
ZERO  IF N      0489  15  1987  0291
                0291  20  1988  0341
                0341  21  1987  0340
                0340  11  0399  0147
                0147  66  0250  0351
THEN RETUR      0351  60  1987  0391
 TO PS3R        0391  21  1974  0026
                0026  60  0470  0383
                0250  65  1988  0443
                0443  20  0004  0203
                0203  15  0206  0361
                0361  60  0364  0467
                0467  22  0364  8001
                0200  35  0004  0411
                0411  16  8002  0469
                0669  24  1992  0295
                0295  30  0002  0401
                0401  11  8003  0259
                0259  24  1993  0146
                0146  45  0300  0451
                0300  67  8002  0309
                0451  65  0364  0769
                0769  15  0262  8002
                0201  46  0254  0255
                0255  65  0364  0819
                0819  15  0322  0377
                0377  20  0364  8001
                0309  16  1987  0441
                0441  45  0294  0345
                0294  65  1992  0200
                0345  67  1993  0297
                0297  15  0350  0305
                0305  60  8002  8003
                0364  65  0000  0200
 DECREMENT      0484  60  1974  0481
 TALLY IF       0481  11  0434  0439
 GAMMA ZER      0639  21  1976  0479
OUT IF TAL      0479  46  0432  0534
IS ZERO  I      0433  10  0336  8003
NOT GAMMA       0336  60  0000  0355
NEXT WORD       0355  21  1974  0193
   STORE        0400  24  0303  0256
 GENERATED      0256  46  0359  0260
INSTRUCTIO      0359  16  1991  0395
   AND          0260  15  1991  0395
INCREMENT       0395  69  0298  0501
BY ONE          0501  22  0298  8001
AND RETURN      0298  21  0000  0353
TO GENERAT      0353  65  1991  0445
IF STORAGE      0445  15  0434  0689
NOT EXCEED      0689  20  1991  0344
                0344  16  0347  0651
 ALARM          0651  46  0303  0405
                0405  65  025R  0286
                0303  01  0000  0303
                0534  65  1987  0491
                0491  20  1988  0541
                0541  60  0393  0383
                0383  21  1987  0250
                0212  60  0000  0455
                0455  69  0308  0461
                0461  24  0414  0517
   FORM ENT     0517  69  0370  0523
      FOR       0370  10  0772  0427
 STATEMENT      0427  21  1977  0330
                0330  21  0634  0337
                0337  60  014R  0403
                0403  21  1979  0532
 GENERATOR      0532  20  1981  0684
                0684  60  0000  0505
 DICTIONARY     0505  65  035R  0313
                0313  35  0004  0473
                0673  20  1980  0483
                0483  60  0386  0641
                0641  20  1982  0535
                0535  21  197R  0531
                0531  69  0414  0158
                0308  60  014R  0453
                0453  21  1977  0380
 URAR EQUAL     0380  65  0265  0869
                0869  20  1955  0408
                0408  65  1976  0631
                0631  16  1972  0477
 STORE          0477  45  0430  0681
 ORIGINAL       0430  15  8001  0387
 STATEMENT      0387  15  0390  0495
 AS             0495  20  1976  0529
 COMMENTS       0529  15  0632  0437
                0437  69  0440  0145
                0681  21  1981  0734
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          STD   W0006   PS14                   0736  24  1982  0440
PS13B     01     9999   W0009                  0632  01  9999  1981
PS133     STD   ABEX3                          0158  24  0511  0464
          RAL   PC              INCREMENT      0464  65  1958  0363
          ALO   ONET                           0363  15  0262  0567
          STL   PC                             0567  20  1958  0661
          STL   W0009                          0661  20  1985  0688
          PCH   W0001              AND         0688  71  1977  0527
          STU   W0001   ABEX3                  0527  21  1977  0511
PS14      RAU   URAR            FETCH WORD     0440  60  1955  0409
          AUP   PS14A    8003    IN URAR       0409  10  0412  8003
PS14A     RAL    0000                          0412  65  0000  0655
          STL   TEMP3                          0655  20  1994  0397
          HMI           PS16    IF WORD IS     0397  46  0450  0751
          RAL   URAR             NEGATIVE      0450  65  1955  0459
          SLO   EFTY1   PS15     ASSIGN IT     0459  16  0265  0919
PS15      SRT    0004           A SYMBOLIC     0919  30  0004  0629
          LDD   PS15A   SR3      LOCATION      0629  69  0682  0635
PS15A     AUP   TEMP9                          0682  10  0148  0503
          STU   W0001                          0503  21  1977  0480
          RAM   TEMP3   PS16                   0480  67  1994  0751
PS16      SLT    0002                          0751  35  0002  0307
          STL   TEMP3            EXTRACT       0307  20  1994  0447
          RAU    8003           OPERATION      0447  60  8003  0755
          SLT    0006           FROM WORD      0755  35  0006  0969
          STU   TEMP4                          0969  21  1995  0348
          ALO   PS18            FETCH OP       0348  15  0801  0805
          STU   TEMP1           MNEMONIC       0805  21  1992  0545
          TLU   00001    8002    FROM TABL     0545  84  0600  8002
PS18      RAU    0000           AND CHECK      0801  60  0000  0855
          SUP   TEMP4           FOR ADMISS     0855  11  1995  0749
          SRT    0006           STORE OP I     0749  30  0006  0413
          NZU   ALARM           ADMISSABLE     0413  44  0254  0268
          STL   W0004   PS27                   0268  20  1980  0533
PS27      RAL   TEMP3            EXTRACT       0533  65  1994  0799
          SLT    0004           DATA ADDRE     0799  35  0004  0509
          STL   TEMP3            FROM WORD     0509  20  1994  0497
          RAU    8003           OUT IF D I     0497  60  8003  0905
          NZU           PS19    NEXT LOC       0905  44  0659  0310
          SUP   NZZZ                           0659  11  0462  0667
          NZU   PS27A                          0667  44  0471  0372
          RAU    1900   PS19                   0372  60  1900  0310
PS27A     AUP    8001                          0471  10  8001  0627
          SRT    0001           OUT IF D I     0627  30  0001  0633
          NZU   PS18A           NOT ACCUM      0633  44  0487  0738
          RAU   ACCUM   PS19                   0738  60  0691  0310
PS18A     SRT    0002           OUT IF D N     0487  30  0002  0493
          NZU   PS20            ADDRSS WIT     0493  44  0547  0398
          SRT    0003            STATEMENT     0398  30  0003  0357
          SLO   EFTY1           GENERATE       0357  16  0265  1019
          SRT    0004           MNEMONIC       1019  30  0004  0679
          LDD           SR3     IF D IS IN     0679  69  0732  0635
          AUP   TEMP9   PS19     STATEMENT     0732  10  0148  0310
PS20      STL   TEMP1           GENERATE       0547  20  1992  0595
          RAU    8003            MNEMONIC      0595  60  8003  0653
          SLT    0004            D IS NEIT     0653  35  0004  0463
          AUP   PS23     8003   NEXT NOR I     0463  10  0466  8003
PS23      RAU   D                STATEMENT     0466  60  0718  0773
          STU   TEMP2                          0773  21  1993  0296
          SUP   D0C09           OUT IF D I     0296  11  0727  0731
          NZU   PS23A            NOT EXTNS     0731  44  0685  0436
          RAL   TEMP1           IF EXTENSI     0436  65  1992  0597
          SRT    0007           GENERATE       0597  30  0007  0513
          LDD           SR3      MNEMONIC      0513  69  0516  0635
          AUP   D0C09   PS19                   0516  10  0727  0310
PS23A     RAU   TEMP1                          0685  60  1992  0647
          SRT    0007           GEN NUMERI     0647  30  0007  0563
          LDD   PS23B   STNON                  0563  69  0566  0523
PS23B     AUP   TEMP2   PS19                   0566  10  1993  0310
PS19      STU   W0003                          0310  21  1979  1544
          RSU   FLAG    PS25                   1544  61  0421  0275
PS25      STU   FLAG            POSITIVE       0275  21  0421  0324
          BMI           PS26    FLAG IF IN     0324  46  0677  0028
          RAU   W0003                          0677  60  1979  0683
          STU   W0002   PS27                   0683  21  1978  0533
PS26      RAU   URAR            PUNCH AND      0028  60  1955  0759
          AUP   ONE              RECYCLE T     0759  10  0434  0739
          STU   URAR             PS13C IF      0739  21  1955  0458
          SUP   U                URAR NOT      0458  11  1991  0645
          NZU           PS28     EQUAL TO      0645  44  0849  0500
          LDD   PS13C   PS133          U       0849  69  0408  0158
PS28      RAL   S               S EQUALS S     0500  65  1957  0761
          ALO   ONET            PLUS ONE       0761  15  0262  0767
          STL   S               AND FORM       0767  20  1957  0360
          LDD           SR3     NEXT LOCAT     0360  69  0663  0635
          LDD           SR3FD                  0663  69  0666  1069
          RAU   W0002                          0666  60  1978  0733
          NZU   PS30    PS29                   0733  44  0637  0788
PS30      RAU   W0003                          0637  60  1979  0783
          NZU   PS32    PS31                   0783  44  0687  0838
PS32      LDD   TAU     PS133                  0687  69  1960  0158
PS29      RAU   TEMP9                          0788  60  0148  0753
          STU   W0002   PS30                   0753  21  1978  0637
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    PS31   RAU  TEMP9                        0838  60  0148  0803
           STU  W0003  PS32                  0803  21  1979  0487
    TAU1   NOP  0000   PS                    0416  00  0000  1234
    SR1    STD  EXIT   SR1F                  0145  24  0448  0851
    SR1A   SLO  INCR   SR1F                  0650  16  0853  0851
    SR1F   SLT  0002                         0851  35  0002  0407
           NZU         EXIT                  0407  44  0811  0448
           SLT  0002          SR1 BLOCKS     0811  35  0002  0817
           LDD  SR1D          KK CONSEC      0817  69  0420  0823
           SDA  SR1D          LOCATIONS      0823  22  0420  0873
           SRT  0004          FROM XXXX      0873  30  0004  0833
           LDD  SR1L          YYYY           0833  69  0486  0789
           SDA  SR1L   8001                  0789  22  0486  8001
    SR1D   STD  0000   SR1A                  0420  24  0000  0650
    SR1L   LDD  0000   SR1D                  0486  69  0000  0420
    INCR   00   9998   9999                  0853  00  9998  9999
    SR3    STD  EXIT          SR3 CONVER     0635  24  0448  0901
           DIV  TWSIX         THREE DIGI     0901  14  0304  0415
           STL  TEMP1         NUMBERS IN     0415  20  1992  0695
           LDD  SR3B   SR3A   TWO LETTER     0695  69  0498  0951
    SR3A   STD  TEMP2         MNEMONICS      0951  24  1993  0346
           AUP  ONET                         0346  10  0267  0867
           SRT  0001                         0867  30  0001  0923
           NZU         SR3A1                 0923  44  0777  0478
           SLO  NINEO                        0777  16  0393  0697
           NZU         SR3A2                 0697  44  1001  0252
           ALO  STL    SR3A2                 1001  15  0354  0252
    SR3A1  SLT  0001                         0478  35  0001  0735
           SUP  8001   TEMP2                 0735  11  8001  1993
    SR3A2  ALO  NINEO                        0252  15  0393  0747
           SLT  0001   TEMP2                 0747  35  0001  1993
    SR3B   SRT  0002                         0498  30  0002  0955
           AUP  TEMP1                        0955  10  1992  0797
           LDD  SR3C   SR3A                  0797  69  0750  0951
    SR3C   SLT  0002   EXIT                  0750  35  0002  0448
    SR3ED  STD  EXIT          GENERATE       1069  24  0448  1051
           RAU  8003          SYMBOLIC       1051  60  8003  0809
           SLT  0004          LOCATION       0809  35  0004  1119
           AUP  LOCUS         FOR NEXT       1119  10  0638  0543
           STU  TEMP9  EXIT   STATEMENT      0543  21  0148  0448
    SRN    STD  EXIT          SRN FORMS      0800  24  0448  1101
           RAL  ARITH          NUMBERS       1101  65  1954  0859
           NZE  SRN5          OUT IF FLO     0859  45  0512  0763
           RAL  SRN2          ING POINT      0763  65  0766  0521
           SLO  MU            FIX ASINTE     0521  16  1951  1005
           AUP  N      8002   ER IF FIXE     1005  10  1989  8002
    SRN2   SRT  0010          POINT          0766  30  0010  0839
           RAU  8003   SRN4                  0839  60  8003  0847
    SRN5   RAL  MU            FLOATING P     0512  65  1951  1055
           ALO  FIFTY                        1055  15  0322  0827
           SRT  0004            MU PLUS      0827  30  0004  0737
           ALO  NBAR          FORTY NINE     0737  15  1953  0457
           STL  TEMP1          PLUS NBAR     0457  20  1992  0745
           SLT  0008                         0745  35  0008  0813
           NZU  SRN6                         0813  44  0917  0318
           BMI  SRN6                         0318  46  0917  0422
           RAL  N                            0422  65  1989  0593
           SRT  0002          AND MANTIS     0593  30  0002  0899
           RAU  8002              IS         0899  60  8002  0507
           NZU         SRN4                  0507  44  0861  0847
           SCT  0000            N TO 8 S     0861  36  0000  0883
           AUP  TEMP1         NIFICANT F     0883  10  1992  0897
           SUP  8002                         0897  11  8002  1105
           AUP  TWOT                         1105  10  0508  0863
           RAU  8003   SRN4                  0863  60  8003  0847
    SRN6   RAL  OTREY  LARM     ALARM        0917  65  0470  0286
    SRN4   STU  N      EXIT                  0847  21  1989  0448
A   SRAC   STD  EXIT   SRACA  ABSOLUTE       0850  24  0448  1151
A   SRACA  RAL  8002                         1151  65  8002  0909
           STU  JAY    SRACR    ROUTINE      0909  21  1956  0959
    SRACR  RAU  JAY                          0959  60  1956  0911
           SUP  A0001                        0911  11  1849  0903
           STU  NEWCT                        0903  21  0658  0961
           NZU         SRAC3  EQUALS ARC     0961  44  0465  0816
           RAL  JAY                          0465  65  1956  1011
           ALO  ONE           INCRMNT JA     1011  15  0434  0889
           STL  JAY                          0889  20  1956  1009
           ALO  SRAC1  8002   FETCH JAYT     1009  15  0662  8002
    SRAC1  RAL  A0001  SRAC2    CONSTANT     0662  65  1849  0953
    SRAC2  SLO  N             RECYCLE IF     0953  16  1989  0643
           NZE  SRACR  SRAC5  EQUALS JTH     0643  45  0959  0947
    SRAC5  RAL  JAY                          0947  65  1956  1061
           ALO  RAL                          1061  15  0514  1169
           ALO  ARINC                        1169  15  1952  0657
           ALO  ABCON                        0657  15  0410  0515
           RAL  8002   EXIT                  0515  65  8002  0448
    SRAC3  RAU  JAY                          0816  60  1956  1111
           AUP  ONE                          1111  10  0434  0939
           STU  JAY                          0939  21  1956  1059
           SUP  ARCNT         NEW ARCON      1059  11  0762  0967
           BMI         SRAC7   ARCNT NO      0967  46  0520  0621
           AUP  8001            EXCEEDED     0520  10  8001  0877
           STU  A0001         N STORED A     0877  21  1849  0302
```

```
                AUP   SRAC6
                LDD   N          8003
SRAC7           LDD              ARPUN
                RAL   ARINC
                SLO   ONE
                ALO   ARCNT
                STL   ARINC
                STU   AC001      SRACA
ARCNT             00    0051     0000
SRAC6           STD   AC001      SRAC5
PS100           STD   AREX3
                SRT     0003
                LDD              PS101
                LDD              PS101
                LDD   AREX3      PS101
PS101           STD   EXIT1
                SLO     8002
                SLT     0001
                ALO     8001
                SLT     0001     EXIT1
00001           ALF   Y          SOAP2
00002             88    0100     0000
00003           ALF   I          SOAP2
00004             64    9200     0000
00005             64    9900     0000
00006           ALF   P          SOAP2
00007           ALF   W          SOAP2
00008             00    0800     0000
00009           ALF   FOOAA      SOAP2
00001             00    0075     7677
00002             00    0168     7383
00003             00    1061     8477
00004             00    1561     7376
00005             00    1682     7376
00006             00    1974     7788
00007             00    2082     8373
00008             00    2482     8364
00009             00    3582     7383
00010             00    4575     8965
00011             00    4662     7469
00012             00    6079     6184
00013             00    6179     8284
00014             00    6464     8579
00015             00    6579     6173
00016             00    6679     8273
00017             00    6973     6464
00018             00    9968     7383
RS              LDD              DROPU
                RAL   NEWCT
                NZE   RSA
                LDD   RSA        ARMIN
RSA             RAL   U
                ALO   ONE
                LDD              CHKOP
                NZE              RSR
                RSU   N          RN1
RSR             RAU   N          RN1
RN              LDD   RN1        SRN
RN1             STU   NRAR
                LDD   RN1        CHKAR
CI1             AUP   ONET       ADLOW
ADLOW           STU   TEMP1
                STL   TEMP2
                LDD              CHKAR
                RAL   U
                SLO   ONE
                LDD              CHKOP
                NZE              VEC
                RAL   U
                ALO              8002
                  44   9995
                AUP   U
                AUP              8003
                  17   9998
                RAU   8002
                SUP   OFIVE
                NZU   RETA
                RSL   FOUR
                LDD              SUBM
                RAL   U
                SLO   THREE
                STD   RETA
                STL   U
                SRT     0004
                ALO     8001
                ALO              UBSR
                  01   9999      9998
URSR            LDD              SR1
                RAU   TEMP5
                LDD   RETC       PS7
VEC             LDD   RETC       SUBM
RETC            RAL   TEMP4
                ALO   1          RETR
```

NEW AB CON

```
0302  10  1155  1109
1109  69  1949  8003
0621  A9  0374  0927
0374  A8  1952  0757
0757  16  0434  0989
0989  15  0762  1017
1017  20  1952  1205
1205  21  1849  1151
0762  00  0051  0000
1155  24  1849  0947
```

JAY IN LOW

```
0900  24  0911  0464
0564  30  0003  0973
0973  69  0276  0729
0276  69  0779  0729
0779  69  0511  0729
0729  24  0782  0785
0785  16  8002  0693
0693  35  0001  0949
0949  15  8001  1255
1255  35  0001  0782
0719  88  0000  0000
0720  88  0100  0000
0721  69  0000  0000
0722  64  9200  0000
0723  64  9900  0000
0724  77  0000  0000
0725  86  0000  0000
0726  00  0800  0000
0727  65  9090  6161
```

MNEMONICS FOR REQUIRED OPERATION

```
0600  00  0075  7677
0601  00  0168  7383
0602  00  1061  8477
0603  00  1561  7376
0604  00  1682  7376
0605  00  1974  7788
0606  00  2082  8373
0607  00  2482  8364
0608  00  3582  7383
0609  00  4575  8965
0610  00  4662  7469
0611  00  6079  6184
0612  00  6179  8284
0613  00  6464  8579
0614  00  6579  6173
0615  00  6679  8273
0616  00  6973  6464
0617  00  9968  7383
0245  69  054R  1201
0548  65  065R  0913
0913  45  0866  1067
1067  69  0866  1219
0866  65  1991  0795
0795  15  0434  1039
1039  69  0392  0845
0392  45  0396  0997
0396  61  1989  0743
0997  60  1989  0743
0244  69  0749  0800
0743  21  1953  0306
0306  69  1159  0812
```

NRAR EQUAL N

```
0950  10  0262  1117
1117  21  1992  0895
0895  20  1993  0446
0446  69  0990  0812
0999  65  1991  1594
1594  16  0434  0402
0402  69  1305  0845
1305  45  075R  1209
0758  65  1991  0945
0945  15  059R  8002
059R  66  999R  0807
0807  10  1991  0995
0995  10  064R  8003
0648  17  999R  1644
1644  60  8002  1003
1003  11  0356  1161
1161  44  0565  0916
0916  66  1269  1023
1023  69  0326  0827
0328  65  1991  1045
1045  16  069R  1053
1053  24  0406  1259
1259  20  1991  0394
0394  30  0004  1355
1355  15  8001  1211
1211  15  0664  0664
0664  01  9999  1319
1319  69  0477  0472
0472  60  1996  1251
1251  69  0404  1209
1209  69  0404  0404
0404  65  1995  1049
1049  16  0452  0854
```

STORE V AN ARITH

					0929	24	0932	0935
SUBV	STD	FINI			0935	15	1991	1095
	ALO	U			1095	15	0748	8002
	ALO		8002		0748	64	9998	1309
	64	9998			1309	16	0514	1369
	SLO	RAL			1369	35	0002	0325
	SLT	0002			0325	44	0565	0530
	NZU	RETA			0530	30	0002	0787
	SRT	0002			0787	15	0490	1145
	ALO	ALO			1145	20	1996	1099
	STL	TEMP5			1099	69	0502	1405
	LDD		GETAB		0502	35	0004	0963
	SLT	0004	GETEF		0963	21	1995	0932
GETEF	STU	TEMP4	FINI		1405	24	0414	1167
GETAB	STD	OUT			1167	65	0658	1013
	RAL	NEWCT			1013	45	0966	1217
	NZE	GETAE			1217	69	0966	1219
	LDD	GETAF	ARMIN		0966	69	1195	1201
GETAE	LDD		DROPU		1195	15	0798	8002
	ALO		8002		0798	65	0000	1455
	RAL	0000			1455	16	1952	0907
	SLO	ABINC			0907	15	0460	8002
	ALO	VFA	8002		0460	44	6849	0414
VFA	44	6849	OUT		0565	65	0452	0857
RETA	RAL	I	RETB		0857	20	1995	0848
RETB	STL	TEMP6	RET		0848	65	1988	0793
RET	RAL	R			0793	20	1987	0540
	STL	L			0540	65	0843	1047
	RAL	SLT13			1047	69	1000	1103
	LDD		REF	ALO 8002	1000	60	1153	0957
	RAU	LOW1			0957	10	0490	1245
	AUP	ALO			1245	69	0898	0400
	LDD	VAR2	PS7		1250	10	0262	1267
CN1	AUP	ONET	VAR	STORE V AN	1267	21	1992	1295
VAR	STU	TEMP1		ARITH	1295	20	1993	0496
	STL	TEMP2			0496	69	1149	0812
	LDD		CHKAR		1149	69	0652	1505
	LDD		STRTA	GENERATE N	0652	69	1555	0800
	LDD		SRN		1555	69	0808	1261
	LDD		CHKNN		0808	35	0004	1419
	SLT	0004			1419	15	0452	1007
	ALO	I	VAR6		0898	65	1995	1007
VAR2	RAL	TEMP4	VAR6		1007	15	0514	1469
VAR6	ALO	RAL			1469	69	0522	0375
	LDD	VAR1	OSGN1		0522	65	1992	1097
VAR1	RAL	TEMP1	VAR3		1097	20	1954	1057
VAR3	STL	ARITH	EEC2		0243	69	0546	1199
DF	LDD		SETEL		0546	20	0362	0193
	STL	PORR	PS3		0174	65	0362	1317
ENDT	RAL	PORR			1317	45	0620	0671
	NZE		ENDTA		0620	69	1073	0376
	LDD		ENDTB		1073	65	0426	0781
	RAL	SXTNT	ENDTC		0781	69	0212	0665
ENDTC	LDD	PS12	LDSR		0671	69	0424	0376
ENDTA	LDD		ENDTB		0424	65	0977	0781
	RAL	SVNTT	ENDTC		0376	24	0414	1367
ENDTB	STD	OUT			1367	65	0670	0425
	RAL	TEN			0425	16	0320	0475
	SLO	FL			0475	46	0254	0879
	BMI	ALARM			0879	65	8001	0885
	RAL	8001			0885	15	0000	1605
	ALO	0000			1605	20	1989	0442
	STL	N	GEN2		0198	69	0195	0948
EE	LDD	RR	NUINC		1057	21	1975	0193
EEC2	STU	OPSGN	PS3		0197	69	1100	0812
EN	LDD		CHKAR	GENERATE N	1100	69	1203	0800
	LDD		SRN		1203	69	0456	1261
	LDD		CHKNN		0456	69	1359	0665
	LDD		LDSR		1359	65	1962	1417
	RAL	NU			1417	15	0770	0525
	ALO	EN1			0525	10	8002	0933
	AUP	8002			0933	16	0434	1089
	SLO	ONE			1089	69	0492	1345
	LDD	EN4			1345	22	0492	8003
	SDA	EN4	8003		0770	65	1977	0831
EN1	RAL	J0001			0831	20	1993	0492
	STL	TEMP2	EN4		0492	16	1977	0881
EN4	SLO	J0001			0881	45	0784	0935
	NZE		EN3		0784	65	1993	1147
	RAL	TEMP2			1147	16	0262	1467
	SLO	ONET			1467	35	0004	1027
	SLT	0006			1027	15	0630	0985
	ALO	PHI			0985	69	0935	0375
	LDD	EN3	OSGN1		0935	65	1980	0893
EN3	RAL	N			0893	21	1961	0764
	STU	V1			0764	16	1517	0771
	SLO	MAXE			0771	46	0474	0625
	BMI		ENA		0474	65	0262	1097
	RAL	ONET	VAR3		0625	60	8003	1097
ENA	RAU	8003	VAR3		0215	69	0196	0948
EW	LDD	RW	NUINC	COMPILE	0180	60	1991	1395
ENDH	RAU	U			1395	10	0258	1063
	AUP	OONE	ENDY4		0175	69	0176	0929
ENDL	LDD	ENDY	DROPK					

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741         ENDY    LDD             CHKNK       IF U EQUAL      0176  69  0979  0862
742                 LDD             UBETA        BETA PLUS      0979  69  0932  1035
743                 NZE   ENDY1                                 0932  46  0636  0837
744                 RSL   NZA                                   0837  66  0640  1445
745                 STL   TEMP4                                 1445  20  1998  0998
746                 RAL   BETA                                  0998  65  0406  1311
747                 LDD             CHGOP                       1311  69  0814  1567
748                 STL   TEMP1                                 0814  20  1992  1495
749                 RAL   BETA                                  1495  65  0406  1361
750                 SLO   ONE                                   1361  16  0434  1139
751                 STL   TEMP4                                 1139  20  1998  1048
752                 ALO   ENDY2     8002      SET CONTEN       1048  15  1301  8002
753         ENDY2   RAL    0000               BETA MINU        1301  65  0000  1655
754                 STL   TEMP2                ONE EQUAL       1655  20  1992  0596
755                 RAM    8002                TO CONTEN       0596  67  8002  1705
756                 SLO   STLA1                BETA WITH       1705  16  085A  1113
757                 NZE   PS12      END10                       1113  45  0212  1617
758         END10   RAU   TEMP4                                 1617  60  1998  1249
759                 STU   U                    IF BETA         1249  21  1991  0444
760                 RAU   TEMP2                MINUS ONE       0444  60  1998  1197
761                 SMI             ENDY3       CONTAINS        1197  46  1150  1351
762                 RSU   TEMP1     ENDY4        STL ACC        1150  61  1992  1063
763         ENDY3   RAU   TEMP1     ENDY4                       1351  60  1992  1063
764         ENDY4   LDD   PS12      PS7                         1063  69  0212  0400
765         ENDY1   RSL   ERONE                                 0636  66  1180  0943
766                 STL   TEMP4                                 0943  20  1998  1098
767                 LDD             UCHGE        RECOMPILE      1098  69  1401  0454
768                 RAU   U                                     1401  60  1991  1545
769                 SUP   TWO                                   1545  11  0390  1595
770                 STU   U                                     1595  21  1991  0494
771                 AUP   TWO                                   0494  10  0390  1645
772                 AUP   ALO                                   1645  10  0490  1695
773                 LDD             PS7                         1695  69  1148  0400
774                 RAU   U                                     1148  60  1991  1745
775                 AUP   ENDY7     8003                        1745  10  1198  8003
776         ENDY7   RSL    0000                               1198  66  0000  1755
777                 STL   TEMP1                                 1755  20  1992  1795
778                 RAU   LOAC                                  1795  60  1248  1253
779                 LDD   ENDY3     PS7                         1253  69  1351  0400
780         EN      RAL   N                                     0204  65  1980  0993
781                 NZE   ZN        PS3                         0993  46  0226  0193
782         GN      LDD             CHKAR                       0241  69  0544  0812
783                 LDD             SRN                         0544  69  1247  0800
784                 LDD             CHKNN        COMPILE        1247  69  1200  1261
785                 ALO   LOCS      GNA                         1200  15  1303  1107
786         GNA     LDD   PS3       REF                         1107  69  0193  1103
787         IL      LDD             SETEL                       0239  69  0542  1199
788                 RAL   I         ADLOW                       0542  65  0442  1117
789         IN      RAL   I         VAR          V EQUALS I     0236  65  0442  1267
790         MINI    RAL   OONE                    RAL  RAR      0224  65  0258  1163
791                 STL   TEMP4                    RECOMES       1163  20  1998  1298
792                 LDD   MINC      UCHGE                       1298  69  1451  0454
793         MINC    RAL   SCON      MINB                        1451  65  0504  1409
794         MINB    STL   L         PS3B                        1409  20  1987  0250
795         MINL    RAL   U                                     0220  65  1991  1845
796                 STU   V1                                    1845  21  1961  0864
797                 LDD             CHKOP                       0864  69  1667  0845
798                 NZE             MINI                        1667  45  0820  0224
799                 RAL   RSL                                   0820  65  0202  1157
800                 ALO   LOW                                   1157  15  0510  0765
801                 LDD   MINC      REF                         0765  69  1451  1103
802         MINN    RAU   D0003                                 0211  60  0721  0675
803                 STU   R                                     0675  21  198A  0741
804                 LDD             SRN                         0741  69  0594  0800
805                 LDD   MINI      GENN                        0594  69  0224  1077
806         MY      RAL   ONE       MYA                         0186  65  0434  1239
807         MYA     STL   W0008                                 1237  20  1984  0888
808                 RAL   AXO                                   0888  65  0791  1945
809                 STL   L         PS3                         1945  20  1987  0193
810         UN      RAU   N                                     0191  60  1989  1043
811                 NZU   UNA                                   1043  44  1297  1348
812                 RAL   TWO       MYA                         1348  65  0390  1239
813         UNA     RAL   FOUR      UNB                         1297  65  1260  1123
814         UNB     STL   W0008     MINN                        1123  20  1984  0211
815         UN      RAL   THREE     MYA                         0161  65  069A  1239
816         WI      RAL   FIVE                                  0240  65  1093  1347
817                 STL   W0008                                 1347  20  1984  0936
818                 RAL   RSLLO                                 0938  65  0841  0646
819                 STL    0051     MINC                        0646  20  0051  1451
820         ENDG    RAU   W0008                                 0181  60  1984  1289
821                 ALO    0052                                 1289  15  0052  1207
822                 SUP   ONE                                   1207  11  0434  1339
823                 NZU             ENDGA                       1339  44  1143  0644
824                 SUP    8001                                 1143  11  8001  1299
825                 NZU             ENDGB                       1299  44  1353  0654
826                 SUP    8001                                 1353  11  8001  1459
827                 NZU             ENDGC                       1459  44  1213  0914
828                 SUP    8001                                 1213  11  8001  1519
829                 NZU             ENDGD                       1519  44  1173  0524
830                 SUP    8001                                 1173  11  8001  1029
831                 NZU   PS12      ENDGE                       1029  44  0212  0834
832         ENDGA   STL   W0002     READA                       0644  20  1978  1234
833         ENDGB   STL   W0003     READA                       0654  20  1979  1234
```

```
ENDGC   AUP   W0002                             0914  10  1978  0983
        SLT   0004                              0983  35  0004  1193
        ALO   W0003                             1193  15  1979  1033
        ALO   NZA                               1033  15  0640  0696
        AUP   BYI                               0696  10  1349  1403
        STU   0051                              1403  21  0051  0754
        STL   0052    PS12                      0754  20  0052  0212
ENDGD   RAL   NZA     ENDGF                     0524  65  0640  0746
ENDGE   LDD           DROPU                     0834  69  0887  1201
        RAU   BYI                               0887  60  1349  1453
        AUP   NZZZ    ENDY4                     1453  10  0462  1063
ENDGF   STL   TEMP4                             0746  20  1998  1398
        LDD   PS12    UCHGE                     1398  69  0212  0454
NF      RAU   INTGR           N EQUALS L        0217  60  1973  1127
        SRT   0008             AND N            1127  30  0008  0796
        ALO   N                                 0796  15  1989  1743
        SRT   0001            MU EQUALS         1243  30  0001  1399
        STL   N                PLUS ONE         1399  20  1989  0592
        RAU   MU                                0592  60  1951  1805
        AUP   ONE     NF2                       1805  10  0434  1389
NF2     STU   MU      PS3                       1389  21  1951  0193
NR      STL   NBAR            N NBAR MU         0170  20  1953  0506
        STL   N                DEL AND          0506  20  1989  0642
        STL   MU              ARITH ZERO        0642  20  1951  0804
        STL   ARITH   NF                        0804  20  1954  0217
NW      LDD   NR      TKOP    STORE OP          0213  69  0170  1223
NZ      LDD   NR      NZ4                       0194  69  0170  1273
NZ4     STD   OUT                               1273  24  0414  1717
        LDD   NZ1     CHKNK                     1717  69  0870  0882
NZ1     RAL   0001            COMPILE           0870  65  0001  1905
        SLT   0002    NZ6                       1905  35  0002  1411
NZ6     SUP   SIXNI                             1411  11  0964  1569
        NZU           FIXVA    LDD FIX          1569  44  1323  0624
        SUP   NNTEN              OR             1323  11  0476  0931
        NZU           FLOTE                     0931  44  1085  0686
        RAL   FIVFO   LARM      ALARM           1085  65  0988  0286
NZ2     RAU   VI                                1250  60  1961  0815
        NZU   FLOT1                             0815  44  1619  0920
        RAL   STLA1   NZ7                       0920  65  0858  1263
NZ7     LDD   FLOT1   REF                       1263  69  1619  1103
FLOTE   RAU   ARITH            FLOAT IF         0686  60  1954  1509
        NZU   NZ2                               1509  44  1250  1014
        RAL   FIVET            Y AND FIX        1014  65  1767  0821
        LDD   FLOT1   LDSR    C AND FIX         0821  69  1619  0665
FLOT1   RAU   8003    OUT                       1619  60  8003  0414
FIXVA   RAU   ARITH                             0624  60  1954  1559
        NZU           NZ2                       1559  44  1313  1250
        RAL   FIXNR                             1313  65  1016  0871
        LDD   NZ2     LDSR                      0871  69  1250  0665
PF      STL   NBAR    PN1     N NBAR AND        0234  20  1953  1159
PN1     STL   N       PN       MU ZERO          1159  20  1989  0231
PN      RAL   ONET            ARITH TO          0231  65  0262  1817
        STL   ARITH   NF2      FLOATING         1817  20  1954  1389
PW      LDD   PF      TKOP    TKOP AND P        0235  69  0234  1223
STSMT   STD   FINI            STORE STMT        1300  24  0832  1135
        RAL   FLOP1            NO OF STM        1135  65  1038  1293
        AUP   LINK                              1293  10  0634  1439
        SLO   ONE              QUANT            1439  16  0434  1489
        ALO           8002                      1489  15  0692  8002
        STU   N0001   FINI                      0692  21  0568  0832
OF      RAU   PSI                               0230  60  0160  0865
        AUP   ONE             INCRMNT PS        0865  10  0434  1539
        STU   PSI              AND SET          1539  21  0160  1363
        MPY   SIXT              COUNT           1363  19  0384  0656
        STL   FLOP1                             0656  20  1038  0891
        RAL   ONE     TF2                       0891  65  0434  1589
QUA4    NZU           CURTN   IF TALLY          1350  44  1503  0854
        AUP           8003     NON ZERO         1503  10  0756  8003
        RAL   0000    QUA20   SEND NXT W        0756  65  0000  0806
QUA20   STL   GAMMA   QUA3    TO GAMMA          0806  20  1974  1177
QUA3    RAU   GAMMA                             1177  60  1974  1079
        NZU           QUA1                      1079  44  1083  0884
        SRT   0002            EXTRACT           1083  30  0002  1639
        STU   GAMMA           PEWTH             1639  21  1974  1227
        RAU   8002            SYMBOL            1227  60  8002  1185
        STU*  TEMP1           IS                1185  21  1992  0846
        NZU   QUA2    QUA3    SYMBOL ZER        0846  44  1449  1177
QUA1    RAU   TALLY            INCRMNT          0884  60  1976  0981
        SUP   ONE               TALLY           0981  11  0434  1689
        STU   TALLY   QUA4                      1689  21  1976  1350
QUA2    SUP   SVTY2           IS SYMBOL         1449  11  0752  1257
        NZU   QUA5                              1757  44  1461  0862
        RAL   CHI             INCRMNT CH        0862  65  0915  1669
        ALO   ONE     TF2                       1669  15  0434  1589
TF2     STL   CHI              CLEAR L          1589  20  0915  0368
        STU   STAR             AND STAR         0368  21  0622  0775
        STU   EL      QUA3                      0775  21  0320  1177
QUA5    RAU   EL                                1461  60  0320  0825
        AUP   ONET            INCRMNT EL        0825  10  0262  1917
        STU   EL              ALARM  IF         1917  21  0320  1373
        SUP   SIXT             MORE THAN        1373  11  0384  1739
        NZU   QUA7    QUA50    FIVE SYMB        1739  44  1349  0694
QUA50   RAL   PSI                               0694  65  0160  0965
```

```
                SLO   ONE
                STL   PSI       ALARM
QUA7            RAU   STAR
                SRT   0002
                AUP   TEMP1
                ALO   FLOP1
                ALO   CHI
                SLO   SEVEN
                ALO             8002
                STU   N0001
                STU   STAR      QUA3
CURTN           LDD             FLOP      STORE
                RAL   W0005     CURT1     CONVERT NO
CURT1           SLT   0002                OF STATMNT
                SUP   NINTY                REING
                SUP   8003                 QUANTIFIE
                NZE             CURT2       TO PURE
                AUP   8001      CURT1       NUMERIC
CURT2           AUP   8001
                SRT   0002
                SLO   8002
                SRT   0001
                ALO   8001
                SLO   8002
                SRT   0001
                ALO   8001
                SLT   0002
                ALO   FLOP1
                SLO   TWO
                ALO             8002
                STU   N0001
                LDD   W0004
                STD   0001                VARIABLE
                LDD   Z
                STD   0002                Z
                LDD   W0003               LOWER
                STD   0003                VARIABLE
                RAU   FIVFT
                STL   0004
                ALO   TAU5      QUA9
QUA9            STU   TALLY               RETURN TO
                STL   TAU                  SCANNER
                RAL   RSL       PS2R
TAU5            RAU   PC
                AUP   THOUS
                LDD             PS12A
                LDD             STSMT
                LDD   TAU2      PSS
TAU2            LDD   QUA21     DCRMT
QUA21           LDD             FLOP
                RAU   W0005
                NZU   PS        QUA10     NUMBER
QUA10           RAL   W0004               STORE
                STU   0000
                STL   0001                QUANT VARB
                STL   0003
                LDD   Z                   Z
                STD   0002
                RAL   W0002
                STL   0005
                RAU   SCON      QUAMN
QUAMN           STU   0004
                RAU   SEVNT
                STL   0006
                ALO   TAU3      QUA9      TO SCANNER
DCRMT           STD   FIN1                DECREMENT
                RAU   PSI                  QUANT COU
                STU   TEMP3     DCMT3      FOR ALL
DCMT3           RAU   TEMP3                PSI LESS
                NZU             FIN1       THAN OR
                SUP   ONE                  EQUAL TO
                STU   TEMP3                CURRENT
                MPY   SIXT                 PSI
                ALO   DCMT1
                LDD   DCMT2
                SDA   DCMT2     8002
DCMT1           RAU   N0005
                SUP   0000
                NZU   DCMT3     DCMT2
DCMT2           STU   N0005     DCMT3
TAU3            LDD             FLOP      STORE
                LDD   RAR
                STD   0001                G
                RAU   W0006
                STL   0000
                STL   0007
                STU   1900
                LDD   NONON
                STD   0002
                LDD   WDIF
                STD   0003                  IF
                LDD   D0007
                STD   0005      QUA30
```

```
0965  16  0434  1789
1789  30  0160  0254
1343  60  0622  1277
1277  30  0002  1133
1133  10  1002  1307
1307  15  1038  1303
1303  15  0918  1719
1719  16  0672  1327
1327  15  0680  8002
0680  21  0568  0921
0921  21  0622  1177
0854  69  1307  0660
1307  65  1981  1235
1235  35  0002  0941
0941  11  0744  1499
1499  11  8002  1357
1357  45  0760  1511
0760  10  8001  1235
1511  10  8001  1967
1967  30  0002  1423
1423  16  8002  1031
1031  30  0001  0937
0937  15  8001  1443
1443  16  8002  1501
1501  30  0001  1407
1407  15  8001  1413
1413  35  0002  1769
1769  15  1038  1493
1493  16  0390  0896
0896  15  1540  8002
1549  21  0568  0971
0971  69  1980  1183
1183  24  0001  0904
0904  69  1457  0810
0810  24  0002  0856
0856  69  1970  0982
0982  24  0003  0906
0906  60  1767  1021
1021  20  0004  1507
1507  15  0960  1015
1015  21  1976  1129
1129  20  1960  1463
1463  65  0202  0367
0860  60  1958  1513
1513  10  1066  1071
1071  69  0674  0461
0674  69  1377  1300
1377  69  0730  0519
0730  69  1233  0736
1233  69  0786  0560
0786  60  1981  1285
1285  44  1236  0690
0690  65  1980  1335
1335  21  0000  1553
1553  20  0001  0954
0954  20  0003  0956
0956  69  1457  0910
0910  24  0002  1006
1006  65  1978  1283
1283  20  0005  0908
0908  60  0504  1609
1609  21  0004  1457
1557  60  0960  1065
1065  20  0006  1659
1659  15  0912  1015
0736  24  0832  1385
1385  60  0160  1115
1115  21  1994  1447
1447  60  1994  1599
1599  44  1802  0832
1603  11  0434  1839
1839  21  1994  1497
1497  19  0381  1056
1056  15  1701  1563
1563  69  1114  1819
1819  22  1114  8002
1709  60  0572  1427
1427  11  0001  1106
1106  44  144   1116
1116  21  057   1447
0912  69  116   0660
1165  69  041   1121
1121  24  000   1004
1004  60  198   0987
0987  20  0000  1653
1653  20  0007  1010
1010  21  1900  1703
1703  69  0386  1156
1156  24  0002  1206
1706  69  1750  0962
0962  24  0003  1256
1256  69  0725  0528
0528  24  0005  0538
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1020        QUA30   LDD   W0001
1021                STD    0004
1022                LDD   W0004   QUA31
1023        QUA31   STD    0006
1024                RAU   NINFT
1025                STL    0007
1026                STD    0008
1027                ALO   TAU4    QUA9
1028        TAU4    RAL   PSI
1029                SLO   ONE
1030                STL   PSI
1031                NZE   QUA22   PSU
1032        QUA22   RAL   TAU2
1033                STL   TAU     QUA21
1034        FLOP    STD   OUT
1035                RAU   PSI
1036                MPY   SIXT
1037                STL   FLOP1
1038                SLO   SIX
1039                ALO           FLOP3
1040                 06   N0001   W0001
1041        FLOP3   LDD   OUT     SR1
1042        PCMMA   LDD   PF      COMMA
1043        QCMMA   LDD   FF      COMMA
1044        NCMMA   LDD   NR      COMMA
1045        RCMMA   LDD   RR      COMMA
1046        RR      LDD           ADDK
1047                STU   V1      RR2
1048        ADDK    STD   OUT
1049                RAL   K
1050                ALO   ONE
1051                SLO   NINTN
1052                RMI           ALARM
1053                ALO    8001   STK
1054        STK     STL   K       OUT
1055        RR2     ALO   RR1      8002
1056        RR1     STU    0001   PS3
1057        RW      RAL   STL
1058                ALO   K
1059                ALO   W
1060                LDD           REF
1061                LDD   RR      TKOP
1062        PZ      LDD   RR      NZ4
1063        WF      LDD   WL      NUMIN
1064        WL      LDD           DROPK
1065                LDD           CHKTK
1066                NZE   WL1     ALPHA
1067        ALPHA   LDD           SETEK
1068                RAL   K       RR2
1069        WL1     LDD   ALPHA   TKNZ1
1070        TKNZ1   STD   OUT
1071                STL   TEMP1
1072                SLO   00006
1073                NZE           PWRW
1074                LDD           GETEK
1075                NZE   FLTW1   NFLW1
1076        FLTW1   RAL   ARITH
1077                NZE   FLTW2   NFLW2
1078        FLTW2   RAL   V1      WL3A
1079        WL3A    LDD   GAMM    SWTCH
1080        SWTCH   NZE   RALWK   STLAC
1081        STLAC   STD   EXIT
1082                RAL   STLA1   STLRC
1083        STLRC   LDD   RALW1   REF
1084        STLA1   STL    0001    0000
1085        RALWK   STD   EXIT    RALW1
1086        RALW1   RAL   K
1087                ALO   W
1088                ALO   RAL
1089                LDD   EXIT    REF
1090        GAMM    RAU   OTWO    GAMM1
1091        GAMM1   ALO   ONE     WL3C
1092        WL3C    AUP   TEMP1
1093                STU   TEMP1   NETTA
1094        NETTA   STL   V1      FLIK
1095        NFLW2   RAL   FIVET
1096                LDD           LDSR
1097                STU   OPSGN
1098                RAL   ONET
1099                STL   ARITH   WL3A
1100        NFLW1   RAL   ARITH
1101                NZE   NIFW2   NINW2
1102        NIFW2   RAL   V1
1103                LDD           SWTCH
1104                RAL   FOURT
1105                LDD   GAMM    LDSR
1106        NINW2   RAU   OONE    WL3C
1107        PWRW    LDD           GETEK
1108                NZE           FXEX
1109                RAL   ARITH
1110                NZE   GAMM    FXREX
1111        FLAR    RAL   ONET
1112                STL   ARITH   GAMM
```

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0958        69   1977   0780
UPPER VARB  0780 24   0004   1407
            1407 69   1990   1333
QUANT VARB  1333 24   0006   1909
            1909 60   1012   0468
            0468 20   0007   1060
            1060 24   0008   1561
TO SCANNER  1561 15   1064   1015
            1064 65   0160   1215
            1215 16   0434   1939
            1939 20   0160   1613
            1613 45   1166   0205
            1166 65   0730   1435
            1435 20   1960   1233
            0660 24   0414   0618
            0618 60   0160   1265
STORE STAT  1265 19   0384   1306
            1306 20   1038   0091
            0091 16   0704   1649
            1649 15   0802   1657
            0802 06   056A   1977
            1657 69   0414   0145
            0207 69   0234   1037
            0208 69   0198   1037
            0210 69   0170   1037
            0209 69   0195   1037
            0195 69   144A   1551
            144A 21   1961   1114
            1551 24   0414   061A
            061A 65   1990   0946
            0946 16   0434   0740
            0740 16   1543   1547
            1547 46   1400   0254
            1400 15   8001   1707
            1707 20   1990   0414
TK EQUALS   1114 15   066A   8002
  ZERO      066A 21   0032   0193
            0196 65   0354   1909
            1909 15   1990   0996
            0996 15   1699   1753
            1753 69   135A   1103
            1356 69   0195   1223
            0192 69   0195   1273
            0253 69   0163   1216
IS PREVIOU  0163 69   126A   0929
  OPERATIO  1266 69   1910   0772
  ZERO      1919 45   0822   1473
IF SO EK    1473 69   0526   1179
            0526 65   1990   1114
  THEN      0822 69   1473   0626
  RETURN PS 0626 24   0414   076A
  IF NOT IS 076A 20   1992   1046
            1046 16   0724   1229
IF NOT IS   1229 45   1032   1383
WK FXD OR   1032 69   148A   108A
IF FL IS A  148A 45   113A   0790
TH FIXED O  113A 45   1956   1110
    FLOATIN 1110 45   1164   1315
IF V1 ZERO  1164 65   1961   1365
  COMPILE   1365 69   081A   1171
  STL ACC   1171 45   0774   0875
    AND     0875 24   044A   1601
            1601 65   085A   1663
            1663 69   1316   1103
RAL WK      085A 20   0001   0000
            0774 24   044A   1316
SET OPSGN   1316 65   1990   1096
  TO ZERO   1096 15   1699   1803
  IN BOTH   1803 15   0514   1969
            1969 69   044A   1103
INCREMENT   081A 60   1221   0925
  OPN AND   0925 15   0434   0A40
  SET V1    0A40 10   1992   1597
THEN GO TO  1597 21   1992   1146
            1146 20   1961   1214
COMPILE     1315 65   1767   1271
  LDD FLOAT 1271 69   082A   0465
AND MERGE   082A 21   1978   062A
  WITH FLOA 062A 65   0262   086A
    FLOAT   086A 20   1956   1365
IF WK FIXE  0790 65   1954   1160
  IS PRESEN 1160 45   1264   1415
    FIXED   1264 65   1961   1465
TO SWITCH   1465 69   091A   1171
  FLOAT THE 091A 65   1321   0975
  LDD FLOAT 0975 69   081A   0665
  FIX FIX   1415 60   025A   0A40
            1383 69   0836   108A
            0836 45   0890   1041
            0890 65   1956   1210
            1210 45   081A   1515
            1450 65   0262   096A
            096A 20   1956   081A
```

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1113  FXREX   RAL   FOURT
1114          LDD   FLAR    LDSR
1115  FXEX    LDD   POWR3   LDSD
1116  WY      LDD           CHKTK    IS PREVIOU
1117          NZE           ALPHA    OPN ZERO
1118          LDD   ALPHA   TKNZ2
1119  TKN72   STD   OUT
1120          STL   TEMP1             IF NOT IS
1121          SLO   00006
1122          NZE           POWR     IF NOT IS
1123          LDD           GETEK    PREV FLOA
1124          NZE   FLT1    NFLT1    IF SO GO
1125  FLT1    RAL   V1                ALTR IF PR
1126          NZE   FLT2              NOT IN AC
1127          LDD   FLT2    ALTR
1128  FLT2    RAL   ARITH             COMPILE
1129          NZE   NETTA               FLOAT IF
1130          RAL   FOURT               PRESENT
1131          LDD           LDSR        FIXED
1132          RAL   ONFT
1133          STL   ARITH   NETTA
1134  NFLT1   RAL   ARITH             IF NOT FLO
1135          NZE   FX1F2               FIX GO TO
1136          RAU   OTREY   WL3C      WL3C    IF
1137  FX1F2   LDD           RMONE     FLOAT FIX
1138          RSU   RETA                COMPILE N
1139          SUP   AR33              LDD RETA F
1140          LDD   AR34    PS7         TO ALTR3
1141  AR33    LDD    0000    9005       AND THEN
1142  AR34    LDD   NETTA                 NETTA
1143          STD   EXIT    ALTR3
1144  ALTR    STD   EXIT              ALTR PERFR
1145          LDD           RMONE       FOLLOWING
1146          LDD   ALTR3   STAC1     SEQUENTIAL
1147  RMONE   STD   FINI              RETA MINUS
1148          RAL   RETA                ONE TO
1149          SLO   ONE     FNI4Z
1150  I4ZU1   RAL   TEMP4             INST OF
1151          ALO   I4ZU3               CONTENTS
1152          LDD   I4ZU2               OF TEMP4
1153          SDA   I4ZU2               EQUALS U
1154          RAU    8002    8003     IF NOT LDD
1155  I4ZU3   LDD    0000
1156          STD   TEMP2
1157          RAM    8001             IF LDD SET
1158          SLO   CKLDD               DATA OF
1159          SLT    0002               CONTENTS
1160          NZU           I4ZU4         OF
1161          RAL   U                   TEMP4 TO
1162          SRT    0004                 U
1163          AUP   OONE    I4ZU5
1164  I4ZU4   RAL   U       I4ZU5
1165  I4ZU5   AUP   I4ZU2
1166          LDD   TEMP2    8003
1167  I4ZU2   SDA    0000   FINI
1168  STAC1   STD   FINI              COMPILE NE
1169          RSU   RETA                STL ACC B
1170          SRT    0004
1171          SUP   STLA1   OSGN4
1172  ALTR3   LDD           IUM2U
1173          RAL   RETA
1174          STL   TEMP4
1175          LDD           RMIN1
1176          RAU   OONE
1177          STU   OPSGN   EXIT
1178  IUM2U   STD   FINI              U MINUS TW
1179          RAL   U                   TO TEMP4
1180          SLO   TWO     FNI4Z
1181  FNI4Z   STL   TEMP4   I4ZU1
1182  RMIN1   STD   FINI
1183          RSU   TEMP4             CONTENTS O
1184          SUP   RMIN2    8003      CONTENTS
1185  RMIN2   SML    0000               TEMP4 MA
1186          RAU    8002              NEGATIVE
1187          SLO   TEMP4
1188          SLO   RMIN3    8002
1189  RMIN3    21    0000   FINI
1190  EXIT    HLT   EXIT    EXIT
1191  FINI    HLT   FINI    FINI
1192  OUT     HLT   OUT     OUT
1193  OSGN1   STD   FINI    OSGN3     SET SIGN O
1194  OSGN3   AUP   OPSGN               INSTRUCTI
1195          AUP   OSGN2    8003        TO BE
1196  OSGN4   LDD   FINI    PS7
1197  OSGN2   RAU    8002   OSGN4
1198  URETA   STD   FINI              IS U EQUAL
1199          RAL   RETA                TO RETA
1200          ALO   ONE                 PLUS ONE
1201          SLO   U       FINI
1202  CHGOP   STD   FINI    CHGE1       OP  OF
1203  CHGE1   ALO   CHG1              CONTENTS O
1204          LDD   CHG2              LOWER
1205          SDA   CHG2     8002       CHANGED
```

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1518  65  1221  1025
1025  69  1450  0465
1041  69  0844  1647
0218  69  1371  0772
1371  65  0876  1473
0874  69  1473  0676
0676  24  0414  1018
1018  20  1993  1196
1196  16  0724  1279
1279  65  1083  1433
1282  69  1538  1088
1535  65  1188  0940
1188  65  1961  1165
1565  65  1068  0970
0970  69  1068  1421
1068  65  1954  1260
1260  65  1146  1615
1615  69  1321  1075
1075  69  0678  0665
0678  65  0262  1118
1118  20  1954  1146
0940  65  1954  1310
1310  65  1314  1665
1665  60  0470  0840
1314  69  1168  1471
1168  41  0406  1611
1611  11  1364  1020
1020  69  1523  0400
1364  69  0000  9005
1523  69  1146  1749
1749  24  0448  1651
1421  24  0448  1701
1701  69  1954  1471
1954  69  1651  1104
1471  24  0832  1585
1585  65  0406  1661
1661  16  0434  0990
1500  65  1995  1799
1799  15  0852  1757
1757  69  1360  1713
1713  22  1360  1763
1763  60  8002  8003
0852  69  0000  1903
1903  24  1993  1246
1246  67  8001  1154
1154  16  1807  1711
1711  35  0002  1218
1218  44  1521  0872
1521  65  1991  1296
1296  30  0004  1907
1907  10  0258  1813
0872  65  1991  1813
1813  10  1360  1715
1715  69  1993  8003
1360  22  0000  0832
1104  24  0832  1635
1635  61  0406  1761
1761  30  0004  1571
1571  11  0858  1913
1651  69  1204  1008
1204  65  0406  1811
1811  20  1995  1498
1498  69  1751  1254
1751  60  0258  1963
1963  21  1975  0448
1008  24  0832  1685
1685  65  1991  1346
1346  16  0390  0990
0990  20  1995  1500
1254  24  0832  1735
1735  61  1995  1949
1949  11  0902  8003
0902  18  0000  1406
1406  60  8002  1765
1765  16  1995  1550
1550  16  1304  8002
1304  21  0000  0832
0448  01  0448  0448
0832  01  0832  0832
0414  01  0414  0414
0375  24  0832  1785
1785  10  1975  1329
1329  10  1132  8003
1913  69  0832  0400
1132  60  8002  1913
1035  24  0832  1835
1835  65  0406  1911
1911  15  0434  1040
1040  16  1991  0832
1567  24  0832  1935
1935  15  1238  1593
1593  69  1396  1600
1600  22  1396  8002
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1206  CHG1    RAL   0000
1207          BMI         CHG3
1208          SLO   TEMP4  CHG2
1209  CHG3    ALO   TEMP4  CHG2
1210  CHG2    STL   0000   FINI
1211  POWR    LDD         GETFK
1212          NZE   POWR1  POWRF
1213  POWR1   RAL   V1
1214          NZE   POWR4
1215          LDD   POWR4  ALTR
1216  POWR4   RAL   ARITH
1217          NZE   FXFXW
1218          RAL   FOURT
1219          LDD         LDSR
1220          RAL   ONET
1221          STL   ARITH  FXFXW
1222  FXFXW   RAU   ONE    WL3C
1223  POWRF   LDD   POWR3  ALTR
1224  POWR3   RAL   ARITH
1225          ALO   TENT   POWRH
1226  OPLD    LDD   OUT    LDSR
1227  OPWK    ALO   K
1228          ALO   W      OPWK1
1229  OPWK1   LDD   OPWK2  OSGN1
1230  OPWK2   STU   OPSGN  OUT
1231  LDSR    STD   LDSR1
1232          ALO   LDSR2
1233          LDD   LDSR1  REF
1234  LDSR1   HLT   LDSR1  LDSR1
1235  LDSR2   LDD   0000   9000
1236  OPACC   ALO   ACC    OPWK1
1237  FLIK    RAL   TEMP1
1238          SLT   0006
1239          AUP         8003
1240          RAU   0472   8003
1241  R0001   RAL   SIXT   OPLD
1242  R0002   RAL   OVR    OPWK
1243  R0003   RAL   PRINT  OPLD
1244  R0004   LDD   FPAD4  ALTR
1245  00001   RAL   CN302  POWRH
1246  00002   LDD   00001  LDSD
1247  LDSD    STD   EXIT
1248          RAL   W      00003
1249  00003   ALO   K      0553
1250  00004   ALO   00003  PWRV2
1251  00005   RAL   FIGTT  OPLD
1252  00006   RAL   ALO    OPWK
1253  00007   RAL   FIGTT  OPLD
1254  00008   LDD   00009  URETA
1255  00009   NZE   ADD4   FPAR3
1256  00010   RAL   NINET  OPLD
1257  00011   RAL   LOINU  FPM11
1258  00013   RAU   RAU    FPM13
1260  FPM11   LDD         REF
1261          RAL   MPY    OPWK
1262  POWRH   LDD   ONET
1263          STD   V1     OPLD
1264  PWRV2   LDD         REF
1265          RAL   STDAC
1266          LDD   EXIT   REF
1267  FPAR3   RSL   FIVE0  MULTN
1268  ADD4    LDD         ALTR
1269          RAL   ALO    OPACC
1270  FPAD4   RAL   OVR    OPACC
1271  FPM13   STU   TEMP6
1272          RAL   U
1273          LDD         CHKOP
1274          STL   TEMP4
1275          SLO   BMI
1276          STL   TEMP5
1277          LDD         URETA
1278          NZE         MULT1
1279          RSL   OFIVE
1280          STL   TEMP4  MULT2
1281  MULT2   RAL   U
1282          SLO   ONE
1283          LDD   MULT6  CHGNP
1284  MULT4   LDD         ALTR
1285          RAL   MPY    OPACC
1286  MULT1   RAM   TEMP4
1287          ALO   TEMP6
1288          STL   TEMP6
1289          RAL   BETA
1290          LDD         CHKOP
1291          NZE         MLT7A
1292          ALO   ODNE
1293          NZE   MULT6
1294          RSM   TEMP4  MLT7B
1295  MLT7A   RAM   TEMP4  MLT7A
1296  MLT7B   SLO   OFIVE
1297          STL   TEMP4  MULT7
1298  MULT7   RAL   BETA
1299          SLO   ONE
```

```
CONTENTS  1238  65  0000  1456
TEMP4     1456  46  1410  1460
          1410  16  1998  1396
          1460  15  1995  1396
          1396  20  0000  0832
IS PREV FL 1433 69  0886  1088
 IF SO IS 0886  45  1090  1091
PREV IN A 1090  65  1961  1815
 ALTR IF N 1815 45  1268  1070
          1070  69  1268  1421
IF PREV FI 1268 65  1956  1510
          1510  45  1414  1915
   FLOAT  1915  65  1321  1125
 AND SET  1125  69  0728  0665
 OPSGN TO 0728  65  0262  1318
          1318  20  1954  1414
          1414  60  0258  0840
          1091  69  0844  1421
    ALTR  0844  65  1954  1560
          1560  15  1464  1120
          1650  69  0414  0665
COMPILES  1700  15  1990  1446
 OPN WK NE 1446 15  1690  1354
          1354  69  1058  0375
          1058  21  1975  0414
OPSGN ZERO 0665 24  1368  1421
COMPILES  1621  15  0924  1379
          1379  69  1368  1103
          1368  01  1368  1368
          0924  69  0000  9000
          1750  15  0434  1354
          1214  65  1992  1697
          1697  35  0006  1062
          1062  10  1965  8003
          1965  60  0472  8003
          0536  65  0384  1650
          0537  65  1140  1700
          0538  65  1141  1650
          0539  69  0742  1421
          0550  65  1404  1120
          0551  69  0550  1647
          1647  24  0448  1801
          1801  65  1690  0552
          0552  15  1990  0553
          0553  15  0721  1175
          0554  65  1108  1650
          0555  65  0490  1700
          0556  65  1108  1650
          0557  69  0558  1035
          0558  45  1112  1514
          0559  65  1012  1650
          0560  65  1564  1170
          0562  60  1366  1671
          1170  69  1573  1103
          1573  65  0776  1700
          1120  69  0262  1416
          1416  24  1961  1650
          1175  69  0778  1103
          0778  65  1081  0936
          0936  69  0448  1103
          1514  66  0988  1643
ALTR AND  1112  69  1466  1421
  ALO ACC 1466  65  0490  1750
          0742  65  1140  1750
          1671  21  1997  1800
          1800  65  1991  1496
          1496  69  1950  0845
          1950  20  1995  1548
          1548  16  1349  1454
          1454  20  1996  1901
          1901  69  1504  1035
          1504  45  1158  1410
          1158  66  0356  1162
          1162  20  1995  1598
          1598  65  1991  1546
          1546  16  0434  1190
          1190  69  1693  1567
          1693  69  1596  1421
          1596  65  0776  1750
          1610  67  1995  0952
          0952  15  1997  1002
          1002  20  1997  1052
          1052  65  0406  1212
          1212  69  1516  0845
          1516  45  1220  1721
          1220  15  0258  1614
          1614  45  1418  1270
          1270  68  1995  1102
          1721  67  1995  1102
          1102  16  0356  1262
          1262  20  1995  1648
          1648  65  0406  1312
          1312  16  0434  1240
```

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1300                LDD     CHGOP
1301                RAL     TEMP5     MULTN
1302    MULTN       STL     TEMP4
1303                RAL     BETA
1304                LDD     OPWK2     CHGOP
1305    MULT8       RAL     BETA
1306                STL     U
1307                LDD               CHGOP
1308                STL     TEMP5
1309                RMI               MULT9
1310                RAU     ONE       MULT9
1311    MULT9       STU     OPSGN
1312                RAL     TEMP6
1313                ALO     LOW
1314                LDD               REF
1315                RAM     TEMP5
1316                LDD     OUT       OSGN1
1317    MULT6       RAL     TEMP5
1318                STL     TEMP4     MULT8
1319    YL          LDD               SETEL
1320                RAL     Y         C11
1321    YN          RAL     Y         CN1
1322    ZN          LDD               SRN       GENERATE N
1323                LDD     WY        GENN
1324    CHKAR       STD     OUT       ALARM IF
1325                RAL     ARITH       FLOATING
1326                NZE     ALARM     OUT
1327    CHKNK       STD     FINI      ALARM IF K
1328                RAU     NU          AND NU
1329                AUP     K           NON ZERO
1330                NZU     ALARM     FINI
1331    CHKNN       STD     EXIT      ALARM IF N
1332                SRT     0004      IS MORE
1333                ALO     FIGTO
1334                NZU     SRN6      THAN  2000
1335                SLO     8001
1336                SRT     0006      EXIT        DIGITS
1337    CHKOP       STD     FINI
1338                ALO               8002
1339                 67     9999
1340                SLT     0002
1341                SLO     8002
1342                SRT     0002
1343                ALO     RAL       FINI
1344    CHKTK       STD     OUT
1345                RAL     K
1346                ALO               8002
1347                RAL     T0001     OUT
1348    TNA         RAL     FL
1349                ALO     ONE
1350                STL     FL
1351                ALO     COM1      GNA
1352    COMMA       STD     OUT         INCREMENT
1353                RAL     ONE1          JNU
1354                LDD               SETJN     THEN
1355                SLO     ONE           COMPILE
1356                ALO     STL         STL PHIJ
1357                ALO     PHI         MINUS ONE
1358                LDD               REF
1359                RAL      8003     OUT
1360    DROPK       STD     OUT       DECREMENT
1361                RAL     K             K
1362                SLO     ONE       STK
1363    DROPU       STD     EXIT
1364                RAL     U
1365                SLO     ONE
1366                STL     U         EXIT
1367    GENN        STD     OUT
1368                LDD     GEN2      STRTA
1369    GEN2        LDD     GEN1      SRAC
1370    GEN1        LDD     OUT       REF
1371    GETEK       STD     EXIT1
1372                RAL     K           EK VALUE
1373                ALO               8002
1374                RAL     F0001     EXIT1
1375    NUINC       STD     OUT
1376                RAL     NU        NU EQUALS
1377                AUP      8002       PLUS ONE
1378                AUP     ONE           AND
1379                STU     NU        JNU EQUALS
1380                AUP     NU2         JNUMINUSO
1381                ALO     NU1       8002
1382    NU1         LDD     J0001     8003
1383    NU2         STD     J0001     OUT
1384    SETJN       STD     EXIT          JNU EQUAL
1385                STL     TEMP1     JNU  PLUS
1386                RAL     NU
1387                ALO     STJN1       CONTENTS
1388                LDD     STJN2
1389                SDA     STJN2     8002    OF LOWER
1390    STJN1       RAL     J0001
1391                ALO     TEMP1     STJN2
1392    STJN2       STL     J0001
```

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1240    60  1743  1567
1743    65  1006  1443
1643    20  1006  1408
1698    65  0406  1362
1362    60  1058  1567
1152    65  0406  1412
1412    20  1991  0894
0894    60  1747  1567
1747    20  1006  1202
1202    46  1506  1556
1506    60  0258  1556
1556    21  1978  0828
0828    65  1907  1252
1252    15  0510  1566
1566    69  1320  1103
1320    67  1996  1302
1302    60  0414  0375
1418    65  1996  1352
1352    20  1995  1152
0185    69  1288  1199
1288    65  1191  0950
0184    65  1191  1050
0226    69  1429  0800
1429    60  0218  1077
0812    24  0414  1468
1468    65  1954  1660
1660    45  0254  0414
0982    24  0833  0986
0986    60  1962  1518
1418    10  1990  1646
1646    44  0254  0832
1261    24  0448  1402
1402    30  0004  1664
1664    15  1568  1623
1623    44  0917  0878
0878    16  8001  1036
1036    30  0004  0448
0845    24  0832  1086
1086    15  1290  8002
1290    67  9999  1554
1554    35  0002  1462
1462    16  8002  1771
1771    30  0002  1477
1477    15  0514  0832
0772    24  0414  1618
1618    65  1990  1696
1696    15  1452  8002
1452    65  0032  0414
1502    65  0320  1225
1225    15  0434  1340
1340    20  0320  1673
1673    15  0826  1107
1037    24  0414  1668
1668    65  0262  1718
1718    69  1821  0974
1821    16  0434  1390
1390    15  0354  1710
1710    15  0630  1136
1136    69  1440  1103
1440    65  8003  0414
0929    24  0414  1768
1768    65  1990  1746
1746    16  0434  1707
1201    24  0448  1552
1552    65  1991  1796
1796    16  0434  1490
1490    20  1991  0448
1077    24  0414  1818
1818    69  0442  1505
0442    69  1846  0850
1846    69  0414  1103
1088    24  0782  1186
1186    65  1990  1946
1946    15  1602  8002
1602    65  0700  0782
0948    24  0414  1918
1918    65  1962  1968
1968    10  8002  1527
1527    10  0434  1540
1540    21  1962  1616
1616    10  1370  1274
1275    15  092A  8003
0928    69  1977  8003
1370    24  1977  0413
0974    24  0448  1652
1652    20  1992  1797
1797    65  1962  1420
1420    15  1724  1577
1577    69  0830  1483
1483    22  0830  8002
1723    65  1977  1131
1131    15  1992  0830
0830    20  1977  0880
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1393          SLT   0006    EXIT
1394  NUMIN   STD   OUT
1395          RAL   NU
1396          SLO   ONE
1397          STL   NU      OUT
1398  SETEK   STD   EXIT
1399          RAU   ARITH
1400          ALO   K
1401          ALO           8002
1402          STU   F0001   EXIT
1403  SETEL   STD   EXIT
1404          RAL   R
1405          STL   L       EXIT
1406  REF     STD   EXIT1
1407          LDD   REF1    OSGN1
1408  REF1    STU   OPSGN   EXIT1
1409  STRTA   STD   EXIT
1410          RAL   U
1411          STL   BETA    EXIT
1412  STNON   STD   AREX2
1413          LDD           PS100
1414          AUP   NONON   AREX2
1415  TKOP    STD   FINI
1416          RAU   K
1417          AUP   TKOP1
1418          LDD   R       8003
1419  TKOP1   STD   T0001   FINI
1420  UCHGE   STD   FINI
1421          RAL   U
1422          SLO   ONE     CHGE1
1423  LARM    STL   L
1424          STL   R       ALARM
1425  ALARM   RAU    0000
1426          SLT    0001
1427          ALO   L
1428          SLT    0003
1429          ALO   R
1430          SLT    0002
1431          HLT    1234   PS
1432  END     LDD   FFA     ARPUN
1433  ARPUN   STD   AREX1   ENDA
1434  ENDA    RAU   A0001
1435          NZE           AREX1
1436          AUP   ARINC
1437          SRT    0004
1438          LDD           STNON
1439          AUP   00005
1440          STU   W0001
1441          RAL   A0001
1442          ALO           8002
1443          RAL   A0001   CKLDD
1444  CKLDD   LDD    8003
1445          SDA   TEMP1
1446          AUP    8003
1447          SIA   TEMP2
1448          SLT    0002
1449          RAU    8003
1450          LDD           PS100
1451          AUP   NONO
1452          SLT    0004
1453          STU   W0004
1454          RAU   TEMP1
1455          SRT    0004
1456          LDD           STNON
1457          STU   W0002
1458          RAU   TEMP2
1459          LDD           STNON
1460          STU   W0003
1461          STL   W0005
1462          STD   W0006
1463          LDD           PS133
1464          LDD   ENDA    ARMIN
1465  ARMIN   STD   AREX4
1466          RSU   ONE
1467          AUP   A0001
1468          STU   A0001   AREX4
1469  FF      RAU   CONSO
1470          LDD           PS7
1471          RAU   END
1472          STU   TAU     PS12
1473  FFA     STU   W0001
1474          STU   W0002
1475          STU   W0003
1476          RAU   ROP
1477          STU   W0004
1478          LDD   START   PS133
1479  TN      LDD           SRN
1480          LDD   TNA     GFNN
1481  TL      LDD   TNA     DROPK
1482  ONET    00     0000    0001
1483  TWOT    00     0000    0002
1484  FOURT   00     0000    0004
1485  FIVET   00     0000    0005
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0880  35  C006  0448
1216  24  0414  1470
1470  65  1962  1520   NU EQUALS
1520  16  C436  1590
1590  20  1962  0414
1179  24  0448  1702   SET EK
1702  60  1954  1760   EQUAL TO
1760  15  1993  1847   ARITH
1847  15  1752  8002
1752  21  0700  0448
1199  24  0448  1802   SET VARIAB
1802  65  1988  1793   SET L EQUA
1793  20  1987  0448     TO R
1103  24  0782  1236
1236  69  1640  0375
1640  21  1974  0782
1505  24  0448  1902
1902  65  1991  1947
1947  20  0406  0448
0523  24  0876  1479
1479  69  1182  0900
1182  10  0386  0876
1223  24  0832  1286   STORE OPN
1286  60  1990  1748     IN TK
1748  10  1604  1810     AND
1810  69  1988  8003   EXIT FRO
1604  24  0832  0832     FINI
0454  24  0839  1336   U EQUALS U
1336  65  1991  1798   MINUS ONE
1798  16  0434  1935
0286  20  1987  1690   SET ERROR
1690  20  1988  0254   IDENTIFCT
0254  60  0000  1606   ALARM
1606  35  0001  1714   SUBROUTIN
1714  15  1987  1241   DISPLAYS
1241  35  0003  1654   L R AND
1654  15  1988  1843   STATEMENT
1843  35  0002  1704     NR
1704  01  1234  1234
1754  69  1208  0927
0927  24  0930  1533
1533  60  1840  1804
1804  65  1258  0930
1258  10  1952  1308
1308  20  0004  1570
1570  69  1773  0523
1773  10  0723  1627
1627  21  1977  0980
0980  65  1840  1904
1904  15  1358  8002
1358  65  1840  1807
1807  69  8003  1764
1764  22  1992  1848
1848  10  8003  1656
1656  23  1993  1948
1948  35  0002  1706
1706  60  8003  1814
1814  69  1620  0900
1620  10  0358  1914
1914  35  0004  1325
1325  21  1980  1583
1583  69  1992  1756
1756  20  0004  1670
1670  69  1823  0523
1823  21  1978  1181
1181  60  1993  1806
1806  69  1910  0523
1910  21  1979  1232
1232  20  1981  0934
0934  24  1982  1386
1386  69  1740  0158
1740  69  153?  1219
1219  24  0922  1375
1375  61  0434  1790
1790  10  1840  1906
1906  21  1840  0922
0242  60  1408  1964
1964  69  1720  0400
1720  60  1754  1512
1512  21  1960  0212
1208  21  1977  1030
1030  21  1978  1131
1231  21  1979    82
1282  60  1436   291
1291  21  1980   633
1633  69  1990  0158
0190  69  1943  0190
1943  69  1502  1177
0247  69  1502  0229
0262  00  0000  0031
0508  00  0000  0012
1321  00  0000  0004
1767  00  0000  0005
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1486	SIXT	00	0000	0006	0384	00	0000	0006
1487	FIGTT	00	0000	0008	1108	00	0000	0008
1488	NINET	00	0000	0009	1012	00	0000	0009
1489	TENT	00	0000	0010	1464	00	0000	0010
1490	TWLVT	00	0000	0012	1458	00	0000	0012
1491	FRTNT	00	0000	0014	1141	00	0000	0014
1492	SXTNT	00	0000	0016	0476	00	0000	0016
1493	SVNTT	00	0000	0017	0977	00	0000	0017
1494	NNTEN	00	0000	0019	0476	00	0000	0019
1495	TWSIX	00	0000	0026	0304	00	0000	0026
1496	NINTY	00	0000	0090	0744	00	0000	0090
1497	ONE	00	0001	0000	0434	00	0001	0000
1498	TWO	00	0002	0000	0390	00	0002	0000
1499	THREE	00	0003	0000	0698	00	0003	0000
1500	FOUR	00	0004	0000	1269	00	0004	0000
1501	FIVE	00	0005	0000	1093	00	0005	0000
1502	SIX	00	0006	0000	0794	00	0006	0000
1503	FFTY1	00	0051	0000	0265	00	0051	0000
1504	OONE	01	0000	0000	0258	01	0000	0000
1505	OTWO	02	0000	0000	1221	02	0000	0000
1506	OTREY	03	0000	0000	0470	03	0000	0000
1507	OFIVE	05	0000	0000	0356	05	0000	0000
1508	FRONE	41	0000	0000	1189	41	0000	0000
1509	FIVEO	50	0000	0000	0988	50	0000	0000
1510	SVTY2	72	0000	0000	0752	72	0000	0000
1511	NINEO	90	0000	0000	0393	90	0000	0000
1512	ALO	15	0000	0000	0490	15	0000	0000
1513	MPY	19	0000	0000	0776	19	0000	0000
1514	STL	20	0000	0000	0354	20	0000	0000
1515	NZA	45	0000	0000	0640	45	0000	0000
1516	BMI	46	0000	0000	1349	46	0000	0000
1517	RAU	60	0000	0000	1366	60	0000	0000
1518	DVR	64	0000	0000	1140	64	0000	0000
1519	RAL	65	0000	0000	0514	65	0000	0000
1520	RSL	66	0000	0000	0702	66	0000	0000
1521	ABCON	00	5000	0000	0410	00	5000	0000
1522	ACC	00	0001	0000	0434	00	0001	0000
1523	ACCUM	ALF	ACC	SOAP2	0691	61	6363	0000
1524	FIXNR	00	0000	0501	1016	00	0000	0501
1525	LDAC	LDD	0001	8002	1248	69	0001	8002
1526	I	00	1000	0000	0452	00	1000	0000
1527	LOCUS	73	6161	6161	0638	73	6161	6161
1528	LOW	00	8002	0000	0510	00	8002	0000
1529	LOW1	00	0000	8002	1153	00	0000	8002
1530	MAX	00	0000	0025	0482	00	0000	0025
1531	MAXE	00	0000	0500	1517	00	0000	0500
1532	MAXU	00	0143	0000	0347	00	0143	0000
1533	NONO	00	0000	9090	0358	00	0000	9090
1534	NONON	00	9090	9090	0386	00	9090	9090
1535	PHI	00	6000	0000	0630	00	6000	0000
1536	SLTI3	35	1003	0000	0843	35	1003	0000
1537	STOPF	06	0051	0000	0334	06	0051	0000
1538	TEMP9	73	6161	6161	0148	73	6161	6161
1539	W	00	7000	0000	1699	00	7000	0000
1540	Y	00	2000	0000	1191	00	2000	0000
1541	REG	79	6567	0000	0785	79	6567	0000
1542	FFTY2	00	0052	0000	1508	00	0052	0000
1543	GOTO	00	0000	0160	0350	00	0000	0160
1544	FIFTY	00	0050	0000	0322	00	0050	0000
1545	HNDRD	00	0100	0000	0206	00	0100	0000
1546	LOINU	60	8002	0000	1564	60	8002	0000
1547	STU	21	0000	0000	1558	21	0000	0000
1548	SIXNI	00	0000	0069	0964	00	0000	0069
1549	COM1	20	7001	0000	0826	20	7001	0000
1550	OFOUR	04	0000	0000	1608	04	0000	0000
1551	NININ	99	0000	0000	0429	99	0000	0000
1552	SCON	ALF	S	SOAP2	0504	82	0000	0000
1553	ICNST	69	9090	9092	1658	69	9090	9092
1554	YCNST	88	9090	9092	0151	88	9090	9092
1555	STDAC	STD	0001	0000	1081	24	0001	0000
1556	CN302	00	0000	0302 0	1404	00	0000	0302
1557	BOP	ALF	BOP	SOAP2	1436	62	7677	0000
1558	CONSO	NOP	8000	8000	1408	00	8000	8000
1559	NINTN	00	0019	0000	1543	00	0019	0000
1560	TEN	00	0010	0000	0670	00	0010	0000
1561	AXO	79	0000	0000	0791	79	0000	0000
1562	LOCS	00	0000	4000	1303	00	0000	4000
1563	Z	ALF	Z	SOAP2	1457	89	0000	0000
1564	SEVEN	00	0007	0000	0672	00	0007	0000
1565	SEVNT	00	0000	0007	0960	00	0000	0007
1566	FIGTO	80	0000	0000	1568	80	0000	0000
1567	RSLLO	RSL	8002	0000	0841	66	8002	0000
1568	NZZZ	00	0000	9999	0462	00	0000	9999
1569	THOUS	00	0000	1000	1066	00	0000	1000
1570	RAB	ALF	G	SOAP2	0418	67	0000	0000
1571	WDIF	ALF	IF	SOAP2	1759	69	6600	0000
1572	W0010	00	0800	0080	1986	00	0800	0080
1573		PAT						
1258	Q0012	RAL	NINET	OPLD	0561	65	1012	1650